Abstract

Title of Thesis:	LIVE, LEARN, WORK, WALK: CREATING RESILIENT MULTI-FAMILY HOUSING IN DETROIT, MICHIGAN
	J. Chase Edwards, Master of Architecture, 2023
Thesis directed by:	Professor, Brian Kelly, AIA, School of Architecture, Planning, and Preservation

Detroit, Michigan, and its residents have suffered through economic, social, and environmental hardships from the fall of industrialization since 1950. Some of the largest issues within the city of Detroit are high vacancy rates, high unemployment rates, poverty, and overall lack of acknowledgement to its residents. However, in recent years, organizations within the city have begun to implement various outreach programs to beautify Detroit, improve its current housing situation, and promote community engagement. This thesis proposition looks to help aid these efforts through the introduction of a vertical smart growth architectural hybrid typology used as a catalyst human-centric, resilient urban housing. This is accomplished through the introduction of a community-focused and supportive building program. Overall, creating a self-sufficient, live-work micro-ecosystem to bring life back into the city center.

LIVE, LEARN, WORK, WALK: CREATING RESILIENT MULTI-FAMILY HOUSING IN DETROIT, MICHIGAN

By:
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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2023

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Acknowledgements

Thank you to all of those who have helped me not only on my thesis journey, but my journey through life up to this point. The knowledge and experience I have acquired along the way have inspired my passion for both the built environment and aiming to improve the lives of others through careful, good design. A special thank you to the director of this thesis, Professor and former Director of the School of Architecture, Brian P. Kelly for the guidance, encouragement, and excitement that was brought to the table every day through this process. Additionally, thank you to Professor Emeritus, Ralph Bennett and Lecturer, Marques King for providing me with various forms of research material and insight to Detroit to further progress this thesis. Lastly, thank you to all my friends and family that have shown me support through my academic career. The completion and success of this thesis would not have been possible without all of you, thank you again.

"A profound design process eventually makes the patron, the architect, and every occasional visitor in the building a slightly better human being"

– Juhani Pallasmaa, Finnish Architect & Professor of Architecture

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List of Abbreviations

AMI – Area Median Income

ARPA – The American Rescue Plan

ASPE – Assistant Secretary for Planning and Evaluation

B5 – Major Business District

CNU – Congress of New Urbanism

DHC – Detroit Housing Commission

FAR – Floor Area Ratio

FHA – Federal Housing Authority

FSLIC – Federal Savings and Loan Insurance Corporation

NHA – National Housing Act of 1934

SLUG – Spread-Out, Low Density, Unguided Growth

TND – Traditional Neighborhood Design

TOD – Transit Orientated Design

UN-Habitat – United Nations Human Settlements Programme

U.S. – United States

Chapter 1: Investigation American Legacy Cities

Introduction to American Legacy Cities

Cities such as Detroit, Cleveland, Baltimore, Buffalo, Pittsburgh, Philadelphia, etc., were all once manufacturing powerhouses which were built on entrepreneurship and consumer culture. Through the relocation of manufacturing overseas in modern America, these cities now lay bare in the shadow of what they once were. Defined as America's 'Legacy Cities', they were cultivated through the rapid growth and advances of the industrial era while crafting the premise of the built environment and the modern American society. While the Industrial revolution brought a lot of good, it also brought bad. Legacy cities have generated prolonged problems to which architects, planners, and environmentalists are still seeking the answers today. However, they have also helped spark architectural transformations through the promotion of human well-being.

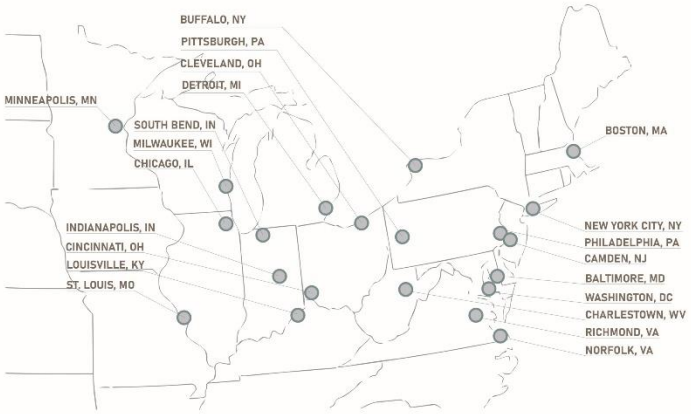

Figure 1: Mapping American Legacy Cities: North-East Region.
(Source: J. Chase Edwards, 2022)

The American Legacy City

In the 19th century and early 20th, century during the peak of the Industrial Revolution, thousands of immigrants pushed towards large cities to find work. However, it was not until after the Civil War when the popularization of the industrial city began to rise. Cities such as Detroit, Cleveland, and Baltimore became the foundation of America through their industrial manufacturing production capabilities and dense populations. Production-based industries were no longer small-town mills and local businesses but rather industry giants mass producing and manufacturing goods for the American consumer. Chasing the available industrial jobs cities had to offer, growth exploded in a short period of time at the beginning of the midcentury.

Through high density cities, a surplus of resources, technological advances, and efficient transportation methods, America quickly became the global industrial leader near the end of the 1880s. In the early 1900s, the industrial efforts of America continued to grow. World War I was on the brink of starting and factories' production ramped up. However, by the end of World War I (ca. 1920), signs of deterioration in industrial cities began to show. This was caused by less demand, the creation of the modern suburbs, and the invention of the automobile. The first major decline in legacy cities was in 1930 during the start of the Great Depression. With increased unemployment rates and factories closing (Figure 2), city residents were forced out of the city causing a decline in population. Towards the end of the Great Depression and the start of World War II, a small spike in city life was seen as America once again needed to mass produce supplies to support the war.

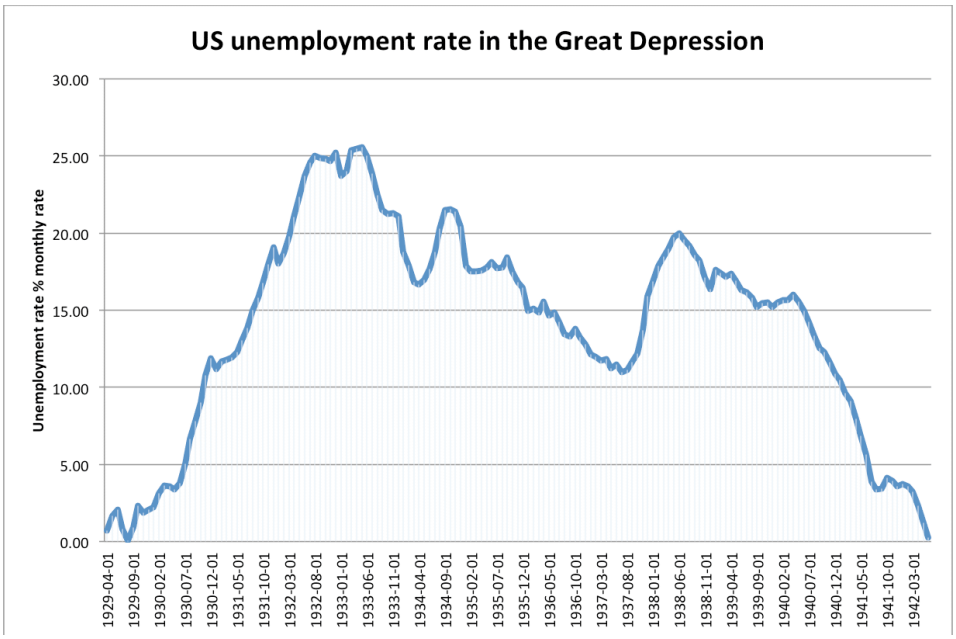

Figure 2: US Unemployment Rate in The Great Depression
(Source: EconomicsHelp.org by Tejvan Pettinger, 2020)

With troops and military personnel returning to the United States of America at the end of the war, factories and the industrial sector began to return to normal. However, 1950 proved to be the peak for many cities as a downward spiral of decline can be seen through a large demand in suburban housing. After the 1950s, the strong industrial workforce began to dwindle, city life had shifted to suburban life, and economic restructuring began to take place; all of which, showed high job loss and distress on American legacy cities for the foreseen decades. Through urban sprawl, loss of work, and economic failures, cities began to deteriorate as middle-class Americans suffered greatly.

Economic Impact

Through technological advancement, the Industrial Revolution pushed America into a new age using mass production. Goods were no longer handmade but rather machine made – this not only promoted increased efficiency but also profits. However, at the beginning of the Industrial Revolution, poverty rates were higher than ever. Factory

workers were often poorly compensated and overworked to make ends meet. The first site of regulations in favor of industrial workers came during the 1930s during the Great Depression. Through which, the 1933 National Recovery Act was passed, granting factory workers fair wages. This act also provided guidelines to promote economic recovery during a time of need. Additionally, in 1935 the National Labor Relations Act was passed, allowing workers to formulate unions within the private sector. Both Acts aided the well-being of factory workers by lowering poverty rates within the factory worker class and providing opportunities for homeownership.

However, industrial cities endured hard financial and economic hardships when factories closed and relocated overseas to Asia. Thousands of workers were displaced and ultimately left the city to deteriorate in hopes of finding work elsewhere. In turn, this created a high vacancy rate within cities to which is still an issue today. In addition, the loss of income and population for cities imposed issues on the expanded infrastructure. To explain – city streets, sewer systems, sidewalks, etc. were built to support mass populations but only saw usage from limited individuals. With a decline in population and taxation income, maintenance of infrastructure by local governments became increasingly difficult to afford.

Social Impact

Though the Industrial Revolution had a large impact on the American economy, it also contributed greatly to the social aspects of America as well. This includes the increase in available jobs promoting the 'class' system, the creation of workplace regulations, and the ideology behind housing type and necessity; all of which forced social reform in various ways. While cities were filled with jobs at the industrial factories, it was often incredibly

unsafe due to no worker safety regulations. Exposure to heavy machinery and raw resources contributed to several life-threatening injuries and illnesses. This includes both the loss of limbs and/or illness from contaminated oxygen. If an individual had become ill or injured, they were forced out of their job.

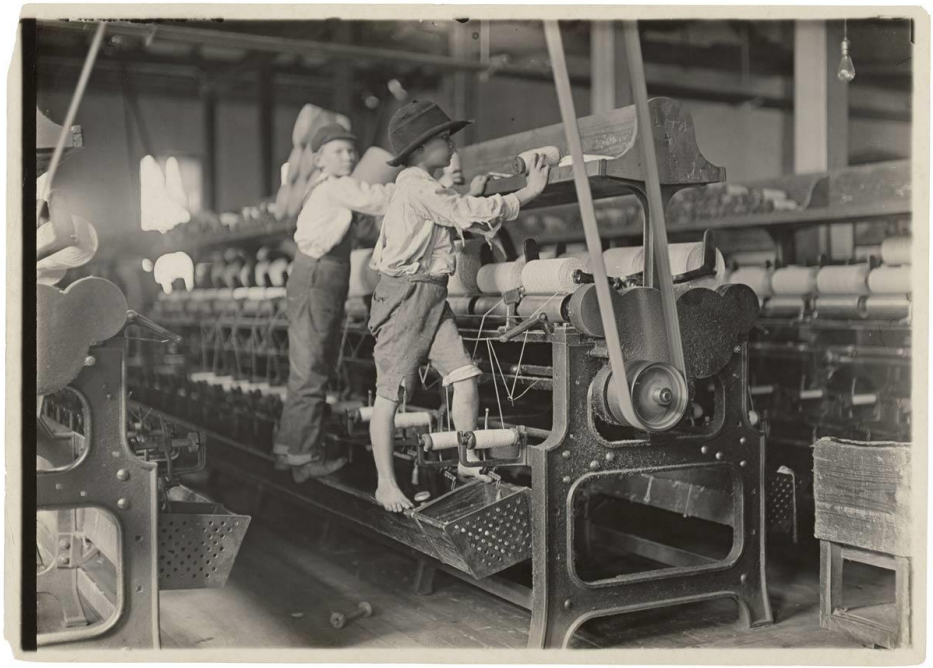

Figure 3: Working Conditions During the Industrial Revolution
(Source: The National Archives, Photo #102-LH-488, 1909)

Living conditions outside of the factory for workers were often not much better. Cities were not prepared nor built to support the well-being of large quantities of people. Immigrants were often placed into small-scale houses or residential dwelling units to which they had to share with two (2) or more families. This was due to a few, issues including a high poverty rate amongst "factory class" Americans and lack of housing due to an increase in city growth. Overcrowded housing was very unsanitary and contributed to the spread of various diseases throughout cities. Therefore, life of the factory class was threatened both at the workplace and at home.

However, as new regulations were passed that aided the factory class, poverty became sparse and homeownership rates became increasingly higher. In addition to the

increased popularity of the automobile and suburban life, workers were able to live further from the city but still access the city for work. After the conclusion of World War II, nearly 58% of Detroit's population were homeowners[1]. However, this would not last as factories began to close in the 1970s and the population began to decline.

Environmental Impact

As we have discovered in more recent years, industrialization also had a huge impact on the health of the environment. During the Industrial Revolution, the focus was on mass production rather than the protection of the environment and mankind. In order to power the machinery, factories turned to coal and other fossil fuels. While coal was not a new source of power, the rate at which it was used during the industrial revolution drastically increased. City skylines were dark and cloudy due to the smoke accumulation from the factories. Air pollution not only was a large issue in terms of endangering the environment, but it also posed danger to the workers of the factories. Workers often worked closely with raw, harmful materials which caused illnesses and long-term health effects. According to EcoMENA.org, the "United States Environmental Protection Agency can identify roughly 80 different toxins through industrial pollution." During the Industrial Revolution, Personal Protective Equipment was not a concern to neither the workers nor the factory owners.

However, air pollution was not the only form of pollution ravishing the environment. Water pollution was also quite common, especially where factories were built adjacent or in proximity to waterways. Factories were to blame for toxic chemicals

[1] Mallach, *The Divided City: Poverty and Prosperity in Urban America*, 23

entering and contaminating local water supplies which, in turn, contaminated potable water within the city[2]. In addition, soil conditions were also compromised through these same toxins. Thus, numerous plots of land that once housed factories (brownfields) within the built environment needed soil rehabilitation prior to completing any potential redevelopment project. All these issues not only promoted deterioration of the atmosphere and danger to humankind, but also destroyed wildlife habitats in numerous ways. For one, air pollution affected wildlife in similar ways as it affected humans. However, wildlife was additionally affected through the mining of raw materials throughout the land causing displacement and interruptions to healthy ecosystems.

[2] "The Environmental Impacts of Industrialization," *EcoMENA*, last modified June 3, 2022, accessed October 14, 2022, https://www.ecomena.org/environmental-impacts-of-industrialization/#:~:text=The%20Impact%20of%20Industrialization&text=The%20biggest%20problem%20is%20air,dioxin%20to%20lead%20and%20chromium

Figure 4: Excessive Factory Pollution During the Industrial Revolution.
(Source: The Library of Congress, Photo #LC-D4-12191, 1890-901)

Post-Industrial Urban Transformations

Population decline, economic failure, and decreased housing support in American cities is the foundation of problems in modern urbanization. Additionally, increased problems arose through the popularization of the suburbs. To address these urbanistic issues, architects, planners, environmentalists, and local political leadership looked for ways to reinvent the American City. These efforts include, but are not limited to, city beautification, redefining of suburban neighborhoods, increased housing options, and the implementation of increased regulations at both the building and city level; all of which de-industrialized the city, promoting urban space and supporting the well-being of its residents while stepping towards overall city resiliency.

However, not every city was able to see the decline and push for changes as necessary. Most of the problems that have been addressed are at the suburban level and not at city centers. Through what we have learned during this study of industrial cities, there seems to be a loss of connection between the city and the person. To explain, post-industrial urban reformations seemed to be focused on the greater city rather than the relationship of the city and the person. Therefore: this begs the question of how can the relationship between the city and the person be salvaged? While there is no single solution, there are certain building typologies that can start to bridge the gap between the two. Creating a singular building that prioritizes the need of the person and promotes engagement between people through architecture can potentially make city life more appealing.

Chapter 2: Investigation of Detroit, Michigan

Industrialization of Detroit, Michigan

As one of America's greatest Legacy Cities, Detroit reaped the benefits and the failures delivered from industrialization. Detroit was founded in 1701 by French Explorer Antoine De La Mothe Cadillac and remained a French colony until 1796 when America was given the land[3]. However, it was not until 1815 that Detroit was officially deemed a city within America. While Detroit was always a prime manufacturing hub due to its access to large waterways, it was not until the Industrial Revolution that it became one of the leading industrial cities. Known as 'Motor City', Detroit quickly became the leader in the automotive industry through the entrepreneurship of Henry Ford in 1986. While

[3] "Detroit History," *City of Detroit*, accessed October 14, 2022, https://detroitmi.gov/departments/detroit-history.

automobiles had already been invented, Ford was able to mass produce vehicles through the implementation of the assembly line.

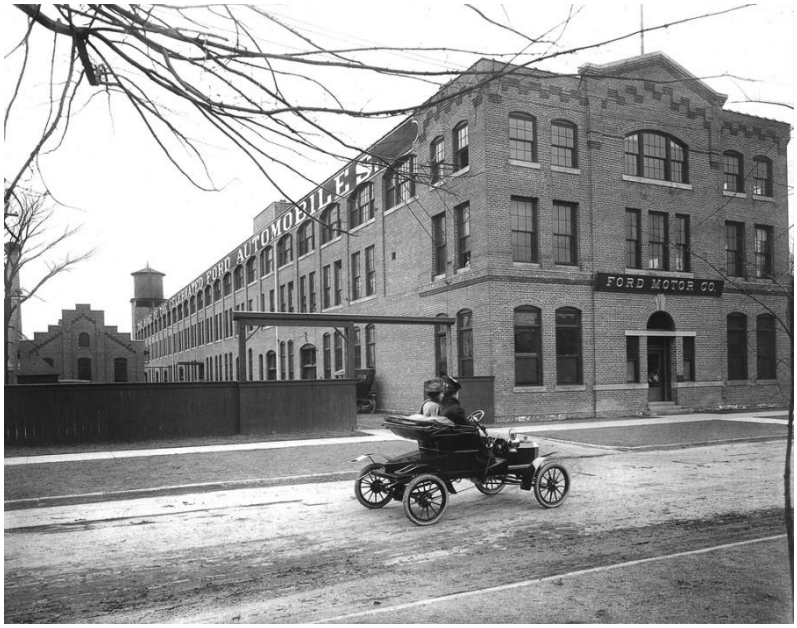

Figure 5: Ford Motor Company Original Piquette Plant, Detroit, Michigan.
(Source: thepiquetteplant.org)

During World War I, automobiles became increasingly more popular, and the demand was higher than ever. During the beginning of the twentieth century, additional automobile manufacturers began to open factories within Detroit. Like any other industrial city, as employment opportunities rose, so did the population. Automobiles continued to be popularized in American Society as time passed. According to *The Divided City: Poverty and Prosperity in Urban America* by Alan Mallach, "by 1925, there were over 17 million cars and 2.5 million trucks on the roads… half of all American households owned a car."

Although the automobile had become part of American society, and demand was steadily increasing, Detroit was devastated in 1930 through the Great Depression[4]. Detroit

[4] Mallach, *The Divided City: Poverty and Prosperity in Urban America*, 21

lost nearly 150,000 jobs at local factories. With a population of roughly 1.6 million at the time, Detroit lost approximately 10% of its available jobs[5]. This caused a slight population decline in the 1930s, but Detroit quickly bounced back as the start of World War II promoted increased automobile demand. Through the conclusion of World War II, and the implementation of post-war suburban housing communities, Detroit was the industry leader of automobile manufacturing. However, the development of post-war suburban communities both improved economic conditions and hurt economic conditions. While suburban life promoted the use and purchasing of automobiles, the population of residents within the city centers began deteriorating. Vacancies within the city became an increasingly relevant issue. However, factory owners continued to gain wealth through automobile sales.

Five (5) years after World War II concluded in 1950, Detroit saw the peak of its population at approximately 1.85 million residents[6]. However, since its peak, Detroit has had a steady decrease in population. As the automotive industry saw hardship in 1970-1980 through oil shortages, rising average fuel prices, and increased international competition, Detroit also saw hardship[7]. By 1990, the automobile industry within Detroit only employed roughly 104,000 Americans. As manufacturing was being phased out due to technological advancement, Detroit did not advance in conjunction. Modern day Detroit still lays bare within the shadows of industrialization but is full of hope and potential.

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[5] Admin, "Admin," *Society for American Baseball Research* (admin /wp-content/uploads/2020/02/sabr_logo.png, February 3, 2017), last modified February 3, 2017, accessed October 14, 2022, https://sabr.org/journal/article/a-sleeping-giant-detroit-in-the-mid-1930s/#:~:text=Detroit's%20population%20rose%20from%20less,58%20percent%20in%20the%201920s

[6] "Statistically Speaking...," *Detroit Statistics*, accessed October 14, 2022, http://historydetroit.com/statistics/.

[7] Thomas J. Sugrue, "From Motor City to Motor Metropolis: How the Automobile Industry Reshaped Urban America," *From Motor City to Motor Metropolis: Downsizing*, accessed October 14, 2022, http://www.autolife.umd.umich.edu/Race/R_Overview/R_Overview5.htm.

Relevant City Issues

Through the advancement of the Industrial Revolution, towns across America exploded into large cities. These cities, such as Detroit, reached new economic and demographic stature through technological advancement. To explain, America as a whole, shifted from an agricultural background to a production-based industrial culture. However, through the decline in the industrial industry, Detroit has suffered from years of continued demographic, economic, and social damage. In the last half century, the local government of Detroit, and even the Greater Michigan area, has been reimagining Detroit in an effort to reestablish a strong foundation for a bright future.

Demographics

During the peak of the era of industrialization in the twentieth century, Detroit saw its highest recorded population at 1.85 million city residents. However, since 1950, there has been an average population decrease of approximately 8.13% per decade[8]. The largest shifts in population came between 1970-1980 and 2000-2010. These two decades alone account for the loss of nearly 550,000 residents, amounting to nearly a quarter of Detroit's population in 1950. According to the United States (U.S.) Census, the current Population (2020) of Detroit sits at 639,614 city residents. The State of Michigan reports 10,050,811 residents in totality, therefore, Detroit accounts for roughly 6.4% of Michigan. While Detroit holds the title of 'largest city' in Michigan, it has dropped down the national ranks in the last decade. In 2010, Detroit was ranked the 24th largest city within the United States.

[8] Kim Kozlowski, "Detroit's 70-Year Population Decline Continues; Duggan Says City Was Undercounted," *The Detroit News* (The Detroit News, August 13, 2021), last modified August 13, 2021, accessed November 5, 2022, https://www.detroitnews.com/story/news/local/detroit-city/2021/08/12/census-detroit-population-decline-u-s-census-bureau/5567639001/.

However, it has since been demoted to the 27th largest (2020) due to a 10.5% population decrease (roughly 75,000 residents).

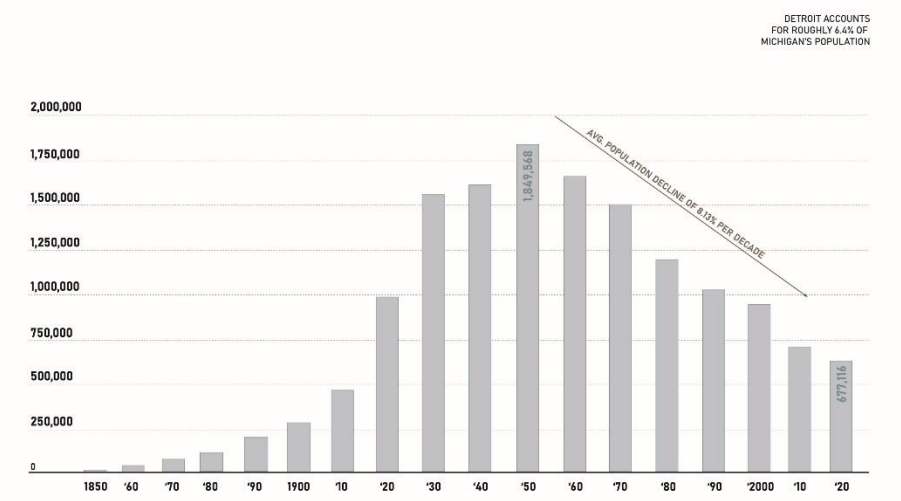

Figure 6: Detroit, Michigan Population Decline Since 1950
(Source: J. Chase Edwards, 2022)

Although Detroit has seen a large population shift in the last 70 years, the city has seen a present-day surge of younger individuals. Of Detroit's 10,050,811 residents, approximately 54.1% of the population are between the ages of 18 and 65 years old and 24.8% of the population is under 18 years of age. 77% of the population's entirety is comprised of Black or African-American persons and 14% are white. Asian, Pacific Islander, Latino, and 'other' make up the additional 9% of the population. However, the population is quite equal in terms of sex. To explain, according to the U.S. Census (2020), female persons make up approximately 52.7% of the population while male persons account for the remaining 47.3%.

The U.S. census reports education percentages in individuals above the age of 25. Nationally, 91.1% (2021) of individuals above the age of 25 years old within the United States have obtained a high school diploma and 37.9% (2021) have obtained a bachelor's degree or higher. For Detroit, 81.9% of residents older than 25 years of age have received

a high school diploma and only 16.4% have obtained a bachelor's degree or higher. Although the city of Detroit has a high population between 18 and 65 years of age, the city's average education falls below the national average.

Though Detroit remains the largest city within Michigan, it has quite a low median annual household income. As of 2020, Detroit's median annual household income was reported by the U.S. Census to be approximately $32,498. At the larger scale, the state of Michigan has a median household income of $59,234 (2020) per year. Therefore, the median household income within Detroit is roughly 54% less than the state average. In addition, the United States median annual household income is approximately $67,521 (2020), putting Detroit at nearly half the average household income of the National average.

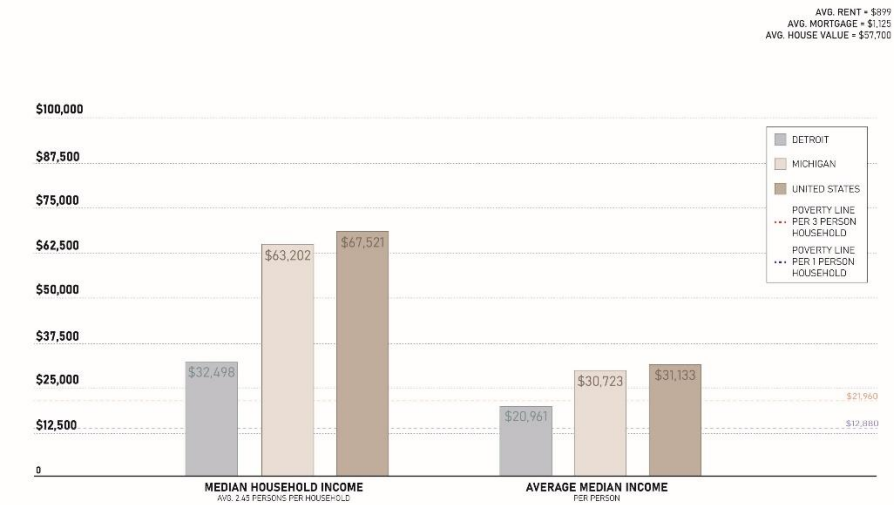

Figure 7: Detroit Income and Poverty Rate Comparison
(Source: J. Chase Edwards, 2022)

In accordance with the Office of the Assistant Secretary for Planning and Evaluation (ASPE), the poverty threshold for a household of three (3) persons is approximately $21,720. With an average of 2.45 persons per household and a median

annual income of $32,498, Detroit as a whole remains above the poverty line even though, on the individual person scale, approximately 33.2% of Detroit is in poverty. One (1) in every three (3) residents within Detroit are in poverty.

Economics

As previously mentioned, Detroit reached its economical height in the 1950s from industrialization and has been in a downward trend since. As manufacturing plants were being phased out for nation-wide modern technologies, Detroit made no plans to advance in cohesion and, therefore, they fell behind. In addition, in efforts to expand the limited infrastructure of the city to the surrounding suburbs, Detroit accumulated a copious amount of debt. Furthermore, the city's debt continued to increase as Detroit lost thousands of jobs due to the large population decline, ultimately requiring Detroit to declare bankruptcy.

The overall workforce within Detroit is quite low and likely contributes to the overall high poverty rate within the city. Per the U.S. Census, approximately only 54.7% individuals above the age of 16 years are employed. However, the city of Detroit has always had this idea of entrepreneurship through the means of creating goods. Within the city, there are numerous local vendors and small businesses that are well known across the Nation, such as Shinola Detroit. However, this same entrepreneurial focus also led to the economic decline from which Detroit still suffers.

In 2013, the city of Detroit declared bankruptcy after accumulating roughly $18 billion in total debt. This debt was the result of numerous large-scale infrastructure projects, infrastructure upkeep, and population loss. With a shift from city-center population to suburban population, the city of Detroit now needed to increase its

infrastructure outwards towards the suburbs. This included the expansion of all water and sanitation infrastructure to accommodate the newly developed suburban areas. In addition, new stretches of highway, which were built on top of African American communities, were installed to accommodate the ease of transportation into the city center. All of these projects, which had cost the city millions of dollars and ultimately raised city taxes.

Through the loss of thousands of jobs from the reduction of manufacturing plants, the city lost thousands of residents. With the loss of residents, the city collected fewer overall taxes from individuals while still having the need to maintain the city infrastructure. In addition, the city was now responsible for the upkeep of the numerous vacant lots within the city. The overall population decline and increase in infrastructure within Detroit led to the economic failure of the city.

During the city's declaration of bankruptcy in 2013, they provided a 'Plan of Adjustment' to reduce their overall debt by $7 billion and created a plan for the city moving forward[9]. Per the Citizen's Research Council of Michigan, as of 2020, Detroit is now ranked second (2nd) lowest per capita in debt with an outstanding gross debt of $1.98 billion. While the city has drastically reduced its accumulated debt over the past few years, the city still ultimately has the same issues through the maintenance of vacant lots and infrastructure upkeep.

[9] Esmat Ishag-Osman, "Detroit's Debt Compared to Other Cities," *Citizens Research Council of Michigan*, last modified February 9, 2022, accessed November 5, 2022, https://crcmich.org/detroits-debt-compared-to-other-cities.

Social

Both the demographic and economic struggles of Detroit have additional social issues within the city. These issues include poor accessibility to basic needs, high crime rates, inequality, lack of proper education, and high unemployment rates within the communities of Detroit. In addition, Detroiters have received the stigma of abandonment through the discontent of the American economy and constant belittlement; all of which have become increasingly more visible through the course of the COVID-19 pandemic of 2020-2021.

As previously discussed, the graduation rate from high school in Detroit for individuals older than 25 years of age is below the national average. This is largely due to the poor availability of good public schools within the city. In addition, the economic and population struggles of Detroit have caused a substantial amount of school closures. Approximately 195 public school closures occurred between the years 2000 and 2015, leaving just 93 schools today[10]. To put this figure into context, with the assumption that 24.8% of Detroiters under the age of 18 are enrolled in public education facilities, there are approximately 26,802 students per school zone.

[10] Nikhil Sai Yekollu, "Social and Environmental Issues for Detroit," Journal of Civil Engineering Research & Technology (2020): 1-4.

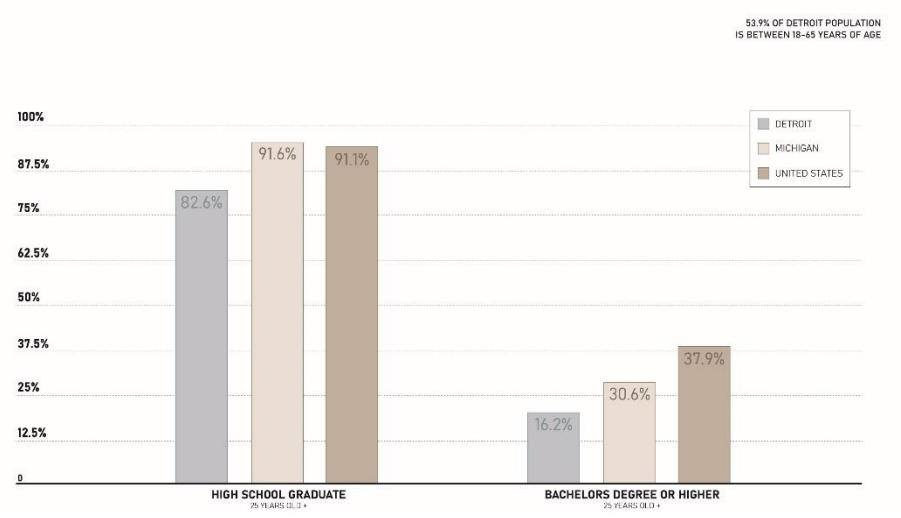

Figure 8: Detroit Education Comparison
(Source: J. Chase Edwards, 2022)

Detroit also has an incredibly high unemployment rate with only 54.7% of residents on the workforce. Nearly half of the residents eligible to work are not. With poor education and poor employment rates, one of Detroit's biggest challenges is promoting work. Ultimately, the workforce suffers from inadequate job training, but the number of jobs available. Where jobs are available within the city, they are often filled by individuals living within the suburbs. To explain, 74% of jobs within the city are filled by individuals living in the suburbs, therefore leaving the majority of Detroiters to find work outside of the city[11].

On the other hand, Detroit has seen years of social inequality amongst Black communities. While more prevalent in the twentieth century, Black individuals were subjected to segregated regions, discriminatory housing, and discriminatory hiring. In addition, Black communities were often targeted through gentrification efforts for the benefits of city infrastructure. This ultimately led to the 1967 riots of Detroit in which

[11] Dustin Walsh, "As Detroiters Take to the Streets, Economic Inequality Comes into Focus," *Crain's Detroit Business*, last modified June 5, 2020, accessed November 5, 2022, https://www.crainsdetroit.com/economy/detroiters-take-streets-economic-inequality-comes-focus.

Black residents rebelled against the social equality faced through everyday life. While the riot happened nearly 55 years ago, much of Detroit still looms in the shadow of inequality. Through the COVID-19 pandemic, like everyone else, Detroit's workforce dwindled from budget cuts. However, most of the budget cuts came from laying off many of the organizations' workforce, most of which were Black.

Figure 9: Military Personnel Arriving in Detroit for the 1967 Detroit Riots.
(Source: Michigan State Archives, 1967)

Detroit also suffers from the lack of available, affordable food and housing in the city's center. To explain, there is no 'true' grocery store within the city of Detroit. Most of the stores present provide residents with limited goods and basic needs but do not supply a large variety nor affordability. To access a big box grocery store, Detroiters must travel around twenty (20)-minutes by vehicle to the city outskirts. In addition, Detroit also has poor housing security and accessible, affordable housing within the city center. With a poverty rate of 30.3%, it is nearly impossible for individuals to live within the city.

Revitalization In Detroit

Within a struggling Detroit comes fragments of hope proposed by the local Governments of the city. To explain, Detroit has promoted increased community engagement from city residents which allows individuals to provide input on city matters. Additionally, the city has provided a housing plan to implement increased affordable housing opportunities for residents. These efforts come in the form of new housing developments and through existing housing developments. Through these aiding efforts, Detroit is diligently working to provide an engaging and revitalized community for residents of the city.

Housing Reformation

With limited accessibility to affordable housing and high poverty rates within Detroit, the city has proposed efforts to increase affordable housing by rehabilitating existing apartment buildings, providing additional housing loans, and providing assisted living programs for the unemployed; all of which has been provided through a seven (7) point plan of action in effort to provide adequate housing to support city residents. At the federal level, the American Rescue Plan Act (ARPA) has provided Detroit with aide through the establishment of a homelessness plan, neighborhood service centers, and monetary compensation. Detroit has received a total of approximately $826,675,290 from ARPA and has obligated roughly $263,037,804 of the funds thus far. This money is being used to tackle various issues and agendas such as neighborhood beautification, increased job opportunities, generational poverty, neighborhood investments, parks, recreational facilities, and as support for small businesses.

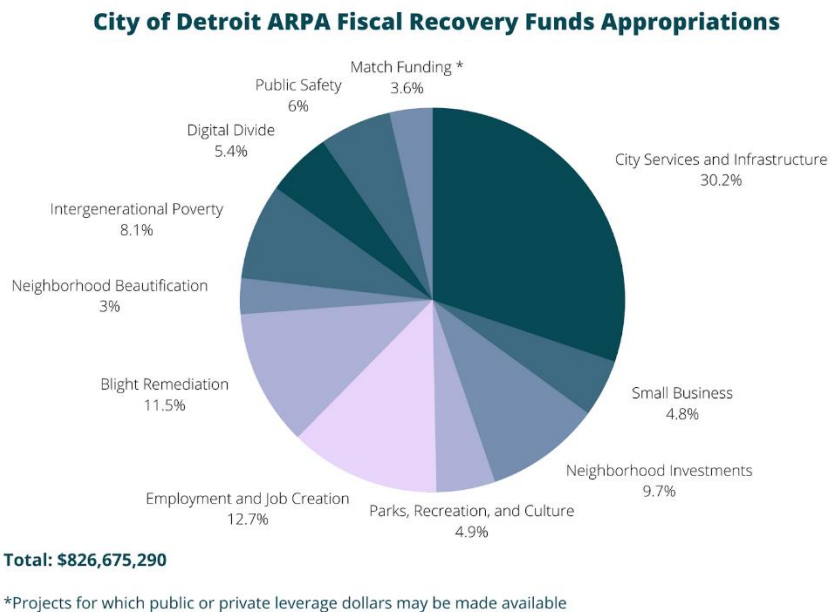

Figure 10: Detroit's Proposed Allocation of The ARPA Provided Funding.
(Source: Citizens Research Council of Michigan, 2018)

ARPA funds have also been allocated to increase the rate at which applicants are approved for affordable housing. Expediated approval processes provide individuals in immediate need of affordable housing with assistance. Likewise, ARPA funds have also been allocated to help those in need provide down-payments for homeownership on homes they are renting. Thus, helping low-income individuals transition from renting properties to owning properties, creating generational wealth. ARPA also aims to aid residents who are subject to rising rents. This program also provides users with immediate placement within employment or educational opportunities to get them back on their feet.

Additionally, ARPA funds are being used to purchase Detroit Land Bank acquired houses for rehabilitation purposes. These houses, likely acquired through foreclosure and abandonment, will be bought, rehabilitated, and rented for ten (10) year periods at 60% of the Area Median Income (AMI). These efforts will allow for family-sized, larger, affordable properties for residents. The Detroit Housing Commission (DHC) has also proposed efforts to tackle vacancy at small-scale apartment buildings with around 30 or so

residential dwelling units. Neglected properties by large-scale developers will be the main target of these efforts. The DHC has provided $20 million in funding to help rehabilitate vacant and blighted structures within city communities, thus allowing for increased housing opportunities while aiming for affordable unit rates.

The DHC also has set regulations on affordable unit percentages for new construction properties. Approximately 20% of the total units within a newly constructed multi-family housing complex must be set aside for affordable housing. Stabilized rent must be provided for residents at approximately 60% of the reported area median income. For the city of Detroit, this means that 20% of units must be $1,624 or less a month. Enticed by the city's high poverty rates, high unemployment, and increasing need for housing, Detroit has implemented several different efforts to help aid the community. These efforts help instill financial stability, housing security, and build resilient communities within the city of Detroit.

Community Engagement

Through the Detroit riots of 1967 and constant battles between Detroiters and local governments, there has been a prolonged distaste between authorities and residents within the city. In addition, with a failing city often comes the feeling of abandonment from the residents. Without support nationally, or locally, residents feel neglected and hopeless through everyday life. Therefore, the city jurisdiction has reconciled with its residents through the implementation of community engagement programs and townhall meetings.

At the local level, Detroit Government and non-profit organizations have worked together to implement programs of community engagement within neighborhoods. These programs include, but are not limited to, the implementation of community gardens,

activities, and networking events. Organizations such as, Keep Growing Detroit, Building Community Value Detroit, and Community Development Advocates of Detroit aim to instill health and education into local neighborhood communities. In addition, these programs aim to create better neighborhoods within Detroit to increase overall community value.

At the jurisdictional level, Detroit has implemented regulations and efforts to be more receptive of community thoughts and ideas. Although required by the federal government through ARPA, Detroit has also been in communication with community stakeholders for the designated use of the ARPA funding. To date, the city of Detroit has hosted 65 townhall meetings in order to take feedback from 411 community residents and stakeholders[12]. Through these efforts of community engagement, the city of Detroit hopes to establish a sense of community well-being and create a place individuals want to live.

Conclusion

While the recent history of Detroit has been quite grim, the city can start to be turned around with architectural installments that aim to over saturate the housing market and support residents with necessary program. This includes the implementation of a hybrid architectural typology with program that provides work, housing, leisure, and services that aid the everyday lifestyle. Housing within the building should be affordable to where it is not exclusive to one "class" but rather creates a diverse culture that individuals desire. Overall, bringing opportunity, life, and support back into the center of Detroit.

[12] Esmat Ishag-Osman, "Detroit's Community Engagement Process Looks Different from Other Cities," *Citizens Research Council of Michigan*, last modified December 14, 2021, accessed November 6, 2022, https://crcmich.org/detroits-community-engagement-process-looks-different-from-other-cities.

Chapter 3: Investigation of Communities

Introduction to Communities

What is a community? A sense of community comes in various ways and is not defined by a singular object. To explain, a community is not defined by a building, person, or place, but rather the relationship one holds with said objects. As defined by Merriam-Webster, a community is 'a unified body of individuals.' The sense of community ultimately boils down to four (4) different types: interest, place, practice, and circumstance[13].

Figure 11: A Formed Community Within a Traditional Neighborhood
(Source: mymosaicrealty.com, 2016)

As for the first principle of interest – a community of individuals always has the same interest in a common place, topic, or policy. Secondly, the principle of place – in most cases, communities are limited to the immediate geographical location of one another. Additionally, communities often are linked due to the practicing of a particular profession or activity. The last type of community, Circumstance, relates to the creation of communities through events and situations. During the discussion of architecture and planning, creating a place to merge each type of community becomes a challenge. The

[13] "5 Types of Communities Explained (Pdf Included)," *FeverBee*, last modified May 15, 2022, accessed November 6, 2022, https://www.feverbee.com/different-types-of-communities/.

four (4) principles of a community should be the basis to every architect's design proposition. In order to create a piece of architecture that is used by more than one party, it must work to become useable for a wide range of activities. With the congregation of different users, a diverse community is formed under one roof where individuals are supported socially.

Additionally, communities are constantly changing and evolving through time. A shift in population and culture ultimately shifts the internal ideologies of communities. As we have previously discussed, through the invention of the automobile, 'place' communities began to shift from urban settings to suburban settings. Individuals found the idea of quiet neighborhoods, homeownership, land access, and convenience to be quite appealing. In efforts to bring urban life back to thriving communities, architects and planners must instill the same principles of suburban communities into urban communities, ultimately creating a diverse, hybrid architectural typology through transforming horizontal communities to vertical communities.

Urban Sprawl

Through the rise in popularity of suburban communities came issues within urban planning and the existing urban fabric. The suburbs, defined as residential subdivisions located at the extents of high-dense metropolitan areas, grew rapidly during the mid-twentieth century. Increased growth and popularity of the suburbs came through the Federal Housing Administration's (FHA) encouragement, developer and building engagement, and poor zoning regulations. However, the creation of the suburbs created continued health, environmental, and social issues due to the reliance of the automobile.

Architects and planners within the twenty-first century are still looking for the answer to reverse urban sprawl.

Figure 12: Exaple of Urban Sprawl and Low-Density Development
(Source: terrascope2024.mit.edu)

The term ‘urban sprawl’ comes from the way the built environment relates to one another, how a place interacts with its inhabitants, and even the inhabitants sense of portrayal by a place. Typically, examples of urban sprawl are locations of spread-out, low-density, unguided growth (SLUGS) in suburban and rural areas. Ultimately, urban sprawl is created through poor planning efforts and rapid growth of a geographical area. Residential, commercial, recreational, and office spaces are all separated from one another creating a patchy, low-density urban fabric. In addition, when the necessities are distanced from each other, traveling from one place to another becomes difficult. Residents of these communities rely on the automobile as a means of transportation rather than walking and biking.

Through poor decision making, the FHA enabled urban sprawl through the implementation of the National Housing Act (NHA) of 1934 and the Federal-Aided Highway Act of 1956. For starters, the NHA created the FHA and the Federal Savings and

Loan Insurance Corporation (FSLIC) while backing developers and builders during The Great Depression to keep the housing industry afloat. In summary, the NHA encouraged developers through stipulations to fully build-out all lots of a desired subdivision and promoted the purchasing of houses through federally guaranteed loans. Additionally, the Federal-Aided Highway Act of 1956 encouraged urban sprawl through the implementation of roughly forty (40)-thousand miles of interstates and highways. This promoted connectivity and increased vehicular travel from the suburbs to cities. With the increased connectivity found through the new highway system, individuals preferred to live where they could have land ownership, acreage, and privacy near the city.

However, the use of the automobile was not the only destruction of urban life. As cities began to evolve in the early twentieth century, new regulations were implemented to provide better planning for land use and districts. The first sign of these regulations in the United States, known as zoning, was introduced in New York City, New York in 1916[14]. Zoning, arguably both good and bad, had further separated the land-use both within cities and the suburbs. Zoning created various districts separating residential, commercial, and office uses, and determined the overall density of each district. Ultimately, zoning also contributed to the segregation of the low-income and minority families.

Impacts of Urban Sprawl

If suburban communities are not designed with humans in mind, it can have large impacts on the overall health of humanity, the environment, and society as a whole. Urban sprawl promotes the use of automobiles; it demotes the everyday walkability and well-

[14] Frunmkin, *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities*, 38

being of communities. As automobiles had become the primary mode of transportation, building and community design tended to revolve around them. Movie theaters, banks, and restaurants began to transform from public gathering spaces to a more drive-in or drive-thru culture.

The reliance of the automobile has driven away the need for individuals to walk from place to place. Therefore, promoting a sedentary lifestyle rather than an active lifestyle. The ultimate health impact urban sprawl has on humanity is the lack of physical activity. According to Policy Advice, only 22.9% of Americans meet the recommended physical activity guidelines for adults. However, the limited physical activity through the reliance of the automobile is not the only health impact. Automobiles pose threats to human life, including other automobile drivers and bystanders. Vehicular accidents can occur through collisions or by losing control of the vehicle. As an individual walking through a community, it truly is not safe to have a vehicle driving by your side. In accordance with the Annual United States Road Crash Statistics, approximately 46,000 Americans die each year from vehicular incidents.

Figure 13: Forced Vehicular Traffic Through Urban Sprawl.
(Source: Urbanizationwebquest.weebly.com)

Combustion engine vehicles also promote increased air pollution and health impacts for surrounding communities. Individuals who reside within suburban communities fall victim to greater health implications from poor air quality. While automobiles have been drastically upgraded to produce less emissions, they still largely contribute to premature deaths from health implications. Through a study completed in 1996 by the Natural Resources Defense Council, it was determined that approximately 64,000 people across 239 American cities succumb to premature death each year due to combustion engine pollutants[15]. In addition, the chance of exposure to these pollutants and related health issues was increased for residents near busy thoroughfares.

In addition to air pollution, Urban sprawl also effects the environment through water contamination, deforestation, and eco-system disruption. In similarity to humanity, polluted air also affects the environment. Greenhouse gas emissions emitted from combustion engines work to deplete the ozone layer. In accordance with the Environmental Protection Agency, transportation equates to 27% of total greenhouse gas emissions. In terms of water pollution, increased paved surfaces associated with urban sprawl promote deposits of pollutants. These paved surfaces often drain into city stormwater infrastructure and, ultimately, back into public waterways. Therefore, through surface runoff, pollutants promote poor water quality, which humanity consumes. Additionally, the construction of low-density, horizontal suburban neighborhoods also contributes to the destruction of local vegetated areas, which in turn, evicts wildlife and ultimately damages the eco-system of said geographical area.

[15] Frunmkin, *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities*, 81-82

New Urbanism

In effort to correct the vulnerabilities of urban sprawl, new urbanism focuses on the creation of well-planned, human-centric, and multi-mode transportation-friendly suburban and urban neighborhoods. Through proper planning and design, neighborhoods start to create immersive communities and places of enjoyment. To complete this, new urbanism typically abides by six (6) main principles as prepared by the Congress of New Urbanism (CNU). These principles include: planning, transportation, implementation, architecture, housing, and development – all of which can be provided at different scales of urban fabric. Whether new construction or city block infill, the principles of new urbanism should be injected into the design.

As we look to break down all principles of new urbanism, we must first investigate the principle of planning. Through all scales of urban development, proper urban planning will take a good design to a great design. In efforts to reestablish walkability, new urbanism incorporates the '5-minute walk' and/or 'pedestrian shed'. This allows everyday activities and all necessities to be accessible within a quarter-mile radius of any particular site or location. In addition, through planning, one should properly plan the intersection between rural-to-urban fabric. The rural-to-urban transect has been broken down into six (6) separate zones to delineate the appropriate densities, with the less dense side of the spectrum being the natural context and the high side of the spectrum being an urban area or special district. In most cases, the urban neighborhood often utilizes various transect zones and must create a proper transition between them. The overall ideology of this principle aims to implement proper planning efforts to create sustainable communities through the relationship of the built environment with humanity.

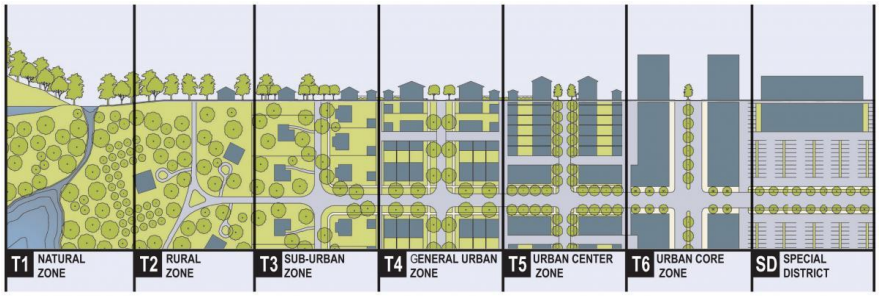

Figure 14: The Rural-to-Urban Transect Zoning Categories
(Source: Congress of New Urbanism By DPZ, 2017)

Secondly, the principle of transportation aims to tackle the issue of parking, positive street design, and the overall interconnection of street networks. Parking ultimately blocks the goals of new urbanism aiming to frame urban fabric through architecture and landscape. Parking should be addressed through the 'park once' strategy to promote walkability through an urban space. This can be completed using public parking structures above or below-grade. However, if done currently, street parking also can be utilized to provide both human engagement and protection. Additionally, overall street design should be accounted for in efforts to balance all means of transportation. While streets act as the main thoroughfare through an area, sidewalks should not be neglected. Sidewalks help create character within the urban fabric while promoting socioeconomical values through increased pedestrian health, multi-modal transportation options, and increased real-estate and retail value.

The idea of the implementation principle revolves around the idea of proposing, installing, and testing new urbanism ideologies within new or existing fabric. Additionally, this principle proposes a form of regulations in lieu of traditional zoning regulations. Known as 'form-based codes', these regulations ultimately organize the placemaking factor rather than the land-use factor. Therefore, form-based codes value a healthy urban area through the physical design of an area and its surrounding relationships.

As tangible architecture plays a large part in urban design, a major principle within new urbanism reflects the form and function of surrounding buildings. Ultimately, through architecture, urban designs become places of use and enjoyment. When thinking of appropriate architectural design, the form and function of the building should focus on the urban environment as a whole and not the individual building. In addition, the built architecture should relate to the culture and history of the geographical urban space. In conclusion, the architecture of the city should support the city's placemaking efforts and should not oppose the urban fabric.

As cities and urban communities are created through people, housing should also be considered in new urbanism. For urban areas housing plays a role in supporting the city internally through its residents. Proper housing promotes cultural, societal, and economical values within the city. Most housing within a city is large-scale point tower or slab multi-family complexes. Furthermore, housing at the extents of the city, within the suburbs, is often single-family detached homes. Ultimately, from point A to point B there is a missing middle housing typology at the transition from urban-to-rural neighborhoods. Middle housing typologies include townhomes, garden-style complexes, duplexes, courtyard housing, etc. In new urbanism, the promotion of the missing middle housing typology increases middle-density housing, housing diversity, and American housing culture. In addition, new urbanism also promotes the need for proper public housing (low-income housing). Historically, public housing was placed in segregated parts of the urban fabric and left to deteriorate. Incorporating city-engaging public housing can allow for the prolonged life of a city. Not to mention, it also allows for increased population and support for low-income families.

Lastly, the principle of development helps promote the strategies of new urbanism into newly developed city areas and neighborhoods. Additionally, the development of new cities and neighborhoods should help link surrounding context. This can be completed through Transit Oriented Design (TOD) and Traditional Neighborhood Design (TND) through the implementation of walkability and public transportation. New development should also consider sustainable design measures at the building and infrastructure level. Furthermore, the development should continue to happen at various scales – from small traditional neighborhoods to large urban centers. However, it is important that development is completed in small portions rather than all at once to not disrupt surrounding context and culture.

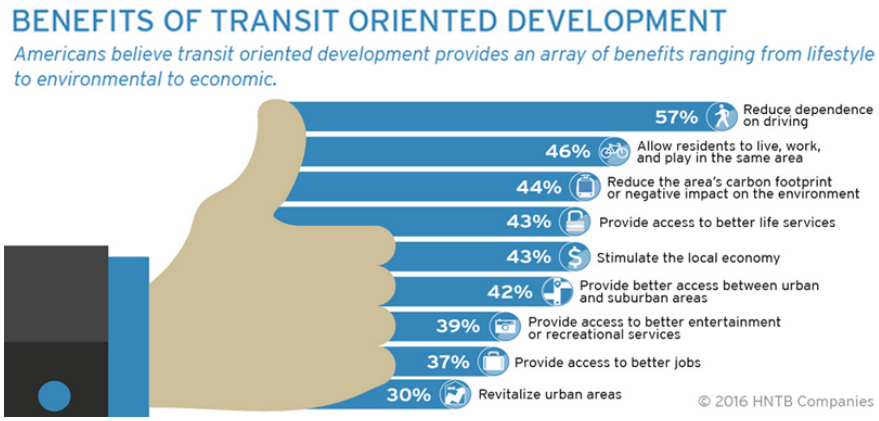

Figure 15: Benefits of Transit Oriented Development
(Source: tod.org by HNTB Companies, 2016)

Smart Growth

New urbanism and smart growth both address similar built environment issues such as, environmental impacts, housing shortages, and overall community well-being. However, new urbanism was ultimately created by built environment professionals such as planners and architects and smart growth was established at the more local level through citizens, environmentalists, and policy makers. New urbanism and smart growth largely share similarities but also major differences. In comparison, new urbanism ideologies are

focused more on the overall function and larger scale of the built environment while smart growth focuses more on small-scale planning through community well-being and engagement.

Smart growth follows ten (10) main principles, some of which overlap with new urbanism. These principles include: mixed land uses; taking advantage of compact design; creating a range of housing opportunities and choices, creating walkable neighborhoods, fostering distinctive, attractive, communities with a strong sense of place; preserving open space, farmland, natural beauty, and critical environmental areas; directing development towards existing communities; providing a variety of transportation choices; making development decisions predictable, fair, and cost effective; and lastly, encouraging community and stakeholder collaboration in development decisions[16]. These principles look to promote convenience, affordability, beautification, and safety within existing cities. In turn, influencing the health, economic status, and futures of the community's residents.

Through the creation of attractiveness, implementation of mixed land uses, and utilization of compact building design into existing communities, creates a place of gathering while promoting economic benefits and engagement. Additionally, the increase of pedestrian activity at the street level instills a sense of safety in the pedestrian mindset. However, to create a well-designed urban community, it must be both walkable and accessible by increasing connectivity. Therefore, various modes of transportation, both public and private, should be available for use. Though, once arrived, the only necessary transportation method that should be needed is walking.

[16] "What Is Smart Growth?," *Smart Growth America*, last modified November 1, 2022, accessed November 12, 2022, https://smartgrowthamerica.org/what-is-smart-growth/.

Furthermore, development of communities that utilize the principles of smart growth should be practical and incorporate collaboration and ideas for community stakeholders. These actions produce fast, effective, and cost-friendly development designs. Additionally, the act of community engagement at the design level helps to establish community support rather than pushback. However, its key that the development of smart growth neighborhoods is completed in existing communities and not undeveloped land, therefore, building on investments made at existing communities and adjacent infrastructure.

In contrast to most urban ideologies, smart growth is centered around the principle of environmental integration. To explain, as described through smart growth, a healthy community is one that contains a high-quality open space and/or greenspace. Additionally, each community should have optimal farmland available to produce locally grown products and support the agriculture industry – all of which, to promote health, prevent flood damage, and contribute to a clean public environment.

Vertical Smart Growth

So far, we have investigated the principles of smart growth in relation to the horizontal ground plane at the larger urban scale. However, these same principles can be extrapolated and reconfigured vertically to be implanted at the individual building level. In reference, Le Corbusier reimagined the promenade of horizontal French Parterre gardens into a vertical garden through the design of the famous Villa Savoye. Implementing the strategies of smart growth vertically into an individual building provides a resilient, sustainable community that promotes engagement and well-being.

Figure 16: Villa Savoye and The Rearticulation of The Horizontal Floor Plan
(Source: Fischer, Flickr.com)

While not all ten (10) smart growth principles can be translated vertically, incorporating the key ideas is doable. To explain, establishing a building that qualifies as vertical smart growth should benefit the surrounding context upon which it is being built. The building should be programmatically mixed-use through the forms of commercial, office, and/or residential building use. If residential dwelling units are provided, various types of unit sizes and prices should be available to support its residents. This includes the implementation of both low-income and market-rate housing options for singles, couples, and families.

In terms of walkability, access to various transportation options, and reinforcing existing communities, the location of which vertical smart growth is being implemented should be carefully thought out. The implementation of these principles relates more to the relationship of the surrounding context and neighborhood rather than the building itself. In reference to the pedestrian shed discussed through new urbanism, all necessities should be accessible within walking distance (1/4 mile) from the building. Additionally, should necessary providers and goods not be within adequate walking distance, various public transportation options should be available to promote sustainable travel.

Lastly, the building itself should create a sense of placemaking through the creation of its own identity. To explain, while the building should maintain typical design practices to not disrupt the design style of the neighborhood, it should be functional to promote placemaking and usability of the public realm. Also, the building should promote open space through the implementation of greenspace. However, it should work to reinforce the urban street wall to promote the beautification of the urban fabric. Therefore, the location of the greenspace becomes increasingly important and can be implemented at the roof-level or center of the urban block.

Chapter 4: Investigation of Urban Housing

Purpose of Investigation

For the purpose of this thesis, the focus on urban housing will be largely on the principles and constructability of efficient multi-family housing building footprints for constrained, dense urban sites. This includes the investigation of high-rise point towers and slab housing typologies. Additionally, although typically a low-rise building typology, we will also investigate live-work housing to determine the main principles of this housing typology. Lastly, for the purpose of resiliency, this investigation of housing will also investigate what constitutes housing to be resilient; all of which create the ideal multi-family housing complex for the urban environment.

Multi-Family Housing Typologies

The idea of multi-family housing came from the increasing need for housing within dense urban neighborhoods. However, various typologies of multi-family housing exist to

portray different scales of density and urban fabric characteristics. Multi-family housing is distinguished by the congregation of multiple dwelling units within a single structure, those of which usually share a common 'party wall'. Typically, multi-family housing is implemented along major transit corridors, in urban residential neighborhoods, and downtown city centers. Furthermore, multi-family housing can be categorized at various scales. This includes building type, urban planning typology, specific housing typology, and at the smallest scale, constructional configurations.

The ideology of the multi-family housing archetype is to create efficient housing by reducing the overall footprint of a building and reduce the cost of housing through providing medium-to-high density impact on a specific area. In downtown, city center locations, the housing building type largely includes multi-story structures. Additionally, urban housing planning typologies often utilize block defining, infill structures. On the other hand, as we move more towards the suburbs, housing building type shifts towards low-rise structures while planning typologies shift to free-standing, detached structures.

Typical multi-family housing typologies are dependent on the location to which they are built. In dense urban environments, it is common practice to see large high-rise buildings inclusive of point towers and slab buildings. In urban residential neighborhoods it is more common to see rowhome, townhome, and perimeter block housing typologies, which are low-rise building typologies. Multi-family housing also often works to bridge the gap between rural neighborhoods and urban neighborhoods, low-rise and high-rise buildings. These housing typologies include garden-style, duplexes and triplexes (both side-by-side and stacked), courtyard, and cottage court housing. However, in most cities, there is a reoccurring issue with the lack of diverse, middle housing options.

While the idea of multi-family housing was not new, extensive exploration of multi-family housing constructional configurations took place during the twentieth century. Leading architects of the time, such as Frank Lloyd Wright, Ludwig Mies Van Der Rohe, Le Corbusier, etc. branched out to explore how the interior configuration of dwelling units could differ. This ultimately led to the five (5) major constructability typologies which, in turn, determined dwelling unit accessibility. This includes: single-loaded corridors, double-loaded corridors, skip-stop, gallery access, and point tower access. The configuration of multi-family housing dwelling units and determination of access ultimately works to increase or decrease engagement amongst residents. To explain, in point tower access, the engagement of residents is more intimate in that there tends to be various small corridors with limited units at each floor. In a large double loaded corridor, the resident engagement is maximized but less personal. On the other hand, gallery access tends to have the widest focus on engagement as open-air corridors engage the entire city rather than the encapsulated building itself.

Point Tower Building Typology

As a form of urbanistic multi-family housing, point towers provide an opportunity for density on a limited site footprint. Point towers were particularly explored during the post-war housing era through the invention of steel and reinforced concrete. While indictive of zoning ordinances, point towers are typically high-rise building typologies that span an increased number of stories, therefore maximizing a constrained site's potential through vertical growth. For point towers, there are typically fewer than ten (10) dwelling units per floor. However, access to units through corridors depends on the individual

building configuration. In most cases, point towers utilize a square corridor at the center of the building to provide access to the units. As mentioned, a smaller aggregation of units per floor and corridor footprint allows for more intimate community engagement amongst residents within the building.

Blues Point Tower (1961) located in Sydney, Australia, as designed by Harry Seidler and Associates, is an early case study of a typical point tower design. The building maximizes the small site,s potential through vertical growth. Blues Point Tower also promotes urban-lifestyle and characteristics through the incorporation of storefront retail units at the ground level. However, like all forms of architecture, point towers quickly evolved as cities became denser. Skidmore, Owings, and Merrill further explored the possibilities of the point tower through their design of the Olympic Tower (1976) in New York City, New York. To explain, Olympic Tower explored the possibilities of promoting increased neighborhood liveliness through the implementation of increased building use within a limited area. Building off Le Corbusier's ideal vertical city, Olympic Tower coupled the residential program with office space, retail, and hospitality while implementing increased amenities for the residents.

Figure 17: The Olympic Tower, New York City, NY
(Source: nynesting.com)

Figure 18: Blues Point Tower in Sydney, Australia
(Source: realestate.com.au, 2018)

Point towers are a crucial part of the built environment urban fabric and provide increased housing opportunities for city residents. To explain, point towers lift individuals off the street level and, theoretically, out of the everyday characteristics of the urban lifestyle while providing desirable city views. Also, point towers allow for more ideal block sizes due to the limited footprint of the building. Smaller block sizes promote increased walkability of neighborhoods through additional circulation paths and street

connectivity; all of which helps to increase overall community engagement at both the individual building and neighborhood level.

Slab Building Typology

In contrast to point towers, slab building typologies focus on both the horizontal and vertical outreach of density within an urban environment. However, like point towers, slab buildings became increasingly popular within the post-war era. Multi-family slab buildings are typically found in both mid-rise and high-rise form depending on the surrounding context and site location. Additionally, slab buildings are designed to make up an entire city block through their typical rectangular form. Therefore, reinforcing the urban street wall while establishing a neighborhood through a single building.

Using horizontal density, unit aggregation per floor is often much more extensive in comparison to point towers. In turn, various unit sizes and footprints are also offered in efforts to provide increased housing options. In the urban environment, slab housing often utilizes the single-loaded or double-loaded corridor as a means of access to each unit. Therefore, the slab building is still quite efficient. The earliest exploration of the slab building typology can be seen through the European modernism era. Designed by William Van Tijen in collaboration with Brinkman and Van Der Vlugt, the Bergpolder Building (1934), located in Rotterdam, Netherlands, is one of the earliest iterations of the high-rise slab building typology. Using gallery access and thin steel construction, the Bergpolder Building explores increased housing density and city connectivity while optimizing natural light. Additionally, the Bergpolder Building maximized the potential of a singular block through the implementation of a mixed-use program. Residents of the building had easy access to daily needs and modern luxuries such as laundry facilities, retail, and offices.

Figure 19: Bergpolder Flat Building, Willian Van Tijen
(Source: kokon.nl)

In comparison to the Bergpolder Building, Le Corbusier's Unité d'Habitation (1952), constructed in Marseilles, France, explores the relationships of slab construction, unit aggregation, unit access, and engagement. To explain, Unité utilizes a skip-stop construction typology to incorporate interlocking units at every floor, which maximizes unit space while limiting circulation. Additionally, Unité works to provide various unit types for increased housing options. Programmatically, Unité was more focused on the internal building community rather than the surrounding urban fabric. Communal facilities inclusive of a fitness center and roof-top playground, track, and pool all worked to create the ideal vertical community.

Figure 20: Unite d' Habitation, Le Corbusier
(Source: 99percentvisible.org)

Both the Bergpolder Building and Unité d'habitation are key examples for looking at the potential of the slab building typology. The increased floor size of the slab building typology allows for additional density within a single building. While it is not as common to have increased verticality through the slab building typology, it allows for an efficient housing complex while optimizing community engagement. In comparison, the Bergpolder Building focused more outwards in connecting with the greater-urban community while Unité focused more on creating a separate community within the building itself.

Live-work Housing

Different from both slab and point tower building typologies, live-work housing is often found in less dense, rural communities. As a form of middle-housing, live-work housing is traditionally defined by ground-level retail with residential dwelling units above. The idea of live-work housing is that the resident of the building owns and operates the retail space below. While this is one of the oldest forms of multi-family housing, the low-

density building typology makes it difficult to implement into dense urban communities. However, in more modern times, live-work housing has transformed through technology. Through the shift in the job market and culture, live-work housing has focused more on providing internal office space rather than street-level retail storefront.

However, live-work housing can be rearticulated from a low-rise building into a high-rise building that follows both the required form and function of urban building typologies. Within a dense city center, the program of live-work housing can drastically influence the functionality and purpose of a building. Through the combination of both traditional and modern live-work housing principles, a diverse community full of engagement begins to form. Ultimately, housing supports individual employment opportunities and vice versa. Additionally, the increased availability of housing and employment opportunities increases the economic value and resiliency of the building.

Resilient Housing

'Resilient housing' encapsulates the standard ideologies of the sustainability movement with increased focus on the individual shelter. Housing should be acknowledged as a basic requirement for all of humanity. As a foundation to humanity, everyone has the right to safety, generational wealth accumulation, and prosperity – all of which starts with a habitable home. From the access of housing to the introduction of increased living standards during the housing progression era (1880-1920), housing continues to prove to be the basis of human well-being. Additionally, housing acts as the main support system to the urban fabric. Without incorporating the principles of resiliency into the ideologies of modern housing, the future of housing comes into question.

In accordance with the United Nations Human Settlements Program (UN-Habitat), an estimated three (3) billion people (roughly 40% of the world's population) will need housing by 2030. As this thesis has been prepared in the year of 2022-23, approximately 96,000 new affordable units would need to be constructed every day for the next eight (8) years to combat the potential need for housing. With these numbers in mind, it is also important to think of architecture as a building built for today's needs that will be utilized in the future. Therefore, housing built today should be resilient to sustain composure for years to come.

Resilient housing can be defined as housing that promotes and encompasses economic viability, social equity, and environmental integrity while being adaptive to the ever-changing socioeconomic normative. Therefore, at the economic level, resilient housing needs to be affordable to support its inhabitants. Depending on the location of the proposed building, affordable housing can be determined based on a specific percentage of the Area Median Income (AMI). While local jurisdictions may require units to be twenty percent (20%) of the AMI, resilient housing design should look to aim upwards of sixty percent (60%). Additionally, resilient housing should be able to support its inhabitants through long-term or short-term job creation and employment opportunities to promote the overall economy of the community. Affordable housing can be achieved through cost-effective, sustainable practice and materiality. However, in efforts to create social equality, it is important to not design affordable housing as affordable housing, but rather blend the building into the urban fabric to mitigate the imposed stigma of affordable housing. Through access to affordable housing and employment opportunities, resilient housing also helps reduce poverty rates while providing access to safety through shelter. Ultimately,

both the principles of economic viability and social equity push the inhabitants towards overall social justice and equality.

Aside from the economic and social values of resilient housing, it must also aim to provide environmental integrity. To accomplish this, resilient housing must push to combat climate change, allow a reconnection of residents to nature and necessities, and promote physical activity. Therefore, at the climate level, reducing the embodied carbon from construction and operational carbon post-construction is crucial in trying to combat climate change through the built environment. This comes through sustainable design and environmentally conscious operational systems. On the other hand, resilient housing must also reconnect its residents to nature through providing adequate access to light and air at the unit level, and overall building level. This can be achieved through the implementation of fundamental dwelling unit design and the implementation of exterior spaces. Additionally, the development of a resilient community should be in proximity to healthy food sources and basic necessities. Lastly, in efforts to continue to improve the health of the inhabitants, resilient housing should aim to promote walkability both internally and externally (depending on the building scale). Through access to all the above-mentioned environmental principles, resilient housing will promote the overall health and well-being of its residents.

In conclusion, resilient housing should aim to support and aid its inhabitants at various scales. Through this support, social, economic, and environmental values are restored and promoted at both the individual building and the surrounding community. The imposed ideologies of the resilient housing typology act as a catalyst to create an integrated foundation to the surrounding community. Through the discussed principles, this housing

typology becomes self-sufficient and begins to form its own centralized economy, therefore allowing the building to sustain the potential adversity of the future and prosper.

Chapter 5: Investigation of Hybrid Precedents

Purpose of Investigation

Hybrid architecture can be defined through the combination and connection of programmatical use at both the public and private level to form a fundamental multifunctional space. This includes the creation of community-based architecture which produces housing, work, leisure, and cultural support[17]. The purpose of this investigation into the hybrid architectural typology is to perform a critical analysis of mixed-use buildings to determine what makes the design successful. This includes the acknowledgement of the surrounding context, included program and support spaces, and overall form.

West End Square 50

Designed by TEN Arquitectos and completed in 2017, West End Square 50 is located in the prominent West End neighborhood of Washington, D.C. The hybrid ten (10)-story building houses a diverse program through a layered form which engages a piece of municipal architecture while supporting community needs. Additionally, using the hybrid building typology, West End Square 50 can maximize economical value through consolidation of horizontal, low-density program.

[17] Idea by Nicolas Bozzano CTRL+ArquitectoZ Julian Alvarez 1449 13ºH and Idea by Nicolas Bozzano CTRL+ArquitectoZ , "Hybridized City," Future Architecture, accessed December 12, 2022, https://futurearchitectureplatform.org/projects/277e2474-043e-4702-94f4-26e7600f21eb/.

Figure 21: West End Square 50 Street Front, TEN Arquitectos
(Source: Karchmer, Architectural Record, 2017)

To further explain, located at the corner of M Street and 23rd Street NW, the prior land usage was underutilized by a one (1)-to-two (2) story municipal fire department. With the surrounding context being dense, medium-scale buildings, the existing fire department was out of place and fractured the urban fabric. To maximize the land use potential, the land was to be redeveloped to incorporate a fire department and a mixed-use, multi-family program to match the existing context. This was completed through the municipality selling its air rights to further increased development potential. The included program within the building works to support the needs of the vibrant and up-scale West End neighborhood. This includes a restaurant and bar, a squash club and support spaces, an exterior upper-level terrace, and affordable housing.

The first floor of the building includes private program related to the demands of the fire department coupled with a micro-lobby for both the squash club and the residences. The squash club entrance is located at the forefront, public façade of the building while the resident entrance is tucked away along the less prominent street. The second level of the building houses the semi-private squash club, restaurant, terrace, and ancillary support spaces. The squash club, approximately 20,000 square feet, is a double-height space housing eight (8) separate squash courts. Nestled within six (6) stories above the squash club are the fifty-five (55) affordable dwelling units configured through one (1) bedroom, +/- 720 square foot lay outs.

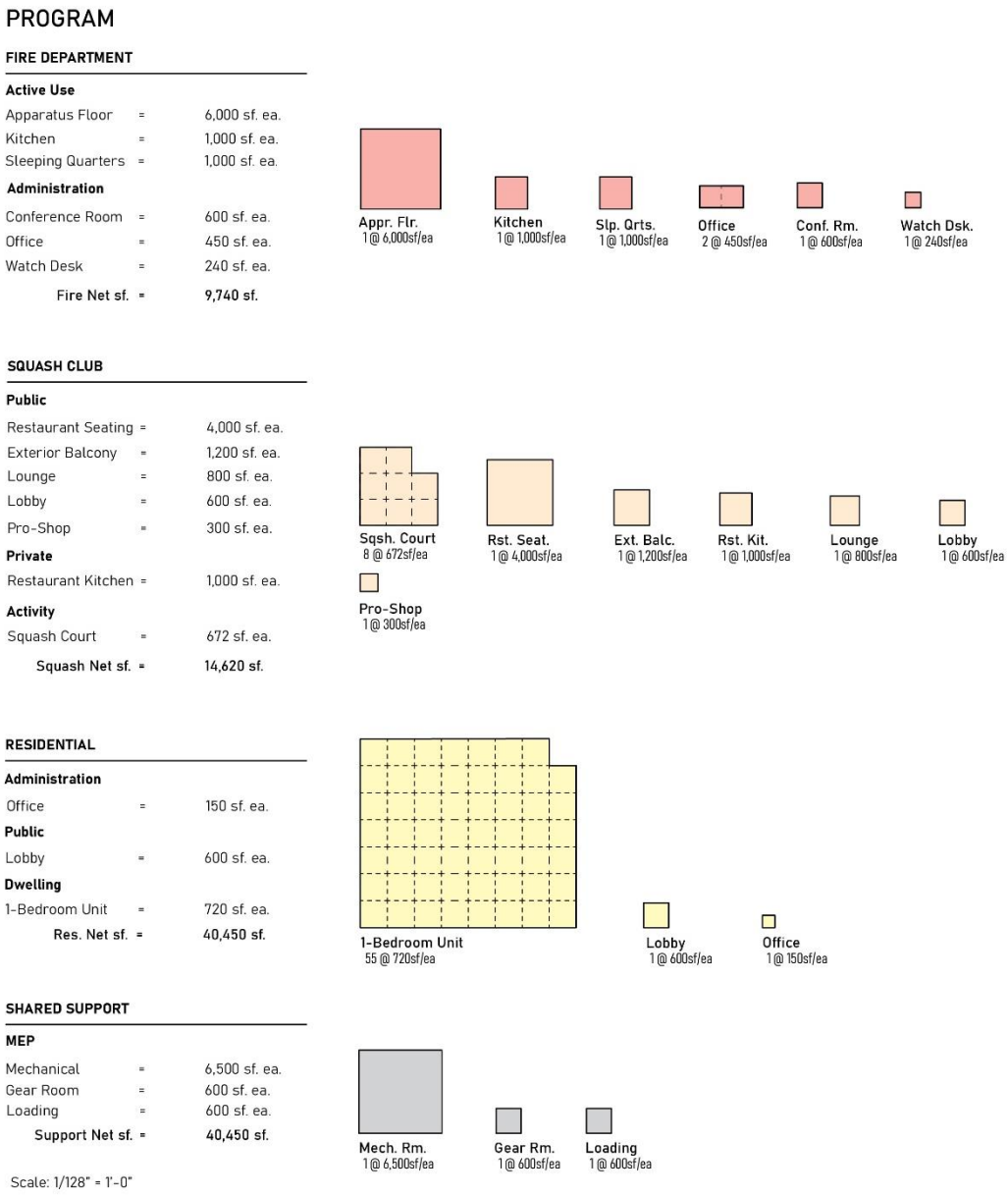

Figure 22: West End Square 50 Program Blocking Diagram
(Source: J. Chase Edwards, 2022)

The overall program for the building is well-suited for the environment in which it was built. Squash courts support the activities of the upper-class individuals of the West End Neighborhood while affordable housing supports the socioeconomic values of the

community. Additionally, the solution to repurpose and integrate municipal facilities helps to support the local government through monetary compensation. In terms of form, the sectional expression of the building allows for this diverse program to be successful. The separation of the loud-environment fire department from the dwelling units through the squash courts provides a buffer zone between the public and private realm. At the exterior façade, the layered program allows for unique expression of materiality and form. The use of the materiality at the façade also reflects the use of the space within the building. To explain, metal cladding reflects the use of heavy machinery at the fire department; the glazed façade at the squash courts promotes a public sense while relating physical activity to the natural environment through increased light and air; lastly, the residential levels provide a sense of privacy through a solid wall composure while continuing the language of the program below[18].

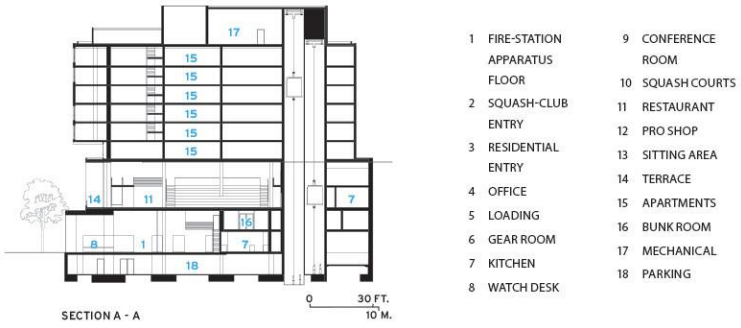

Figure 23: West End Square 50 Longitudinal Section
(Source: TEN Arquitectos, 2017)

[18] Deane Madsen, "West End Square 50 by Ten Arquitectos," Architectural Record RSS (Architectural Record, April 19, 2018), https://www.architecturalrecord.com/articles/13012-west-end-square-50-by-ten-arquitectos.

The Essex

Designed by SHoP Architects and deemed "the anti-Hudson Yards" by The New York Times, The Essex is an individual piece of the wider Essex Crossing community-based redevelopment project in Lower Eastside, Manhattan[19]. Occupying a full New York City Block, The Essex is completed with a twenty-five (25) story tower filled with various program. The Essex works to bridge the gap between the existing urban fabric and community to the community of the future. To do this, The Essex responds to its immediate context through respectful design, community-based integration, and environmental acknowledgement.

Figure 24: The Essex Street-Level Perspective
(Source: fieldcondition.com, 2019)

[19] "Essex Crossing," SHoP, accessed December 12, 2022, https://www.shoparc.com/projects/essex-crossing/.

The Essex is one (1) of three (3) buildings located within the one (1) billion-dollar Essex Crossing redevelopment project located along Delancey Street in New York City, New York. The project aims to provide affordable housing, commercial space, retail space, an urban park, and a rooftop garden while celebrating the historical Essex Market. The first five (5) stories of The Essex (totaling 80-feet tall) house the public and semi-public based program including a section of the Essex Market (renamed as the Market Line) and a movie theater. The Essex Market occupies the basement and first two (2) stories of the building while the movie theater is situated at the upper level. The roof of the market hall and movie theater act as a private exterior terrace for the residents of the building inclusive of a community garden. Situated in the twenty (20) stories above the market hall and movie theater are the 195 residential dwelling units, to which 50% are deemed permanently affordable.

Like the previously discussed West End Square 50 building, the diverse program included within the Essex provides increased community value through social and economic promoted development. The mix of residential, commercial, and retail-based programs allow for a modern approach to live-work housing in a dense urban environment. Additionally, the inclusion of a market hall promotes small-scale, local business rather than big box stores. The rooftop community garden supplies additional support to the building residents through increased access to fresh food, community engagement, and education. Though a part of the greater redevelopment project, the ground-level urban park also provides an intermediate connection between humanity and nature. Both the roof top garden and ground-level urban park aim to combat the heat island effect of New York City while reducing overall stormwater runoff.

Aside from function, the form of The Essex also works to engage the surrounding communities while expressing the internal functions of the building. The setback and rescaled tower after the first five (5) stories provide respectful design to the building's immediate context. Adjacent buildings along Delancey Street and Essex Street vary in both building size and height. With the limited building height and step backs, The Essex provides continuation of the existing street wall in harmony with its counterparts. Additionally, the reduced footprint and location of the point tower further promotes the street wall while limiting the interruption of access to light and air for others.

Much like other hybrid architecture typologies, the relationship between form and function of The Essex should be studied through section (Figure 24). The layering of the building is done through sequential organization from public to private. The loud environment program, such as the market hall, is located towards the ground floor to accompany the loud city street. Acting as a buffer between the public and the private, the semi-private movie theater creates separation between the two (2) worlds. In addition, the location of the theater is ingenious due to the necessity of sound proofing required for the specified program. Providing additional insulation towards sound pollution is the rooftop community garden at the base of the residential tower. Through a reduced footprint in comparison to the first five (5) stories, the residential tower can mitigate its exposure to unwanted noise. The variance in program is also represented at the exterior of the building through material choices and figurative separation of spaces. For starters, the form of the base building provides a sense of hierarchy in comparison to the residential tower. The materiality of the based building helps delineate the relationship of the interior roof-plane and space use. Where the theater is located, the façade tends to be more private with

limited-to-no access to light and air. In contrast, the market hall is lined with large storefront windows and expressive entrances. While still providing access to light and air, the residential tower proves privacy through reflective glass and a firmly structured façade.

Figure 25: The Essex Transverse Section Perspective
(Source: 6sqft.com, 2015)

Pierhouse & 1 Hotel

Designed by Marvel Architects and located in the Brooklyn Heights neighborhood of New York City, New York, the Pierhouse and 1 Hotel is a mixed-use residential building adjacent to the Brooklyn Bridge. In contrast to the prior two (2) precedents investigated, the Pierhouse and 1 hotel is not a hybrid for architecture through its program, but rather its engagement to its context. To explain, The Pierhouse and 1 hotel does not have an incredibly diverse program but rather promotes community engagement and resiliency through maintained connections by embedding the built environment into nature. This is completed through designing around and for nature while accounting for the increased well-being of the building's inhabitants.

Figure 26: Peirhouse & 1 Hotel, Marvel Architects
(Source: marveldesigns.com)

The Pierhouse and 1 Hotel is a resilient, mixed-use residential building located adjacent to Pier 1 Terminal Park. With the building being adjacent to the public park, the basis of design was to establish a transitional threshold from the built environment and nature. However, in doing so, the building becomes both embedded into nature at one end while maintaining the building environment at the other end. To explain, the building maintains porosity between the built environment and nature using glazing and natural color palette. However, at the street front façade, the building relates to the built environment while the park-facing façade relates to the landscape through roof plantings and increased vegetation. Additionally, the park-facing façade terraces to give the effect of the park's continuation up the building.

The program of the building houses both long-term and short-term residential housing, retail space, restaurant space, and community usable space. The Pierhouse long-term housing is completed through 106, through-unit condominium dwelling units. The Pierhouse is a modern take of the previously discussed Unité d'habitation due to its constructability typology of skip-stop corridors. This allows for the maximization of

access to light and air for each unit owner while promoting natural ventilation. Additionally, each unit is orientated towards lower Manhattan for uninterrupted views of the city, landscape, and waterfront. On the other hand, 1 Hotel houses 194 short-stay hotel rooms for increased visitation and pedestrian traffic. In addition, 1 Hotel also includes roughly 17,000 square feet of event space for rent accompanied by a restaurant and a rooftop pool.

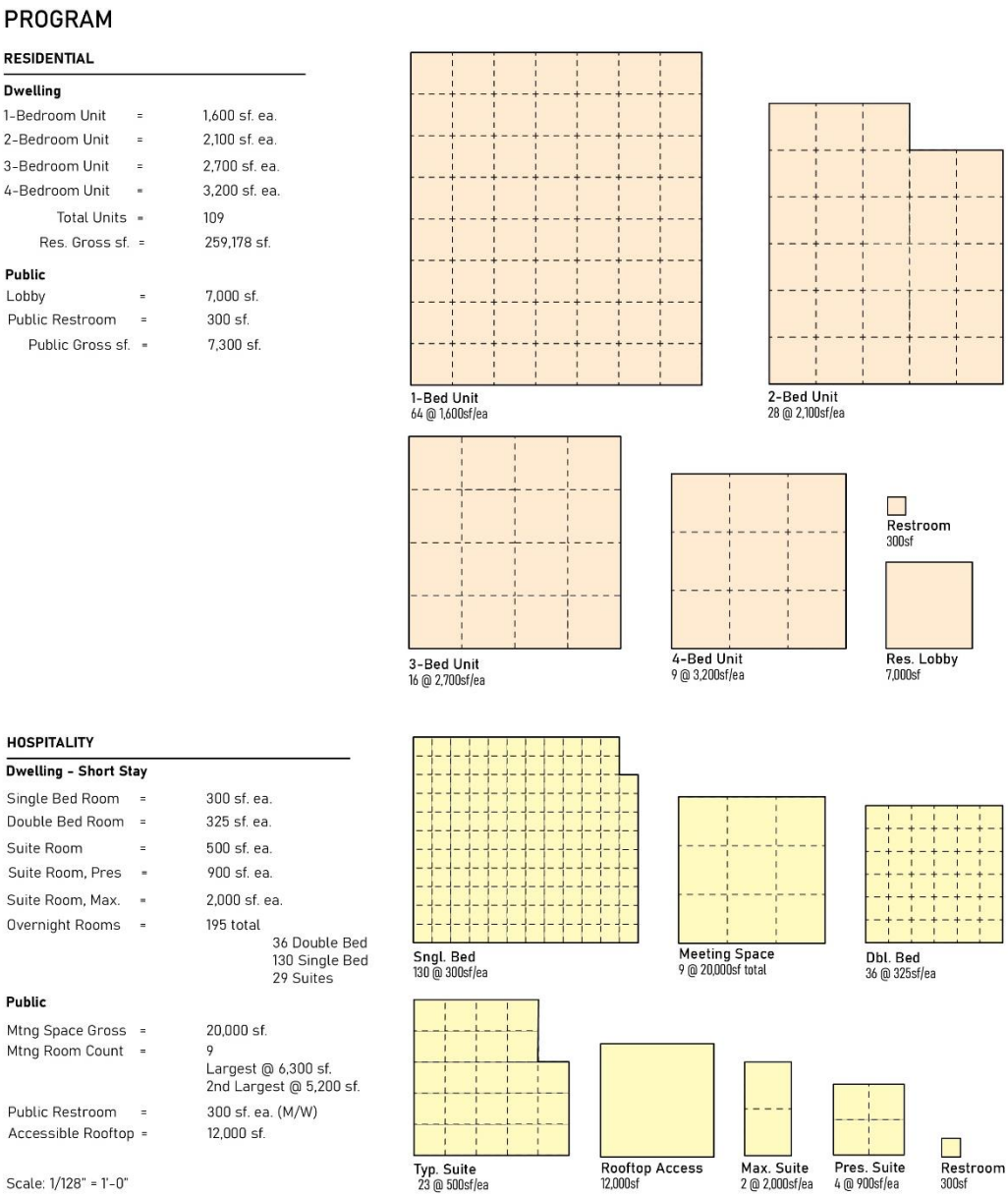

Figure 27: Pierhouse & 1 Hotel Program Blocking Diagram
(Source: J. Chase Edwards, 2022)

As mentioned, while the Pierhouse and 1 Hotel lack a diverse program, the connectivity between nature and buildings and engagement proves it to be a hybrid architectural typology. To further explain, the orientation and configuration of each condominium dwelling-unit allows for the inhabitants to engage in the landscape, the

waterfront, and Manhattan through produced view corridor. The skip-stop style circulation corridors and overall building porosity allow for additional engagement into nature through increased access to light and air. Lastly, the mix of both the long-term and short-term housing increase activity at the building through permanent residents and visitors. Therefore, creating a perpetual yet, ever changing community with increased focus towards engagement with nature.

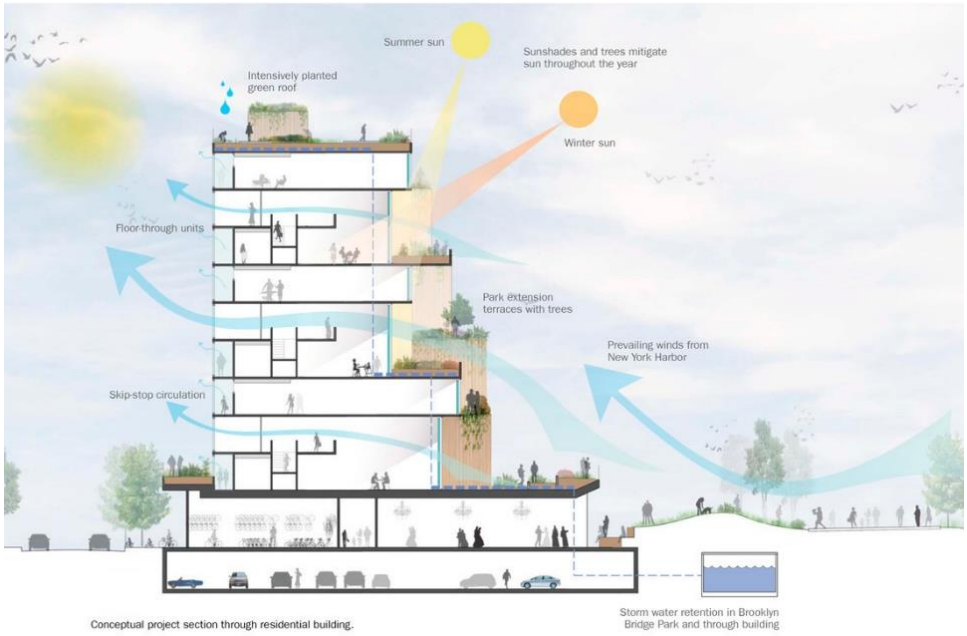

Figure 28: Pierhouse Transverse Section and Sustainability Concept
(Source: marveldesings.com)

Through the investigation of all three (3) precedents various principles of hybrid architecture have come to light. Each precedent focused on the demands of the surrounding community to aid and promote the well-being of its residents. Additionally, the hybrid architectural typology focuses on aiding the built environment as well. This includes maintaining a positive relationship between the proposed building and the surrounding existing context. Although, hybrid architecture is likely better suited for the urban context rather than the suburban and rural context. This is due to the imposed connectivity of the

urban fabric supported by hybrid architecture. The installation of hybrid architecture in the suburban and rural setting would further fracture and disjoint the fabric. In conclusion, the main principles to hybrid architecture include the introduction of housing, work, leisure, and cultural support into a singular building.

Chapter 6: Investigation of Site and Place

Site Selection

This Thesis will focus on Detroit, Michigan to address relevant city issues through the implementation of a resilient, vertically integrated smart community. To do this, we will be rearticulating the researched elements to further progress the modern American housing typology to sustain future adversities. Please note, while Detroit is the focus of this thesis, the overall proposed programmatic hybrid building typology can be implemented within any urban environment at various scales. This thesis uses a struggling Detroit as a catalyst to prove the effects of community-based architecture on the greater city area.

As we look at Detroit, three (3) potential sites have been selected due to the existing embodied potential for success regarding this project's intentions. These sites include (A) 1450-90 Franklin Street, (B) 1101-19 Washington Boulevard, and (C) 1201-11 Griswold Street. All three (3) sites were analyzed through determining criteria and provided a numerical grade based on adequacy. The determining criteria included: access to downtown Detroit, walkability, access to public transportation, access to major street networks, crime rate, site serviceability, impact on adjacent buildings, block density, access to air and light, and access to public amenities.

Site ‘A’ is located along the Detroit waterfront within the old industrial sector. With the implementation of a newly developed housing community adjacent to the site, the site has already been proven to successfully accommodate housing. Additionally, site ‘A’ is located adjacent to an interconnected urban park system that stretches along the waterfront and adjacent to downtown Detroit. However, the site remains distanced from downtown Detroit, public transportation, and is surrounded by low-density urban fabric.

Site ‘B’ is in the heart of downtown Detroit while paralleling the Rosa Parks Transit Center. The site is surrounded by large ornamental office buildings and limited residential buildings. Additionally, the site is well connected to various parts of Detroit through an interconnected urban park system. Through the increased connectivity and density, this site is a key player for the incorporation of a hybrid architectural typology. The mix of commercial and retail with limited residential buildings provides a unique opportunity to successfully bring more people to the city center.

Lastly, site ‘C’ is located adjacent to site ‘B’, however, site ‘C’ fronts an urban plaza. Site ‘C’ is a cluster of three (3) buildings and a parking lot constrained by surrounding site elements on two (2) of the four (4) sides. Additionally, Site ‘C’ is surrounded by higher density mixed-use office and residential buildings. Therefore, limiting the access this site has to natural light and fresh air.

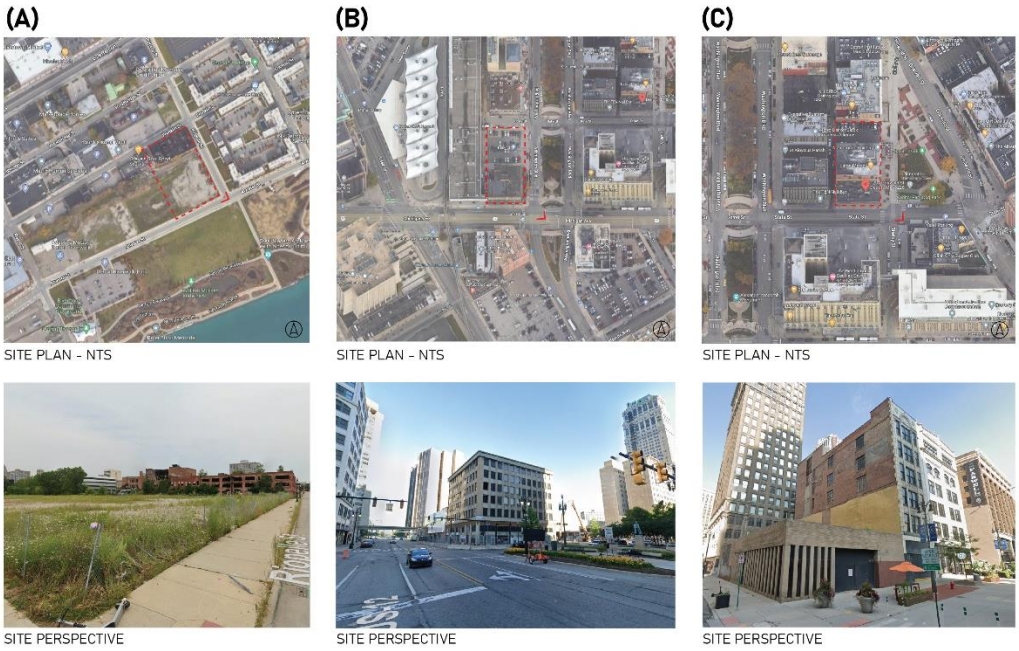

Figure 29: Proposed Site Imagery
(Source: J. Chase Edwards, 2022)

As discussed, all three (3) sites have the potential for the proposed building typology to drastically improve the surrounding community. After comparing the three (3) sites based on the pros and cons of each entity, the best site to move forward with at this time is site 'B', 1101 Washington Boulevard. Ultimately, the selection of the site came down to the determining criteria related to public transportation, access to center city, and access to public amenities. Additionally, the sites rectangular shape and clearly defined boundaries increase the potential for interior based design through limitations. Based on the numerical grading system used, site 'B', 1101-19 Washington Boulevard, is the best candidate for the development of a resilient, mixed-use residential building in downtown Detroit.

1 = INSUFFICIENT 2 = SOMEWHAT SUFFICIENT 3 = NEUTRAL 4 = SUFFICIENT 5 = EXCEEDINGLY SUFFICIENT

DETERMINING CRITERIA	SITE SELECTION (BY ADDRESS)		
	A: 1450-1490 FRANKLIN ST	**B:** 1101 WASHINGTON BLVD	**C:** 1201-11 GRISWOLD ST
ZONING	Special Development District, Riverfront Mixed-use	Major Business District	Major Business District
LOT SIZE	28,575 sf	24,076 sf	18,143 sf
ACCESS TO DOWNTOWN DETROIT	3	5	5
WALKABILITY	2	4	4
ACCESS TO PUBLIC TRANSPORTATION	3	5	4
ACCESS TO PUBLIC GREEN SPACE	5	4	4
ACCESS TO MAJOR STREET NETWORKS	3	5	4
CRIME RATE (1 = HIGH, 5 = LOW)	2	4	3
SITE SERVICEABILITY	5	4	4
IMPACT ON ADJACENT BUILDINGS	5	5	3
BLOCK DENSITY	2	3	4
ACCESS TO AIR & LIGHT	5 Allowable air and light at 4 sides of site	4 Allowable air and light at 3.5 sides of site	3 Allowable air and light at 3 sides of site
ACCESS TO PUBLIC AMENITIES	3	4	4
TOTALS =	**38**	**47**	**42**

Figure 30: Site Selection Matrix
(Source: J. Chase Edwards, 2022)

Site Analysis

The selected site is in the heart of downtown Detroit along the median urban park system created through the beautiful city movement of the twentieth century. Potential increased value is provided through multi-modal transportation options, connectivity to various nodes, and immediate access to office, retail, and urban park land usages. Although, While the location is prominent, the immediate surrounding context has seen some deterioration. Various vacant office and retail buildings line the street of Washington Boulevard creating obscurities to the existing fabric. However, the existing site has the potential to maximize design objectives while celebrating the rich history of the Detroit urban fabric.

Previously known as the Gateway Center Building before succumbing to vacancy, the chosen site, which now lies empty, is constrained by two (2) main throughfares in downtown Detroit. At the corner of Washington Boulevard and Michigan Avenue, the site has easy access to the integrated highway/interstate system as well as the surrounding residential neighborhoods. Should vehicular traffic not be feasible, the site backs up to the Rosa Parks Transit Center which provides public transportation through both rail and bus. Additionally, the site also promotes walkability due to the proximity of major nodes and public amenities. From the site, pedestrians can access 75% of downtown Detroit within a five (5) minute walk and can access the Detroit waterfront, convention center, and sports complexes within a ten (10) minute walk.

Figure 31: Site Adjacencies, Places & Connectivity Diagram (Detroit, Michigan), 1:1000
(Source: J. Chase Edwards, 2022)

While the walkability of the site is a large perk, there are also various forms of public transportation available throughout downtown Detroit. This includes an extensive bus system, an elevated people mover, a linear light rail, and a dedicated bike route. The

main terminal for the busses and people mover is located within the Rosa Parks Transit Center just adjacent to the site, on the corner of Cass Avenue and Times Square. Shared bike stations are located along the bike route (known as the 'Greenway'). The multi-modal transportation options around and through the city provide increased connectivity between user and neighborhood.

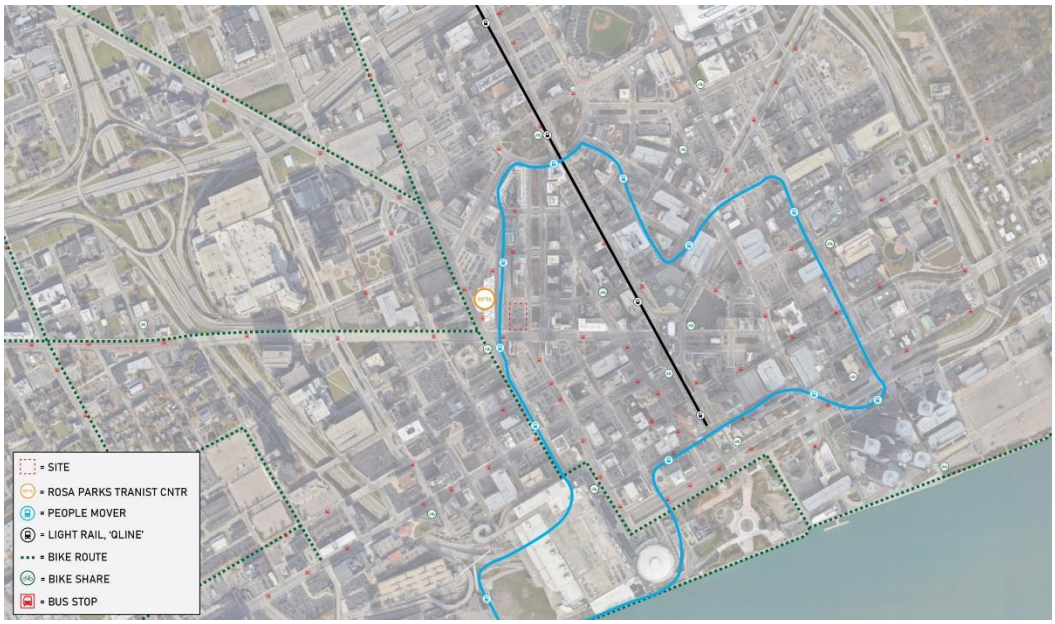

Figure 32: Multi-Modal Transportation Diagram (Detroit, Michigan), 1:1000
(Source: J. Chase Edwards, 2022)

Aside from public transportation, Detroit still heavily relies on the automobile. Michigan Avenue, just south of the site, acts as the main avenue in an effort to connect city-goers to the surrounding suburbs. Washington Boulevard, just east of the site, acts as the main thoroughfare, connecting north and south Detroit. Woodward Avenue also works as a main street, connecting users from the city center to the outskirts. At the extent of the city limit is interstate 375 which brings individuals throughout Michigan into Detroit. Through the walkability, access to public transportation, and access to major street networks, the site is quite accessible in various different ways.

Figure 33: Street Networks Diagram (Detroit, Michigan), 1:1000
(Source: J. Chase Edwards, 2022)

As is, Washington Boulevard and the selected site seems to be disjointed from the true downtown Detroit area for various reasons. For starters, there is a variance in building height along Washington Boulevard that allows for the existing architecture to work against one another. Along the street wall, it is typical for a large high-rise structure to be located next to a two (2)-story structure. While the street wall is continuous for the most part, there are various breaks at street corners to allow for surface parking or public plazas. Like the varied building height, the surrounding context does not have a regularized architectural style. Older buildings tend to be a mix of industrial, modern, gothic, and Chicago school style. On the other hand, newly constructed buildings disengage the surrounding context through post-modern and contemporary style architecture. Lastly, the surrounding context is quite diverse in terms of building usage. Although mostly commercial office space, there are also religious, residential, and retail building usages available along Washington Boulevard.

Figure 34: Figure Ground & Block Disruption Diagram (Detroit, Michigan), 1:250
(Source: J. Chase Edwards, 2023)

Figure 35: Building Typology Diagram (Detroit, Michigan), 1:1000
(Source: J. Chase Edwards, 2022)

The approach into the block of the site is an experiential node as the selected site and the Westin Book Cadillac Hotel begin to act as a gateway into the corridor. As the user works deeper into the corridor, the various garden spaces within the corridor began to create additional nodes, luring the user even deeper. The Grand Circus Park works as the termination point of the corridor, therefore, contracting the user and slowly expanding

the experience until they reach the large open space. Street access is provided to the site through Washington Boulevard, State Street, and Michigan Avenue. With Washington Boulevard having the most street frontage, it is the largest point of access. However, as people move horizontally across the city to reach the transit center, focus on the access of the building is shifted to Michigan Avenue and State Street.

Figure 36: Site Gateway & Access (Detroit, Michigan), 1:250
(Source: J. Chase Edwards, 2023)

This thesis' architectural proposal must aim to provide linkage between the existing, diverse architecture while reinstalling stability back into a divided society. Through the proposed program and site articulation, the proposal must work to maintain connectivity while providing additional diversity amongst the various surrounding nodes. If built out successfully, the selected site provides immense opportunity to increase real estate value of the surrounding area, promote the well-being of Detroiters, and contribute to the beautiful city movement installed within Detroit.

Preliminary Proposal

In response to the relevant city issues of Detroit, the surrounding site context, and demand profile, this thesis looks to implement a mix of supportive programs to create a hybrid architectural typology. At the conceptual level, this includes the implementation of community space, commercial offices, retail, and residential dwellings. Each of these functions create a sequence of spaces that work to foster a diverse, self-sufficient, colony-like community. In our investigation of Detroit's demographics and relevant city issues, we were able to note various vulnerabilities that should be addressed immediately. At the economic level, the proposed program will aim to aid residents and reduce poverty rates through affordable housing coupled with a small-business market hall to promote job opportunities. Affordable housing will be inclusive of both small-scale single bedroom units as well as multiple bedroom units to support both individuals and families. The integration of commercial office space will also aim to support service-based local businesses in addition to the product-based market hall. Through the support of local businesses, generational wealth can start to be built within family households. Additionally, this proposal aims to incorporate long-term market rate housing to increase the overall property value and keep residents within this section of Detroit. Ultimately, by bringing inhabitants back to the city center through housing and leisure, vacancy rates along Washington Boulevard should theoretically be challenged.

To further aid the needs of Detroiters, the proposed program will aim to tackle relevant social issues such as education, support facilities, recreation, and inequality. Community-based programs will include a day-care facility along with a wellness facility to provide support to families in need while improving their overall well-being.

Additionally, the community-based program will work to increase education and job training programs through the implementation of various public classroom spaces.

In summary, this proposal looks to address various socioeconomic issues through a well thought of mix of necessary building programs. In turn, this proposal will increase community engagement by fostering relationships of building inhabitants, promote increased pedestrian traffic to a deteriorating district, and increase job opportunities for those living within the city, all while celebrating the historical and cultural values of Detroit.

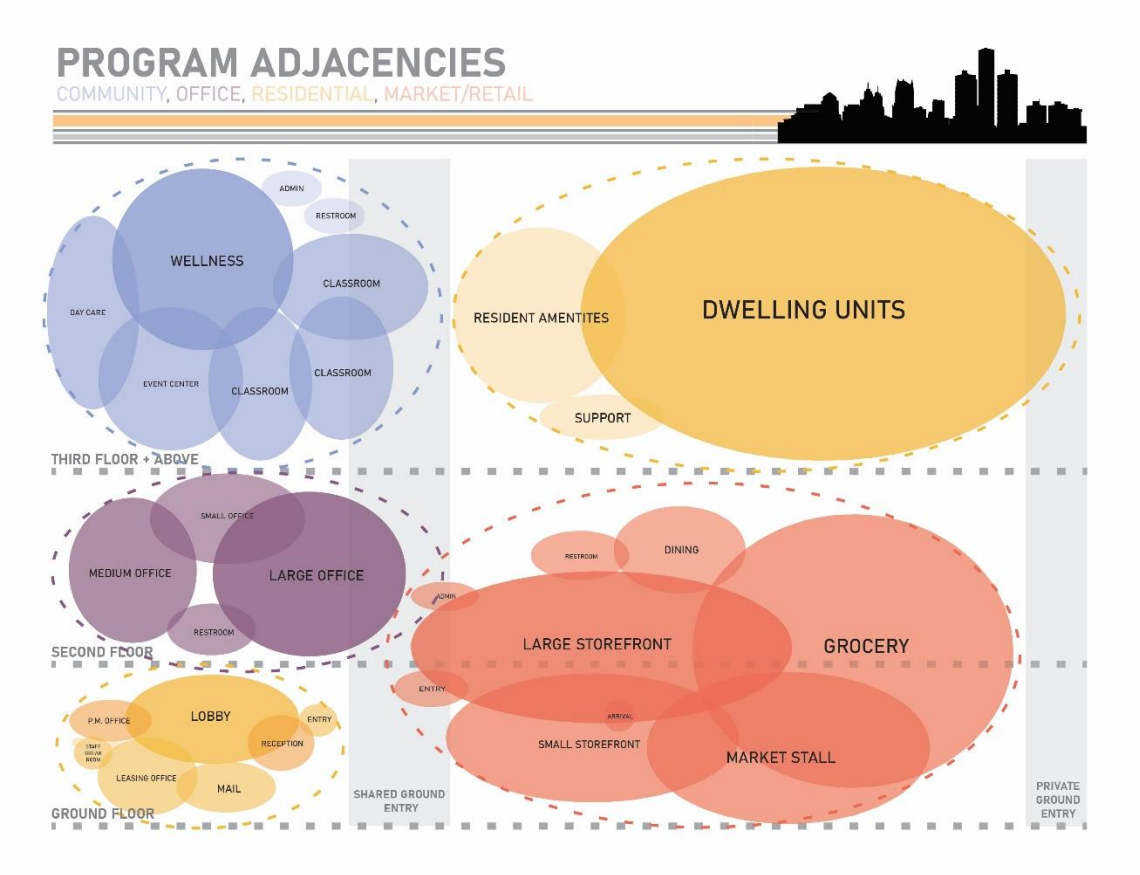

Figure 37: Program Adjacencies Diagram
(Source: J. Chase Edwards, 2022)

Zoning Envelope

The proposed site is located in Detroit's Major Business (B5) District which is regionally oriented to provide increased retail and commercial office space adjacent to the Central Business District and New Center Area. Additionally, the prior utilization of the proposed site was intended for commercial office space, however, the B5 district is still receptive to residential land use at various scales. In terms of building requirements for the B5 District, there are not many restricting factors. To explain, for multi-family dwellings with ground floor retail, there is not a listed maximum building height, floor area ratio (FAR) or maximum/minimum lot coverage. The only restraining factor in terms of the site is the minimum required lot size of 7,000 square feet. With this information in mind, the ultimate height, FAR, lot coverage should be determined based on good design intuition by analyzing the surrounding context.

Figure 38: B5 District Zoning Requirements
(Source: J. Chase Edwards, 2022)

In terms of parking, the proposed building usage of this thesis requires off-street parking for the day-care facility, commercial office space, residential units, and retail space. In accordance with Detroit's accepted zoning code, day-care facilities require one (1) parking spot per every two (2) employees and one (1) per every ten (10) children; the commercial office space requires one (1) space for every 400 square feet of office program;

the residential typically requires 1.25 per dwelling unit, however, this requirement is reduced to .75 per unit due to the adjacent transit center; lastly, the dedicated retail parking will ultimately be determined through the total square footage of the retail complex. Accessible parking spaces will be determined from the final overall quantity of parking. Additionally, off-street loading spaces must be provided for the residential, and retail program.

Figure 39: Off-Street Parking Requirements
(Source: J. Chase Edwards, 2022)

Chapter 7: Final Design and Conclusion

Project Objectives

With careful review of the suburban environment, surrounding context, smart growth principles, and community principles, the objective of this thesis is to establish an urban building that competes with the attractiveness of the suburban environment. This includes the introduction of architectural typology that works to recreate a typical suburban community into a dense urban environment in a singular building. Through the selection of human-centric program, community supportive program, and housing, the building will work to over-saturate the downtown market to reestablish well-being and activity to the

city center. Ultimately creating a resilient, self-sufficient micro-ecosystem that does not rely on the external city, but instead, supports it economically and socially.

Figure 40: Thesis Design Objectives
(Source: J. Chase Edwards, 2022)

Final Program

In order to establish the building program, a demand list has been created based off the needs of downtown Detroit. The selection of program also includes program that would be found within every day suburban life used to create a community. Program that is centered around human activity and supports the social and economic well-being of humanity. As we look at the suburban lifestyle, we are able to establish the presence of housing, food supply and production, entertainment, childcare, various employment opportunities, educational institutions, and health promoting activities. The selected program for this thesis includes a local-vendor market hall, a cultural center, a fitness center, and housing with shared amenities.

The local vendor market hall works to establish a live-work condition for the residents of the building. Fifty-one (51) vendor stalls have been organized by floor based

on food, physical goods, and art-related uses. The cultural center looks to support the surrounding community members and building residents through classrooms and meeting rooms, a theater/auditorium, and a large rentable event hall for community events. The fitness center includes an aquatic center, gymnasium, indoor track, temporary childcare, a group workout room, and traditional fitness equipment such as free weights, machine weights, and cardio equipment.

The housing program looks to create a diverse community through mixed income housing. The aggregate of unit types looks to support both single individuals and families with studio, one (1)-bedroom, two (2)-bedroom, and three (3)-bedroom units. Units are available through both rent and closed purchase. The residents are supported through shared office space, a dog run and dog wash, a lounge, pool, community garden, fitness center, and exterior roof terrace. The overall selection of program aims to create a micro-eco-system that supports the residents of the building while engaging and promoting activity amongst the surrounding community.

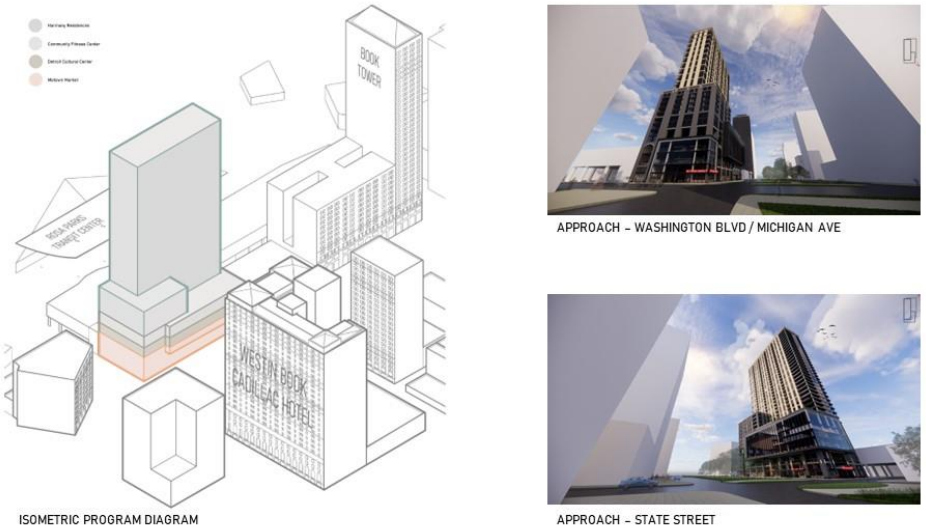

Figure 41: Stacking Diagram of Selected Program, Approach Views
(Source: J. Chase Edwards, 2022)

Design and Architecture

The form of the building considers the organization of the included program, the surrounding building heights, the surrounding building style, and the accessibility of the site. The selected program is organized in a vertical, public to private fashion while which is delineated by façade materiality changes and the pushing and pulling of the building form to create a continuation of the existing fabric. All working to bridge the gap between the existing dense portion of the city to the disjointed urban fabric at the outer edges of the city.

The program, which was carefully selected based on the everyday needs of suburban residents and Detroiters, has been organized vertically based on the public and private nature of the space. The market hall has been placed on the bottom three (3) floors, the cultural center is on the fourth (4^{th}) and fifth (5^{th}) floor, the fitness center is on the sixth (6^{th}) and seventh (7^{th}) floor, and the residencies are on the eighth (8^{th}) through twenty-sixth (26^{th}) floor. The housing amenities are on the eighth (8^{th}) through twelfth (12^{th}) floor. The organization helps create increased relationships between each program and helps to establish the design objectives previously discussed.

Figure 42: Design Strategy Diagram
(Source: J. Chase Edwards, 2023)

The market hall has been designed to include fifty-one (51) total market stalls for various uses and functions. The first floor of the market hall has been organized in a linear fashion, parallel with Washington Boulevard for food-based program including. This includes a café, made-to-order options, and small grocery store type vendors. The placement of said program on the ground level affords train and bus users the opportunity to grab a quick item and get back to the transit center. The second floor of the market hall has been set aside for physical, tangible goods such as small clothing businesses, etc. The third, and final floor of the market hall is designated as the arts floor with private art studios and an art gallery. Also existing on the third floor is a staircase with optional seating to enjoy the natural arts and theatrics of the market hall below.

Figure 43: First Floor, Market Hall Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

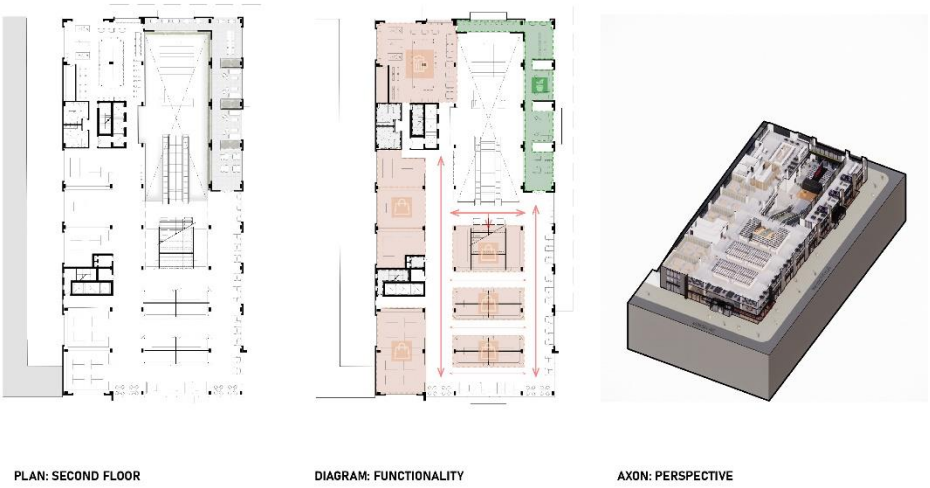

Figure 44: Second Floor, Market Hall Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

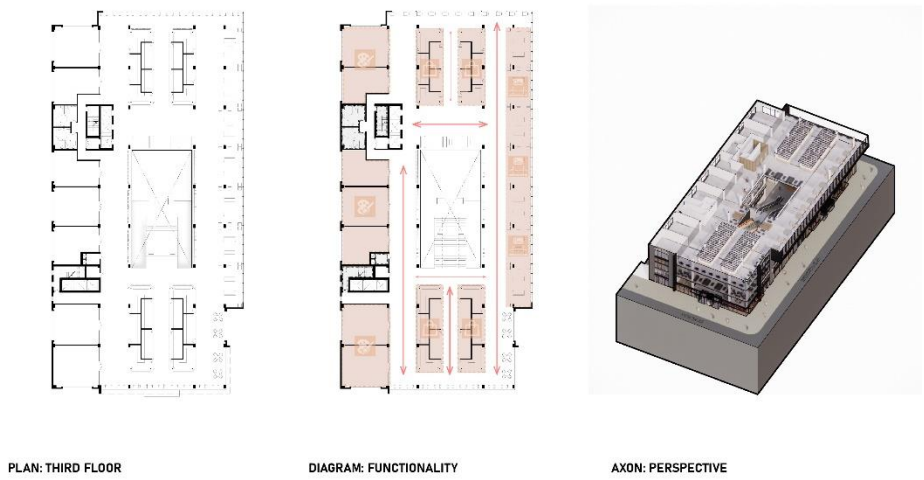

Figure 45: Third Floor, Market Hall Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

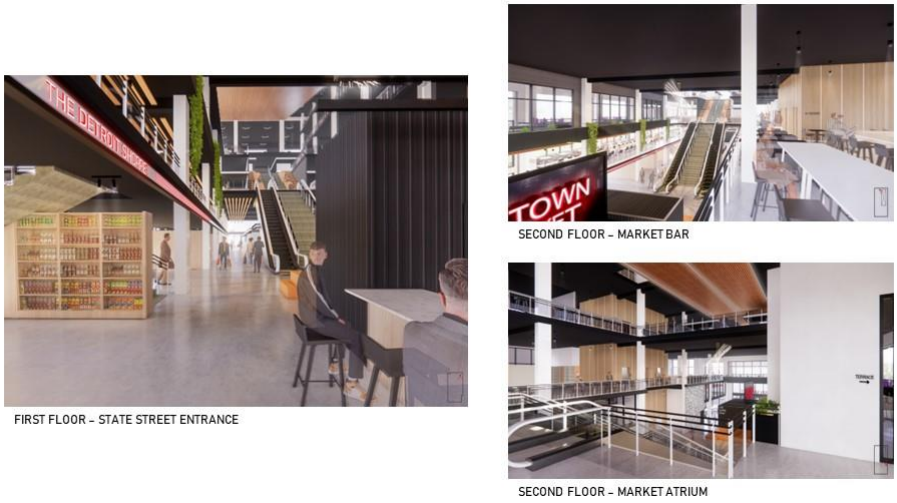

Figure 46: Market Hall Perspectives
(Source: J. Chase Edwards, 2023)

The cultural center on the fourth (4th) floor has been designed to provide norther light to the classrooms and meeting rooms while submerging the theater into the heart of the building. The theater remains a stand-alone item as it floats from the ceiling of the grand atrium. The event hall works to celebrate both the interior and exterior with an outdoor terrace and views down into the market hall below. The cultural center has been

designed around the integration of the space towards the middle of the building, allowing it to be the center of attention.

Figure 47: Fourth Floor, Cultural Center Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

Figure 48: Cultural Center Perspectives
(Source: J. Chase Edwards, 2023)

The fitness center is stretched over two (2) floors, the sixth and seventh floor. The first floor of the fitness center includes an aquatic center at the northern end of the building to harvest the view of uptown Detroit and the northern natural light. Additionally, a gymnasium with a basketball court and temporary childcare facility for gym-goers is

located on the first floor of the fitness center. The second floor of the fitness center, and seventh floor of the building, includes traditional workout equipment, an indoor track, and views down into the gymnasium and aquatic center below. The fitness center aims to provide a means of activity for the surrounding community, increasing overall human well-being.

Figure 49: Sixth Floor, Fitness Center Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

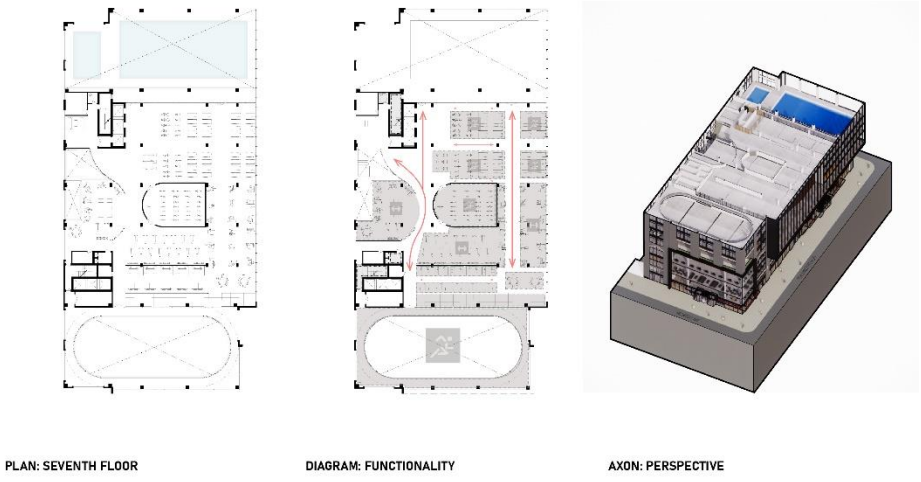

Figure 50: Seventh Floor, Fitness Center Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

Through the sectionality of the lower podium, you begin to see relationships formed by the aggregation of the public spaces. The integration of programs across multiple levels creates unique views and curiosities as the users explore the building vertically. The program has been organized around a large internal atrium that works to celebrate the theater suspended from the ceiling. At the end of the atrium is the event hall, acting at the 'jewel box' or crown to the public space as it promotes gathering and engagement.

Figure 51: Lower Podium Section Perspective
(Source: J. Chase Edwards, 2023)

The upper level of the building has been organized to include a housing-based program. The amenities selected for the use of residents aim to support well-being and economic growth. The eighth floor, or amenity level, includes dwelling units and a leasing office; a community garden for the production of fresh foods; a dog wash and dog run for individuals with pets; a private fitness center; a partially covered pool; and an indoor/outdoor resident lounge for leisure after a long day. Additionally, on the nineth floor of the residential tower is a childcare facility for the use of resident families. The tenth-through-twelfth floor includes a shared office space which provides workstations in the modern work-from-home climate. The office levels are organized by activity, such as

quiet versus collaborative, and are connected through an internal atrium. Both outdoor and indoor space is available for all amenities.

Figure 52: Eighth-Tenth Floor, Residential Amenity Floor Plans
(Source: J. Chase Edwards, 2023)

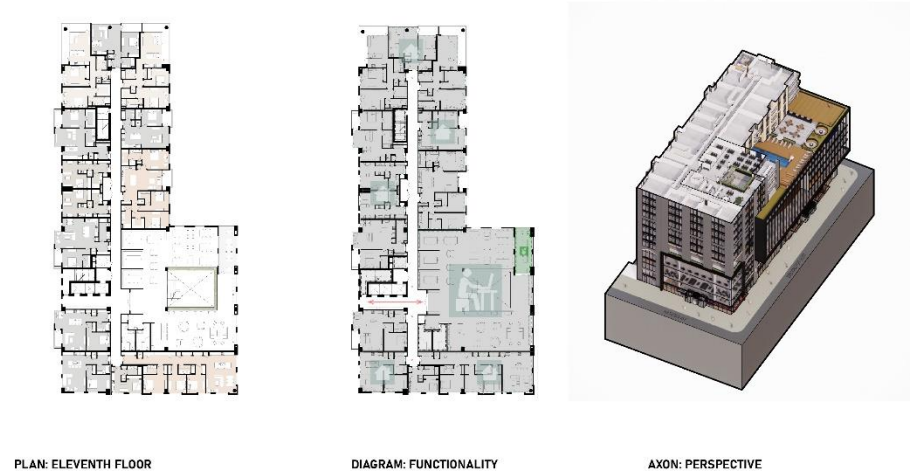

Figure 53: Eleventh Floor, Resident Shared Office Typical Plan, Diagram, and Axon Perspective
(Source: J. Chase Edwards, 2023)

Figure 54: Residential Perspectives
(Source: J. Chase Edwards, 2023)

The dwelling unit aggregation provides four (4) different types of typical units to meet the needs of most individuals and families. The residences are made up of 401 total dwelling units with the primary unit type being the one (1)-bedroom unit. Studio units are approximately 350 square-feet, one (1)-bedroom units are approximately 600 square-feet, two (2)-bedroom units are approximately 1,000 square-feet, and three (3)-bedroom units are approximately 1,400 square-feet in size. The unit sizes and total aggregate has been designed to increase density within the building while still providing housing for all individuals.

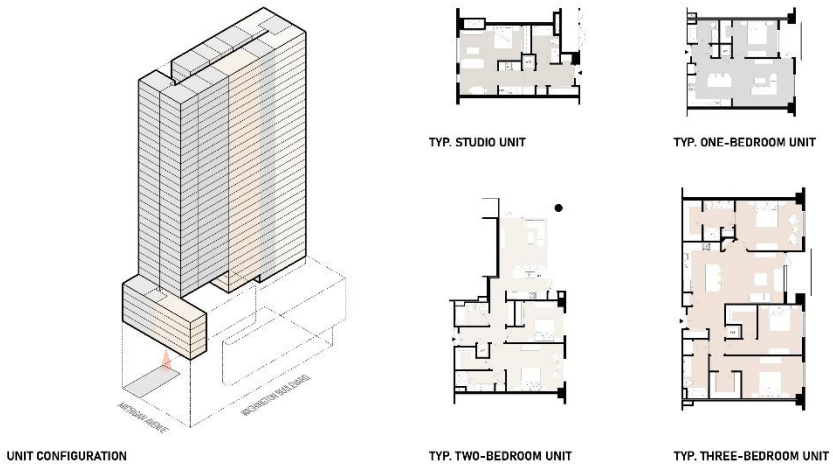

Figure 55: Dwelling-Unit Plan and Configuration
(Source: J. Chase Edwards, 2023)

The multi-family residence includes both market-rate rental and closed-purchased units along with affordable rental units. The aggregate of units is based on the housing market within Detroit, there is a higher vacancy rate of closed-purchase units rather than rental units, therefore, this thesis includes a higher percentage of rental units in comparison to closed purchase. The city of Detroit requires every multi-family housing building to provide 20-percent of its total units towards the need for affordable housing. Affordable housing is classified within the city as 60-percent of the total area median income (AMI). This thesis proposal aims to provide 35-percent of the total units within the building affordable housing at 30-percent AMI while still having 49-percent market-rate rental and 16-percent market-rate closed purchase. The inclusion of both market-rate rental and closed purchase dwelling units produces the additional funded needed to provide a higher rate of affordable housing units at a lower AMI. Closed purchase dwelling units also provide renters within the building to eventually become homeowners if they desire.

TARGET MARKET - DETROIT, MI					
AREA MEDIAN INCOME (AMI)	60% AMI	TOTAL REQ'D UNITS AT 60% AMI	TOTAL VACANT DWELLINGS	HOMEOWNER VACANCY %	RENTAL VACANCY %
$34,762	$20,857	20%	18,502	%12.0	%5.7

UNIT MATRIX - BY BEDROOM					
UNIT TYPE	AVG. SIZE	TOTAL COUNT	NO. OF CLOSED PURCHASE UNITS	NO. OF MARKET-RATE RENTAL UNITS	NO. OF AFFORDABLE RENTAL UNITS (30% AMI)
STUDIO	+/- 350 SF	65	0	15	50
1-BEDROOM	+/- 600 SF	237	50	150	37
2-BEDROOM	+/- 1,000 SF	61	12	20	30
3-BEDROOM	+/- 1,400 SF	38	3	10	25
UNIT TOTALS BY # =		401	65	195	142
UNIT TOTALS BY % =		100%	16%	49%	35%

Figure 56: Target Market and Unit Matrix
(Source: J. Chase Edwards, 2023)

The extensive building program and overall organization creates a diverse community and promotes varied usage at different times throughout the day. During the average weekday, usage of the building is primarily seen by building residents, service workers, working professionals, families, and young individuals. During the daytime, building residents are more likely to use the market hall and community-based program due to the easy access provided. Working professionals and service workers, such as food delivery drivers, are likely to utilize the building during lunch time. Families and tourists are likely to use the building more in the late afternoon of a weekday while young individuals remain the primary user of it at the later hours of the night. During the weekend and holidays, the building is likely to be used by all parties throughout the day.

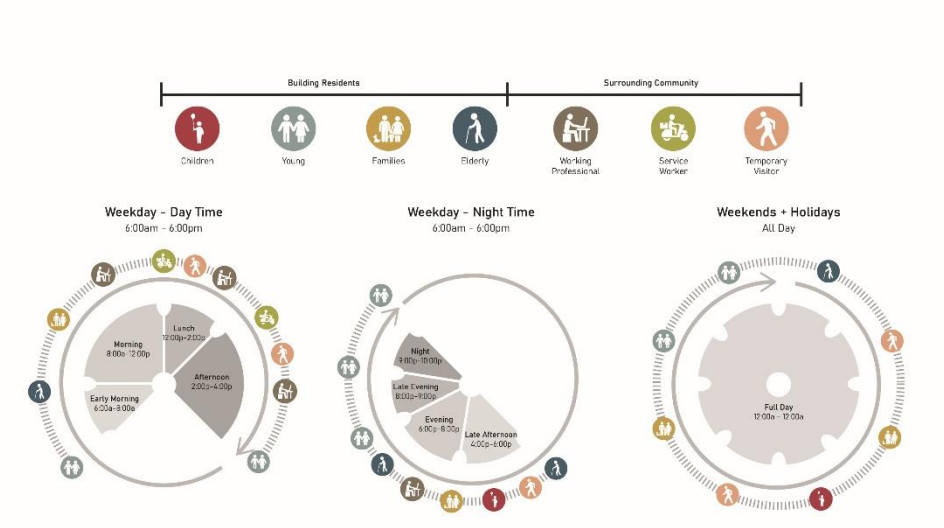

Figure 57: Building Usage Diagram, Time and User
(Source: J. Chase Edwards, 2023)

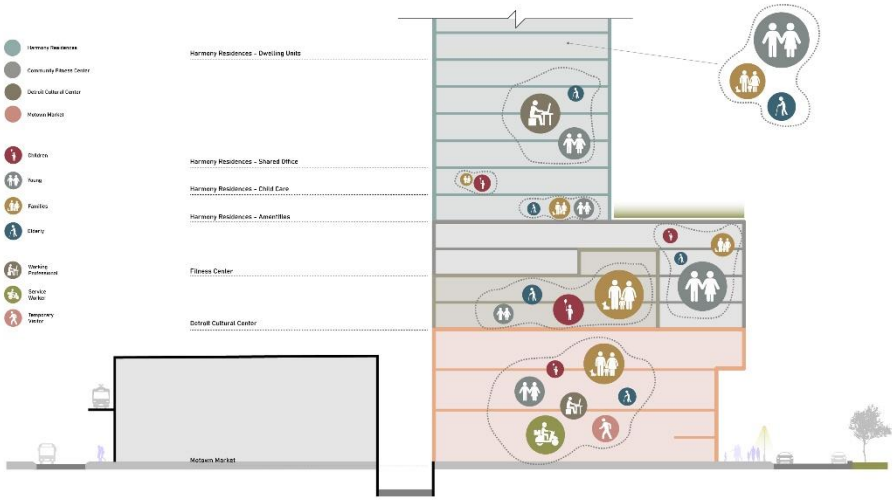

Figure 58: Building Usage Diagram, Program Versus User
(Source: J. Chase Edwards, 2023)

The façade design of the building pulls from the surrounding architecture within the city of Detroit. The primary architectural types are art deco and gothic, however, recent installations of modern or contemporary do exist. The façade encompasses all the stylistic architectural approaches and encapsulates them into one building. The material choice also works to contrast different portions of the building based on the program within. The market hall utilizes a gray brick veneer with major entry points highlighted through a beige concrete masonry unit material or glazing. The cultural center portion of the building is

expressed through the modern-style façade design. Lastly, the housing portion of the building uses a beige brick veneer to mimic that of the Westin Book Cadillac Hotel across the street and provide contrast from the lower podium.

Figure 59: North and East Elevation
(Source: J. Chase Edwards, 2023)

Figure 60: South and West Elevation
(Source: J. Chase Edwards, 2023)

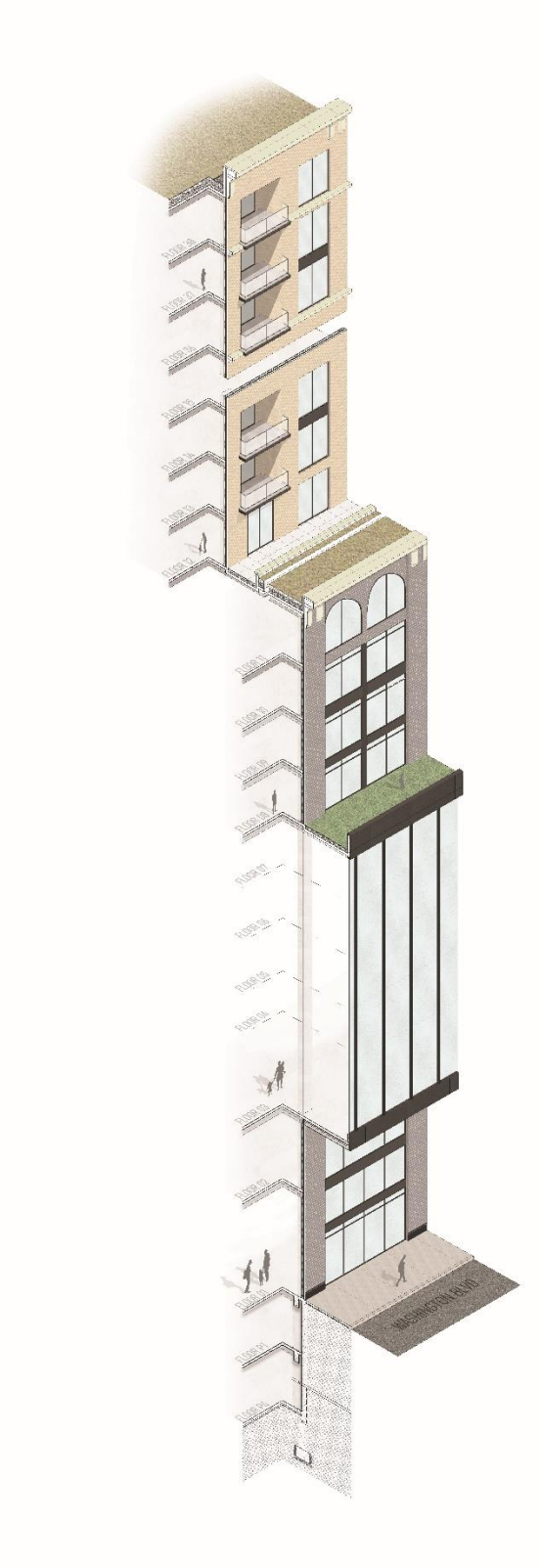

Figure 61: Isometric Wall Section Elevation
(Source: J. Chase Edwards, 2023)

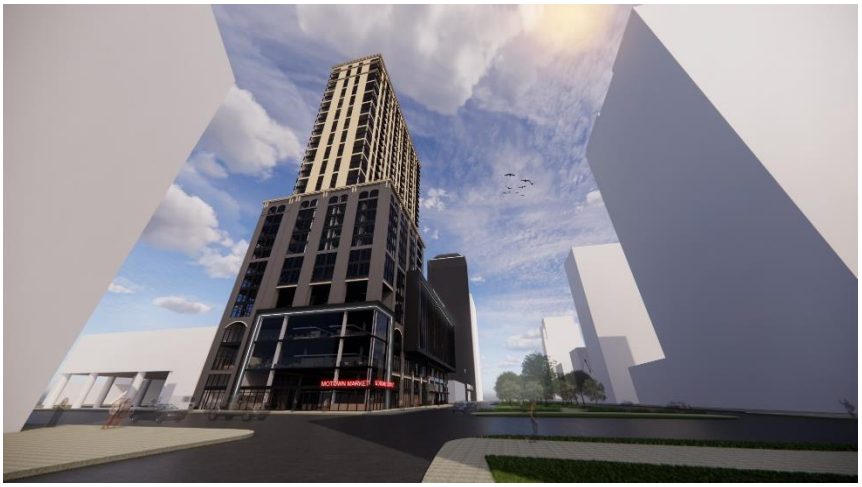

Figure 62: Perspective, Washington Boulevard North Approach
(Source: J. Chase Edwards, 2023)

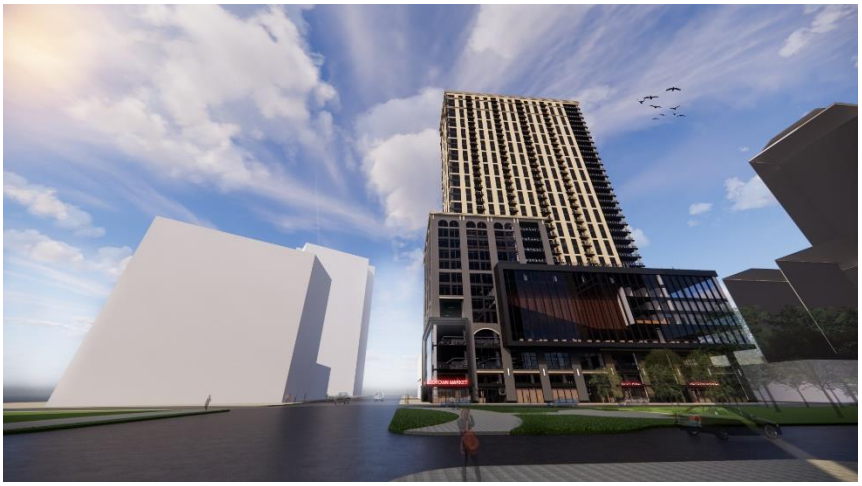

Figure 63: Perspective, Michigan Avenue Approach
(Source: J. Chase Edwards, 2023)

Figure 64: Perspective, State Street Approach
(Source: J. Chase Edwards, 2023

Concluding Thoughts

The implementation of a unique architectural hybrid typology within the city center of Detroit works well to restore life and vibrant activity back into the city. This is done through the over-saturation of housing, at both the affordable and market rate levels, entertainment, shopping, education, and a wellness center. The selected program works to support the surrounding community economically and socially through human-engagement and job opportunities. Additionally, through the live-work environment, the building works to create a self-sufficient micro-ecosystem. This is due to residents generating income and reinvesting it back into the building. Collectively, between the internal and external effects, the building promotes overall community wellbeing.

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