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ABSTRACT

Urban sprawl has caused a severe depletion of activity and community in the Central Business Districts of many Midwestern cities in the United States. This change is the result of fifty years of political and social shifts beginning with the Federal Housing Act and the Federal Interstate Highway Program and continuing today as digitization shrinks the spatial requirements of many information-based corporations and sends their workers to the suburbs. The goal of this thesis is to use the current CBD infrastructure to bring a sense of community life back to the spaces of the city center. The design portion of the thesis reconfigures Fifth Third Tower on Fountain Square in the CBD of Cincinnati, Ohio. A better understanding of the future of the CBD and the way in which the buildings that make up this zone can be modified will be the prime benefit of the research and design.
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INTRODUCTION

The city center and the Central Business District are ripe for redevelopment because there has been a mass exodus of these spaces as people move to the suburbs. Unfortunately, many cities in the United States go about this process in the wrong way. They tend to encourage major public attractors to move into the city and hold events within the city center. This is not the correct method for redeveloping a city. Art museums, new stadiums, and downtown food-fests do not reinvigorate a community and turn it back into a thriving metropolis; they invigorate a specific site within the city for a few hours on a Saturday afternoon. The city center has the opportunity to return to the days when people lived, worked, and played in a lively and exciting downtown environment twenty-four hours a day throughout the year.

The city infrastructure is able to handle the increased growth within the center better than it can handle the continuous expansion into the former countryside. Buildings, utilities, transportation, and city services are currently underutilized within the center. The center has been relegated into a single-use zone, mostly set aside for offices and businesses. Some cities are confused that their office occupancy rates in the Central Business District are not very low, yet their city seems to be a lifeless and boring place that people run from at the end of the workday. Sports teams, art exhibitions, and restaurants don’t use infrastructure; people use the infrastructure. Cities and people must realize that they can be better off financially and socially in a denser environment where the city is able to provide much needed services and contacts. The central city infrastructure is able to provide these services, while the suburban infrastructure is becoming overcrowded.

The goal of the thesis is to demonstrate that the city and the suburb have changed over the past 50 years and the city and its infrastructure may represent the new escape for people. Alex Marshall explains this phenomenon well with his statement,

The suburbs and city have reversed historic roles. The city now represents order, stability, community, and the human scale. The suburbs have become the example of constant change, gigantism, uncontrolled technological forces, and the rule of the marketplace. Whereas once the city symbolized a merciless, soulless world, and the suburbs calmness, family, and nature, the two worlds have almost completely traded places in what they represent.¹

This quote describes a situation that sheds light on where the next major development may take place. The city center can be converted from a strict business and retail district into the “Central District”, a mixed community that contains life’s necessities. The buildings and services exist, and with some modification they can become the new epicenter of the city, potentially slowing the rapid decentralization of our lives.

Being a design thesis, the project will focus on the ways that the design of spaces within the city can help reconfigure urban life. There are currently some major elements within the Central Business District that are lacking and, therefore, tend to make people uncomfortable living there. Some of these things include places for children to play, places to purchase groceries, and places to relax in the park. The design of the buildings in the city center has historically focused solely on economics – solid floor plates copied vertically for 30 stories; people extracted the most rent money from the site, while ignoring the social problems that come about within their tall buildings. The design portion of the thesis will look at current towers in the Central Business District and examine how they can change to accommodate social interaction and life.

The first chapter of the thesis examines the problem of urban sprawl. This phenomenon is having a severe effect on societies around the world. The effects are mostly negative in that money is being wasted and land is being destroyed so greedy humans can have more space for themselves and their vehicles. Cities have been formed and an infrastructure is in place to support large numbers of people, yet the people are constantly moving away from the city, sucking up more natural resources, and leaving vast areas of blackness where a lively environment once was, and still could be.

The sprawl that has taken over our countryside has encouraged a more horizontal understanding of how people are able to operate within built space. In the late 1800s and early 1900s the urge was for humans to build vertically (the tower) to make more efficient use of expensive space within the city. That idea has shifted since World War II to an idea of extension of the city horizontally (suburbs). There is still an infrastructure available inside the city where people can make use of existing infrastructure and can live happily in a vertically oriented city; chapter 2 examines this area and the history of tall structures. Many of the problems with the city are with vertical living in general. Horizontal movement is far easier than vertical movement and people feel more of a flow of space on the horizontal
and more segregation on the vertical. In order to make city-living more attractive for people, the idea of vertical living needs to change and the buildings that support life must also be reconfigured to improve living conditions within a tower.

Chapter 3 investigates the idea of adapting structures to encourage a new use that will enliven the city center. The reasons for adapting existing buildings rather than tearing them down include economic savings, cultural value, and environmental protection. This chapter makes the case for keeping the buildings within the city center and using them as a catalyst for the improvement of the area. Chapter 4 immediately follows this issue with ways the tower and the city center can be reconfigured to encourage new growth and sustainability.

A number of precedents are discussed in Chapter 5, which look at how similar projects have been successful in certain issues related to the thesis. A project undertaken by Pope Sixtus V in Rome looked to convert the Coliseum from an entertainment role into a live-work community for the production of wool. Sixtus understood the value of the building and the how the infrastructure could support a new use, rather than letting the building go to waste. The Downtown Athletic Club, researched by Rem Koolhass, demonstrates how a tower structure can accommodate a wide variety of uses and how it actually mimics the city it sits within. The Netherlands Pavilion at the World Expo 2000 by MVRDV, represents ways in which increased density require innovative solutions for incorporating parks and greenery into the city tower. The Hong Kong Shanghai Bank by Norman Foster rethinks the large office building and attempts to make it more comfortable and less daunting for its occupants. Finally, the Hamilton County region of Ohio is investigated to determine the proper mix of activities and uses within a community, which can be mimicked within a building to help provide a proper mix of activity within a single space.

After a better understanding how to improve life within the tower structure is developed, the ideas must be tested within the context of an actual building. Fortunately, vertical life is thriving in some cities such as New York, Hong Kong, and Chicago. These cities take advantage of their density to provide the necessities of life in a vertical structure; however, it is more enlightening to study an environment where sprawl is destroying the city and present ways to encourage smarter growth. Many Midwestern cities are losing residents to the suburbs while Central Business District infrastructure remains underutilized. Chapter 6 takes the research presented in
early chapters and tests a solution within an actual city that is seeing trying times in its core. Cincinnati’s Central Business District is a prime example of a loss of density to the suburbs while the city is still capable of providing the necessities of daily life. Studying the issues of vertical living in an existing structure of the city fits well with the full use of a city’s infrastructure considering the loss of population in the city center does not make new tower construction viable.

A prominent site and building will help people understand the requirements of such a project and will allow them to better understand the benefits and ill effects of living in a vertical community. Therefore, the Fifth Third Bank tower located on Cincinnati’s Fountain Square will provide the best scenario for the study of how vertical living can be accomplished and can encourage the densification of Cincinnati. A building addition and reconfiguration will show that the ideas of vertical living and city densification are feasible and can provide the Central Business District with a new vibrancy that will attract people and businesses to the area, rather than continuing to let the city deplete until it becomes an unbearable black hole.

This thesis is not meant to be an end-all solution to the problems plaguing the cities in the United States and beyond. It simply identifies and area that can potentially help reduce the burden of urban sprawl, examines that area, and proposes a way of using that area to reinvigorate it. This work is presented with the hope of producing further discussion among cities and communities in the debates surrounding city redevelopment and urban sprawl.

4. A view of Cincinnati’s Central Business District from across the Ohio River in Covington, Kentucky.
THE SPRAWLING CITY

As recent as the 1920s, the city center represented the place where people lived, worked, and played. The mid 1900s saw the city become segregated by building use, with offices relegated to the Central Business District. As a result, over the past 50 years, the Central Business Districts of many cities in the United States have experienced the effects of urban sprawl. People moved to the suburbs to get away from dirty, crime ridden and over-dense cities; as a result, businesses and stores have followed to the suburbs to be near their employees and clients. People continue to move further away from the city as more of their social, business, and entertainment needs move out to the suburbs. In addition, digital technologies make it easier to communicate across long distances, which also encourage people to move further away from the city. When one considers that the Central Business District of any city has been its traditional information and business center, and that information is disappearing into the digital realm, it is possible to anticipate the disappearance of the Central Business District itself. Its role must be rethought or the city center will become a black hole – a desolate zone that will waste away while people continue to destroy the countryside, as they move away from the city.

BRIEF HISTORY OF URBAN SPRAWL

Goldfield and Brownell state that “the 1920s were America’s first suburban decade” in their book, Urban America a History. Affluent Americans would typically live outside the city center and take their horse drawn carriage into the city for business, but the 1920s saw the invention of the automobile. This allowed many Americans to leave the congestion and gritty nature of the urban core. The expanding white-collar executives wanted to live in areas nicer than their blue-collar workforce. Goldfield and Brownell state that the outskirts were the popular choice because in the 1920s the “…suburb was both more accessible and affordable for the expanding middle class than ever before”. The 1930s and 1940s saw a rapid growth in neighborhoods on the outskirts of major metropolitan areas including New York, Boston, and Chicago.

According to Andres Duany in his book Suburban Nation, widespread urban sprawl in the United States began shortly after World War II when the federal government started a number of projects and instituted a number of policies to encourage growth of the nation. The problem, says Duany, began with the Federal

3 Goldfield and Brownell, 290.
Housing Administration and Veterans Administration which provided low interest loans for new home construction. In addition, the federal interstate highway program allowed people to move efficiently to the outskirts of the city. The people, thus, built new homes in the suburbs at prices significantly lower than renting in the city.\textsuperscript{4}

The story continues, says Duany, as the people moved away from the city, the stores began to follow. Eventually, corporations began to move their operations to the suburbs to provide their CEOs with a shorter commute time from their suburban mansions. The final issue that contributed to the rise of sprawl was “single-use zoning” which effectively prevented mixed-use neighborhoods from forming in the outskirts.\textsuperscript{5} Eventually all but the largest corporations and their supporting businesses left the central core of the city, leaving a wasteland of vacant structures and underutilized infrastructure.

Alex Marshall is careful not to forget how the middle-class dream has contributed to sprawl in his book, \textit{How Cities Work}. He notes, “…it does seem absurd at first to have a family of four in a 5,000-square-foot house. Until you realize this has always been the standard for the well off, and nothing compared to the mansions occupied by the truly wealthy”.\textsuperscript{6} After World War II, a symbol of status among the middle-class was home ownership. As this has become the norm, people want to own larger homes and the new status symbol is a three-car garage. The home and the land it sits on are the measuring stick of middle-class wealth. Since homes and the lots they occupy must get larger to meet the latest in middle-class status requirements, people are continuously moving away from the city and the small houses of the suburbs in search of the new subdivision with homes more symbolic of their preferred status.

Although the problem began as early as the 1920s, Duany shows there are “Five Components of Sprawl” which exist today. The components are Roadways, Housing Subdivisions, Shopping Centers, Office and Business Parks, and Civic Institutions.\textsuperscript{7} The important thing about these five components is that, due to zoning regulations, “…..each component is strictly segregated from the others”.\textsuperscript{8} That is to say, suburban communities do not represent a mixed use situation, but the roadways allow them to be connected to different components within the metropolis. In the case of the downtowns, the Central Business District actually contributes to urban sprawl because it represents only office and business uses; this forces people to either drive elsewhere for their daily needs or live without them. Therefore, if the CBD is to become a viable neighborhood, it must learn from

\textsuperscript{5} Duany, 8-10.
\textsuperscript{6} Marshall, 103.
\textsuperscript{7} Duany, 5-7.
\textsuperscript{8} Duany, 5.
the segregation that sprawl encourages and begin to incorporate a mixed-use environment.

**AUTOMOBILES DESTROY THE CITY**

Roberta Gratz elaborates on one of Duany's "Components of Sprawl" by stating, "We have allowed the car and highway engineers to design and shape our lives". Unfortunately, this has become the case. Cities today are not designed to accommodate people; they are designed to accommodate the car and by doing so they have, as Gratz says, "separated, segregated, and isolated the American people". People can even go all day without stepping into their community; they wake up, get into their car, leave the garage, drive to work, park in the garage and enter the office. The process is the exact opposite at the end of the workday. Even worse, people find it more enjoyable to wait in traffic jams on the highways leading to the city than to wait for a bus within the city. Regardless, the city's public spaces have changed from the public plaza into the public parking lot; this is the place where people are most likely to encounter others.

Another problem with the automobile is cost of maintenance. Streets are extremely expensive to maintain, yet they have shifted from something necessary for movement into something of a luxury. Alex Marshall explains in his statement, "The urban grid of streets grouped around a port of train station or a streetcar line has ceased to be the central marketplace of society. It has been replaced by a tangle of streets built around freeway exits". Maintaining this infrastructure of streets is an expensive endeavor for any city, but people continue to push out and pave new roads. Unfortunately, they never stop complaining about the older roads that are in disrepair. A dense environment allows the city to keep the roads operational and allows the "expansion funds" to go into social programs.

In addition, cars act to divide our population into the "haves" and the "have-nots". Middle class people drive away from the city after work, returning to their quaint suburb where they are safe from the "have-nots" or the people who are not able to afford cars. The road segregates the community so people no longer socialize with people outside their class, which effectively homogenizes entire areas and groups of people. Cars not only destroy the city, but they destroy the social makeup of a metropolis, denying people the opportunity to learn from and engage with people unlike themselves.

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8. This parking lot is an example of how the automobile is slowly destroying the city. This lot used to be the site of a building, but has been replaced with parking.

9. Another example of automobiles destroying the city is seen in the background of this photo with a highway separating one neighborhood from the neighborhood in the far background.

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10 Gratz, 33.
11 Marshall, 87.
ENCOURAGING MULTIFAMILY HOUSING

In a 2003 Urban Land Institute publication, Richard M. Haughey makes a case for helping to reduce the consequences of sprawl through multifamily housing developments. Single family housing tends to segregate families because they have little contact with other individuals within their neighborhood, whereas multifamily housing encourages more social interaction due to a high density of people on a plot of land. There are other consequences, according to Haughey, one of which is a higher cost associated with single family subdivisions. He states;

Because of its compact development form, multifamily housing usually requires less public infrastructure, including roads, sewer and water pipes, and electricity and gas lines. In addition, because retail and commercial uses require high concentrations of housing units within a short commuting distance, multifamily housing makes it financially feasible to incorporate these uses into the neighborhood.12

Local governments will also save money because their “per-housing-unit fiscal impact” is lower than suburban developments, which allows governments to focus their budget to other more important endeavors such as education or other public services.

Another reason multifamily housing makes sense is that the typical family structure has changed since 1950s legislation encouraged building single-family dwellings. The authors of Urban America a History point out one such neighborhood of the 1950s, Levittown, New Jersey, was made up of about 12,000 inhabitants, almost all of which were part of the traditional husband-wife-two-children group. Goldfield and Brownell show that even important child rearing texts, such as Dr. Spock’s Baby and Child Care, encouraged children to be raised solely by their parents with little outside influence from other family members or neighbors.13 While this may have made sense in the mid-twentieth century, the makeup of households has changed dramatically. Haughey refers to data from the 2000 census, which shows that only about one-quarter of the United States population belongs to the traditional two parents with children group.14 People belonging to non-traditional households, those who are widowed, divorced, single, or single with children, may be more receptive to multifamily housing situations due to their nontraditional living style, which is more suited to dense city life where many conveniences are easily accessible.

13 Goldfield and Brownell, 346.
14 Haughey, 6.
MIXED USE COMMUNITIES

Convenience and easy access to daily needs is one thing that is required by all people whether they live in the city or in the suburbs. The conditions of sprawl tend to make access to goods less convenient than they would be in the city setting. Not only do suburbs make access to goods harder by forcing people to drive multiple miles for them, but they also pull resources from the city, forcing city dwellers to also drive long distances to find their products. Mixed use communities make these daily tasks easier by providing goods and services only a short distance away, sometimes within walking distance. Unfortunately, sprawl has decentralized our lives and forces us to travel long distances to find goods.

Goldfield and Brownell show that during the 1950s “Downtown was becoming less a place of shopping and more exclusively a place of work”. Stores and residences moving from the city center into segregated zones within the suburbs destroyed the mixed use nature of many downtowns across America during this time period. The authors point to the Peachtree development of Atlanta, which spurred growth in the downtown area, but unfortunately the developments were single zoned projects such as convention centers, hotels, and sports stadiums. While these things tend to attract large numbers of people from the suburbs, they arrive in their automobiles and leave at the end of the event, returning the downtown area to a desolate state. Goldfield and Brownell confirm that many cities in America followed Atlanta’s plan for success by developing projects that attracted large numbers of people to downtown, but they admit that many of the developments were “…directed more to free-spending visitors than to urban residents”.

Suburbs also designate zones for visitors and zones for residents by developing large areas of commercial space away from the residential neighborhoods. Encouraging a denser mixed-use situation in the city center will encourage more diversity and promote neighborhoods that are populated by both visitors and residents. This will make cities active at all times of the day and night, creating a safer and more lively environment where homes, shopping, businesses, and cultural institutions are easily accessible and conveniently located for all classes of people.
PAYING FOR SPRAWL

A common perception among suburban people is that the suburbs make everyday tasks more convenient and cheaper than living in the city. People have an easier time getting around the suburbs and can easily drive to a store for any good they need without having problems finding a parking spot. Roberta Brandes Gratz points out some myths of the ongoing debate over the merits of living in the suburbs versus living in the city in her book, Cities Back from the Edge: New Life for Downtown. She says;

The myths of convenience and of consumer advantage are popular. Malls and superstores, according to the argument, are convenient because people can drive to them, park, and drive home. Downtown, in contrast, has no place to park, prices are high, and choices are limited. In reality, this is backwards. Distance, private cost of travel, public impact costs, and a whole host of other expenses...are conveniently left out of the equation.\textsuperscript{18}

Her argument is an economic one. Many people believe that the suburbs provide a cheaper cost of living than the city. On the surface this is true, but people fail to notice the hidden costs of expanding infrastructure, environmental costs due to automobile exhaust and destructive development, and the monetary cost of erecting new buildings as existing buildings lie dormant. Also left out are personal expenses for maintaining a vehicle, such as gas, insurance, and repair costs. Gratz points out, “The public, in effect, carries the cost for temporary cheap goods”.\textsuperscript{19}

Sprawl is not only an economic burden for individual people; it also affects the budgets of cities, regions, and nations. A 1998 study by the Sierra Club, entitled Sprawl: The Dark Side of the American Dream, notes that communities are paying huge amounts of money to allow people the luxury of a larger home on a larger lot. The report provides the following examples;

Between 1970 and 1995, Maine spent over $338 million building new schools while the number of public school students declined by 27,000.

The city of Fresno has doubled in size since 1980, producing $56 million in yearly revenues, but the cost of services has risen to $123 million (not including costs for roads and sewers).

From 1970 to 1990, Minneapolis-St. Paul closed 162 physically adequate schools in urban and central suburban areas and opened 78 brand new schools in the outer suburbs.

\textsuperscript{18} Gratz, 171.
\textsuperscript{19} Gratz, 171.
Providing services to new development has grown so costly in Prince William County, Virginia, near Washington, D.C., that even though the county has the highest property-tax rate in the Commonwealth, every new house brings a $1,688 shortfall.\textsuperscript{20}

Another study, done by Peter Newman and Jeffrey Kenworthy, shows the dramatic difference in per-dwelling-unit costs of fringe and inner city development in Australia. They found that, over 15 years, lower density fringe development costs approximately $140,000 more than inner city development.\textsuperscript{21} This figure accounts for the overall economic costs of developing the land and infrastructure that supports the families of the developments. It is important to note that the $140,000 figure was for each dwelling unit in the development, so the total cost to the city grows quickly as more people are housed. These figures demonstrate that a large amount of money is being spent to extend and maintain infrastructure, while city infrastructure is underutilized.

In The Costs of Sprawl – Revisited by the Transportation Research Board, many pieces of literature pertaining to the costs of sprawl are reviewed and compared. This report shows the challenge of obtaining quality data because of the wide variety of issues that each specific development encounters. This particular report looks at three major studies, two done in 1989 and one done in the mid-1990s, and averages the numbers in them to determine the economic effects of sprawl. They found that sprawling communities spent 25% more on roads, 5% more on schools, and 80% more on utilities than compact communities.\textsuperscript{22}

Although the numbers vary in each study regarding the cost of sprawl, it is clear that the trend is in a higher cost of low-density development when compared to higher-density developments. The money being spent to extend and maintain the city infrastructure to suburban developments could be used to improve the quality of life for all residents of a community and can provide funds to improve education, which is a serious problem among large metropolitan areas. The economic impact of sprawl is significant and must not be ignored.

**CONTINUED SPRAWL THROUGH DIGITIZATION**

Urban sprawl was the product of 1950s policy, but continues today with the addition of telecommunications technologies. Since the...
beginning of time humans have had to acquire, process, and transmit information to each other. Initially, the information was transmitted orally from one individual to another, which held little requirement for the physical space in which the transmission took place. As communication progressed, humans began to graphically display their ideas in the form of cave paintings. The cave art came from the fact that humans occupied caves, but eventually it became problematic to transfer ideas in this manner. Portable devices such as tree bark were used to transmit information on the move. Eventually, the Chinese developed paper which was lighter and more durable than the tree bark. Paper evolved and the printing press was developed, which brought written words to the common man since people could rapidly and cheaply reproduce large amounts of information. Storage of and access to these books was required and the library was developed. We have moved into the era of digital information, which allows huge amounts of information to be stored in relatively small areas and promotes quick and easy transmission from virtually anywhere in the world to any other locale in the world.

In addition, many of our physical possessions have begun to transform into bits. On-demand movies from our cable company eliminate the need for VHS tapes or DVDs. Our music can be stored as mp3s in which the contents of 50 audio cassettes can fit on a chip smaller than a single cassette. Even books and periodicals have shifted to a digital presence. While not all of our information can be stored on a small server (notably, certain artifacts which lose their importance in the digital format), large amounts of information are beginning to shift to the digital environment and this trend will continue into the future.

The shrinking and easy transmission of digital information does not provide a positive outlook for America’s business and financial districts, which are full of this information. Although more information is being produced, the space required to store the information is shrinking, which means the information businesses in the Central Business District are using less space. In addition, Joel Kotkin points out that “the decline in the vitality of twentieth-century office culture, brought about by the downsizing and restructuring of major corporations, has reduced the demand for huge blocks of office space”. Eventually, as people begin to work from alternate locations and can have face-to-face encounters over the internet, the businesses in the Central Business District will decentralize, leaving vast amounts of space in the inner cities. The question, according to Kotkin, is what the future of the center holds.

15. In addition, as information becomes stored digitally, the amount of space required for the information shrinks and becomes more hidden. As information turns into bits, more space becomes available for other uses.

24 Kotkin, Joel, chapter 3.
FUTURE OF THE CBD

The city center and the Central Business District are falling deeper and deeper into the black hole that has been created by urban sprawl. Many people find their lives easier and safer in the suburbs, even though they are often less exciting and fairly homogenous. Sprawl has sucked the vibrancy and the convenience of city life out to the far reaches of the suburbs, leaving the poor and underprivileged to rot in an environment that is capable of sustaining a great diversity of people and activity. The infrastructure exists to support the conveniences of the suburb within the current central city structure, yet people are not willing to give up their cars and their homogenous way of life for a far more convenient and exciting way of life.

A study by Robert E. Lang shows that office space growth has become focused on the suburban office park rather than on the central-city office development. The study, entitled Office Sprawl: The Evolving Geography of Business, states;

Between 1979 and 1999, cities’ share of metropolitan office space significantly diminished. In 1979, 74 percent of office space was found in central cities and only 26 percent was found in suburbs. By 1999, the central city share of office space dropped to 58 percent while the suburban share grew to 42 percent.25

This trend will continue as central city office space becomes obsolete and suburbs build new high-tech business parks. Therefore, the central city will continue to decline and the office buildings will remain empty.

Due to the lack of business interest in the Central Business District, the large tower structures associated with it represent a significant infrastructure that is ripe for a new use. In the future, the buildings will become empty mostly as a result of digitization which will open up large areas of sheltered space to be modified for a new use. The water, electrical, and telecommunications, and transportation systems are present and the street system is in place to handle traffic concerns. Everything necessary to return the Central Business District to its vibrant past (although in a new light) exists underground and above it, and it is more economic to modify the spaces for a new use rather than implementing a tabula rasa in the suburbs and other environmental preserves. In effect the city exists, but it is not being used by the people.

TALL BUILDINGS GO VACANT
The tall building, known as the skyscraper, is an American innovation of the late nineteenth century. The buildings are a response to the growing need for space at the center of the city, near much of its daily activity. Eventually, sprawl pulled people from the city and the buildings at the city center began to go vacant. Many of these buildings struggle to keep occupants in a time where business parks in the suburbs are drawing more businesses and suburban residential neighborhoods are attracting more people. The history of this building type must be investigated and a new approach to these structures must be put to use to save the city center and the tall buildings that occupy it.

HISTORY OF THE TALL OFFICE BUILDING IN AMERICA
The tall office building, also known as the skyscraper, found its beginning during the late 1800s in Chicago. William Curtis, in his Modern Architecture Since 1900, identifies two main reasons for building vertically. The first was the desire to locate the entire population of Chicago, which was growing rapidly, in the downtown area known as the “loop”, an area measuring only nine blocks square. The second reason for building taller buildings was the economic desire to earn the most income from a single plot of land. Initial skyscrapers were very much economical endeavors lacking any architectural style of their own. They provided the largest floor plate that could be efficiently lit by natural light while using the typical masonry aesthetic.

In her book, Form Follows Finance, Carol Willis examines the office tower in terms of its financial value. She says early buildings were mostly commercial endeavors where owners would attempt to extract the most money from their space. She quotes George Hill, writing in an 1893 issue of Architectural Record, as saying, “An office building’s prime and only object is to earn the greatest possible return for its owners, which means that it must present the maximum of rentable space possible on the lot, with every portion of it fully lit”. She also describes the way skyscrapers were (and to some extent, still are) designed. The dimensions of the smallest office space were defined and multiplied across a floor plate to make the most efficient circulation. These floor plates were then copied vertically until the desired square footage was established. Finally, the facades were designed to admit the greatest amount of natural light.

28 Willis, 24.
Sarah Landau chronicles the Rise of the New York Skyscraper from its early days. Office towers were developed to handle the huge increase in office functions as industrial and manufacturing activities increased dramatically in the late 1890s through the early 1900s. She traces the increased need for space to the early 1900s when offices were primarily located in refurbished residential buildings. As the need for more data processing staff created the need for more training personnel, the converted spaces became impractical and the office building type was developed to accommodate the increase in white-collar office workers, secretaries, paper records, supplies, and other executive requirements.

No matter what the need for space demanded of built structure, the office tower would not have been possible without the technological innovations of the elevator and the iron/steel skeleton. William Curtis identifies Burnham and Root's Reliance Build in Chicago (1890-1894) as the first building to use the steel structure to free itself from the masonry traditions that had been followed for centuries. The weight of masonry required that lower walls be thicker and heavier to sustain the weight of all the floors above. The combined strength and lightweight properties of iron and steel allow buildings to extend higher, without dramatically increasing the width of the lower walls. Landau elaborates that the steel structure also provides wind bracing to help sustain the increased wind loads that occur at high elevations. In addition, he states that the steel frames can be fireproofed easier than traditional wood components, which allows buildings to have higher occupancies and reach to new heights without reducing the safety of the people inside. Landau also noted the importance of the elevator. She states, "...the elevator was unquestionably among the essential factors in the evolution of high buildings, and a skyscraper design with the elevator as a primary determinant – the Equitable Building – emerged in 1868". Elevators provided easy access to high floors, out of reach of the typical individual using stairs. As elevators and elevator safety improved, buildings could attain new heights.

Beyond the purely financial reasons for skyscraper form lie the iconographic and competition basis for skyscraper design. Early skyscrapers were designed as real estate investments and space was leased to businesses. As corporations grew, they began to fill entire buildings and started to build their own buildings and named them in honor of the company. The early 1900s was a time when insurance companies held stakes in skyscrapers. Eventually, other companies fought to develop the newest and most interesting...

30. Curtis, 46.
32. Landau, 35.
skyscraper design. The New York Times building, the Chrysler Building, and the Hancock Building represent different periods, yet maintain the same idea of outdoing the competition in the design of the company headquarters through technological and ornamentation advances. Cities also compete to attain the tallest building in the world, which holds an amount of prestige and attracts companies and businesses. The buildings of a city make up much of its image, so cities and corporations will continue to protect their towers and develop new buildings to outdo their competition.

**PROBLEMS WITH THE TALL BUILDING**

The skyscraper was not received well by all people at the time of its prominence. Urban advocates enjoyed the profitability of the tall buildings, but noticed a decrease in the health and happiness of residents as the tall buildings sheltered the city streets from light and fresh air. Carol Willis notes that there had been building height and bulk limits proposed as early as the 1890s. The financially productive skyscraper form, where the building lot was extruded vertically, which provided to maximum amount of floor space, changed in 1916 with the passing of New York City’s first building ordinance. The 1916 Zoning Resolution restricted the vertical height of buildings at the sidewalk and required setbacks to allow natural light to advance to the city street. This was different from Chicago’s building codes which strictly limited the height of buildings. These were the earliest social and health concerns over the dense living and working conditions associated with districts of skyscrapers and other tall office buildings.

Other social conditions within the skyscraper pose problems for people living and working within the spaces. For instance, the repetitive copying of floor slabs vertically tends to segregate occupants of different floors making it hard for them to interact socially. In addition, the large size of the building tends to ostracize people, effectively making them feel as though they are an inconsequential part of the whole. One building that took these social concerns into account was Norman Foster’s Hong Kong and Shanghai Bank, which attempted to cluster spaces within the building and adjust floor heights to allow interaction among building occupants on different floors. A detailed description of this building and the systems that make it possible are located later in this paper.

The density created by the large size of skyscrapers is something that encourages social growth and interaction, yet it also introduces

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21. A primitive diagram of the 1916 NYC Zoning regulations, which were put into effect to maintain proper lighting and ventilation at the street level. The regulations do not determine the form, but encourage the use of a stepped facade, which became popular after 1916.

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32 Willis, 68.
severe problems for the world in terms of ecology and sustainability issues. Ken Yeang states the concern well in his book *The Green Skyscraper* by stating, “Cities and their large buildings demand greater attention with regard to their ecological design because these are the places where the problems of resource-consuming and environment-polluting economic relations and ways of life threaten global natural resources and ecosystems most clearly and most insistently”. The amount of energy used within a tall building is daunting in that the air must be conditioned, people must be able to move vertically with elevators and escalators, and businesses require electricity to operate. Denser environments allow people to share the resources within a building, which reduces per-person-cost, but they still use large amounts of energy. Yeang shows that the amount of energy used can be cut by over half by simply incorporating natural ventilation principles. Dense areas will inevitably use large amounts of energy, so it makes sense to attempt to develop strategies that will help lessen the effects of energy consumption on the natural environment.

**SAVING THE TALL BUILDING**

The thesis and proposal that follow investigate ways to reuse the tower structures of the Central Business Districts across the United States. Urban sprawl and the rise of long distance digital communication have depleted the inner core of many cities and left partially or completely vacant structures. Since the central city infrastructure can handle more density, and a denser living situation can help the environment, it seems to make sense to reuse the tall buildings of the Central Business District. The entire district must be rethought to incorporate a mixed-use environment so that the neighborhood can act as a self sustaining object, making the burdens of transportation easier and less hazardous to the environment. The following portion of the thesis seeks to find a way of adapting the tall buildings to support a socially vibrant zone for living, working, and playing.

22. The combination of 1950s sprawl and 1990s digital decentralization are pulling people from the city, leaving a wasteland of human residue at the city center.


36 Yeang, 256.
ADAPTATION MAKES SENSE

In his book, How Buildings Learn, Stuart Brand says, “From the first drawings to the final demolition, buildings are shaped and reshaped by changing cultural currents, changing real estate value, and changing usage”. Humans tend to adapt their spaces to meet their current needs, whether they add a window in front of the kitchen sink, or whether they simply rearrange the furniture in a bedroom. This idea is carried to the urban scale in terms of reuse of buildings in the Central Business District. Our changing notions of the spaces we use have prompted a move to the suburbs and other technologies will continue to encourage the abandonment of the Central Business District by major businesses, which will open the opportunity to reuse the infrastructure in a new way.

The tendency is to demolish buildings that are no longer useful and replace them with buildings that are designed for a specific use that is currently in demand. Unfortunately, the Central Business District is the result of a major investment in terms of buildings, roads, utilities, telecommunications, and other important infrastructure. Removing these buildings does not make economic or environmental sense. In addition, the buildings represent the city – they are the city – and their value extends beyond a purely monetary worth and moves toward a strong social attachment to them as an image of the city.

ECONOMIC SAVINGS

The tendency for redevelopment of a site is to demolish the buildings and rebuild as required. Brand notes that this is simply a get-rich-quick strategy that ignores the implications for the city and the social value that the existing structure represents for the community. He also notes that buildings are thought of as a final sale price rather than in the form of time and the amount of investment that the building represents to the city. These concerns revolve around developers who are simply in the business for money and do not carefully analyze the social implications of their actions.

Jane Jacobs understands the value of buildings in monetary terms and makes the statement that “time makes the high building cost of one generation the bargains of a following generation”. The idea is that the monetary cost of everything that went into the development of the building is infused in the project and also within the city. It is not simply about the building itself, but also the fabric of the city and the understanding that the monetary value is not strictly about the money spent to build a tower.
ENVIRONMENTAL SAVINGS

Constructing new buildings uses an enormous amount of energy, especially when the buildings are of a significant size, like those found in the Central Business Districts of the world. These buildings represent a large amount of energy consumed and destroying them represents the waste of that energy plus that required in the destruction and removal of debris. Include the energy required in erecting a new building, and the amount of energy used becomes significant. Calvin W. Carter makes this point in saying, “When the rehabilitation of old buildings is subjected to scientific analysis and computation, there is no doubt that it saves more energy than does new construction”.

Carter continues his argument by describing the amount of energy required to construct a new building. He states that the energy required is not just the energy necessary to run the construction machinery, but also that which is required to manufacture and ship the materials to the building site. He goes on to show that it makes more sense to reuse existing buildings that are in good condition rather than replace them since “…..replacing all the existing buildings in the United States would require the world’s entire energy output for one year – approximately 200 quadrillion Btu’s of energy”. Redeveloping and reusing the buildings in a city’s Central Business District would save the energy required to demolish, remove, and rebuild and, in addition, it would save on other energy costs as well. Making the Central Business District into a viable neighborhood with a complete offering of a traditional neighborhood would save on auto emissions from workers coming into the city from the suburbs. With current energy and environmental concerns weighing heavily in the minds of people around the world, it only makes sense to develop a strategy for reuse of buildings that will go empty in the near future.

ISSUE OF VALUE

Brand sums up the issue by stating that as buildings mature, they tend to demand a form of respect from the community; they develop a value for the city and the people of the city. The argument is that the value of the building and the site moves beyond the monetary cost of replacing it and into an issue of social pride in the city and the value that the buildings have in the image put forth by the city. Therefore, buildings that are well known and respected shall be saved and reused once their original usefulness has passed.

24. A continuous outward growth destroys precious natural resources - leaving black holes - and wastes money that could be used elsewhere to improve existing conditions.

42 Carter, 105.
43 Carter, 106.
44 Brand, 10.
In his book, *Architecture of the City*, Aldo Rossi speaks about collective memory. He speaks of how the people understand a city in terms of its history and how they place themselves into that history to understand where they belong. He continues,

One can say that the city itself is the collective memory of its people, and like memory it is associated with objects and places. The city is the locus of the collective memory. This relationship between the locus and the citizenry then becomes the city's predominant image, both of architecture and landscape, and as certain artifacts become part of its memory, new ones emerge. In this entirely positive sense great ideas flow through the history of the city and give shape to it.

Rossi shows that the physical artifacts of the city’s history are extremely important to the people’s understanding of their role within the city and how the city shapes their everyday life. The buildings represent the city – they represent the people – and this becomes very important to the image of the city.

25. A city's image is reinforced by the collective memory of the residents. Destroying the buildings destroys the objects that provide memories to the people.

46 Rossi, 130.
RECONFIGURE THE CITY

Considering the significant negative economic, environmental, and iconographic effects associated with sprawl, it makes sense to reuse underutilized spaces and infrastructure that currently exist in the city, more specifically in the Central Business District. As sprawl and digitization continue to suck people and objects from the center, more and more space will be available. The Central Business District, occupied mainly by offices and retail, will see a sharp drop in occupancy leaving many office towers available for new development.

Adapting these towers will prove beneficial for the occupants of the city, the economy of the region, and the environment surrounding the city. Significant amounts of space exist and can be reconfigured to meet the needs of society and a mixed-use neighborhood, but the spaces currently do not serve the uses that are required to make the neighborhood vibrant and enjoyable.

RECOMBINANT ARCHITECTURE

In his book, *City of Bits*, William J. Mitchell describes his idea of recombinant architecture as a new way of designing buildings in the digital age. His argument is that because of the way digital technologies change how we interact with information and space, the spaces we use will have to be analyzed, modified, and recombined to form new spaces that recognize the new technologies. Since the idea is good in principle, it is not solely applicable to digital technologies.

The ideas of analyzing spaces, modifying them, and recombining them in new ways works in any location where a force is changing the way people interact with architecture. It is specifically useful in the Central Business District where the spaces will eventually not be used in the ways for which they were originally designed. Therefore, the spaces will be modified to meet new demands and social activity which will take place in a location that was designed with other ideas in mind.

Horizontal into Vertical

Moving through the city is a linear process that involves flowing from one location to another freely. While pedestrians use sidewalks and cars use the street, the process allows enough freedom to start and stop as necessary to take advantage of the city’s offerings and

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26. The image above demonstrates how the horizontal city is reconfigured into a vertical orientation and breeding density.

27. The image at left shows the problem with current vertical circulation where people move vertically without interacting with the other floors in the building.

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provides the right mix of structure and spontaneity. The reason this works well is the horizontal layout of the city at street level which creates a continuous plane of vision not interfered by height.

One problem associated with incorporating city systems into the tower is that of vertical circulation. Vertical circulation requires a large amount of space and energy to be efficient. The typical arrangement is a series of elevators located in the building’s core with fire stairs used mainly for emergency evacuation. Unfortunately, this hinders the flow that is associated with traversing the city. A new system of moving vertically is necessary to better incorporate the different floor levels and provide more visible access within the building.

*Office Tower into Living Tower*

Another problem with the tower is the way in which it has been designed to make efficient use of floor space for office tasks. Unfortunately, the efficiency of floor space reduces the social comfort of the space and hinders interaction among occupants. It becomes necessary to break the floor planes to allow views and interaction between floors, which encourage interaction and community. Varying the building section will make for more interesting spaces and encourage more interaction which will foster a sense of comfort and belonging lost in the typical office tower.

Fortunately, the office tower provides an existing framework of infrastructure that can be used in the new design. Water, sewer, electrical, communications, and HVAC equipment in the office environment are capable of handling most requirements for the kinds of mixed use that is desired in the tower and the city. These systems can be used or upgraded at a cheaper cost than rebuilding the entire structure and its systems.

*Private into Public*

Encouraging public spaces in vertical buildings requires a change in the way people understand the tower. Typically, the first two or three floors of the tower are dedicated to more public uses such as retail and restaurant and above that the spaces become completely private. People are not used to sitting in a public space on the 20th floor of a building, but they have little problem relaxing for lunch in a nearby park. Moving these street-level parks into the air requires a new understanding of public space and who is required to monitor and use the space.
Regardless, these spaces must be incorporated into the vertical circulation system and should provide the kinds of things seen on the typical street within a city. Cafes, parks, gardens, and playgrounds offer a mix of neighborhood requirements that can be used by the varying occupants of the building and will encourage more interaction than a varied circulation system alone. Once people understand they are able to relax within an atrium on the 20th level, they will have the opportunity to encourage the growth within the building as well as encourage more vibrancy on the streets of the city.

**RECOMBINANT URBANISM**

The ideas of improving towers to be used as neighborhoods cannot exist on their own. No one building should contain all of the necessary resources within a city; the buildings and open spaces of a city should work as a network that connects all of the things that people need. Enclosing all of a person’s needs in one building will serve to homogenize and segregate the population as much as sprawl. The buildings and outdoor urban spaces must be planned to encourage a proper mix of use and people, so the city remains lively at all times of the day. Therefore, the exterior streetscapes and public spaces should encourage urban life and act as intermediaries to the buildings; comfortable spaces that add to the urban experience rather than simply acting as connectors similar to today’s streets and highways. Buildings, atria, and exterior public spaces must work together to encourage growth and community within the city.

Unfortunately, this requires people to rethink their notions of the city. Examining the city at the regional level must include an analysis of the things in each sector that are missing for the city’s neighborhoods. While the merits of zoning are impossible to ignore, the downfall is a city that is segregated by use, forcing people to drive long distances for their goods and services. A denser living situation within the city, including an incorporation of mixed-use programs, will help to develop a city that meets the needs of all of its people, rather than only a small portion. Neighborhoods must have a character of their own, providing its people will different and exciting opportunities, while never ignoring the basic daily needs of its citizens. Not only must the buildings within a specific district be examined in this context, but the entire city must be studied to make the best of its resources.
THESIS PRECEDENTS

The following projects are examples of specific issues addressed in this thesis. While the perfect example of a building incorporating these ideas is not easy to find, many projects make use of the ideas and theories being put forward, especially in recent tower design in Europe and Asia.

COLISEUM RENOVATION 48

The Coliseum in Rome represents a large structure, important to the people of Rome, being reused after the original program became obsolete and new uses became apparent. This is important to the study because the building was extremely large and was then redesigned into smaller spaces for a new use. The similarity to large towers in the Central Business District where large floor plates will be broken down into smaller spaces is clear.

The Coliseum was originally used as a stadium for many events in the early Roman times. Gladiators would fight in front of thousands of people, and criminals would be executed for their crimes against Rome. Unfortunately, the building fell unused after the gladiators and their entertainment ceased to be popular. This is the time when Pope Sixtus V decided to use the pile of rubble for something more useful than an empty building.

Sixtus’ idea, put to paper by Domenico Fontana, was to turn the coliseum into a wool factory where poor people of the city would have the ability to work and also find shelter in the apartments of the Coliseum’s upper levels. The idea was to save a massive structure, which took great time and numerous resources to complete, and reuse it in a way that made sense given the layout of the spaces. Obviously, the building would have needed many improvements, but the improvements would have taken less energy and resources than a demolition and new construction. The project began in 1590 and workers labored at a frenzied pace, but the death of Sixtus put an end to the construction since many people were against the project for many reasons, one of which was the poor conditions of “industrial” work in the 1500s.

Although little exists to document the project, it is important to understand that the idea of using a structure built for other purposes by earlier generations dates back many years and has been tried on many occasions at different levels of success. Perhaps the Coliseum could have been preserved and saved for future generations. Or the

building may have been studied by architects as an adaptive reuse precedent which was very successful. Either way, the idea of reusing existing infrastructure has been around for a long period of time and the merits of such an endeavor have been understood by countless generations of architects, designers, and visionaries.

**THE DOWNTOWN ATHLETIC CLUB**

The Downtown Athletic Club is a study of how the tower is able to incorporate many different uses in a manner that breeds interesting juxtapositions and scenarios, which allow the building to act like a bustling neighborhood where difference is what makes it exciting. The mixed use nature of the building also enforces the idea of a vertical neighborhood. The building makes downtown living possible; it has all of the needs of the people using it, from living to eating to working out.

The project relates to the ideas in this thesis by taking the elements of the city that are typically laid out horizontally and incorporating them into a vertical structure. The layout, or plan, of the building creates a lively dialogue and odd juxtapositions. Moving from floor to floor creates what Rem Koolhaas defines as “an abstract choreography” in which the occupants of the building move between floors and programs “in a sequence as random as only an elevator man can make it”.

Koolhaas also mentions that “…each of the Club’s floors is a separate installment of an infinitely unpredictable intrigue that extols the complete surrender to the definitive instability of life in the Metropolis”.

This is an example of how a mixed use development should not only be the norm on the neighborhood scale, but should also be the case for individual buildings. While every program of the city cannot, and should not, be incorporated into a single structure, it makes the city, the neighborhood, and the building more vibrant and lively. This vibrancy and liveliness is what people require in their neighborhoods and what allows people to develop a sense of ownership toward their surroundings. Creating places where people are able to interact with a variety of people and places only works to promote healthy relationships among different people.

For all of its merits, the Downtown Athletic Club also has its problems. First, the first twelve floors of the club are open only to men. This discourages interaction among different genders. Although the Club caters to the needs of the male, it should also incorporate some program for other individuals if it is to add to the social liveliness of...
the neighborhood. Removing females from the lower floors removes the opportunity for the chance encounter with somebody who possesses a different belief system.

In addition, the fact that the organization is a club defines limits in terms of access and membership. Buildings should be rethought to promote a sense of public life and easy access. While secure and private realms are necessary, a portion of each building must be established as a “public zone” to encourage interaction. The building must become an anchor of the city and allow people access to its public spaces. The Downtown Athletic Club does not do this since the building does not have any windows on the lower floor and public space does not exist. Exterior public space should flow into the building to encourage interaction among different classes, genders, and races.

**NETHERLANDS PAVILION AT WORLD EXPO 2000**

The Netherlands’ entry into the World Expo 2000 is a building that studies how our buildings will change to handle increased city density. Although lack of space is not a current problem in many Midwestern cities in the United States, the building itself makes use of some innovative technologies that provide for interior courtyards and new ways of moving from floor to floor without using stairwells or elevators. The typical box is modified to create spaces that break the norm for tower design. The building represents an extreme idea of what a skyscraper can be, which may be beneficial in the reuse of Cincinnati skyscrapers.

The MVRDV website notes that the Netherlands is a country that is dense by its very nature of being small in size and constantly growing in population. They have to rework their land to make it useful and, as such, MVRDV has promoted a more vertical orientation for the cities as a way of increasing available space. The firm promotes more density and attempts to design ways of improving the quality of life even with the increased population. This is opposite of typical American thinking, in that most Americans believe more spacious living is better; an example of this is the continued urban sprawl as people move further away from the city to occupy their own acre of land.

The typical American thinking can benefit from these experiments in improving quality of life while increasing density which will ultimately create a better quality of life and a more efficient way of living. The project incorporates technology with nature – creating an artificial

![35, 36. Interior shots of the Downtown Athletic Club showing the mixed nature of the programs within the spaces.](image)

![37, 38, 39, 40. MVRDV’s Netherlands Pavilion from the World Expo 2000.](image)

51 MVRDV. [http://www.mvrdv.nl](http://www.mvrdv.nl).
nature. They also make use of “.....multi-level public space as an extension to existing public spaces”. The merits of incorporating public space into buildings have been discussed earlier in this thesis. The idea of dividing up the programs and placing them on different levels, according to MVRDV, “surrounds the building with spatial events and other cultural manifestations. The building becomes a monumentalised multi-level park. It takes on the character of a happening”.

The project also attempts to find solutions to vertical cities. One issue in particular is the problem of a flow of circulation, rather than the stop-and-go method of the elevator. The project uses exterior stair and interior elevation changes to address this concern. In addition, the problem of lack of light and lack of fresh air is considered and designed for. It is important to look at this precedent as a method of making density livable and enjoyable. Dense cities save money, time, and the environment. Therefore the city becomes important as an efficient and enjoyable place to live, work, and play.

**HONG KONG AND SHANGHAI BANK HEADQUARTERS**

The Hong Kong and Shanghai Bank Headquarters design breaks down the scale of the building into small clusters that act like neighborhoods within a city. The building is also very environmentally conscious, attempting to bring elements of nature into the center of the tower. As the Foster and Partners website states, “The bank is a quest to reinvent the skyscraper; to explore the gradations between public and private space; to breakdown the scale of the building visually and socially, creating village-like clusters; to bring daylight into the heart of the building”. The idea of breaking the building down into small clusters and incorporating natural elements can be retrofitted into the American skyscrapers in an attempt at making them more livable and friendly for the people using them.

The bank is separated in terms of privacy which benefits the users and other people in the city. According to the website, “The bank has a public base, a private summit and a central section composed of semi-private/semi-public space. At street level a 12-meter high public concourse runs clear beneath the building, extending Statue Square into the Bank itself”. This is something that is rarely practiced in American cities. It is necessary to include mixed-privacy spaces as well as mixed-use spaces. This idea creates a variety that allows people to hide or be seen, which tends to create a sense of comfort because people are able to easily change their environment.
The building breaks the large structure down into sizes that are more manageable and comfortable for humans to deal and interact with. This is necessary when dealing with large structures such as skyscrapers. Humans tend to feel uncomfortable in spaces that are designed at too large a scale. Breaking down the building into “districts” allows people to find their way easier and gives them a sense of belonging to a particular “district”. In addition, it allows people to interact with other members of the building, especially when public spaces and circulation routes are used effectively in the design process.

Finally, the building incorporates natural elements in the form of parks in the sky to give people the ability to get away from their work by moving to a different zone within their district; it is possible to leave the city in your mind. Like in the MVRDV project, the natural elements make people feel more comfortable in a city setting which tends to feel dirty and stagnant in terms of the environment. The ability to use technology to bring nature to the city will give them the opportunity to get away temporarily, while preserving the real natural environments for recreational use on a more permanent basis. American cities can make use of these ideas to encourage more people to move into the CBD area and increase the density to allow more offerings to be available in the district.

**REGION AS PRECEDENT**

The requirements of a city cannot be expressed without looking at the region in which it is located and analyzing the things that make the region successful. For this purpose, the Greater Cincinnati and Hamilton County areas were looked into to provide insight into the makeup of the area. Analysis of Hamilton County concluded more than 50% of developed land is marked for residential use, while institutional, industrial, and office account for a combined 38.2%. The Central Business District of Cincinnati does not meet this mixed use figure since a majority of the space is occupied by office and institutional programs.

A neighborhood must provide for most of the daily needs to the community it is serving. It is not conceivable to have every possible need of the community because connections to other neighborhoods are vital for proper interaction, but it is preferable to cover many uses necessary in a person's daily activity. For instance, the CBD in Cincinnati has plenty of business, retail, and some restaurant offerings but lacks residential, entertainment, educational, and

outdoor areas to support a community. The density of buildings can support most of these functions, yet the residents are not there to support the establishments. This turns into a catch-22 where both entities, the residents and the establishments – are needed to support each other. Government regulations and incentives can help this problem, but the space to support these uses needs to be available and experientially exciting enough to draw people to the area.

In order to determine the necessary programs of a specific neighborhood, one can analyze the data for the entire region, in this case Hamilton County. Since many people living in Hamilton County are influenced by the City of Cincinnati in their daily lives, it is conceivable that the city should provide for the needs of these people if it was to attract them back to the center. A more dense population will still need the same general area in order to successfully continue to prosper, but the space should be more efficient. A single neighborhood must provide for education, housing (low, middle, and high incomes), entertainment, shopping, business, food/restaurant, and recreation. The proportion of these requirements in the city should be roughly the same as the regional requirements.

Under this assumption and after translation of the Hamilton County Regional Data Center’s land use study of the region, the Central Business District requires approximately:

- 56.4% Residential
- 24.3% Institutional
- 8.3% Industrial
- 5.6% Commercial Office
- 5.4% Parks and Recreation

These figures are only estimates for requirements since the data is being analyzed and used in a new realm, but they should server as a benchmark for the spatial requirements of a neighborhood or segment of the neighborhood.

46. A typical mainstreet development used as a regional study.
REDISCOVERING CINCINNATI’S CENTER

There are many cities across the United States and around the world that are seeing their Central Business Districts struggle as the suburbs continue to draw people and businesses. One such city is Cincinnati, Ohio which is seriously in need of a downtown revitalization plan. Although the downtown area boats a relatively low office vacancy rate, it seems to be barely making it and is on the verge of collapse from lack of interest within the region. The city resources and infrastructure are capable of catering to a denser and wider mixed use situation, like they enjoyed during the late 1800s and early 1900s, but people continue to push outward into the vast Ohio, Kentucky, and Indiana countryside. This section will look into Cincinnati’s problems and propose a design solution that may help encourage people to move into the district and convert it from the Central Business District into a lively and exciting Central District.

CINCINNATI SPRAWL

In a 1998 study, the Sierra Club named Cincinnati “the nation’s 4th most sprawl-threatened major metropolitan area”. The Sierra Club’s website also notes that USA Today named Cincinnati the 11th most sprawled city in the United States. Finally, the website notes a University of Cincinnati report done from 1980 to 2000 which shows a 141% growth in developed land while the population only grew 15%. These numbers represent a serious concern for the Greater Cincinnati Metropolitan Region which, according to a 1999 report by Michael Gallis Associates will continue to grow outward away from the city center. According to the report, failure to address the core’s population loss “…could threaten the economic health and quality of life of the urban core and the metro region”.

In addition to the deteriorating core, it is important to understand the economic requirements of expanding the city’s infrastructure to the suburbs. Extending and maintaining transportation, utility, and communication infrastructure to undeveloped green-fields in the suburbs represents a significant cost. These infrastructural amenities currently exist in the city and are not utilized to their full potential, which means the city and the region must pay for unused services while expanding their services to the outskirts of the city; for a city with serious budget constraints, this is a serious problem. The inefficiency of the system is a waste of physical and environmental resources for a city that continues to struggle with budget issues.

47. The destruction of the city center began in the 1950s as the government provided funds to expand the nation’s infrastructure to the outskirts of the city - that expansion continues today.

59 Michael Gallis Associates, see section on “Urbanization”.
Perhaps more important in a long term view is the destruction of precious environmental areas. Suburbs are constantly destroying green-fields to build new low density communities and big-box retail. Existing built environments are easily able to accommodate an increase in density without much destruction to the environment, yet builders continue to push out into the natural environment that is shrinking everyday. The natural environment must be preserved for the health of the entire world and the enjoyment of future generations. Buildings in the center of Cincinnati are vacant which is a problem because the natural environment has been significantly altered in this region, the land is currently not being used, and people are moving further away from the city destroying more green-fields. It is time to redevelop the center to make use of the current infrastructure and protect the natural environments of the outskirts.

**CINCINNATI’S TALL BUILDING DISTRICT**

There are several tall buildings within the city that are currently being used for office space, which in the near future may see themselves go vacant due to the decentralization of information within the context of the digital revolution. Buildings such as the PNC Tower and the Fifth Third Building in the immediate core and the Kroger Building on the outskirts of the Central Business District represent large amounts of space within a fairly dense neighborhood, yet are major contributors to sprawl because they are strictly office space, which is not supported by other uses within the neighborhood. These tall buildings can be used in a new way that will help the neighborhood become revitalized and return to the days when the basin area of the Cincinnati River’s banks were filled and lively.

A recent Cincinnati Post article, which appeared in the online edition, states that the downtown area is in poor condition, but the city leaders are hoping some future events may bring people to the area. They are relying on the opening of Great American Ballpark, the new Contemporary Arts Center, the popular stage act The Lion King, and the annual Jammin’ on Main event to lure suburbanites to the downtown area. The suburban families may be brought into the Central Business District for the cultural events, but they will not stay. The city is banking on visitors to save the city, while they are neglecting to see that the city will not fix the crime rate or the empty streets by bringing temporary visitors to the city for single cultural events; however, the city could use this to encourage people to move into the downtown area. Unfortunately, the city is not encouraging
mixed-use growth within the basin and is simply hoping new attractions for visitors will be enough to turn the city around.

The same Post article refers to a low 13% vacancy rate among offices in the downtown area. While this is extremely low for any city, it is not a good thing considering that office space makes up a majority of the neighborhood. The problem is the tall buildings attract plenty of office workers, but they end up returning to the suburbs at the end of the workday. Any visitor to the city will see a somewhat lively city from 8:00AM until 5:00PM, but during the evening and overnight hours the city becomes vacant, which provides an excellent opportunity for criminals to act and for people thinking about living in the city to conclude the idea is not worth the trouble. The problem for the city is not a lack of attraction to large events or sites, it is a lack of attraction as a 24 hour neighborhood; people are just not interested in going downtown for anything other than a special event.

**DESIGNING A SOLUTION**

The project focuses on the Central Business District of Cincinnati, Ohio. The goal is to design a scheme that can spur growth and diversification in the district to turn it into a twenty-four hour neighborhood. While the planning process for the entire neighborhood is vital in addressing the current problems within this area, it is not possible to accomplish this in the time allotted for a thesis project. Therefore, the site had to be narrowed causing the project to act as a template for the entire area. The site selected is the Fifth Third Building located on Fountain Square in the Central Business District of Cincinnati, Ohio. The building will be redeveloped to encourage the growth of mixed-use occupants to the building and the surrounding area. The building and location were selected for the reasons outlined below.

**History**

The river basin of Cincinnati began to grown in the early 1800s through many pig slaughtering businesses and manufacturing firms that grew quickly because of the close access to the Ohio River. The city continued to prosper and in 1841 Cincinnatian Jacob Scott proclaimed, “That within one hundred years from this time, Cincinnati will be the greatest city in America; and by the year of our Lord two thousand, the greatest city in the world”. A large influx of immigrants from 1830 to 1860 forced the basin to quickly expand to accommodate the residents and growing businesses; eventually,
the residential area shifted from the river basin, to the north, past the Miami-Erie Canal (now Central Parkway) into Over-the-Rhine. The area in the River Basin continued to provide manufacturing and slaughtering jobs for the residents, which represented a shift to the business realm that continues today. The people were forced to move because of the over-crowding of the basin and the poor living conditions that resulted from the industrial nature of the surrounding businesses. However, as late as the 1860s, Fourth Street in the city center was “the most prestigious (sic) residential address in the city”. By the 1870s people began to move up the hills into the nearby countryside; this was the first major move away from the city center.

Fountain Square began to take shape in 1871 with the erection of a fountain from Germany, which remains on the site today. The fountain took the place of a market house that was torn down to accommodate a new esplanade. The area surrounding the Fountain gained more importance with the construction and opening of Carew Tower in 1930. Unfortunately, post-WWII sprawl hurt the Central Business District and by 1958 the value of the Central Business District property fell to only 10% of the city’s total real estate value. In 1971, redevelopment of the area was in full force with the opening of Fountain Square, a public parking garage, and Fifth Third Tower. These moves turned the fountain and Fountain Square into the unmistakable center of the city. Today the area thrives as the center of business and communications for the City of Cincinnati, yet after 5:00PM and on weekends the area around the square becomes very desolate and cold. Although there are some problems with the area, it represents an opportunity to develop the river basin into the bustling community that it was in the 1800s, albeit in a more vertical orientation.

**Tall Building**

The adjacent areas of Fountain Square incorporate a significant number of tall buildings which will provide the means of studying how neighborhoods can make use of skyscrapers and how the skyscraper can accommodate mixed use neighborhoods. The height and size of the buildings provides a wide variety of spaces, some 400 feet in the air on a building corner, some twenty feet in the air in the middle of the building, which will promote and accommodate a mixed environment. Therefore, the study will progress to the design of a system that encourages vertical circulation and the type of wandering that occurs within the city on the street level. While the Fifth Third
tower has been selected in order to keep the size of the project under control, the idea is that the concepts developed in the building design will be useful for other buildings in the area and around the world. In addition, the principles studied will be able to take shape in existing buildings and new construction alike.

**Significant Public Space**

The most significant public space in the Central Business District, perhaps in the entire City of Cincinnati, is Fountain Square, located at Fifth Street between Vine Street and Walnut Street. The site is the location for many outdoor events held throughout the year and every citizen of the city knows where Fountain Square is and how to get to it; the square is understood as the center of the city. While this space works on the outdoor level and serves as a beacon within the city, it fails to connect to the buildings surrounding it. There are many opportunities to look out onto the square from the buildings surrounding it, but the connection to the square from the buildings is fairly weak and not direct. The connections from mixed use spaces within the buildings to the square become important in encouraging the mix that is desired. This location and issue presents a significant opportunity to study and design for a flow of space that acts like a city street, bringing people from the square up into the spaces surrounding it and weaving the public outdoor space into the buildings.

**Lack of Mixed Use**

The area surrounding Fountain Square lacks the mixed use nature that encourages quality neighborhood growth. Most of the property in the area is business or retail with some spaces that support the businesses. Since it has been shown that these businesses will be (and currently are) decentralizing and shifting their locations outside the Central Business District, the leftover spaces will represent an opportunity for redevelopment. Studies of Hamilton County indicate a residential usage of around 56% and to be a viable neighborhood it would make sense to meet this percentage. In order to draw that many residents, other daily needs have to be incorporated into the buildings in a way that promotes interaction and interesting juxtapositions. The single use situation of the Central Business District makes it a ripe area for redevelopment into a mixed use neighborhood.
BUILDING INFORMATION

The Fifth Third Bank building currently operates as the headquarters of the Fifth Third Corporation and serves primarily as office space. The building was constructed in the mid-1960s in the International Style which was typical of the time. The steel skeleton supports 2 floors of retail followed by 28 floors of office space and 2 floors of high-end penthouse apartments. Below the building and the adjacent Fountain Square is a multi-level parking structure.

The current design of the building operates as a series of floor slabs (12 feet, floor to floor) connected by elevator shafts. This hinders the ability of the occupants to communicate easily between levels and acts to segment the building by level. In addition, the lower levels do not take advantage of the adjacency of Fountain Square. There are two small revolving doors that provide access to the building, which effectively cut off the inside of the building from the social gathering point of the square.

FACILITY PROGRAM

One problem with tower design within the typical Midwestern Central Business District is the lack of a mixed-use within the building and the surrounding neighborhood. The occupants of these towers are generally office workers supported by some retail and restaurant facilities on the lower three floors. This segregation encourages a separation between the public and private that hinders interaction above the fourth floor. While it is necessary to have private spaces, these spaces should not take up 95% of the structure clustered in one location. In fact, interspersing the public spaces in small quantities throughout the structure will encourage more interaction because people will come across them more often than they would one or two large public spaces. The building must be reconfigured to encourage a mix of spaces, programs, and people throughout the building which will foster the interaction required to turn the Central Business District into a vibrant community.

Rather than redesigning the floors of the building, the program of the project is a series of public spaces incorporated into the current structure which act as a catalyst to spur a mixed use of the existing floor spaces. The elevators will act as express transportation to a number of zones within the building where users will then enter the public pods to continue their journey to their desired level. The pods will serve as a place of impromptu interaction with other users of the building, encouraging a new social discourse not found in current

53. A better configuration includes a wide variety of uses to meet the daily needs of the people occupying the space of the Central Business District. A mix of uses throughout the buildings would also help reinvigorate the city.
skyscrapers. Based on the desired “zoning” of the floor slabs, the pods will take on a use concurrent with the occupants’ daily needs not currently considered in the Central Business District while attempting to infuse enjoyable public spaces in the sky. In addition, a new lobby pod will be introduced to better connect Fountain Square to the Fifth Third Bank building, allowing the spaces to interact more effectively than they do now.

Vertical Circulation

Vertical circulation must remain efficient, but the environment and flow must be improved so that the system can function as required. Incorporating a new method of vertical movement on the exterior of the building to encourage a spatial interaction between floors is vital to the project because it allows the building occupants to see, hear, and visit other locations within the building, which they would normally not be able to do. In addition, the exterior circulation will take some stress off the central core elevators, allowing them to take passengers to higher floors quicker and safer. This efficiency will make all levels of the building easier to access which allows the spaces to become more receptive to programs that require high traffic flow, such as stores and restaurants.

Adding new circulation (elevators/escalators) requires more power to operate efficiently, therefore the energy requirements of such a system must be taken into account. In addition, vertical circulation takes up a significant amount of space, so it would be beneficial to incorporate these devices into the new structures’ occupied public spaces so as not to relegate the circulation to the inner dungeon, but rather to make it into a space occupied and used because of the positive atmosphere. It is most important to make the spaces of vertical circulation more inviting so people are willing to use them, which will make them more dynamic and attract more attention.

Public vs. Private

The theoretical issues will be addressed through a series of public spaces pulled up into the building which will foster the kinds of social and spatial interaction that is required to make vertical living more attractive and reasonable. These spaces located throughout the building will help to create the flow and interaction that is typically found while moving horizontally through the city. The ability to flow quickly, easily, and spontaneously through the city is what makes it
enjoyable and exciting. The buildings within the city should operate similarly, which will only enhance the experience of living in the city.

The public spaces must relate directly to the programmed spaces which are adjacent to them so they are used by the people occupying the building at all levels. Therefore, public spaces related to residential life must be located near a high density of residential units. This is how public spaces are distributed throughout the city and it should be no different within a building. The public spaces must also be useful and environmentally comfortable for the occupants so they will make use of them around the clock and throughout the week. The overall goal is to convert the building from a workday building to a 24-hour building.

Conclusion
In summary, the goal of the project is to investigate how the traditionally horizontal neighborhood spaces can be distributed in a vertical manner to encourage more social interaction within a tall building structure. Thus it is important to consider the vertical circulation within the building and the way in which the building meets the ground and the public space of Fountain Square.

BUILDING DESIGN

Prototype for Midwestern Central Business Districts
The building design is a way of exploring the ideas found within the theoretical portion of the project. The important thing about the building design is that it is only one resolution for one condition out of hundreds of tall buildings in the Midwest. The development of the same theoretical ideas in different cities, in different neighborhoods, on different streets will end with completely different solutions. However, there are some specific conditions that are being addressed in a prototypical way.

Tall Building
Due to the nature of the investigation, the building must be of a significant height. Since the spaces in the first four stories of Central Business Districts are generally mixed use and have easy physical and visual access, it does not make sense to study these as it does tall buildings. The spaces of concern for this project are those that are out of range visually and physically; in most cases these are above the fifth floor. This scenario of the tall building also provides
more space for the elements being added, since the building is not restricted by close or abutting buildings or structures. Tall buildings provide more of a challenge in connecting the various spaces together and also connecting the spaces in the building to the spaces at ground level, but they also provide more freedom to expand the building beyond the current skin.

**Programmatic Layout**

While the different programmatic spaces throughout the building can be placed virtually anywhere, some scenarios are more likely than others. Since the circulation and public spaces will be affected by the programmed spaces it makes sense to establish a general roadmap of where these different zones will occur. The spaces are located similar to how they would occur within the city.

The first and most public zones would remain in high density at the lower floors to provide easy access for visitors. The lower floors would house civic spaces and governmental offices, high densities of retail, and a large amount of entertainment. Moving higher in the building, office spaces would be located above the most public zone in the lower portion of the structure. Halfway up the building, at floor 15 is a large public open space with a park-like setting for large gatherings or sporting events. Immediately above and below these spaces are retail and office spaces that serve the building. These are located here due to their central nature within the structure – serving both the 30th floor and the 1st floor equally.

Important office and high traffic businesses are located at each of the express floors due to the amount of traffic that will pass them. Moving away from the express floors, more private businesses will be located in the floor above and below. Residential space will fill the rest of the building to provide a high number of people to help support the office, retail, and entertainment spaces. In addition, a boutique-like setting will occur on floor 30 and above. This zone will house high-end entertainment, retail, and penthouse apartments.

It is important to note that the goal of the project is to encourage interaction within the building, but also between buildings and exterior spaces within the city. Therefore, it is inappropriate and inconceivable to house everything a person needs in one structure. Rather, a mix of offerings occurs in every building, which encourages people to move through the different spaces that make up the city, both on the street level and high into the buildings.

57. The programmed spaces within the building are distributed vertically throughout the building with more public near the base and more private near the summit.
Vertical Circulation

The overall goal of the project is to distribute the city’s different programs into the vertical realm effectively reconfiguring the way the building is used and experienced while encouraging more spatial and social interaction within. The primary method for accomplishing this is to modify the way in which people move vertically through the building. The current system of elevators within the building will remain for structural and economic reasons, but their role will change to an express system of transport. The elevators will serve every fifth floor within the building, stopping at floors 5, 10, 15, 20, 25, and 30. The goal is to alleviate the stress on the system by stopping 6 times rather than 32, which will provide faster service to the entire building. Two elevators will remain in their current operating form to continue to provide accessibility to the entire building.

Once an individual reaches the express floor as mentioned above, they will exit the elevator and continue their journey at the exterior of the building. Escalators will connect the remaining floors between the express floors. The escalators will provide more of a flow within the system to encourage more interaction within the building. Rather than move directly to floor 23 within an elevator, the occupant will arrive at the 20th floor and will then move up the escalators to floor 23 all the while passing floors 21 and 22. This gives more of a feeling of traveling through a city and allows the occupant to spontaneously decide to halt their journey on floor 21 to pick up a bagel at the local bakery.

Since vertical circulation takes a significant amount of space, the system will extend beyond the current shell of the Fifth Third Tower. This design move will leave a majority of the floor space available for tenants rather than becoming circulation space, effectively saving the building owner in lost rental revenue. Moving the circulation system beyond the floor will also allow other more public spaces to intermingle in the circulation system, which is how these spaces tend to interact within the city; therefore, the public spaces will be tied to the programmed private spaces through the circulation system.

Public Spaces in the Sky

Since the circulation system is pushed beyond the skin of the existing building, it makes sense to push the new public spaces beyond. The pods that result begin to take on a distinct feeling of their own, depending on the surrounding private spaces that make up the building. The public pods will serve the needs of vertical living,
working, and playing on a level that will be community owned and maintained.

Serving the more residential areas of the building, which increase in density near the top of the building are a children’s playground (floors 24-28) and a community garden (floors 18-22). Both of these spaces serve the residents similar to the way they would in a dense urban environment at street level, except they are now high above the street. The pods give urban residents a place to take their kids and a place to grow small vegetables and plants, things that are traditionally left out of Central Business Districts, yet remain important to a mixed use community.

Serving both the residential and office areas of the building are a Vending and Café pod (floors 8-12) and a Public Park (floors 14-16). These take traditional urban spaces and pull them up into the building. The park is thought of as a hardscape resting point for lunch or relaxing, complete with a water element. The vending pod creates a more enjoyable locale for vending machines and small food shops, which are usually part of a tall building’s gloomy inner core.

Located at the highest region of the building is an energy pod (Floors 30-Roof). This pod serves an important role in studying alternative energy systems for tall buildings. The incorporation of new pods and the use of escalators require a large amount of energy in addition to the amount already used by the tower. This pod is to be an educational facility where scientists study the energy sources as the systems work to provide more energy to the building. In addition, the pod will serve local schools and the local community in educating them about the energy concerns with urban living.

The most important pod within the building is the new building lobby located at street level and extending up to the 5th floor. This pod will act as the connector between the building and the surrounding community. It will serve to introduce occupants to the circulation system and will act as a central meeting point within the building. The pod will incorporate a portion of the adjacent square as an interior space, so it will effectively pull the public Fountain Square up into the Fifth Third Tower.

**Building Systems**

The most challenging portion of the design process is the execution of the structural system, since the public pods will extend beyond the current skin and structure of the Fifth Third Tower. To efficiently
To accommodate the large pods, a system was devised in which two large trusses (12 feet in depth) tie into the existing steel structure for each pod. The existing steel structure at the new trusses will be reinforced to help carry the increased load. From these large trusses are built either five or six floors of the pod. The floors are either hung with tension rods 10 inches in diameter, or built upwards using traditional steel framing techniques. The floor plates within the pods hang from the tension rods and tie back into the existing floors of the tower.

The HVAC, electrical, and plumbing systems that are required within the pods are self-sustaining systems located on the pod roof or within the interstitial spaces of the pod. While the systems are self-sustaining, they must tie back into the current systems at the building’s core. This process takes place only at the express floors to help reduce cost and construction requirements.

The skin of the pods is a curtain wall system that is made up of typical glazed panels and aluminum panels laid out in a fashion that meets the lighting and view requirements of each particular pod. The interior materials vary depending on the requirements of each pod, but are similar enough that a reasonable cost can be maintained.

**Pod Aesthetic**

The pods being added to the Fifth Third Tower must be different from the existing building in order to make it clear that the building has been modified since the modifications will give the building a new life. For this reason, the form has developed into an irregular shape and size. While the form is irregular, the spaces are designed to take into account the activities going on inside and the ways that the people will likely use them. The pods are divided into two main portions. The vertical circulation portion is housed in a more regular and solid form because people tend to move in straight lines as they progress through a city in search of their destination. The areas of the building that house the public spaces are housed in a more fluid glass structure because people tend to move in more irregular patterns within these types of spaces.
CONCLUSION

The goal of this thesis is to rethink the way the Central Business District operates in the metropolis since the zone has undergone serious change due to the effects of sprawl. As people, stores, and offices leave the city center, the tall buildings of this district must be adapted to meet the needs of the people who will occupy this zone. The Central District must become a complete and sustainable neighborhood that provides for the daily needs of the people who occupy it. The buildings and city infrastructure can accommodate this change and they must do so, otherwise America’s Central Business Districts will continue to degenerate into a black hole.

Incorporating mixed-use programming into the Central Business District will help the zone attract enough people to act as a magnet for the businesses that have left for the suburbs. This will also help to control congestion in the area, which occurs as people arrive for work and when they leave for the day. The high congestion at these times can be spread out across the entire day, making the district safer and livelier. The neighborhood can be alive 24 hours per day, 7 days per week, rather than only during business hours.

The design portion of this thesis shows a single building modified to house the activities of a vibrant, mixed-use community. This is a first step in the rediscovery of the community that once thrived in the spaces of the Central Business District, but does not encompass the potential of the entire district. Subsequent building modifications in the area will only strengthen the community by providing more spaces to house people and their daily needs. As more people move in, the community will become more, which will provide more opportunity and create a more vibrant community. The vertical community will become interconnected, giving people at all locations within the city a unique and exciting experience.

The success of any redevelopment relies on the people and the policy-makers of the community. If cities continue to build attractions to encourage city growth, they will fail. Cities must invest in their people rather than in stadiums, museums, and events. The high priced attractors, such as stadiums, are important for a community, but do not act as daily attractors. People are the only thing that can provide the lively and exciting environment on a daily basis. Community leaders must focus their efforts on analyzing their city and using their existing infrastructure to attract people and encourage the growth of a district that is on the decline.
WORKS CITED

Print Works


Brand argues that buildings learn and grow over time and must change to meet the needs of the people using them. He encourages people to shape their environments to meet their particular needs and suggests that buildings should not be replaced; rather they should be modified to meet changing needs.


Part of a larger volume of works, this essay examines the energy savings associated with adaptive reuse as opposed to demolition and new construction. The book provides numerical figures that back up the idea that energy is saved by reusing buildings rather than replacing them.


Cincinnati: The Queen City provides an excellent history of the city, its residents, and its growth. The book provides historical information about the growth of the Ohio River Basin and the Central Business District along with information about Fountain Square.


Curtis provides a detailed history of Architecture since the turn of the 20th century. His writing focuses mainly on the aesthetic and theoretical dilemmas within the practice of architecture and the solutions many masters has preferred. Taken from the book was information on the design of the skyscraper.


Duany, a father of the New Urbanist movement describes the move of people from the city to the suburbs. Specifically used is the chapter entitled, “What is Sprawl, and Why?” which provides reasons for the move from city to suburb and describes the history of urban sprawl. The New Urbanist ideas have been used to design many neighborhood and city projects around the world.


Urban America details the history of American settlements beginning with Jamestown and continuing through present day trends within the metropolis. Particularly relevant to this thesis is Part 4, The Vital Fringe which follows the move from city to suburb and beyond.


Gratz, with co-author Norman Mintz, introduce the issues that are affecting downtowns and city centers across America. Her book includes examples of cities that are reinventing their downtowns and the methods that are allowing them to do so. Useful to this paper are the myths of sprawl and the way they can be overcome.


This renowned book by Jacobs is a study of many cities around the United States. She attempts to decipher what makes some cities and neighborhoods good and what makes others bad. The book provides specific details about mixed use neighborhoods, walkability, and 24 hour neighborhoods.


Kotkin uses his background in business and the “new economy” to study the effects of new technologies on people and the cities. The book is dedicated to how people are changing their ideas of life in the new digital era, many of which suggest a new role for the city center.

The book is a study of New York and the ways that have made it successful and why it is a great example of the city. Specifically, the book provides information on the Downtown Athletic Club and the ways in which city programs are incorporated into towers.


The book provides an extremely detailed history of early skyscrapers in New York cover all topics from technological developments and innovations to aesthetic concerns and corporate image. The book was used primarily for the historical growth of tall buildings in New York, one of the first cities to adopt them for widespread use.


Lang's article analyzed 13 of the nation's largest real-estate markets to define trends in office location from 1979 to 1999. The study shows an increased level of commercial development in the suburbs during this time. Detailed statistics are provided to support the trends.


Chapter 4, Trading Places: the City and the Suburb, demonstrates how the dream of living on an acre of land in the suburbs has reversed the roles of city and suburb. The suburb is now the congested, busy, and dirty locale, while the city has become the new frontier for people to escape the insanity of the suburb.


This important report commissioned by the City of Cincinnati provides an outlook for the city in the new millennium. The report focuses on the Cincinnati Metropolitan Region including parts of Indiana and Kentucky. The report attempts to provide ways the city can achieve social, political, and economic prosperity in the new century.


As dean of the Architecture School at MIT, Mitchell has been studying the effects new technologies are having on architecture and the way people are responding. Specifically important to this thesis is his chapter on “Recombinant Architecture” which describes how buildings are responding to new ideas based on technological change.


Newman and Kenworthy examine the sustainability issue in terms of the urban environment and promote reducing human dependence on the automobile. They provide statistics that show that automobiles and suburban living cost significantly more, both environmentally and monetarily, than dense urban environments. The examples in the book focus on Australia cities, but the principles are applicable to the entire world.


A celebrated architect, Rossi describes the city and how the elements of the city work together to make one important whole. The book focuses on life of the city and how the city evolves and morphs. In addition, Rossi looks at the artifacts that make the city important and memorable.

The Transportation Research Board wrote a literature review of a number of reports on the monetary costs of urban sprawl. The review combines a number of reports, providing an overview of the costs on a nationwide scale and is able to average data from a number of different metropolitan areas.


Willis examines the financial and economic reasons for the development and evolution of the skyscraper. The insight she provides makes clear that design of the buildings was generally about economic profit and has only recently become an endeavor into the social and health issues associated with life in a tall building.


Yeang argues that the skyscraper will not be disappearing as a building type, so it makes sense to develop tall buildings that are sustainable and friendly to the environment. The book provided good insight into the needs of skyscrapers and how the ecology debate fits into the design process.

Digital Works


The website of Norman Foster’s firm shows an entire chronology of their projects with detailed descriptions of the theoretical and pragmatic issues involved in the buildings. The site was used for the information on the Hong Kong and Shanghai Bank project.


The HCRPC provides considerable data on the Hamilton County area. Statistical about the demographics and usage of the area are specifically relevant to the topic.


Haughey, writing for the Urban Land Institute provides insight into the need for more multifamily housing in our cities. His reasons are economic and social, but will also help reduce problems of traffic congestion, pollution, and a lack of diversity. He follows his statements by proposing that many people today would rather live in a multifamily building due to the increasing population of non-traditional households in America.


The website for the architecture firm MVRDV showcases their major works and has theoretical descriptions of the project that they have undertaken. The site was used primarily for their information on the project for the World Expo 2000.


The Sierra Club, an organization to protect our neighborhoods and environment, provides information about Urban Sprawl in the form of studies done on American Cities. This study focuses on urban sprawl conditions in Cincinnati and how this effects the residents of the area.


The Sierra Club, an organization to protect our neighborhoods and environment, provides information about Urban Sprawl in the form of studies done on American Cities. This study focuses on the condition of sprawl throughout the United States and provides statistical data about the problem.
APPENDIX

DESIGN DOCUMENTATION

62. Fountain Square Side
64. View from the corner of Vine and Fifth Streets
65. Section perspective of Playground Pod