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Urban Residential and the Interstitial: Evaluating Multifamily Housing,
Urban and Suburban Living

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Urban Residential and the Interstitial: Evaluating Multifamily Housing, Urban and Suburban Living

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Abstract

When one thinks of important issues in America today, they do not think of running out of housing and buildable land. However, census estimates show that the American population will increase by one-third by the year 2030.¹ So, at the current rates, it will become an issue. To address this situation we must look towards a new residential architecture.

Unfortunately for homebuyers, local councils, irresponsible designers, contractors, and developers control the modern realm of residential architecture. This lack of involvement and irresponsible design by design professionals has lead to the problems that we have that we have today: sprawl, slums, environmental degradation, and urban decay. These problems coupled with population growth, creates environmental, planning and aesthetic problems for future generations. Untouched this situation would result in a hodgepodge of communities that would break the definition of urban and rural boundaries, creating an all-encompassing suburban form.

In response to these problems, the proposal is to meet the needs of the future with socially, aesthetically, and spatially responsible multi-family housing, which by densification space cuts down on land consumption and can create a getter sense of community. This complex will be an amalgamation of strategies from successful multifamily communities with desired American ideals. In addition, defensible space techniques will be applied to fix failures of past multifamily developments.

The project will incorporate unit types appropriate for the projected dominant demographics of 21st Century America and downtown Cincinnati. The project will be located in the interstitial zones and voids created by sprawl, population movement from the central city core, and the expressway conditions. Design techniques and approaches relevant to the conditioning of interstitial space will be used to create an integrated design.

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Chapter 1 – Introduction

1.1– Problem Statement

Residential design, at high ranges of density has been tried in America, and some would say has been unsuccessful as a whole. The concentration of successful multifamily projects has come from Europe, Japan, and many developing countries where space is limited and urban living is embraced. These projects have been designed by both American and International architects however. But, Americans have developed different ideals and culture than the rest of the world due to land availability, and this is what creates the problem with the implantation of an existing foreign typology with a different inherent set of design priorities. Americans want individual ownership and space. This is reflected by the typical subdivision development full of fenced yards, sport utility vehicles, mini-vans, and mammoth roofs. The answer for ownership of land and open space has always been to look outside the city, not at the spaces left behind by population shifts. A successful design must provide what Americans want, and what makes multifamily housing successful with some elements of suburbia and multifamily housing.

This design includes an increase in density from suburbia, but a decrease in density from past multifamily housing, and the incorporation of a range of users to meet the needs of changing American families. This approach to multi-family residential design can address the developing...
problems that have been articulated by the Urban Land Institute. In a 2003 study of the recent census trends, the ULI demonstrated a need for multi-family housing in America, which according to them could answer problems such as sprawl, urban decline, and environmental deterioration.¹

Suburban sprawl is no new issue to the United States. It has been slowly growing since the early 20th Century, but instead of growing at a steady pace, it grows exponentially. The suburbs grew out of the post-WWII housing boom. This need for quick, expansive housing allowed for a market niche in which developers emerged to take control of projects rather than architects. Then you throw in mass production of construction materials and the emergence of the expressway system in the 1950’s and there are the origins of a large problem. This rapid standardization and availability allows for rapid realization of the American dream. No longer do blue collar, inner city tenement dwellers have to settle for less. By moving to the suburbs, they too can live the American dream. All of these things together create a void that quickly becomes filled with architectural uniformity and an aesthetic that is not driven by competent designers, but by the tastes and income of the suburban residents.²

The contention here is not to say that the “American dream” is an undesirable aspiration. Everyone should want to strive to have the best living conditions and financial situation for their family. This is one quality of life that makes America distinctly different than the rest of the globe. However with potential for rapid growth there must be boundaries and guiding factors. By the early 1970’s the amount of suburban growth and population was equal to that of the urban metropolis in the United States.³ Some of these larger areas today have been coined “megaburbs” or the “edgeless city.”⁴ Robert Lang, the author of Edgeless Cities: Exploring the Elusive Metropolis, concludes that its this rapid edge development that could cloud the boundary between what we typically saw as urban, suburban, and rural.⁵ The edgeless city development is now responsible for sixty percent of development in some metro areas. It is this fast growth that makes today’s suburbia more ambiguous and uncontrollable than ever.⁶ The evolution of the suburb is a vast topic onto itself, but the important thing is to see where it’s going and what designers can do about it.

There have been many attempts by architects and planners over the years to try and solve this problem. New Urbanists like Andres Duany,
the creator of Seaside, Florida, addresses the fact that suburbs are not only bad for people, they are also very badly designed. He attests that our suburban sprawl turns the residents into unhealthy and dangerous urban castaways. The suburbs are designed to corrupt and create problems because of their isolation, segregation, and wasting of natural resources. Duany concludes that this version of the American Dream is a corrupted, bastardized version of what the American Dream should be. The problems he addresses with sprawl are not only functional ones, but he also looks at the aesthetics of suburban sprawl as detrimental to residents. This “assaulting” aesthetic quality is blamed upon the range of suburban housing forms, the separation of land uses due to zoning, and the gearing of design towards the automobile. Duany attributes his blame towards mainly the planners and bureaucrats who keep spawning new suburbs. These groups are the ones who have allowed for zoning and the standardization of roadways, dominance of form for the automobile, and misguided governmental policies. These factors then dictate a change in the hierarchy of form. Instead of putting the built environment first, they put the roadways and articular spaces first to dictate the form of the buildings. This then creates a paradox for designers because the built

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8 Ibid.

9 Ibid.

10 Ibid.
environment no longer is number one, it takes a back seat to secondary infrastructure.

Low density, multifamily housing is a rather new building type to the United States that could prove to solve multiple problems, not only the one’s that this thesis addresses. Besides housing needs and revitalization the main problem is suburban sprawl. With population growth and movement away from cities, the mass of the population is shifting. Also with the movement from urban to suburban, there is a shift from high density housing to an extremely lower density of housing. To counteract this, one can implement higher density multifamily complexes that would contain some of the outward movement. One of the most appropriate sites for these new complexes would be the voids left by the population shift in the interstitial space of urban zones, therefore not moving outward but filling the voids within.

Multifamily housing reduces the amount of required infrastructure such as roads and sewers that developer neighborhoods require.\textsuperscript{11} Multi-family housing can also have a lower environmental impact than low-density residential housing. Since multifamily housing requires less infrastructure than low-density residential, there is use of less raw materials, less consumption of energy to create infrastructure, and less digging up and stripping of land. The ULI states that multifamily

\textsuperscript{11} Ibid.
structures: create efficiencies in garbage, mail, and recycling that reduce energy consumption; are more compact and have fewer impermeable surfaces; and their residents have tendencies to use public transportation or have lesser commuting times.¹²

When looking at the housing market, one must look at the demographics, and the typical American family is no more. There is past U.S. Census data that reinforces these trends. From 1900 to 2000, the average American family decreased from 4.76 people to 2.59 people.¹³ In the year 2000, there were three times as many widowed or divorced men and women as there were in 1950.¹⁴ Of all the new households established in the 1990’s, two-thirds of them were headed by single adults or single parents with families.¹⁵ According to the Urban Land Institute, “Married couples with children have been declining in number since 1970 and now account for just one-quarter of the American population.”¹⁶ Because of this trend towards atypical families, nontraditional households are now the majority, instead of the minority in the United States.¹⁷ Finally, the demographic see as typical renters, people between the ages of 20 and 29 who have had declining numbers in population over the past two decades, will see an increase

¹² Ibid.
¹³ Haughley, p6.
¹⁴ Ibid.
¹⁵ Ibid.
¹⁶ Haughley, p2.
¹⁷ Ibid.
of eleven percent in population between 2000 and 2010.\textsuperscript{18} As a whole, nontraditional households do not have the income that a traditional family has. Making these complexes mixed income would then increase marketability and decrease economic failure because of the larger demographic appeal. Therefore, offering a product with a wider price range is a smarter economic decision than settling with one demographic.

So, with these main areas of concern in mind, one can then approach the architectural question of how one can best design a multi-residential complex that will be attractive and affordable enough to draw people in and break the stigmas of higher density residential design. The design importance is then broken into the whole and the parts. The whole project must seem cohesive and not like an amalgamation of housing types to be successful. Here the idea of neighborhood and community becomes important. At the same time however, the units must be individually distinguishable and adaptable, so that users feel a sense of ownership and individuality. The units must also cater to the varying user groups. Units for single parent families will be different than those for the elderly or single people in their twenties.

Precedent may be the most important area of research for this typology. Analyzing what has been done and how these designs have been successful or unsuccessful is imperative in selecting design

\textsuperscript{18} Haughley, p7.
alternatives. Coverage of American projects and international projects is necessary to get the proper analysis of successful precedents required for the subject matter. Once the important ideas from the literature and precedents have been properly analyzed, it is imperative that checklist of imperative strategies and areas of concern be developed for design. The core ideas will then be laid out for design implementation.
Chapter 2 – Background: Policy and Precedent

2.1 - History of Multifamily Housing in the United States

To understand the need for effective multifamily housing today one must examine its past and origins in America. The Urban Land Institute defines multifamily housing as five or more dwelling units within the same building, side by side, or on top of each other. This definition is important to examine the right typologies in or past and present culture. Pre-19th Century there was an abundance of multifamily housing in colonial America. Many families would live together in the same roof, related or not. This was mainly due to the economics of the 1700’s and the fact that many people could not afford to be landowners, let alone sole homeowners. At this time only about one in six people in the United States owned property.¹ At this time in New York City, there were many property owners doing ground leases. Landowners would lease out land to multiple tenants and it was their responsibility to keep up and improve upon the parcel and the building. Once the lease was up their duty was over. These were the first multifamily rentals in colonial America.

By the Industrial Revolution in the 1800’s growing immigration and industrialization was creating a population boom in the inner cities. Factories springing up in the cities also meant that this was where the

jobs were and that’s where the blue-collar population went. So, there was a great need for affordable, higher density housing in the city for the working class. Tenements became the new building type, defined as any building with three or more households under a single roof. The term tenement still has a terrible connotation today. While tenements where built close to the factories and meant walking to work, this also meant extremely high pollution, especially in major industrial cities like Chicago, New York, and Pittsburgh. Tenement landlords made good profit because of the fact they could maintain a low level of upkeep and the fact they could jam as many people into these buildings as possible. Tenements became the home of disease and death because of their bad construction, terrible plumbing and sewage, and overcrowding. This separation of the wealthy and the poor and immigrants became the birth of the inner city ghetto and slums (Schmitz:2000).

Towards the end of the 1800’s, advances in public transportation and technology, allowed better off families to move out of the city to the suburbs and commute by trolley or train. The slums were a continuing problem ever with this slight shift. In 1893, the Board of Health concluded that more than one million New Yorkers lived in multifamily dwellings.\(^2\) This was seventy percent of the New York population, of which eighty percent lived in tenements. With the publication of Jacob Riis’, How the

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\(^2\) Schmitz, 6.
Other Half Lives, in 1890 and an 1894 publication by the Commissioner of Labor on slums, the population of the United States began to grow aware of the terrible problem in the inner cities. New York was the first city to begin passing laws and codes for tenement housing and health codes. Reform began slowly and the slums began to slightly improve.

Up until this time not all multifamily housing was tenements. Increased land values caused only the rich to be able to afford a detached house. Apartment complexes began to be developed for the middle class. More respectable than tenements, these buildings had amenities such as electricity and indoor plumbing. These buildings were very popular because of their style of living, but also because developers made very good profits because of the high demands. These apartments did not change the common American’s opinion towards multifamily housing however. Apartments and tenements were accused of being the source of crime, disease, and sexual depravity. At the 1921 National Conference on Housing, James Ford said that “a child’s sense of individuality, moral character, and intellectual efficiency could only develop in a private, detached dwelling.”\(^3\) Some people ignored these accusations and still invested in apartments because of the growth of construction technology. The steel frame and elevators allowed for high-rise, high-density dwellings in the city with more space and comfort. As of the census

\(^3\) Schmitz, 8.
of 1920, more Americans lived in the city than in rural areas.\textsuperscript{4} Like in colonial America, being a homeowner was nearly impossible, so more multifamily buildings were being constructed and old row houses were being subdivided for rent. This trend continued through the 1920’s and the construction boom was only aided by the standardization and mass production of construction materials and with the leadership of the hero architects (Schmitz:2000).

With the stock market crash of 1929 and the Great Depression, nearly all construction was halted. However, there was now an incredible for more affordable housing. At this point the Federal government stepped into the housing realm, a place they had not been involved with before. The Housing Division of the Public Works Authority was established in 1934 and the United States Housing Authority in 1937 to aid in the production of multifamily housing and the clearing of slums. These new homes were to be owned by the local governments, and despite early resistance were very successful.

During World War II, the housing industry declined to focus on wartime production. Once the war was over in 1945 and the population returned from overseas, there was an extreme shortage of homes. The 1950’s saw a boom in housing production, mostly in the suburbs due to the availability of land, the implementation of the highway system, and

\textsuperscript{4} Ibid.
the emergence of the residential builder as a major player in the housing industry. Although almost all of these homes were single family, there was one post-war innovation in the multifamily sector. Gustave Ring’s mass production of garden apartments became the new typology of the 30’s and 40’s. This multifamily model has stuck around and “between 1960 ad 1978...almost 50 percent of the rental units built in the United States were garden apartments.”

In 1949, the federal government passed the Housing Act of 1949 that promised decent homes for all Americans. This coupled with the emergence of the home loans of today and highways allowed people to own their own homes for the first time, often outside of the city. In the wake of this movement, an urban void was left. Subsequent legislation by the federal government to solve this problem lead to urban renewal. The goal of urban renewal was to demolish the slums and revitalize the poorest parts of American cities. Two problems emerged from this. People who were displaced from the slums were not given adequate compensation to live elsewhere, and not enough consideration was given to the effect on the remaining infrastructure that would suffer. The government responded with public housing, and this was very often multifamily housing. This building were built using the latest architectural and planning theory and the reflected the style of Modernism. High

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5 Schmitz, 10.
rise structures like Stuyvesant Town in New York became a model for designers. Architects like Le Corbusier and Mies van der Rohe designed similar high-rise multifamily urban apartments, but they were often for the upper class and not affordable by the targeted class. The common American Modernist public housing projects like Pruitt Igoe and the Robert Taylor Homes failed to meet expectations and were considered 20th Century failures, permanently giving public housing and its users a black eye (Schmitz:2000).

During the late 1950’s and early 60’s, multifamily housing saw a decline due to the increase of single-family homes, the passing of new tax legislation in 1954, and scandals surrounding Section 608 legislation. In the mid-1960’s, multifamily housing began to recover, but took on a different face. With substantial migration of people to California, Texas, and Florida new infrastructure had to be built. Section 202 was also passed to allow for more affordable housing for the elderly, who were now a large part of this shifting demographic. In 1961, Section 234 of the Housing Act allowed for the construction of condominiums. They were not popular at first, but with the emergence of REITs, the construction of apartments and condos in the suburbs during the 1970’s became popular. With the move to the suburbs, the apartment industry adapted to the increase of usable space, and created complexes with many more

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Schmitz, 13.
amenities like pools and tennis courts.

With the trend of America moving towards a less “traditional” household, multifamily homes were on a slight rise during the 70’s. However, the energy crisis of 1973 would put a halt to construction because of escalating costs. To help out the situation in 1973, President Nixon made the Department of Housing and Urban Development to oversee all federal housing assistance programs. With the passing of the Housing and Community Development Act of 1974, Section 8 was created to direct funds directly to the client in need instead of the housing project. This is still a major part of housing today. With the economic fluctuation of the 1980’s, multifamily housing construction declined and virtually ceased during the later Reagan administration and continued into the 1990’s with Bush.

During the 1990’s, it was the general consensus that past public housing initiatives were all failures. Developers and owners had to become increasingly business savvy and evolve to make profits. With Clinton’s creating of HOPE VI, the crime ridden high rise structures of old were demolished and replaced with lower density, mixed income neighborhoods where tenants could develop ownership over time. Since this time, multifamily construction has grown in the United States. A new generation of clients emerged and saw renting as a viable housing

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7 Schmitz, 14.
solution. Revitalization of downtowns and adaptive reuse increased the number of people moving into the city. Even with this trend, “from 1994 to 1997 just over two-thirds of the rental units built in the United States were built outside central cities.”\textsuperscript{8} Currently there is still a need for multifamily housing as shown by census trends. With the sprawl of people to the suburbs from the city, voids left behind could serve as excellent spots for a less dense multifamily development that meets the needs of the target demographic. It is up to the architect to continue this trend and try to erase the stigma that surrounds urban, multifamily development through aesthetics and design.

2.2 - Precedent Analyses

To better understand how I am using each individual precedent in this document, I am categorizing them to help the reader understand what elements I am analyzing and extracting from each design. There are three main categories that will be looked at: past “failures”, contemporary American designs, and European and Asian designs by both American architects and foreign architects. The term failure is put into quotations because whether the precedent was a failure or not can be somewhat subjective in certain cases.

\textsuperscript{8} Schmitz, 15.
2.3 – Failed Projects

Pruitt-Igoe – Minoru Yamasaki

Pruitt – Igoe, perhaps the most well known image of multifamily housing failure in the United States, completed construction in 1956 in St. Louis, Missouri. St. Louis had been suffering from an extreme loss of urban population to the suburbs. Resulting from this was the origin of the ghettos and slums. Poorer families could not afford to move out to the suburbs, so they replaced the people who left. Usually this demographic was of African American ethnicity. In order to resurrect the city and create re-growth, multifamily housing projects were put into place in the very communities that were inhabited by the displaced families. A young New York architect, Minoru Yamasaki, would be hired as the chief designer of Pruitt-Igoe and other St. Louis projects. City leaders in St. Louis believed that this Modernist style of multifamily housing championed by the likes of Le Corbusier would be the savior of the inner cities. Yamasaki was a proponent of high-rise Modernist structures, claiming they were a “practical necessity” that would remove the “cancers” from the city and that “they are best suited the needs and limitations of the situation.” He went even as far as to condemn low-rise walkups.

10 Van Hoffman, p199.
11 Van Hoffman, p197.
When completed the complex consisted of thirty-three high rise towers with a total of 2,870 units. At this rate the ratio of units per acre was between 55 and 44.4. Originally more towers were to be built along with row houses, however the St. Louis Housing Authority cut them because of budget. The projects were also to be racially integrated, but they could not attract white tenants and they became solely black. With these occurrences, Yamasaki claimed that the design would fall short of what he intended because of the increased density and scale and the budget cuts made by the PHA that were a response to inflation. These budget cuts made Yamasaki make some cuts in the construction detailing, room sizes, and in the amenities and luxuries that would be put in the projects. These “luxuries” included paint on concrete block walls in the circulation spaces, insulation on pipes, screens on windows, and public restrooms on the ground floors. With these things occurring many people who didn’t have to live in such conditions didn’t. Pruitt-Igoe’s vacancy rate rose to sixteen percent in the 1960’s, which was only three to five percent for the rest of St. Louis. In 1970 this rate would reach sixty-five percent. Since the tenants who lived there were mostly on welfare, the income of cash could not support the maintenance and management fees, so they went on strike. During these periods, the projects became riddled with crime. The gallery spaces between circulation and elevator stops

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12 Van Hoffman, p200.
13 Ibid.
became known as “gauntlets.” Gangs and thieves broke the infrastructure and graffitied the walls. In 1970, a remodeling program was undertaken to improve amenities, but it couldn’t stop the downward spiral and the PHA was forced to demolish it in 1972.

The original thought was that Modernist high-rise apartments with amenities would bring the upper and middle class back to urban St. Louis. Unfortunately, due to budgetary changes and the extreme faith put into Modernist design, they attracted low-income families. Without a policing agent in the buildings and on the ground, and direct access to the site by emergency vehicles, crime could fester and build. The idea of “superblocks” to stop traffic from gaining thoroughfare through the site was used to no avail as well. Yamasaki was one of the first architects to use the skip-stop elevator system in a real design. This allowed for thinner slabs, but made tenants travel two floors sometimes to get home. Apartments were lined with large, long corridors to give the high-rise structure some interior, exterior spaces for “children to play.”

These spaces then became the before mentioned gauntlets because of their immenseness and the lack of direct circulation. If no respect and effort is put forth by owners and designers to give people a quality product, they in turn will not respect the property as their own.

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14 Van Hoffman, p195.
Key points derived from precedent:
- Importance of low-rise design and site integration of building design to control of public space
- Material selection in terms of durability, ability to be refinished, and quality selection
- The superblock’s detriment to site and urban circulation due to the lack of interior roads

Robert Taylor Homes – Shaw, Metz and Associates

Once completed in 1962, the Robert Taylor Homes became the single largest public housing development in the United States. The “projects”, as they came to be known in Chicago, were located adjacent to the Dan Ryan Expressway on the South Side. The Robert Taylor Homes were just a part of a huge public housing movement in Chicago during the urban renewal phase of the 1950’s. The main objective was to clear out slums and replace them with high-rise, mixed income complexes on the same ground that the slums were demolished. The 4,312 units of the Robert Taylor Homes were completed in 1962. The architects, Shaw, Metz, and Associates, designed the twenty-eight, sixteen story buildings largely in groups of three in a horseshoe formation. They were red and yellow brick clad, poured concrete structures built in the same “gallery” style that Yamasaki’s Pruitt-Igoe was built.

Like Pruitt-Igoe, the goal of these buildings was to create a
modernized place for lower and middle class families to live instead of the slums that were created by the industrial tenement slums of early 20th Century Chicago. The Chicago Housing Authority was responsible for the design and erection of the complexes. The high-rise construction type was chosen for multiple reasons. First, going vertical meant that there was more open space on the site and one could get more units in less area. High-rise construction was also deemed to be more cost effective than low-rise structures because it could exploit new technology and materials.\textsuperscript{15} Having to purchase fewer sites also meant that the housing authority would have to spend less political capital and save time. The Housing Act of 1949 also specified that 810,000 units of public housing had to be erected in the next five years, so by going with dense, high rises the city could meet its annual quota much easier.\textsuperscript{16}

Similar problems arose in the construction of the Robert Taylor Homes as in Pruitt-Igoe. Private funding was needed to undertake the large construction costs, and at some point funds would fall short so cuts had to be made in design and construction. The rooms were scaled down in size, shoddy materials were used, and basic construction principles were overlooked like insulating shafts in the buildings.\textsuperscript{17} The design suffered as well, even though there wasn’t as much design consideration


\textsuperscript{16} Ibid.

\textsuperscript{17} Ibid.
as in Pruitt-Igoe. The buildings were like giant monoliths in an open field devoid of trees, landscaping, and or anything that would give the project some sense of scale. The grounds around the buildings were covered in grass though, unlike the pavement of Pruitt-Igoe. The gallery hallway scheme was used as a projected activity area for the children of the building, but the Chicago AIA would later prove that this typology was the “wrong format for housing families and children” because of the lack of community scale.\textsuperscript{18}

Like Pruitt-Igoe before them, the Chicago Housing Authority demolished the last of the Robert Taylor Homes in 2003. The problems with the complexes were similar to that of St. Louis’, but not on the same scale. Residents in the complexes felt like “project rats, living on a reservation like untouchables.”\textsuperscript{19} The Chicago Housing Authority is in the process of replacing the displaced families of these projects with more appropriate multifamily housing in the form of mixed-income, low-rise walkups and single-family homes that are at the same scale as the urban environment that occurred before the erection of the Robert Taylor Homes.

**Key points derived from precedent:**
- Design of units towards the appropriate demographic for best fit
- Importance of a differentiation of scale between urban residential

\textsuperscript{18} Smith, p295.
\textsuperscript{19} Smith, p298.
and the rest of the urban fabric
- Integrated greenspace in design regardless of urban space

2.4 – American Projects

Loloma 5 – Will Bruder Architects

In the Loloma 5 project, Will Bruder Architects makes a bold move by trying to implement low-density multifamily housing with an urban aesthetic into a suburban context. The project is located in Scottsdale, Arizona, one of the more rapidly growing cities in the American Southwest. The Southwest has a unique suburban context in that most of the suburban development there was post-WWII and sprouted almost overnight. This new development has a very modern aesthetic due to the architectural influence of people like Frank Lloyd Wright and Paolo Soleri in the southwest. So the design question with this project is two-fold, how does one put an urban typology into a rapidly developing suburban context, and where does the frontier past of the southwest meet its modern ties. To counteract the inherent problems of sprawl Bruder decides to “juice up” suburbia to bridge the cultural and aesthetic gap between urban and suburban.20

Loloma 5 is the first of three residential projects that Bruder is doing with Context Development. It is serving as the initial test of

Bruder’s hypothesis on suburban multifamily implementation. Since this project was a test, the site and project are of smaller scale, less risky than a much larger development. The program calls for five town houses to be put onto a narrow 9,000 sqft site in Old Town Scottsdale. These 1,540 sqft town houses must attract buyers that would just as easily settle for purchasing a regular suburban home instead of living in a multifamily complex. The site offers mixed context off old and new. The older existing buildings are of typical Spanish-style, but there are multiple modern developments that make this square a “nucleus of an emerging downtown scene.”

The site’s narrowness does not allow for conventional arrangement of the buildings. Instead the architect angled the five, three-story units to optimize views of the mountains and other areas of the site. The façade facing the main street is clad with zinc panels to give the complex a more distinguished image. Along the northern glass façade facing the mountains, the architect put the site circulation, both vehicular and pedestrian. In this space interaction between users is encouraged and it is somewhat private because of the two adjacent buildings. This space also allows the residents to pull their cars under their townhouses.

The construction of the complex is concrete block foundation with a wood framed top. These materials along with the corrugated steel, wood

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21 Ibid.
and metal veils give the complex a rugged aesthetic that is contextually appropriate. Even though each unit is the same size and layout, the massing and form of the building doesn’t allow for conformity. This can also be attributed to the excellent use of materials and detailing on the facades. The units allow for different levels of privacy, breaking the program into three different levels. Interior space is also set aside for a possible at home working area.

The building form is an east/west linear orientation. The five units are rectangular in plan with a north/south orientation. Along the northern wall the flat façade is broken into a triangular projection that allows for views from the master bedroom. Circulation is centered in the core of each unit and is separate for each form. The perforated metal panels allow for some passive shading systems on the facades, and other green systems are incorporated into the design much like other projects in the southwest.

The aspects of the Loloma 5 project that make it a significant precedent are not physical as much as they are conceptual and programmatic. Bruder’s ideas of connecting the old and new aesthetics in a suburban/urban zone would have been a risk for most developers, especially with the demographic they were trying to lure in. In this case the unit they offered was spacious, segmented well, and offered the possibility for a home office, something appealing to the new generation of young professional families. The courtyard also “creates a public realm...
where residents can meet and develop a sense of community.”

**Key points derived from precedent:**
- Aesthetic choices based on the likes of the target demographic
- Unit entrances protected in the core of the design away from public access
- Circulation progressions allowing for a protection of spaces transitioning from semi-public to private

**Palm Springs Modern Homes – DesignARC**

Like the Loloma 5 project, the modern homes of Palm Springs are sited in the southwest in a region that has strong architectural ties. The Modernist community has a strong presence in Palm Springs since the first Frank Lloyd Wright and Albert Frei homes were erected there. However, since the 1960’s the growth of Palm Springs has suffered some because of its image of a resort town and a place for Los Angelinos to go for a holiday. In order to revamp the housing market, DesignARC and Dennis Cunningham Developers began making single-family Modern homes eight years ago. They chose the Modernist aesthetic to tie in the nostalgic look of the past prosperous times.

These single-family homes were double height wood framed buildings in the form of L-shaped plans where the voids in between

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22 Pearson, p134.
became the yards. These yards contained pools and gardens that were protected by the buildings and high walls from prevailing winds. These homes sold easily because of their desert aesthetic to non-traditional families, so the developer saw an opening in the housing market to take advantage of. He set DesignARC out to create more Modernist homes that were multifamily and at a density that is more urban than suburban.

The multifamily projects, 48@Arenas and 48@Baristo, were designed and built between 2000 and 2002. The complex at Arenas was constructed in two phases of clusters of eight, three deep on each of the two adjacent lots. The units are two stories and have double-height living areas much like the first projects the team did. Also like the other projects, the L-shaped plans and urban density creates many private exterior spaces. Some of these spaces are also terraces and trellised for sun shading. The Modernist aesthetic and material choices gives a large connection between interior and exterior, which is very important to the scheme because of the increased building footprint. These footprints are then arranged on the site like tiled puzzle pieces giving the site some complexity.

When asked if the architects used the precedent of Spanish village towns for the organization and density of the complex, which is

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24 Ibid.
the default typology for Palm Springs, they said absolutely not. They tried to deny this style because “Spanish Revival is the architecture of the colonizers.” They went with the Modernist aesthetic because of its success in the housing market and “The Modernist vision was socially inclusionary. It was optimistic, expressing faith in a democratic future instead of an inappropriate display of power and wealth.” This aesthetic is therefore also more appropriate for the clients they seek to market to.

The most important aspect about these projects is the architect’s evolution from a less dense suburban form to a more dense urban form in a setting that doesn’t necessarily require it. The increase in density allows for a better definition of defensible space and privacy, but at the same time allows for community because of the closeness. The Modernist aesthetic also draws from something historic, but could still be considered avant-garde because of the lack of Modernist homes in America today. Finally, these projects are directed at resurrecting a fluttering city creating an “urban spirit” with their density and are placed in commercial sectors, away from traditional single-family housing.

**Key points derived from precedent:**

- L-Shaped plans organized in a manner to create defensible spaces between them and terraced private greenspaces

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25 Giovannini, p141.  
26 Ibid.  
27 Ibid.  
28 Ibid.
- Appropriate design for micro and macro site
- Double height spaces with traditional wood framed construction

**Orange Grove – Pugh + Scarpa**

Located in West Hollywood, California, the Orange Grove development by Pugh + Scarpa fills a void in the residential market that is similar to that of the Modernist projects in Palm Springs. The 6,700 sqft multifamily development is located on what was a vacant lot in a residential part of West Hollywood. The developer, originally in commercial real estate, saw a need for more flexible loft space in West Hollywood, especially in this section where residences were dominantly low-rise apartments.\(^{29}\) The developer hired Pugh + Scarpa to create a building that applied “the minimal elements of Modernism to create urban environments with an edge.”\(^{30}\)

From the beginning the architects knew they were working with a small budget, but they took this into consideration early so it wouldn’t affect the design. By using cheap materials such as stucco, which also reflects the 1960’s and 70’s buildings around it, and a conventional wood frame structural system ideal for the tall, narrow building.\(^{31}\) The building takes place as two large forms rising above the low-lying existing buildings. They are treated with the stucco and rusting metal louvers.

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\(^{30}\) Ibid.

\(^{31}\) Ibid.
that create an open and close relationship between the building and the site. These elements give Orange Grove a “physical and psychological relationship to the street,” which reflects the “evolving notion of urban living in Los Angeles.”

The complex has five individual units that are fairly similar, only varying slightly in plan. They are arranged on a north/south axis with the circulation on the northern face of the complex. Like the Modernist homes of Palm Springs, the interiors are full of double height spaces with a color and materials palette that is light and of an industrial nature. Each unit has two private balconies that are oriented for maximum sun exposure with privacy number one. The plan in rectangular in form with the kitchen and living area separated by the open staircase and a translucent shower and bathroom area. The stairs lead up to a much more open second floor plan that can be used for a master bedroom or a business area. The architect, Scarpa, suggests that the narrow site was advantageous to design because “Having taller spaces where there is no one living below or above is advantageous to the resident. It clearly establishes each person’s domain, and I think is easier for people to live in.”

Even though the complex was designed with minimalism and a budget in mind the design makes it successful and appealing to buyers. The incorporation of well-crafted and clean interior finishes creates a

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32 Ibid.
33 Milionis, p144.
nice, light space for living and work. The use of double height spaces and the flooding of light due to the Modernist aesthetics also deems very appealing to the residential market. Flexibility, clean lines, and light are three areas of design that seem to be a universal good thing when one talks to prospective buyers and renters. Like the other projects, the Orange Grove development seeks to achieve a more Modern aesthetic at a density that is more urban where the building forms stretch to the lot lines for an urban feel. These past two statements seem to be underlying similarities that these projects have.

**Key points derived from precedent:**
- Materials and construction similar to cheap, suburban building
- Open plans and double height spaces for maximum flexibility
- Aesthetic similar to residential homes of the area

**The Titan – Jonathan Segal Architect**

Architect and developer Jonathan Segal took a few risks with past projects in downtown San Diego that were deemed stupid at the time of construction. However, Segal thought that with the redevelopment of downtown San Diego that people would want to move back to the city and into attractive lofts and row houses. He constructed many dwellings that were live-work spaces on the fringe of San Diego’s urban redevelopment. Now he is reaping the benefits of his foresight.

His latest project, the Titan, is located on the fringe of Little Italy
between the San Diego freeway and the bay. This past of the city was quickly being redeveloped and because of its density offered an excellent urban setting with the bay, trendy stores, small businesses, and Italian restaurants near by. With the low interest rates due to San Diego’s housing crunch and the changing image of the urban fringe his projects became instantaneously successful.\(^{34}\) The other factor in the success of the design would be the construction cost, because Segal himself was financing it. The final price per square foot was $86, Segal’s lowest price to date.\(^{35}\)

The inspiration for the forms and aesthetics of the projects came from the sculpture of Donald Judd and the painting of Richard Diebenkorn who Segal was intrigued with at the time.\(^{36}\) Both the artists explored geometrical forms using steel and perspective paintings. Segal wanted to translate their art into a façade with “scale and rhythm to dance down the street.”\(^{37}\) To achieve this Segal created two forms that seemed to be two separate buildings colliding with different geometries and treatments. The front façade is clad with rusted, mild steel, while the other form is mainly light stucco and glass. The metal horizontal box stays low to the ground while the light glass mass rises high on the site. A walkway and social courtyard unite the interstitial space between the forms.

\(^{35}\) Jarmusch, p148.
\(^{36}\) Ibid.
\(^{37}\) Ibid.
To cut costs and keep the construction costs low for the 22 units, Segal eliminated double loaded corridors, elevators, underground parking and traditional fire stairs. Instead each unit is stacked upon another and are accessed through individual exterior stairs. The units use double height ceilings and light flooded rooms like the other projects, but unlike the others the square footages for the Titan are incredibly lower, ranging from 450 sqft to 950 sqft. Some walls are completely glass, giving the spaces a much larger feel and connecting them with their courtyards. The complex only has thirteen parking spaces for the twenty-two units, so Segal assumes the clients will do a lot of walking. This area is covered however, and extremely well monitored because of its interior inclusion in the forms.

This project relates the most to the end product of this thesis in many ways. Both Cincinnati and San Diego are sprawling cities where there is an attempt being made at urban revitalization. The units in this complex are smaller square footages, with an extremely dense and random patterning. Most of all the cost and demographics for the projects are similar. While spaces like these would go for much higher prices in California, in Cincinnati they would be perfect for young professionals and childless families.

**Key points derived from precedent:**

- Facades along major roads respond to the movement of traffic

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Ibid.
- Range of unit sizes and variations to fit wider range of clients
- Trendy and flexible design reflecting the young professionals’ culture

2.5 – European and Asian Projects

Housing in Fukuoka – Steven Holl

Steven Holl’s housing complex in Fukuoka, Japan exemplifies the execution of very basic multi-unit housing principles by a signature architect while still keeping the parti and the designer’s signature style intact. The twenty-eight unit complex was completed in 1991 along one roadside block on the outskirts of the city of Fukuoka. The site sits at a “T” shaped road intersection that occurs along the southwestern façade. The road has a slight curvature towards the east that Holl reflects in the massing of the complex. There are three other buildings to the east of the complex that are new in construction and reflect the size, color, and the avant-garde of Holl’s building.

The complex is essentially a five-story rectangle with a slight curvature to it. From that mass Holl carves out four courtyards that face the southwest to create a comb-like shape. The entire complex is clad in various shapes of light grey precast concrete, except for the southwestern façade which is precast that is dyed black. This increases the illusion of the cutting ad carving of the form that Holl uses to achieve his two concepts of articulated and empty space. The floors of these
spaces are shallow pools of water, which “are conceived as empty spaces for meditation, in isolation from the everyday life of the houses, and raised above street level. These four openings join up with the rest of the complex via their respective porticoed spaces opening onto the inside of the block.”39 Along the rear of the outdoor spaces is the central circulation spine through the center of the rectangular form.

The first floor path leads one through the public and private sectors of the building: the shops, cafes, playground and the pools respectively. The path on the second level connects staircases to the apartments along with closed views of the open courtyard. The last circulation path on the third level is open to the sky above, which is “the building’s third element of relation.”40 Along the sides of the five forms that protrude the spine are porches for the individual tenants. They are represented as random punctures in the building’s skin, along with the windows, and are articulated by a change in material to aluminum sheets used for the porch railing. The orientation and positioning of these porches allows sunlight to reach the north facing porches, “so that the complex is never subject to closed shadows or marked hierarchies, this being precisely the process of what Holl calls articulation.”41

In the twenty-eight living units there are eighteen different types

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40 Cerver, 182.
41 Ibid.
of units derived from five typologies: an L-shape, linear, bi-level, and two combinations of the first three. They are assembled together as pieces to different puzzles that create a similar form yet all vary in section and plan to create a similarity with an inner complexity and uniqueness. The interior of these spaces reflects these same ideals and also the multi-functionality of partitions and elements in Japanese housing. Moveable screens and pivoting panels allow for a variation in interior space. The aesthetic however, is more that of Holl than traditional Japanese architecture and design.

Holl’s aim in this project was not a creating an object, but “to provide an apparatus which combines meditation with interrelation, privacy with community, visual connections with enclosures. Here, architecture is seen as a mechanism to facilitate the various requirements of life, material as well as spiritual, rather than creating conditions or imposing its own logic.” These simple binary oppositions are achieved easily through Holl’s manipulation of form, space, detailing, and materiality. These elements take what could be considered normal apartment homes to a signature level, and create a possibility of respect and fondness for ones dwelling.

In the early stages of this design it can be assumed that Holl boiled down the ideals of his user in order to achieve a better design. In this situation, his clients were urban Japanese singles and families. From

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42 Cerver, 185.
the Japanese culture he took the ideas the public and fast moving urban life, meditation, respect for nature, and the functionality of design. By successfully incorporating each of these ideas into the design, he creates a bond between the user and their surroundings. These apartments are more likely to be considered a home rather than some place where they hang their hat at night. This grooming of the design is an area that must be taken more seriously and thought through more thoroughly if more American designs are to be successfully implemented.

**Key points derived from precedent:**
- Five plan typologies generating unique floor plans for each unit
- Balconies that are subtractive and therefore provide for a semi-private experience without detracting from the form
- Design elements and greenspaces reflecting the culture

**Goldstein South Housing Development – Frank O. Gehry**

The Goldstein Sud Housing Development located eight kilometers outside of Frankfurt, Germany, is a good example of a transitional work from Frank Gehry from his early collage-like work to his current sculptural forms. The forms of the buildings are still very rectilinear in volume with Gehry’s signature sculptural forms clad in zinc panels added where desired. The orientation of the buildings on site and the landscaped paths also add to the sculptural form with still having a preconceived purpose.

The complex is located to the east of Frankfurt in the last
undeveloped housing zone of the time, Goldstein South. This plot of land has connections to educational facilities, a community sports complex, and a mass transit tram stop. The connection and close vicinity to amenities such as education, recreation, and transportation are very important factors in the decision making process for users. So, the siting of this complex could not be more advantageous. Within the boundaries of the complex, the program includes 162 housing units with adjacent parking areas, a social center or clubhouse, small neighborhood retail shops, and a semi-public park, which ties the entire complex together with a twisting path. The park’s major spaces are distributed along a natural circulation path that occurs in the complex. There are two major axes: a north/south and an east/west. The north/south axis connects the semi-public park with the greenbelt. The east/west axis connects the housing with the tram stop and the educational facilities. These two paths are discernibly different because of their aesthetic treatment. The north/south axis is planted with a variety of trees because of its connection of the park and the greenbelt. The east/west axis is seen as more of a transportation path that has a linear grid of trees and hardscape paths made for pedestrian and bicycle travel.

The housing units are organized into seven major blocks that vary in scale and from three to five stories in height. They are arranged on the site to create semi-enclosed courtyards between them. It’s these courtyards that connect to the major paths and are broken up by these
paths to create spaces within the courtyard. The interior planning of each of the housing blocks differs with its orientation to the site and its relationship to the amenities on site. There are three basic plan strategies used by Gehry "that yield a variety of plan typologies." The housing units that run along the east/west axis have exposure to southern light for the kitchen, dining, and living areas, and views of the axis’s foliage and greenbelt. The units that run along the north/south axis have the kitchen, dining, and living areas oriented perpendicular to the building, so that these spaces have access to the morning and afternoon sunshine. Each of these blocks was then oriented along the circulation path as to emphasize them and the spaces they serve.

Gehry’s aesthetic for the building is one of binary opposition. For the rectangular common forms that have the living units, he clads them in a low relief plaster with varying colors that are extremely bold: white, burnt sienna, and yellow ochre. These forms have flat roofs that step within each form to create terraces and varying heights. The windows for the rectangular forms are in a very repetitive grid with the only variation being the number of mullions. The windows are very visibly framed with white paint and on some occasions the windows wrap the corner of a building. To oppose these forms Gehry uses his signature zinc paneling to clad the entries, stairs, penthouses, and balconies. The forms of these

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programmatic elements are more sculptural and range in shape. The balconies are stacked trapezoids with punctures for the user. The vertical sloping along with the stacking of these forms allows each shape to act as a roof for the space below.

The entrances are composed of concrete ramps and stairways with a curving swoosh roof of zinc panels. Interior stairs and other programmatic elements have forms ranging from very rigid, sharp shapes to curving cylinders. This play of materials and changing of forms gives the building a very interesting aesthetic while creating an intuitive knowledge of the building in the user because of the allocation of certain materials and forms to certain programmatic elements. This use of the zinc panels “contrasts with the level planes and formal simplicity of the rest of the surfaces comprising the various facades of this residential complex.”

**Key points derived from precedent:**

- Additive forms with distinct material and formal differences to allow for a quick knowledge of entry versus unit
- Site paths creating semi-private subspaces for use by select users
- Connection between existing infrastructure outside the site and interior to the site

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44 Broto, 278.
Buchen Housing Estate – Santiago Calatrava

The Buchen housing estate by Santiago Calatrava is a pure example of a housing development that was constructed with the idea of keeping a repetitive form and using prefabricated modular pieces. Located along a main road outside of the small town of Wuerlingen near Zurich, the homes are situated on an open field plot of land owned by the Remer Real Estate Company. The entire complex consists of twenty-four freestanding dwellings arranged in two twelve-unit rows around a main square. Three groups of six terraced homes were also located at the southern part of the site parallel to the edge of the woods and the main road and perpendicular to the entry road. These were the buildings given to Calatrava. The main stipulation given by the realtors to Calatrava was that concrete be the major building material of the entire colony.

Calatrava uses the sloping nature of the site and the ability to create “plastic” prefabricated concrete forms to drive his design along with his style of structurally expressive forms. The site naturally slopes down from south to the north, from the tree line of the forest to the main road. Calatrava uses the slope to create terraces, three main levels in section, and multiple outdoor spaces for each user throughout the entire complex. On the northern façade, the lower levels of the dwellings are exposed to the field through a large amount of glazing. From each dwelling the user can access their own semi-private patios, which are separated from each other by translucent screens. The heavy curved...
form of the third level overhangs these patios. At the center of each patio overhang there are tapering columns with diamond sections that are at a diagonal to resolve the bearing forces of the third level, which are the building’s "characteristic image." Each of these northern third level faces also have their own glazing with tapered overhangs to restrict the views into the other dwellings. This northern side is seen as the main entry point.

Moving to the southern side on the lower level on encounters a straight run of stairs that lead from the lower level to the backdoors of the complex and the woods. This is considered to be the second level and the next level of outdoor spaces or the backyards. The stairs are arranged together in pairs along the complex. The rear façade is mostly glazing as well and is shaded by a large horizontal fin. Glass skylights along the rear walk allow sunlight to reach the vestibule before the stairs below. The separation of public and private is expressed through the two opposing forms of the building: "The rooms of a more public nature look out to the double-height portico, creating a semi-glazed façade. Only a narrow concrete panel separates one volume from the other. The volume containing the top floor bedrooms, a total of three per unit, begins right above this continuous and communal arcade space to stretch back toward the woods under a shell-shaped roof." This third level of the building is

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45 Broto, 256.
46 Ibid.
accessible from each unit's spiral staircase, which resembles a gazelle’s antler, at the northern corner of the living space.

The exterior treatments of the buildings have an extremely early 20th century International Style appearance. As stipulated, the entire structure and cladding is prefabricated concrete with only a few exceptions: the steel tensile railing for the stairs and the large amounts of glazing. However, no matter what the material, the entire complex, inside and out is painted white, with only the green tint of the low-e coating glass to contrast. This paint job and the range of forms and shapes allows for a great deal of shadow play. The Venetian blinds in the photos can lead one to believe that because of the large amount of northern and southern glazing there is a great deal of thermal loss and gain. However, for the more aesthetically in tune consumer, Calatrava’s sleek design could seem very desirable.

**Key points derived from precedent:**

- High visible reflection of site in design parti
- Transition from public to private on the interior of the spaces via vertical circulation
- Building form and treatment appropriate to the construction materials and methods
Chapter 3 – Background: Literature Reviews

3.1 – Design

The fact of the matter is human beings are social animals. We live together in groups because of our need for social interaction on a daily basis. As of the early 1990’s, “over three-quarters of the population of the Western world live in town and cities. Most live in housing which was built as part of a group.”¹ In Colquhoun and Fauset’s publication, Housing Design: An International Perspective, the authors look at developments of grouped and clustered housing in the Western world over the past quarter century. From that they separated the developments into categories based on site and user types. They then developed seven design principles that were used in the successful strategies by architects. Not to reflect on each of these areas in the design process would have to lead to design failure.

The first design principle is the size of the development and scale appropriate to site. The authors say that the scale of the project must be possible to be designed by one architect or a small team of architects, so the projects do not become to big and inhuman.² Smaller scale projects also allow for smaller scale construction methods and detailing, which

² Colquhoun, p14.
can become expensive and complex at a larger scale. They also attribute the failure of multifamily housing programs of the mid-20th century to the large scale. They suggest that “architects and planners need to come to terms with the problem of creating development strategies for which ensure that individual projects are of a sufficiently small size within an overall coordinated urban design policy.”

For the design this means simply keeping the overall impact low and considering how the existing infrastructure will be affected by the new complex.

The second principle given by the authors is the importance of designing roads and footpaths, which relate to the buildings. They also attribute the segregation of traffic and pedestrian paths to the failure of 1960’s multifamily housing. It’s the isolation and break of the common front door that makes the building undesirable and often inconvenient. Merging the existing grid with the new development is the task here, while still maintaining good traffic flow and not ignoring the pedestrian.

The third principle branches off the first two. It is the building’s appropriateness to the site. This involves a response to nature, terrain, and culture. This is more than a site study, it is design incorporation. The fourth principle takes this idea, but says to relate design appropriately to built form according to scale, proportions, and orientation.

The fifth topic area is probably the most critical for this type of development.
project because it has to do with image. The image of multifamily urban housing isn’t a good one. For a design to be successful it must be so great that the image of this typology is changed. The authors state the when it comes to aesthetics today’s patrons “seek refuge in nostalgia.” Whether it’s an old Arts and Crafts style or building a complex that resembles the urban forms that used to be there, this is what developers want. This is the architect’s dilemma. Does one design for modern style or the user’s taste? The book lays out seven subheadings under image to consider: a degree of aesthetic complexity, many attractive ground level entrances, careful choice in color and materials, resident personalization of land, design the corners, show difference in form and buildings through changes in aesthetics, and only attempt the avant-garde on a small scale.

With the importance of the exterior image there is also an importance given to the interior design. The design of interesting interior spaces is important to success. Again the authors lay out seven subheadings for consideration: personalization of private spaces, placement of windows for views and light, staircases as a visual link, roofs designed to maximize volume, relationship between private indoor and outdoor spaces, the hearth, and well designed communal areas outside the dwellings. While not all these factors can have equal weight

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4 Colquhoun, p17.
5 Colquhoun, p19.
6 Colquhoun, p21.
in the design, it is important to find a balance. Interesting floor plans and exterior form must go hand and hand in this project to maximize space usage.

The final characteristic of successful multifamily design is the incorporation of the residents in the design process. This final area may not be as applicable for this thesis. The incorporation of users means that the people who will be living there have already been selected and that the project is more community based than design by an architect. The process of design for this thesis just cannot support such an effort. However, the other six characteristics do deem themselves important, but can often be overlooked. Having looked at some of my precedents and reading this text, there are definite correlations between good design and what the authors have stated.

3.2 - Methodology

In attempting to fully integrate the new typology of this thesis into an existing urban setting, I am looking at Peter Eisenman’s work and investigations in the interstitial and with the technique of blurring. In Eisenman’s works compiled in Blurred Zones, Eisenman and other authors review his past projects that he has term as blurred or interstitial projects. This constitutes a third step in Eisenman’s design process that takes a greater consideration to site, program, and diagram to make a fully integrated work that fits the existing context. In Eisenman’s words,
“Blurring, or the blurred zones that characterize the work presented here, deals with the world of affect, rather than effect, as presenting a strategy for a different mind/body relationship in architecture.”

The first idea of blurring, has more to do with a conscious attempt to view all information on a site, program, and design diagram in order to create a project that blurs its boundaries and fits its context better: “Blurring is one strategy for unmotivating not desire itself but the specific desires for such things as presence, ground, and meaning. Blurring is a conceptual activity.” In doing this Eisenman takes on usual deconstructivist activities such as breaking down and redefining familiar binary pairs and “seeks to undermine the conceptual as well as the physical clarity of elements such as figure and ground.” Once the normal conceptions of figure/ground and poche have been “blurred”, the process of the interstitial has begun and the spaces that are produced no longer have traditional relationships and hierarchies, but a higher degree of interaction and less degree of definition.

In Eisenman’s works presented here he breaks his design process and that of conventional architects down. Eisenman states that he introduces something new to the design process here: “Blurring takes

8 Eisenman, p7.
9 Ibid.
many definitions = the between, the interstitial - and many different forms in the work that is presented here. Basically, the process of blurring introduces a third phase into the process of design.”\textsuperscript{10} The two initial steps contain the textual material of site and program and typical architectural typologies. Eisenman’s third step is “a diagram, a blurred condition between form and content, between site and program...”\textsuperscript{11} that stems from the amalgamation of as much research and analysis as possible.

All the information complied by Eisenman produces diagrams and themes that create tropes which drive the space forming process: “This site diagram interacts with the diagrams of function and type in a transformative process that produces a melding of all three.”\textsuperscript{12} If the diagram is executed properly, a blurred zone is produced where interstitial spaces exist. Spaces that are not secondary to walls or structure, but themselves have the ability to push and pull the design in certain ways. These forceful spaces “could be a void within a void, an overlapping within space of space, creating a density in space not given by the forming of a container with a profile.”\textsuperscript{13}

The processes of blurring and the interstitial have given me a better understanding of the design process and the design diagram. Their incorporation into my design methodology is vital to this projects success.

\textsuperscript{10} Eisenman, p8.
\textsuperscript{11} Eisenman, p9.
\textsuperscript{12} Eisenman, p96.
\textsuperscript{13} Eisenman, p100.
because many of the characteristics of this thesis resemble greatly the projects Eisenman reviews in *Blurred Zones*.

### 3.3 – Environmental Behavior

In residential design, more than other forms of architecture, the designer must take into careful consideration the wants and needs of the family. If the desires of the family are not fulfilled, they are likely to move to a place that meets their needs more effectively. Residential design is like no other because of the large selection and the rate of turnover. So for one’s design to be successful, one must analyze what satisfies the user physically and psychologically.

In the collection of essays in *Residential Environments: Choice, Satisfaction, and Behavior*, the authors address the issues of environmental satisfaction of the user in residential architecture. Their backgrounds range from architects to psychologists, and their findings range from the theoretical to the scientific. I feel that this book could be a valuable source of information for the design of my thesis project and also a springboard into different areas of research that the architect may not know to focus on for designing.

As was stated before, the nature of this book is one of a wide variety of findings and reports. The authors come from different backgrounds and even though it was written from the perspective of western culture, the studies cover both the eastern and western
hemispheres; and where I am particularly interested the United States and northern and western Europe. The book addresses that the largest void in western residential design is in the lower-middle to low income range, not the target demographic of most American designers or developers. This typology has been a constant struggle in the United States, which has seen failed implementation of many government-assisted projects.

Where American designers have failed, other foreign markets have succeeded. While this success is due to the difference in cultures states earlier between Europe and the States, the text points to design quality first. One of the authors, Juan Ignacio Aragonés, points to the fact that unlike American projects, European projects are more appropriately designed with higher quality materials and with low-income families in mind.¹⁴ This disparity is one area I wish to concentrate on in order to bring some European concepts into American design more appropriately.

The book also concentrates on the ideas of dwelling and home. While there is no mention of Heideggerian views on dwelling, the underlying idea remains the same. The authors point to a difference between the “house” and the “home”, to the difference between just living and dwelling: “...the physical dwelling also exhibits a psychological

dimension of an emotional nature, in which a feeling of comfort and safety merges with the need to personalize dwelling.”\textsuperscript{15} With other texts, I can take the theoretical ideas of dwelling from Heidegger and merge them with the psychological aspects of dwelling from this text. In the introduction to the essays, Aragonés touches on the importance of the home:

These material changes are significant, but the dwelling is more than a structure full of things. It is also an institution created for different ends. Its construction is a social phenomenon. Its form and organization are influenced by the culture in which it develops and may be viewed to reflect the relationship between culture and environment.\textsuperscript{16}

He mentions the cultural aspects of the construction of the dwelling and the communal nature of it. Before modern construction techniques, the building of homes was a group effort of the family and neighbors. This dependence created not only a great neighborly bond, but also gave the family some stake in their home. Their blood, sweat, and tears went into the construction of the home, and as one of the authors points out later in the text, an important characteristic of successful of low income housing is that the users feel a responsibility and ownership of the space.\textsuperscript{17}

Another essay in the text talks to the idea of scale, in the architectural sense of the word. The authors point to four layers of

\textsuperscript{15} Aragones, p3.
\textsuperscript{16} Ibid.
\textsuperscript{17} Aragones, p4.
residential architecture: “Dwellings, neighborhood, neighbors, and urban community...” which “... imply two dimensions of possible inquiry: one physical, which refers to installations and services, and the other social, concentrating on social networks.” For this thesis the idea of project scale is most likely the most important initial decision that will be made. The project already has a multi-family communal aspect, but to what extent. To what densities can one design to before it is too much or not enough? The text addresses this complexity: “The complex neighborhood experience, which consists of an amalgamation of physical, social, perceptual-cognitive, and behavioral components, results from a compound of social and physical characteristics of the residential environment.” The idea of the neighborhood and social interaction plans a large part in the choice of a residential community. The book recognizes this and states, “The components and aspects of residential environments can be grouped in three levels...first is the physical level...second is the psychological level...third includes social relationships...” So the choice of a user group is now crucial to the appropriate design. Young families are especially defensive and picky when it comes to dwelling, according to the text. You do not have to study the socio-family construct to understand that a young mother and father will want the best environment for raising a family.

Aragones, p5.
Ibid.
Ibid.
One last small study in one of the essays also intrigued me. It has to do with pro-environmental issues and aspects of the community. The author, John Thogersen, comes to the conclusion that environmentally responsible programs such as recycling, which often fail because of individual lack of care, can thrive in a highly interactive community. The main reason for this is a social peer pressure and the idea that if more people do it, more change is seen.

This text could be a vital source to my thesis because it covers the ideas of spatial design, site, community, and dwelling from a fresh psychological perspective that can be easily understood and applied in an architectural sense.
Chapter 4 – Hypothesis

4.1 – Thesis and Assertions

The problems set forth in the beginning of this document are two-fold: what do architects, planners, and developers do to meet the potential housing crunch of the twenty-first century appropriately, and how do we confront sprawl and the multiple sub-problems that sprawl entails like environmental issues, aesthetics, and sociological implications. It is my thesis that these problems cannot be solved all together, they are too large and difficult to figure out. However, attempts can be made to make small strides in the right direction and in essence kill two birds with one stone. What I propose is low-density multifamily housing structures that occur at the interstitial and urban fringe spaces left behind by suburban sprawl. With the appropriate attention given to density and correctly contextualizing the design, along with the selection of the appropriate demographics to design for, I believe that this typology can be both financially effective and effective at making small steps at addressing solutions of suburban sprawl.

The project that results from this hypothesis will be placed in an underdeveloped urban zone in Cincinnati.

4.1.1 - Increase in remodeling numbers may lead to a possible shift towards renting. Also shows U.S. homes are getting older.

4.1.2 - Similar increases are also seen in maintainence and repairs in homes, showing the age of U.S. homes.
Cincinnati, and more specifically Hamilton county and Butler County, is in the top thirty metropolitan areas when it comes to population movement due to sprawl. Setting a specific location and site will allow the design to be tailored specifically to a certain demographic that will be considered the population that is most prone to filling the urban void. The renting demographic in the twenty-first century is larger than one would assume:

Residents of multifamily rental housing are as diverse as the population itself. They span income distribution, from households that could buy a home but choose instead to rent, to moderate-income renters, to lower-income households that rent out of necessity. Apartments also serve a variety of lifestyle needs. Upper-income households are attracted to the convenience and location of upscale apartments, often found in cities and high-end neighborhoods. Lack of maintenance, ease of relocation, and convenience of location and transportation are other factors that encourage households to choose rental housing.¹

The renting population is beginning to challenge typical stereotypes and have become higher wage earners, young professionals, empty nesters in the inner city and suburbs looking for better commutes or freedom for ownership

responsibilities near employment. So, first the designer must act as the developer and figure out the correct demographical projections for the future by looking at population movement trends, census data and birth rates, and the headship rate. The headship rate is the percentage of population that heads households determined by marriage rates, divorce rates, remarriage rates, and the age at which children leave home. With census trends showing that there is a movement towards atypical American families, the young population staying independent longer, and the renting demographic enlarging there will be not only an increase in the number of individual households, but households in the median range that is appropriate for renting.

Considering all the renting demographics, only a few seem appropriate for a downtown Cincinnati complex. Past trends and housing movements in downtown Cincinnati have been geared lately towards young professionals and recent college graduates. These demographics are mostly in the middle income bracket because they do not have the earning power or credit line yet to purchase a home, nor do some of them want to because of the idea of buying a

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2 Colton, p120.
3 Colton, p35.
home in suburbia or elsewhere is considered “settling down.” Also included in the upper part of this mid-range renting demographic are single male or female professionals who are not married or have been married and find renting better because of their freedom from homeowner responsibility and the convenient location downtown offers. Once one compares these demographics to census and population growth trends there is a correlation. The young professional population or what will be referred to as the “echo boomers”, the demographic of twenty to twenty-nine year olds that resulted from the baby boomers, will become a major in the renting market: "Predictions of future housing demand will largely depend upon an analysis of the echo boomers and the aging of the baby boomers, the two largest cohorts."\(^4\) Statistical analysis in the next section will show this demographics size and characteristics.

Once that demographic has been decided upon and appropriately design for, the population shift back towards the center of the sprawling form will cause some default positive movement against sprawl that is both consciously and unconsciously seen. In the design and building profession

\(^4\) Colton, p41.
“growing concern over suburban sprawl has renewed both public and private interest in the role apartments can play in creating more livable communities. Recognized for their often more efficient use of infrastructure and service delivery, and their contributions toward reducing congestion and pollution, apartments are becoming an important ingredient in the smart-growth agenda.” An effective design must then take the appropriate strategies that are outlined in the precedents and in the literature to create a design that becomes a part of the surrounding community, but serves a magnet and example for similar future growth.

4.2 – Evidence and Reasoning

A large part of the reasoning for this hypothesis is derived either by straightforward analytical deduction or by reviewing articles and documents from groups that analyze future trends for the government by charting census trends, like the Urban Land Institute or the Department of Housing and Urban Development. The first assumption that the population will see a growth boom is a basic trend demonstrated by generation fluxuation. It is said, “The large size of the echo boom generation was largely due to the

5 Colton, p120.
increased number of potential mothers from the baby boom cohort, along with moderate increases in fertility rates. In 1990, the number of births reached 4.16 million, nearly matching the 4.3 million record set in 1957.”

From this basic analysis, one can assume that there will then be a need for more housing just as in the mid-20th Century because of the baby boomers: “The demand for housing production in the decade of 2001 to 2010 is therefore projected to be almost 10% greater than for the decade of the 1990’s.”

The 1990’s already saw an increase in housing numbers because of moderate population growth and coming out of the recession of the 1980’s, but a third of this growth was due to immigration, both legal and illegal. Based off the housing trends of the 1990’s, researchers were then able to determine the increase in the housing population for the next decade: “Projections by the Joint Center for Housing Studies in 1999 indicated that the number of U.S. households should increase by an average of 1.1 to 1.2 million annually from 2001 to 2010.”

As stated before, this average growth in the housing market will be due to the echo boomer generation coming of adult and buying age in the first decade of the twenty-first century: “By 2010, the echo boomers will account for more than one in ten owner households and four in ten renter households.” The same census information that tells us of this

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6 Colton, p34.
7 Colton, p36.
8 Colton, p35.
9 Colton, p41.
growth also shows some slight demographic trends. This echo boomer generation, unlike the previous baby boom generation or generation X, is more racially diverse, is more educated on average, is more individualistic and independent, and is in no rush to get married or settle down. Men and more importantly women are more career minded. A majority of these young adults are then put into the middle wage category that “makes up the remaining 37% of multifamily households. As a whole, middle market multifamily renters are younger and more mobile than affordable or lifestyle renters.” The rest of the middle wage earners are then made up of young, mobile households, college grads without enough money to purchase a home, mature single women without children, and single parent households. For these people renting in multifamily structures is a very appropriate, if not necessary solution.

4.3 – Opposing Views

The major opposition to this thesis is the obvious growth trends in homeownership. Homeownership has become much more viable a solution in the twenty-first century mainly due to the low interest rates stemming from 9-11. Homeownership is also seen as a more intelligent solution than renting because of the equity one can earn from making a purchase. Unfortunately, the less fortunate earners who need that equity the most are the ones that cannot afford to buy as easily for multiple

10 Colton, p128.
reasons. Rising property costs due to sprawl are also a factor. Lots to build homes on that are closer to the central metropolitan area have become increasingly more expensive, i.e. Orange County and the counties of Atlanta. So, besides those who must rent, it is really a decision of individual tastes and lifestyles.

It is the lifestyle of the twenty-first century young adult that I think will increase the renting market. Even with homeownership rates increasing in the 1990’s, the amount of apartments constructed was also increasing.\textsuperscript{11} With trends toward more white collar jobs and a more urban, fast pace lifestyle, the freedom of multifamily living maybe an appealing solution to a generation that is already showing signs of individuality.

4.4 – Conclusion

In looking at precedent and the history of multifamily housing, sometimes it does not matter how innovative or responsive the design is if the money or the research is not there. From what I have seen, the largest aspect that is similar between all the successful contemporary projects is someone’s, be it an architect or a developers, vision to recognize a potential trend or unattended niche in the housing market. So, by applying a similar strategy to this design project, half of the success is already in place if the correct typology has been established.

\textsuperscript{11} Ibid.
The next task is in the design. The design must be appropriate for the demographic chosen and also fit its urban context. Movement towards more urban living must be on the agenda for people in the future if some sort of dent is to be made in the problems of sprawl. Housing Trends in the Twenty-First Century agrees and states, “The challenge of suburban sprawl should provide an incentive for the development of multifamily residential alternatives in both suburban and urban locations.” Solving the dilemma of sprawl is going to come down to the realizations of the many, rather than the innovations of few.

12 Colton, p168.
Chapter 5 – Design Criteria

5.1 – Introduction

The major reasons for the selection and characteristics of the program and site are based mainly upon the trends and demographics of the past census research. In response to these numbers and the major demographic characteristics a certain typology was constructed that would meet both the intricacies of the demographic and the problems of sprawl addressed earlier in the document. Using both precedent and personal experiences a basic program was derived and then alerted to fit specific changes in the overall project direction (see diagram 5.2.2). The site was always considered urban or on the urban fringe. The site selection depended strongly on the demographic selected and an appropriate setting for them, as well as a raw lot size that was determined by research. This research produced an equation that was based on basic square footages and density relationships in urban and multifamily environments. The site was then selected based on design possibilities and overall individual features.

In the design itself, there are some key challenges and issues that I wish to address in the program and the process. First, how does one use design concepts like Eisenman’s blurring and interstitial zones to create a design that breaks normal conceptions of binomial pairs, but still has a strong sense of defensible space principles which rely highly upon
the ideas of property distinction and defined boundaries. Second is the integration of site features. This falls under the section of blurring also. This design must go farther in discreetly hiding parking or dumpsters than placing fences and bushes in sight lines. The next design issue is the interior spaces and layout. The goal is to achieve an efficient use of space, but the question is how to achieve this in a non-conventional manner. Also, how are variations in the floor plans introduced that still make the units uniform in design and construction, but provide places for individuality and design features? The final design problem is all encompassing, dealing with form and aesthetics. In an environment like Cincinnati, where there are not many signature buildings and the people are conservative, is it more appropriate to create something that stands out in a good way, or a design that blends with the context and takes less of a risk but is potentially better accepted.

5.2 – Program

The program for this project is for the typology of a low-density (in terms of urban), low-rise urban multifamily housing complex directed toward the demographics that include the “echo boomer” generation, young professionals, couples without children, and single professionals that enjoy the freedom of an urban setting. The program is then responsive to the type of dwelling units and the most of all the amenities that will attract the desired demographic. Multiple designs and layouts will
be offered for the units, in order to produce variety and a more desirable product. The following are the program, square footages, and spatial descriptions that have been derived from precedent analysis, typological research, and personal experience. The size of the complex and number of units is derived from an equation, as mentioned earlier, that was assimilated through various sources. Once applying these equations to the desired site, the size and shape then become more concrete.

**Desired density - 25 to 30 units per acre**

(Total unit square footage + Amenity square footage)

\[ \times 1.25 \text{ (mark-up for circulation, HVAC, etc)} \]

\[ /3 \text{ stories maximum} = \text{approx. 30% lot square footage} \]

**Unit types:**

Single Bedroom - 500 to 600 SQFT

- variations: loft style, couple design, and single occupant design
- basic spaces: master bedroom, restroom, kitchen, flexible room for living or dining area, master and public closets
- amenity spaces: area for laundry hook-up, private balcony, additional storage, larger kitchen

**Lot Coverage Percentages:**

Building Footprint - 30%

Parking Hardscape - 10%

Greenspace - 30%

Service (Trash, Garage, etc) - 30%

**Parking Requirements:**

Single Bedroom - 1 car

Two Bedroom - 1.5 cars

Three Bedroom - 2 cars

*Plus basic code and zoning requirements

Diagram 5.2.1 - Complex adjacency diagram.
Two Bedroom - 600 to 800 SQFT
- variations: loft style, family design, and two occupant design
- basic spaces: master bedroom and smaller bedroom or equal room combination, restroom, kitchen, flexible room for living or dining area, bedroom and public closets
- amenity spaces: area for laundry hook-up, private balcony, additional storage, larger kitchen, two restrooms

Three Bedroom - 900 to 1100 SQFT
- variations: loft style, family design, and three occupant design
- basic spaces: master bedroom with two smaller bedrooms or three equal bedrooms, restroom, kitchen, flexible room for living or dining area, master and public closets
- amenity spaces: area for laundry hook-up, private balcony, additional storage, larger kitchen, two restrooms

Secondary / Amenity spaces:
Lobby - square footage to be determined by circulation
Community or Social room - 600 SQFT
Swimming Pool - 800 SQFT plus service area, indoor or outdoor TBD
Laundry area - 400 SQFT, possible relationship to pool and health area
Health Club - 1800 SQFT, located adjacent to pool
Administrative offices - 800 SQFT each, located adjacent to lobby
**Service spaces:**

Garbage area - dumpster corral, located central to complex
Central Utility area - cable and phone switches, and gas and water meter locations in a central location for each building for easy service access
Parking - ten parking spaces available for those going to business office or delivery. Garage containing approx. 100 spaces for residents and staff.

**5.3 - Site**

Choosing the site location was a process of deduction in which possible sites were systematically eliminated from a possible list based on the evolution of the thesis and the site’s compatibility with the typology and the desired demographic. First, the site had to be placed in an urban setting, in which the space and lot were a secondary, “interstitial” space that was a result of decades of infrastructure evolution. Secondly, the site had to have an appropriate scale to it. The lot size and surrounding building heights had to reflect that of the building typology of the site.

With that information I selected a triangular slice of land bounded by Seventh Street to the North, Central Avenue to the East, and the Sixth Street ramp to northbound
Interstate 75 to the South, on the western side of downtown Cincinnati. This site is currently occupied by two buildings belonging to a Baptist ministry, who is looking for a possible reconditioning of the site because of demographic movement. The site slopes sharply at the southern edge to meet the grade of the Sixth Street ramp, but the area is bounded by a treeline to break the visual and auditory effects of I-75.

The site receives its shape and designation as an interstitial space because of the nature of its origin. Prior to the 1950’s, this parcel would have been a simple rectangular block in the westward extension of the Cincinnati cartesian grid. After the addition of the highway system and specifically I-75, the site became a backwash of land that was shaped by the ramps and flow of traffic around it. Now the site has two major faces because of the one-way, dual direction traffic flow around the site. On Seventh Street to the North, traffic enters the city from the interstate and is exposed to a long northern facade of the site. On the southern side the movement is reversed. Traffic from the city on Sixth Street is heading west towards the highway in one of the cities largest emptying points. This is one of the many positive reasons for why this site was selected:

- Located at major entry/exit point to city, near highway
- Topography offers protection from highway with access to city
- Location is close to other apartment developments
- Close proximity to Cincinnati Convention Center, City Hall, and other downtown businesses
- Smaller urban scale

The major hurdles that this site provides are issues that are associated with downtown Cincinnati. Downtown living must become a viable option for the young demographic. In similar cities to Cincinnati where there has been a resurgence in the downtown, it usually begins with the young generation moving in because of what the city offers, which is totally different from that of a suburb which could seem too family oriented.

5.4 - Design Focal Points

This section will focus on describing the elements that have been extracted from research and precedent analysis that will be directly integrated into the design process. They include both design elements and features of successful multifamily housing precedents and the appropriate characteristics of the suburbs that will be applied to an urban setting so that a better transition is made for users to the core, and people for a lack of better words “given what they want.”

**Personal Space** -

Part of homeownership that is appealing is the chance for personalization of space and landownership. It is important for someone to customize and personalize their house so that it becomes a home. This idea will be used on both the interior and exterior of the design. Units will be designed with some elements of flexibility in mind by the use
of movable partitions and such. Also, renters will be allocated exterior hardscape and greenspace for socialization or gardening. This will also allow for community interaction, but must include some level of maturity and tolerance for other’s desires and activities.

**Safety and Security -**

For the American family the suburbs provide safety and separation from the supposed crime and vices of the city. In the suburbs this is achieved through community strength, built environment such as vegetation and fencing, and also through property spacing. In order to lure people back into the city, the spaces must feel safe and be designed so that they define the properties boundaries clearly. Using defensible space techniques defined by Oscar Newman, the buildings will use their presence and mass to define edges that will keep the desired demographics in and the troublemakers out. The importance here is to keep the design from looking like a fortress with gates and fences, and still achieve some level of block transparency.

**Automobile Freedom -**

The American suburb was a product of the automobile revolution, and because of that the suburbs are designed with the automobile in mind, especially in terms of hierarchy and scale. In an urban setting such as Cincinnati, the car is still needed and will be provided for in the design.
The design will allow for secure, covered parking that will serve its first purpose, but also be a community interaction point. So residents will still maintain the freedoms that a car provides them, but the eyesores that a great deal of parking will cause will be hidden and integrated.

**Unit Variation** -

One common theme amongst successful precedents in this typology is the availability of many different floor plans or unit types and the characteristic of these units being multiple floors. Having a larger selection of floor plan types allows for a wider range of tastes within the renting demographic, and therefore a larger percentage of occupancy. Units with multiple units, like the ones examined in the precedents section, allow for different levels of privacy in the unit. In some cases one of the levels was actually designed to be flexible enough to provide for an at home office, which has become popular recently because of the technology and connectivity available through the home environment not just the business environment.

**Exterior Space Integrated into Design** -

Another characteristic of successful designs, not just in this typology, is the integration of the landscape and exterior space into the design to work as a whole. In this design this area is ever more important because of the relationship between this area and defensible
space and the characteristics of the suburbs. For example, in Gehry’s Goldstein South Housing design, emphasis was placed on creating a design with paths connecting the important adjacent parts of the site, the transportation and the park. Of his braided path, between the building masses, were then opportunities for site amenities like benches, private sitting areas, and children’s playground equipment. Because the suburban home has a yard, this design must also offer some integrated greenspace for activities and added aesthetic quality.

_points of community interaction_

A common thread in a few of these points is community interaction. A renting complex with a larger degree of community interaction and activities has a greater chance for success and a lack of crime. The suburbs offer points for community interaction by default because of their density and the cul-de-sac. This allows both couples and their children to interact with others easily. So, in the circulation spaces and exterior spaces it is important to allow for spaces of interaction, being solely visual or more desirably audible. These spaces must be more than elevator waiting areas. Some contemporary complexes offer community rooms with games and movie screens that can be rented for parties and entertainment on the grounds. Strengthening bonds between individuals creates a greater level of pride, respect and responsibility.
Providing Amenities -

Perhaps the most obvious design point is providing amenities. The American culture tends to gravitate towards the extremes, purchasing items with the most bells and whistles. In purchasing or renting a home, it is usually the owner who provides the most amenities and the largest range of specialization that has the greatest amount of success. This trend began in the 1970’s with the implementation of simple things such as pools and tennis courts, but has escalated to private health centers and wireless internet access. In a society where one-stop shopping stores reign supreme, it is important to provide as much variety as one can on site. These spaces are outlined further in the program and will be selected based on the characteristics of the demographic.

5.5 - Methodology

The formation of the methodology for the resulting project of this thesis is the direct result of the selection of the site and its characteristics. Since this site is considered an interstitial space, there is a certain amount of infrastructure and history that influence any possible built formation. In order to take all this data into consideration, the formation of a design matrix with layers of physical and design data was formed. In ways this approach to the design of the massing is similar to Peter Eisenman’s approach to the interstitial outlined in chapter three of this document.
On top of the use of the grid and force lines generated from the existing infrastructure in the Eisenman fashion, there were additional areas of design concern in the matrix: defensible space, programming ideals, and circulation patterns. Once all the information was compiled into a design matrix, appropriate drawings were generated from individual intersections of the matrix. These drawings range from the conceptual to

<table>
<thead>
<tr>
<th>ARTERIAL CIRCULATION</th>
<th>DEFINING MODULES</th>
<th>CHARACTERISTICS</th>
<th>MASSING METHOD</th>
<th>TREATMENT/MATERIALITY</th>
<th>RELATIONSHIPS</th>
<th>IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>W TO E 7TH STREET DECEL N CENTRAL AVE 30 MPH CITY E TO W 6TH RAMP ACCEL PEDESTRAIN N/S ON CENTRAL</td>
<td>ONE WAYS, ACCEL/DECEL FROM HIGHWAY, VIEW CHANGES, POINT OF FORM PERCEPTION</td>
<td>RESPONSIVE TO ACCEL/DECEL IN FORM AND ELEVATION WHERE IS FORM PERCEIVED? DEFORMING</td>
<td>REPETITION AND RYTHEM, FORM ADAPTATION GLASS, CURTAIN WALL, METAL PERFORATIONS</td>
<td>AC:CITY GRID AC:INTR CIRCUL</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>DE Defensible Space</td>
<td>PROGRESSION OF ZONES SEE PLAN DIAGRAM</td>
<td>MASSING TO LOT LINES DIMINISHING FORMS TO CENTER BROKEN BY LANDSCAPE</td>
<td>ADDITIVE MEAN DISTANCES FROM PENETRATIONS</td>
<td>AUTHORITATIVE MATERIALITY LANDSCAPE BOUNDARIES OF AGGRESSIVE FLORA</td>
<td>DSPACE:GSPACE DSPACE:MS MASSING DSPACE:INTR CIRCL DSPACE:PROGRAM</td>
<td></td>
</tr>
<tr>
<td>CITY GRID</td>
<td>CARTESIAN GRID ROTATED 9 DEGREES CCW FROM TRUE NORTH, 1:1.3 BLOCK RATIO</td>
<td>ORIGINAL URBAN FORM STATIC</td>
<td>GRIDDED, LOW RISE, VERTICALITY, LOT LINE EXTRUSION W/ SETBACKS ADDITIVE</td>
<td>OLD, EXISTING, DURABLE BRICK, STONE</td>
<td>CITY:WEST END CITY:HIGHWAY</td>
<td></td>
</tr>
<tr>
<td>WEST END GRID</td>
<td>CARTESIAN GRID ROTATED 7 DEGREES CW FROM TRUE NORTH, ELONGATED E/W AXIS FROM OVERPASS TOPOLOGY</td>
<td>FORM RESULTING LATER IN CITY DEV., INDUSTRIAL AND SUBURBAN DEV.</td>
<td>INDUSTRIAL BLOCKS WAREHOUSE W/ OPEN PARKING AREA, ROW HOUSES ADDITIVE</td>
<td>INDUSTRIAL, MOVEMENT TO LOW END RESIDENTIAL, SEMI-PERM'T METAL CLADDING</td>
<td>WEST END:CITY WEST END:HIGHWAY</td>
<td></td>
</tr>
<tr>
<td>HIGHWAY CONDITION</td>
<td>POST-1950’S FORM CURVES BASED OFF CIVIL ENGINEERING MAXIMUMS</td>
<td>BRAIDED FORM THAT’S UNWINDING, VERTICALITY AND SPEED, CUTTING AND UNRESPONSIVE</td>
<td>CURVILINEAR FORMS INTERWEAVING VERTICALLY SUBTRACTIVE AND DEFORM</td>
<td>RESPONSIVE TO SPEED/ACCEL. CIRCULATION, TRANSPARENCY GLASS, TRANSLUCENT POLYMER</td>
<td>HIGHWAY:CITY HIGHWAY:WEST END</td>
<td></td>
</tr>
<tr>
<td>INTERIOR CIRCULATION</td>
<td>30% GARAGE, SERVICE SPACE (28K SQFT), EGRESS REQ, 3 ELEV SHAFTS, ENTRIES BASED ON CAR SPEED RADI</td>
<td>INEFFICIENT, PAUSES FOR SOCIAL INTERACTION AND PRIVACY TRANSITION</td>
<td>ADDITIVE VINELIKE FORMS BRANCHING SUBTERRAINIAN GARAGE</td>
<td>THIN, LIGHTNESS OF STRUCTURE BLURRING BETWEEN EXTERIOR AND INTERIOR SPACE</td>
<td>INTR CIRCL:GSPACE INTR CIRCL:PROGRAM</td>
<td></td>
</tr>
<tr>
<td>OPEN/GREENSPACE</td>
<td>30% GREENSPACE (28K SQFT) 10% HARDSCAPE (9K SQFT)</td>
<td>PUBLIC TO PRIVATE DEFI PERSONALIZATION OF SS LANDSCAPE FORMS DEFINE SPACES</td>
<td>PATHS/FORMS BREAK LARGER SPACE INTO MANY SUBSPACES PRIVATIZED TO CERTAIN UNITS</td>
<td>PERMEABLE SURFACES TERRACING AND BUFFERING VERTICALITY AT HIGHWAY</td>
<td>GSPACE:DSPACE GSPACE:MS MASSING GSPACE:INTR CIRCL</td>
<td></td>
</tr>
<tr>
<td>MICRO SITE MASSING</td>
<td>ADJACENT MASS/VOID BUILDING HEIGHTS SEE PLAN DIAGRAM</td>
<td>FORCE LINES MADE FROM MASS VOID HGT, SEPARATE FROM GRID FORMS</td>
<td>RESPONSIVE TO ADJ FORMS MIRRORED OR INVERTED ADDITIVE OR SUBTRACTIVE REACTIVE MASSING</td>
<td>VOIDS OR CUTS IN FORMS CHANGE IN MATERIAL COLOR OR TREATMENT</td>
<td>MS MASSING:GSPACE MS MASSING:DSPACE</td>
<td></td>
</tr>
<tr>
<td>PROGRAM ADJACENCIES</td>
<td>UNIT SIZES (550-1100 SQFT) 24 2-STORY UNITS BUILDING/EGRESS CODES</td>
<td>PUBLIC TO PRIVATE, AMENITIES TO CENTER VARIATIONS (DIAGRAM) URBAN FORMS</td>
<td>OUTSIDE TO INSIDE PLAN ADDITIVE BLOCKING EFFICIENCIES IN CHASE AND STRUCTURAL ALIGNMENTS</td>
<td>RELATIVE TO POSITION IN FORMAL MASSING, MATERIALS CHANGE IN UNIT BUT HAVE SIMILAR STRATEGY</td>
<td>PROGRAM:DSAPCE PROGRAM:INTR CIRCL</td>
<td></td>
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</tbody>
</table>

Diagram 5.5.2 - Design Matrix
pure graphic standards in the form of ideal plan diagrams, pure diagrams, and sections. From that a hierarchy of drawings was made so that certain grids or diagrams had a higher impact on possible form generations.

With the compilation of this information, the responsibility is then on the designer to make aesthetic decisions on what moves to make in the generation of forms. This process involved the use of drawing overlays at varying scales and the manipulation of three dimensional forms generated via computer modeling. The tools available in the computer allowed for multiple form generations over a shorter period of time until one that was deemed most desirable because of its inclusion of all the areas of concern was generated. However, the job of the matrix is not finished there. The diagrams and drawings are then applied at ever increasing scales in order to generate forms that are residential in scale.

### 5.6 - Outcomes

The final design generation, and by final I mean the most current iteration of design since no design is final, yielded a product that has many formal moves but behind each move there is a definite context and reason. There are three main buildings to the complex that are a result of the unique form of the site and the surrounding buildings. They vary in height according to their adjacent elevations and massing, rising higher towards the city center. Interior spaces and circulation are generated from an ideal section that plays off one another to create serpentine structures.
Exterior stair towers in the complex’s interior lead up to various units, again breaking down spaces into smaller more manageable slices. Materiality and program locations are taken exactly from the design matrix and create a building that can be understood and deciphered with a bit of thought.

In the end, the urban context which is so strong and generates the design ultimately becomes the cause of many of the problems in the concurrent detailing of the design. Ultimately, the success of this thesis will be found in the built form and whether or not the issues of urban designs (defensible space, blight, scale, and circulation) can be resolved in a manner fitting to a residential design. Grids or diagrams had a higher impact on possible form generations.

With the compilation of this information, the responsibility is then on the designer to make aesthetic decisions on what moves to make in the generation of forms. This process involved the use of drawing overlays at varying scales and the manipulation of three dimensional forms generated via computer modeling. The tools available in the computer allowed for multiple form generations over a shorter period of time until one that was deemed most desirable because of its inclusion of all the areas of concern was generated. However, the job of the matrix is not finished there. The diagrams and drawings are then applied at ever increasing scales in order to generate forms that are residential in scale.
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