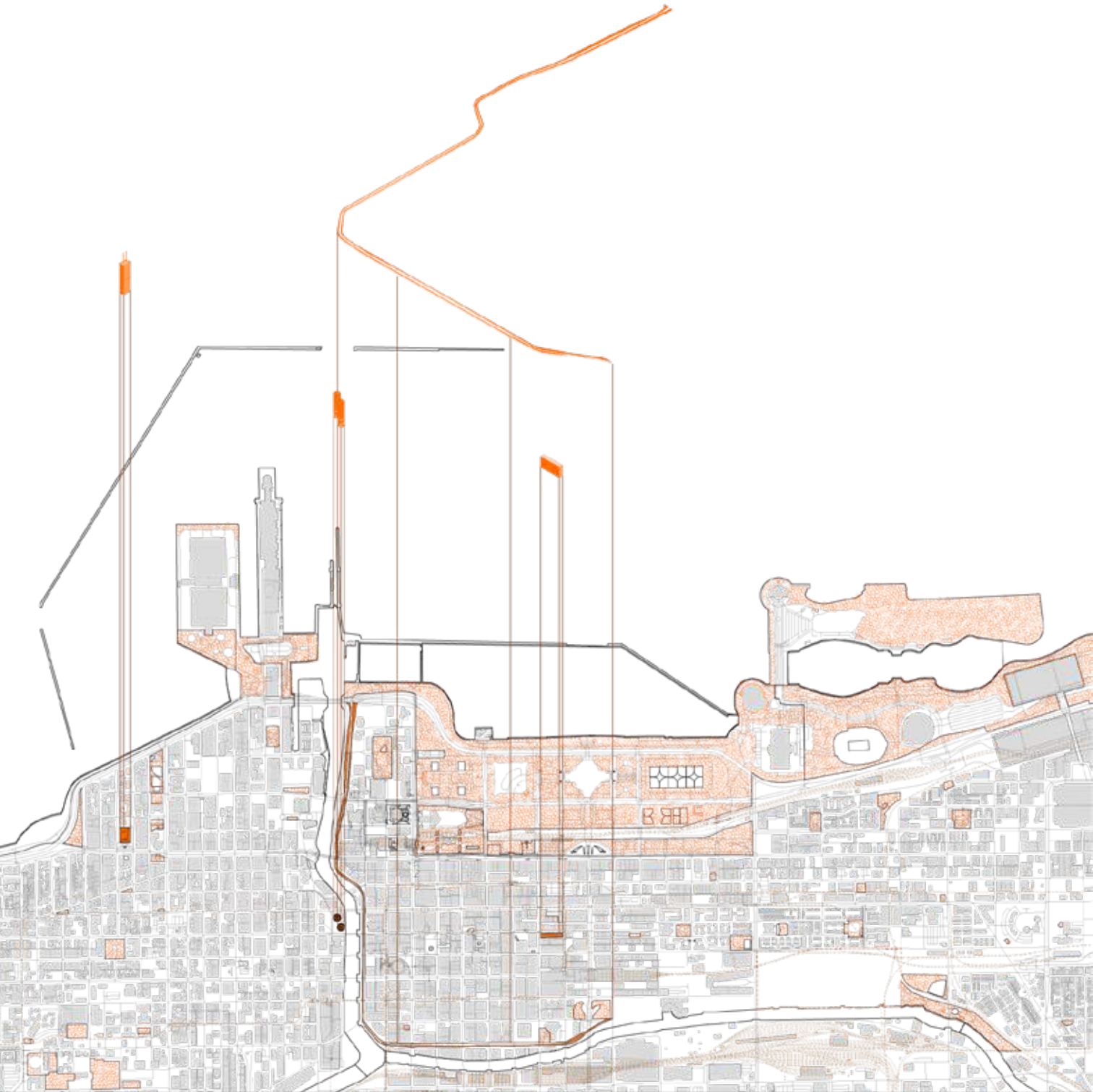
City of Doubles

Incorporating contemporary manufacturing in the 21st century in the City of Chicago

Vannut Hannah



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Master Dissertation Project:	Chicago, the City of Doubles
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Student:	Vannut Hannah
Academic Year:	2018/2019
Publication Date:	19/06/2019
Study Program:	International Master of Science in Architecture KU Leuven, Faculty of Architecture Campus Sint-Lucas Ghent

Chicago, City of Doubles,

The Second City.
The Dual City,

Wacker Drive,
Marina City,
River City,
The Hancock Tower,

The Monadnock

IMAGE: RICARDO ESQUIVEL. VIEW OF THE CHICAGO RIVER AND SURROUNDING BUILDINGS.

ABSTRACT

City of Doubles

Incorporating contemporary manufacturing in the 21st century in the City of Chicago.

Chicago's twinning nature includes physical artefacts as well as theoretical distinctions. The city is the second city of the United States, it bears a dual-city statute as a result of the distinct divide between the North and the South, but also represents manmade 'twinning' structures such as Marina City and River City, both exceptional designs by Bertrand Goldburg, Chicago's multilayer street Wacker Drive and the Monadnock building on West Jackson Boulevard.

The dissertation "City of Doubles" situates itself within the hot topic of re-urbanizing manufacturing. Today, industrial companies have seen the advantages of returning to their urban roots but encounter difficulties for their return. Ever since their departure, cities have evolved and expanded, focusing on optimizing residential fronts and leaving little or no room for a potential industrial return.

It goes without saying that Chicago is a city whose contribution to industry, architecture and urban planning was an inspiration for many growing cities around the world. Its historical industrial relevance and current problems, of a social divide, are the reason why this city has been chosen to become the sample city where manufacturing and industry are re-incorporated amongst residential, commercial and public spaces.

This research paper seeks to shed light on the architectural aspect of the return of manufacturing to the city of Chicago. It uses a specific building, the Monadnock Building - one of Chicago's most pristine architectural structures - as a paradigm to create a contemporary version of itself which answers to the needs of today's contemporary city: the re-urbanization of industry and manufacturing and the creation of (job) opportunities for its people. The building is analyzed on all aspects and redesigned into two prototypes which embrace modern technology but respect the original grammar of the Monadnock Building.

This dissertation aims to successfully re-integrate manufacturing in the city of Chicago, provide its people with more job opportunities and create connections between its communities, re-defining Chicago's individualistic impression. The city's dual-statute between the North and the South can thereby gradually diminish as manufacturing spaces spread all over the city. When this has fully transpired, every neighborhood in Chicago will receive the same amount of opportunities, which eventually results in increasing a healthy living environment for all.

I would first like to express my sincere gratitude to my thesis professor Martine De Maeseneer of the faculty of Architecture at the KU Leuven for her continuous support, patience, motivation and enthusiasm. Her guidance helped me at all times during the research and design of this thesis.

ACKNOWLEDGMENTS

Foremost, I would first like to express my sincere gratitude to my thesis professor Martine De Maeseneer of the faculty of Architecture at the KU Leuven for her continuous support, patience, motivation and enthusiasm. Her guidance helped me at all times during the research and design of this thesis.

I would also like to thank the experts, Robert Somol, Francesco Marullo and Jeff Kipnis who are based in Chicago who provided me with a generous amount of knowledge of the city, the site and its history. Without their passionate participation and input, the dissertation would not have reached the same end result as it did.

Finally, I must express my very profound gratitude to:
My mom, for her unconditional love and support throughout the years,

My dad for his unlimited support and constant encouragement,

José, for always being there to brainstorm for creative ideas,

My sister for taking care of me and continuously lifting my spirits during difficult times,

My fellow classmates and friends for the stimulating discussions, the sleepless nights working together and for all the fun we had these past five years.

This accomplishment would not have been possible without any of them. Thank you.

Hannah Vannut

TABLE OF CONTENTS

CHICAGO

C. SANDBURG

Hog Butcher for the World,
Tool Maker, Stacker of Wheat,
Player with Railroads and the Nation's Freight Handler;
Stormy, husky, brawling,
City of the Big Shoulders:

They tell me you are wicked and I believe them, for I have seen your painted women under the gas lamps luring the farm boys.
And they tell me you are crooked and I answer: Yes, it is true I have seen the gunman kill and go free to kill again.
And they tell me you are brutal and my reply is: On the faces of women and children I have seen the marks of wanton hunger.
And having answered so I turn once more to those who sneer at this my city, and I give them back the sneer and say to them:
Come and show me another city with lifted head singing so proud to be alive and coarse and strong and cunning.
Flinging magnetic curses amid the toil of piling job on job, here is a tall bold slugger set vivid against the little soft cities;
Fierce as a dog with tongue lapping for action, cunning as a savage pitted against the wilderness,
Bareheaded,
Shoveling,
Wrecking,
Planning,
Building, breaking, rebuilding,
Under the smoke, dust all over his mouth, laughing with white teeth,
Under the terrible burden of destiny laughing as a young man laughs,
Laughing even as an ignorant fighter laughs who has never lost a battle,
Bragging and laughing that under his wrist is the pulse, and under his ribs the heart of the people,
Laughing!
Laughing the stormy, husky, brawling laughter of Youth, half-naked, sweating, proud to be Hog Butcher, Tool Maker, Stacker of Wheat, Player with Railroads and Freight Handler to the Nation.

1 INTRODUCTION

1.2 BACKGROUND - PROBLEM STATEMENT

The return of industry to an urban setting is a worldwide phenomenon and paramount for the future development of cities all around the world. The issues today remain where these companies can go and how they will be integrated in the contemporary city of today.

Chicago is the second city of the United States and was once the fasted growing city in the world due to its status as an important transit depot between the East and the West. It is particularly prominent for this research paper and design proposal that Chicago's industrial history is taken into account whilst designing for future cities, seeing as it was once one of the most important and influential industrial places of the world.

1.2 DESIGN QUESTION

"*How can industry and manufacturing for the city of Chicago be re-urbanized and what are the effects it will have on the city in terms of social and urban reflection?"*

1.3 OBJECTIVES

The objectives of this dissertation can be narrowed down to three scales:

On city scale, the proposal looks into how historic rails and trails can become (retail guided) links in between Chicago's neighborhoods allowing inhabitants to reform their 'mental map' of the city and dare to cross boundaries.

On neighborhood scale, the dissertation starts by deeply researching manufacturing in past, present and future. Its objective is to understand how and what it would mean when industry re-enters its former districts. It proposes an architectural solution to combine industry, residential, recreation and retail in one area.

On the building scale, the dissertation focuses on the needs of the new industrial building in combination with residential and retail spaces. It analyses what spaces are needed, their (functional) organization and how they work together to create a new typology of industrial architecture.

The general objective of this dissertation is to re-urbanize industry in Chicago, study the influence it will have on the city and design a prototype neighborhood where manufacturing, commercial and residential aspects all apply.

The proposal's social objective is to create a connection between the city's common communities and gradually decrease the current conscious social divide. Communities should be perceived as equals, attract the diverse groups and obtain the same opportunities. This could significantly influence employment rates, poverty and general welfare in current declining communities.

1.4 SCOPE AND PARAMETERS

The dissertation lies within the scope of “Resilient and Sustainable Strategies” of the architectural sector.

Its purpose is to develop a project which has thoroughly analyzed the past and present and proposes a detailed, comprehensive design which meets the needs of the contemporary city, its communities, its neighborhoods and its residents whilst taking into account the authenticity of all the approached aspects.

The parameters of the dissertation are:
The proposal invests in modern day technological aspects, taking into account the usage and choice of materials to fit the present day standards.

The project meets the current *Chicago River Walk* request, resulting in a large public space along the river which connects to the Loop in the North and China Town in the South. The project also invests in public covered and open spaces within the design, contributing to a highly social and connected environment.

The design reinstates a working-living environment in the city, also including commercial and public space, ensuring a healthy living environment.

2 RESEARCH

2.1 RESEARCH CHICAGO PROBLEM STATEMENT

2.1.1 Short History of Chicago

2.1.1.1 From Settlement to City

The city of Chicago is built on three main elements: a prominent location, a network of trails - which included well-connected routes for trading goods (even before European settlers arrived) - and portages[1] , which were defined by the Native Americans. Before the incorporation of Chicago, it were the Native Americans who lived in the region, in villages they built themselves. European settlers only arrived during the 17th and 18th century and were the ones who initiated the lands' transformation to the city it has become today.

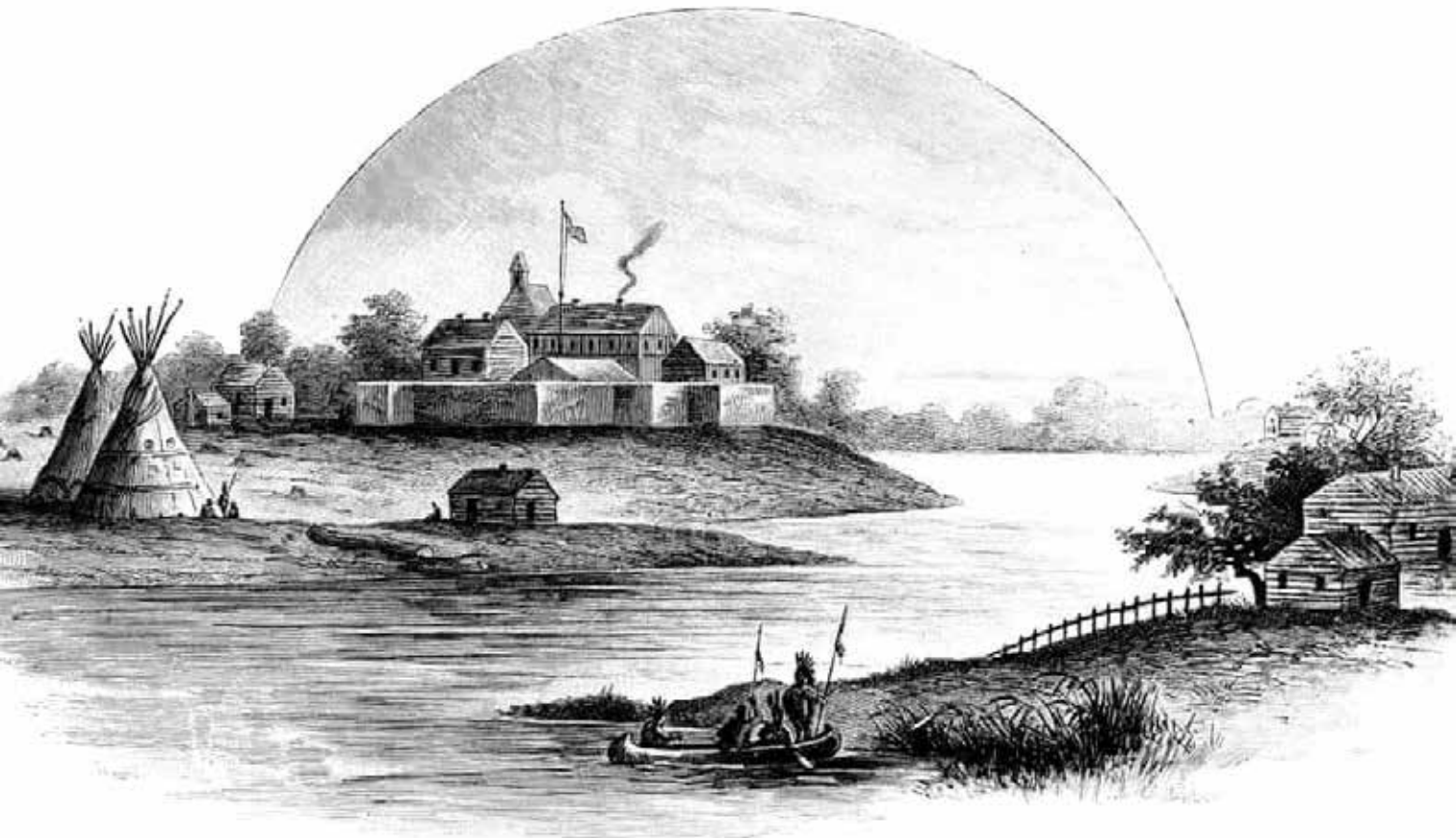
It only took a few decades for Chicago to evolve from a prairie landscape to a busy and vibrant town of builders, hustlers and businessmen. In only 60 years did Chicago's population grow from 4,500 to more than 1 million inhabitants in 1910[2]. The 'Chicago Boom' started around 1840 as the town, then consisting of four houses, grew to be one of the fastest growing cities in the world. It wasn't just a city which established a hinterland but a city where ports, infrastructure and manufactured products from milling, butchering, brewing and trade grew and were sold as products for local and regional markets.

As soon as the Illinois Canal and the Michigan Canal (I&M Canal) opened in the spring of 1848, a new acceleration emerged inducing an economic dynamism until the 1920's. The river meant new means of transportation, not only transforming Chicago, but the nation. The Midwest gained a whole new market of wheat, corn and lumber, all of which had to pass through Chicago, seeing as it was the center of the Mid-Western cities. The city rapidly became a busy hub filled with cargo and passenger ships, freight trains and carriages. The increase of transportation mediums also resulted in an acceleration on the construction front in the city.

In 1871, the Great Chicago Fire took place destroying most of Chicago's early history. Even though it devastated most, the city was given a chance to rebuild itself. Within merely twenty years, the city was rebuilt using technological advances in engineering and innovative design methods forming Chicago as a 'new type of city'. In the decades that followed Chicago evolved into one of America's prime locations for architectural innovation.

1 PORTAGES WERE PLACES MEANT FOR CARRYING BOATS FROM ONE WATER SYSTEM TO THE OTHER. FOR EXAMPLE, FROM THE MISSISSIPPI RIVER TO THE GREAT LAKES.

2 SOURCE: U.S. CENSUS



A 19th-century illustration showing Chicago in 1831. Photograph: CLU/Getty Images

2.1.1.2 An Industrial City

The city transformed itself - expanded the harbor, broadened the river, literally raised itself out of the mud and built a sewerage system. Chicago's public works provided jobs for the continuing stream of immigrant laborers coming to the city. More people meant more construction, provisions, services etc., which in turn lead to more jobs and even more people.

As mentioned in 2.1.1.1 Chicago was bustling with ships, carriages and trains (both freight and passenger), and was defined as the country's leading railroad center. It had become the city of trade, commerce and manufacturing. Manufacturing and technologies evolved creating larger markets and a faster fabrication of products. Iron, steel, furniture, clothes and tobacco were only a few of the manufactured goods in Chicago.

In 1890, as the Union Stockyards opened, making Chicago one of the leading slaughtering and meat packing cities of America, Chicago's employment numbers significantly increased once again. Over 30,000 Chicagoans were employed in the clothing industry, 18,000 in the furniture industry and over 25,000 in the printing and publishing industry. Chicago was considered as America's central haven for large scale industry, but in fact, it was more than that. Even small scaled manufacturing companies could be found everywhere in Chicago, even outnumbering the large-scale manufacturing companies. These smaller companies were mostly found in the West and North sides of the city.

Due to the fact that the heaviest industrial companies were located near the canal, these companies started using it as a ditch for their industrial waste. This lead to a consequential increase of pollution in the canal which after a while wasn't tolerated by the city.

In 1889, the Sanitary District of Chicago (now the Metropolitan Water Reclamation District of Greater Chicago) came up with a solution to this problem: permanently reversing the direction of the river by digging an entirely new and bigger canal. This was one of the largest infrastructural interventions ever done and is celebrated to this day.

2.1.1.3 An Economic Downfall

The city's growth and prosperity did experience a major downfall in October 1929 during the Great Depression as the stock market crashed ensuring that the demand for Chicago-made goods took a plunge. The Great Depression was particularly severe in Chicago because of the city's reliance on manufacturing. Merely fifty percent of Chicagoans who had been working in manufacturing before the downfall in 1927, were still employed in the sector in 1933. African Americans and Mexicans were especially affected by this change. An estimation shows that by 1932 forty to fifty percent of Black people in Chicago were unemployed[3].

During the 1970's until the late 1980's Chicago underwent a restructuring which resulted in an employment drop, mainly in manufacturing jobs. It is stated that approximately a quarter of a million jobs in manufacturing were lost during this time as the transition of a dominant manufacturing employment decreased and a dominant service employment emerged. Service job employment doubled its numbers while manufacturing encountered a general decline in the whole country. High-wage jobs were being replaced by low-wage jobs resulting in a five-billion-dollar loss corresponding income. However, the remainder of the employed in manufacturing did not lose productivity. In fact, as technology evolved, production levels rose and so did their wages, even with less employees[4].

Nevertheless, the city survived the depression, the post-war boom and the restructuring from the 1970's until the late 1980's , and this with a great deal of its pride and prosperity still intact. Even though the city will never undergo the same economic drive and status as during the period between the 1930's and the 1950's, and although the city faces countless other economic challenges such as poverty, inequality and decline in infrastructure, the city remains to be seen as the city "that works" and face its challenges head on.

3 ENCYCLOPEDIA OF CHICAGO. THE GREAT DEPRESSION IN OCTOBER 1929

4 RESEARCH PAPER: CHICAGO'S ECONOMY: TWENTY YEARS OF STRUCTURAL CHANGE. ISRAILEVICH PHILIP & MAHIDHARA RAMAMOHAN.

2.1.2 From Historic Lines to Contemporary Trails

2.1.2.1 Indian Trails and Borders

Chicago's historical Indian trails date back as far as 1804. These indigenous routes emerged from the land's natural high grounds making it possible to avoid the swampy surrounding pieces of land. The Native American tribes used these higher laying strokes as trading routes which led to important meeting points for many of the tribes.

The Native people passed down their knowledge of the land's features from one tribe to another and eventually to the incoming European settlers, who arrived during the 17th and 18th century. As the foreign settlers swiftly came to understand how important these trails were and how they were connected, they started exploring the idea of how the trails could be adapted for military and commercial purposes. When foreign settlers started their first adaptations, using these trails as a means of transportation, they slowly started to take over the land and transformed the prairie landscape into a township.

One of the most important transformations can be linked to the disappearance of one main indigenous route and the emergence of one of the most influential roads of the current city namely, Clark Street. This street runs North to South though the Loop, and has always been a key line of transportation through Chicago. It is also portrayed as a mark in history due to the fact that its prior name was the Indian Boundary Line Road. This title referenced the Treaty of St. Louis in 1816 which pushed the indigenous people further out of Chicago. Merely 17 years later, as Chicago was formally incorporated as a town, the 1833 Treaty of Chicago was introduced, revoking all indigenous claims to the area, continuing this exclusion of the Native American people[6].

According to John Low[7] , it is thanks to the Native American people that the European settlers could even begin to understand the importance of any trails in the area, which eventually led to adaptations and developments making it the modern road infrastructure it is today.

5 SUSAN SLEEPER-SMITH. PROFESSOR OF HISTORY AT MICHIGAN STATE UNIVERSITY.

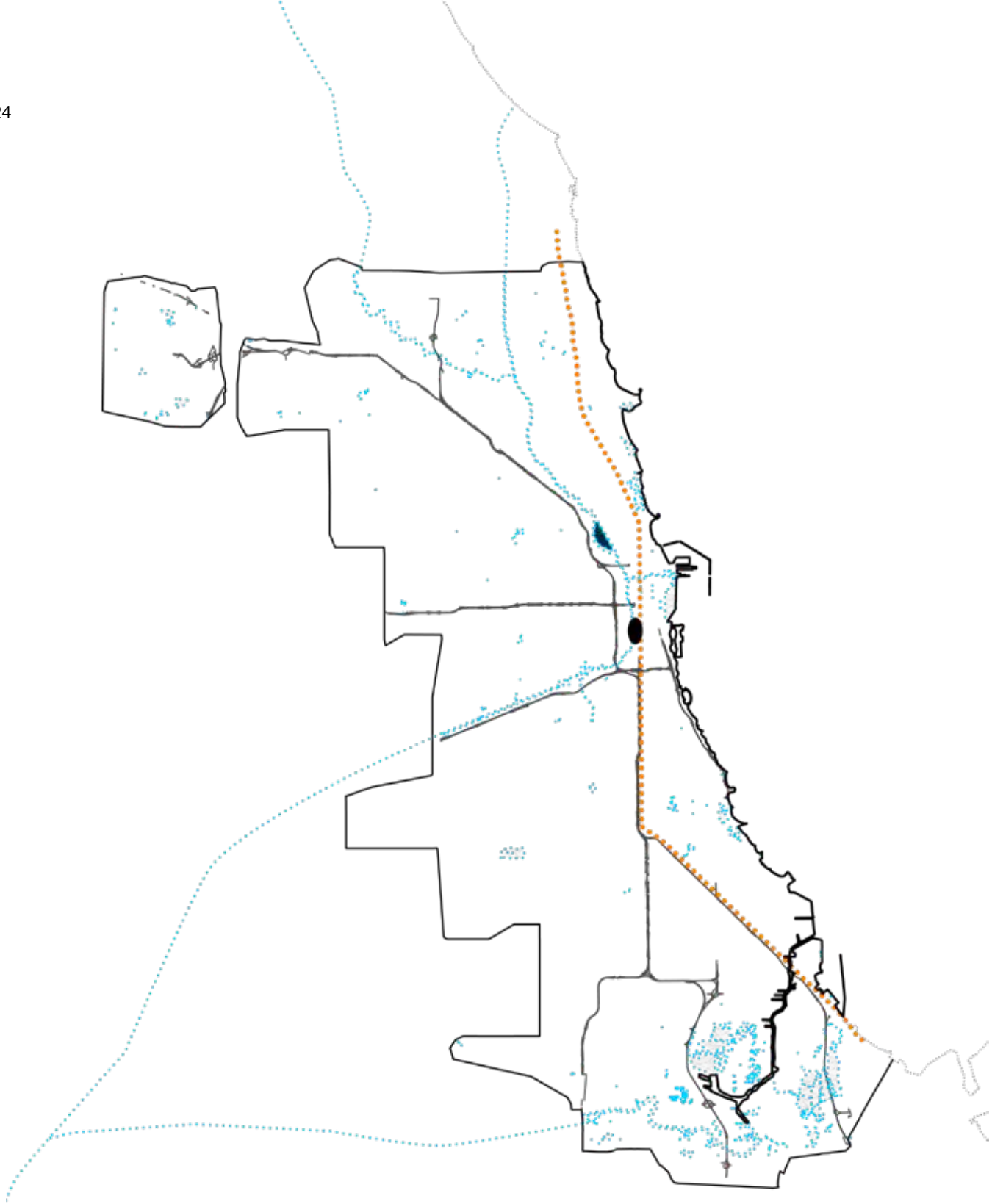
6 HOWARD TANNER. NATIVE AMERICAN ROUTES: THE ANCIENT TRAILS HIDDEN IN CHICAGO'S GRID SYSTEM. (THE GUARDIAN. 2019)

7 JOHN LOW: A PROFESSOR AT THE OHIO STATE UNIVERSITY - NEWARK - THE INDIGENOUS SCHOLAR AND POTAWATOMI TRIBE MEMBER.

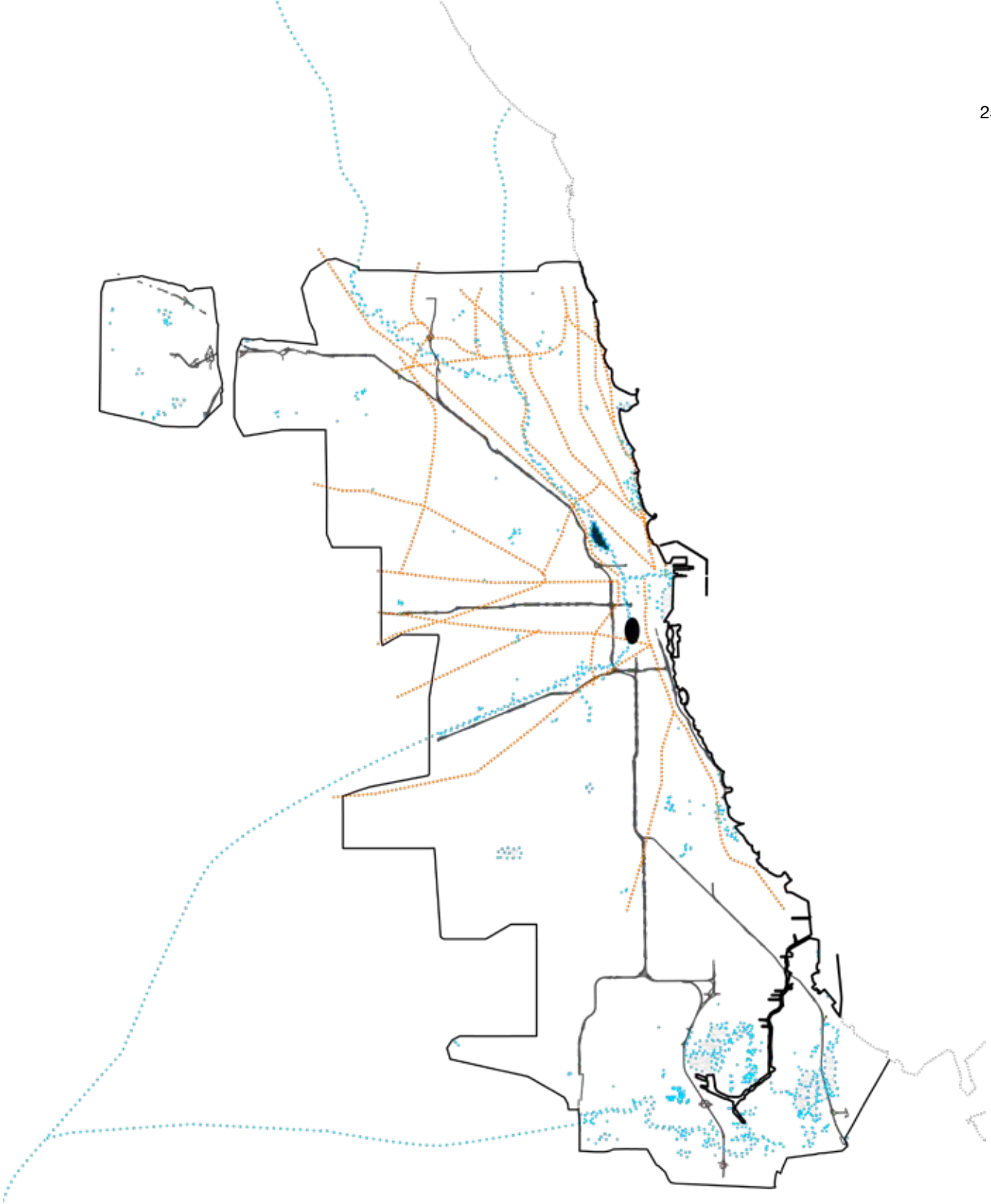
"The Indians marked the way, we just followed."

- Susan Sleeper-Smith[5]

PHOTOGRAPGH OF ORIGINAL CLARK STREET. JOHN CHUCKMAN



MAPPING OF THE HISTORICAL INDIAN BOUNDARY LINE. HANNAH VANNUT



MAPPING OF THE HISTORICAL INDIAN TRAILS MARKED BACK TO 1804. HANNAH VANNUT

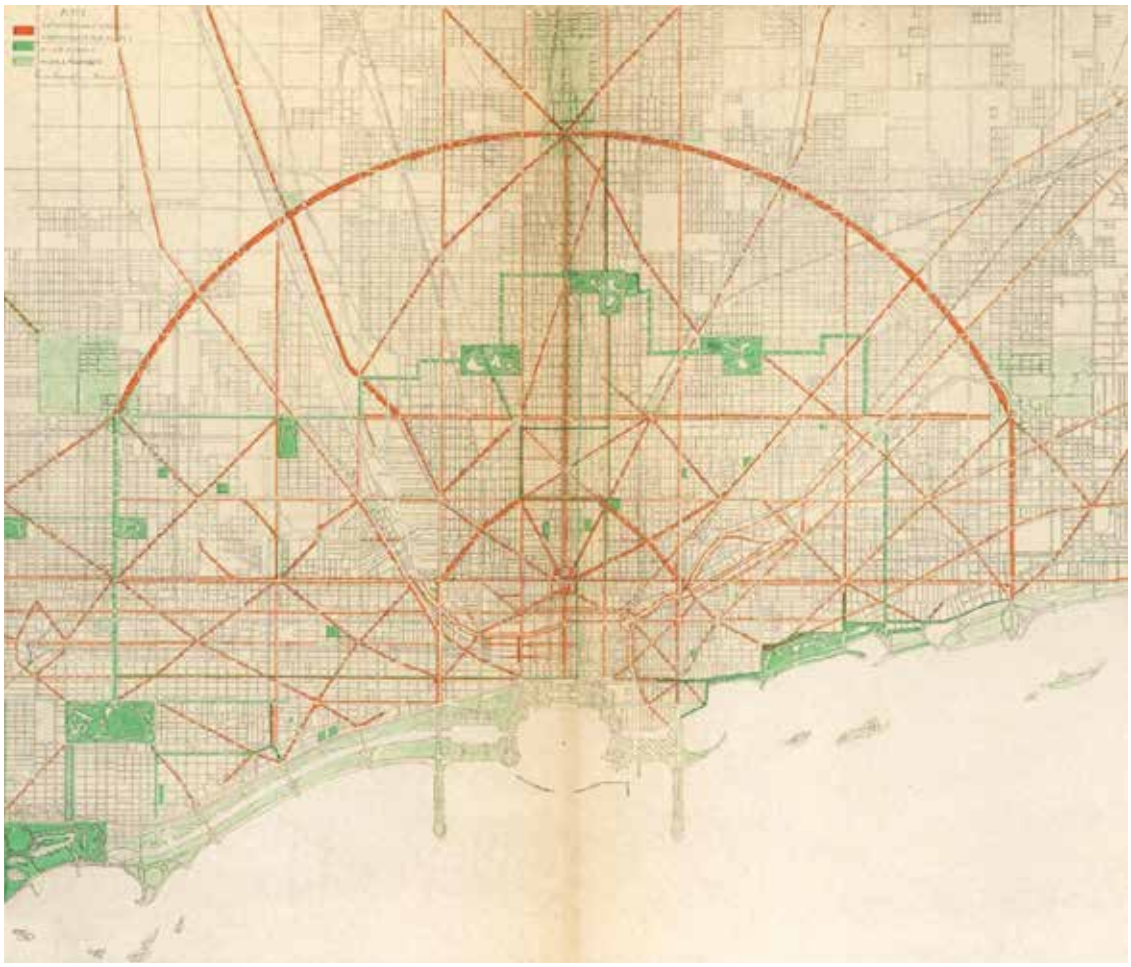
2.1.2.2 1909: The Burnham Plan

In 1909 Daniel Burnham created the *Plan of Chicago*, a proposal that sought out to beautify the city - much like Paris' Haussmann plan and sometimes even referred to as 'Paris on the Prairie'. The city thought it be best to look into different scenarios for the rapidly growing city. Many different proposals were handed in and considered but only Burnham's plan continues to be a reference in urban design today.

For nearly three years, Burnham and his co-author Edward H. Bennett looked into multiple other large cities around the world, studied how they grew, how their infrastructure was organized and how it influenced the economy of the city. As a result of this research they created six categories in which the *Plan of Chicago* would be able to focus on the economic, transportation and social needs of the city.

The *Plan for Chicago* recommended broadening streets, laying down more parks, new railroads, harbor facilities and civic buildings. Even though the plan has been criticized for its focus on mainly physical improvements, the plan has been said to lay down the basis of the city's current organization in helping urban planners in designing and expanding parks, bridges and the city's highway network.

PORTRAIT OF DANIEL H. BURNHAM

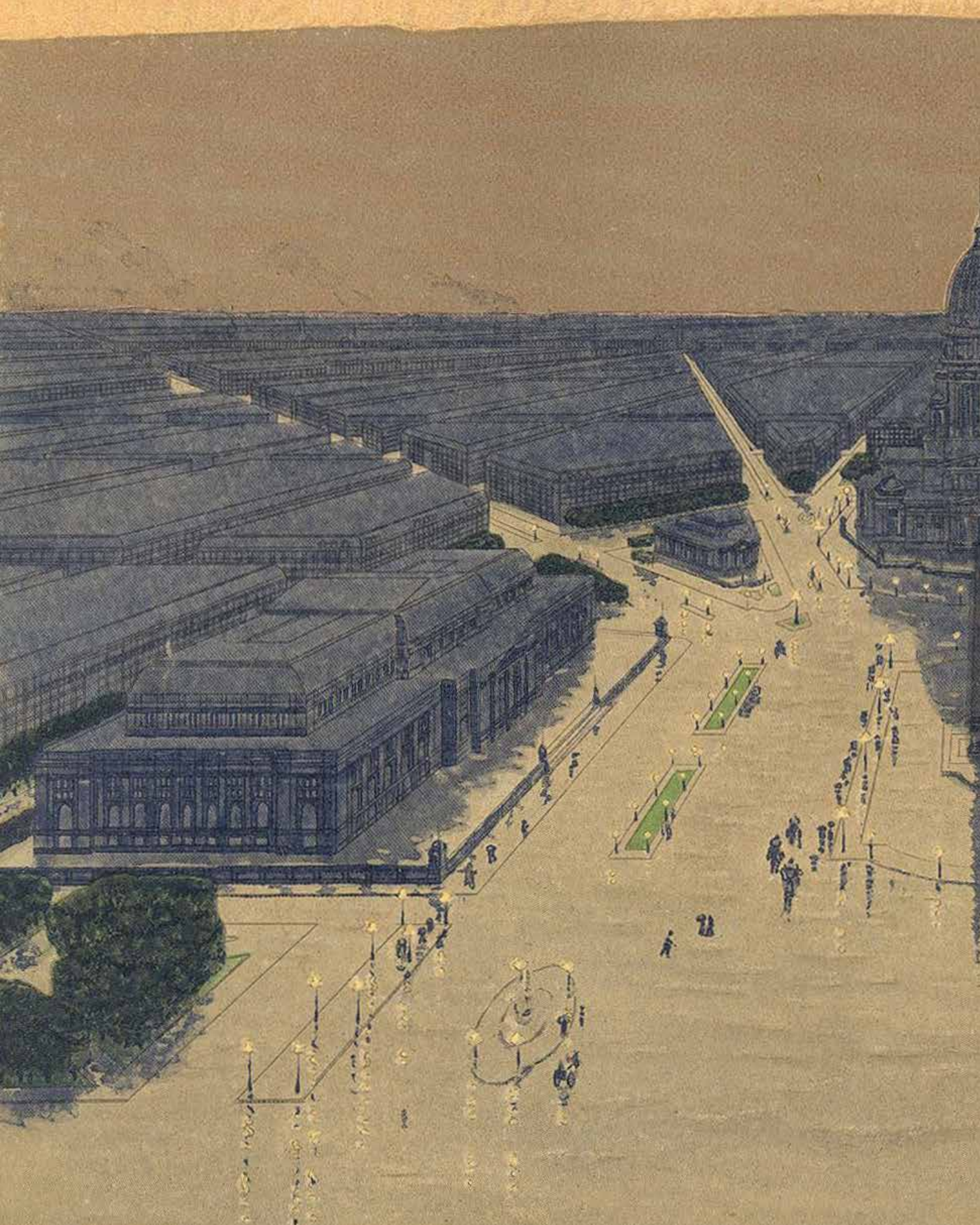


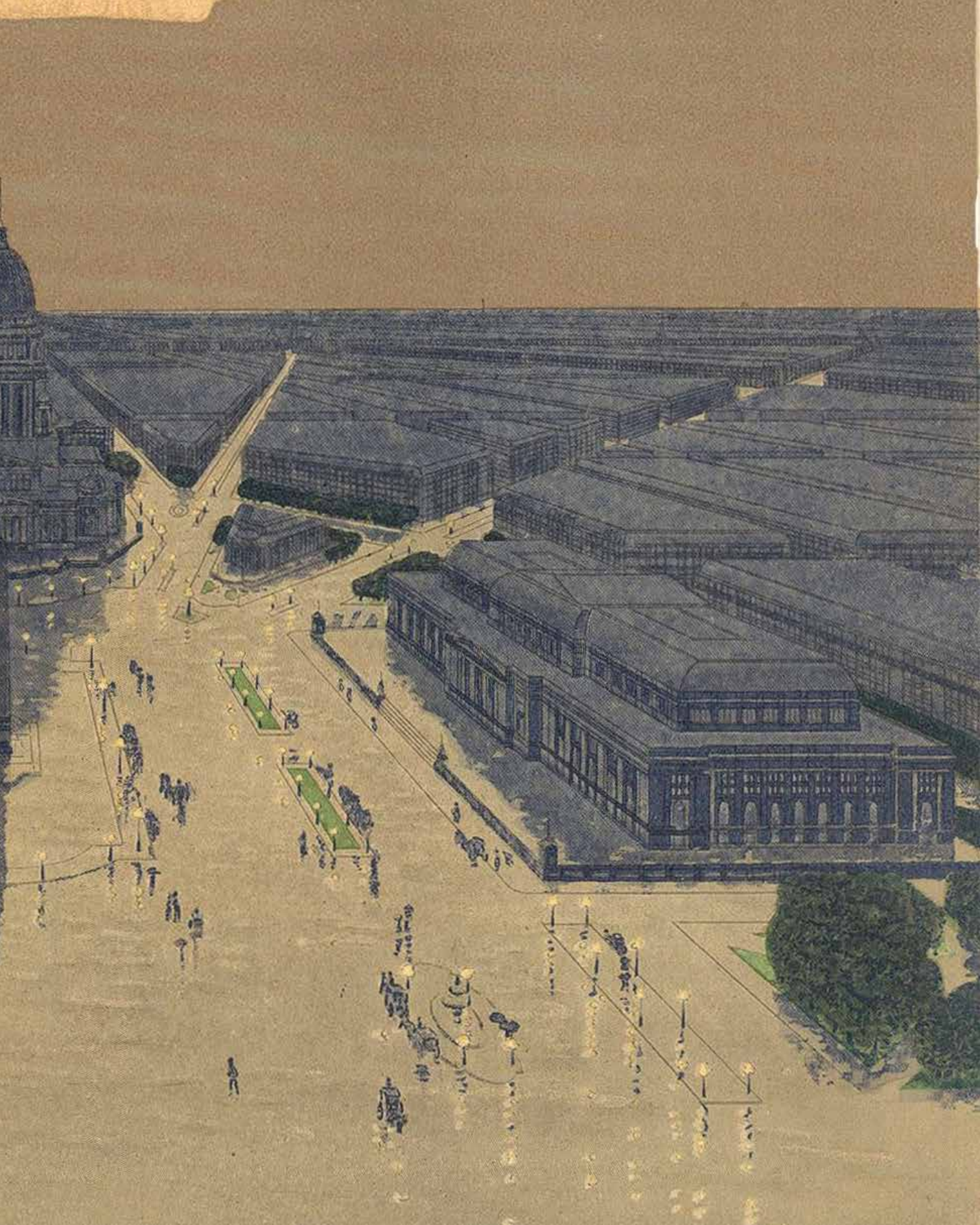
The six categories were the following[8]:

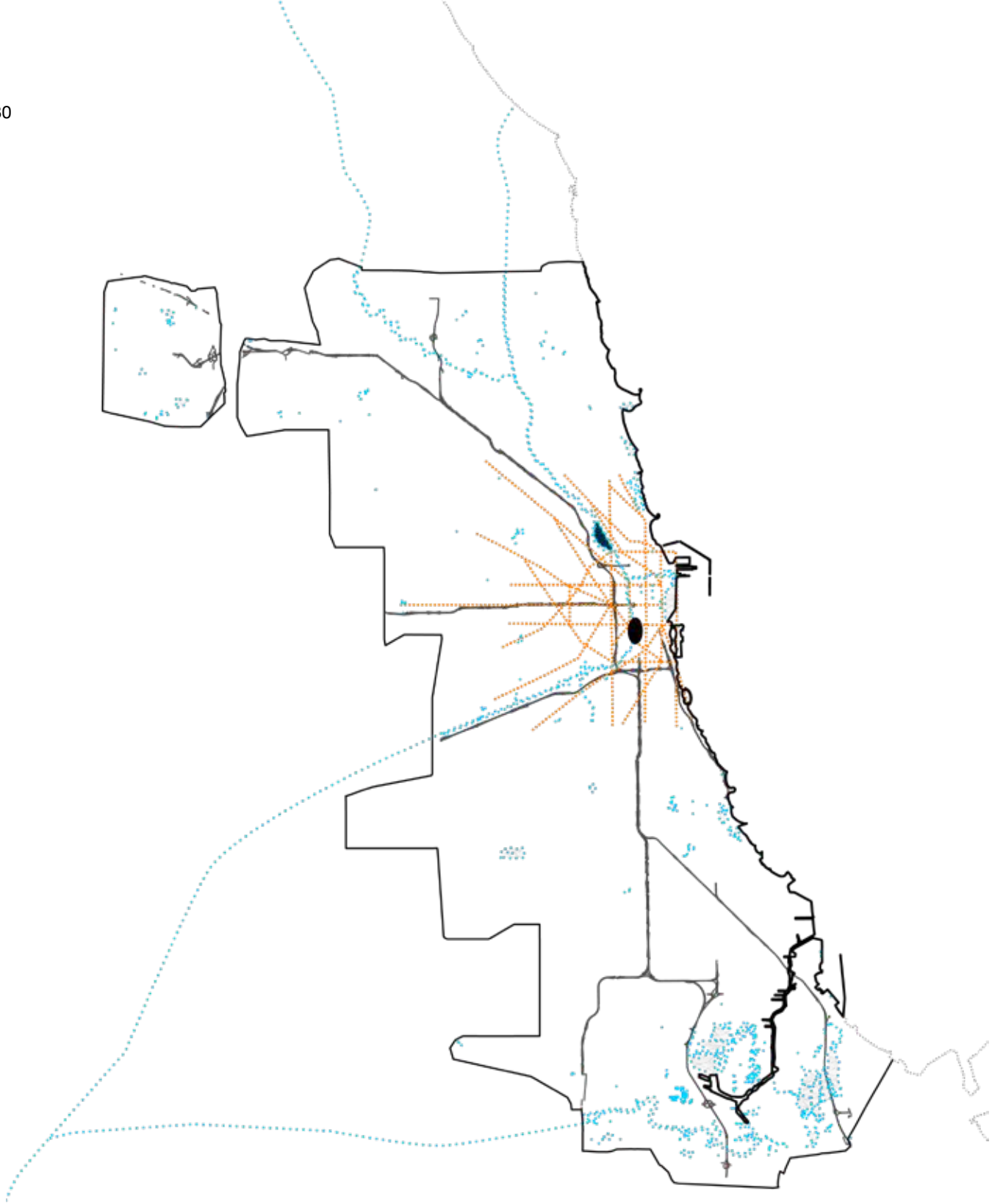
1. The improvement of the lake front.
2. The creation of a system of highways outside the city.
3. The improvement of railways terminals and the development of a complete reaction system for both freight and passengers.
4. The acquisition of an outer park system and of parkway circuits.
5. The systematic arrangement of the streets and avenues pithing the city, in order to facilitate the movement to and from the business district.
6. The development of centers of intellectual life and of civic administration, so related as to give coherence and unity to the city.

8 CHICAGO ARCHITECTURE CENTER (CAC) ARTICLE: 1909 PLAN OF CHICAGO

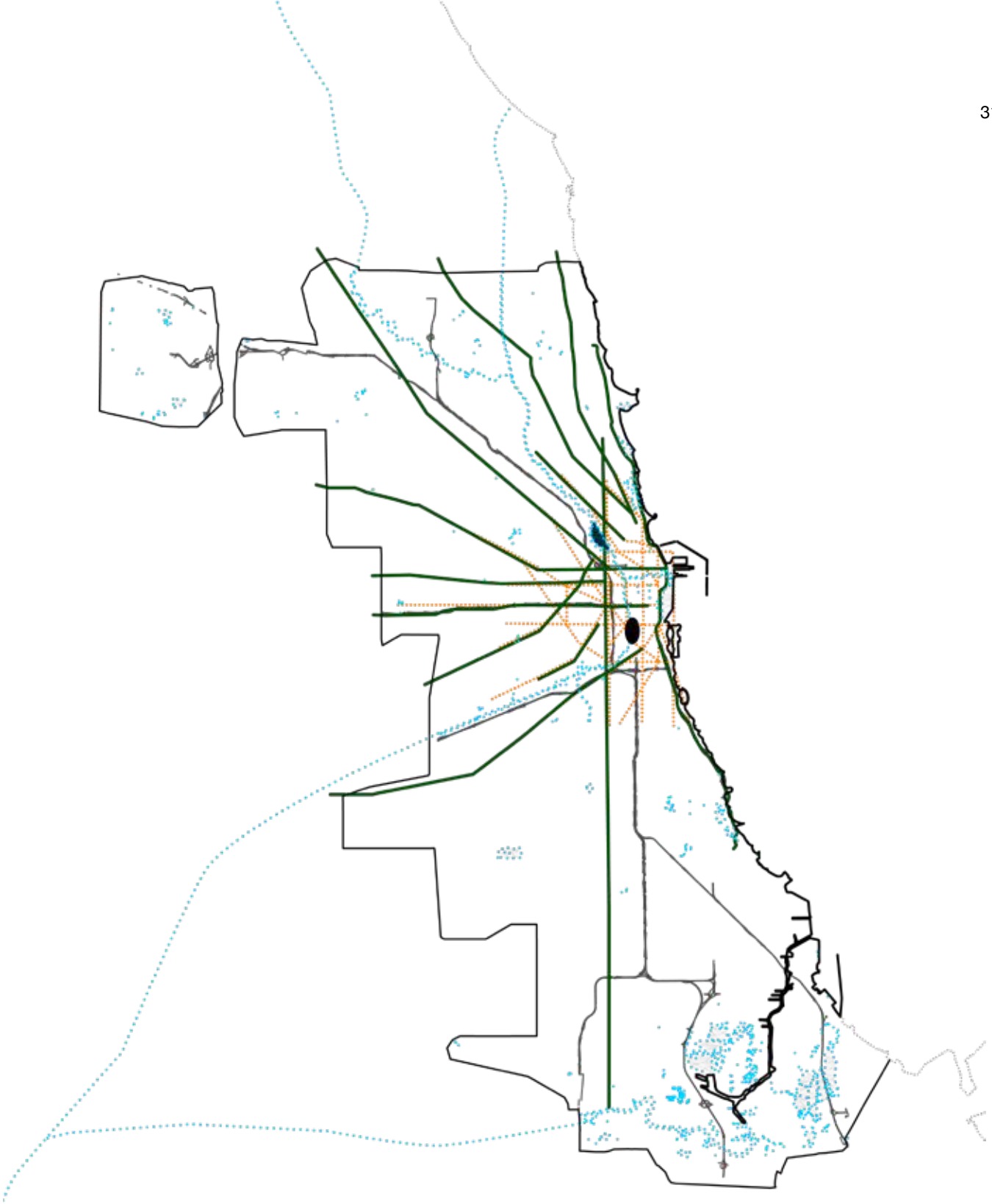
IMAGE NEXT PAGE:
PLAN OF CHICAGO BY DANIEL H. BURNHAM







MAPPING OF THE BURNHAM PLAN FOR CHICAGO. HANNAH VANNUT



MAPPING OF THE IMPLEMENTATION OF THE BURNHAM PLAN. HANNAH VANNUT

2.1.2.3 From Rails to Trails

As 2.1.1.2 mentions, Chicago has a broad network of railroads, some of which still in use but many of which have remained vacant since the mid-1990s when train usage slowed down and eventually stopped. Most of these tracks were left untouched and ceased to produce any interaction with its neighborhoods. Despite these desertions, the city soon apprehended the economic potential these rails have to influence retail purchases and development linked to its surrounding neighborhoods. As a result, organizations started to transform old rails into public trails.

Chicago has currently invested in a few rails-to-trails conversions around the city. Some of which positively influenced its surrounding neighborhoods and some which seemed to have failed, or have less of an impact. Today the city consists of seven trails, four of which are existing and three of which are planned for the near future. The very first implementation of a rails-to-trails conversion was the Prairie Path, built in 1963, running a West-East bike path/running trail through Illinois. Its annual revenue consisting of approximately 1,5 million dollars. The trick, Steve Butchel[9] says, is to not only think these trails serve potential joggers or cyclists but also serve the everyday-credit-card-user. For example - the south suburban town of Frankfort reconstructed its mall as to let all entrances face the Old Plank Trail adjacent to it and later saw a positive economic flux.

Nevertheless, location is key for a trail conversion to work in an economic manner. Take the Major Taylor Trail, in the South of Chicago and the 606 trail in the North of Chicago. The Major Taylor Trail connects a low-income/medium-income community to another low-income/medium-income community. This trail isn't considered as anything more than merely a normal bike path running through the South Side neighborhoods.

IMAGE: THE MAJOR TAYLOR TRAIL (SOUTH CH

ICAGO)

On the other side we have the 606, or the Bloomingdale Trail, which is considered a 'linear park' with lush greenery and public art. Occasionally it is even called the Chicago version of the New York High Line.

The 606, connects to the city in a different way than the Major Taylor Trail. The 606 was looked into, planned and thoroughly designed, whereas the Major Taylor Trail appears to have spent less time investigating. This links back to the location of the trails. The southern line, the Major Taylor Trail, is located in a low density, low income community and radiates an isolated feeling from its district. This is due to the row of trees running alongside it which visually disconnects the trail from its local residents. The 606 is the exact opposite, clearly present and highly visible due to its elevated structure.

If successful, the rails-to-trails developments can lead to the gentrification of the surrounding neighborhoods, which leads to higher housing demands, higher property values and overall attraction of the neighborhoods. Nevertheless, the overall gentrification and upgrading of rural and suburban areas is also perceived as a negative result for some of the area's lower-income residents. They fear it will induce a strain on their financial situation. For most people, having property values go up 20-30% in five years is a good thing, but it also means these people have to pay taxes on the increased value which for seniors and other people with fixed incomes could result in a challenge.

Jamie Simone[10], interim director of the Trust for Public Land, ran the 606 construction and thinks every neighborhood should have safe parks and trails. *"If all neighborhoods and all communities had equal access to parks, then there wouldn't be this difference in quality of neighborhoods, at least as far as parks go,"* she says.

9 STEVE BUTCHEL: EXECUTIVE DIRECTOR OF TRAILS FOR ILLINOIS, A NON-PROFIT ADVOCACY ORGANIZATION.

10 JAIMIE SIMONE - INTERIM DIRECTOR OF THE CHICAGO REGION OFFICE AT THE TRUST FOR PUBLIC LAND. - A NON-PROFIT ORGANIZATION WITH HQ IN SAN FRANCISCO WITH 30 OFFICES NATIONWIDE.

IMAGE: THE 606 TRAIL. MOLLY PAGE

IMAGE: THE 606 TRAIL. MOLLY PAGE

CONCLUSIONS

1. *A rails-to-trails project should be a visual connection to its surrounding neighborhoods.*

2. *A trail should connect to nearby vibrant and/or business districts.*

3. *The trail user is taken into account.*

4. *Trails are more than just cycling roads or jogging paths but have an economic potential - more specifically in retail purchases and retail influence.*

5. *A rails-to-trails project can have an impact on the gentrification of neighborhoods, property value, taxes and the overall vibe in a community.*

6. *The trails have the potential to connect different Neighborhoods and communities with each other - connecting diverse ethnic groups and people of different statutes.*

2.1.3 An Organized City

Chicago is organized in three ways to accomplish different goals.

The first, Chicago *wards*. These are political districts that change every decade along with the census and are often manipulated to suit certain interests of groups.

The second are the *communities* of the city. In total the city has 77 communities all of which have defined boundaries which were decided on in the 1920's by the Chicago Department of Public Health and the University of Chicago's local Research Committee. The goal of a community is to group people according to shared characteristics.

The last subdivision are the *neighborhoods*. Chicago has more than 200 neighborhoods whose goals are to break the city down to a human scale. These boundaries frequently change due to real estate development and shifting demographics.

11 A QUOTE FROM SAM KLING'S PHD DISSERTATION, INVOLVING THE INFRASTRUCTURAL TRANSFORMATION OF CHICAGO, GIVING US INSIGHT OF WHAT THE GRID STOOD FOR AND WHAT IT BECAME.

2.1.3.1 The Chicago Grid

The usage of a grid is very common in the Midwest and Chicago is no exception. The city had three advantages to creating its organization: Firstly, after the Great Chicago Fire, the city was given a clean slate to start from scratch.

Secondly, the city's geographical restrictions are almost nothing, considering there aren't any mountains or other features in the way which can interrupt the grid.

Lastly, the Plan of Chicago by Daniel Burnham was a vision for the city which gave them a starting point.

Originally, the grid was used as a method to handle financial considerations. Chicago's first plat was made by James Thompson, a surveyor from Kaskaskia. He drew out the town with straight streets, all twenty meters wide and with alleys five meters wide. This became the basis of the city's organization and was used as a tool to extend the pattern to new sections of the land as the city grew.

Even though the Plan of Chicago devotes a whole chapter to "Streets within a City", proposing numerous ways of moving traffic, new diagonals and a green beltway of boulevards connecting with parks that surrounded the Loop, many weren't implemented in today's current road infrastructure. The diagonal streets that are present in the city are older than the Plan of Chicago makes out. They are actually old Indian Trails mapped by the Native Americans. The Burnham Plan had always envisioned the city but would never have been implemented without the legwork of generations of Native Americans seeing as the current road system is based on trails created by the Indigenous folk (see 2.1.2.1 Indian Trails and Borders).

In conclusion, the origin of Chicago's contemporary road system can be linked back to the lines of transportation the Native American people used to get to meeting points or other tribes.

"The grid was drawn on a map before it was actually built, and it was the blueprint for Chicago's growth, even before the city reached anywhere near the extent to which the grid was supposed to extend."

- Sam Kling[11]

2.1.4 Declination in Neighborhoods

The city of Chicago can be seen as a ‘dual city’, a city of inequitable communities. In the North, neighborhoods are statistically richer, safer and more diverse than communities in the South.

“The stigmatization heaped on poor neighborhoods and the grinding poverty of its residents are corrosive, leading to … ‘moral cynicism’ and alienation from key institutions, setting up a cycle of decline. Those with the means move out, leading to further cynicism and an intensified ‘poverty trap’ in the neighborhoods left behind.”

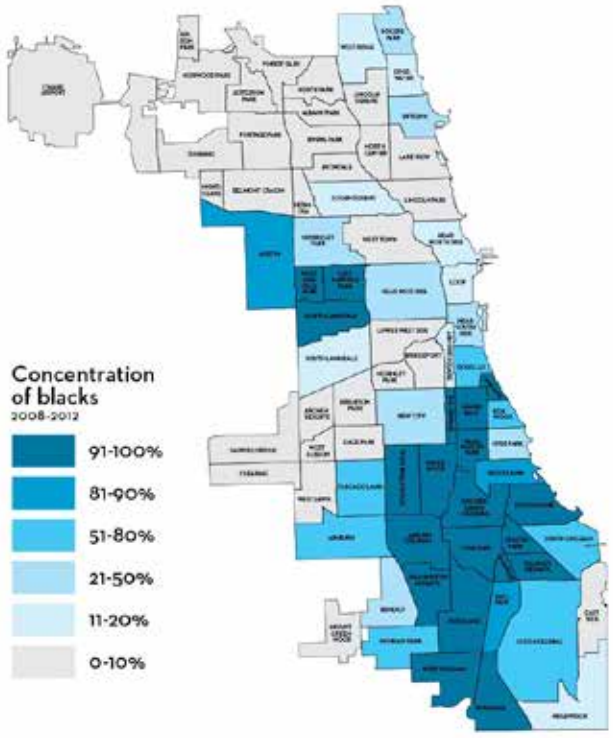
- Robert Sampson[12]

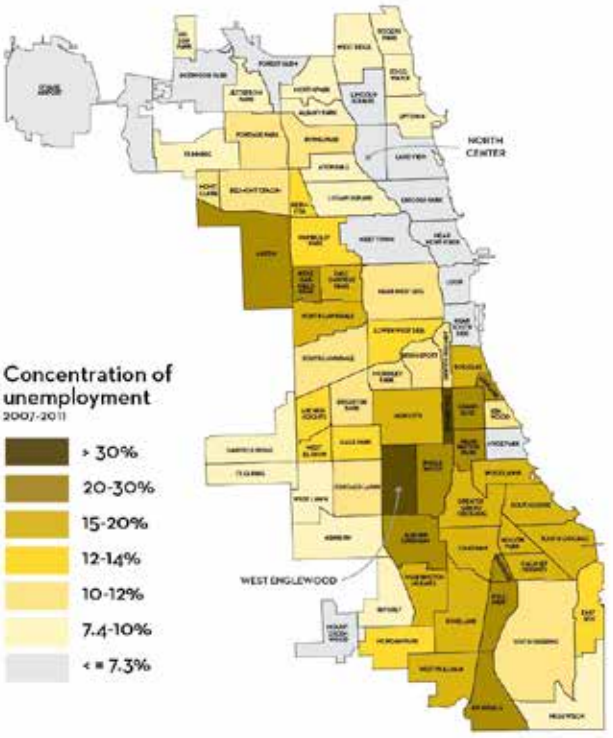
12 ROBERT J. SAMPSON. PROFESSOR OF THE SOCIAL SCIENCES AT HARVARD UNIVERSITY AND FOUNDING DIRECTOR OF THE BOSTON AREA RESEARCH INITIATIVE.

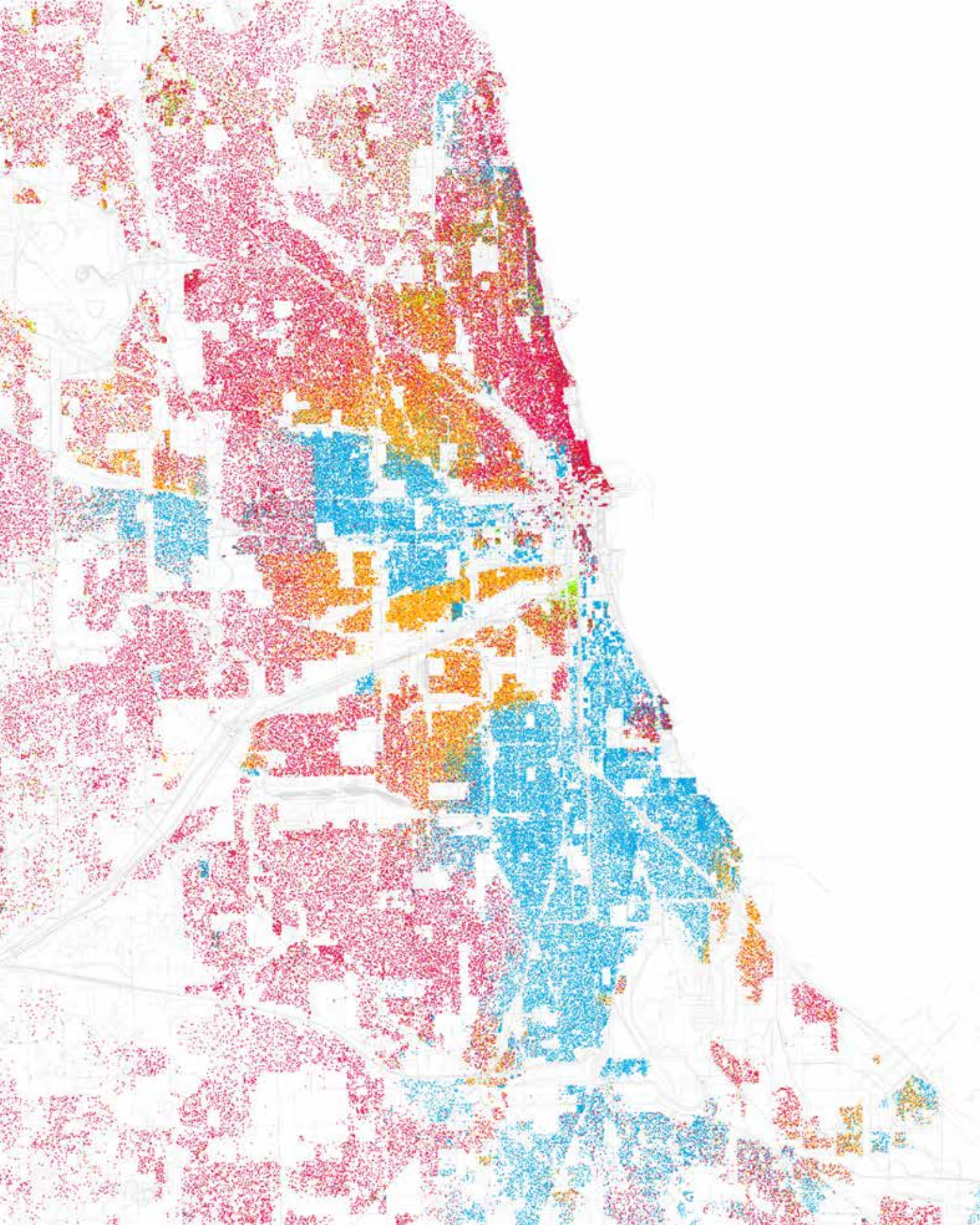
IMAGE SOURCE: SOCIAL IMPACT RESEARCH CENTER

A city divided by race and by opportunity

In West Englewood, the unemployment rate is nearly eight times what it is in North Center.







2.1.5 Chicagoan Class Divide

As one of America's largest cities, Chicago has shown growth in the globalized world - at least on a superficial level. Imposing skyscrapers serving as condos and offices popping up along the riverfront to suit large international companies that have relocated their headquarters to Downtown Chicago.

In May, in 2018, the unemployment rate for the Chicago metropolitan sank to 4.1 percent, being the lowest since the start of the tracking by the government in 1976. This means approximately one quarter of the households in the city earned more than $100,000 in one year in 2016. There is a reason why Chicago was named one of the four "Cities of Opportunity".

Yet these opportunities and income rates don't apply or reach all communities of the city. An example: the inhabitants of Englewood, in the South of the city will not have the same opportunities as a neighborhood like Streeterville, in the North. The cause to why can be narrowed down to two reasons: The first being segregation and the second, the disappearance of industrial jobs in factories, steel plants and logistics companies.

Segregation has made it difficult for black families to gain access to economic activity in certain parts of Chicago. This leads to these families living in neighborhoods where education and job opportunities are limited. According to Andrew Diamond[13] , this problem has only intensified over the years. He states the acceleration of segregation is caused by the city leaders, who over the years have been channeling money downtown and away from poor neighborhoods.

People stuck in segregated neighborhoods, with limited education and job opportunities need a way to get out.

IMAGE: MAPPING OF CHICAGO'S ETHNIC RACES

As for the second reason, the disappearance of industrial jobs in factories, steel plants and logistics companies, dating back almost half a century when people without or with little education could still find themselves a good job in large industrial companies in the South or West of Chicago. Up until today the majority of these factories had relocated to the suburbs or oversees, seeing to fewer employment opportunities for inhabitants without or with little education.

The disappearance of industrial jobs and the businesses that supported them jump-started a downward spiral in many areas of Chicago. Unemployment rates began to rise having an influence in neighborhoods as more and more people became unemployed and started luring around their homes and in the streets. Neighborhoods began to feel unsafe, even unstable.

“There’s a qualitative shift in the neighborhood, and it becomes a cycle, where people begin to feel like it’s dangerous, like they want to move out.”

- Chad Broughton[14]

Those who have the means to leave do and those who don’t stay, creating an even larger divide among neighborhoods. This gradually re-forms the neighborhoods as kids who used to grow up alongside a mix of middle-class and low-income families suddenly only grow up in a low-income zone, where many adults aren’t working or struggle with their finances. There are less role models to look up to and the network to people and opportunities to help them make a difference for their future slowly fades. This then evolves into violence and higher crime rates in these specific neighborhoods,

in turn painting a negative picture for investors and businesses, pushing them away from possibilities of developing new businesses in those areas.

Wilson documents that seventy percent of black mean nation-wide worked full-time in the 1970's but by the 1980's this number went down to fifty percent. Today, around forty percent of black 20-to-24-year-olds in Chicago are unemployed and out of school, compared to seven percent white 20-to-24-year-olds in Chicago.

Neighborhoods that struggled thirty years ago, still struggle today. People have something called a "mental map"[15] of the city where they form a certain view of a specific place in the city in their mind. Chicago's residents know where they would like to live and where they don't, no matter how affordable the rent is or how good the amenities are.

Unemployment rates for black people in the metropolitan area of Chicago was 16.2 percent compared to the 4.7 percent of unemployed whites [16]. Chicago is the most segregated city in America, this happens when groups are separated by race and income for decades.

Today, 700,000 jobs are located within a 30-minute train or bus ride from the Loop and North Side while only 50,000 jobs are located within a 30-minute commute on public transit from the South Side. This shows the investment in places where there are a lot of job opportunities is where the city is booming and where it's not. It is almost a 45-minute commute from some neighborhoods in the South of the city to Downtown Chicago. If this is a job that starts at 3 A.M. in the morning, it makes it extremely difficult for the employee to reach

13 ANDREW J. DIAMOND. AUTHOR OF CHICAGO ON THE MAKE: POWER AND INEQUALITY IN A MODERN CITY. (PUBLISHED 2017).

14 CHAD BROUGHTON. SOCIOLOGIST AT THE UNIVERSITY OF CHICAGO.

his/her work when not in possession of a vehicle. People in this situation have to take a job opportunity this far away from because there aren't enough companies in their own neighborhood that are hiring. It also isn't an option to move to a higher-opportunity neighborhood because housing is much more expensive and these families don't have the means to afford such a place.

The goal isn't to try to upgrade every black Chicago residential area to a wealthier neighborhood, but to bring the opportunities to them. Have developers open new complexes where jobs are created and people are brought together. So far there are few examples of such developments, for example the new shopping complex in Englewood with multiple stores and shops can provide jobs for the local residents. Developers hope that these projects will set the example and create a ripple-effect to inspire others to do the same.

15 ROBERT J. SAMPSON. PROFESSOR OF THE SOCIAL SCIENCES AT HARVARD UNIVERSITY AND FOUNDING DIRECTOR OF THE BOSTON AREA RESEARCH INITIATIVE.

16 NUMBERS ACCORDING TO THE NATIONAL URBAN LEAGUE.

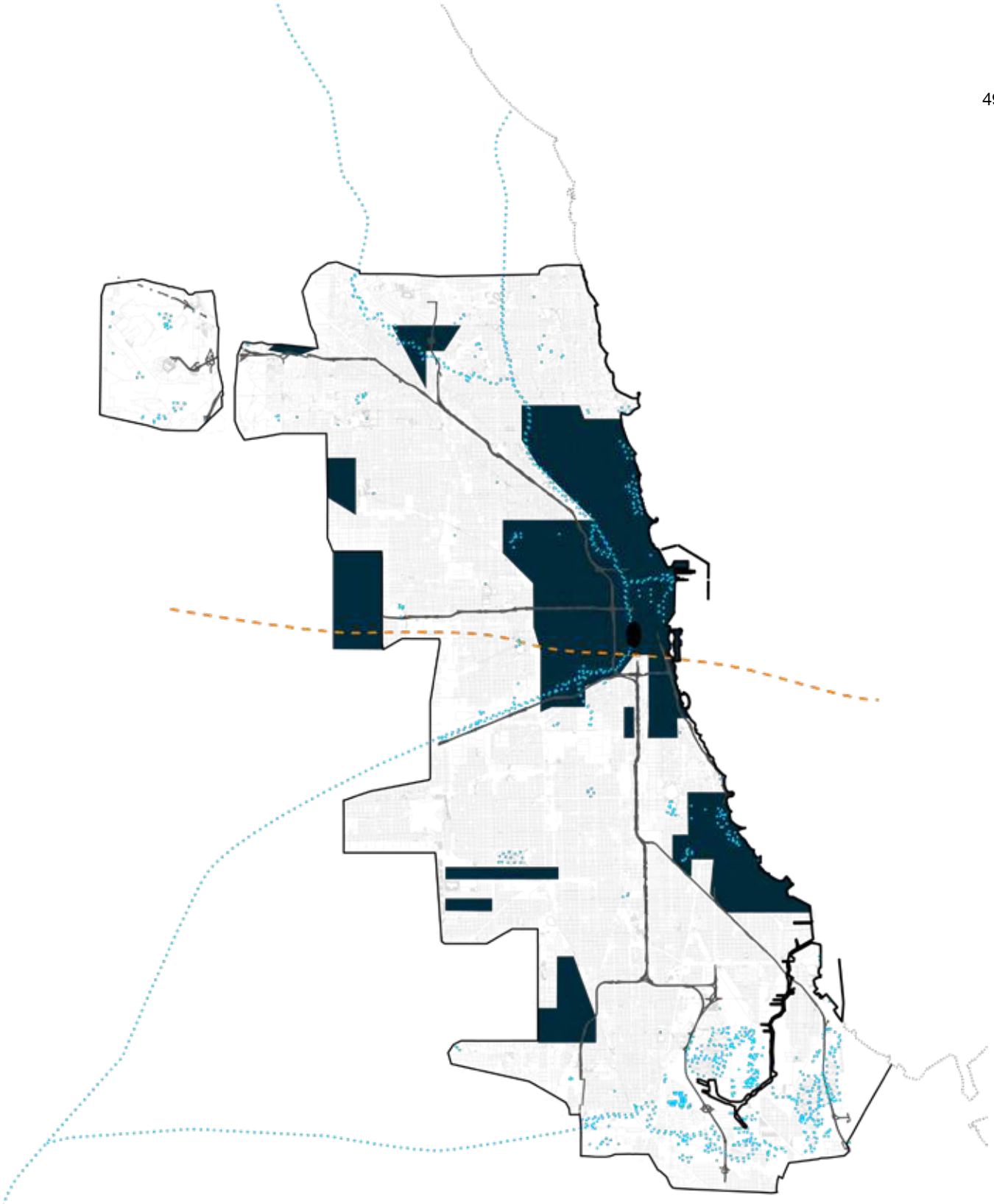
2.1.5.1 Creative Class

The introduction of this paper mentioned how Chicago's inhabitants are divided into classes, namely: the blue-collar working class, the service class and the working class[17].

The creative class includes people employed in law, business, science, technology, management, media, culture, arts, entertainment and healthcare facilities. This class represents approximately 35,1% of Chicago's metropolitan workforce, which is slightly above the nations average. These are usually well-paid professions with highly-educated and/or highly-skilled employees.

When mapped out, the creative class is primarily present in the center of the city, in the Loop, and makes its way North along the Milwaukee corridor and the Lincoln/Clark Corridor - inhabiting Lake View, Lincoln Park and Streeterville. Another large creative class cluster can be found further south of the Loop in Hyde Park - which has been defined as one of the upcoming neighborhoods of Chicago. Nevertheless, these three main clusters each have their own focus professions. For example, the Loop and Lincoln Park are more business-professional directed whilst Hyde Park concentrates on a more academic approach as it surrounds the University of Chicago.

17 RICHARD FLORIDA. CO-FOUNDER AND EDITOR OF CITY LAB. SENIOR EDITOR ARE THE ATLANTIC. UNIVERSITY PROFESSOR IN THE UNIVERSITY OF TORONTO'S SCHOOL OF CITIES AND ROTMAN SCHOOL OF MANAGEMENT.



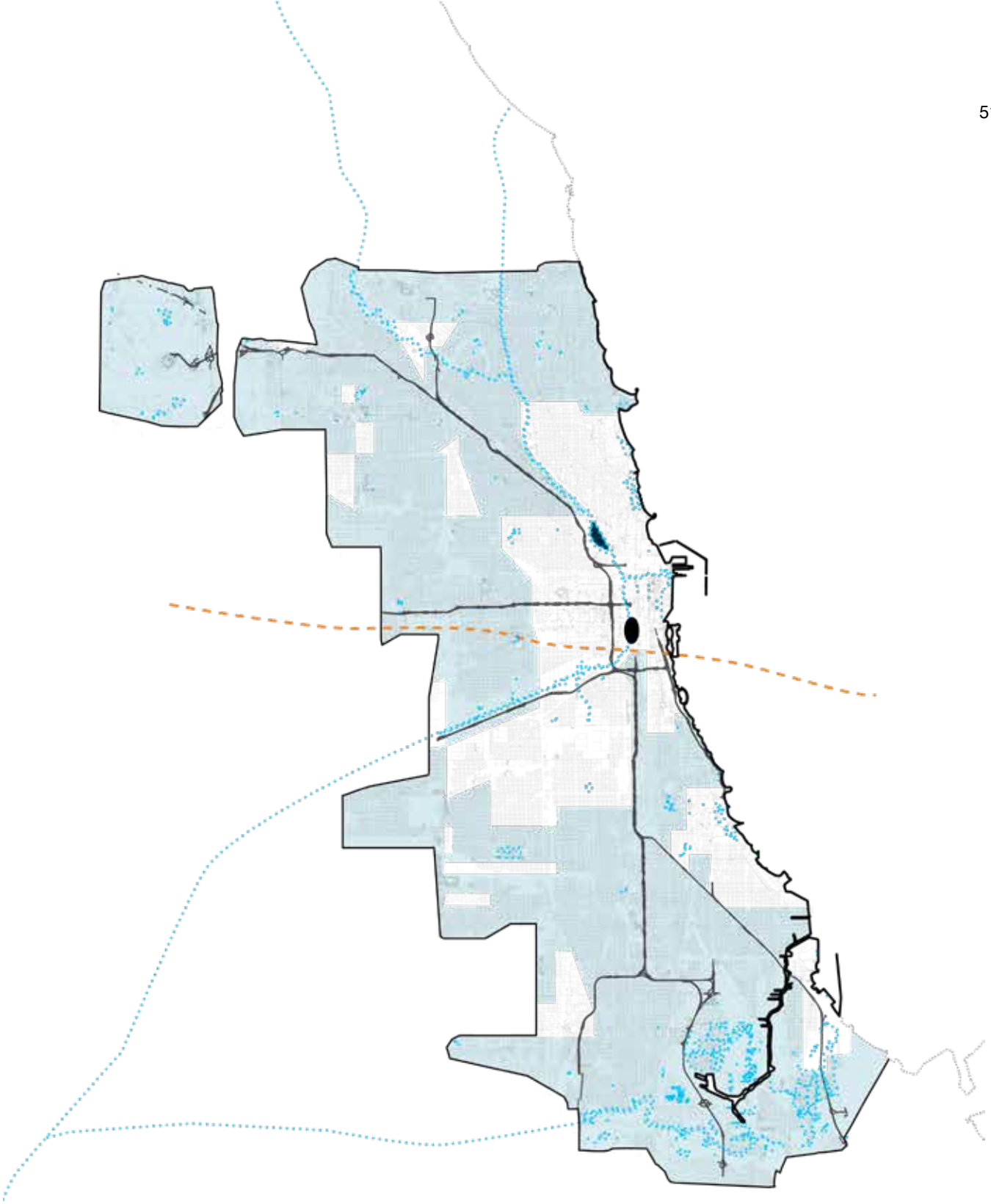
MAPPING OF THE CREATIVE CLASS. HANNAH VANNUT

2.1.5.2 Service Class

The service class consists of low-wage, low-skill workers who have service professions in food preparation, food service, retail sales and administrative and clerical positions.

This is the largest class of workers in Chicago, representing approximately 43,4% of the region's workers.

These jobs are usually found in the periphery of the creative class neighborhoods, more to the city's outer rim, such as Englewood, Austin, Riverdale, South Chicago and Washington Park.

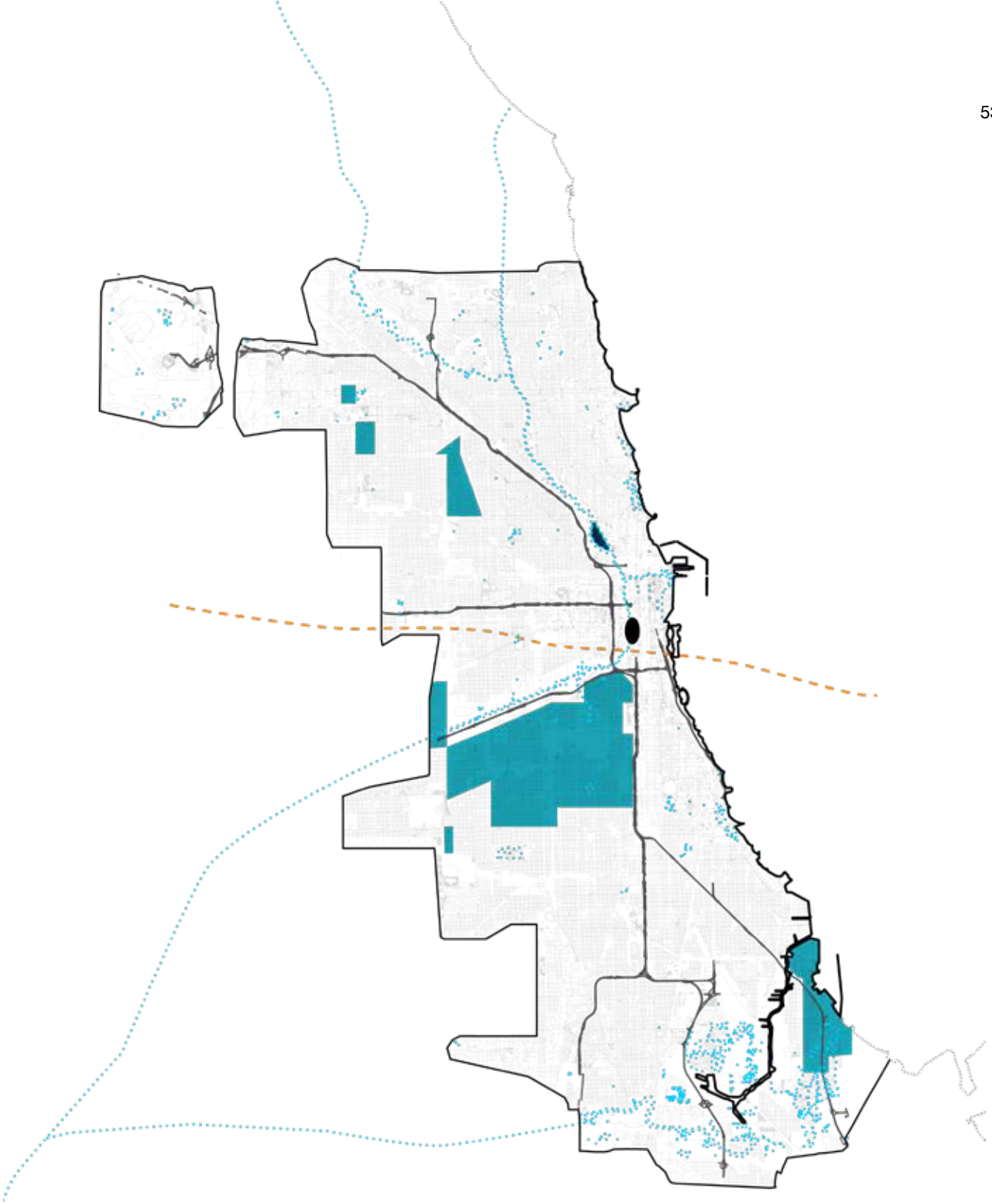


MAPPING OF THE SERVICE CLASS. HANNAH VANNUT

2.1.5.3 Working Class

As for the working class, only a few neighborhoods cease to exist. This class once defined and made the city of Chicago to what it is today. People working in this class are employed in factory jobs as well as transportation and construction jobs. This is the smallest working class of Chicago consisting only of 21,4% of the region's workers mostly in neighborhoods Little Village, Cicero and Joliet. Many of these remaining workers are immigrants with Latino roots.

South Deering, far south, remains a fort for the blue collar workers, even 30 years after the closing of the Wisconsin Steel factory as well as South Lawndale, despite the closings of the Big Western Electric and the International Harvester plants.

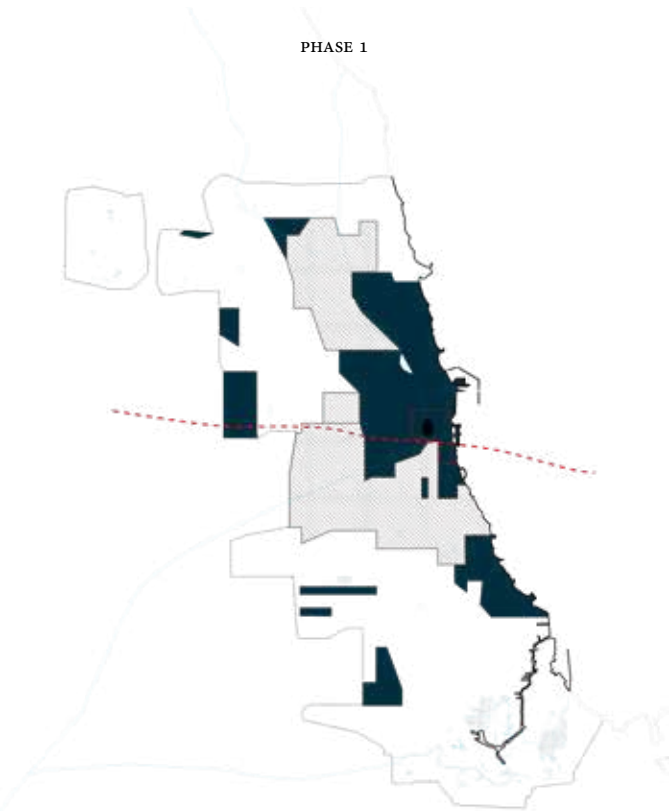


MAPPING OF THE WORKING CLASS. HANNAH VANNUT

2.1.5.4 The Reinterpretation - Redefining the classes

Manufacturing and industry has evolved over the years and is regaining momentum in the today's world. Manufacturing has become greener, cleaner, smaller, more complex and compact. It is about small-scale industry/ micro-industry and neo-cottage industry. Chicago's 'smoke chains' or the 'cloud above the city' has long disappeared from the city, but the industrial companies are returning in a different form. These small-scale manufacturers require technological skills more than ever but sadly a lot of positions are unfulfilled due to the lack of qualified workers.

The classes of Chicago will undergo a change in the near future as these facilities start to erupt and evolve in the city. The working class will encounter growth in its numbers and might be redefined as new job positions will emerge in the coming years.



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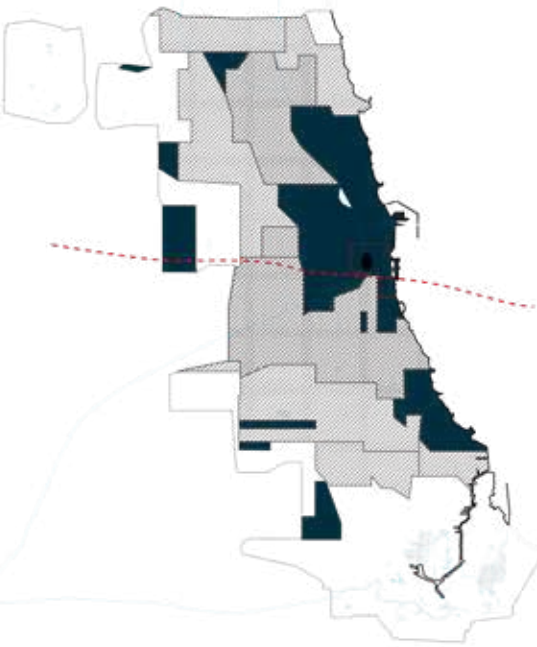

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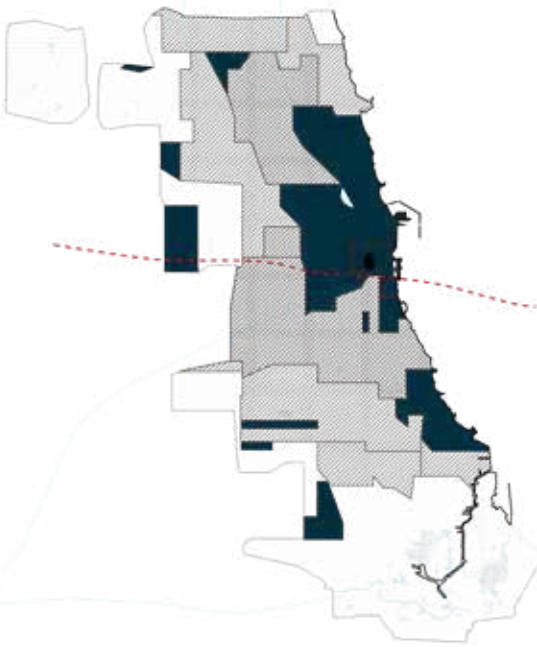

MAPPING OF THE EVOLUTION OF THE CHICAGO CLASESS. HANNAH VANNUT

2.2 INDUSTRIAL RELEVANCE

2.2.1 Chicago's Industrial History

As 2.1.1 of this dissertation explains how traditional manufacturing was critical for the growth of American cities such as Chicago, providing high-wage jobs in manufacturing until the city's downfall in 1980. The Great Depression ensured that many companies closed or moved away from the city making sure that the inner city lost fifty percent of its industrials firms, reducing industrial jobs from 40,000 to 20,000.

Today, the fact is that these industrial companies are looking to return to the city but find there is no space for them. This due to the fact that industrial land was immediately taken up by the tight housing market for residential use and commercial activity.

TRADITIONAL MANUFACTURING METALLIC LAKE ZURICH. ILLINOIS, CHICAGO

2.2.2 Modern Manufacturing

Since then industry and manufacturing has come a long way: improving on levels of innovation, automation and mechanical difference. Contemporary factories are safer, cleaner and technologically based with design based products. Even wages are having improved (paying better than a standard job in the city) but the offered jobs are limited and require a specific pre-training.

The space needed to produce a product has decreased, the technology has become more advanced and the production has become cleaner and greener. Automatization, more specifically robotics, has increased the average worker output. Technology has made huge jumps in the past years which, despite our fears, have led to more labor jobs for humans; more engineering jobs, an increase in demand for high trained workers to oversee the robotics and maintenance of the new equipment. Technology has also influenced manufacturing by increasing efficiency, sparking innovation and increasing production time. Even social media and internet have become important technological aspects for manufacturing. They are used as marketing tools to spark interest among the public and raise demand numbers for their products.

MODERN MANUFACTURING: THE USAGE OF ROBOTICS & CNC MACHINES

2.2.2.1 Chicago for Entrepreneurs

Small-scale manufacturing is taking a step in the world. It embraces all craftsmanship starting from small food operations to artisan studios for furniture or glass to beer brewing. More and more people around the world are interested in starting their own small operations. By providing spaces where this can happen in a community, a neighborhood, industry and manufacturing can be re-integrated into cities and re-introduced to the inhabitants. This “comeback” of industry in cities in combination with residential buildings is already a ‘hot topic' in Canada, San Francisco, New York and other American cities, along with Chicago.

Chicago has become one of the most important entrepreneurial centers[18], producing many facilities where ideas can be brought to life, further developed and even produced. These firms come in all shapes and sizes - one no less important than the other. You have small firms who want to scale in the future and those who don’t. Either is fine, but these are typically firms which work in small spaces: maker spaces with a low revenue and low unit production. They are usually craft-based, design oriented and have less entrepreneurial aspects to them than larger firms. The larger firms can grow to become global manufacturers with factories all over the globe.

All these firms combined, from small-scale to large-scale to global-scale, form the ecosystem of manufacturing in which all contribute to benefit their cities and in turn their cities benefit them.

In the early 20th century, cities started to separate residential, commercial and industrial functions from each other, convinced this was the most advantageous solution for a healthy living-working environment. This derived from the history of industry in the city. Looking back to the Industrial Revolution and how things operated then compared to contemporary factories, we see enormous progression. Indeed, living quarters were best located away from the factories who produced pollution for all its surroundings, impacting the health of anyone living nearby, but today this isn’t the case.

2.2.2.2 Industrial Architecture

The concept of industry, and more importantly the buildings themselves, have always had an impact on society and architecture. Starting off by influencing modernist architecture, Le Corbusier for instance. The machine, the mechanistic designs fascinating the world and eventually influencing today's rapidly changing technological age.

Today, old factories are being transformed from the "one-factory-per-company model to the neo-cottage industry which focuses on one building which houses multiple companies that share common spaces, machinery and software. In Nina Rappaport's[19] book *Vertical Urban Factory*, she identifies manufacturing's new form as multi-story spaces. These hubs house multiple manufacturing companies with industrial commons but also include management, finance, real estate and technology in their approach. As former urban factories used to focus on mass production, today small-scale industries focus on small batch production with the necessity of a tight network. All these small-scale industries must be interlinked by this network for the chain to work. This is how a 'manufacturing hub' will be defined in the future.

San Francisco, Vancouver and New York all have projects looking into strategies to mix residential and industrial zones together again in a healthy and attractive way.

18 LEC - A NON-PROFIT ORGANIZATION WHICH SUPPORTS ENTREPRENEURS AND HELPS THEM BUILD THEIR PATH TO BUILDING THEIR BUSINESS.

19 NINA RAPPAPORT. ARTICLE IN THE METROPOLIS. FACTORY ARCHITECTURE IN THE AGE OF INDUSTRY 4.0. 2017.

REVISITING URBAN MANUFACTURING: NEW ARCHITECTURE. SIMON NILSSON

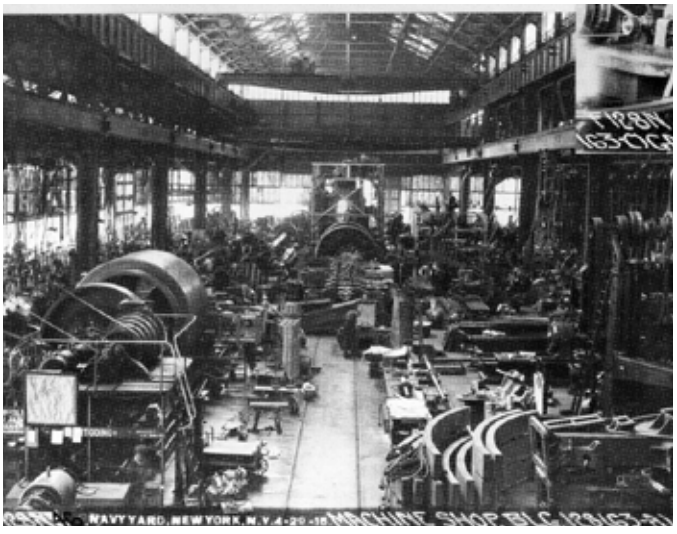

IMAGE: OLD SHIP MAKING FACTORY

2.2.2.3 Industrial Targets

Another dependent factor to take into account is who is the target group to work in these spaces. Are companies looking for small-scale local artists who are looking for cheap rental spaces for their work? Or is the board looking for upper class, wealthier business or retail specialists looking to set up their firm in the neighborhood. Is there a goal which aims to keep rental prices in a certain range so that the affordability remains within reach of the local residents and of the surrounding residents or other neighborhoods?

In this dissertation, our focus goes to Rezkoville, just South of the Loop. The goal is to bring together the inhabitants of all its surrounding neighborhoods. Rental prices vary in the circumjacent neighborhoods but are relatively lower than the Chicago Loop and neighborhoods north of the site. This is due to the fact that Rezkoville used to be an industrial site and has never been anything else. The goal for the design project (which will be explained further in this research paper) is to attract people from all ethnic races, wealth and professions.

CONCLUSIONS

1. *Manufacturing has become greener, cleaner, smaller and more complex over the years.*

2. *Encouragement of entrepreneurship is a must for the modern city.*

3. *Small-scale industry & neo-cottage industry is the modern approach for manufacturing.*

4. *It is important to know who the target class is for the workshop spaces/ new companies.*

5. *Companies require different training for their employees.*

2.2.3. The Challenges of Manufacturing[20]

Land usage is the first challenge of contemporary manufacturing. Purchasing land and laying down infrastructure is considered a high cost for the development of a manufacturing building. Since industrial land was pushed out of the city, taking jobs with it, more land came free to become residential areas leaving no room for its return. Therefore, finding land is difficult and cannot only be portrayed as an industrial area as it used to. People want to live in the city, where jobs are available. By bringing back industry, it will provide more job opportunities, luring people back to the city.

IMAGE: UI LABS. CHICAGO

20 URBAN MANUFACTURING ALLIANCE IS A COALITION OF ORGANIZATIONS AND INDIVIDUALS THAT ARE MAKING SURE MANUFACTURING ECONOMIES ARE FIT FOR THE 21ST CENTURY. THEIR COLLECTIVE GOAL IS TO CREATE PATHWAYS TO MIDDLE-CLASS JOBS AND SPARK LOCAL ENTREPRENEURSHIP AND INNOVATION IN CITIES.

The second challenge is the workforce development. There is a distinct skills gap between current employees of manufacturing firms and those interested in working in the sector. The future employees need to undergo specific training, mainly in technology, to be qualified for jobs in manufacturing.

The third challenge is the ecosystem - the relationship of business providers and service providers who need to work together in order for a solid working ecosystem. This is usually not the case, but a simple solution is to create a middleman/middle-company whose responsibility is making sure the public and private interact.

The last challenge is equity. As mentioned before, Chicago has a social divide based on educational and job opportunities. This is not only the case in Chicago but can be seen across the whole country. Unemployment numbers declined across the country, poverty levels rose nationally and in the future (by 2020) all jobs will require a degree of some sort. Things must change to help the large amount of people with no degree or educational background, but perhaps possess skills and craftsmanship knowledge of some sort. The divide is disproportionally felt in the communities. Some communities are left behind and receive less chances as others. It should become a priority to ensure that these communities become respected, well-connected and opportunistic communities with as many chances as the others. The cities must strive for an equitable innovation economy.

2.2.4 Organizations and companies

The trend of re-urbanizing industry and manufacturing has stirred up many interesting debates, propositions and companies.

2.2.4.1 Urban Manufacturing Alliance

The UMA is an American coalition of multiple organizations and/or individuals whose goals are to rebuild and prepare the manufacturing sector for the 21st century. By using different approaches they will be able to bring people together, provide more job opportunities for the middle and lower classes and support any entrepreneurial activity in cities.

2.2.4.3 Jane Addams Resource Center (JARC)

JARC in Chicago is an organization which helps job seekers reach the right level of education depending on their interest and goal and is also a go-to firm for employers seeking persons with certain skill sets and training.

2.2.4.3 HSSMI

HSSMI is an organization which helps manufacturers evolve, expand and reach their goals. The company has a division which specifically focuses on the future market and demand for the different products. It is companies and divisions, such as HSSMI, who need to start enabling strategies for the re-incorporation of industry to the city.

2.2.4.4 Artisan Exchange

Artisan Exchange is a company in Philadelphia which provides shared manufacturing spaces for growing entrepreneurs. They try to gather companies who can and want to share knowledge, resources and facilities. The like-mindedness will not only bring a social environment to the work-floor but will also allow these companies to expand and exchange knowledge and in turn support and encourage each other.

2.2.5 Partnerships for workforce developments in cities

In different webinars organized by UMA, a couple of the included organizations are introduced and interviewed about their vision and approach to certain topics such as land use policy, real estate development, workforce development, local and regional branding and equity and inclusion and how these have an impact on one another.

In a webinar with Dan Swinney[21] from Manufacturing Renaissance[22] in Chicago and Steve Jurash from the Manufacturing Alliance of Philadelphia, the topic focused on the needs of the manufacturing in the city and the different approaches possible.

2.2.5.1 Manufacturing and employees

Manufacturers are searching for employees who are willing and able to perform high-valued and complex work but are currently having trouble finding people with the right skills. The Manufacturing Alliance of Philadelphia made a group whose main purpose is to become a link between the public manufacturing companies and the private citizens of Chicago.

"72% of manufacturer's trained workforce is in their mid-60's, who will replace them?"

- Urban Industrial Initiative[23]

21 DAN SWINNEY, EXECUTIVE DIRECTOR OF THE MANUFACTURING RENAISSANCE OF CHICAGO

22 MANUFACTURING RENAISSANCE IS A NON-PROFIT ORGANIZATION BASED IN CHICAGO WHICH ADDRESSES THE WIDE LOSS OF JOBS AND THE IMPACT THIS HAD ON ITS COMMUNITIES.

23 URBAN INDUSTRIAL INITIATIVE (UII) AN ORGANIZATION WHICH WAS CREATED TO KEEP URBAN MANUFACTURING COMPANIES FROM LEAVING THE CITY OF PHILADELPHIA. THEIR GOAL IS TO RETAIN MANUFACTURING IN THE CITY BY PLACING LOW-INCOME INDIVIDUALS IN MANUFACTURING JOBS.

2.2.5.2 De-industrialization of public education

Manufacturers fear that the current education system doesn't introduce manufacturing to students. They are under the impression that there is no link between students, adults and the manufacturing business. Returning manufacturing companies want to hire people who know what they are doing, who are trained for the functions they will be proving. Sadly, these companies don't trust the educational system and fear that the interested students who graduate don't have the correct skill sets.

According to Dan Swinney, the school districts are alienated from manufacturing. Looking back fifteen years ago, people thought that manufacturing was dead. Today, people are realizing that manufacturing isn't dead and is being recognized all over the world. The only problem is its connection with the public in which the realization hasn't yet been made.

Nevertheless, multiple organizations such as the Manufacturing Alliance of Philadelphia have initiated workshops and boot camps to train people for the available manufacturing jobs. They act as a middleman between the public companies providing jobs and the public residents searching for them. In this situation companies state their needs, what they are looking for in their hires and the workshop development organization makes sure to realize them in their workshops.

In this situation manufacturing takes the lead in determining the curriculum of the schools' specific classes to help spark an interest and even shape youngsters who are interested in this specific field of profession.

Community colleges also seek opportunities to work with manufacturers but realize they need to be better equipped to do so. A solution could be to share materials with other universities or companies who need the same machines and/or equipment. For example, a college could have a workshop space with machinery from 7 A.M. until 3 P.M. and an entrepreneurial company could have the same space from 2 P.M. until 9 P.M. This presents an opportunity for colleges, universities and manufacturers to combine investments, save money and start partnerships with one another[24].

For example Sierra College in California (a community college) has a partnership with Hacker Lab in Sacramento (a maker space[25]) which includes sharing resources. Students from Sierra College receive a discount on a membership price for the lab. This partnership doesn't only benefit the school but also benefits the maker space firm. Students can master skills in CNC/ information technology, laser cutting and 3D printing as they aspire to become the next generation urban manufacturers.

The partnership includes funding from the college for the Hacker Lab which includes sponsored events, rent payments for the first two years and programming fees. In return the students acquire an off-site lab where they can gather skills for a decent price thanks to the reduced membership price[26].

24 STEVE JURASH IN A WEBINAR: BUILDING PARTNERSHIPS FOR SUCCESSFUL WORKFORCE DEVELOPMENT PROGRAMS: LESSONS FROM CHICAGO AND PHILADELPHIA. STEVE JURASH: PRESIDENT OF MANUFACTURING ALLIANCE OF PHILADELPHIA AND C.E.O. PHILADELPHIA IS ONE OF THE LEADING ADVOCATE CITIES IN THE MANUFACTURING SECTOR. THEIR GOAL IS TO STRAIGHTEN TIES BETWEEN MANUFACTURERS AND THEIR COMMUNITY.

25 MAKERSPACES ARE COLLABORATIVE WORK SPACES WHERE PEOPLE WITH COMMON INTERESTS GATHER TO SHARE EQUIPMENT, IDEAS AND KNOWLEDGE FORM HIGH-TECH TOOLS TO NON-HIGH TECH TOOLS.

26 WEBINAR URBAN MANUFACTURING ALLIANCE: LESSONS FROM SACRAMENTO: MAKING MAKER SPACES WORK FOR YOUNG PEOPLE. FEATURING GINA LUJAN AND ERIC ULLRICH OF HACKER LAB AND CAROL PEPPER-KITTREDGE FROM SIERRA COLLEGE.

2.2.6 Workshops

A degree alone is not enough to enter the manufacturing world today. Hard skills are just as important as soft skills. Manufacturing companies are looking for employees who have a certain amount of knowledge concerning engineering, I.T. management, etc., but they also expect a certain level of professional skills such as correct language in the profession, knowing how to disagree in a professional way, writing a resume and how to properly shake a hand.

Multiple workshops are available where volunteers and trained staff teach people all sorts of skills needed for a job in manufacturing. There are classes focused on improving life skills, literacy skills, reading skills and math skills. There are courses in all aspects of information technology and there are lessons which specifically focus on professional behavior in the workplace. These are classes for people who need to improve their professional skills. For instance: learn to disagree with a co-worker and shake someone's hand with confidence. Management classes are also an option for those who want to broaden their knowledge on the business end of things and possibly apply for a different position in the firm.

Manufacturers usually state what they are looking for in the people they hire, so the workshop organizations will know which classes to provide for the available jobs. Usually manufacturers are looking for people who are able to work with machinery, such as press brakes for sheet metal and welding equipment. They generally need people with decent amount of knowledge in CNC (computer numerical control) seeing as contemporary manufacturing deals with a lot of automation and robotics.

COLLAGE DIFFERENT TRADES:
WOOD WORK, METAL WORK, WELDING, PRESS BRAKE, PAINTING, CNC MACINES, IT, PHYSICAL LABOR, GLASS WORK, CERAMICS, BASIC SKILLS, PROFESSIONAL SKILLS

2.2.7 Workforce development

Formation programs are a way to integrate students in the field of manufacturing.

For example, a student at a community college might not have any knowledge of manufacturing or even know that there are many good unfilled jobs in the city. It is up to the college to introduce the topic to the students, spark an interest and provide further steps to those who are interested. They do this by providing classes focused in general knowledge of manufacturing, industry and engineering. Fields trips can be arranged to visit multiple companies who are open to giving the students a tour to give them a taste of the field outside the classroom. Some students could be given the opportunity to do an internship at one of these firms for the extra experience during their degree which might even lead to an apprenticeship later[27].

Manufacturing Connect (MC) is a nationally recognized career path program that creates links between colleges, universities and schools with its surrounding manufacturing sector. MC has three prototypes each specified in a different category.

First, Manufacturing Connect is a high school program for students from the ninth grade until the twelfth grade.

Second, the Young Manufacturers Association (YMA) helps young adults already in/or interested in working in the manufacturing sector.

Third, the Instructors Apprenticeship for Advanced Manufacturing (IAAM) is a program where instructors are trained to be competent on all levels.

It's important to remember that the workforces aren't only a connector between education and manufacturing but that they are an opportunity for students to connect to resources, jobs and businesses.

27 WEBINAR URBAN MANUFACTURING ALLIANCE: BUILDING APPRENTICESHIP PROGRAMS TO ENGAGE YOUTH IN MANUFACTURING CAREERS. FEATURING CLAIRE MICHAELS OF SFMADE, STEPHEN TUCKER, FORMERLY OF PARTNERS FOR A COMPETITIVE WORKFORCE AND JAMES BAX OF THYSSENKRUPP BILSTEIN OF AMERICA, INC. AND SARAH MONGEAU OF FORMETÁL

2.2.8 Workforce development in Chicago

Manufacturers, freight and logistics firms in the greater Chicago are thriving. Of all jobs created between the year 2010 and 2012, twenty percent were part of the manufacturing, freight and logistics sector. Industry that is re-urbanized results in sustainable change. It would generate the growth of many businesses in Chicago, raise the demand of skills and jobs in multiple communities and therefore be able to hire more people, therefore reducing poverty and promoting equality in Chicago.

IMAGE: PEOPLE OF CHICAGO. FULTON MARKET. PAWEL SKRABACZ

CONCLUSIONS

1. *The workforce is ageing.*

2. *We need to preserve companies that are creating jobs.*

3. *A goal is to help people acquire certain skills to fill the unfilled jobs positions.*

4. *Declination of trades in high school and communities can lead to many unfilled jobs in and out of the city (if this continues there will be 2 million unfilled jobs in the next ten years).*

5. *A link is needed between the public (manufacturing) and the private (residential) sector in the city to help strengthen the ties between the two.*

6. *Many people live in poverty due to the fact they don't have the right education or lost jobs and couldn't do anything with their skill set.*

7. *Manufacturing companies seek people with the right set of skills and correct training - they set the rules for the organizations/community colleges who prepare potential employees.*

8. *Educational systems can spark the first interest in students and should provide further opportunities to help them explore it further by including classes in the curriculum and credit system.*

9. *High schools, colleges and universities are the first groups to approach to set up partnerships with manufacturing companies*

2.3 LITERATURE REVIEW/CASE STUDY ANALYSIS

2.3.1 Design for the Opportunity Society

A TedxTalk given by Larry Keeley[28] gives the viewer/ listener a deeper understanding and insight on designing for the future of the city of Chicago.

Keeley starts by using Daniel Burnham's Plan (1909) as an introduction to Chicago and its history. He states that this Plan was Chicago's "ticket" to a successful organization for the city: *"Burnham gave the city its first push, providing it with roads, parks, buildings, sewers, a public riverfront and a public lake front of which this remained undivided and accessible to all."*[29] The plan, which according to Keeley, was greatly successful and a major key for Chicago's build-up today.

Keeley emphasizes how contemporary planners and designers must use this information, build on it while brainstorming and designing for the next 100 years. He encourages them to design for the community, providing opportunities and healthy living arrangements for its inhabitants.

He talks about contemporary projects which have already implemented this innovative thinking and design, namely the '606' - inspired by the High Line of New York - also known as the Bloomingdale Trail - Chicago's Millennium Park and Chicago's Maggie Daley Park. These three projects all show signs of historic, innovative planning. A design which was forged under the collaboration of planners, artists, designers and politicians together.

Keeley uses the PMQ Headquarters[30] in Hong Kong, as an example on how a community can grow and provide opportunities for the community. The complex allows local performers, artists and designers to exhibit their work, organize events and find support from others to help them develop their work and ideas. The idea behind a vibrant cultural hub, such as PMQ, could help anybody with no degree, no resources but with an idea. The PMQ Headquarters is there to further develop the idea in the right direction and later potentially start a business.

28 KEELEY LARRY: AN INNOVATION SPECIALIST, GLOBALLY RECOGNIZED TEACHER, SPEAKER, WRITER AND THINKER OF THE POTENTIAL IMPACT OF A STRATEGIC COMBINATION OF DESIGN AND BUSINESS.

29 KEELEY LARRY, DESIGN FOR THE OPPORTUNITY SOCIETY: THE 21ST CENTURY PLAN OF CHICAGO. (TEDX TALK, 2017).

30 FORMER POLICE MARRIED QUARTERS AND GROUNDS OF QUEEN'S COLLEGE WHICH HAS BEEN TRANSFORMED INTO A MIXED-USE VENUE FOR ARTS & DESIGN.

IMAGE: PMQ HEADQUARTERS. HONG KONG.

CONCLUSIONS

1. *In conclusion to this Tedx Talk, a proposal for such a project must embrace the community in which it is situated, grasping both its history and context.*

2. *It must wield the community's creative potential and economic resources to eventually fabricate a center for development.*

3. *It must attract inhabitants from all surrounding neighborhoods to embrace their creative ideas and explore all possible options.*

4. *Such a center should be a non-profit organization using funding from the government, investors and organizations such as the 1871 and Chicago Theatres whose mission is to help these entrepreneurs achieve their goals as they will help innovate the future.*

2.3.2 Nina Rappaport: Vertical Urban Factory

Nina Rappaport is an architectural critic, curator, educator and director of the project/think tank, the *Vertical Urban Factory*, which investigates the modern factory in terms of technology, the factory in the city and the architectural issues that come along with it.

"Can the factory as a place of work programmatically reassert its relevance in the urban fabric with the advent of free trade, globalization, and gentrification, making production more local?"

"Can urban factories make cities more self-sufficient?"

During a seminar of The Conference[31] in 2017 Nina Rappaport speaks to the public about the Vertical Urban Factory, where it came from and what it could become. She takes the listeners back to 1936, the Lingotto Factory or the Fiat Factory in Turin, citing how this building was a spectacle in the city: a factory where the car is finished on the roof with a rooftop test track. The factory had an influence on the early technological age - which has now evolved into machine based design.

She reminds us about the history of industry, how large-scale factories moved out of the cities because labor was cheaper and space became more valuable and more difficult to purchase in the city center. This departure of factories meant many workers were left behind and had no place to go (see 2.1.5 Chicago Class Divide). As time went by manufacturing was zoned-out of the city and replaced by residential zones - seeing as cities felt this should be the prioritized zone in the city.

Rappaport's project/think tank the *Vertical Urban Factory* (VTF) focuses on the return of these companies: where and how could this happen? What will the impact be and how will these new factories look like in the 21st century?

IMAGE: LINGOTTO FACTORY 1936

The first problem the *VTF* tackles, is space. As mentioned before, manufacturing was zoned-out of the city to make room for residential projects. Rappaport explores different methods to re-establish factories in the city alongside at the residential zones.

Hybridization. A new trend around the globe is the ‘mixed-use’ complex. A complex which houses both apartments and cafes to introduce a social atmosphere in the neighborhood. Why not launch a new combination by adding industry to the mix? To transform the mixed-use complex into an industrial hybrid. The *Vertical Urban Factory* cites how manufacturing has evolved to become greener, cleaner and more complex, making it more attractive and easier to integrate in the city. Manufacturing has taken on a different form, employs less people and has turned into small-scale businesses which are in contact and linked to one another.

It is important that factories are ‘showcased’ - people have to like them, accept them in their city and their community. The concept *Industrial Tourism* comes to mind. To ease industry back into society, the element of mankind’s curiosity must be triggered. For instance, give the residents a glimpse of what industry is today by introducing the *Transparent Factory*.

Places where small-scale manufacturing has been initiated by groups with common interests are for example different furniture makers in Brooklyn, New York. By coming together, sharing the renovation costs they were able to renovate a building and transform it into a high-tech building with common industrial facilities for all of them to use. Another example was the BMW Plant in Leipzig by Zaha Hadid indicating that industry can in fact be an interesting element of the street scape today.

31 THE CONFERENCE. A NON-PROFIT ORGANIZATION ORGANIZED BY MEDIA EVOLUTION. THEY INVITE SPEAKERS FROM ALL AROUND THE WORLD TO TALK ABOUT WORLDWIDE HOT TOPICS GOING FROM PSYCHOLOGY TO ART TO MARKETING TO GENETICS EXPLORING HUMAN BEHAVIOR, NEW TECHNOLOGY AND HOW TO MAKE IT ALL HAPPEN.

IMAGE: VAN NELLE FACTORY. NINA RAPPAPORT

IMAGE: VERTICAL FACTORY. NINA RAPPAPORT

CONCLUSIONS

1. *Zoning in the city needs to change. The re-integration of industry must be paired with residential and retail zoning.*

2. *Allow the integration to be flexible - this so that the working and living environment can easily merge together.*

3. *Industrial Commons are introduced: bring machinery together so manufacturers are provided with opportunities to share them in a common space.*
   This will increase social interaction between workers from different companies which can lead to an education hybrid. Workers can help educate each other and increase the innovation of products.

2.3.3 Case Studies:

IMAGE: STRATHCONA VILLAGE. VANCOUVER. CANADA

2.3.3.1 An Industrial Hybrid

Strathcona Village, designed by GBL Architects, lies in Vancouver's (Canada) Downtown Eastside district and will be Vancouver's largest redevelopment project since 2009.

This project represents a residential - industrial site located just outside of Vancouver's central business district, much like the idea of Rezkoville in Chicago. Strathcona Village focuses on production, design and repair of the area, all within an effort to preserve or expand industrial job opportunities. It is the first mixed-use project of its kind in the area which also focuses on bringing back the work spaces to the city.

Two floors are specifically designed for this use in the most efficient and flexible way. These work spaces will be suited to accommodate businesses, artist studios, product showrooms, bars / cafes, etc. The complex also combines social housing with market residential units to attract a diverse range of people to the complex.

2.3.3.2 Neo-cottage Industries

'New Lab' located in Brooklyn, New York has transformed Navy Yard's former ship building factory into a complex of industrial buildings employing more than 7,000 people from multiple firms.

One of the buildings, named 'New Lab', was recently renovated by Marvel Architects housing 70 companies and 400 employees. New Lab is an example of a neo-cottage industry complex, a hive for hybrid advanced manufacturing consisting of rentable studios, workshop spaces, (web)conference rooms, common lounges and café spaces. Tools, hardware, investments in 3D printing, nano clean energy, hardware robotics, etc. are shared between firms.

UI Labs in Chicago is another modern approach of a mix-use industrial complex. These spaces are considered co-working spaces with conference rooms, chat and call rooms but also contains 'massive' machinery for the 'factory of the future' on the other side of the building. The complex houses around 300 members whereof three quarters are focused on industry and one quarter is specialized in academics and non-profit organizations. The UI Labs combine large and small companies who have common goals to create jobs in the city and promote entrepreneurship.

IMAGE: NEW LAB, BROOKLYN, NEW YORK

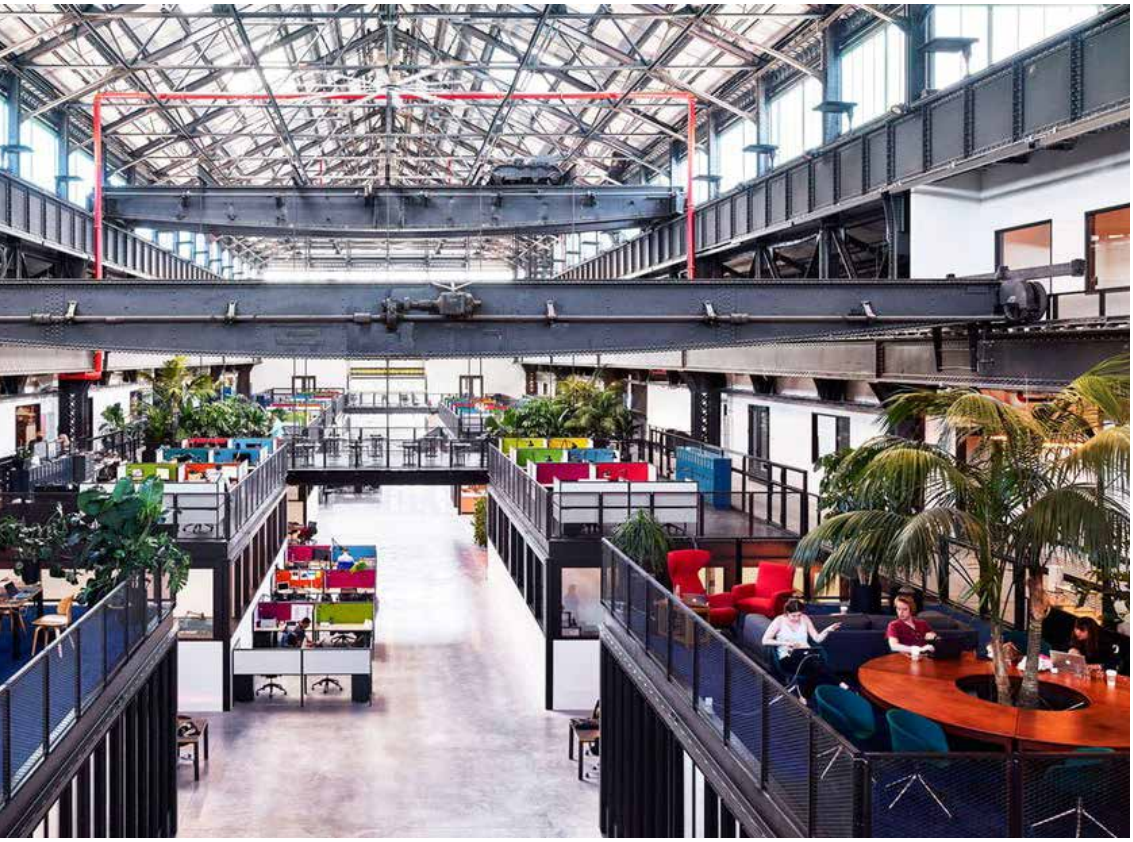

IMAGE (NEXT PAGES) UI LABS, CHICAGO

2.3.4 Paris, France

Cities today must provide an answer to the current question of density: how do we make cities denser for a better future while maintaining an accessible and acceptable urban plan? This in general is a challenge, but one all cities will face in the near future. Paris is one of the densest cities in of Europe and is considered a good example of an acceptable urban model.

Paris is organized by the Haussmann Plan (1853-1870), which was designed by Baron Georges Eugène Haussmann, a prefect of the Seine Department. He was personally appointed the job by Emperor Napoleon III and was supposed to carry out the massive urban renewal program. This plan included: constructing new boulevards and broad avenues, constructing stations, theatres and churches, developing parks such as Bois du Boulogne and Parc Montsouris and lastly introducing a better water supply system and integrating an underground sewerage system.

In other words, Haussmann's plan transformed Paris from a medieval place to a prestigious and modern city, sculpting Paris' modern identity. It was a project with mainly one goal: to beautify the city, whatever the cost (a factor which attained major critique).

Haussmann's Modèle de Ville stands for the architype of flexibility. The Parisian urban model can deal with challenges that the cities of tomorrow will face. The question is how? What makes the Haussmann style so special and different from other cities?

IMAGE: PARIS, FRANCE. PHOTOGRAPH OF TYPICAL HAUSSMANN STREETS

The answer: Haussmann created a plan which fulfilled the social aspirations which answered to any human needs and made room for all technological evolutions.

2.3.4.1 Paris Haussmann Exhibition

LAN architects[32] looked into this topic and made an extended analysis on Paris' urban cityscape. After this study they created an exhibition called "Paris Haussmann" where all their research and findings were exhibited for the public.

LAN's study examined the city's characteristics, in and out of its historical context, rediscovering architectural heritage. It reinterpreted the city in volume, history and usage.

The study used form to transcend history, while also keeping its distance from manuscripts, memoirs, chronologies, archives, paintings and photographs. Instead they looked for information in maps and measurements. The study visually categorized and compared the main axes, identified the public spaces, organized the *blocks* and buildings in function of their current geometric forms, sketched out the 'filled' spaces and accessed the 'empty' ones.[33]

The exhibition was divided into six main parts:

The first - *The Line*. This was a historical overview of the city and its transformation based on photos, mock-ups and plans of the city. *The Line'*s goal was to rediscover and highlight Paris' architectural heritage.

The second part focused on proving how exemplary Paris' network is on the mobility front. Haussmann's building style is the architype for flexibility. The city is organized through blocks of different sizes and functions. Each block of the 19th century is still as effective for sustainability today as it was then. On the one hand you have the emptiness versus the filled spaces and on the other you have the density and the accessibility of the city. Nevertheless, the combination of all these aspects creates a feeling of harmony.

32 LAN - LOCAL ARCHITECTURE NETWORK. PARIS BASED FIRM CREATED BY BENOÎT JALLON AND UMBERTO NAPOLITANO IN 2002. THEY EXPLORE ARCHITECTURE AS AN AREA OF ACTIVITY AT THE INTERSECTION OF SEVERAL DISCIPLES.

33 ALEXANDRE LABASSE. DIRECTOR OF THE PAVILION D'ARSENAL (26 JANUARY 2017).

IMAGE: LAN ARCHITECTURE. ROADWAYS BUILT. PARIS. FRANCE.

IMAGE: LAN ARCHITECTURE. BUILDINGS CONSTRUCTED. PARIS. FRANCE.


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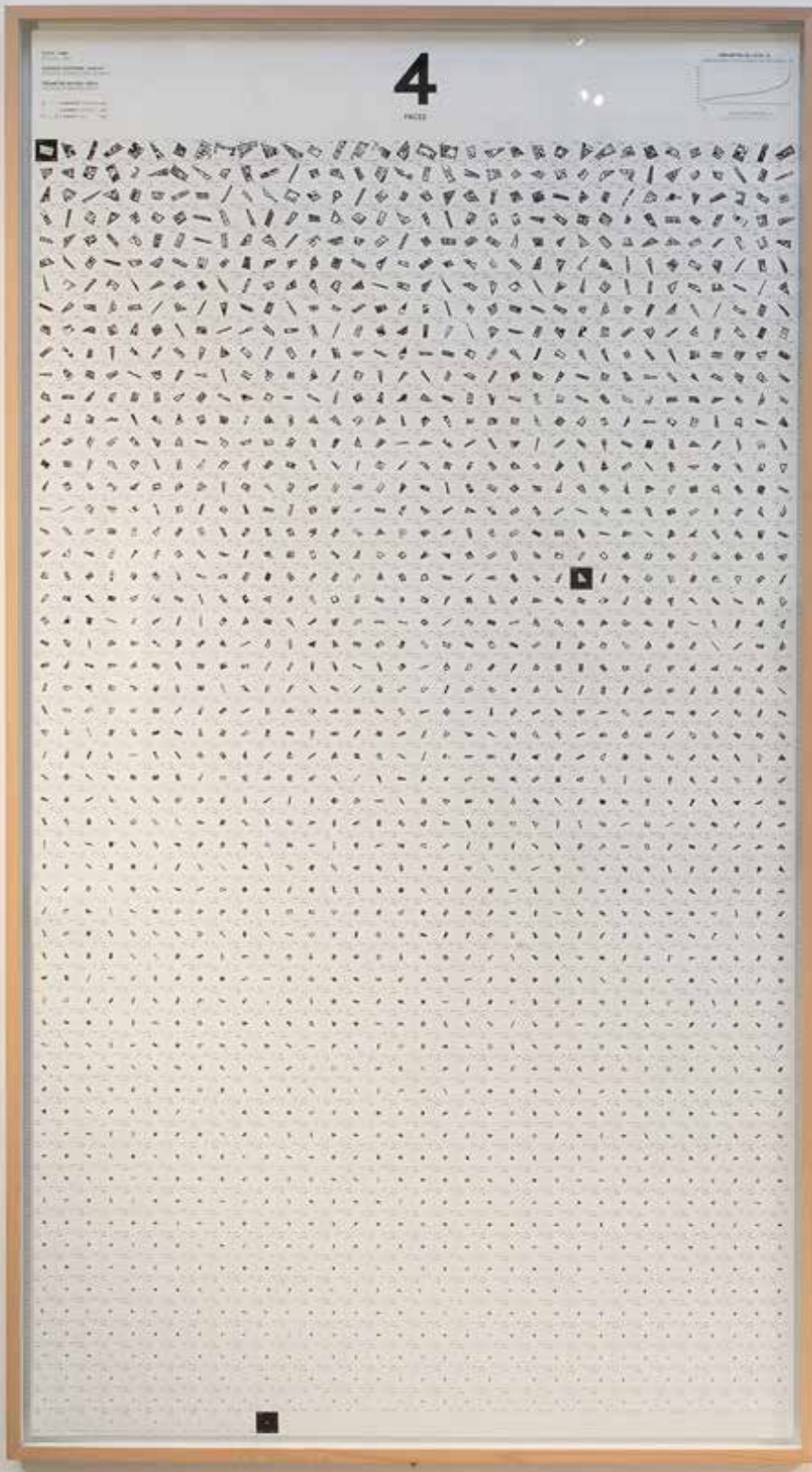
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The third part of the exhibition purely focused on the analysis of the shape of the blocks and tried to define and understand them. It was concluded that the Parisian blocks create the density in the city, even though it doesn't feel like it.

Each block has a specific geometric form, typology and morphology. These three elements act as stepping stones in creating a dense neighborhood. In conclusion, the more compact the block, the better for the densification of the city. The more square meters they withhold, the more comfort and quality the building will express.

The staircases are filled with natural light due to the voids created in the roofs. Other rooms such as toilets, hallways and service facilities were appointed to spaces with less natural light. All spaces flow from one to the other and have been designed to ensure an automatic natural ventilation flow.

In the middle of the blocks, there are spaces which are considered "transparent" spaces. These transparencies come to light when the designer creates a void in between buildings. From above we see 'cubes' (the blocks) with square-shape holes cut out of them to create the shape of the blocks. This way the buildings have access to natural light from a minimum of two sides and an easy access to a natural ventilation flow.

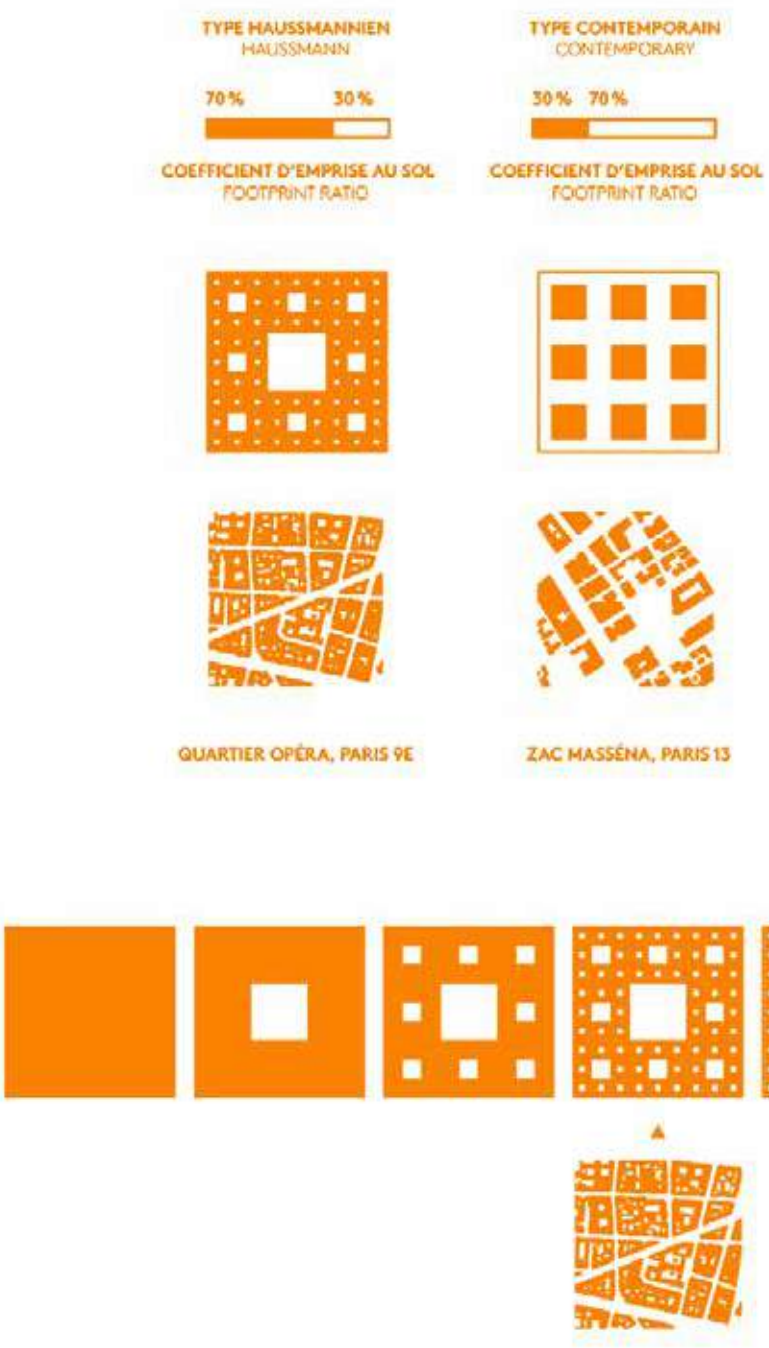


IMAGE: LAN ARCHITECTURE. ANALYSIS BLOCKS PARIS. FRANCE.

The façades were considered a separate aspect to the rest of the building. Its main function was to attract people. Fifty percent of the façade must of been covered, the rest could be left empty. Later, as the years passed, designers started to fill these empty spaces in the façade, but in a repetitive way. As long as light and air could spread itself in an organic and natural way through the building, there would be no problem.

The physical form of the blocks differ and can be categorized into two sections: the first, in size and number of sides on the block and the second, in the perimeter. Throughout the blocks, an observation was made that the same floor heights and principal façade lines were used and that the blocks were joined, or rather, connected by complex party walls.

Today, the Haussmann style buildings remain to have the same amount of stories but undergo different programs compared to the original function - a residential function. The original program used to be (per story) - (1) commercial function on the ground floor/ (2) mezzanine for commercial space/ (3) residential function with the highest ceiling/ (4) and (5) residential function with a typical ceiling height/ (6) residential function with a low ceiling and continuous balcony and (7) a mansard roof.

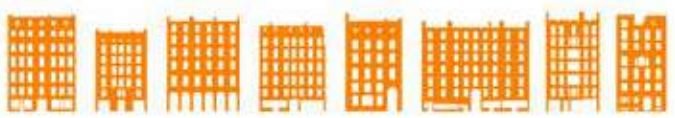


IMAGE: LAN ARCHITECTURE. FAÇADES. PARIS. FRANCE.

The fourth part examines the 'walkability' of the city. How 'walkable' is the Haussmann urban fabric compared to other metropolitan networks? What is the density of the Pari¬sian model compared to international standards? What is the efficiency of the built footprint at the block level in relation to contemporary typologies?[34]

The Haussmann grid results in high levels of irrigation, walkability and accessibility compared to other large cities. The accessible portion within a walkable perimeter of 400 meters is 63 percent. The results of the accessibility of the Parisian grid show us that it's a homogenous grid. The service accessibility is exceptionally high, allowing for a certain degree of effectiveness leading to a higher value in urban fabric.

Paris' grid consists of primary streets, secondary streets and tertiary streets. All contributing to the homogenous grid. The primary streets are the boulevards of the city, with a width of approximately 8,9 meters and broad sidewalks to accompany them. The secondary streets, in contrast to the boulevards, have rather narrow sidewalks (approximately 4 meters wide) and no street furniture. The tertiary streets or ways are purely meant as an access way into blocks. They have a more domestic feel to them, sometimes not even possessing a sidewalk.

34 UMBERTO NAPOLITANO, BENOÎT JALLON AND FRANCK BOUTTÉ


AVANT 1850
1850 - 1914
1955 - 1975
1976 - 2010


AVANT 1840
1840 - 1914

The fifth part of the exhibition studies the methodology and classification of every block. The urban fabric consists of heterogeneous block (diverse blocks) which differ in size and form. The reason why there are so many different sizes and forms is because there are old blocks and new blocks which are present in the city. Urban connectivity was given the priority in the urban development which means the buildings were shaped to fit some of the roads around them. In total, 3385 blocks were studied, catalogued and classified in the system according to the number of sides and the perimeter.

The last part of the exhibition focused on the relationship between the size of the blocks and their common characteristics. It took one small block, one large block and one medium sized block to analyze their common ground. They may differ morphologically but unexpectedly they have quite similar typologies: façade, density, development over time, type of spaces, distribution of empty spaces and the current number of buildings.

We can conclude that the study mainly focused on the Parisian blocks, as they are the key elements to the densification of the city. It is the fine-tuning of the building that is directly linked to the flexibility of the building. Sadly, a lot of the richness, space and structure has been lost over the years. Today, we find ourselves in the same space. Bedrooms are very standard: a bed, a wardrobe - consisting of standard measurements - drawn in a plan. We want to keep the building and the spaces interesting and vibrant.

IMAGE: LAN ARCHITECTURE. FAÇADE 1.

IMAGE: LAN ARCHITECTURE. FAÇADE 2.

IMAGE: LAN ARCHITECTURE. FAÇADE 3.

IMAGE: LAN ARCHITECTURE. FAÇADE 4.

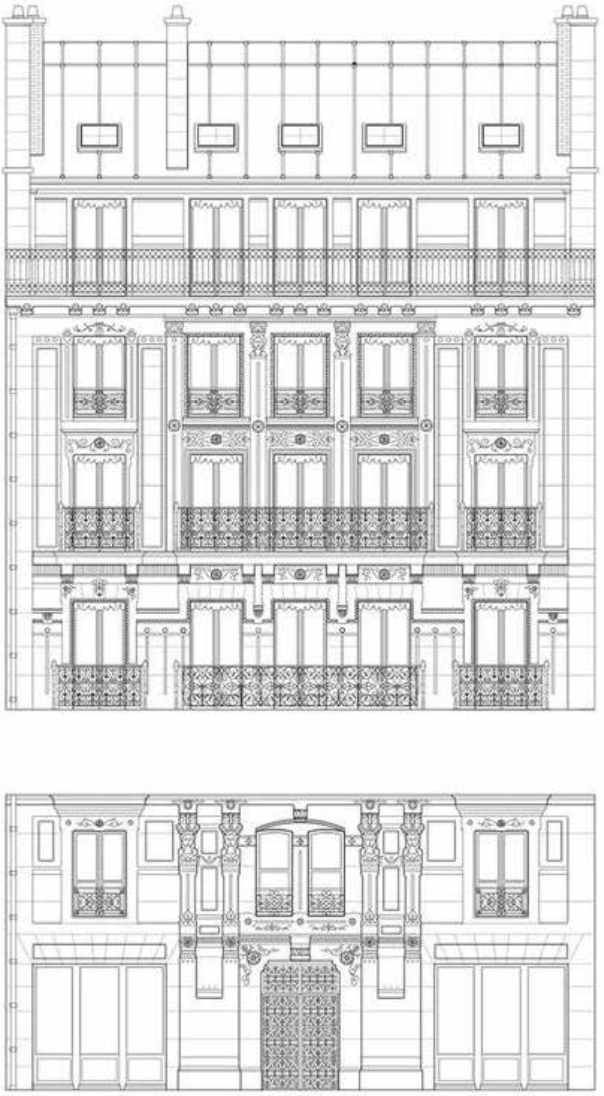
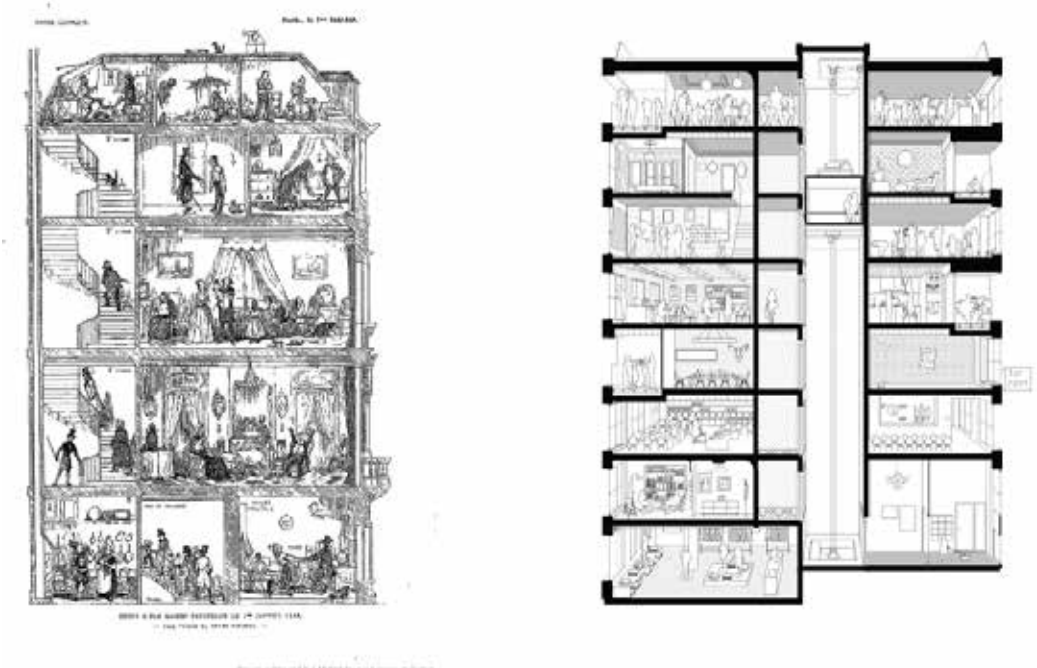


IMAGE: LAN ARCHITECTURE. EXPLODED FAÇADE. PARIS. FRANCE.

2.3.4.2 Paris' flexibility

The standard Haussmann Parisian blocks look the same from the outside but are used in multiple ways. The structure withholds a certain kind of flexibility, which allows the building to adjust to the function. It is a simple structure, which easily carries the loads down to the ground. Today structures are built in a similar way but less resistant.

This shows us that the Haussmann structure was very flexible and allows us to make changes in the present without many implications on the building.



IMAGES: ARTISTIC INTERPRETATION OF THE HAUSSMANN BUILDING + GENERAL SECTION OF THE HAUSSMANN BUILDING

2.3.4.3 Paris' contemporary approach

Today Paris' urban development has shifted to the combination of industrial sites combined with urban housing. After many industries left the city, their warehouses were either dismantled or transformed into museums, entertainment venues, offices and even lofts. The RATP Group[35] strives to find a balance in the two for their large-scale project for Paris. The development should symbolize the city in everyday life, it should represent a good mix of a dense city, a mixed city and a city of flexibility. Paris, the city of different lifestyles and rhythms. The project supposedly will make up of 50 percent of social housing and 50 percent of private housing.

Industrial jobs are currently being rejected in the périphérique but the preservation of workshop spaces and garages are gradually receiving increased attention. More and more are being renovated or transformed into spaces for art exhibitions, music venues, residential space and office space. The abandoned warehouses can be transformed as to add to Paris' social and functional diversity.

35 RÉGIE AUTONOME DES TRANSPORTS PARISIENS. STATE OWNED PUBLIC TRANSPORT OPERATOR AND MAINTAINER. THEIR GOAL IS TO CREATE 2000 DWELLINGS WITH 50% SOCIAL HOUSING IN PARIS BY 2024. EIGHT INDUSTRIAL SITES WERE CHOSEN IN 8 DIFFERENT DISTRICTS

CONCLUSIONS

1. *Cities of tomorrow face the challenge of densification.*

2. *Paris' Modèle de Ville can be seen as an architype for flexibility.*

3. *Parisian blocks were modified to fit the street scape of the city. The form must fold according to the road and the height was determined according to the street width.*

4. *Parisian blocks are the stepping stones for Paris' density. Each categorized according to amount of sides and/or perimeter.*

5. *With a simple structure the Parisian blocks can easily adjust to different functions allowing for a maximum flexibility feature.*

6. *Parisian blocks are still as sustainable now as they were in when they were first built.*

2.3.5 Lacaton & Vassal: User-freedom in spaces

According to Anne Lacaton and her partner Jean-Philippe Vassal the concept 'inhabiting' is of the greatest importance in design. For them this concept doesn't only embrace the term housing, as many would think, but in their mother tongue, French, 'habiter' is defined as: *the state of being somewhere: space is whatever its use is.*[36] This is their drive to include freedom of use, generous spaces and the possibility of appropriation to their designs. According to them when designing such spaces, the user is given more space which leads to a more qualitative usage of the space, which leads to better quality of life and therefore improves the quality of human relationships. It is important to create spaces where the user finds his/her freedom.[37]

They view their work as a starting point for further development: to improve the housing conditions and to introduce a more open social life to its residents.

36 ANNE LACATON. PRINCIPAL OF LACATON & VASSAL ARCHITECTES (PARIS). ASSOCIATE PROFESSOR OF ARCHITECTURE & DESIGN AT THE SWISS FEDERAL INSTITUTE OF TECHNOLOGY (ZURICH)

37 ANNE LACATON INTERVIEW FOR ICON BY PETER SMISEK. PUBLISHED MARCH 1 2017.

2.3.5.1 Transformation of the Grand Parc Estate, Bordeaux

This is a project which was realized in 2016 by Lacaton & Vassal, Fréderic Druot and Christophe Hutin. This project transformed 530 dwellings of three social buildings in Bordeaux, France.

This social housing complex dates back to the early 60's and counts over more than 4000 dwellings. The renovation took place in three buildings of this complex, which count 530 dwellings of the total 4000. The goal of the renovation was to redefine the qualities and comfort of each residence.[38] Each place was given an extended winter garden and balcony which allowed more natural light to penetrate the residence and introduced views of the city which weren't visible beforehand.[39]

The design grasped the existing building without making important interventions on the structure, the stairs or the floors. The intervention focuses on generous extensions, which according to Lacaton & Vassal, are key to enhance the quality of the dwellings. The extensions introduce a winter garden and balcony to the residence and thereby allow the resident to 'live outside' while being at home. At the same time these winter gardens function as a climate buffer for the apartment.

38 LACATON & VASSAL TRANSFORMATION OF 530 DWELLINGS, BLOCK G, H, I.

39 THE GUARDIAN. GRAND PARC, BORDEAUX REVIEW - A RUSH OF LIGHT, AIR AND VIEWS.

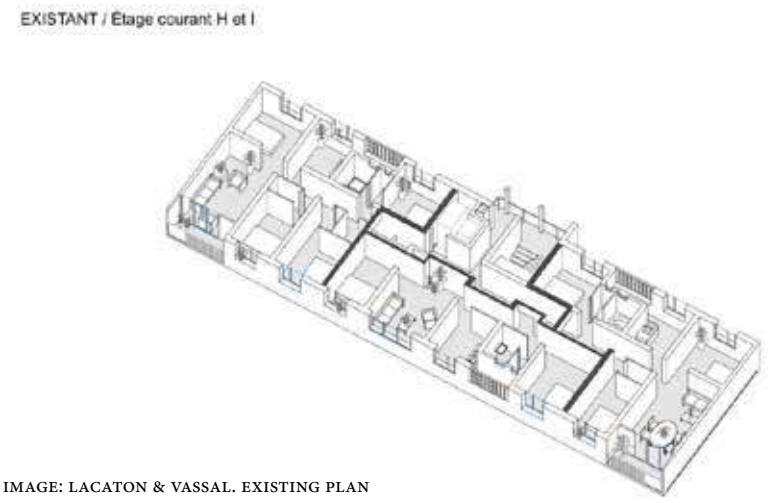


IMAGE: LACATON & VASSAL. EXISTING PLAN

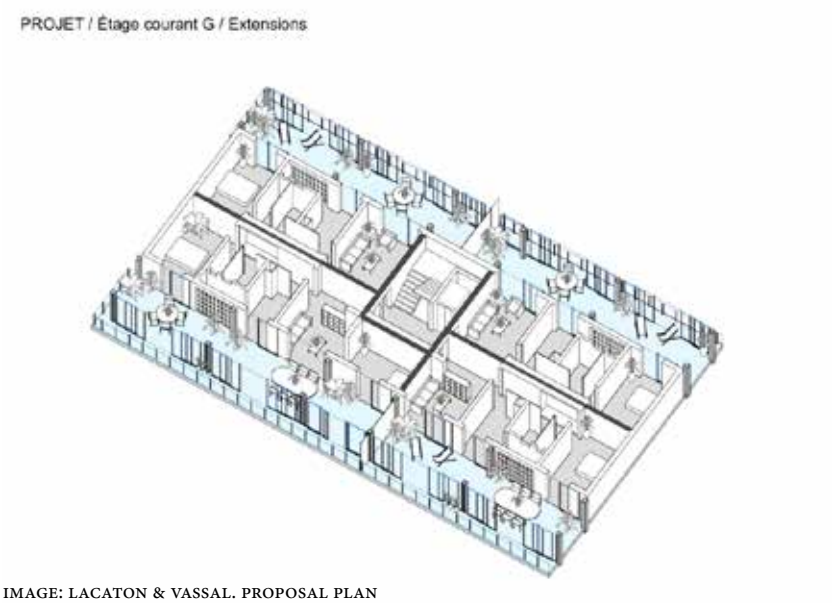


IMAGE: LACATON & VASSAL. PROPOSAL PLAN

IMAGE: LACATON & VASSAL. FINAL IMAGE OF THE TRANSFORMATION OF THE GRAND PARC ESTATE, BORDEAUX. FRANCE.

CONCLUSIONS

1. *The structure allows for the flexibility of the building.*

2. *Winter gardens offer an outdoor experience whilst still inside the residence.*

3. *The façade acts as a climate buffer for the dwellings whilst embracing a flexible system allowing for the resident to manipulate it (open/close curtain system).*

2.3.6 Case Study: Efficient public infrastructure

In the neighborhood of Clichy-Batignolles, in Paris the 40-unit housing complex demonstrates an approach to reform part of the city's history and identity. Given its location at the edge of the mixed use area, this project lies in between an eco-quarter[40], very similar to the ones currently being built all over France, and a more traditional, Haussmann sense of urbanism.[41] The project started with in-depth research of the heritage of the surrounding buildings and their values. The challenge lay in increasing the capacities of this form so that it can evolve and welcome other programs. The choice of proportion between offices and housing and the design of a largely covered glass façade, which shelters the technical portions, have granted this volume a durable sense of versatility.

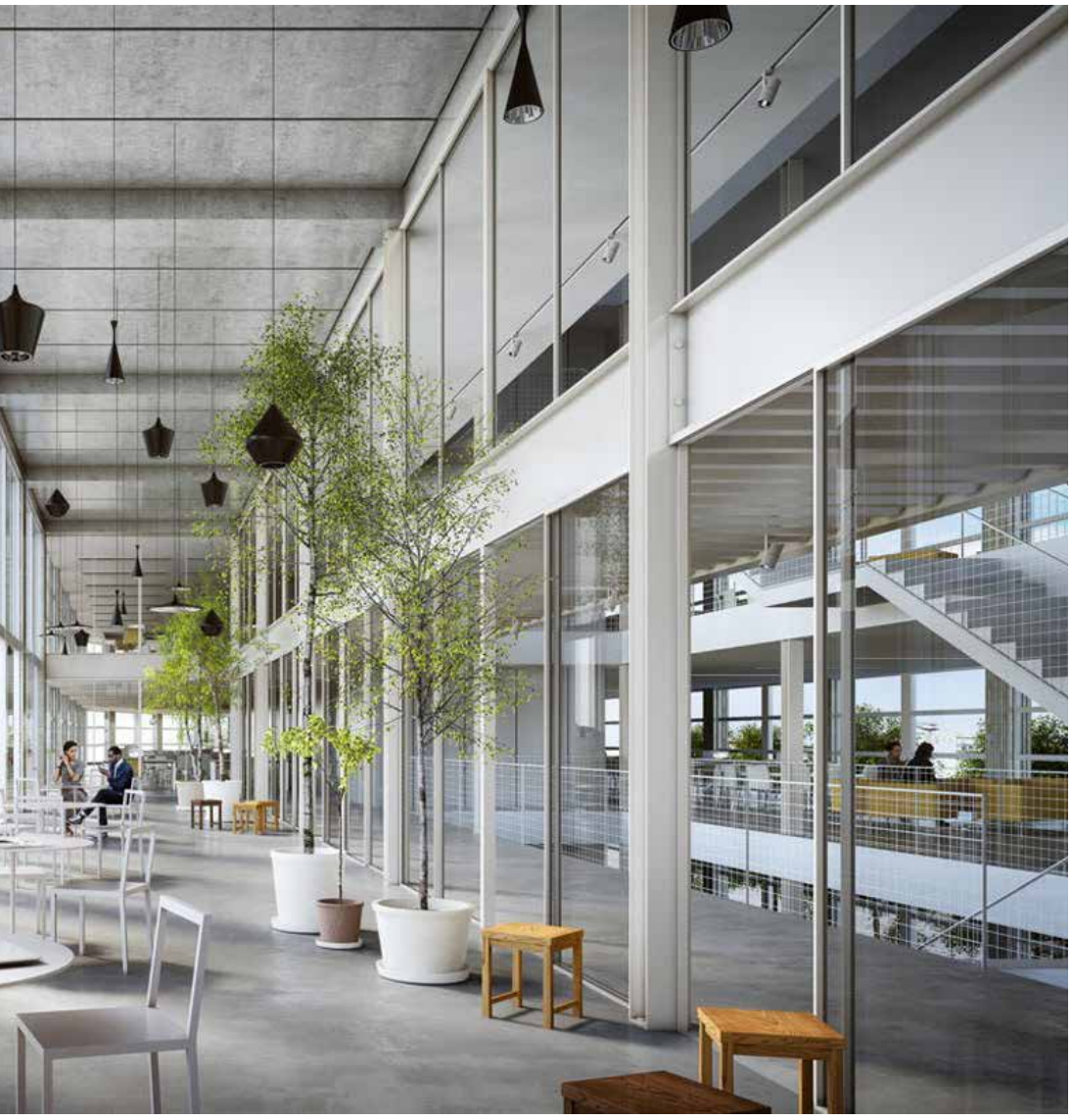
In Clichy-Batignolles, the vocabulary of offices and flexible structures from the 1970s met up with the grand principles of Haussmann. In Clichy, an artist's participation in the façade helped reconstitute the collective memory that had been forgotten over time.

40 SHMURAK SUSANNAH. "PARIS IS BUILDING THE ECO-COMMUNITY OF THE FUTURE RIGHT NOW. HERE'S HOW".

41 GRAZIA SERGIO. CLICHY-BATIGNOLLES IN THE METROPOLITAN DYNAMICS OF NORTHWEST PARIS.

IMAGE: CLICHY-BATIGNOLLES EXTERIOR.

IMAGE: CLICHY-BATIGNOLLES INTERIOR.



DECLARATION

PHILIP B. WILLIAMS

City of wind and glass dressed in frozen lace,
of the wide-stone tower that would not burn,
of Lake Michigan and the poor who never
see the sun drop lines of light across the cold ache
of water, of televised faces spitting water on children
in a park obliterated of its pigeons. City of pigeons
on train platforms where trains say the names
of approaching destinations like prophets: you know
me as your restless child. I creep through dimensions
of snow-scythed wind and ruthless summers
looking for my semblance in neighborhoods
gentrified into dull disasters of coffee and scones.
I have loved you like darkness loves the base
of a throat yet songs I could sing for you
won't come. City of Lou Malnati's and Giordano's,
of segregation and gang wars, of bus drivers
who seem to hate me and so I hate them back,
the blade of their impatience, the phantom dark
beneath their abrasive eyes, until I meet the one
who says "good morning" back and it sounds
like "I love you" and "I'm sorry" and I needed
to hear that this morning because traffic's slow
as a corroded vein and the Red Line changes
races halfway through and that feels wrong
and beyond explanation like the parking meters
eating our tired bodies down to their good bones.
At night, Michigan Ave. slips on its suit of lights
and tourists while Madison and Central Park
roll restless with Shark's fried fish and barbershops
where a boy sits with the buzz of clippers
carving something beautiful from the black curls
on his head. You've been on my mind, City
of African music festivals and Bud Billiken
parades, City of name changes I refuse to honor.
Sears to Willis, the ghost of a Marshall Field's relief
oxidized into obscurity. Here is my face, City.
Here is my face and my hands are open for you.
Here is the body that has rejected your violence,
that has been missed by your bullets, City.
Here is the scimitar of my tongue to cut you
down to your particulars, in hope to find
something in you to love that will love me back.

3. Chicago, the City of Doubles

Chicago, as mentioned in section 2.1.5, shows a distinct divide between the North and the South, causing a dual city statute. This is the social divide of the city but is there another?

The city is defined as the second city of America. It is the home of Marina City - a complex consisting of two towers. It houses the John Hancock Center – originally two towers which were cut in half and placed on top of each other.[42] The major multilevel street Wacker Drive, with its lower and upper deck, running alongside the river throughout the city. And the Monadnock building – the building which was built in two phases each representing a different architectural era.

Chicago is a series of doubles. [42]

42 ROBERT SOMOL. ARCHITECTURAL THEORIST, CURRENT DIRECTOR OF THE SCHOOL OF ARCHITECTURE AT THE UNIVERSITY OF ILLINOIS AT CHICAGO (U.I.C.).

IMAGE: DOWNTOWN CHICAGO. VANNUT HANNAH

John Hancock Center

The John Hancock Center, is a 100-story skyscraper located in Chicago, Illinois. It is a design by the architectural firm Skidmore, Owings & Merrill.

The original design consisted of two towers but due to inconvenient issues related to purchasing and selling plots in the area, the design was altered. The final design illustrates the two towers stacked on top of each other.[43]

The structure was finished in 1970 and remains one of Chicago's most recognizable skyline buildings.

Address:
875 North Michigan
Avenue, Chicago, Illinois.

43 OSBORN LYNN J. BRITANNICA. JOHN HANCKOCK CENTER. CHICAGO. ILLINOIS.

IMAGE: HANCOCK TOWER CHICAGO. ILLINOIS.

IMAGE: GENERAL IMAGE OF CHICAGO'S BUSINESS AREA. WACKER DRIVE LOCATED BOTTOM LEFT.

Wacker Drive

Wacker Drive was designed in the 1909 Plan of Chicagi by Daniel Burnham. It was first opened in 1926.

It is a major miltilevel road running alongside the Chicago River in the Loop. The upper level, a.k.a. Upper Wacker Drive, is meant for local traffic while the lower level, a.k.a. Lower Wacker Drive, is intended for through-traffic and service vehicles.[44]

44 ATLAS OBSCURA. LOWER AND UPPER WACKER DRIVE CHICAGO. ILLINOIS.

IMAGE: WACKER DRIVE. CHICAGO. ILLINOIS

Marina City

Marina City is a famous mixed-use, residential-commercial, building by Bertrand Goldburg. The complex consists of two twin towers of a same height (179 meters).

The concept of a 'city within a city', where living environments and work places were placed close together, was supposed to make the project a success. It was Goldburg's experiment on bringing back the middle class to the city. [45]

River City

River City is Bertrand Goldburg's second mixed-use development in Chicago, using a liked-minded design as his Marina City structure.

The initial design consisted of a large-scale development, adding up to multiple 72-storey, mixed-use skyscrapers. The actual built complex was modified to a 'snake-like form', as a result of dismantling the towers and laying them om their side.[46]

45 CHICAGO ARCHITECTURE CENTER. MARINA CITY.

46 BERTRAND GOLDBURG.ORG. PROJECTS: RIVER CITY.

IMAGE: MARINA CITY. CHICAGO. ILLINOIS. HANNAH VANNUT

IMAGE: RIVER CITY. CHICAGO. ILLINOIS. HANNAH VANNUT

3.1 THE MONADNOCK

The Monadnock located in Chicago's South Loop area, 53 West Jackson Boulevard, is one of Chicago's most pristine structures. It represents the transition between load-bearing masonry structures and steel-frame construction.[47]

The historical artefact also belongs to Chicago's twinning nature. In general, all these doubles can be seen as representatives for the city's social double image, separating the North from the South in cases of education, poverty, gentrification and violence.

In this dissertation, the Monadnock, as one of the double representatives, was chosen to become the paradigm for the design of the contemporary city and its needs.

47 THE MONADNOCK BUILDING. OFFICE OF THE BUILDING.

IMAGE: MONADNOCK BUILDING CHICAGO. ILLINOIS. HANNAH VANNUT

3.1.1 Analysis & Design Tools

3.1.1.1 Two Structures

The Monadnock was built in two phases: the northern half, the Monadnock, designed by Burnham and Roots, completed in 1891 and the southern half, the Kearsarge, designed by Holabird and Roche and completed in 1893.

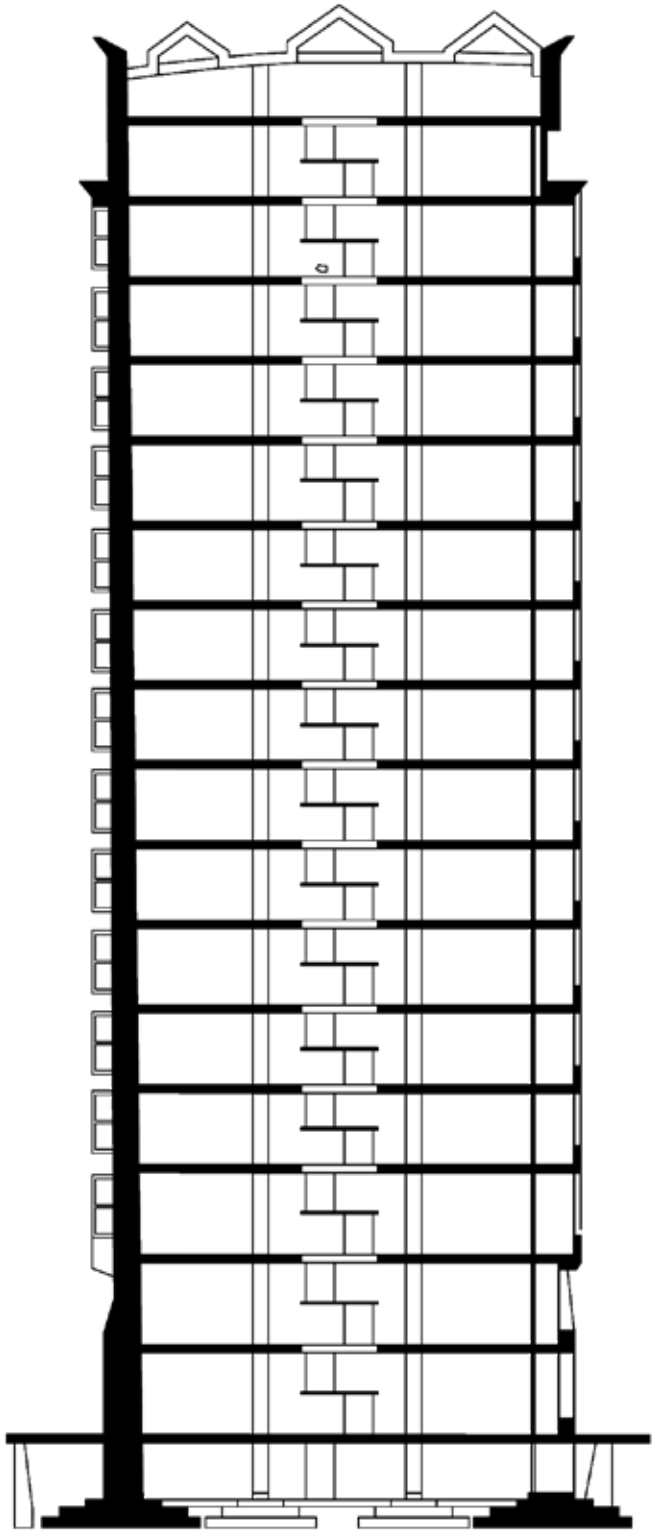
In general, the building acts as a whole but represents the end of one building tradition and the start of a new one, namely the implementation of steel. The structure is a symbol for the transition from thick load-bearing masonry walls to a light steel frame structure.[48] Since the two sides weren't constructed at the same time, both have their own elevator shafts, heating plant, staircases and plumbing.

The northern half, the Monadnock itself, consists of a base of approximately 1m80 at the base and reduces in thickness as the construction climbs its way up. This half is an actual block, a mass building, painting itself as an ornament of modern architecture.[49]

The southern half, the Kearsarge, initiates one of the first steel frame implications of the city. Its columns radiate a certain rhythm which generates a pattern in the façade, similar to the Monadnock's rhythmic façade, but not an immediate copy.

48 CHICAGOLOGY. MONADNOCK BUILDING: CHICAGO TRIBUNE. DECEMBER 6, 1958.

49 LESLIE THOMAS. THE MONADNOCK BUILDING, TECHNICALLY RECONSIDERED



SECTION MASONRY LOAD-BEARING MONADNOCK. ILLUSTRATION BY HANNAH VANNUT

3.1.1.2 Two Façades

The façade is influenced by the internal structure and reflects the architectural transition.

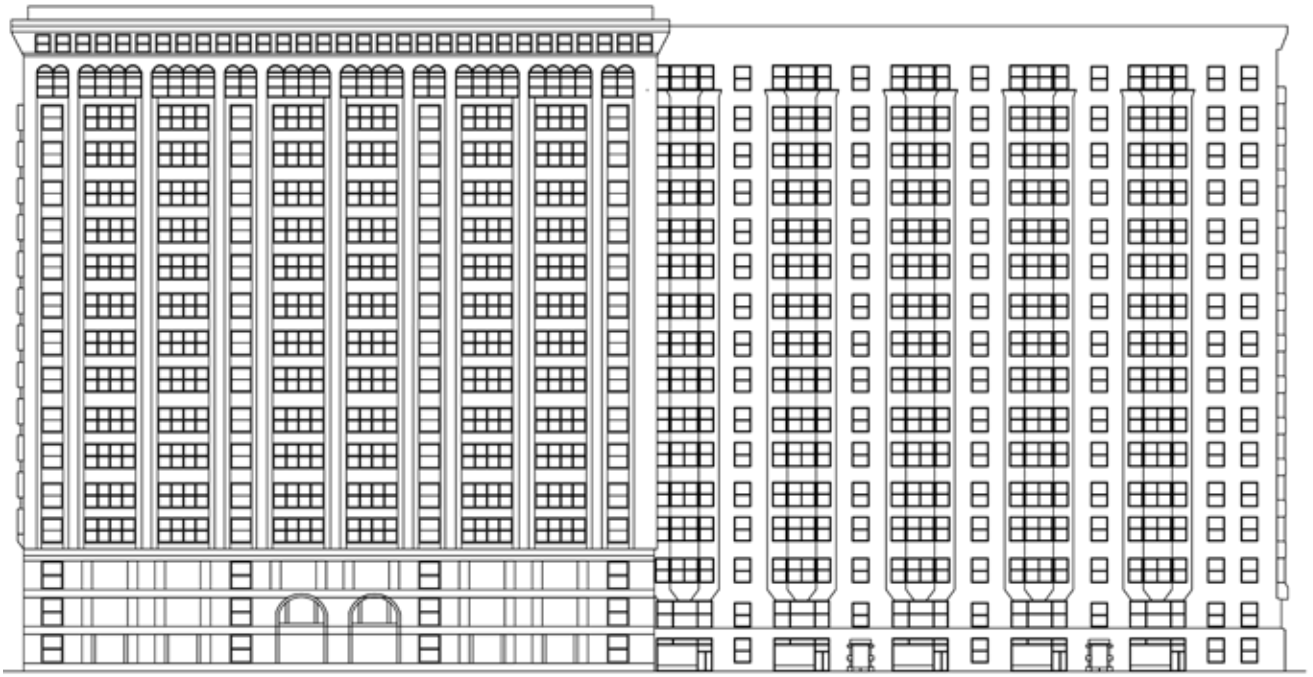
The Monadnock represents modern architecture with a clean façade, lacking in ornamentation and consists of deep and narrow windows. This is due to the thick masonry walls, making the infiltration of natural daylight in the building difficult. As a solution for this, bay windows were used to counter the minimum daylight incidence. These bay windows consist of their own steel structure.[50]

The Kearsarge, on the other hand, represents a more classical point of view, using ornamentation in the façade and a brick terracotta cladding system, which is fixed to the metal frame. Here, the use of bay windows is also implemented and thanks to the large apertures at the base of the building, the Kearsarge can allow more daylight light to enter the building and show off its internal retail stores.[51]

Not only does the Monadnock show differences in its finishes but also in height. The Monadnock reaches a height of approximately sixty meters, making it the highest load-bearing skyscraper in commercial structures. Burnham and Root's design counted sixteen stories and an attic, whilst Holabird and Roche's half counted seventeen stories, this difference in amount of levels is visible in the façade seeing as the Kearsarge extends a bit higher than the Monadnock.

50 THE MONADNOCK BUILDING. OFFICE OF THE BUILDING.

51 CHICAGO ARCHITECTURE CENTER. MONADNOCK BUILDING. ONE BUILDING WITH TWO FACADES.



FAÇADES OF THE MONADNOCK. ILLUSTRATION BY HANNAH VANNUT

3.1.1.3 Two Buildings

The total length of the building stretches up to 122 meters and the width approximately 20 meters.

When analyzing the building's standard floor plan, four elements attract our attention: the building's twinning (or fourfold) division, the façade's rhythm, due to its structural elements, the centralized circulation path and the offset line in between the façade and the circulation.[52]

The twinning artefact was at one point in history internally divided, creating four divisions in total: The Monadnock, the Kearsarge, the Katahdin and the Wachusett. All four were interconnected by a long corridor which ran through the middle of each floor making a harmonious whole from the inside.[53] At one point in history, in 1938, the building was remodeled making sure each building had its own entrance, elevators and heating system, but in 1992 the building was restored back to its original design.

Not only does the façade of the building reflect the structural elements of both sides (the columns and the use of bay windows), but also the plan shows these same elements. Once again, we see that the rhythm on both sides are similar but not direct copies of each other.

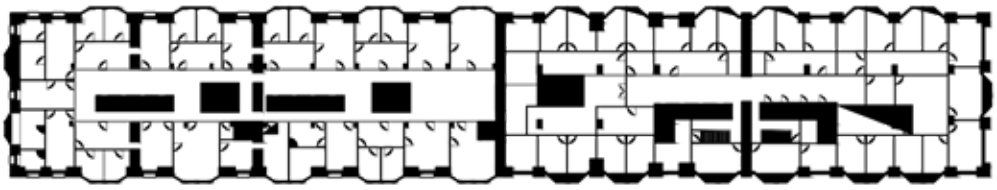
Circulation was put in the middle of the building, making all spaces available to the façade and maximum daylight access. The internal aluminum staircases, within this circulation 'strip', represent the first use of aluminum as a structural element in a building. Natural daylight was brought into the building by bay windows in the façade, but also in the halls by installing skylights above the staircases and elevators.

The last element which the plans illuminates is the offset line of internal walls in between the façade and the circulation. This creates a room in between the outer spaces and the circulation. The Monadnock is a rather narrow building and since these spaces are located away from the building envelope, which consists of bay-windows, and away from the circulation halls, with skylights, a solution had to be found to distribute daylight to them.[54] Feather-chipped glass was used in the interior walls as an element to distribute light from the outer and inner rooms to the middle spaces whilst keeping a certain level of privacy intact.

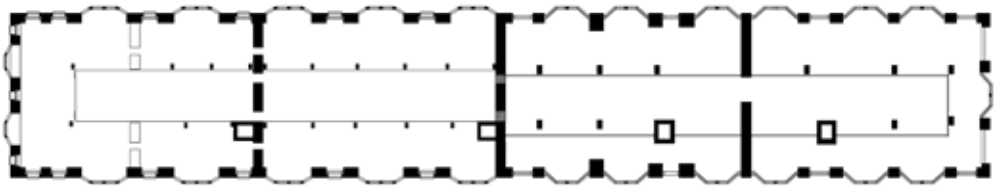
52 CHICAGOLOGY, CHICAGO TRIBUNE. DECEMBER 6 1958.

53 SAHARCHIPEDIA. MONADNOCK BUILDING; KEARSARGE BUILDING; KATAHDIN BUILDING, WACHUSETT BUILDING.

54 CHICAGO ARCHITECTURE CENTER. MONADNOCK BUILDING.



BASIC PLAN MONADNOCK. ILLUSTRATION BY HANNAH VANNUT



STRUCTURE INTERIOR MONADNOCK. ILLUSTRATION BY HANNAH VANNUT

CIRCULATION MONADNOCK. ILLUSTRATION BY HANNAH VANNUT

3.2 THE MODERN MONADNOCK

Using the three previously analyzed features of the Monadnock as design tools for the modern interpretation for the 21 century Monadnock, the follow elements need to be taken into account:

The building must respect and illustrate the double aspect of the original Monadnock. This can happen by dividing the building in two halves in a vertical manner (like the original Monadnock) or a horizontal manner. Hence, we can create two prototypes for the contemporary vision of the modern Monadnock: The Modern Replica and the Alternate Modern Replica.

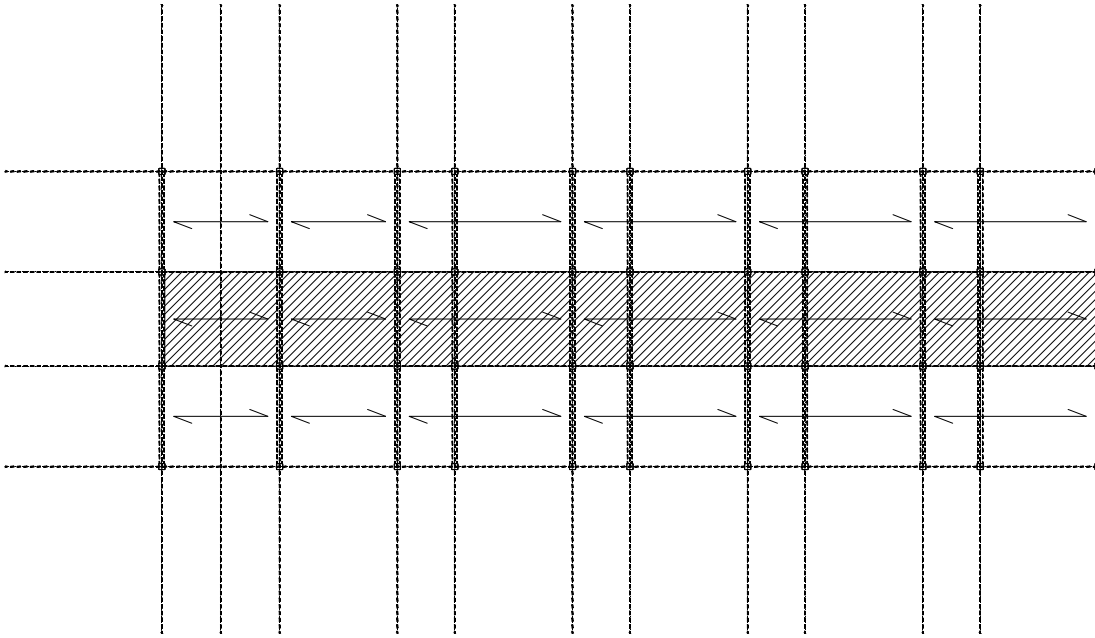
IMAGE: RENDER FACADE PROTOTYPE 1 MODERN MONADNOCK BUILDING. . VANNUT HANNAH

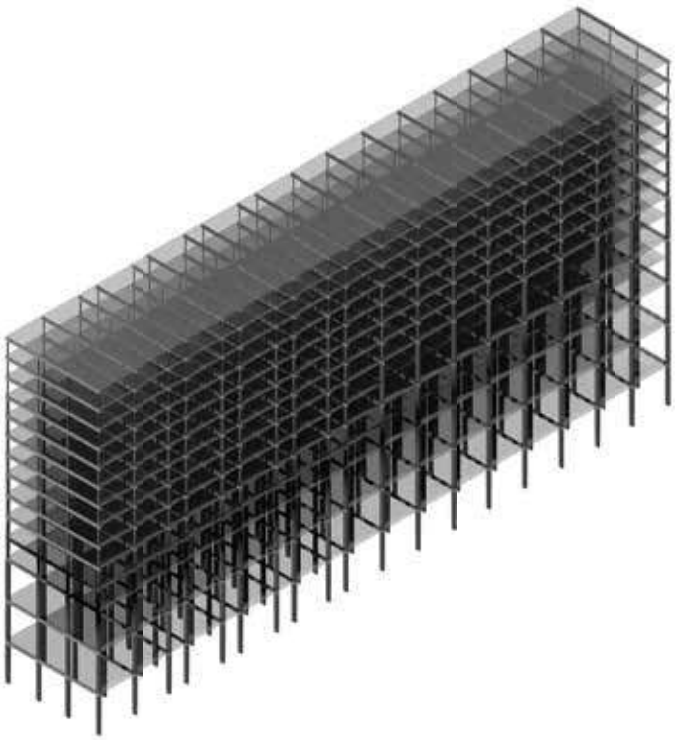
3.2.1 The Structure

Both prototypes consist of the same structure. The structure must follow the usage of a steel frame, like the Kearsarge, and follow the rhythmic composition of the full original building.

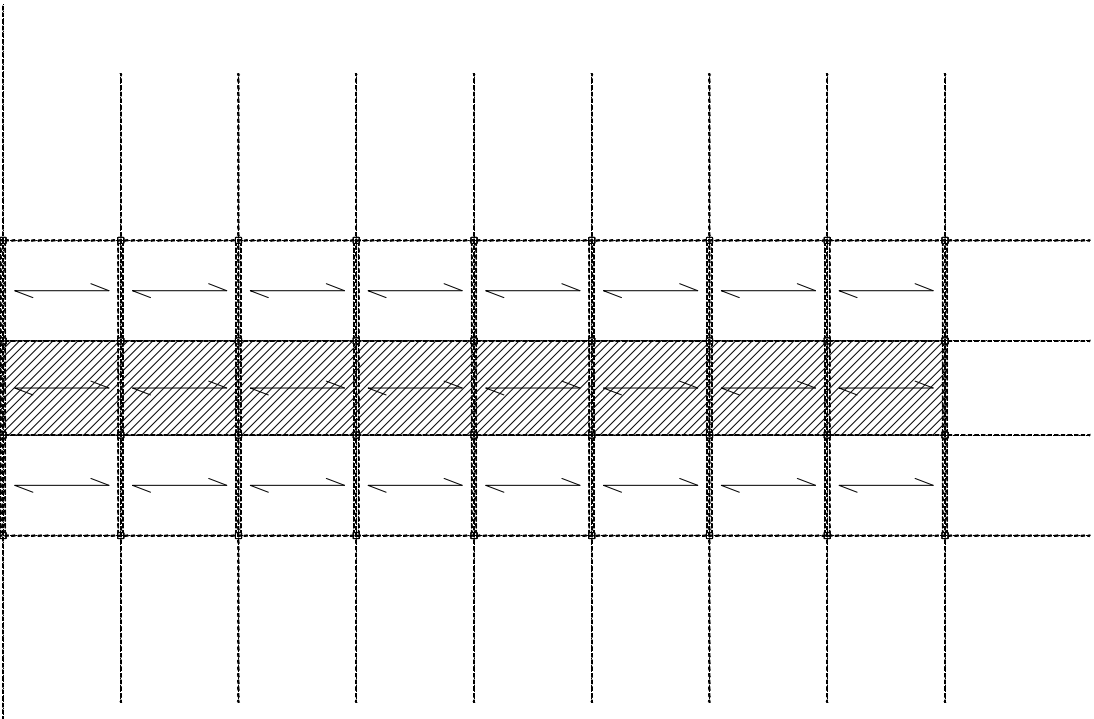
One half of the Modern Monadnock prototypes will illustrate the exact same rhythm as the original Monadnock, with an alternating distance between the columns going from seven meters to three-and-a-half meters back to seven meters. The other side will illustrate a simplified version of the rhythm, sticking to a separation of seven meters between the columns.

By using a steel frame, the design can save on material usage, will allow for an easier natural daylight penetration and contributes to the simplicity and flexibility of the building. This structure allows the design to have an open-plan concept on every floor maximizing the building's flexibility and foreseeing easy changes in possible future developments.





3D REPRESENTATION OF THE NEW STRUCTURE. HANNAH VANNUT



GENERAL STRUCTURAL PLAN. HANNAH VANNUT

3.2.2 The Plan

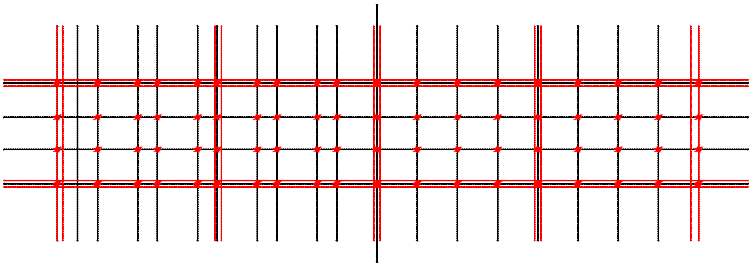
The Modern Monadnock must illustrate a divide either in a vertical manner or a horizontal manner. Nevertheless, both prototypes embrace the same plan build up.

The rhythm from the structure will follow in plan showing the columns and their separation of either seven meters or three-and-a-half meters.

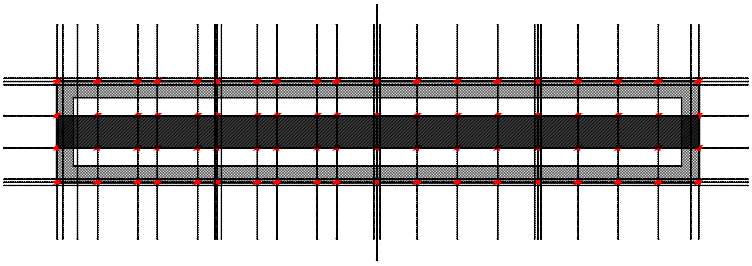
The circulation will once again be put in the center of the building as to enhance space against the façade where daylight easily penetrates the room.

The offset line in between the circulation ‘strip’ and the outer spaces against the building envelope will still be present in the new Monadnock – later explained how it functions (see section 3.2.2.1).

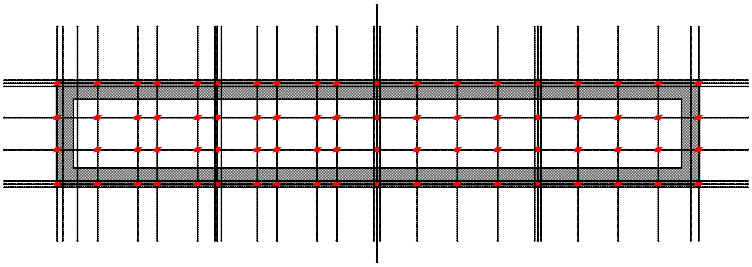
As the structure allows, the internal walls can be placed anywhere where wanted or needed – open-plan concept. In the designs of both prototypes, the internal walls will consist of glass panels (alternating between frosted, colored and clear glass – according to the room, function and desire of the user). Few solid internal walls will be used as to maximize the distribution of light and maximize ‘transparency of the building.



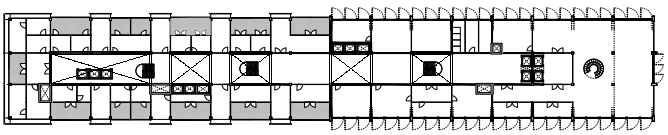
INTERPRETATION OF THE MONADNOCK - THICKNESS SCHEME. VANNUT HANNAH



INTERPRETATION OF THE MONADNOCK - CIRCULATION SCHEME. VANNUT HANNAH



INTERPRETATION OF THE MONADNOCK - WINTER GARDEN SCHEME. VANNUT HANNAH



INTERPRETATION OF THE MONADNOCK - BASIC PLAN. VANNUT HANNAH

3.2.2.1 Prototype 1: The Modern Replica

This first prototype is the most similar prototype to the original Monadnock, diving the building in two in a vertical manner.

Just like the original Monadnock, this construction will embrace two façades to reflect the double character of the building. The modern interpretation will strongly differ in material and appearance from the original design. Going from the original dark, mass masonry block to the exact opposite: a light, translucent polycarbonate skin on one half and a simple glass façade with sun shading appliances on the other.

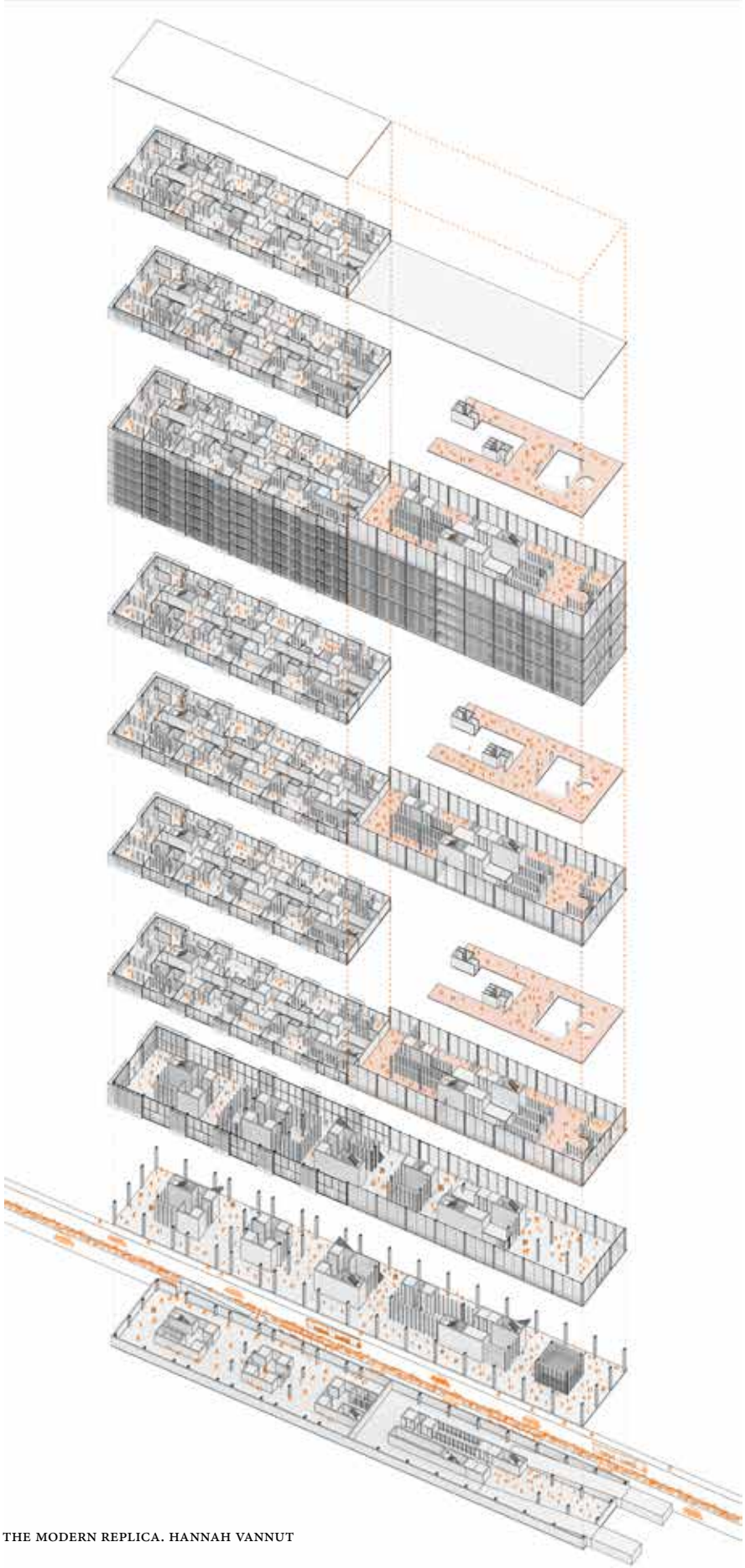
To insinuate the original thickness of the Monadnock's masonry walls, the new envelope uses a double skin façade with an offset of eighty centimeters on one half of the building and rotating shading devices on the other. The outer layer of the double skin façade is made up of polycarbonate panels. These translucent panels stand in for privacy, light penetration and ultimate sun shading.

As seen on the floor plan: the offset of polycarbonate panels follows the rhythm of the structure and allows for the façade to move inwards and outwards – as a reflection of the original bay windows of the Monadnock.

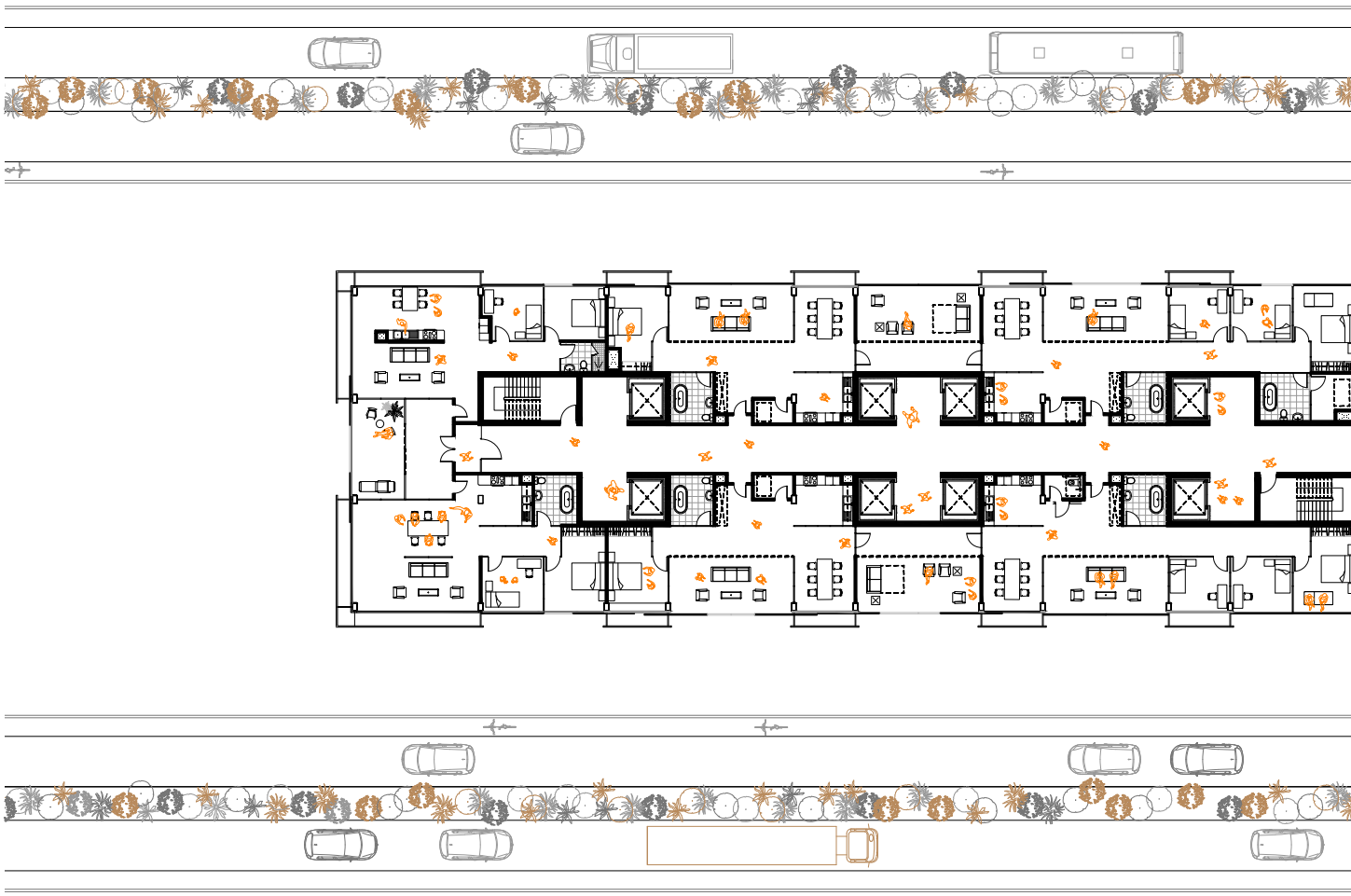
Where polycarbonate panels aren't portrayed, a fixed sliding door on the inner layer of the double skin façade takes place and allows the resident or owner to decide on an open or closed façade.

This brings us back to the offset line in the middle of the envelope and the circulation 'strip'. This line is then used as a 'winter garden boundary line'. Glass panels are set on this line as to create a space which can be both a balcony (outdoors – open façade) or a winter garden (indoors – closed façade) allowing the user to choose what they want or need.

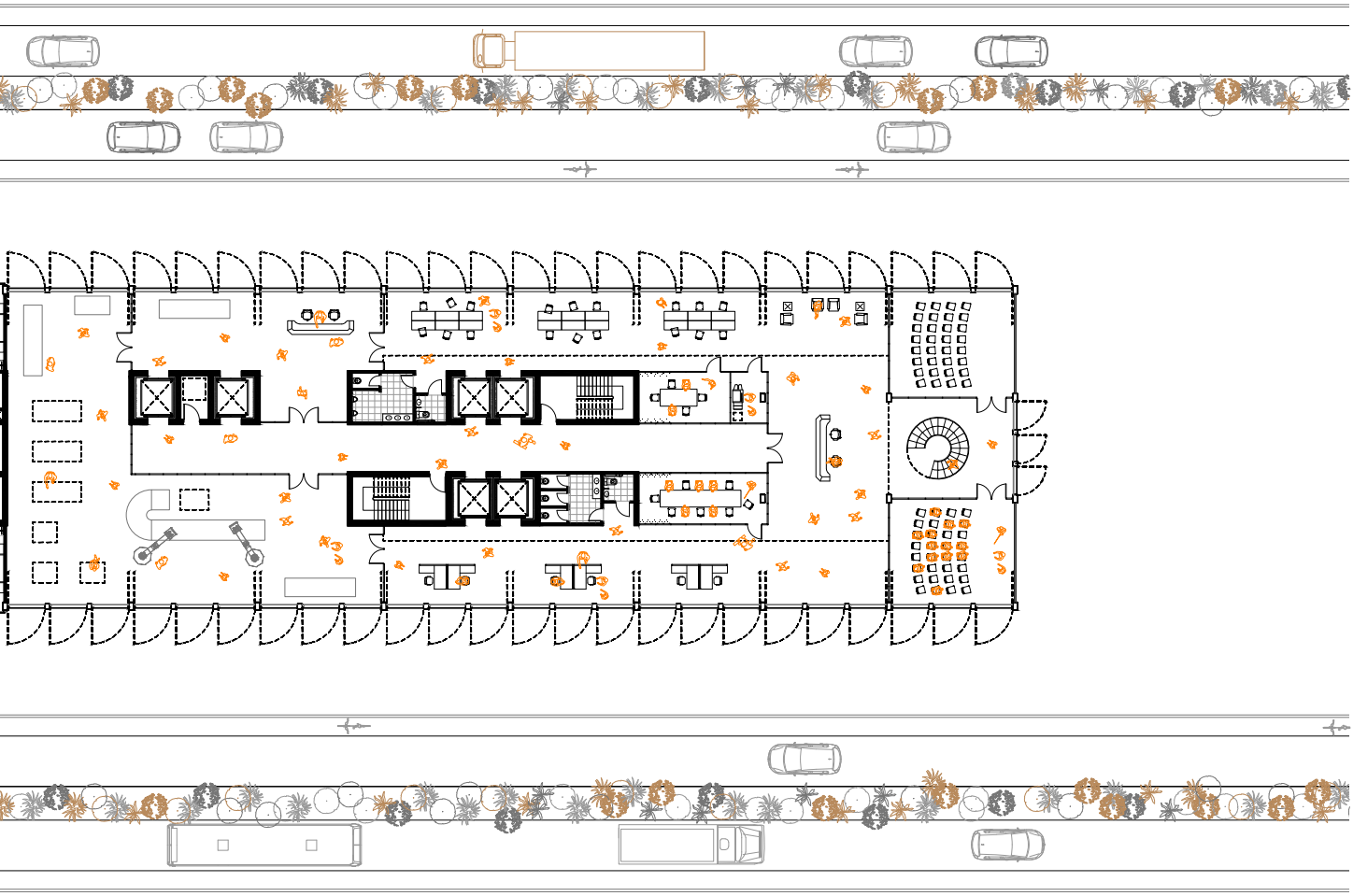
The other side uses a clear glass envelope where its steel profiles dominantly take their place in contrast to its hidden family behind the polycarbonate skin. This side uses dynamic sun shading devices which can rotate and be adjusted to the sun setting. By allowing these devices to rotate to and away from the façade – they in turn create a dynamic façade addressing the same offset as the polycarbonate double skin façade.



EXPLODED 3D PROTOTYPE 1: THE MODERN REPLICA. HANNAH VANNUT



PROTOTYPE 1: STANDARD FLOOR PLAN (+7) - MANUFACTURING - OFFICES



PROTOTYPE 1: STANDARD FLOOR PLAN (+7) - WORK SPACE - OFFICES - CO WORKING

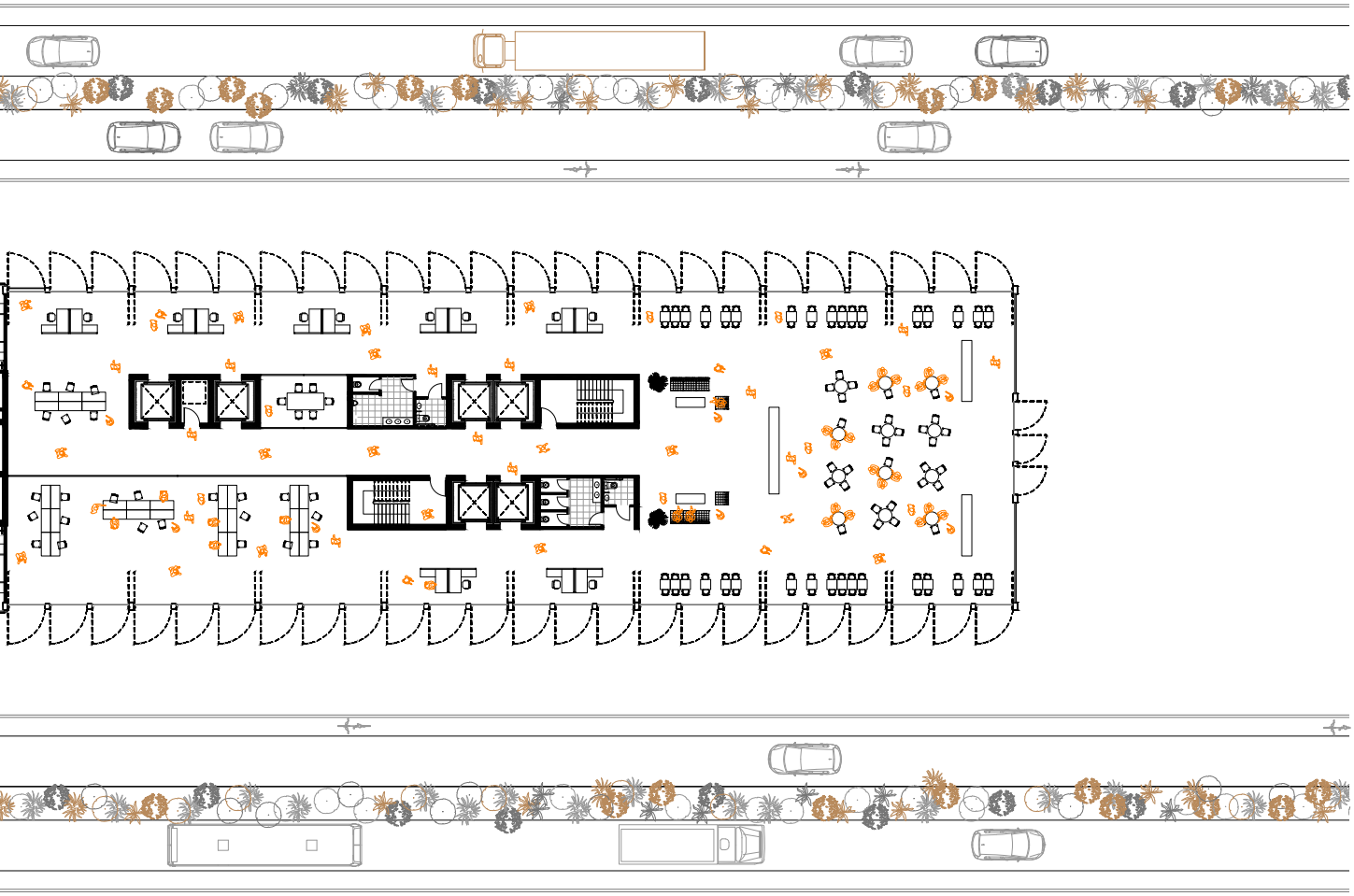


IMAGE: RENDER INTERIOR OFFICE PROTOTYPE 1&2 MODERN MONADNOCK BUILDING. . VANNUT HANNAH

3.2.2.2 Prototype 2: The Alternate Modern Replica

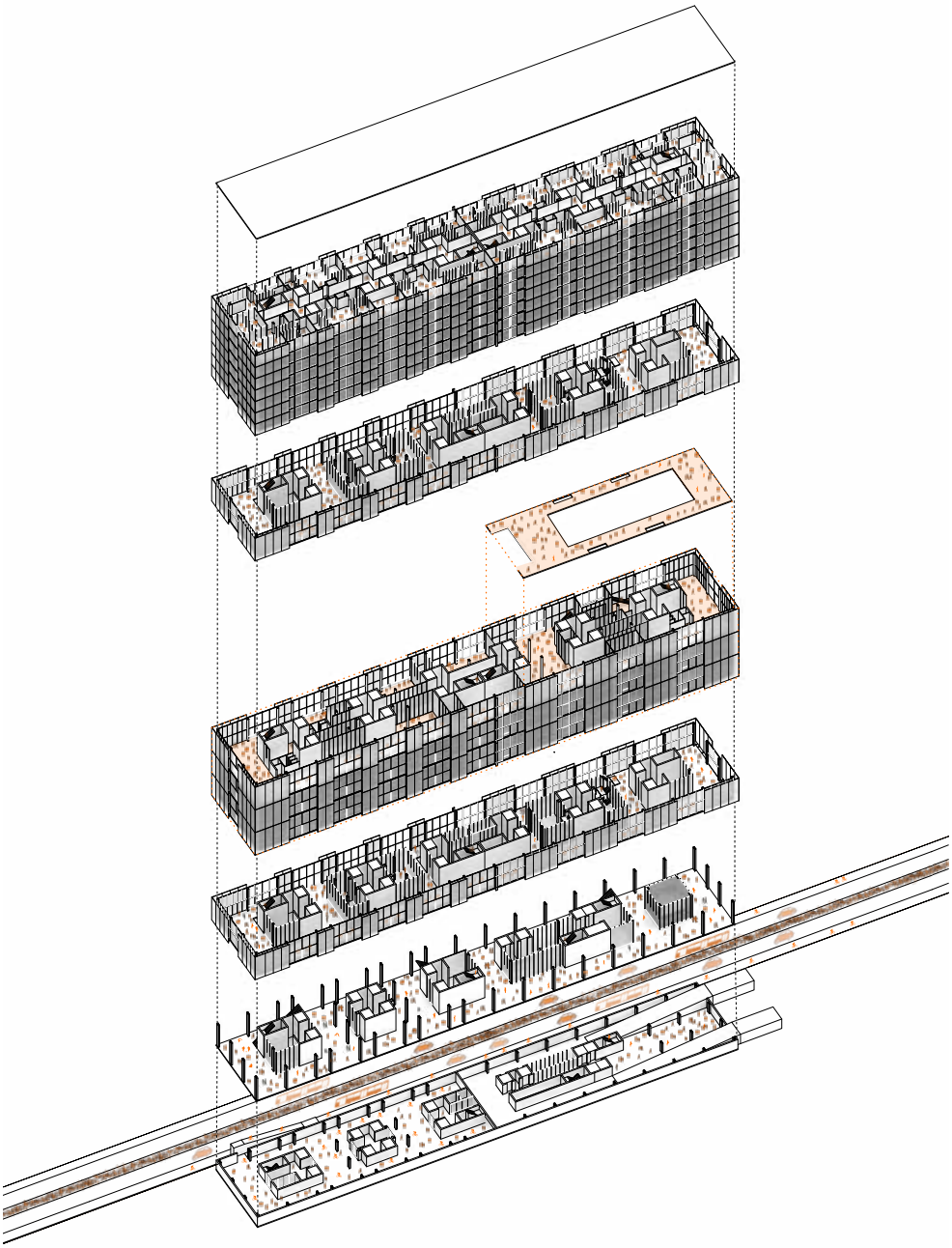
The second prototype is very much alike to the first prototype but divides the building in two in a horizontal manner.

The first few levels hold the same functions, namely workshop spaces and manufacturing spaces, but in the middle of the building a shift happens and another focus starts: residential zoning.

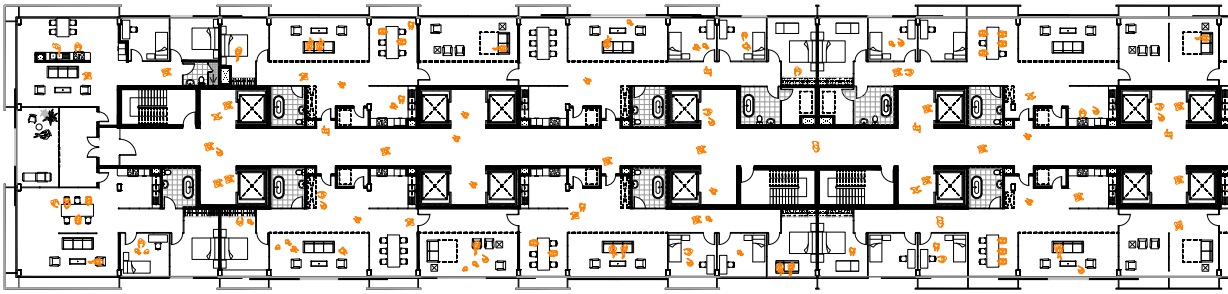
In this prototype the façade only portrays one image, either illustrating the double skin façade with the polycarbonate outer skin or the simple glass façade with visible steel profiles and sun shading devices.

This means the horizontal divide is only felt from the inside of the building.

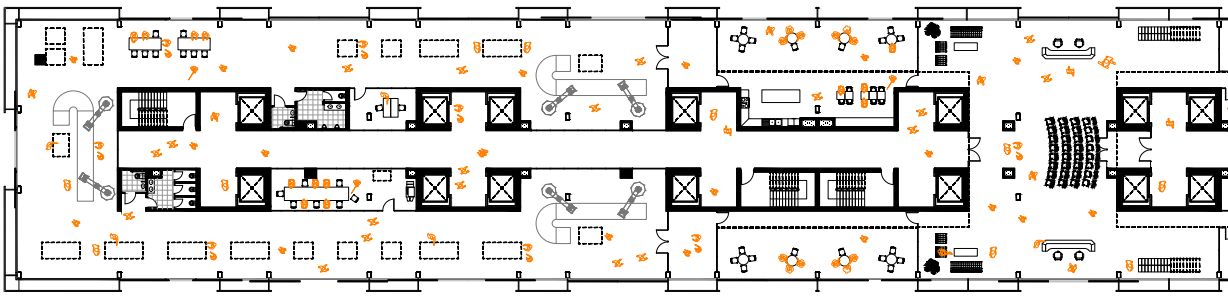
Other than these elements, the building plan remains the same with the same structure and build up.



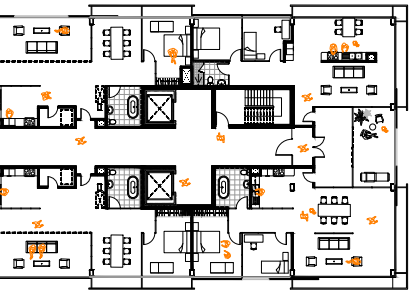
EXPLODED 3D PROTOTYPE 2: THE ALTERNATE MODERN REPLICA. HANNAH VANNUT

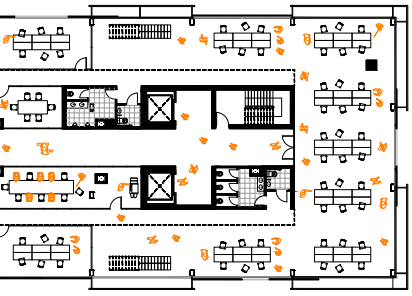


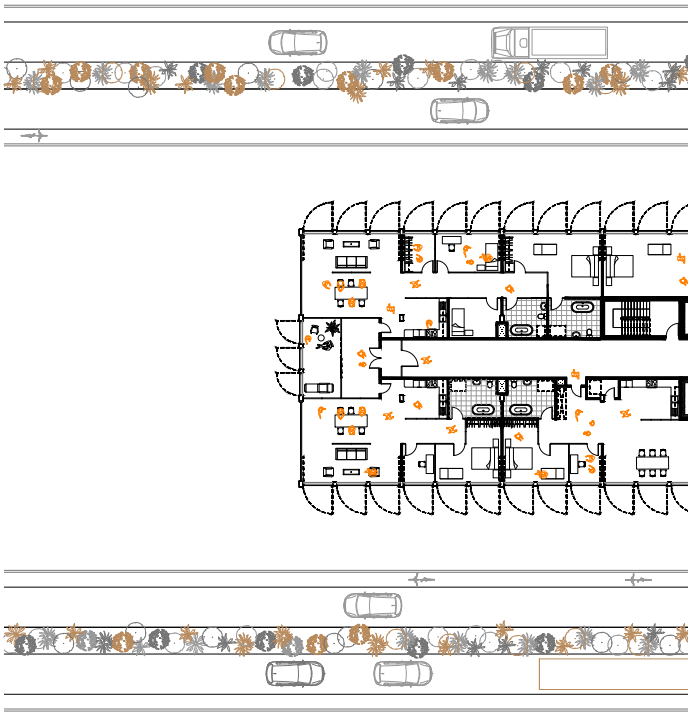
PROTOTYPE 2: STANDARD RESIDENTIAL FLOOR PLAN - VERSION 1



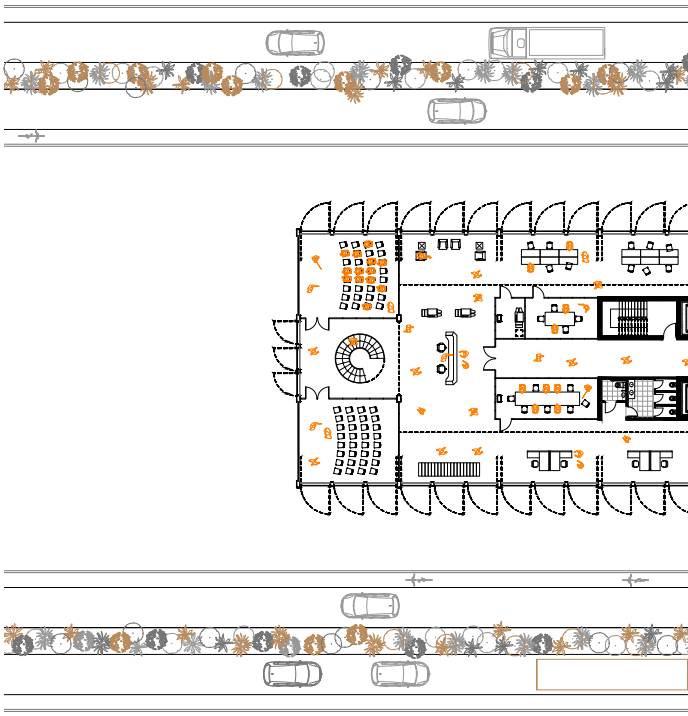
PROTOTYPE 2: STANDARD WORK SPACE - INDUSTRIAL FLOOR PLAN - VERSION 1



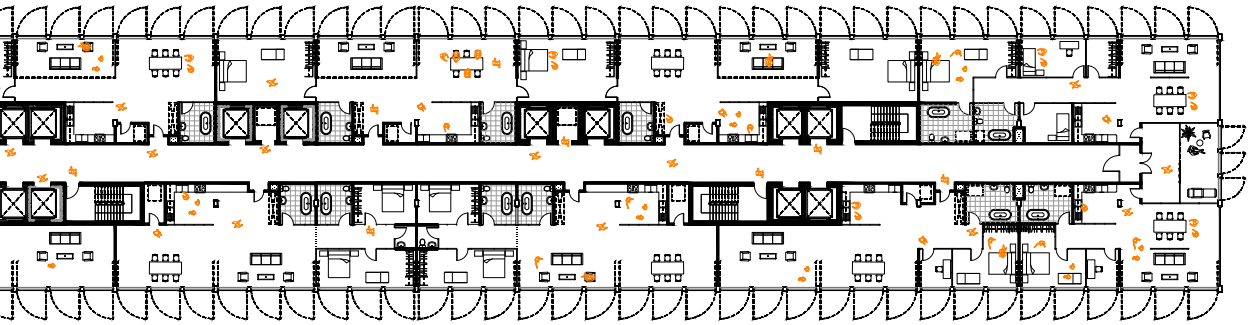




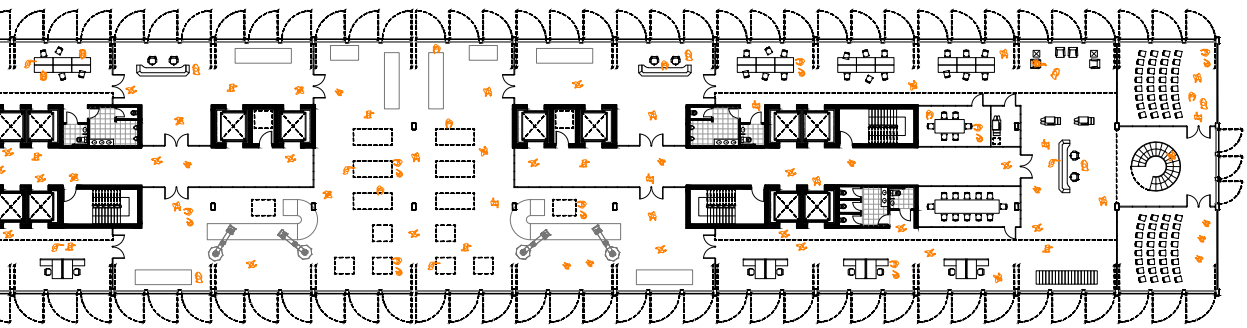
PROTOTYPE 2: STANDARD RESIDENTIAL FLOOR



PROTOTYPE 2: STANDARD WORK SPACE - INDU



R PLAN - VERSION 2



STRIAL FLOOR PLAN - VERSION 2

IMAGE: RENDER INTERIOR APARTMENT PROTOTYPE 1&2 MODERN MONADNOCK BUILDING. VANNUT HANNAH

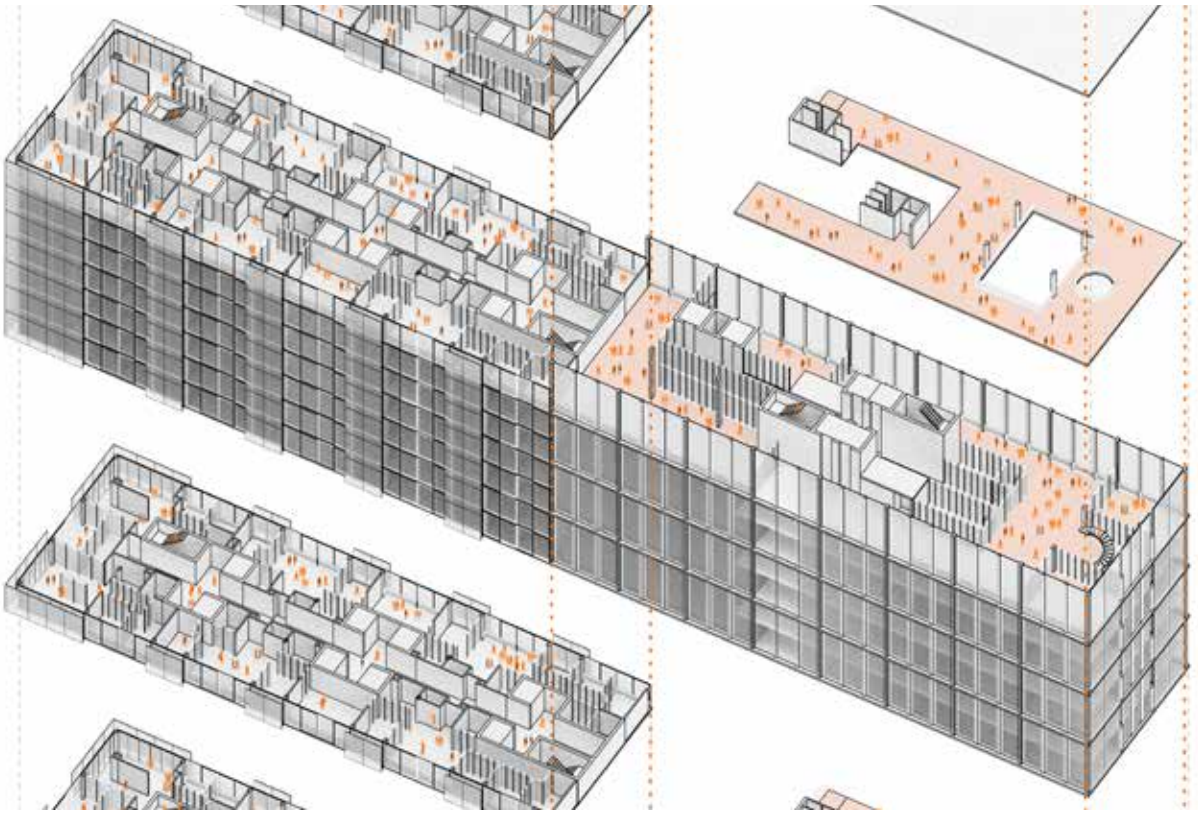


IMAGE: ZOOM IN EXPLODED VIEW PROTOTYPE 1. VANNUT HANNAH

CONCLUSIONS

Two prototypes emerge from this study: both using the same structure, namely a steel-frame structure. The difference between the two is the way the building is perceived as two entities.

The first prototype divides the building in a vertical manner, just like the original Monadnock. Once again, the façade shows us two skins of the building which reflect the interior shift between the two halves: a residential half and an industrial half. This prototype also respects the original structural rhythms of both sides of the Monadnock.

The second prototype divides the building in half in a horizontal manner. Here the façade illustrates one image, meaning the divide isn't visible from the outside. In the second prototype the division is only felt from the inside-out: a shift in functions. The bottom half includes public space, industrial spaces and work spaces, whilst the top half is strictly used as residential zones. Since this prototype uses one façade, it uses one structural rhythm, meaning only one of the two original structural rhythms are present in this design.

My personal preference goes to the first prototype. The main reason being to preserve the key elements of the original Monadnock Building. The visibility of the functional divide from the outside by using two façades reflects not only the interior shift of the building, but also respects the original design from the 19th century. The first prototype maintains more of the original Monadnock's grammar in check by retaining the original structural rhythm of both sides of the building but changes the skin and functionality to suit the needs of the 21st century.

3.3 FROM TIME CAPSULE TO MANUFACTURING STRUCTURE

3.3.1 The Time Capsule

The 19th century Monadnock can be seen as a pristine collector's item. It is a one-of-a-kind, historical building preserved to radiate everything from during its built era.[55]

The building ground floor is strictly used as a retail street, but not just any types of stores. It houses stores strictly reflecting the type of shops from the 19th century. Shops such as: a hat store, a shoe shop/shoe repair store, a barber shop, a florist, clothing stores and more all take us back to the 19th century.[56] The point of these stores was to grasp the authenticity of shops and retail from then, when men went to work and would be able to quickly stop by the barber and the florist on the way home or during lunch.

Above this retail street the Monadnock is a full-time office building, housing mainly attorneys, electricians, banks and railroad companies.[57] This counts approximately 1600 offices with areas going from 23 m2 to 560 m2 and due to its flexible structure, allows companies to grow without having to relocate.

55 ROBERT SOMOL. ARCHITECTURAL THEORIST, CURRENT DIRECTOR OF THE SCHOOL OF ARCHITECTURE AT THE UNIVERSITY OF ILLINOIS AT CHICAGO (U.I.C.).

56 THE MONADNOCK BUILDING. OFFICE OF THE BUILDING.

57 CHICAGOLOGY. CHICAGO TRIBUNE. FEBRUARY 1896.

IMAGE: OUTSIDE GROUND FLOOR MONADNOCK. CHICAGO. ILLINOIS.


S Federal St
SOUTH LOOP
SELF
PARK
318 SOUTH FEDERAL
BARBER SHOP

3.3.2 The Manufacturing Monadnock

Today, we must look at what functions are needed in the city. As section 2.2 of this dissertation sketches an image of industry, what it used to be, what it has become and the return to the city, the question remains, how this can happen and where.

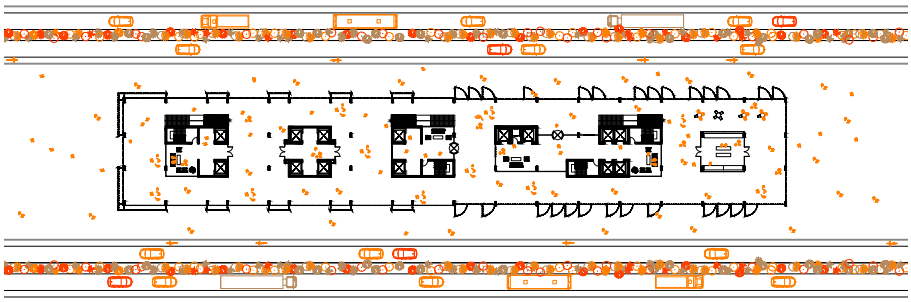
The city has turned into a place of consumption without production – and that is a problem. It is crucial that manufacturing is given a place in the contemporary city, alongside residential, retail and recreational spaces.

The new Monadnock prototypes from this dissertation are designed as to provide the returning manufacturing companies a space alongside other functions and services of the city.

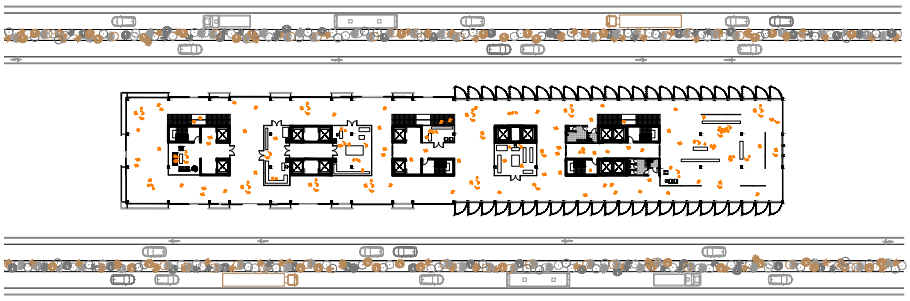
Prototype 1: The Modern Replica and prototype 2: The Alternate Modern Replica, show how residential and manufacturing/industry can work next to each other in vertical or horizontal manner together with other work related functions such as co-working spaces, offices and workforce development programs, used as a middleman to connect the private industrial companies to the public.

The ground floor and first floor of both prototypes are reserved for public space, housing cafes, stores and open spaces for its residents and workers of the area.

In contrast to the original Monadnock the contemporary Monadnock literally becomes a retail street. The building is set on its columns, raising it a full seven meters from the ground level creating a covered, outdoor public space in a very densely built area. This way the ground floor remains a permeable public area with entrances to the building on top in the center.



PT 1 & 2: STANDARD GROUND FLOOR PLAN: FULLY ACCESSIBLE



PT 1 & 2: STANDARD FLOOR PLAN (+1) - PUBLIC SPACE

3.4 NEIGHBORHOOD SCALE - REZKOVILLE

3.4.1 Rezkoville a non-place

A specific site was decided on as a starting point for the dissertation, namely: Rezkoville. Rezkoville is situated just South of the Loop, running alongside the East bank of the river, in Chicago, Illinois. The size of this vacant piece of land is approximately 25 hectares, making it big enough to become a new neighborhood in Chicago's South Loop community.

Rezkoville is often referred to as a brown field, a barren ruin, a non-place, despite its history. This 25-hectare field used to be one of the many train yards of Chicago, which at the time was an important transit depot and one the fastest growing cities of the world. It remained like this until the late 1960's when the yard was abruptly abandoned after a mass transit decline in the age of the automobile, also resulting in the demolishment of Grand Central Station, just North of the site.

Due to the abandonment of the site, wildlife took over, gradually transforming it into an accidental nature preserve with tall prairie grass, trees and wildflowers growing uncontrollably along the dirt paths. Rezkoville at the time was said to be perceived as 'an awkward place' in the shadow of the city; a place no one went; no one knew of until one day you could find yourself standing right in front of it.[58] The whole lot was eventually demolished because of its uncontrollable and disorderly magnification. The forest was bulldozed, this included ejecting fifty homeless people from their homes, who were spread out and hidden in the wildlife. After this, the site continued to be neglected, allowing nature to take its course for the second time, transforming it into its original state of prairie land.[59]

58 SMITH RYAN. CHICAGO READER. ON THE TRAIL OF DISCOVERY - IN REZKOVILLE.

59 DEGRANE LLOYD & LYDERSEN KARI. CHICAGO READER. THE RESIDENTS OF REZKOVILLE'S TENT CITY BATTLE THE ELEMENTS - AND PERSONAL DEMONS.

Chicago currently counts 77 neighborhoods, with Rezkoville on the verge of becoming the 78th neighborhood. Multiple plans to re-brand the site as a large mixed-use development have been in motion for years.

IMAGE: CURRENT STATE OF REZKOVILLE. HANNAH VANNUT

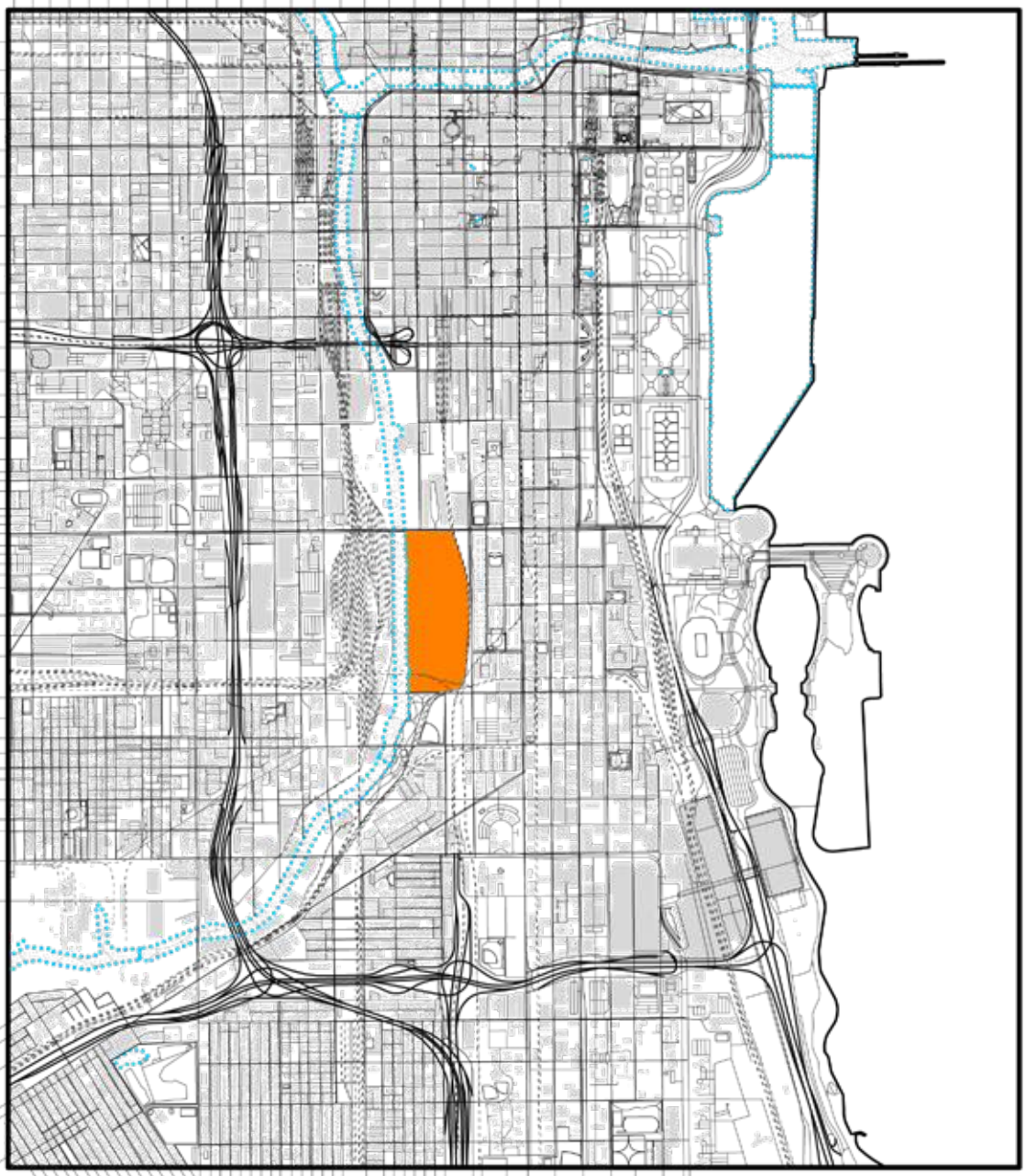


IMAGE: REZKOVILLE. HANNAH VANNUT

3.4.2 Re-implementing the grid

Chicago has its own original grid which is portrayed throughout the whole city but seemingly stops in certain parts of the city – particularly post-industrial zones such as Rezkoville.

To commence filling such a vacant land history and current ‘lines’ were implemented on the site.

Chicago’s historical Indian trails, the Burnham Plan and Chicago’s current grid were taken into account.

As 2.1.2 From Historic Lines to Contemporary Trails explains what and how these lines were once/or are still important to the city, this chapter will look deeper into its actual relevance for the project.

Firstly, the Indian Trails. Once these trails have been overlaid onto the general map of present Chicago, a closer look can be taken to Rezkoville. There we see one, particular trail ran straight through the site, crossed the river and connected with other trails further East and West of Rezkoville.

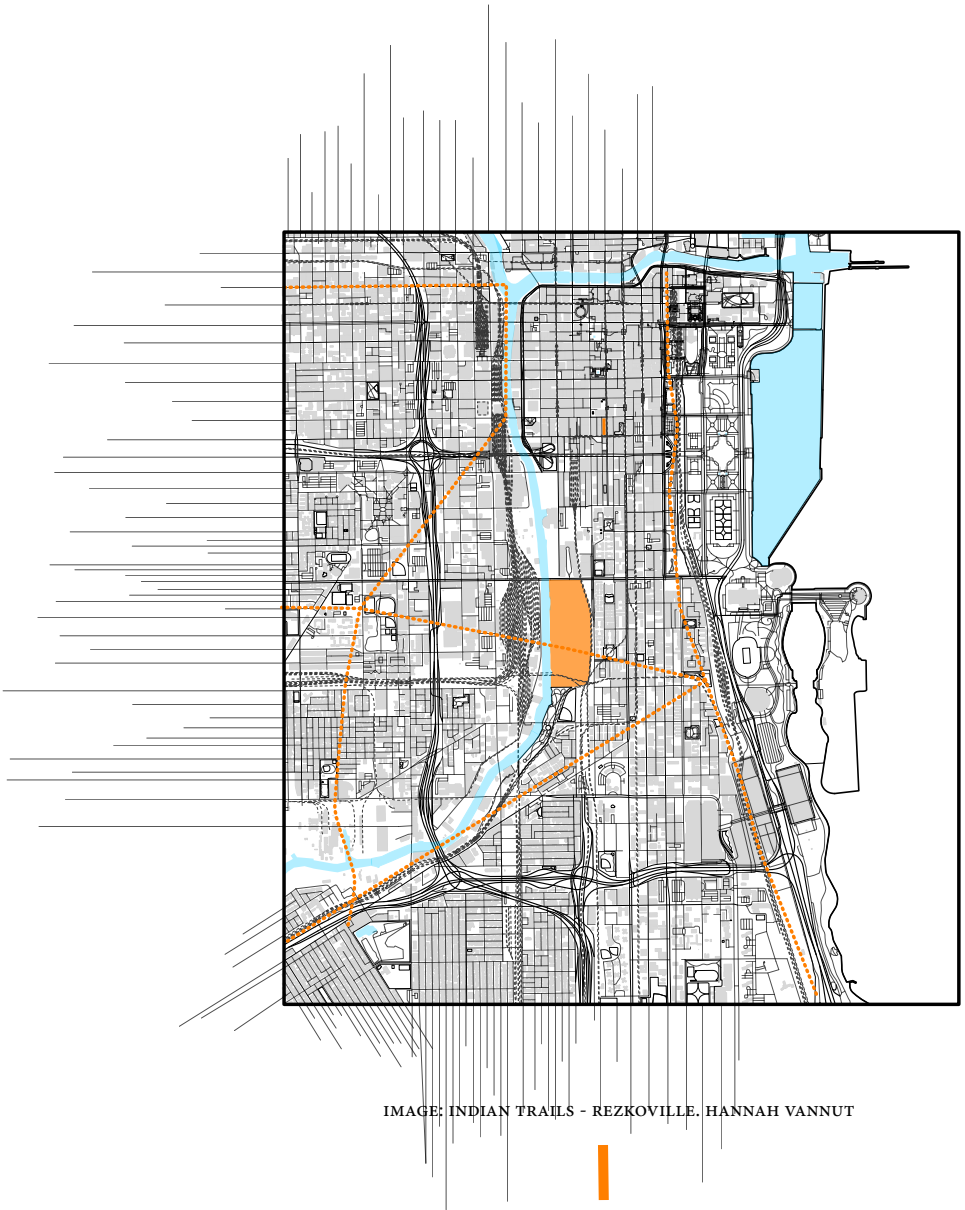


IMAGE: INDIAN TRAILS - REZKOVILLE. HANNAH VANNUT

Secondly, the Burnham Plan. Also here, one particular line – proposed street – runs through the site making its way from the lower south-eastern corner to the upper north-western river bank, crosses the river and then connects to other proposed infrastructural lines. As mentioned before, the Burnham Plan wasn't fully implemented in Chicago today – this particular line being one of the diagonal streets which wasn't used in today's contemporary street organization.

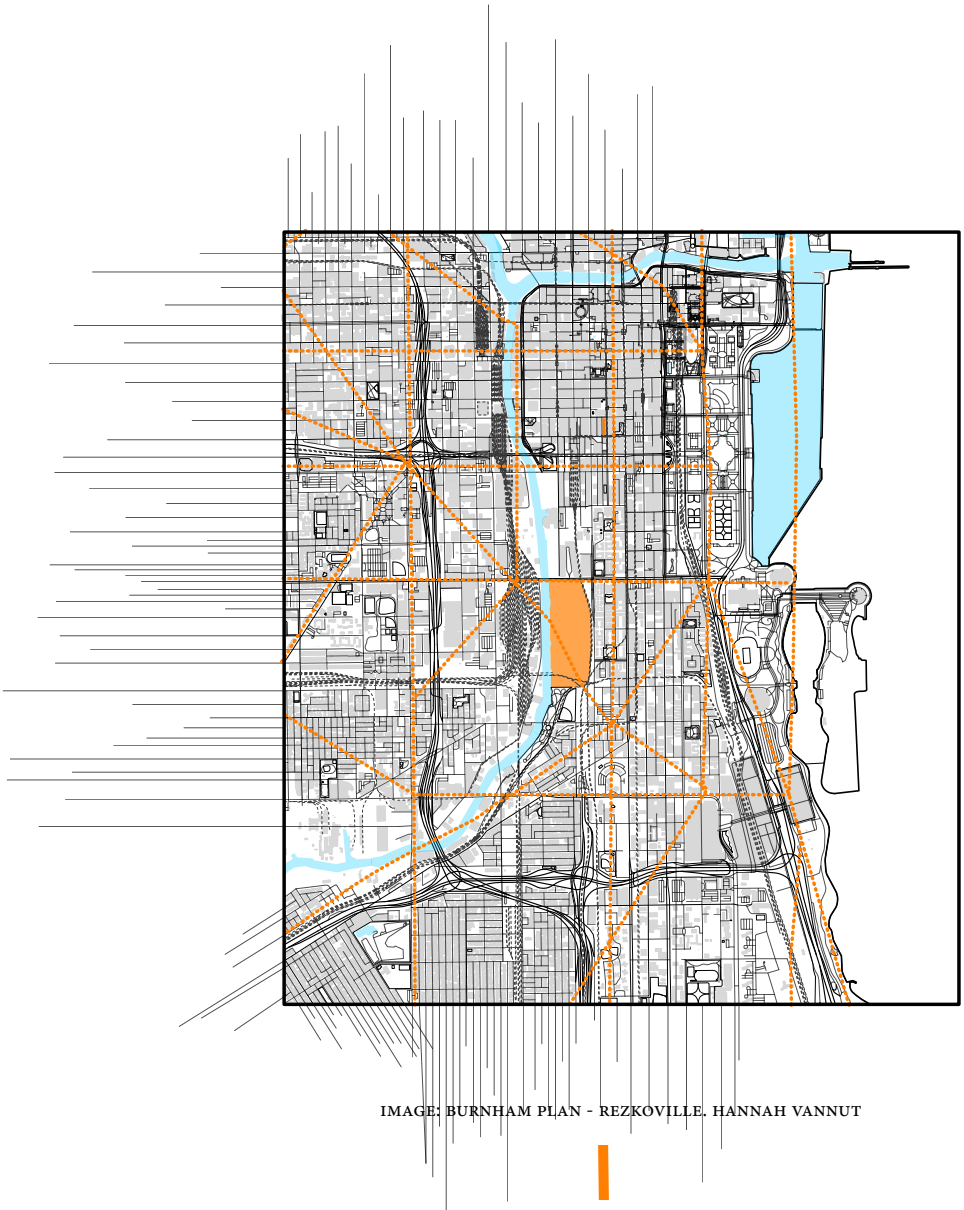


IMAGE: BURNHAM PLAN - REZKOVILLE. HANNAH VANNUT

Lastly, Chicago's grid. The grid has a unique character, wielding city blocks of approximately 200 meters by 100 meters.[60] The grid also encounters a few exceptions: it experiences a rotation to fit infrastructural interruptions, and as mentioned before, it undergoes interruptions due to post-industrial zones causing neglected pieces of land and irregularities in streetscapes. Since nothing runs through Rezkoville but the same streets continue on all sides of the site, we can project the line by connecting the loose ends.

This way all four roads: Wells Street, Wentworth Avenue, 15th street and 14th street are shown on the site as contemporary grid lines.

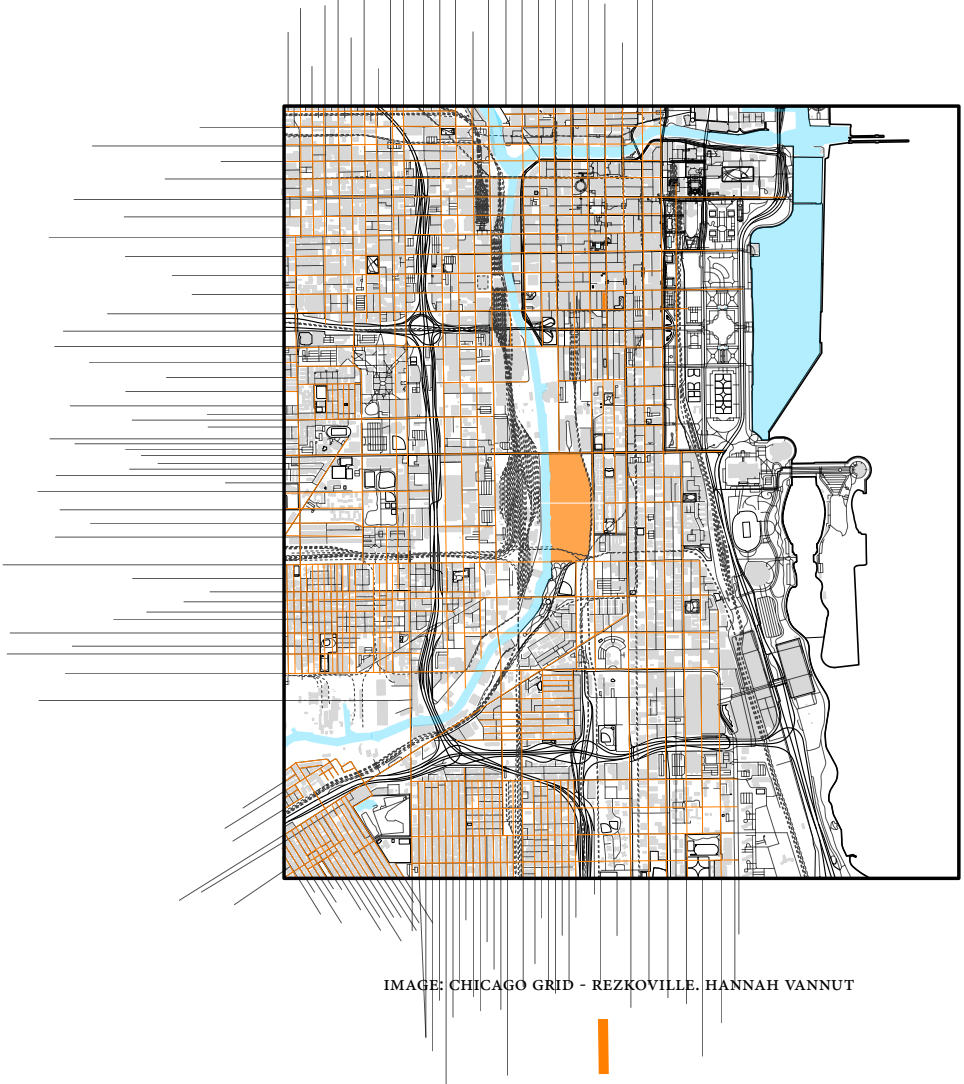


IMAGE: CHICAGO GRID - REZKOVILLE. HANNAH VANNUT

60 ENCYCLOPEDIA OF CHICAGO. ORIGINS OF THE GRID.

3.4.3 Defined Infrastructure

The Monadnock was used as a paradigm to create a modern Manufacturing building fit to support its city and answer to its current needs, but who is to say it can't be more?

This dissertation takes the Monadnock and projects it on the site – for the moment disregarding the current grid projection and historical lines.

When the Monadnock is projected onto the vacant land, using the width of the building as the width of the street, a total of 48 Monadnocks can fit onto the site.

This radical decision enforces a new grid to the site. The buildings define the infrastructure around them. Now that this very present and distinct grid is in front of us we project the historical lines back on the site. This makes the final abstract image of the future living-manufacturing neighborhood.

IMAGE: MONADNOCK BUILDING. CHICAGO. ILLINOIS. HANNAH VANNUT

IMAGE: FIRST MONADNOCK PROJECTION. HANNAH VANNUT

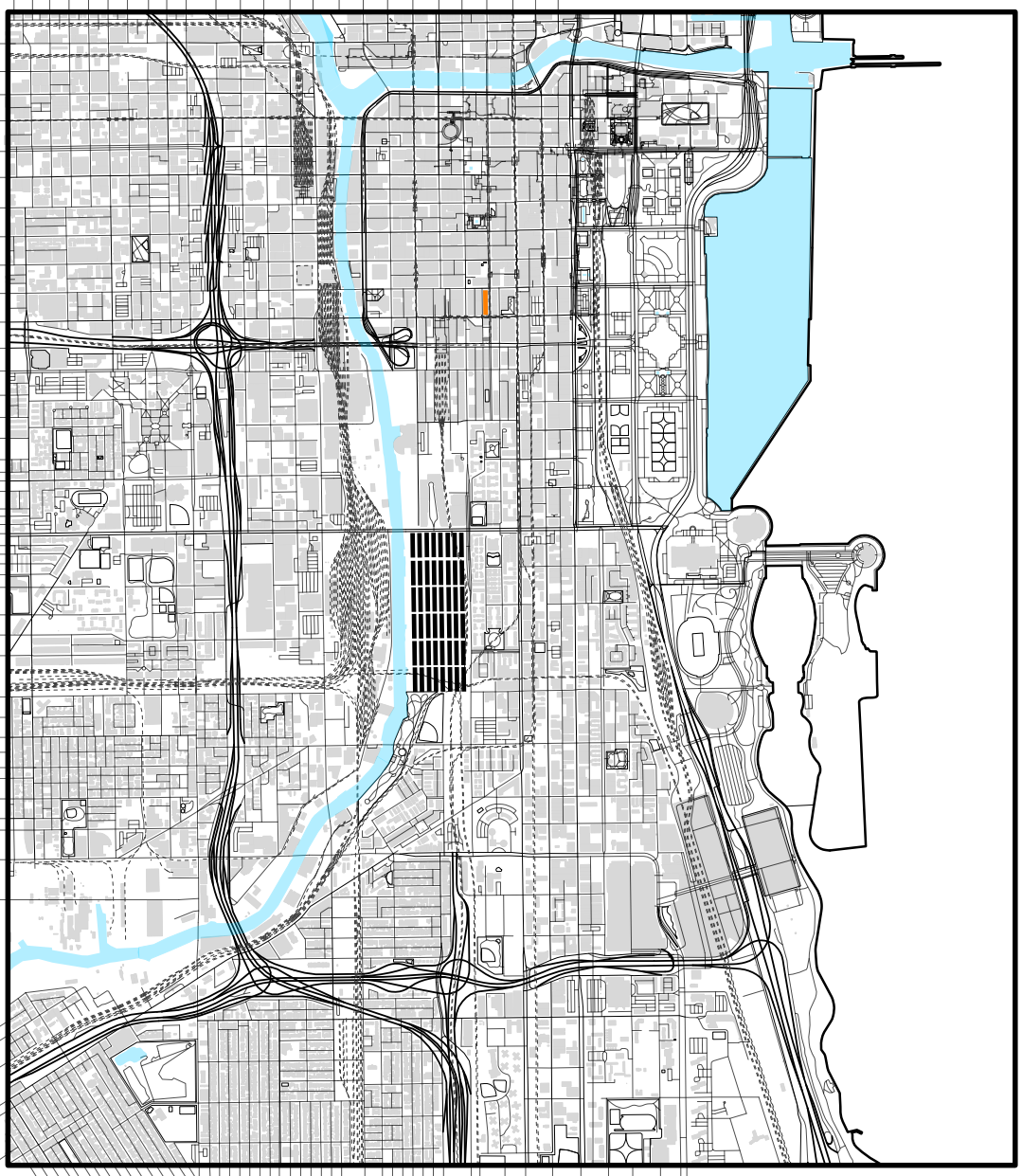
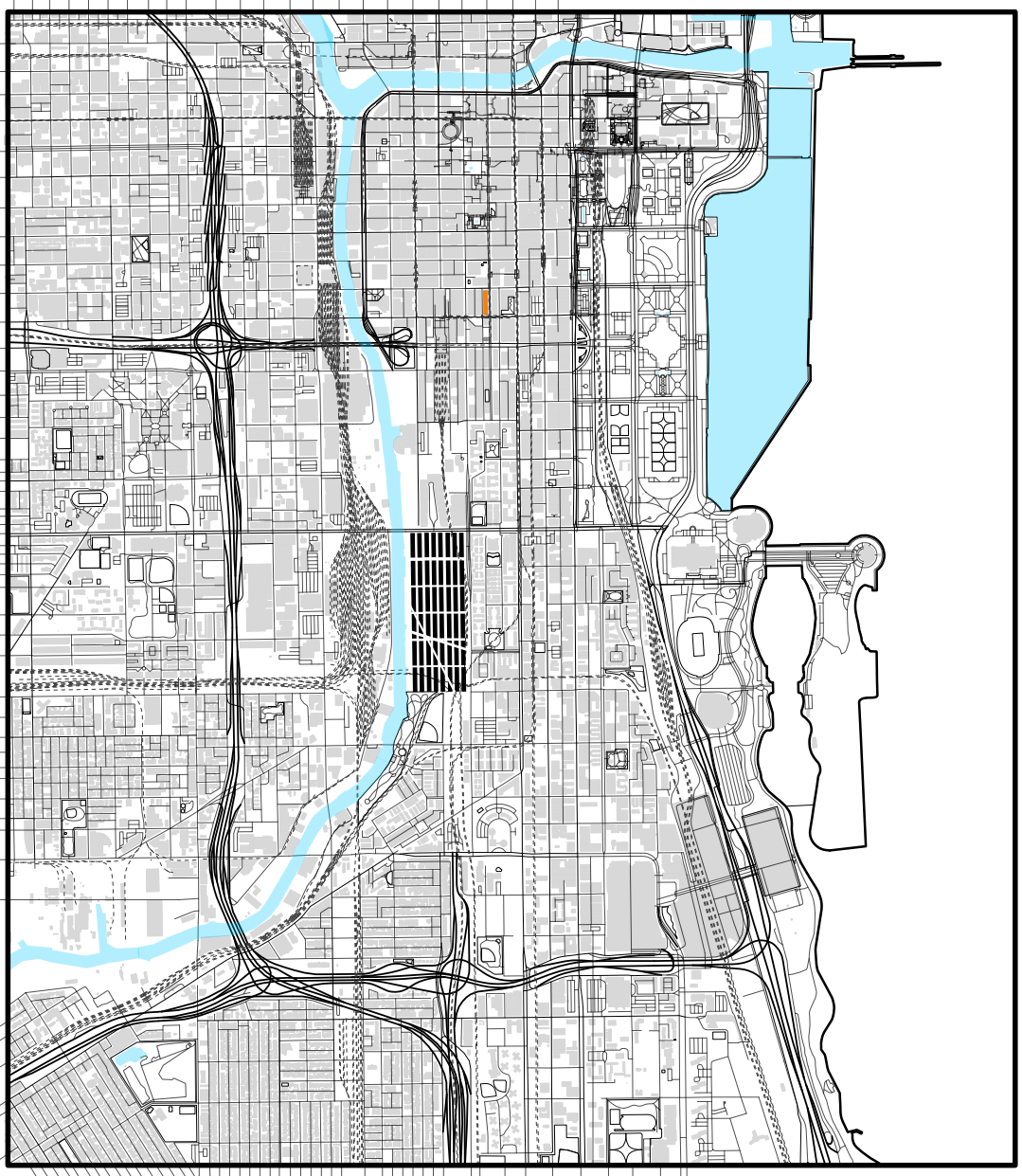


IMAGE: IMPLEMENTATION OF HISTORICAL AND CURRENT LINES. HANNAH VANNUT



3.4.3.1 Proposal One: The Master Plan

By using what I had learned from Paris, and its Haussmann plan I decided to enforce the same regulations here: Haussmann cuts.

Where existing infrastructure ran, the buildings had to fold to allow those to run through, respecting the current situation of the city. This included the train tracks running in the East alongside Clark Street, the tracks in the South forming a border between Rezkoville and Ping Tom Park.

I further created a scheme suggesting where high density, high-rise buildings would take place and where low-rise, low density areas would be.

The proposal was built on the analysis of the surrounding cityscape. In the East, Rezkoville borders a residential area with low rise buildings and low densification rates. The West borders the river and as the rest of Downtown Chicago suggests this should be taken into account. Most of the Central Business District is built right up to the river border but many are undergoing construction to create a public river front for the residents and visitors of the city. The South brings the site to an open public park – Ping Tom Park, which connects to China Town. The area bordering this park should suggest more open space and low density rates.

By implementing this scheme, the projected Monadnock's had to be cut, altered and some removed to fit this scheme. At the end it is hard to still see the Monadnock's form and strong insinuated grid.

This "defragmented" master plan shows a neighborhood which is unidentifiable with the Monadnock, which makes me question why the Monadnock was used in the first place.

IMAGE: DENSIFICATION SCHEME - FUNCTIONAL SCHEME. HANNAH VANNUT

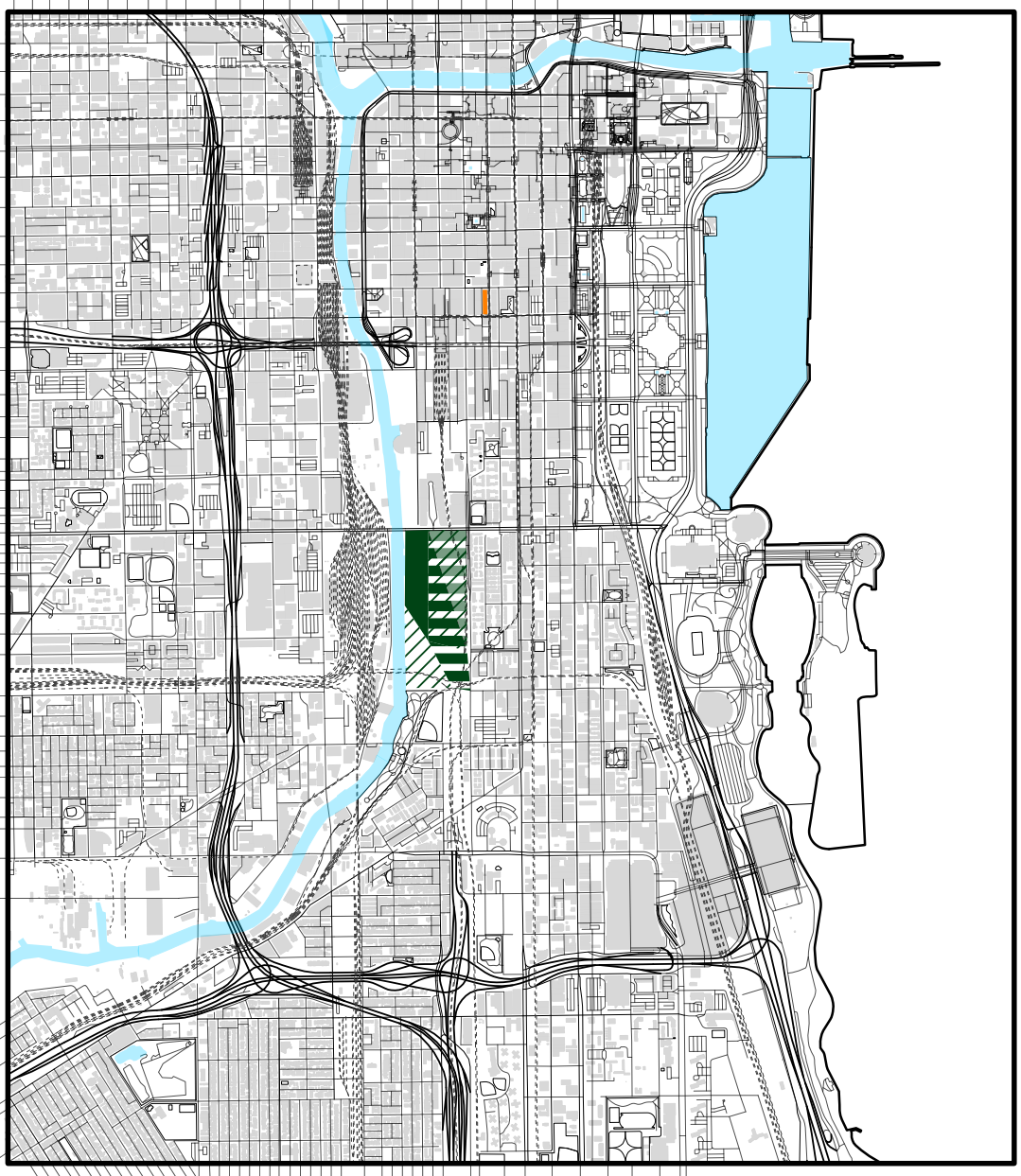
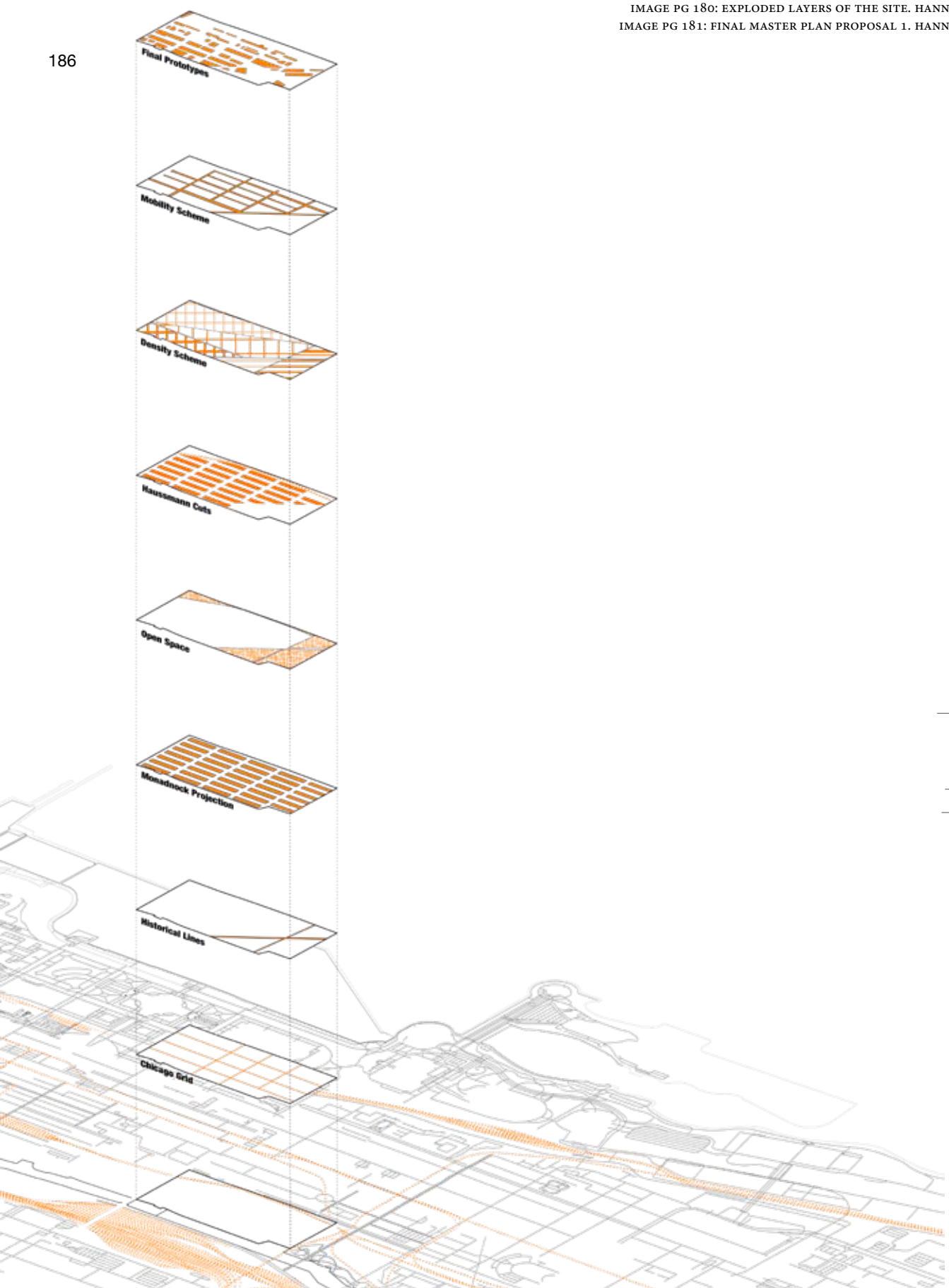
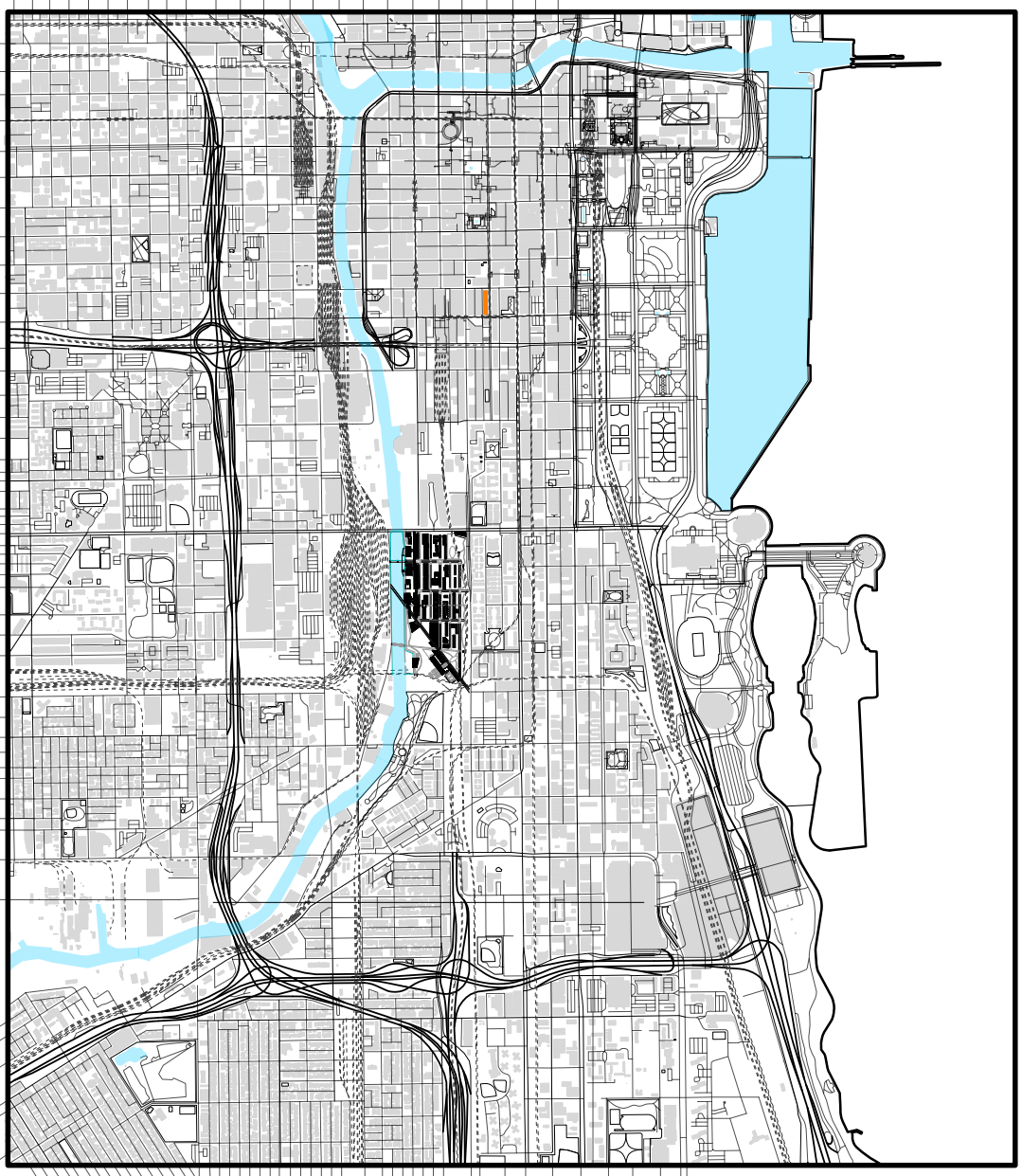


IMAGE PG 180: EXPLODED LAYERS OF THE SITE. HANNAH VANNUT
IMAGE PG 181: FINAL MASTER PLAN PROPOSAL 1. HANNAH VANNUT





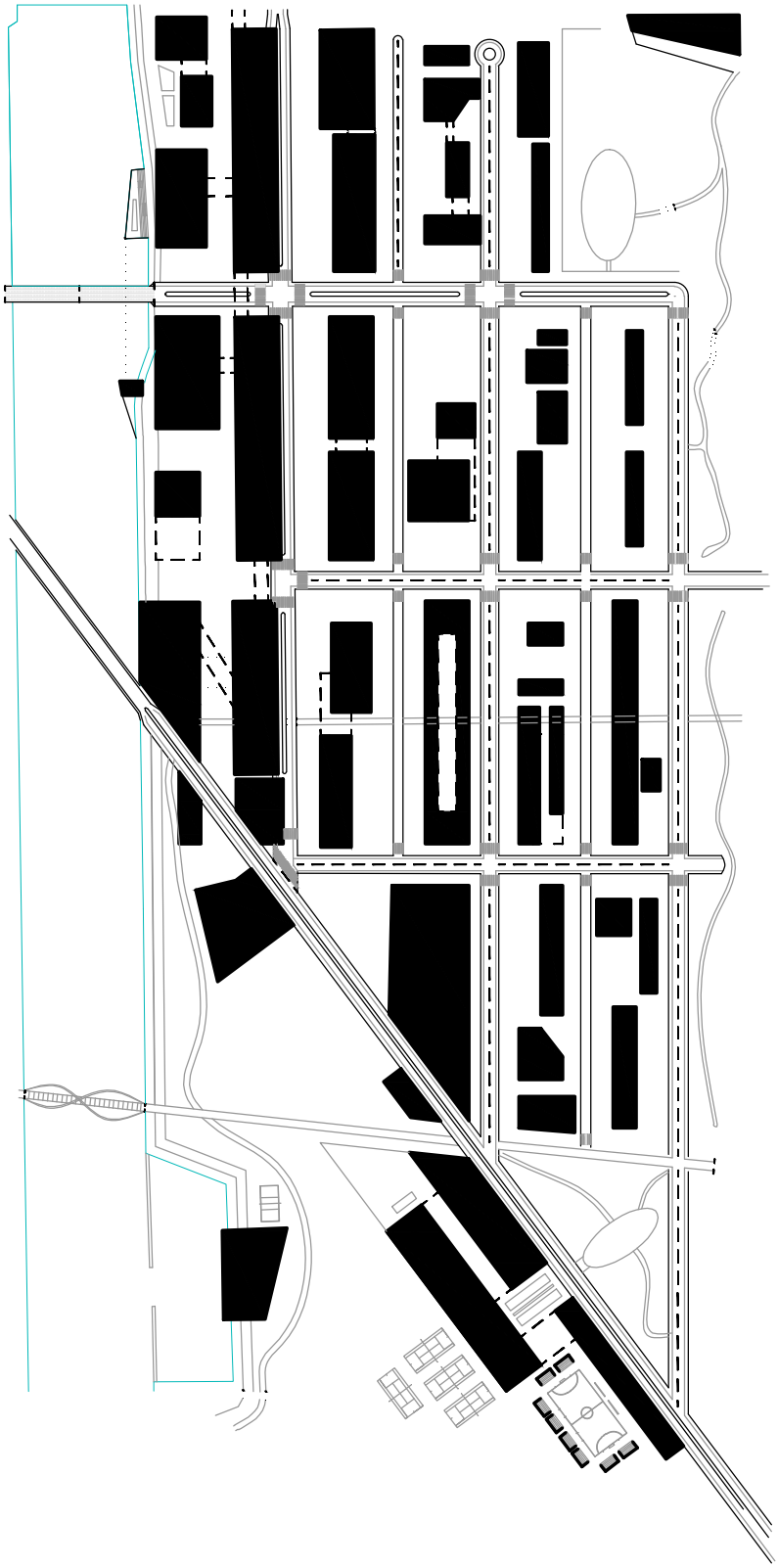


IMAGE: ZOOM MASTER PLAN PROPOSAL 1. HANNAH VANNUT

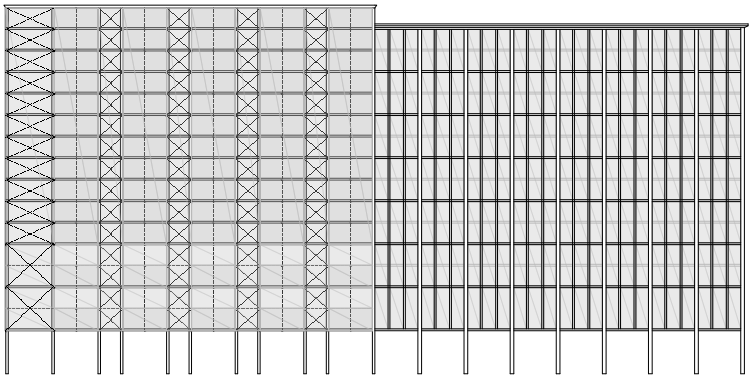


IMAGE: SCHEMATIC FACADE PT 1. HANNAH VANNUT

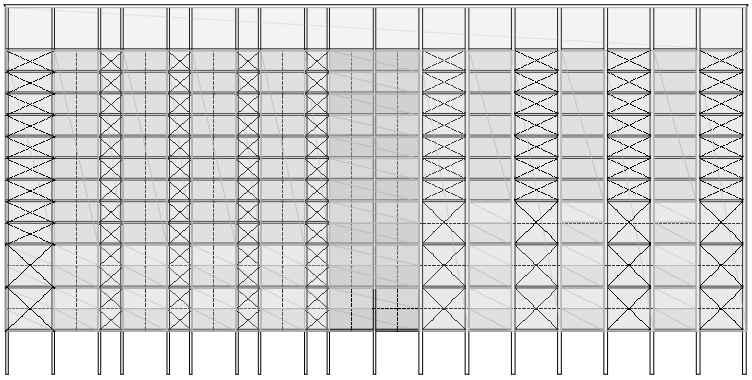


IMAGE: SCHEMATIC FACADE PT 2. HANNAH VANNUT

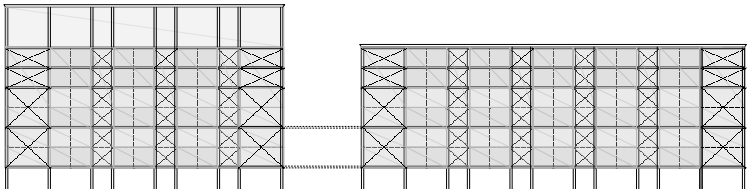


IMAGE: SCHEMATIC FACADE PT 2 - FRAGMENTED. HANNAH VANNUT

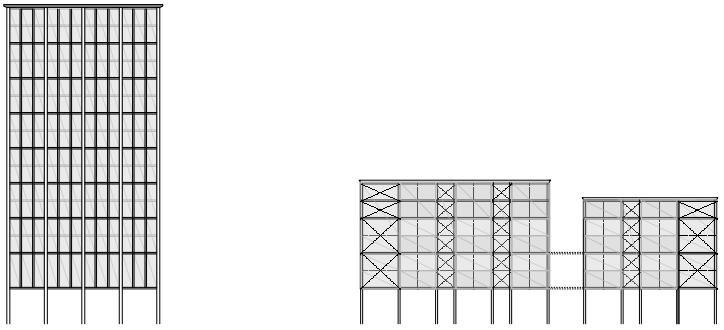


IMAGE: SCHEMATIC FACADE PT 2 - FRAGMENTED. HANNAH VANNUT

3.4.3.2 Proposal Two: : 21st century Hilbersiemer

The final result of the first proposal didn't exceed the expectations that were created in the first place: namely the return of the grid – infrastructure defined by the Monadnock.

As a reaction, I returned to my original abstract plan: the copy-pasted projection of the Monadnock with the historical lines making cuts through the buildings.

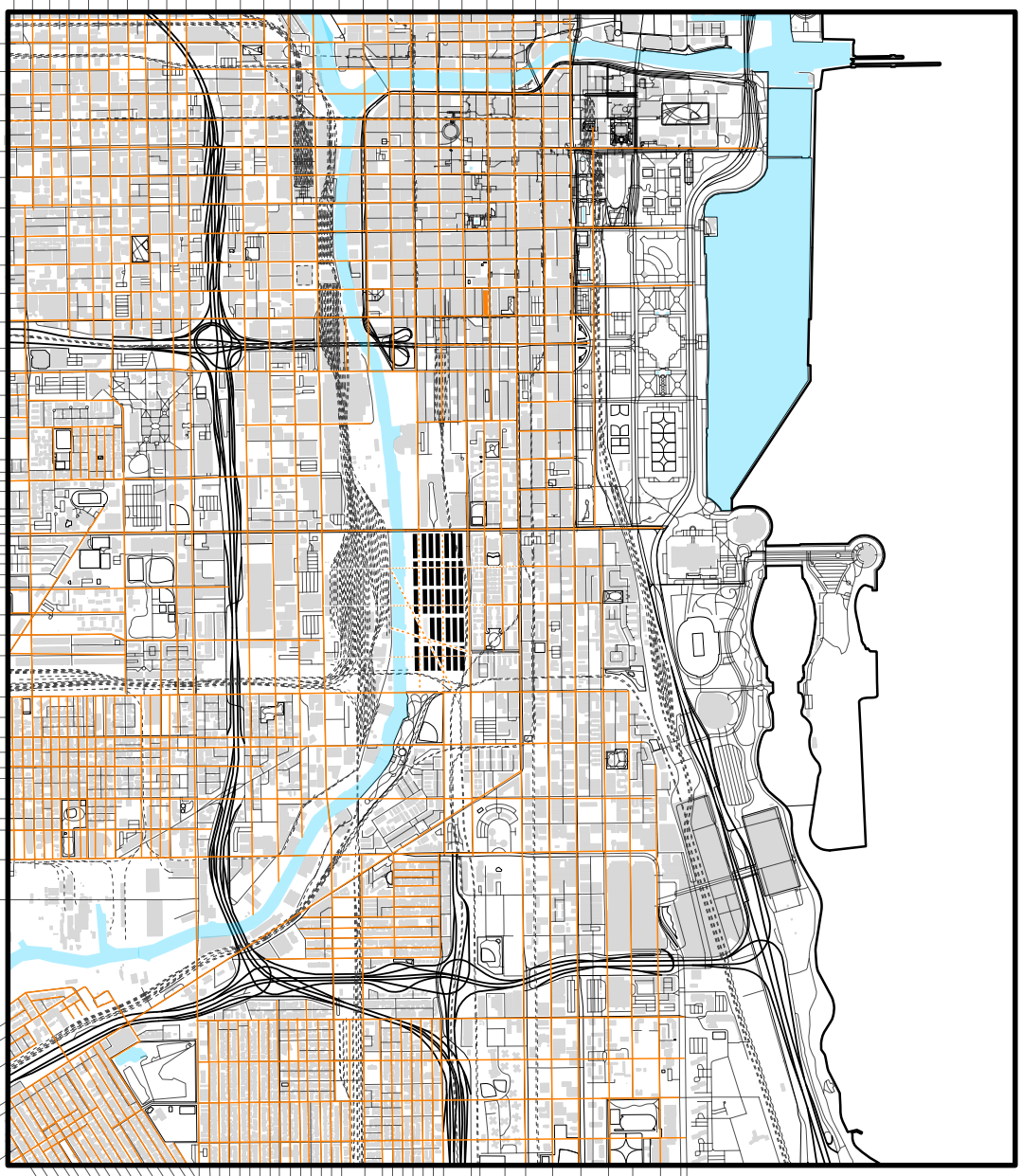
This time, the current grid of Chicago was taken into account. The ends of 14th Street, 15th Street, Wells Street and Wentworth Avenue were connected – allowing for a better connection between the East and West side of the river. Wells Street and Wentworth Avenue became wider streets, seeing as they connected North to South or connect to the Central Business District. 14th Street and 15th Street became less intense cuts seeing as they penetrate and cut two rows of Monadnock buildings in half. The general image of a Monadnock should remain a primary concern.

In this second proposal the last row of Monadnock buildings was removed as to create an area between this dense, abstract grid and its bordering public park (Ping Tom Park).

Respect for the river should be granted in a different way than the rest of Downtown Chicago. Building to the rim of the river has had an impact on the city and its public spaces. Today, the Chicago River Walk has become a main point of interest for the city and should be implemented along the banks of Rezkoville. The column of Monadnock buildings against the bordering river were also removed.

According to Robert Somol and Francesco Marullo (local residents of Chicago), it is important to keep one row of Monadnock buildings in between the river and the new addition to Wells Street. This to avoid creating a second Michigan Avenue.

IMAGE: SECOND MONADNOCK PROJECTION. HANNAH VANNUT



In this second proposal we use the same “density scheme” but use it in a different fashion. This time the scheme represents density in a manner of functions. The changes are therefore not external, such as proposal one, but internal. The more intense the grid, the higher the density, the more manufacturing and residential the buildings are, the less public space will be. Spaces of the scheme that are less intense, are configured by combining manufacturing and residential spaces but granting more access to commercial and potentially public space. The least intense areas of the scheme represent more public, residential and common space (this in the buildings) and less manufacturing spaces and commercial spaces.

It is the intersection of Wells Street and the historical lines that catches the eye. This spot radiates a different vibe than the rest of the abstract grid. It is the center of the design where the Modern Monadnock, the Burnham Plan, the Indian Trail and Chicago infrastructure come together. To magnify this illusion on this specific spot of Rezkoville, one Monadnock building was removed. The Monadnock just North of the intersection – which experienced the most cuts from the previously mentioned historical lines and Chicago grid. Since the design for the Modern Monadnock embraces a permeable ground floor it acts as a covered (outdoor) space, another hot topic of Chicago today. By taking away this one specific Monadnock, North of the intersection, an exception is created, not only as a vacant plot but also as the only uncovered, public open space in between the endless Manufacturing Monadnocks.

The Loop

Chicago River Walk

Wells Street

Industrial Train Depot

Chicago River

Indian Trail Implementation

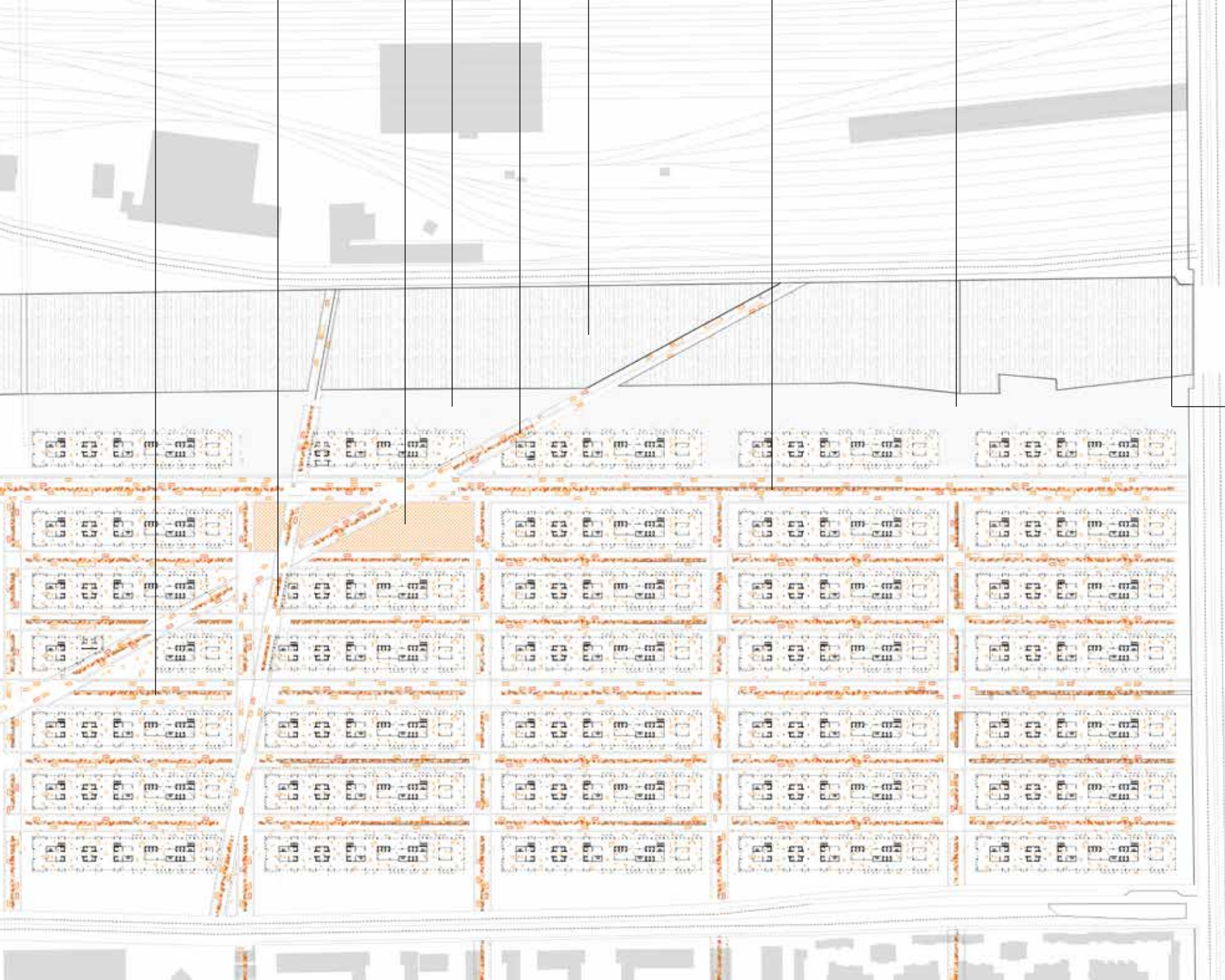
Chicago River Walk

Exception in the grid = public space

Burnham Plan Implementation

Wentworth Avenue

IMAGE: STREET SCAPE. MONADNOCK PROJECTION HANNAH VANNUT



3.4.3.3 *The Vertical City* (Ludwig Hilbersiemer)

The Vertical City, created by Ludwig Hilberseimer in 1924, is illustrated by a famous graphite drawing. Unknowing of the existence of this project, I created a modern interpretation of this design.

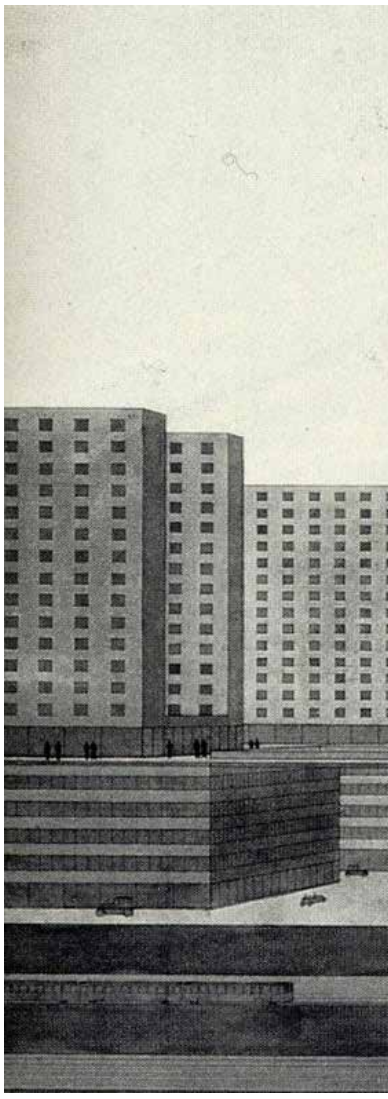
The Vertical City, illustrates a cross-section of city with no center, merely endless identical blocks. The drawing represents a city where the people live above the city's industry.

The whole image is divided into layers: the bottom layer representing industry.

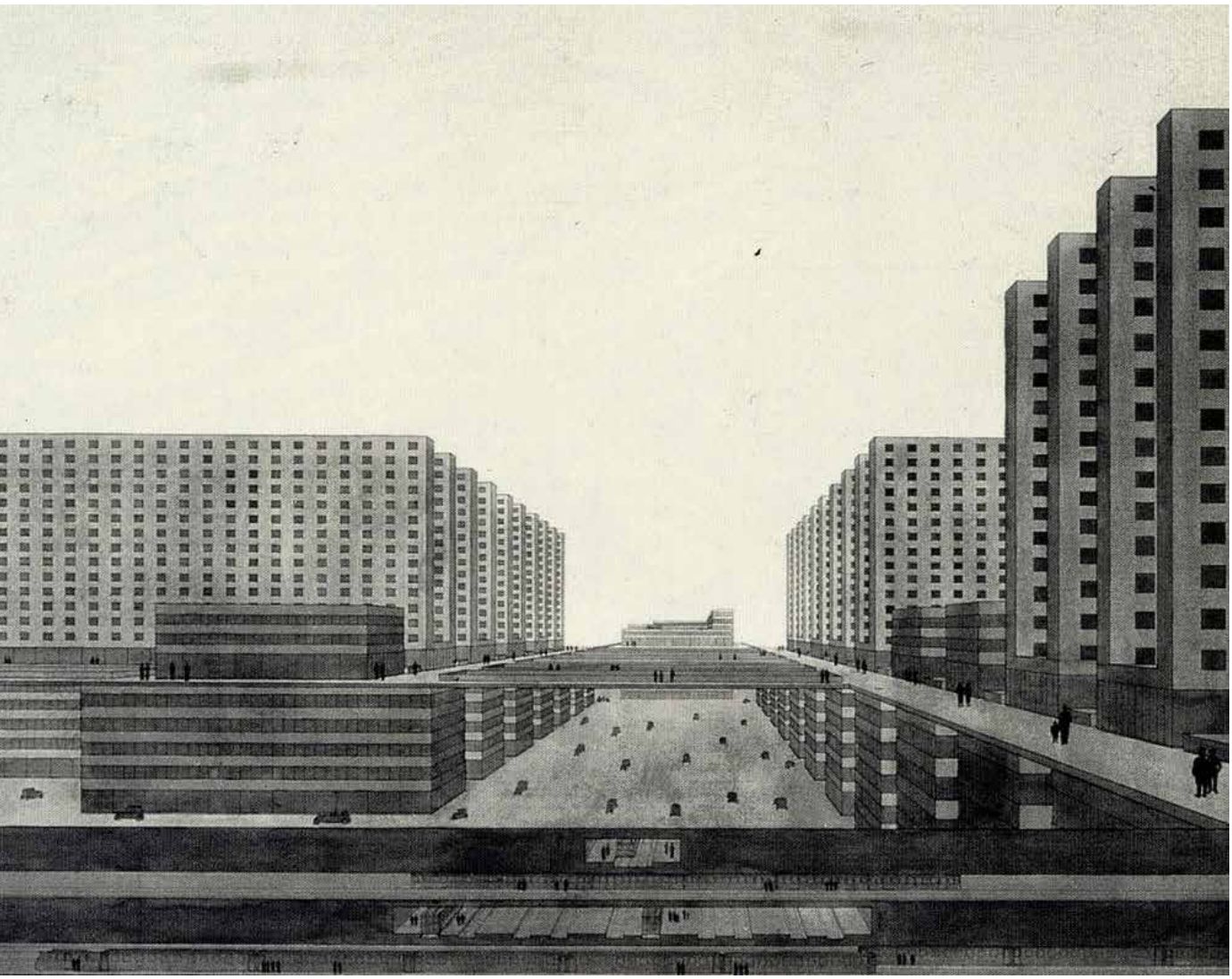
The layer above that represents the automobile slab. This layer illustrates how cars travel in uniform through the city, with no car lane markers or traffic signs and not a single human in sight. It is unclear where the cars go after they reach their destination since there are no parking spaces or driveways. Even the buildings in this layer consist of a different appearance than the rest of its body in the upper layers.

The highest layer of the city consists of identical high rise buildings. The higher one gets in the drawing the more they are exposed to light and air, whereas the lower layers are entirely or extremely cut off from natural daylight or fresh air.[61]

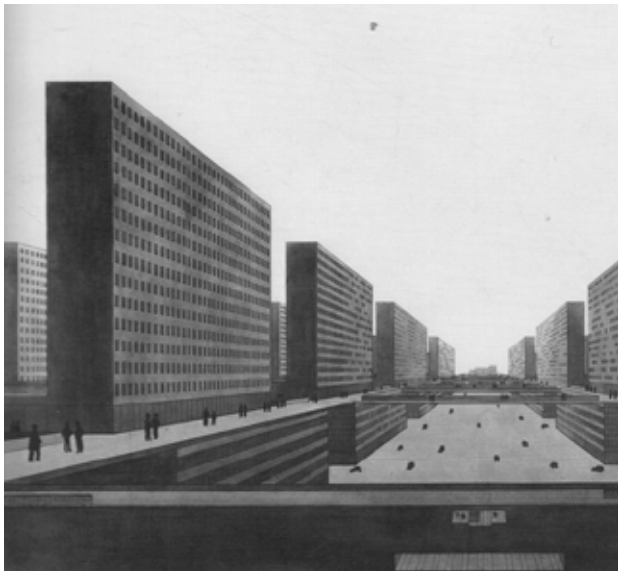
After the collapse during the 19th century, the fragmented grid was produced of the contemporary city. A discontinuity of urban grids starts to form, leading to exterior changes of the urban condition. Hilberseimer is suggested to be a prime theorist in the concept of the Ladder, the linear city (for more information see appendix: *Albert Pope: Ladders*).



61 BAUER ANA. LUDWIG HILBERSEIMER'S VERTICAL CITY



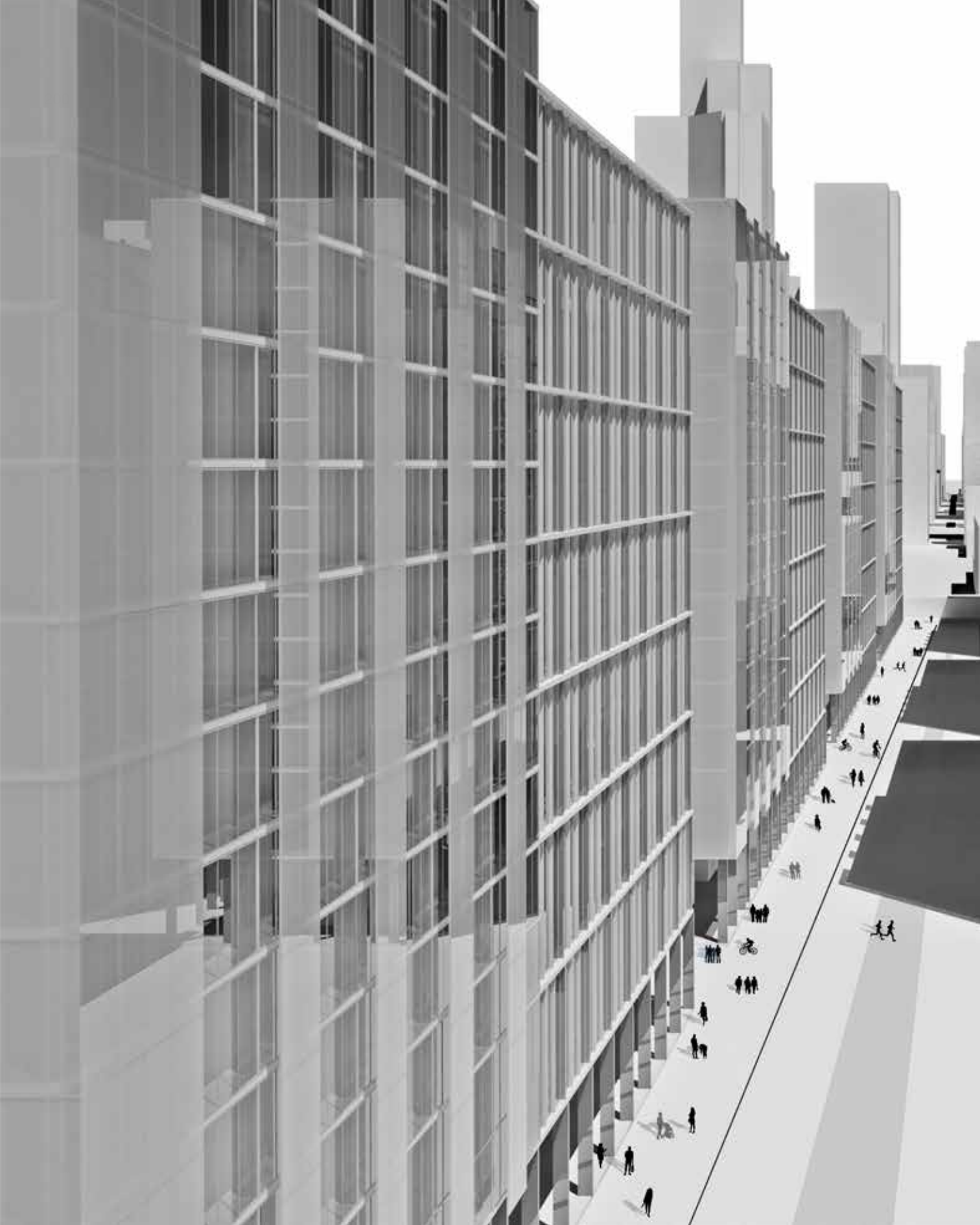
LUDWIG HILBERSEIMER'S VERTICAL CITY. 1924.



LUDWIG HILBERSEIMER'S VERTICAL CITY. 1924.

REZKOVILLE'S INTERPRETATION OF HILBERSEIMER'S VERTICAL CITY
RIVER PERSPECTIVE + THE LOOP. VANNUT HANNAH

NEXT PAGES: REZKOVILLE'S INTERPRETATION OF HILBERSEIMER'S VERTICAL CITY.
CITY PERSPECTIVE + THE LOOP. VANNUT HANNAH



CONCLUSIONS

In this dissertation the inversion of an old and a new Monadnock takes place:

By taking the original Monadnock, a pristine collector's item, reinterpreting it by using 21st century technology, but preserving the original structure and rhythm, the grammar is preserved but the skin and outcome are different.

While there is only one original 19th century Monadnock, this dissertation suggests that the designed 21st century typologies could configure endless modern Monadnocks suited to rehabilitate manufacturing among residential and public functions.

3.5 CITY SCALE - CHICAGO

Chicago illustrates a physical and metal divide between the North and the South. This dual-city statute allows for inequity to take place amongst the public. This is cause by numerous factors mentioned earlier on in this paper.

3.5.1 Chicago's Existing Trails

Chicago currently holds seven rails-to-trails conversions, but has the opportunity to create more. The existing trails are spread out among the city[62]: four in the North, two in the center and two in the South. Again the North being invested in twice as much as the South.

62 KENNEDY SEAN. FROM RAILS TO TRAILS: THE ECONOMIC IMPACT OF CHICAGO'S RE-PURPOSED RAILWAYS.

The existing trails were conversions of abandoned railroad tracks to jogger/cycling routes. The one more successful than the other.

The main goal of these trails is to connect various neighborhoods with each other, but with merely seven trails this is hardly enough.

IMAGE: CHICAGO LAKE FRONT. ILLINOIS. ELISA VANDENREYDT

IMAGE: CHICAGO TRAILS. ILLINOIS. ELISA VANDENREYDT

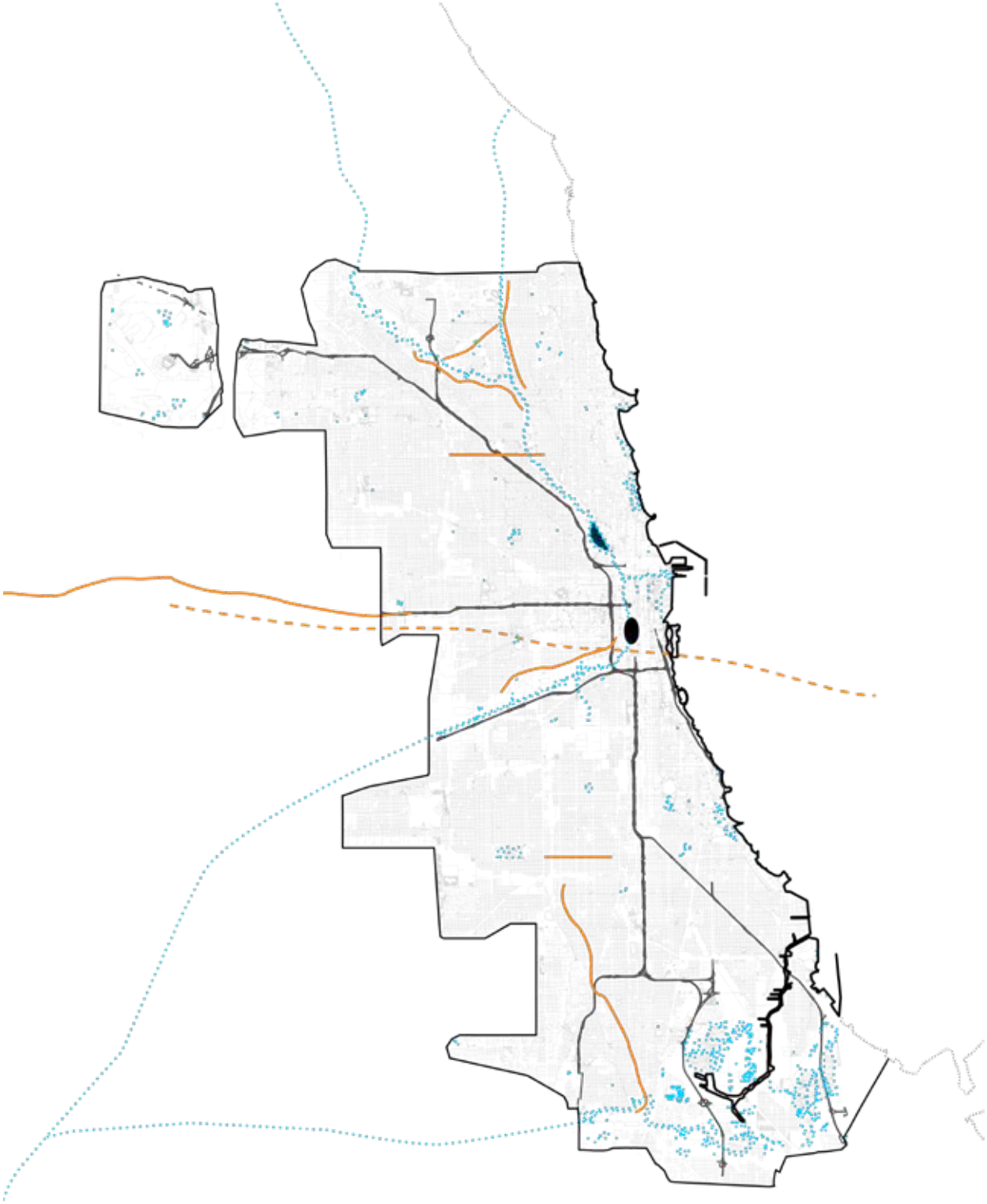


IMAGE: EXISTING TRAILS CHICAGO. ILLINOIS. HANNAH VANNUT

3.5.2 Upcoming neighborhoods

After a study of the various neighborhoods in Chicago five specific places tend to stand out: Hyde Park, Bridgeport, Pilsen, Portage Park and Andersonville.[63] These five places are supposedly the current upcoming neighborhoods of Chicago. They are currently blooming in sectors such as arts and crafts (models, filmmakers, writers) but attract also the middle and low class citizens.

This needs to be taken into account when taking the design to a larger scale: the city scale. If the implication of the Modern Manufacturing Monadnock succeeds, it can be reproduced in different places among the city. Local small-scale manufacturing and entrepreneurship is increasing not only in one spot but all over the city. It is important to provide them with spaces which are accessible for every one of the city.

63 RIOS COURTNEY. 2019 PREDICTIONS: KEEP YOUR EYES ON THESE CHICAGO NEIGHBORHOODS.

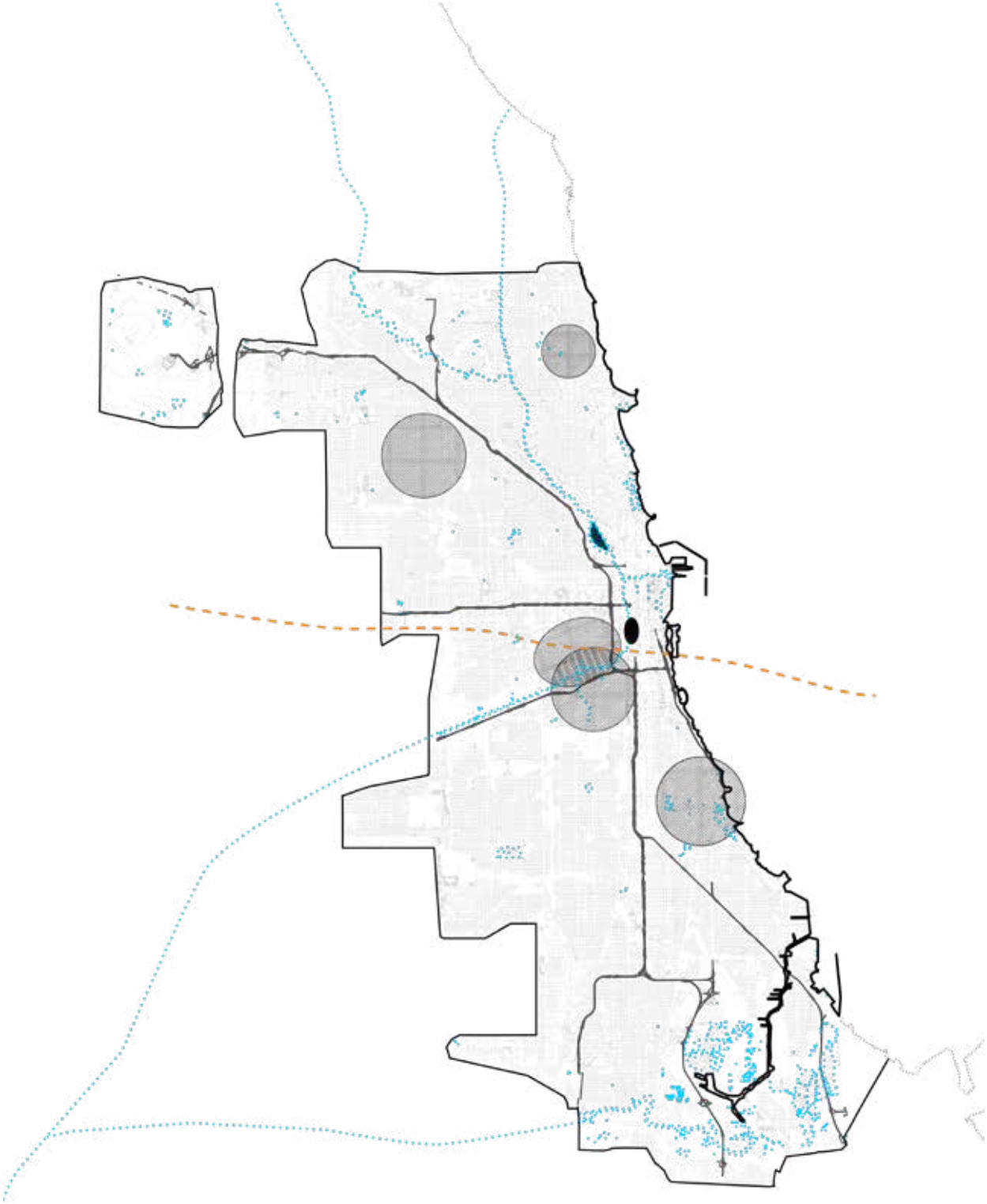


IMAGE: RISING NEIGHBORHOODS CHICAGO. ILLINOIS. HANNAH VANNUT

3.5.3 Proposed Trails & Manufacturing Hubs

The proposed trails for Chicago take the existing trails and the upcoming neighborhoods into account. For instance, the Englewood trail stops at a certain point but can be prolonged to reach Hyde Park without any major obstacles. This way a public connection is made between and upcoming neighborhood and (for the moment being) a less attractive, invisible neighborhood.

Again these trails take place on abandoned rails of the city's history, reinventing them into vibrant public spaces.

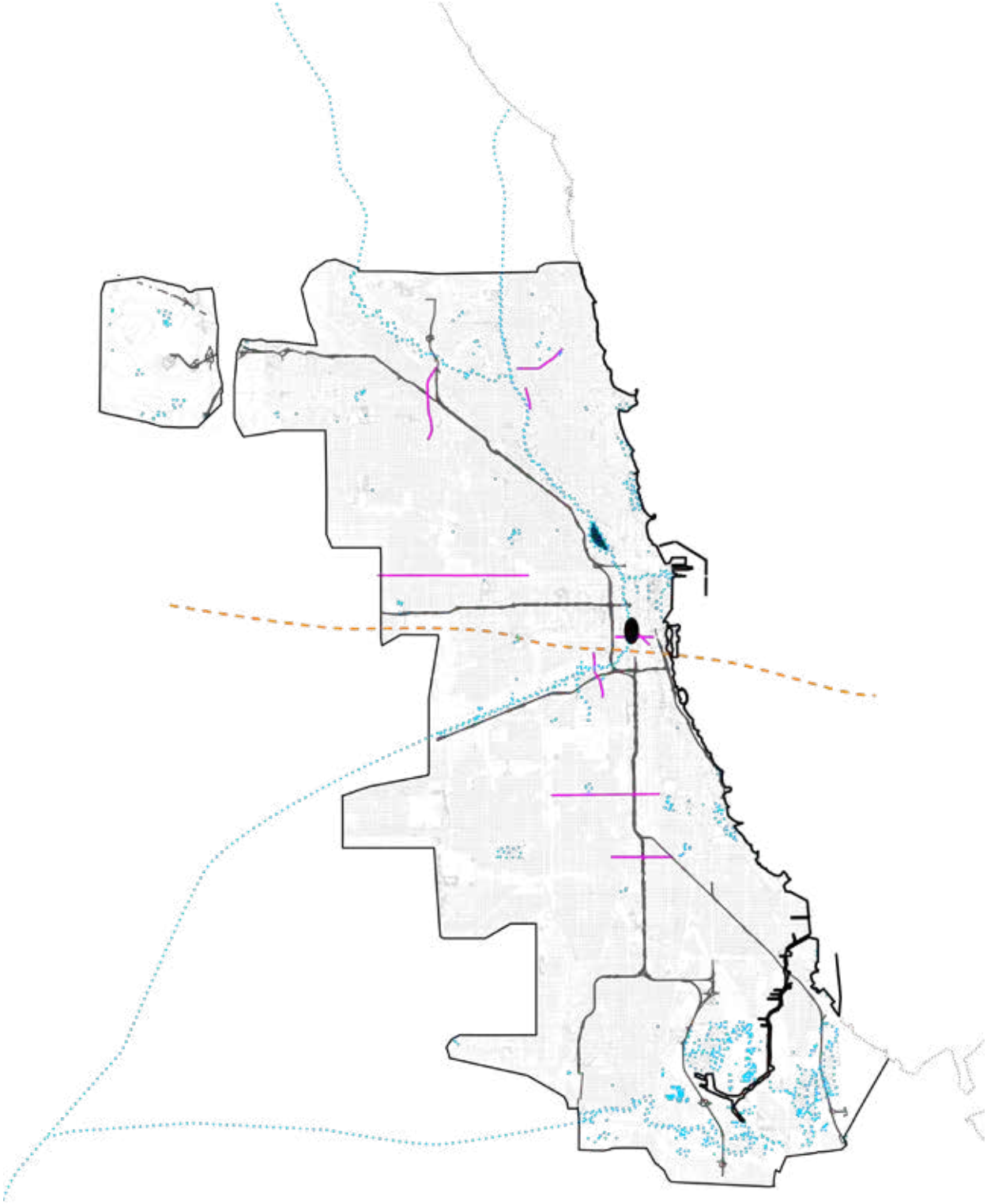


IMAGE: PROPOSED TRAILS. ILLINOIS. HANNAH VANNUT

CONCLUSIONS

When the implementation of the Modern Monadnock succeeds in various places of the city, the social agenda re-emerges. The goal to mix up the current North and South divide, is yet to-be-determined.

Re-urbanizing manufacturing to provide opportunities for the city, the public and the private will impact the social and cultural state in Chicago and hopefully in the long run make an impact on the city's inequitable divide.

BIBLIOGRAPHY

REPORTS

Atelier Brussels. BOZAR. 26/10/2016-15/01/2017. A Good City Has Industry Exhibition Booklet. Accessed 3 June 2019.

Bereitschaft Bradley, Cammack Rex. *Neighbourhood Diversity and class creativity in Chicago*. Published 2015. Publisher: Elsevier Ltd.

Chicago Federation of Labor and the Center for Labor and Community Research. *Creating a Manufacturing Career Path System in Cook County*. Published December 2001.

Israilevich Philip, Mahidhara Ramamohan. *Chicago's economy: Twenty years of structural change*.

Jin Mike, Blum Ken, Swinney Dan, Carnes Laura, Pfleger David. CLCR. *The State of Illinois Manufacturing*. A report for the Illinois Manufacturers' Association. Published December 2003.

Leslie Thomas. *The Monadnock Building, Technically Reconsidered*. Published 2013. Publisher: CTBUH Journal

Swinney Dan. Center for Labor and Community Research. *Building the Bridge to the High Road*.

WEB SITES/WEB ARTICLES

Artisan Exchange. Manufacturing Space Rental. Renting Space [https://artisanexchange.net/index.php/entrepreneurs/manufacturing-space].
Accessed 4 March 2019.

Bauer Ana. 2017. Ludwig Hilberseimer's Vertical City. [https://courseblogs.bard.edu/arth234s17/ludwig-hilberseimers-vertical-city/].
Accessed 4 June 2019.

Bee Breeders. Creative hubs that impact their communities. [https://architecturecompetitions.beebreeders.com/creatives-hubs-that-impact-their-communities].
Accessed 19 February 2019.

BMIAA. 2018. [Exhibition] "Paris Haussmann. A Model's relevance" at Centro Cultural de Belém. [https://www.bmiaa.com/events/exhibition-paris-haussmann-a-models-relevance-at-centro-cultural-de-belem/].
Accessed 18 March 2019.

Bradley Bill. 2013. Next City. Manufacturing is alive and well in Greater Chicago. [http://ht.ly/o5G0x].
Accessed 12 March 2019.

Bula Frances. Industrial fit meets residential glass in Vancouver. 2015. [https://www.theglobeandmail.com/report-on-business/industry-news/property-report/industrial-grit-meets-residential-glass-in-vancouver/article22520073/].
Accessed 24 February 2019.

Chan Kenneth. 2018. New container-inspired building with 350 homes opens in Vancouver. [https://dailyhive.com/vancouver/strathcona-village-belcourt-residence-vancouver].
Accessed 24 February 2019.

Chicago Architecture Center. Monadnock Building. [http://www.architecture.org/learn/resources/buildings-of-chicago/building/monadnock-building/].
Accessed 25 April 2019.

Chicago Architecture Center (CAC). 1909 Plan of Chicago. [http://www.architecture.org/learn/resources/architecture-dictionary/entry/1909-plan-of-chicago/].
Accessed 10 May 2019.

Chicagology. Monadnock Building. [https://chicagology.com/goldenage/goldenage131/].
Accessed 21 March 2019.

Coclanis Peter. Encyclopedia of Chicago. Business of Chicago. [http://www.encyclopedia.chicagohistory.org/pages/198.html].
Accessed 10 May 2019.

The Conference/Media Evolution. Nina Rappaport - Taking On: Rapid Urbanisation. 2017. [https://www.youtube.com/watch?v=7F--cUswuwo].
Accessed 19 February 2019.

Dallke Jim. 2018. Chicago Inno's 19 startups to watch in 2019. [https://www.americaninno.com/chicago/startups-to-watch].
Accessed 26 February 2019.

Davey Monica. Russonello Giovanni. In Deeply Divided Chicago, Moet Agree: City is Off Course. The New York Times. 2016. [https://www.nytimes.com/2016/05/07/us/chicago-racial-divisions-survey.html].
Accessed 24 April 2019.

Dukes Jesse. Without Native Americans, would we have Chicago as we know it?. 2017. [http://interactive.wbez.org/curiouscity/chicago-native-americans/].
Accessed 1 March 2019.

Ferrando Josep. 2015. Workshop. Self-sufficient Housing.[https://josepferrando.com/portfolio/workshop-self-sufficent-housing-1st-prize-2/].
Accessed 2 May 2019.

Florida Richard. 2013. Class-divided cities: Chicago Edition. [https://www.citylab.com/equity/2013/02/class-divided-cities-chicago-edition/4306/].
Accessed 26 February 2019.

Goldsberry Clare. 2016. Building & Construction, Materials, Sustainability: Multiwall polycarbonate sheets bring sustainability to building designs. [https://www.plasticstoday.com/building-construction/multiwall-polycarbonate-sheets-bring-sustainability-building-designs/88267594624043].
Accessed on 6 May 2019.

The Guardian. Tanner Howard. 2019. Native American routes: the ancient trails hidden in Chicago's grid system,. [https://www.theguardian.com/cities/2019/jan/17/native-american-routes-the-ancient-trails-hidden-in-chicagos-grid-system].
Accessed 28 February 2019.

HSSMI. A Manufacturing Innovation Institute. [https://hssmi.org].
Accessed 20 February 2019.

ICIC. Case Study: What works for cities: Urban Manufacturing Alliance. [http://icic.org]. Accessed 11 March 2019.

Jane Addams Resource Corporation. [https://www.jane-addams.org].
Accessed March 12 2019.

Keeley Larry. 2017. Tedx Talks. Design for the Opportunity Society: the 21st century Plan of Chicago. [https://www.youtube.com/watch?v=XX2OKtjlegc&t=6s].
Accessed 19 February 2019.

Kennedy Sean. 2016. From Rails to Trails. [https://www.wbez.org/shows/curious-city/from-rails-to-trails-the-economic-impact-of-chicagos-repurposed-railways/cdecb603-ca8d-4b4f-827d-82dfc7ee8a02].
Accessed 19 February 2019.

Keohan G. Thomas, 1989. Tech Notes. Historic Interior Spaces. The Monadnock Building. [https://www.nps.gov/tps/how-to-preserve/tech-notes/Tech-Notes-Interior02.pdf].
Accessed 3 April 2019.

LAN. Paris Haussmann. [https://www.lan-paris.com].
Accessed 17 March 2019.

Mantecadmin. How Manufacturing has evolved in recent years. 2018. [https://mantec.org/manufacturing-evolved-recent-years/].
Accessed 11 March 2019.

Manufacturing Alliance of Philadelphia. Programs and Services. [http://www.manufacturingonline.org/vendors.cfm].
Accessed March 10 2019.

Marlon. Miltiwall Polycarbonate Glazing. [http://www.brettmartin.com/~/media/Files/Plastic-Sheets-Documents-English/Marketing-Documents-English/marlonst_brochure_eng.pdf].
Accessed 9 May 2019.

N.N. Monadnock. [http://www.monadnockbuilding.com/the-building.html].
Accessed April 20 2019.

Nilsson Simon. Corner Factory - Revisiting Urban Manufacturing. [https://issuu.com/nilssonsimon/docs/corner_factory].
Accessed 1 March 2019.

Pavillion Arsenal. Paris Haussmann - A model's Relevance. [http://www.pavillon-arsenal.com/en/expositions/10574-paris-haussmann.html].
Accessed 18 March 2019.

Pavillion De L'Arsenal. 4 Mixed Used Building Developments. Exhibition from October 20 to November 27 2016. [http://www.pavillon-arsenal.com/en/expositions/10489-4-mixed-used-building-developments.html].
Accessed 19 March 2019.

Pope Albert. 1996. Ladders. Pages 16-29. [https://parsonssummer2012.files.wordpress.com/2012/07/albert-pope-ladders.pdf]
Accessed 5 June 2019.

Porter James. 2018. How to make sure the Englewood Line Trail is a real asset for the community. [https://chi.streetsblog.org/2018/05/08/how-to-make-sure-the-englewood-line-trail-is-a-real-asset-for-the-community/].
Accessed 5 March 2019.

Rappaport Nina. [http://www.ninarappaport.com/main.html?id=0].
Accessed 23 February 2019.

RENTCafé. Chicago, IL Rental Market Trends. Last updated 2019. [https://www.rentcafe.com/average-rent-market-trends/us/il/chicago/].
Accessed 25 February 2019.

Rappaport Nina. 2017. Factory Architecture in the Age of Industry 4.0. [https://www.metropolismag.com/architecture/factory-architecture-age-industry-4-0/].
Accessed 16 March 2019.

Rappaport Nina. 2017. Factory Architecture in the Age of Industry 4.0. Metropolis. [https://www.metropolismag.com/architecture/factory-architecture-age-industry-4-0/].
Accessed 25 April 2019.

Rowley Jason. 2017. Here are the best startup cities in the Midwest. [https://techcrunch.com/2017/08/02/here-are-the-best-startup-cities-in-the-midwest/?guccounter=2].
Accessed 26 February 2019.

Semuels Alana. 2018. Chicago's Awful Divide. The Atlantic. [https://www.theatlantic.com/business/archive/2018/03/chicago-segregation-poverty/556649/].
Accessed 24 April 2019.

Smith Ryan. 2016. Ont the trail of discovery - and disappointment- in Rezkoville. [https://www.chicagoreader.com/chicago/rezkoville-rezkoland-tony-rezko-related-midwest-roosevelt-river/Content?oid=22692399].
Accessed 19 February 2019.

Strathcona Village. The Workspaces @ Strathcona Village. [http://www.strathconavillageworkspaces.com/#location].
Accessed 25 February 2019.

Tendolkar Ketki. 2011. Architecture 7 Urbanism. Albert Pope: Ladders (1996). [http://architectureandurbanism.blogspot.com/2011/04/albert-pope-ladders-1996.html]
Accessed 6 June 2019.

UFacturing Renaissance. Manufacturing Renaissance reduces poverty through manufacturing. [https://www.mfgren.org].
Accessed March 10 2019.

Urban Manufacturing Alliance. Webinar: State of Urban Manufacturing. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Building Partnerships with Local Government. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Making the Model: Organizational Structures for Local Branding Platforms. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Reuse, Recycle, Rejuvenate: The re-urbanization of Manufacturing. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: How to form a strategic Alliance with a Manufacturing Extension Partnership. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Making Maker Spaces work for Young People: Lessons from Sacramento. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Community College Partnerships to Create Workforce Pipelines: Lessons from Denver and San Bruno. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Manufacturing Alliance. Webinar: Equity and Inclusion in Urban Manufacturing. [https://www.urbanmfg.org].
Accessed 4 March 2019.

Urban Industry Initiative. [http://www.uiiphilly.org].
Accessed March 10 2019.

Urban Matter. 2019. Predictions: Keep your eyes on these Chicago Neighborhoods. [https://urbanmatter.com/chicago/chicago-neighborhoods/].
Accessed 26 February 2019.

Vertical Urban Factory. [https://www.verticalurbanfactory.org/OVERVIEW].
Accessed 23 February 2019.

WTTW. The History of the Chicago River. [https://interactive.wttw.com/chicago-river-tour/history-chicago-river].
Accessed 10 May 2019.

RESOURCES

The following organizations are mentioned in the paper. If you are seeking extra information on these organizations, you can contact them directly.

Chicago Architecture Center
111 East Wacker Drive
Chicago, IL 60601
312.922.3432
http://www.architecture.org

Rails-for-Trails Conservancy
National Headquarters
2121 Ward Court, NW, 5th Floor
Washington, DC 20037
202.331.9696

Trust for the Public Land
120 S LaSalle St #2000
Chicago, IL 60603, USA
+1 312-750-9820
chicago@tpl.org

Urban Manufacturing Alliance (UMA)
https://www.urbanmfg.org

Jane Addams Resource Center (JARC)
4432 N Ravenswood Ave
Chicago, IL 60613, USA
773.728.9769
https://www.jane-addams.org

HSSMI
Queen Elizabeth Olympic Park, 3 Lesney Ave
London E20 3BS, UK
+44 20 3823 5623
https://hssmi.org

Artisan Exchange
208 Carter Dr Unit 13 B
West Chester, PA 19382, USA
+1 610-719-0282
https://artisanexchange.net

Manufacturing Renaissance
3411 W Diversey Ave # 10
Chicago, IL 60647, USA
+1 773-278-5418
https://www.mfgren.org

Urban Industrial Initiative (UII)
4500 Worth St
Philadelphia, PA 19124, USA
+1 215-948-9285
http://www.uiiphilly.org

HackerLab
2533 R Street Suite 120
Sacramento
916.514.7044
https://www.hackerlab.org/en

Manufacturing Connect (MC)
https://www.mfgren.org/manufacturing-connect

Young Manufacturers Association (YMA)
https://www.mfgren.org/yma

Instructors Apprenticeship for Advanced Manufacturing (IAAM)
https://www.mfgren.org/iaam

Ted
https://www.ted.com/#/

GBL Architects
10 Rue Marcel Dassault
59700, Marcq-en-Barœul, France
+33 3 20 72 54 24
http://www.gblarchitects.com

LAN Architects - Local Architecture Network
47 Rue Popincourt
75011, Paris, France
+33 1 43 70 00 60
https://www.lan-paris.com

Pavilion d'Arsenal
21 Boulevard Morland
75004 Paris, France
+33 1 42 76 33 97
http://www.pavillon-arsenal.com/en/

Régie Autonome des Transports Parisiens
54 Quai de la Rapée
75012 Paris, France
+33 1 58 78 80 00
https://www.ratp.fr/en

Lacaton & Vassal
206 Rue la Fayette
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