

UNDERSTANDING CONTEMPORARY URBAN SPACES: ALTERNATIVE  
SPATIAL MAPPING TECHNIQUES FOR EXPLORING PEOPLE’S SPACES

A THESIS

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BY

ASHRA MADHUBHASHINI WICKRAMATHILAKA

DR. NIHAL PERERA – ADVISOR

BALL STATE UNIVERSITY

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## DEDICATION

**For Nirmani**, for showing me the value of a person with an infinite dream.

**For *Thaththa***, for telling my younger self that women are not born to be in the kitchen and raising children, they also are working in space as astronauts, deep in the sea as Marine Specialists, and they are leading the world.

**For *Achchi***, for telling me that there is wisdom in the shadows as much as the light.

## **ABSTRACT**

**THESIS:** Understanding Contemporary Urban Spaces: Alternative Spatial Mapping Techniques for Exploring People's Spaces.

**STUDENT:** Ashra Madhubhashini Wickramathilaka

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"Land-use" is one of the most popular mapping techniques used by urban planners. However, the four or five highly generalized large-scale land-uses they employ are unable to capture most urban activities that are important to ordinary people. While People's Spaces (Perera, 2016) argues for the need to understand how people create spaces for their daily activities and cultural practices, critical cartographers have been using different mapping techniques to explore and understand people's spaces. This study juxtaposes social space and critical cartographic discourses to explore how these alternative spatial mapping techniques could be adapted for planning and development, to better understand people's spaces. The study outcomes identify spatial mapping techniques and processes by applying them to the Industry neighborhood areas in Muncie, Indiana, USA.

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## **CHAPTER ONE: INTRODUCTION**

Map is a contentious but important decision-making tool. It is a tool to explore spatial relationships and for both analysis and implementation in urban planning practice. Urban planning is concerned with the creation, control, and regulation of social spaces. As it deals with developing new areas and revitalizing existing urban areas, the planning process utilizes several types of maps. Planning and re-planning are cyclical processes that are built upon mapping and re-mapping of spaces. Maps are portrayed as scientific, rational, and objective depictions of the ground. Yet, the subjectivity inherent in spatial representations can have a significant impact on how the represented spaces are planned.

Yet, mapping is creating and building the world as much as measuring and describing it. Long affiliated with the planning and design of cities, landscapes and buildings, mapping is particularly instrumental in the construing and constructing of lived space (Cosgrove, 1999). As a result, it is critical to take a step forward and critique the methods and tools that planners employ, as these shape decisions about space, and thus people's lives. Human and cultural geographers, cartographers, anthropologists, landscape designers, and sociologists are all contributing to critical cartographic scholarship. However, critical cartographic (mapping) techniques have no practical application in spatial planning practice. Therefore, this study fills the gap of the practical application of alternative mapping techniques taken from the critical cartographic scholarship. The study and outcomes help planners to practice inclusive planning and development in practice that help better-understand social spaces.

The subjectivity inherent in spatial representations can have a significant impact on how spaces are perceived and conceived, i.e., represented and planned. Maps produce abstract spaces. The

land use maps, for example, have flawless boundaries and possesses the same intensity of activities that are perfectly fitting within the color-coded, categorized and separable polygons.

In *People's Spaces*, Nihal Perera (2016) demonstrates how ordinary people create (social) spaces for their daily activities and cultural practices. Critically adapting the categories from Henri Lefebvre (1974) and David Harvey (1973), Perera (2016) points out that space is either outside of our cognition--i.e., *absolute*, undefined, and unrecognizable--or *abstract*--defined in terms of abstract categories--until it is adapted by people for their own living and activities which produces *lived* spaces in Lefebvrian terms. Perera (2016) defines these as *people's spaces*, people being subjects with no official power to create space like the state or capital. Critically following James Holston (1989), he (Perera 2016) identifies this process of transformation as the familiarization of space in which, while they adapt to extant spaces subjectivities, the subjects also transform extant spaces in ways that could accommodate their daily activities and cultural practices to the degree possible.

Towards the end of the book, he demonstrates that people (non-state and market actors) also create spaces making the state and capital negotiate their needs. Through its chapters, the book highlights the need to explore the spatial stories that exist besides, between, and in the interstice of the hegemonic social and spatial structures. Providing a view of how people create their own spaces, in the last chapter, Perera and Liyanage (2016) describe the vibrancy, liveliness, diversity, and character of description of the most common people's neighborhood center in Sri Lanka, the *handiya*).

*Handiya* is not merely a physical entity, but a social space defined by a set of activities and processes. The myriad activities that makes it include: buying, selling, eating, drinking, walking, waiting, meeting, chatting, sharing information, learning, teaching, criticizing, gathering, protesting, fighting, and celebrating. Intense activity area includes a local taxi park, a few shops, and a *pola*. (Perera and Liyanage, 2016).

This everyday space-making process provides ample dynamics, diversity, and meanings to space. If we may refer to the social and physical components of social space, each activity in society connected, interacts, and co-exists, in collusion and collision with other activities. The physical spaces created for and along with these social activities show similar characteristics, some operating separately while others overlapping. Hence, it is significant to understand the interaction between social activities and corresponding physical spaces.

Evidently, urban planners need to better understand social spaces, i.e., multiple definitions, meanings, and the core values of the physical spaces for the users prior to making “professional” decisions about their subjects through the physicality of space. However, as Perera (2009) point out, locally produced important social-gathering places like *handiyas* and *polas* are not included in (official) plans and, even if they are, the plans do not capture the true essence of the place. Instead, they provide a lot of information such as is heights, longitudes, and latitudes which are not used in the planning process. It is because either planner does not recognize the significance of people’s spaces and the “professional” tools they use are incapable of capturing those places.

According to the International Cartographic Association (ICA), the issue is not with the map. A map, according to ICA, can depict a geographical reality. In its definition, “A map is a symbolized representation of geographical reality, representing selected features or characteristics, resulting from the creative effort of its author’s execution of choices, and is designed for use when spatial relationships are of primary relevance.” (ICA, 2021)

In contrast, William Bunge (1969) questions map-making: “Geography is often defined as the study of the earth’s surface as the home of man. But the view from which men’s home?” (Page 5). The “reality” is unique to each individual and not universal. The information gathered through human senses is used to her/his construct reality, which is then fed into pre-construct

knowledge. Therefore, the reality is also a preconceived notion. Moreover, the geographic reality does not exist by itself; there are an infinite number of realities that exist and coexist. In the absence of a social component, geographic reality is contextualized. As a constructed knowledge, i.e., a perception, geography, creates geographic space, but people transform geographic spaces through their daily activities. It is this adaptation of abstract geographic spaces—among other spaces- for their own life activities and practices that Perera (2016) calls familiarization of space. Hence, Bunge (1969) who questions the mainstream map-making insists the mapmakers use their skills to produce people’s geography.

What this highlight is the difficulty of mapping social spaces. Lefebvre (1991: 85) asks “How many maps, in the descriptive or geographical sense, might be needed to deal exhaustively with a given space, to code and decode all its meanings and contents?” He elaborates that,

It is not only the codes—the map’s legend, the conventional signs of map-making and map-reading—that are liable to change, but also the objects represented, the lens through which they are viewed, and the scale used. The idea that a small number of maps or even a single (and singular) map might be sufficient can only apply in a specialized area of study whose own self-affirmation depends on isolation from its context. We are confronted not by one social space but by many-indeed, by an unlimited multiplicity or unaccountable set of social spaces. (Lefebvre 1991: 85).

In their introduction to *Mapping the Subject: Geographies of Cultural Transformation*, Steve Pile and Nigel Thrift (1995: 2) suggest that:

There is the difficulty of mapping something that does not have precise boundaries. There is the difficulty of mapping something that cannot be counted as singular but only as a mass of different and sometimes conflicting subject positions. There is the difficulty of mapping something that is always on the move, culturally, and in fact. There is the difficulty of mapping something that is only partially locatable in time-space. Then, finally, there is the difficulty of deploying the representational metaphor of mapping with its history of subordination to an Enlightenment logic in which everything can be surveyed and pinned down.

Consequently, critical form of cartography began to challenge the hegemonic tradition of cartography that all knowledge is “scientific” and ought to be “scientized.” “Critical cartography challenges academic cartography by linking geographic knowledge with power, and thus is political.” (Crampton & Krygier, 2006).

*A History of Spaces* by John Pickles (2004) is unquestionably a turning point because it questions the map-making process and introduces the concept of deconstructing the map. It lays a solid foundation on which to build. Prior to that, in *The New Nature of Maps: Essays in the History of Cartography*, J.B. Harley (2001) defined the map as a "social construction." He maintains that maps are more than just representations of reality; they have a significant impact on how space is conceptualized and organized.

Drawing on postmodernist philosophers such as Foucault, during the late-1980s and early-1990s, the advocates of critical cartography set out to reveal the ‘hidden agendas’ of cartography as tools of socio-spatial power. Denis Cosgrove (1999) presents his argument about the changing meaning of mapping over time and its influence on contemporary seeing and knowing. Building on these theoretical platforms, critical cartographers presented a new mapping practice known as counter-mapping. Counter-mapping refers to mapmaking processes that challenge the formal maps of the state. Nancy Peluso’s (1995) counter mapping, Denis Wood’s (2015) Deep Mapping, participatory mapping, indigenous mapping, collective mapping, and sketch mapping are a few of mapping techniques developed by the critical cartographic scholarship.

Building on this discourse, human geography scholars such as Bunge (1969) and Jeremy W. Crampton (2010) emphasize the importance of developing people's geography. Some interdisciplinary fields of study instigated by these studies include spatial humanities and spatial anthropology. Critical-cartographic spatial-mapping approaches are used in a wide range of

research areas. Digital spatial mapping applications (Web-GIS, apps) emerged as a primary resource out of scholarly activities at the intersection of computing or digital technologies and humanities disciplines.

James Corner's (1999) essay, "The Agency of Mapping," brings cartography and planning together. It challenges traditional cartography as an act of representation by engaging urban and landscape planning and design professionals in mapping as a creative act or a process. He offers a discussion of the social, imaginative, and critical dimensions of mapping as a means to discover or make previously unseen or unimagined realities visible. The relationship (and the tension) between these two aspects of maps as a powerful tool and their crisis of representation is a useful point of departure for this study. In this thesis, I focus on the interface of people's spaces and critical cartography.

### **The study**

The goal of this thesis is to explore methods for documenting people's stories of spaces by utilizing spatial mapping techniques. In sum, while Perera (2016) demonstrates the need to understand how ordinary people create spaces for their daily activities and cultural practices, critical cartographers have been searching for different mapping techniques to explore and understand people's spaces (Crampton and Krygier, 2006). While addressing almost the same interest, or very close interests, these two discourses approach the production of social space, to put more simplistically, from two different sides: social (space) and cartographic (mapping). These fields of study complement each other. In this thesis, I juxtapose these discourses, apply mapping techniques to find spatial stories highlighted in Perera (2016). As planning is central to this thesis, I ask how the resulting techniques could be adapted for planning and development of communities.

The objectives of the study include.

1. To explore critical-cartographic spatial-mapping techniques through existing literature and select a spatial mapping technique/s.
2. To apply the selected spatial mapping technique/s to a chosen neighborhood in order to test its effectiveness in documenting people's stories of spaces.

### **Thesis organization**

The second chapter explores the existing knowledge pertinent to the research project via the reviewing of existing literature. The review of literature begins with understanding the concept of the map, its evolution, and its power. Then, the chapter explores and organizes the scholarly work on spatial mapping from a variety of disciplines, such as human geography, cultural geography, urban planning, landscape architecture, and geopolitics. The final section of the chapter compiles selected alternative spatial mapping techniques, their application on the ground, and the outcomes. Based on the review of literature, the chapter will highlight the gaps in knowledge that the thesis addresses and the theoretical approach it adopts. The summary presents all critiques and arguments presented in the literature review about maps, their power, and their contribution to understanding people's spaces in a concise manner.

The third chapter delves into methods, discussing the methodology, particularly the approach to conducting research, including theories and concepts, and then spelling out the phases of the approach. Graphs, charts, and maps are used to illustrate data collection procedures, analytical techniques, and the researcher's positionality, i.e., their role in this study.

The study's findings and analyses are combined in Chapter 4. This chapter is organized around a series of maps created through primary and secondary data collection, each map with its own

description and interpretation. Furthermore, each map created with primary data and its interpretations are compared to a land use map created with secondary data. To develop a stronger and more comprehensive argument, the description includes relevant theories and concepts. The chapter concludes with a summary paragraph that presents a succinct argument on the general results and analysis.

The final chapter, Chapter 5, summarizes the discussion, conveys the conclusions, and makes recommendations. The conclusion is discussed in relation to the research purpose, followed by a summary of the significance of the findings.

## **CHAPTER TWO: METHODOLOGY**

### **Introduction**

The aim of this chapter is to provide a comprehensive overview of the research methodology used in this study. To begin, the chapter outlines the research question and objectives, which serve as the foundation for the research approach. Additionally, the data collection methods are described in detail, highlighting their relevance to the study and the research site.

The subsequent sections of the chapter delve into the primary and secondary data collection sources, detailing the techniques and tools employed in the analysis. The chapter aims to provide a clear and concise understanding of the research methodology, allowing readers to follow the research process from beginning to end.

### **Research Design**

This project is exploratory in nature, aiming to figure out alternative spatial mapping techniques. The goal of the study is to enable an alternative understanding of people's spaces that produces rich spatial narratives and stories, rather than relying on traditional cartographic maps to do so. Traditional cartographic maps represent physical features and spatial relationships between objects in a standardized way and utilize standard quantitative variables which do not fully capture the subjective inherent experiences and personal meanings that people attach to their lived spaces. In contrast, according to the literature alternative spatial mapping techniques allow for more nuanced and context-specific representations of people's spaces, which better reflect the diversity and complexity of spatial narratives and stories. In addition, the study aims to determine how different spatial mapping techniques could be useful to enhance inclusivity in the urban planning process. The conventional urban planning process often relies heavily on

quantitative measures, neglecting the importance of qualitative aspects. This approach fails to capture the diverse perspectives, narratives, and experiences that make a space a place.

Consequently, one of the primary objectives of urban planning, ensuring people's quality of life, is being challenged.

To address this issue, I propose experimenting with alternative mapping techniques to enhance inclusivity in the urban planning process. While I may not be able to transform the entire process, I aim to make a meaningful impact by improving a small segment of it.

The study questions the application of land use mapping to understand the people's spaces of the urban planning process. Land use mapping is a commonly used spatial mapping method that has been relied on to identify patterns of land use, space utilization, and development trends.

However, the accuracy and validity of this method need to be questioned.

Land use mapping often oversimplifies the complexities of the land use patterns and fails to account for the diverse needs and perspectives of the communities who use the land. Instead of capturing the nuances of land use, the technique is designed to categorize uses and assign color codes, thereby stripping away the unique qualities and characteristics of the space's activities.

Perera (2016) elaborates in his book "*People's Space*" that people's space is defined as spaces created by ordinary people through cultural and daily practices. He goes on to say that quantitative tools like surveys and maps are insufficient to understand the people's use of space.

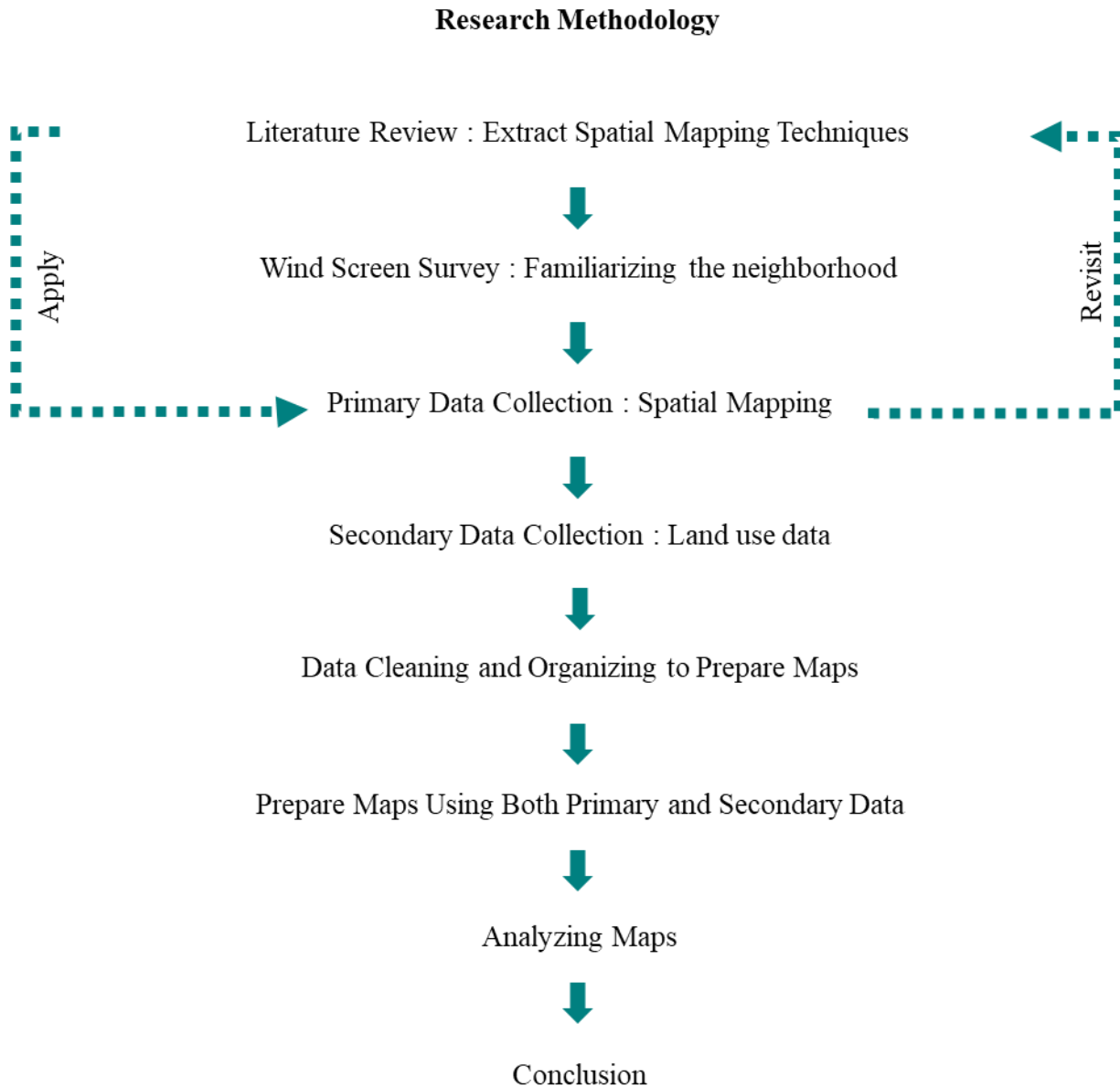
The methods they use to carve out space from the dominant system do not belong to the same system of formal thinking; they use their agency to figure out when and where to adapt extant spaces (Perera 2016).

However, critical-cartographic scholarship has also responded to this issue, in their own realms, making an immense contribution to both theoretical and practical development on critical cartography. I attempt to bridge two discourses in my research by developing an alternative spatial mapping approach. This approach utilizes critical cartographic mapping techniques to accommodate spatial stories and can be applied to the urban planning process. It is important to consider that no perfect tool exists that can provide a complete understanding of space. Each tool has its own unique behavior and constraints that must be considered. In chapter two-latter part of the literature review presents a few studies that applied alternative spatial mapping techniques for the purpose of understanding the use of spaces by different social and cultural groups in the city, enhancing public participation and people's input into development projects.

While there are significant qualitative developments in the area of cartography that attempts to map out people's geography, I was not able to find any studies that presented any alternative spatial-mapping technique to understand people's spaces from an urban planning standpoint. This study contributes to an alternative mapping technique that could understand and document urban spaces from the urban planning point of view.

In par, with the research objectives, the research followed a qualitative approach. It starts with exploring literature to explore available alternative spatial mapping techniques that have been used to get the stories of people's spaces. In addition, most of the techniques applied in this study are directly or indirectly are taken from scholarly work.

## Research Methodology



*Figure 1: Research Methodology in Flow-Chart*

### **The site background and the written history**

The site selected for this study is the Industry neighborhood in Muncie, Indiana, USA. Muncie is located in East Central Indiana fifty miles to the northeast of Indianapolis. Prior to colonization, in the early 1800s, Delaware Indian tribe had lived around the White River in the area of

modern-day Muncie. Muncie was founded in 1865 as a primarily agricultural settlement made up of pioneers, i.e., Caucasians who had arrived from Europe, and other early residents. The discovery of natural gas in the late-1870s prompted a flurry of industrial activity, including the establishment of the Ball Brothers Glass Manufacturing Company in 1887. Since then, the Ball family has made significant contributions to Muncie, including establishing and/or supporting Ball State University, the YMCA, Camp Crosley, Ball Memorial Hospital, the Masonic Temple, the American Legion, and the Minnetrista Cultural Center. The Ball Brothers Foundation, which continues to sponsor local activities, continues their legacy (Muncie Neighborhoods, 2021)

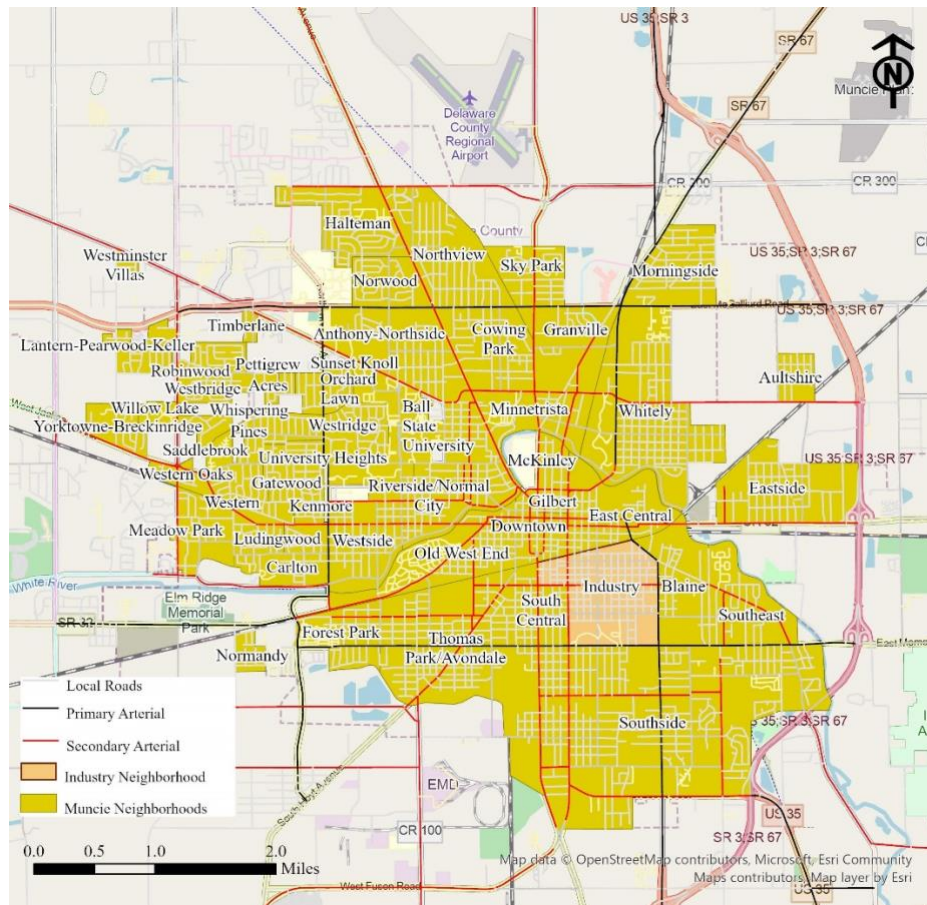


Figure 2: Muncie and Industry Neighborhood Location

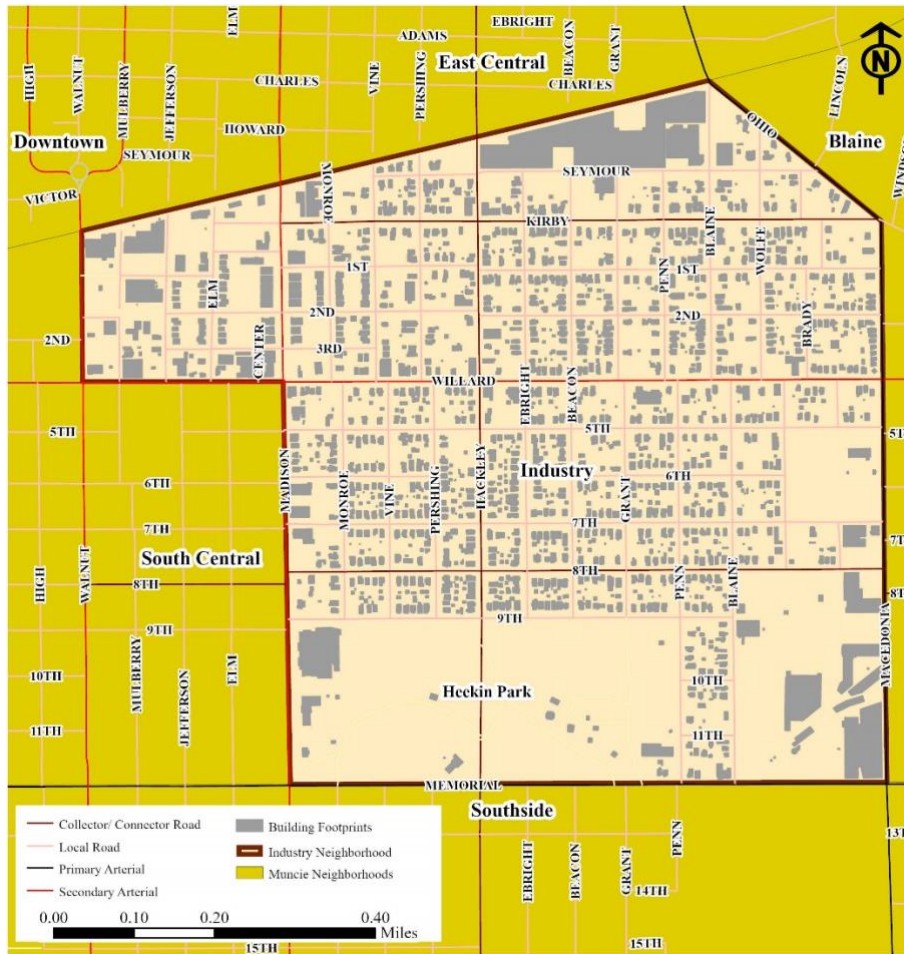


Figure 3: Industry Neighborhood

However, industrialization has slowed since the natural gas in Trenton field was depleted around 1910. The city of Muncie grew well into the mid-twentieth century, but the homes in the historic districts did not. Some have been inhabited by citizens willing to repair and maintain the homes, while others have remained vacant. The cost of rehabilitating some of the worst-affected homes can cost hundreds of thousands of dollars, making many of them lost causes for the town. Some citizens, find something more within these historic districts and homes, spending years researching and restoring the homes (Ball State University, 2021).

Workers from local firms such as Kistleman Brothers, Hemingray Glass, Ball Corporation, and the Indiana Bridge Company, among others, lived in the Industry Neighborhood.

## The Industry Neighborhood through my eyes.

The Industry neighborhood (see figure 3) is located on the city's southern outskirts. The neighborhood is surrounded by auto-related businesses as well as a few abandoned industrial sites.



*Figure 5: Abandoned House a Residential Street*



*Figure 4: Heekin Park*

Heekin Park, built in 1913 for the comfort of the Industry neighborhood's residents, contained a wading pool, campground with huts, and a small zoo. Heekin Park is still available to current inhabitants for recreation and community events. Muncie's Boys and Girls Club is also located near the park (Industry Neighborhood Action Plan, 2021).

The Industry neighborhood was chosen because of its demographic aspects, various housing situations, history, and stories I have heard about it. African Americans make up the majority of

the population. Below is a series of traditional quantitative maps obtained from the US Census Bureau website that compares the Industry neighborhood with the surrounding areas. All the maps show census tract data and census tract 3 covers the majority of the Industry neighborhood.

These maps depict popular socioeconomic indicators such as population, median household income, employment status, and educational attainment, among others. Almost all maps directly indicate that the Industry neighborhood is deficient in population, median household income, employment status and educational attainment. None of the below examples demonstrate what the Industry neighborhood has to offer and what people do there.

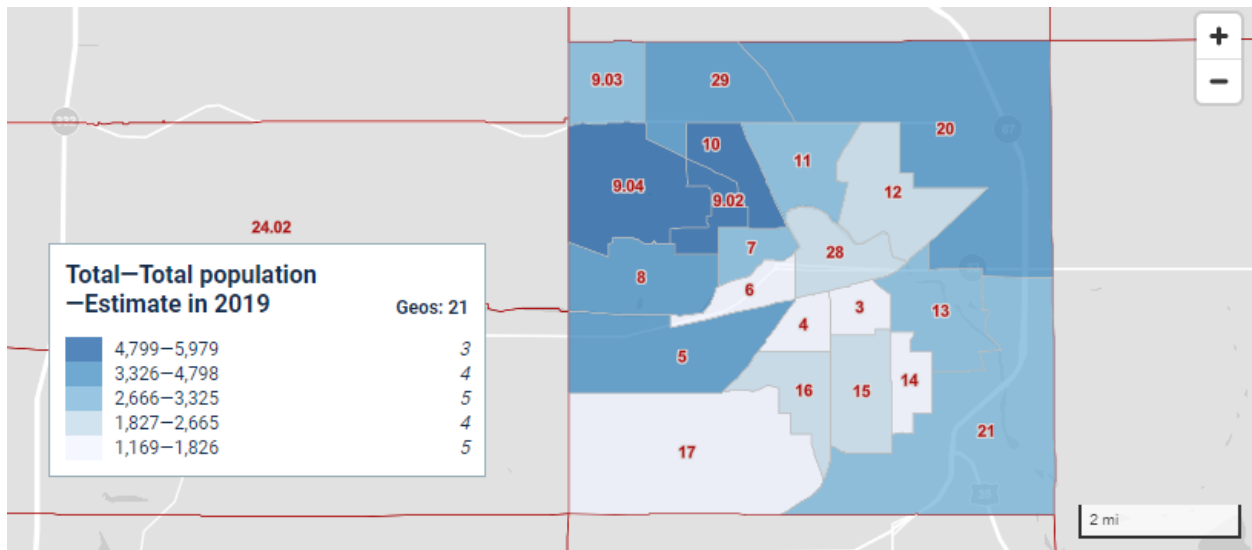


Figure 6: Total Population- Estimation in 2019- ACS 5-Year Estimates

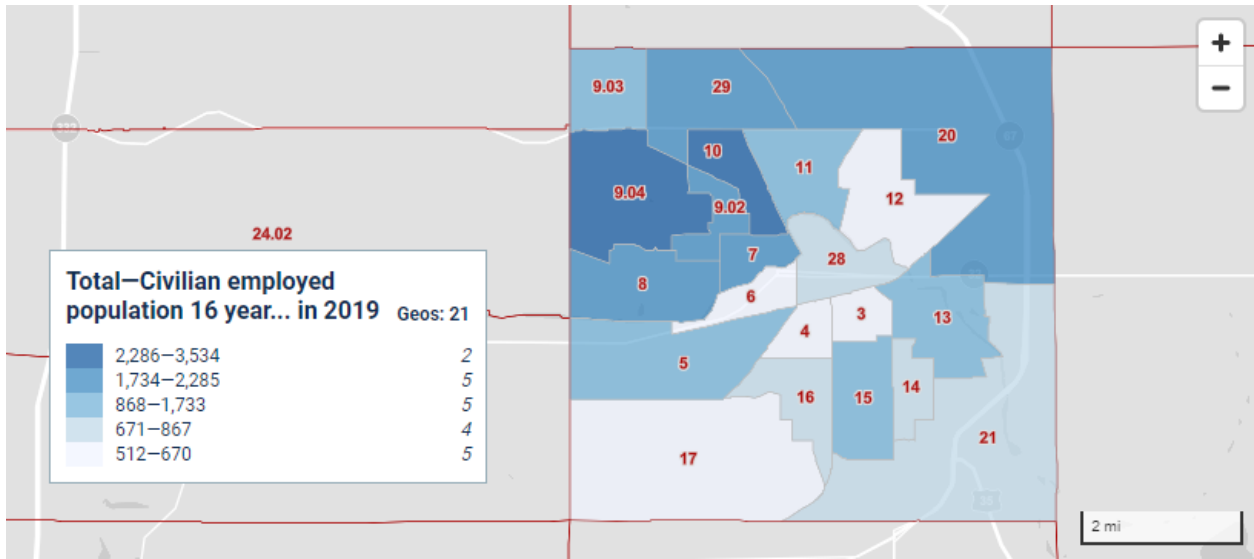


Figure 7: Total Employed Population 16 Years and Over-Estimation in 2019-ACS 5-Year Estimates

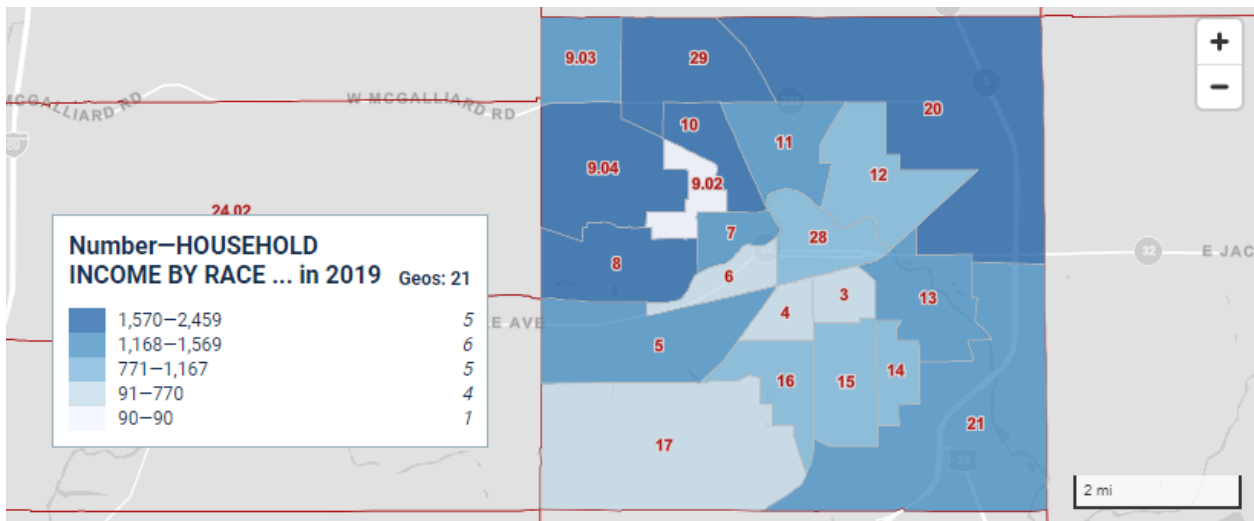


Figure 8: Household Income by Race & Hispanic or Latino Origin of Householder-Households- Estimation in 2019-ACS 5-Year Estimates

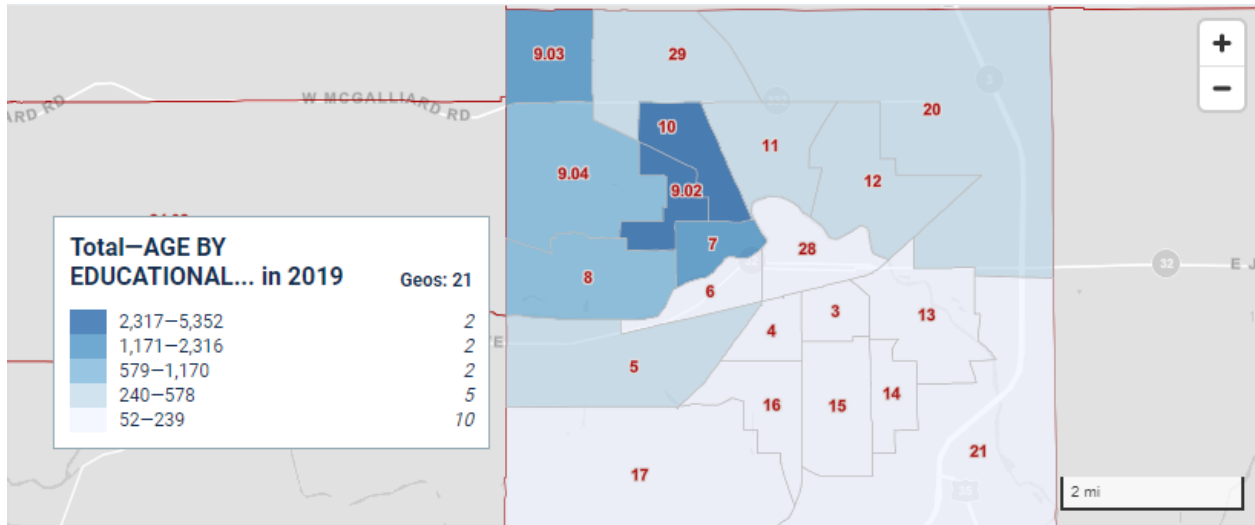


Figure 9: Total Age by Educational Attainment - Population 18 to 24 Years-Estimation in 2019-ACS 5-Year Estimates

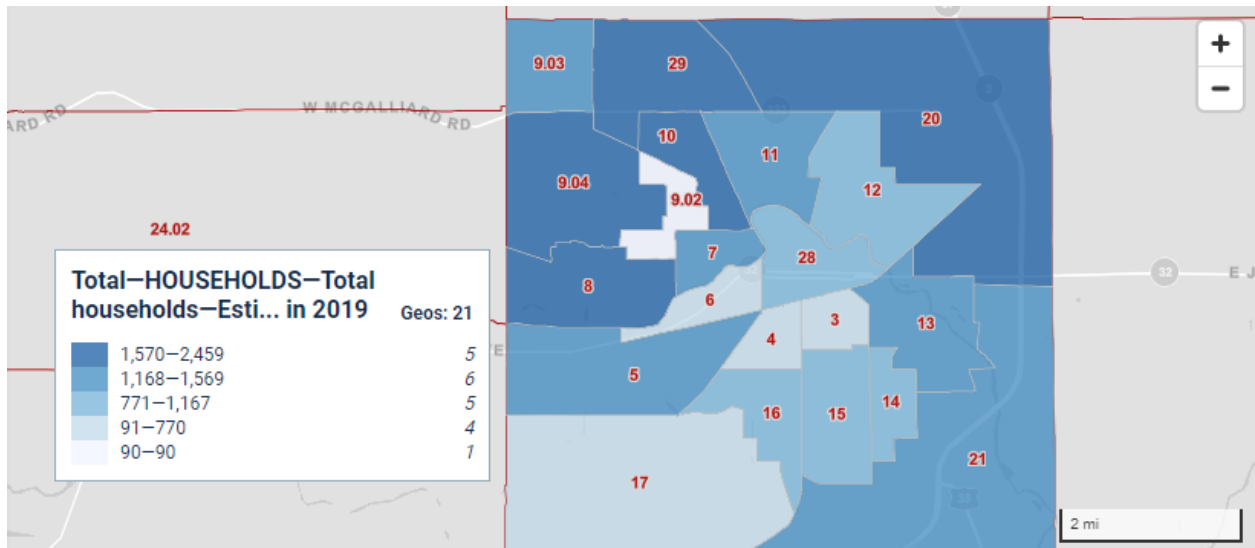


Figure 10: Total Households Estimation in 2019-ACS 5-Year Estimates

Since Muncie's rise and fall, the Industry neighborhood has encountered numerous obstacles. There are several abandoned industrial sites in the area and those who worked in these industries used to live between 1890 – 1930 in the neighborhood. To pursue new jobs, the majority of individuals departed Muncie, including the Industry area. As a result, the Industry area had to fend for itself. People in the area, struggled to come forward. I was interested to discover how people embraced so-called abandoned houses and gave them new life. Parks, active industrial

sites, abandoned industrial sites, abandoned residential sites, highly active residential sites, abandoned schools, churches, retail activities, and so on make up the Industry neighborhood.

Therefore, the area was an excellent location to exercise variety of mapping techniques.

The maps above, which were acquired from the census website, offer some statistical analysis about the neighborhood. According to these maps the residents are low-income and have a weak economic position. In summary, what these maps highlight is what the neighborhood lacks, or does not have at the present time.

During my fieldwork, I observed what they already possessed. Building communities on people's strengths rather than what they do not have or lack is a progressive and comparatively successful approach. During my field research, I saw how active the residents of the area were in while using public spaces. People talked to their neighbors on the sidewalk; young boys had parties on the sidewalk; teenage kids played basketball in the middle of the road; people had garage sales in their front yards; and buyers finalized the deal while on the sidewalk. Also, small children did artwork on the sidewalk; a group of children cycled on the road, sidewalk, and in an abandoned yard. Houses were full of flowers, vegetables, and herbs; children had nice play houses; some drive ways were used as mini basketball courts; small gardens were full of landscape ornaments; people installed small places on tree trunks to feed birds; some houses had motor bikes, and some houses had 2-3 cars parked at their garage and drive way, Many houses had tables and chairs on their front porches, and people sat there watching the streets, reading, and crafting things out of wood, quite a few of houses had temporary workshop places for carpentry work.

Despite the fact that my colleagues described the Industry neighborhood as decrepit, my observations did not confirm their opinion. During my first months in Muncie, while strolling

around the city, I noticed a lot of glass bottle fragments on the sidewalks and a lot of empty beer cans. I noticed a condom near a small library and park that I visited in Muncie Downtown. None of those items characterized the respective neighborhoods as blighted like the claims I have heard from various people about the Industry neighborhood. While I have heard these claims, I am an outsider and may not fully understand the situation. It is possible that I don't comprehend the value of filling every single house in the community. During a housing market lecture, one of my professors stated that it is always advisable to keep 6-10 percent of vacant homes to maintain rental housing market rates. This community may not have as much financial capital as the rest of Muncie's neighborhoods, but I believe it has tremendous social capital where other neighborhoods may lack of.

### **Data Collection**

The study is qualitative in nature, but it uses quantitative and map information as needed. It also involved both primary and secondary data collection. The primary data collection involved the use of several mapping techniques on the ground, whilst the secondary data collection involved the gathering of most recent land use map data for the area. Meanwhile, the Delaware-Muncie Metropolitan Planning Commission (DMMPC) GIS unit provided data layers such as the Muncie city boundary, neighborhood boundaries, building footprints, and the road network data in shape file format. These data was used to create a base map to aid the fieldwork.

During the field work, different spatial mapping techniques extracted from the literature were used. The data collection process began with a series of windshield surveys to familiarize and determine a starting point for the fieldwork. After several visits to the neighborhood, the Heekin Park, a public park on the outskirts of the neighborhood, was chosen as a starting point. The

Heekin Park was chosen as the starting point for fieldwork for several reasons. As an outsider, I felt more comfortable walking in the park and its surrounding area since it is designated as a public space. I believed that people would be more likely to notice me walking around and be willing to engage in conversation, which could help me build connections within the community. Additionally, walking along the neighborhood streets might have felt intrusive or uncomfortable, as I did not want to appear as though I was invading people's privacy. Overall, the decision to begin fieldwork in Heekin Park was made with the goal of establishing a positive and respectful relationship with the community.

### **Primary Data Collection**

Fieldwork for this study was conducted in two phases. During the first phase, I conducted a windshield survey of the Industry neighborhood. To accomplish this, I rode on several buses that traveled through the area, including Industry Bus Route No. 9, which runs from South Walmart through Willard Avenue, Burlington Bus Route No. 8, which goes through Kirby Road, and Heekin Park No. 10 Bus Route, which travels along 8th Street. These bus routes typically operate on weekdays from 6 am to 6 pm and on Saturdays from 8 am to 6 pm, with no service on Sundays. The primary purpose of this initial survey was to gain a broad understanding of the neighborhood and its residents, rather than to collect specific data. Nonetheless, during the survey, I gained valuable insight into the locations where most school children disembark, and I took this into consideration when creating the activity maps as starting points. After conducting the windshield survey, I proceeded to the second phase of my fieldwork where I gathered data for this study.

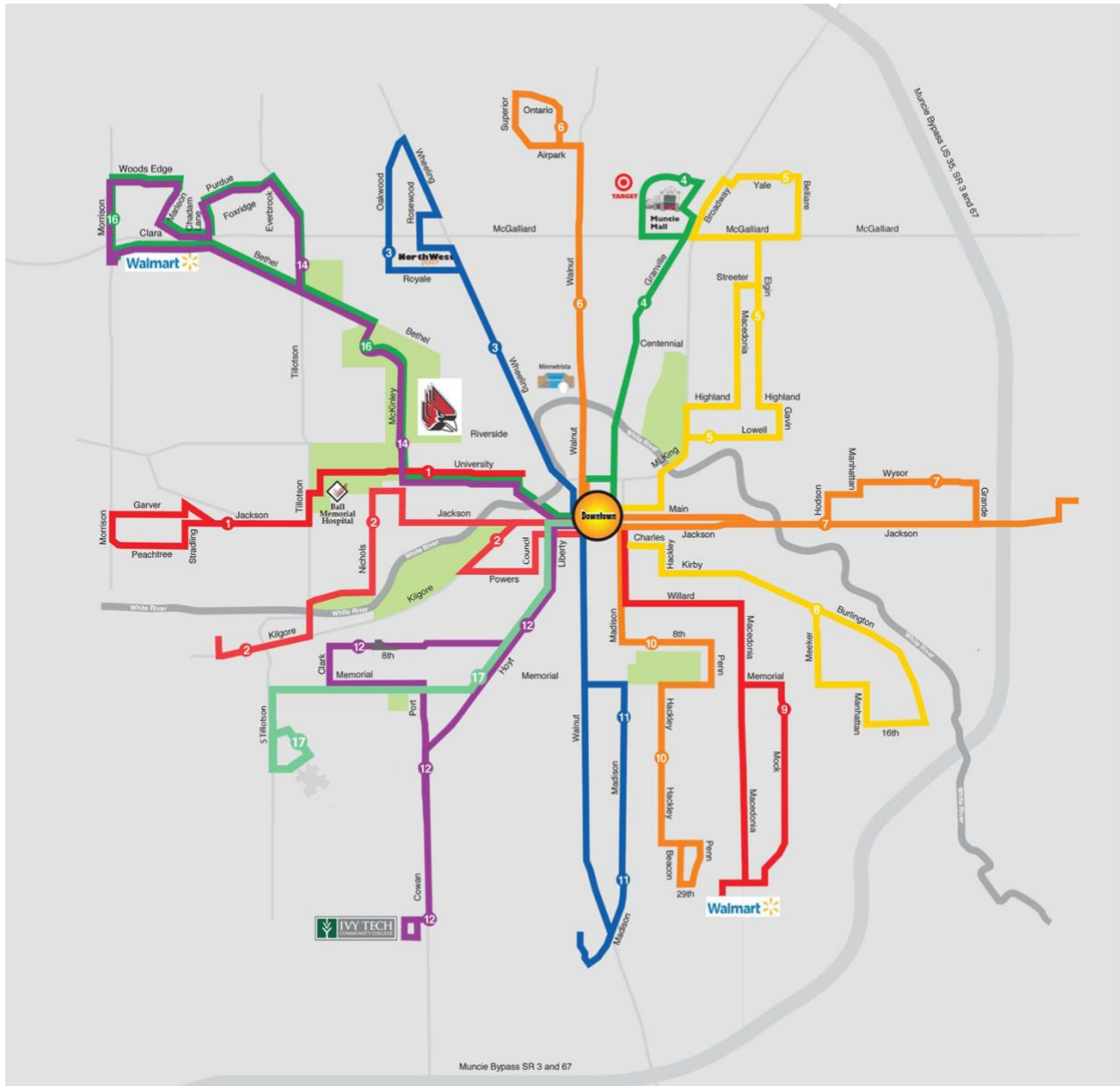


Figure 11: Mits Bus Routes in Muncie, Indiana (Mits, February)

Observations at Heekin Park enabled me to try out, evaluate, and adjust the methods. Even though various spatial mapping techniques are discussed in the literature review, I had to rule out most of them, especially the ones that required close contact, because of the Covid pandemic. All mapping techniques that require people's direct participation and/or group activities were eliminated from the final list due to Covid19 restrictions imposed by the university as a safety precaution of the university and Muncie community. Therefore, the spatial mapping techniques

employed in this study were narrowed down to deep mapping and activity mapping techniques. Residents' activities during the day and night, weekday and weekend were observed to create activity maps. Every activity was documented with the date, time, number of people participating, and gender profile with approximate age categories. Features of the built environment were observed and recorded in detail for the deep mapping techniques. After a while, people in the area volunteered to draw maps and/or point out locations and share their stories about the location, making fieldwork more interesting, informative, and deep.

One of the most important aspects of the research process is the simultaneous review of literature and fieldwork. It was a circular process that I followed until the very end of the thesis. Even though the fieldwork began with spatial mapping techniques obtained from the literature, as the project developed, I felt forced to return to and research additional material in order to represent the extraordinary stories on the ground.

### **Secondary Data Collection**

To conduct a land-use map for the Industry neighborhood, the latest land-use data was obtained from the Open Indy Data Portal. The data was in a raster format, which provided a detailed visual representation of the area. However, upon closer inspection, it was discovered that the available data did not conform to the standard categories that urban planners typically use to classify land use. In this thesis, I chose not to reclassify the land-use data I obtained from the Open Indy Data Portal for the Industry neighborhood to match the standard categories used by urban planners. The reason for this decision was that it required me to define categories of land uses to match standard classification that planners use. Due to the process of categorization, generalization, and simplification, land use maps eliminate the diversity and richness of the data. I aim to avoid repeating myself in order to standardize the data.

## **Mapping Techniques**

### **Deep Mapping**

Denis Wood (1992) is a cartographer and a scholar who is known for his work on "deep mapping" which is a method of mapping that goes beyond traditional cartographic techniques to explore the cultural, historical, and social layers of space. He argues that traditional maps, which are often created for specific purposes such as navigation, fail to capture the complexity and richness of space. Instead, he suggests that "deep maps" should be created to convey the multiple meanings and stories associated with space. Deep mapping is a way to understand the space and its meaning beyond the physical representation of it. It is not just creating a map but creating a representation of a space that encompasses the complexity and richness of the location, its meaning. Deep mapping primarily utilizes physical objects that are not typically chosen by cartographers to create maps, yet these objects reveal narratives about social spaces.

### **Activity Mapping**

Activity mapping is a method used to understand and analyze patterns of human activity in a particular space. It involves creating a map that shows the locations of different types of activities such as walking, cycling, driving, their frequencies, and the times of their occurrences such as the days of the week. The map can also inform the characteristics such as the age, gender, and socioeconomic status of the people who engage in those activities.

### **Preparing the Maps**

ArcGIS Pro software was used to create data layers (shape files), organize them into a geodatabase and prepare maps using both primary data (field data) and secondary data (land use data). Since data cleaning and organization and map preparation steps are so closely related, I

have combined both phases in this section. Field maps were densely packed with notes, symbols, denotations, and color codes. After completing each field work session, I cleaned the data and organized data into separate shape file layers. The primary focus was on creating shape files and organizing them in the geodatabase. Then I created a common map layout to ensure that all maps, especially their visualization are consistent.

I intended to ignore the scale of the map the beginning of the research project. It is primarily due to the scale's restriction on showing certain elements that play a larger role on the ground. Here, I refer to the gap between the intensity of social activity and the physical size. For example, a sidewalk appears as a thin strip on the map, sometimes not even visible, but sidewalks play an important role as a social space. In *Sidewalk City: Remapping Public Space in Ho Chi Minh City*, based on 15 years of fieldwork, Annette Miae Kim (2015) mentions how map scale was a challenge she had to overcome in order to demonstrate the strength of sidewalks. She used photographs to show more details. Therefore, I distorted maps to emphasize the story and the message. When the map was distorted, it became more of an artwork than a map. My main goal was to use alternative mapping techniques to improve the inclusivity of the planning process, therefore I chose maps over distorted images. Then I prepared maps using ArcGIS software and exported them.

## **Analysis**

The analysis involves the comparison of map visualizations. The maps generated from primary data are juxtaposed with the land use map of the region, while my own interpretation of each map is provided. Moreover, I have taken into account observations, supportive narrations, and my own experiences from conducting fieldwork, all of which contribute to building up my interpretation of maps.

## **Positionality**

Positionality refers here to an individual's worldview as well as the position they take on a research task and its social and political context (Savin-Baden & Major, 2013 and Rowe, 2014).

My objective is to determine the spaces that people create and to effectively map them in a manner that provides an accurate representation of the real world, without any manipulation, invention, or recreation. Therefore, it is imperative that I position myself in a way that minimizes any biases or judgments that may arise from my observations of people's behaviors and the physical infrastructure. By doing so, I can ensure that the study reflects a near real-world view of the spaces created by people, while maintaining objectivity and integrity in my research approach.

As an international student (an outsider), my understanding of the United States was limited, and I had numerous stereotypes about the country and its community. The last two years have been difficult for me since I have had to unlearn a lot of beliefs about people, culture, language, governance, and the country as a whole. As a result, after a period of time, I chose to abandon all of my preconceived notions and views in favor of a fresh perspective on things and situations. I wanted to be the person I was before I knew anything about the United States of America and its people. However, while this positionality was beneficial, it also served as a bottleneck during the research.

This (incomplete) positionality allowed me to observe a lot of features of the area. These include the visually observable aspects of the built environment such as slogans, flags, colors, and textures. It also allowed me to study people's behavior, postures, and gestures like eye contact, smiles, and curiosity. There were times, though, when I could have delved deeper if I had prior knowledge of their culture and social behavior.

Before conducting fieldwork, I had never been to the Industry neighborhood. As a result, my impressions of the Industry neighborhood were never formed based on previous encounters. That allowed me to observe without being judgmental and see things a fresh about the neighborhood. However, I have heard stories and had brief experiences about the Industry neighborhood from other friends and faculty who worked and studied there during my research project. Almost all of the stories were, in some way or another, connected to the neighborhood's declining living standards and deprivation throughout time. Therefore, I tried to make observations and record those on site, without coming into the conclusions.

### **Summary**

As this study is exploratory in nature, it began with a literature survey to gain an understanding of mapping methods and case studies before proceeding to fieldwork. However, due to varying contexts and spatial stories of the residents, I had to revisit the literature to explore better methods to apply. Unfortunately, due to Covid-19 fieldwork guidelines applied by Ball State University, participatory mapping approaches that would have produced a better spatial narration of the population had to be removed. Primary data collection started with a windshield survey, which led to the fieldwork where data was collected to produce the maps presented in this study. Secondary data (land use) was obtained from the GIS Unit of the Delaware-Muncie Metropolitan Planning Commission (DMMPC) in the form of a shape file. The categories presented in the dataset were not in line with the standard categories that planners use, but I refrained from changing/modifying the data to match the standards. The analysis mainly comprised comparing, contrasting, and presenting observations with each map produced.

## **CHAPTER THREE: LITERATURE REVIEW**

Literature review provides a critical analysis of published literature related to alternative spatial mapmaking process and methods. This chapter establishes the context for the research and identify the research gap through analyzing literature from different disciplines. The mapping methods applied in this study are extracted from the literature. The literature review and the fieldwork and a loop as I had to revisit several times to find better mapping techniques to employ get better representation on the ground.

### **Critical Cartography**

Critical cartography is an approach to mapmaking that incorporates social space and social and political power relations. Emerged in the late-1980s and early-1990s as a response to the dominant approach to mapmaking. It criticizes the traditional approach of mapmaking for ignoring the biases and power dynamics built into the way maps were created and used. In response, critical cartography emphasizes the need to examine the social, political, and cultural contexts in which maps are produced and used and to make these underpinnings of the mapmaking process explicit (Wood & Krygier, Critical Cartography, 2009). It was seen as promoting a progressive and impartial representation of the environment.

Critical cartography is an approach to mapmaking that emphasizes the ways in which maps are used to construct and reinforce social and political power relations-(Crampton & Krygier, An Introduction to Critical Cartography , 2006)-: It is a critical examination of cartography, the practice of making maps, and the ways in which maps are used to represent and understand the world. Critical cartographers argue that maps are not neutral or objective representations of reality, but rather are subjective interpretations of the world that are shaped by the values and

perspectives of the people who create them (Harley, *Deconstruction the map*, 2011). They believe that maps used to reinforce existing power structures and to marginalize certain groups of people, such as indigenous populations or minority groups (Rosseto, 2014).

Critical cartographers also focus on ways in which maps are used to construct and reinforce social and political power relations, often drawing on the work of Michel Foucault, Pierre Bourdieu and other critical theorists to analyze how maps are used to create, maintain and challenge different forms of knowledge and power (Pickles, *A History of spaces: Cartographic Reason, Mapping & the Geocoded World*, 2004).

The critical cartography approach also pays attention to the ways in which maps are used in different contexts, such as in colonial and post-colonial situations, and in the creation of national identities (Rosseto, 2014). It also emphasizes the need for more inclusive and participatory map-making processes, to ensure that maps reflect the perspectives and needs of all members of society.

There are several different techniques that critical cartographers use to analyze and critique maps and map-making processes. In his book *Deconstructing the map*, J.B. Harley (1992) highlights the significance of breaking down the elements of a map, such as symbols, colors, and labels, to understand how they are used to construct meaning about places, cultural biases and convey messages about power, structure, and hierarchy to the reader. For example, J.B. Harley points out the British cartographers 'during the colonial era reluctance to accept the absence of knowledge about other parts of the world. Similarly, Brian Harley and David Woodward's *Cartography in the Traditional Islamic and South Asian Societies*" (1992) provides a critical analysis of the

history of cartography and the ways in which it has been used to support colonialism and imperialism.

Matthew H. Edney (2007) is one of the pioneers who critiqued cartographic history and mapped spaces on the basis of discourse analysis. He applies discourse analysis in many of his works that examines the language and narratives that are used in maps and map-making, and how they are used to shape our understanding of the world. Matthew's *Mapping Empires, Mapping Bodies: Reflections on the Use and the Abuse of the Cartography* (2007) highlights the fact that modern imperial maps, modern idea of empire and the concept of female bodies (at that time) are equaling and can be represented and treated as the same way (Edney, *Mapping Empires, Mapping Bodies: Reflections on the Use and the Abuse of the Cartography*, 2007). He applies discourse analysis to examine imperial mapping, concepts, and the representation of women in different economies.

Foucaultian genealogy is a mapping method that has been inspired by the work of Michel Foucault, is used to trace the historical development of maps and map-making practices, and to understand how they have been used to reinforce power relations over time. Power of maps by Denis Wood, *Mapping an Empire: The Geographical Construction of British India, 1765-1843* by Matthew Edney (1997) and *The New Nature of Maps* by J.B. Harley and David Woodward (2002) are a few scholars who applied the Foucaultian genealogy in their work.

Participatory democracy in the 1930s gave the rise to participatory urban planning (Álvarez Larrain, 2019). Techniques like “survey” and “hearing” as a result of urban activists who wanted to have a collaborative response to city resource problems (Guldi, 2017). Participatory mapping is also a technique emerged under the shade of the critical cartographic discourse that involves

engaging with marginalized communities and other groups that are often excluded from traditional map-making processes, to ensure that their perspectives and needs are reflected in the maps that are created (Guldi, 2017).

In 1995, Nancy Lee Peluso used “counter-mapping” to map forest resources in Kalimantan, Indonesia. Since mapping forest resources are instructively political, she prepared two different mapping processes for the local community who uses the forest for their day-to-day work such as livelihoods, and government officials who govern the forest resources. Community-based maps incorporated indigenous knowledge. Bringing the two conflicting perspectives together, and representing marginalized perspectives in it, she created maps that challenge dominant narratives and power relations. She uses these techniques to question the objectivity of maps and to expose the social, political and ideological contexts of map production and the ways in which they are used to shape our understanding of the world. She terms these counter maps.

### **Social Space**

Urban planning primarily focuses on the production and reproduction of social spaces through legal means and political power, via physical (scientific) maps. Henry Lefebvre was one of the pioneers who introduced the social construction of space in the modern western society. Many scholars still lean on the concepts presented by Lefebvre, directly or indirectly. Lefebvre's contribution to the understanding of the social production of space has also had a profound impact on the field of urban planning. By highlighting the dynamic inter-relationship between different aspects of space, Lefebvre emphasizes that space is not just a passive product but an active and ongoing process of creation, negotiation, and transformation. Additionally, he argues that space is not neutral as it is social construct. He uses the “spatial triad” to explain his argument on the social production of space. The spatial triad consists of spatial practice,

representation of space, and representational space. Representational space is a passively experienced space. Representations of space are the conceptualized spaces. Representations of space take on a physical form such as maps, plans, and models. The spatial practice of a society is revealed through the physical and experiential deciphering of space. The social space is produced through dynamic inter-relationship between representational space, representation space, and spatial practice over the time.

Lefebvre also categorizes social space into absolute, abstract, and lived spaces. As adopted by Perera (2016), “Absolute space is the “raw” physical spaces that are “out there”, and abstract spaces are spatial structures produced by dominant actors and lived spaces are created by ordinary people” (p.1). Perera builds on Lefebvre's idea that space is not neutral but is a social construct and argues that ordinary people play an important role in creating spaces through their day-to-day practices and interactions. He (Perera 2016) continues to enrich the lived spaces into “people’s spaces” by incorporating that the agency of the ordinary people have for creating spaces for their day-today activities and cultural activities.

According to Perera, in addition to the state and capital (corporations), well addressed by Lefebvre and Harvey and their followers, ordinary people (including government officials when at home) who do not have the political or corporate power to create space also create social space. People's spaces, as he calls them, are created through the agency of ordinary people and their ability to practicalize the abstract spaces produced by capital and the state. By incorporating the experiences and perspectives of local communities, people's spaces are unique, meaningful, and reflect the values and cultural practices of those who occupy them and the ways these were negotiated. He introduces and includes “ordinary people” as a one of the key players in creating spaces other than capital and the state. Capital and the state produce abstract spaces, yet people

employ their agency and creativity to transform abstract spaces into people's spaces by adding social values.

Edward Soja (1996) also introduces "Third Spaces" as an extension of Lefebvre's concept.

Third space extends and deepens the conceptualization of space that emerged from Lefebvre's work on the social production of space. (p. 6)

Lefebvre's social space is an important starting point for the development of Third space, but it needs to be supplemented and extended to fully account for the complex and dynamic spatialities of contemporary societies. (p. 63)

Soja's concept of the "Third Space" refers to a new kind of space that emerges through the interactions and overlaps between different social and cultural groups. This space is created through the mixing of cultures and the sharing of experiences and is characterized by a sense of hybridity and flexibility. Soja argues that the Third Space is a site of resistance against the dominant cultural and political forces that shape society. By blurring the boundaries between different cultural groups, the Third Space challenges the dominant cultural norms and values and offers new possibilities for social and political change. Soja argues that Third space can challenge dominant cultural norms and values by promoting multiculturalism, which he defines as the "coexistence and mutual enrichment of diverse cultures" (p. 37). By creating spaces where different cultural groups can come together and exchange ideas and experiences, Third space can challenge the homogenizing effects of dominant cultural norms. For example, Soja describes how the city of Los Angeles has become a Third space where different cultural groups have blended together, creating a vibrant and diverse urban landscape.

According to David Harvey (2014) there are three distinct ways of understanding space and time. Those are absolute, relative and relational. "Absolute space is fixed and immovable. This is the space of Newton and Descartes. Space is understood as a preexisting, immovable, continuous,

and unchanging framework (most easily visualize as a grid) within which distinctive objects.” (Harvey, 2014 p.26). For him, absolute space “[is] the space of cadastral mapping, Newtonian mechanics, and its derivative engineering practices.” (Harvey, 2014 p. 26). The relative space and time, views space and time as relative and dependent on the observer's frame of reference. This view emerged with Einstein's theory of spatial relativity and his ideas of relative space and time. The relational time and space views space and time as relational and interdependent, shaped by the relationships and connections between things. This view emphasizes the importance of understanding the connections between objects, events, and processes in shaping our experience of space and time.

The discourse surrounding social space continues to grow and evolve with numerous scholars adding to the existing understanding of this complex and multifaceted subject. As the exploration of social space deepens, the field continues to expand and offer new insights into social space studies. Harvey, as a Marxist geographer and urban theorist, has written extensively on the relationship between social inequality and the built environment but from a political-economy standpoint. His work emphasizes the importance of understanding how the built environment is shaped by through the process of capital accumulation, and how this in turn shapes social inequality. In his seminal book "*The Condition of Postmodernity*," Harvey (1992) argues that the built environment is not just a physical manifestation of social and economic relations, but also an active force in shaping those relations. He contends that the way cities are planned, developed, and managed reflects and reinforces the existing power structures and contributes to social inequality. Additionally, he emphasis the relationship between the right to the city and urban social movements and argues that cities are key sites of struggle for radical change through his "*Rebel Cities: From the Right to the City to the Urban Revolution*.”

Susan Fainstein is a planner and urban geographer who has written extensively on the role of social justice in urban planning. Her work emphasizes the importance of involving community members in the planning process and the potential of planning to create more inclusive and equitable spaces. Her book “*The Just City*” (2010) argues that the traditional top-down approach to urban planning, which is dominated by technical experts and elite, often fails to take into account the needs and perspectives of marginalized communities.

Don Mitchell (2003) has written extensively on the relationship between power and the built environment but from a political-economy perspective. In his book *The Right to the City: Social Justice and the Fight for Public Space* (2003), he emphasizes the idea of the right to the city and argues that cities should be planned and developed in ways that prioritize the needs of all residents, not just the powerful. Mitchell argues that individuals who were underrepresented in urban planning and development process have a right to participate in shaping the built environment and to have their needs and interests considered.

Despite the important insights and perspectives offered by scholars of social space, these concerns and insights are often not fully incorporated into urban planning practices. The methods and tools used in urban planning can often be limited and reductionist, and they can fail to capture the complexities, nuances, and power dynamics of social spaces. As a result, the significant contributions made by scholars are often not fully reflected in the outcomes of urban planning processes.

However, as previously highlighted, the critical cartographic discourse has made efforts to tackle the limitations of [traditional] cartography in capturing diverse spatial narratives. This work continues, and the discourse has started to question the very idea of the map is.

## Map

As introduced in the introduction, the idea of “maps as representations” of objective reality was questioned by Denis Wood and John Krygier. Their position is that maps are propositions.

“Maps affirms the existence and the location of its subject. Maps are propositions in its graphic form” (p.198) (Krygier & Wood, 2009). The word “proposition” is much stronger than the word “representation” as it comes with the idea of “judgement” whereas “representation” depicts rather acting on behalf of someone.

The immense persuasive power of maps is well explained by Michael Foucault's work on *Panopticism* (1975). Panopticism has a connection with intangible mental spaces. In a similar way, maps also influence the reader by creating a mental space where a belief is formed.

Through their visual representation, maps convey to the reader the notion that what is shown on the map is real and actually exists on the ground.

The dualistic quality of maps was argued by Rob Kitchin et al. in their Thinking about maps article. “...mapping is holistic or fragmentary, stochastics or regular, invariant or contingent, natural or cultural, objective or subjective, functional or symbolic so on.” (p. 03) (Kitchin Perkins, & Dodge, 2009). Moreover, the concept of mind-body, the connection which has a significant impact on how people perceive the world, is used to explain the persuasive power of maps. When the mind is viewed as separate from the body, the tools used, such as maps, can be seen as detached from the subjective and unpredictable qualities of embodied knowledge.

However, by emphasizing the unity of mind and body, a more subjective and hybrid approach to mapping can be taken into consideration. The article further elaborates that there are also critical questions surrounding the uniqueness of graphical knowledge and the possibility of the world being subject to general theorem.

Denis Wood also comprehends that maps as engines that convert social energy to social space, social order, or knowledge (Wood, Fels, & Krygier, 2009), as maps achieve producing social space by linking selected things onto a common plane [a map]. Seemann (2012) highlights that the “maps are not end product but starting points. They include thoughts and emotions and must be seen as visual impressions in a broader context of visual culture.” Social space, social order, and knowledge are subjective concepts that are constantly evolving, and as Seeman highlights, they are not static or solid components. Maps can help to produce or represent these concepts by using thoughts and emotions, but they are dynamic tools that are influenced by the mapmaker and the social and cultural context in which they are created and interpreted.

According to J.B. Harley’s *The Map and the Development of the History of Cartography*, the idea about “the map” is different in different cultures. It runs from graphical form to different textual forms. Harley elaborates, maps have taken many different forms over the centuries, ranging from purely graphical forms such as maps created with ink on paper, to more textual forms such as descriptions of landscapes or geographical information recorded in written texts. Harley also emphasized the role of maps as historical documents, reflecting the political, economic, and cultural ideologies of their creators, as well as the cultural and historical context in which maps are produced and used, and the ways in which maps reflect the values and beliefs of the societies that create them.

"Zhang's Rhapsody" is a Chinese textual map that dates to the 13th century and is considered one of the earliest examples of a textual map. The text, written by the Chinese geographer Zhang Zeduan, is a written description of the landscape and geography of the city of Kaifeng, China, during the Song dynasty.

"Zhang's Rhapsody" is significant because it provides a detailed, written representation of the geography and urban landscape of Kaifeng, rather than a graphical representation. It includes descriptions of the city's streets, buildings, bridges, and waterways, as well as its markets, shops, and other social spaces.

The first capital of the Han house

Lay on the banks of the Wei River.

To the left, there are....

The double defiles of the Yao and the Han

The barrier of the Taolin,

Connected by the Two Hua peaks...

To the right, there is...

The gap of Longdi,

Which partitions China from the barbarian lands...

At its southern front, there are.

Zhongnan and Taiyi,

Twisting upward tall and stately.

At its northern rear, there are.

High hills and level plains...

In the distance, there are.

Nine peaks and sweet spring. (Yee, 1994)

Similarly, "*PrairyErth: A Deep Map*" by William Least Heat-Moon, published in 1991, is a mixture of narratives, history, and cartography. In the book, Heat-Moon explores the Flint Hills region of Kansas, a sparsely populated area of rolling hills and tallgrass prairie. He takes a deep dive into the region's history, geology, ecology, culture, and people, using both traditional and non-traditional research methods. The term "deep map" is used by Heat-Moon to describe a kind of cartography that goes beyond traditional topographical maps, incorporating cultural,

historical, and ecological information into a more comprehensive understanding of a place. The idea is to create a layered and multi-dimensional understanding of a landscape, including the physical features, human history, and cultural significance. Moon explores the concept of deep mapping;

A deep map looks past the surface of a place and tries to get at the underlying structures, the history and the culture that give a place its unique character. (page 9)

A deep map is an attempt to map not only the contours of the land but also the contours of the stories that have been told about that land. (page 9)

A deep map can be seen as a form of exploration and excavation, an attempt to uncover the hidden depths of a place and to reveal the layers of history and meaning that lie beneath its surface. (page 14)

A deep map is a way of seeing a place, not just as a location on a map, but as a complex and interconnected web of stories, history, culture, and ecology. (page 14)

Deep maps are not meant to be comprehensive or definitive; they are meant to be exploratory and suggestive, opening up new ways of seeing and understanding a place. (page 84)

The land is more than its map. A place is more than its geography. Its people, its story, its meaning - this is the territory where the soul resides. Yet a deep map must begin with geography and proceed through history to reach the spirit. (page 163)

A deep map is not just a map of the physical terrain; it is a map of the cultural terrain as well, a way of representing the ways in which people have interacted with and transformed the landscape over time. (page 14)

In deep mapping, there is a recognition that a place is not just a natural or physical environment; it is a social and cultural environment as well. (page 84)

Deep mapping is a way of giving voice to the people who have lived and worked in a place, and of recognizing the ways in which their lives and stories have shaped that place over time. (page 84)

A deep map is a way of making visible the hidden histories and geographies of a place, and of recognizing the often-overlooked contributions of the people who have shaped it. (page 85)

Deep maps can help to foster a sense of connection and belonging among the people who inhabit a place, by showing them how their lives and stories are intertwined with the landscapes they inhabit. (page 85)

These passages illustrate the idea that deep mapping involves a multi-layered exploration of a place that goes beyond traditional cartography or geography to encompass history, culture, ecology, and the stories that have been told about that place over time. Additionally, deep mapping is a way of recognizing the ways in which people's lives and stories are intertwined with the places they inhabit. Deep maps can help to reveal the often-overlooked contributions of the people who have shaped a place over time and can foster a sense of connection and belonging among the people who live there. The goal of deep mapping is not to provide a definitive or complete representation of a place, but rather to open up new ways of understanding and appreciating it.

Similarly, "*Siam Mapped*" by Thongchai Winichakul, a historian of Thailand, explores the history of mapping in Thailand and its impact on the country's identity and politics. The book demonstrates that maps have played a crucial role in shaping Thailand's national identity, and that the country's modernization and centralization efforts were closely tied to the production and use of maps. Winichakul (1994) contends that the Thai state used maps to assert its control over the territory and its people, often at the expense of minority groups and peripheral regions.

Winichakul also examines the ways in which maps have been used to represent and construct knowledge about Thailand's geography, history, and culture. He argues that the production of maps was not simply a technical process, but involved cultural and political factors that shaped the way in which information was collected, represented, and disseminated.

However, Winichakul says that "Cartography and census, together with the archive and the museum, are the most powerful tools in the making and sustaining of nation-states." (page 9)

(Winichakul, 1994). Therefore, several studies reflect the creative and innovative ways of using cartography: one of the most powerful tools to explore and reveal people's spaces.

*Deep mapping the river* by Selina Springett (2014) has applied deep mapping approach to explore a project that involves the Cooks River, an urban river system in Sydney, Australia.



*Figure 12: Deep mapping the Cooks river*

By leveraging deep mapping, this method has facilitated the collection of diverse perspectives and levels of involvement that various groups possess in relation to the river. In addition to highlighting the ecological significance, deep mapping has enabled an exploration beyond that domain.

Further work in this vein includes Annette Kim's *Sidewalk city: Remapping Public Space in Ho Chi Minh City* (2015), Vietnam. The book encompasses 15 years of fieldwork. The book examines how informal economic activities, such as street vending and motorbike repair, have shaped the use and perception of sidewalks in the city. Using spatial mapping and spatial ethnographic methods, Kim provides a nuanced analysis of the ways in which sidewalk space is

contested, negotiated, and repurposed by different actors, including residents, business owners, and government officials. The book highlights the importance of recognizing the multiple and often conflicting meanings attached to public space, and the need for more inclusive and participatory approaches to urban planning and governance.

“Denis Wood’s (2015) deep mapping project that exposes the transformational processes that brings neighborhoods into being as rich lived places.” (Dodge, 2017). Wood's project, titled "Everything Sings: Maps for a Narrative Atlas," focuses on the city of Boylan Heights in Raleigh, North Carolina, and involves collaboration with local residents, artists, and writers. The project includes a series of maps that provide a vivid and multifaceted portrait of the community, exploring its history, ecology, culture, and everyday life.

As mentioned in the early in this chapter Nancy Lee Peluso (1995) conducted a counter-mapping exercise to map the distribution of forest resources in Indonesia. Peluso conducted interviews with a variety of stakeholders, including government officials, logging company representatives, and local residents, to understand the ways in which they perceived their relationship to the forest. She also used satellite imagery and GIS software to create maps that represented different claims to forest resources, including those of indigenous groups, migrant settlers, and logging companies.

Peluso's research revealed that the Indonesian government's approach to forest management was not only unsustainable but also undermined the livelihoods of local communities who relied on the forest for their subsistence. By creating counter-maps that represented the complex and diverse claims to forest resources, Peluso challenged dominant power relations and provided a more nuanced understanding of the ways in which people interact with and rely on natural resources.

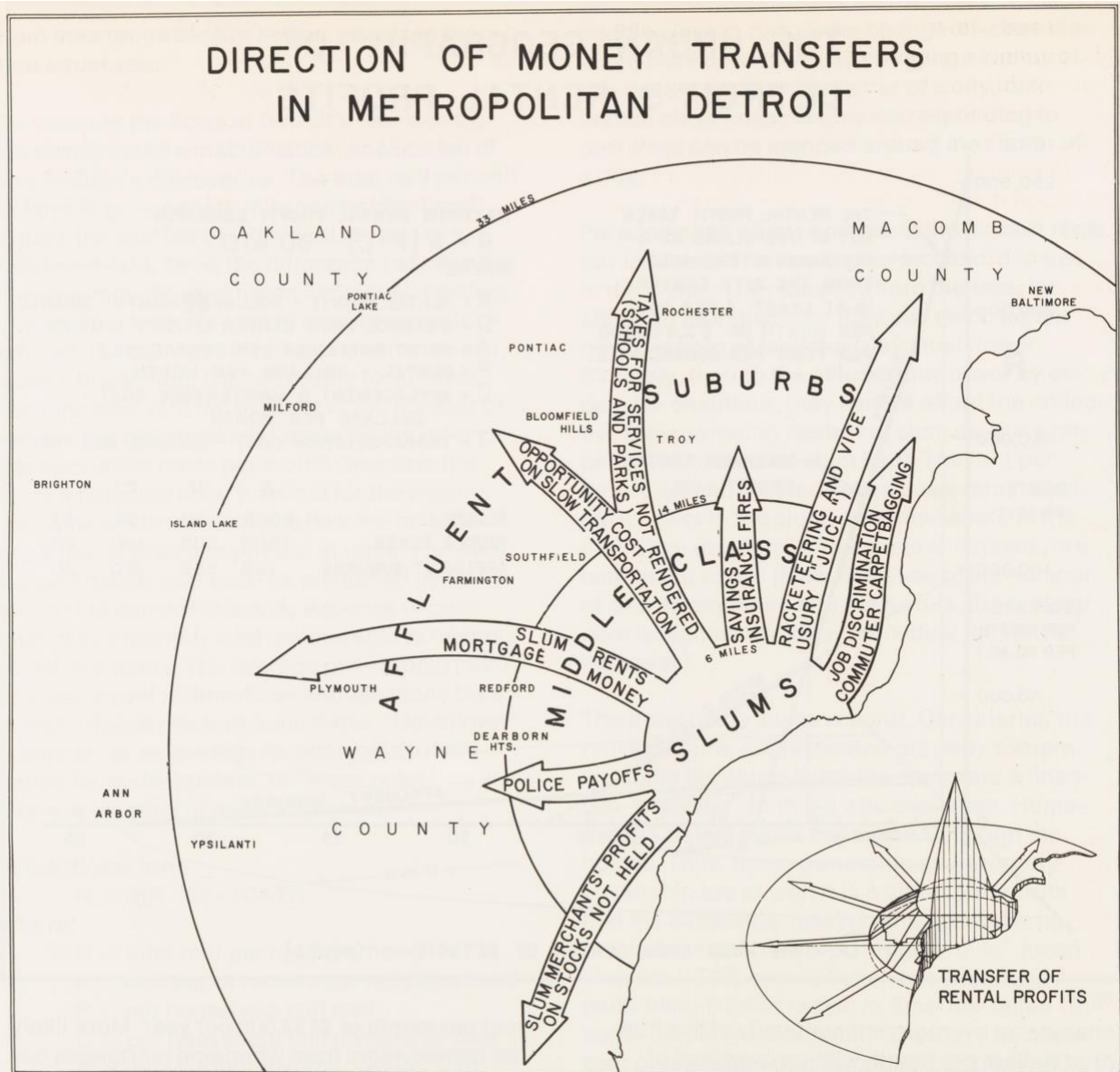


Figure 13: Direction of money transfers in metropolitan Detroit

The map "Directions of money transfers in metropolitan Detroit" is a thought-provoking visual representation that employs quantitative data to highlight the social inequality experienced by the poor community in Detroit. Rather than relying on charts and figures, the map illustrates how the income generated by the slum community is disproportionately distributed among the more affluent segments of the population (Bunge, 1971).

According to Foucault's understanding, power is based on knowledge, and it makes use of knowledge. Power reproduces knowledge by shaping it in accordance with its anonymous intentions. Power re-creates its own fields of exercise through knowledge (Gordon, 1972). In this way, critical cartography aligns with Foucault's ideas about power and knowledge, seeking both to expose and challenge the ways in which power shapes the production and use of knowledge. By creating maps that reflect the perspectives and experiences of marginalized groups, critical cartography seeks to empower those who have been historically excluded from the dominant narratives of society.

Despite being a dominant discourse with the potential to impact people's lives and address social injustice and inequality, urban planning has historically excluded the spaces and interpretations of invisible and intangible populations. To combat this exclusion, scholars from a wide range of disciplines, including environmental studies and architecture, have begun to incorporate critical cartographic mapping methods. This approach aims to bring these marginalized perspectives into mainstream analysis, which continues to evolve and expand.

### **Summary**

Critical cartography scholarship theory has predominantly been built on social sciences, geopolitics, and power-knowledge theories and concepts. However, critical cartographic scholars continue to question maps, their purpose, the power they hold, and the access they provide to privileged communities. Building on the critical cartographic theoretical foundation, critical cartographic approaches tend to expand and branch out through different fields of study, aiming to produce better spatial narratives and give a voice to the voiceless through mapping. However, despite being one of the main disciplines that could benefit from critical cartographic mapping practices, urban planning has failed to incorporate them into its processes.

## CHAPTER FOUR: FINDINGS & DISCUSSION

The planning practices of people for their spaces are temporally linked with maps that highlight the areas under study and inductive approaches to neighborhood planning. When planners value neighborhoods for their diversity and character, maps attempt to capture these characteristics by collecting data on various experiences of their residents from the ground. In this section, I present the maps I produced using the data I collected in the form of a story. I will then compare and contrast my experience with the previous map-making experiences I had in Sri Lanka. Additionally, I will evaluate the effectiveness and shortcomings of the story maps of the Industry neighborhood and reflect on the process.

When I was in the field, I was quite startled at first. As this was a new experience for me, the biggest question was, what should I map? Mapping is subjective, and the mapmaker uses their agency. In order to make my observations as close to the ground as possible and derive the story through the mapping exercise, I refrained from referring to other material or stories about the neighborhood from different sources. The observations were made firsthand, but determining what to map (and what material to exclude) was an infinite question. Yet, I had to find a finite answer to it. I was also confronted with the question of not wanting to destroy an infinite question with a finite answer.

In the first phase of the fieldwork, instead of mapping the area, I started to map the questions and comments directed at me by the inhabitants of the area. People clearly noticed my presence since I was an outsider, and they had questions for me. Figure 14 shows some of these questions and parts of the conversations that occurred in the neighborhood while I was doing the fieldwork. Figure 15 shows all the respective locations where I responded to their questions. Both these

maps are not directly related to the resultant people's spaces, but they are connected to the mapping process.

Once I returned home, after each fieldwork session, I closed my eyes and visualized the things I had observed. It was relatively easy for me to create mental images of the neighborhood when I had only a brief understanding of the area. However, I found it increasingly difficult to create these images as I became more familiar with the neighborhood and its inhabitants. At the outset, I could recall only a few physical structures, some of which were landmarks that helped me to orient myself, and some were notable structures such as distinctive houses, large trees, or communal events like parties and basketball games. These elements and activities held abstract meanings in relation to the neighborhood, making them easy to visualize. Over time, as I added more details to it, the mental image became increasingly complex to visualize. In short, it is easier to visualize spaces when we have a limited understanding of the details rather than a comprehensive understanding and this image is a highly-simplified my own understanding of the neighborhood.

### **Approaching the Neighborhood**

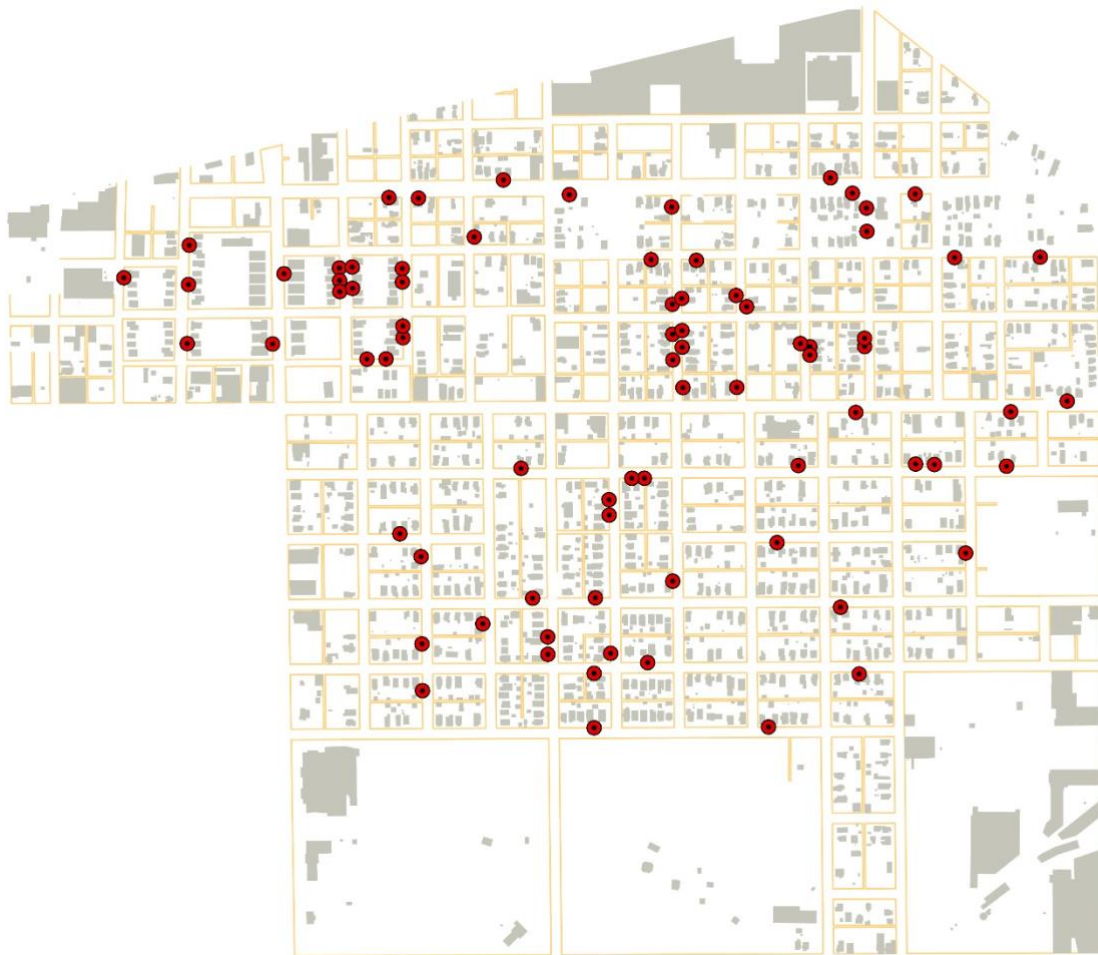
In the second phase of my research, I started to map out various activities carried out by the inhabitants of the neighborhood. During this phase, I engaged in both observation and conversation with people living in the area. As I talked to them, I discovered that they often described their relationship with their immediate surroundings in terms of the prominent activities they engaged in within that space. For example, people say, "I repair cars here," "I maintain lawns here," "I play here," or "We chill here."

I noticed that there was often a difference between the activities that people mentioned and the activities that I observed them doing in a particular space. For instance, on one occasion, I saw a person repairing cars on the sidewalk, so I noted it down on my map. However, when I spoke to the same person a few days later, he mentioned that while he did repair cars in that space occasionally, he and his friends mostly used it as a meeting spot every afternoon.

While observations are important in mapping out the activities that people engage in within a particular space, having conversations with the inhabitants of the neighborhood provides a richer understanding of the significance of these activities in their daily lives. By combining both observation and conversation, we can create more accurate and detailed maps that capture the complex and multifaceted nature of the neighborhood and the people who live there. Therefore, preparation of maps solely based on our observations may not provide a complete picture, but engaging in conversations with people can enrich our understanding of their relationship with the space around them. Therefore, I had followed up conversations to create a better spatial story for mapping.

These conversations were always interesting. I asked residents to point out locations on the map where we were standing at that time. Almost all the time, they first searched for their house on the map and then successfully located themselves. In contrast, when I did a similar mapping project in a neighborhood in Sri Lanka, they always asked me to find the nearest junction or road before locating themselves on the map. This was one of the main differences I observed in how people locate themselves on the map, either in relation to their house (in the Industry neighborhood) or in relation to the closest junction (in Sri Lanka). It is evident that in the industry neighborhood people's spatial awareness begins with the self and expand outward. Therefore, when conducting a mapping activity from the perspective of the residents, it is crucial

to start from their immediate surroundings, rather than imposing the mapper or planner's point of reference onto the map. Additionally, I also noticed that people in the Industry neighborhood were more comfortable with maps. They checked the north of the map and read lines and directions. On the other hand, in the neighborhood in Sri Lanka where I did mapping, people needed a little help finding directions and reading the [western] map. It was evident that the level



*Figure 14: Places where I had to stop and answer questions from the residents of the area.*

of familiarity with maps in these two groups was significantly different. Therefore, mappers and planners need to be cautious and conscious of these sensitivities of people rather than stereotyping every community as being good with maps.

I observed that when people describing spaces of the Industry neighborhood, they commonly use “I” to emphasis their relationship with the space. For example, “I play basketball here, with my friends”, “I walk in the evening along this road”. In contrast in Sri Lanka, people used collective pronoun to describe their relationship with the space. For example, “Our children play here”, “We wash our clothes here” “Women gather here in the evening to have a chat”. This was very distinctive difference I observed in people’s spatial narrations when it comes to describing common spaces.

During the mapping activity in the Industry neighborhood, residents raised several questions, one of which was particularly important: 'Where are you from?' As shown in Figure 14, the

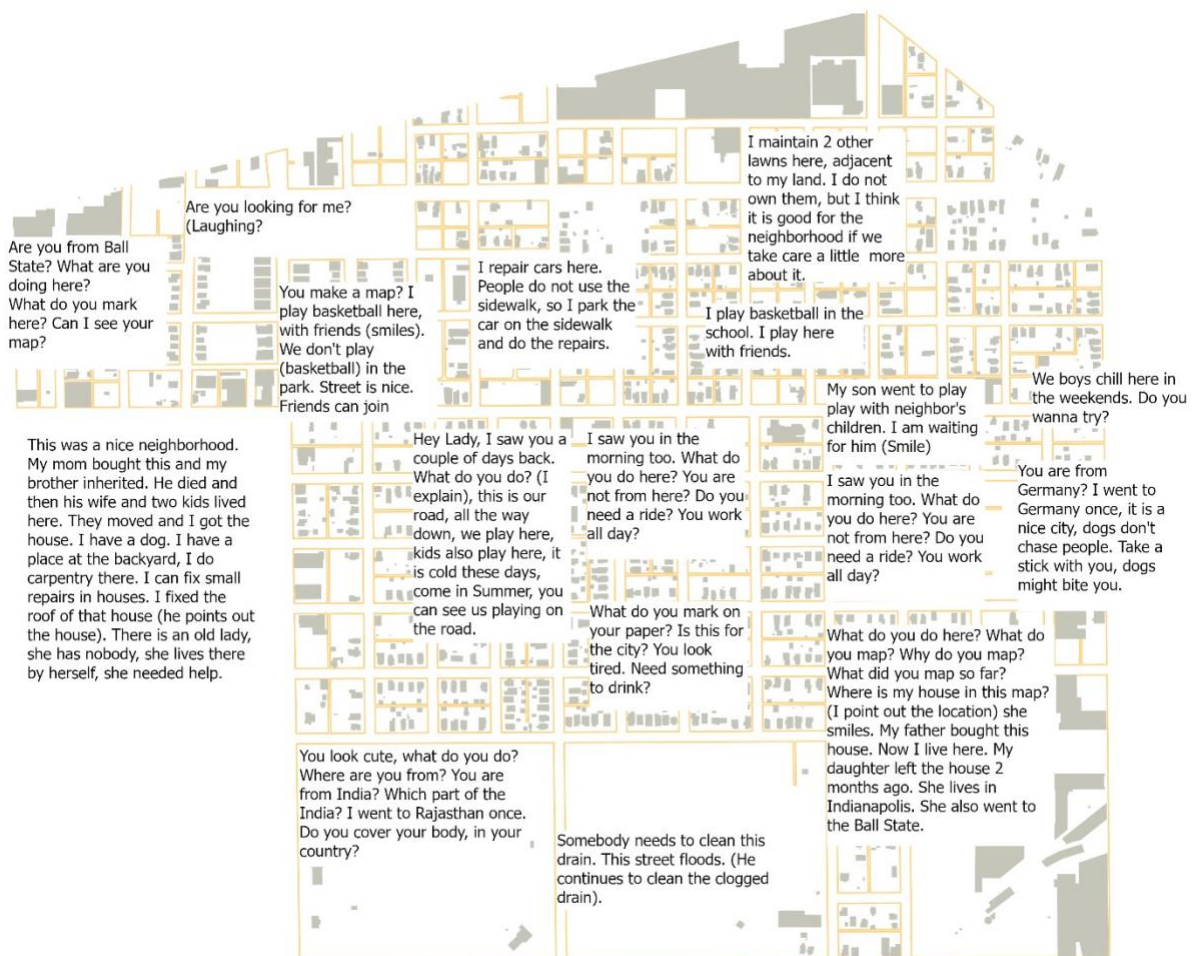


Figure 15: Questions and Comments Received from Residents

inhabitants were curious about the mapper's origins. Figure 14 illustrates that the inhabitants were curious about the mapping process, and this inquisitiveness was evident during my fieldwork. I mostly wore a t-shirt that displayed the names of the universities where I studied, including Ball State University. In the Industry neighborhood, people assumed it was a school project and expressed curiosity about it. In Sri Lanka, residents questioned the mapping project, assuming it was either a survey before demolishing their settlement or a survey to determine the number of houses/households to provide food, housing materials, or financial aid. Figure 13 shows a few selected comments and snippets from the conversations I recorded and added to the map at the conclusion of a fieldwork session. As I continued to conduct fieldwork, I observed that the residents gradually became more familiar with my presence, displaying a growing sense of comfort and ease in interacting with me.

## **Mapping**

I then delved into deep mapping techniques as applied by Denis Wood (1970) to create a neighborhood atlas for Boylan Heights. The technique involves selecting physical features of the ground that are not conventionally mapped by cartographers, planners, or mapmakers but collectively tell a story. Figure 15 shows basketball hoops located on the streets of the industrial neighborhood. While it is quite common to see basketball hoops in driveways and gardens across the USA, I noticed that children and young adults were using the streets as mini basketball courts

in this particular neighborhood.

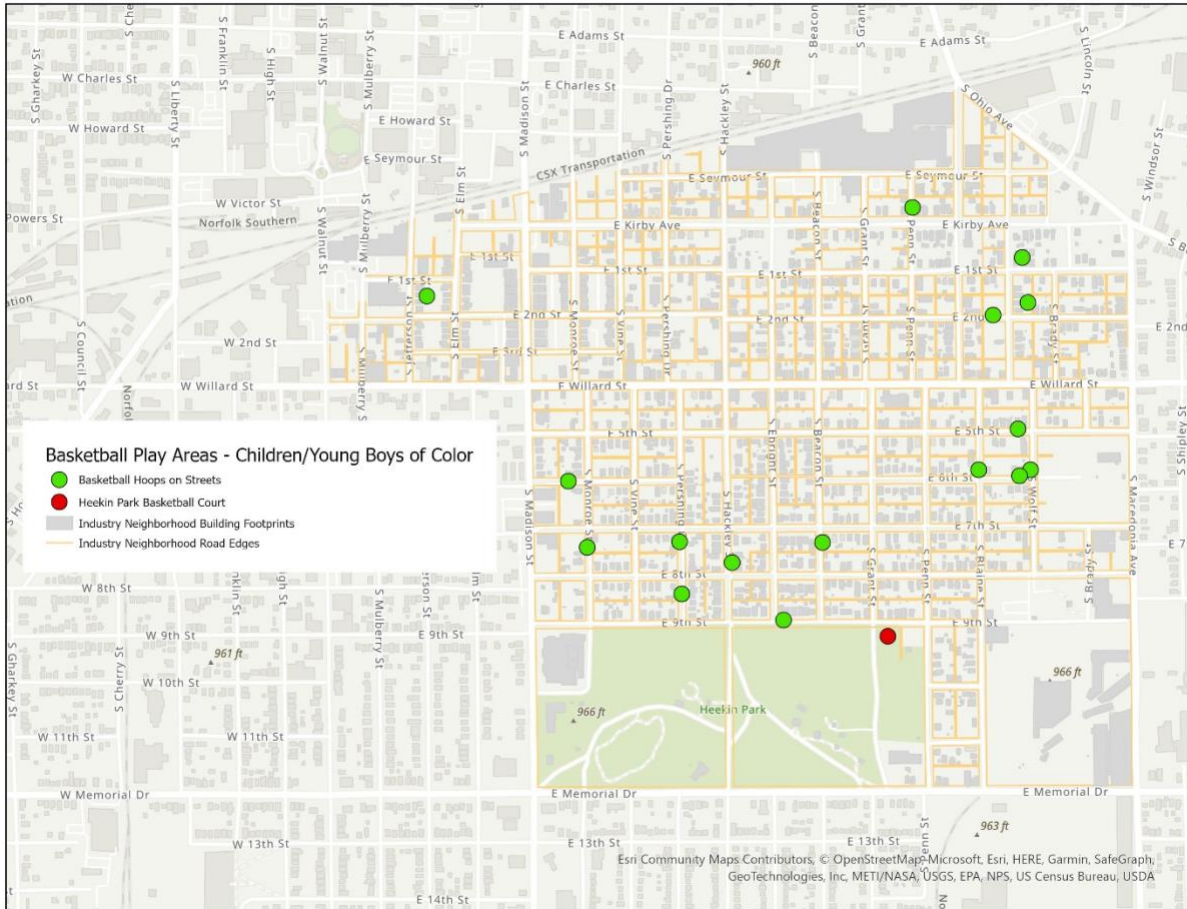


Figure 16: Basketball mini courts

During my fieldwork I noticed that Heekin Park, located at the southern edge of the neighborhood, had a basketball court. However, I observed that children of color seldom used the court, while their white counterparts used it frequently. Instead, children of color often played basketball and rode bicycles on the streets and alleys. Despite designed to provide recreational and open spaces for neighborhood residents, Heekin Park appeared to be underutilized by children of color. I did not witness any of them playing basketball there.

Neighborhood alleys have been overlooked by geographers, social scientists, and planners, but consequently, been included in city policies. In traditional mapping methods, especially land-use mapping, the mapmakers measure a predetermined set of categories that are beneficial for profit and wealth creation. Planning professionals tend to avoid documenting aspects that challenge capitalism and the market. For example, planners place more value on streets as transit corridors, which can generate profit in the market, rather than as social spaces. The conventional mapping process makes it difficult for them to comprehend, visualize, and classify spaces like alleys as they become liminal.

The streets in this neighborhood were more than single-use transportation routes; they also serve as gathering places for teenage boys and play areas for young adults. Despite being common uses for streets in many neighborhoods, these activities are often overlooked by mainstream analysts and mapmakers.

It is important to understand the role of Heekin Park as both a recreational and social space. This raises questions such as whether the park fulfills its intended purpose, and why it is less desirable to some residents compared to narrow alleys and streets. It also challenges the notion that the availability of open spaces is a sufficient standard for meeting the recreational needs of diverse communities. Figure 4a and 5a helped to bring about these questions and understandings developed through the study.

### **Questions and Understandings**

Figure 16 inspired me to map the spaces that children occupied in the neighborhood. I found that they primarily utilized alleys, sidewalks, and streets located in the south side of the neighborhood. While I could not determine the exact reasons for this pattern, it is possible that

the lower volume of automobile traffic in the south side of the neighborhood contributed to this trend.

I experienced the dilemma of classifying someone as an Other. The other exists in contradiction, or perhaps in paradox, being either invisible, or hyper visible, but rarely just visible. "The other" can be perceived in contradictory ways: on the one hand, they may be invisible, ignored or overlooked by the dominant group, and not seen as important or worthy of attention. On the other hand, they may be hyper visible, subject to intense scrutiny, surveillance, and even discrimination. In this way, "the other" is paradoxical and complex, as their visibility and invisibility is dependent on the context and the perspective of those who are observing them.

In the context of mapping and planning, certain groups overlooked or ignored in the process, resulting in their invisibility on maps and in planning decisions. At the same time, these same groups also hyper visible due to their marginalized status and the attention they draw from the dominant group. In this way, "the other" exists in a paradoxical state, neither fully visible nor fully invisible, and often subject to marginalization and erasure. Feminists have been responding to the portrayal of humans (mankind) as masculine and, also in critical cartography, there is an emerging branch that feminizes mapping which made women hyper visible. Evidently, in mapping, the planner and cartographer first notice the "space" and not the "user" that is being used. Thus, planner and mapper's ability to recognize different users of the space depends on the ability to recognize different uses.

Planners apply land use mapping techniques to see the changes occurred in a particular space over the time. Usually, spatial mapping techniques like land use mapping extol the virtue of chronological and other statistical categories such as densities, rather than actual social/people's

spaces. It is the chronological segregation that land use maps are more capable of demonstrating rather than the chronology itself. In land use maps, the order of the land uses, and different stages are prioritized over the overlaps of uses and users. The latter combination can be relatively legible in activity mapping.

Figure 17 shows the spaces used by children living in the area for playing. Orange dots shows the basketball hoops and polygons shows areas where I observed children who used spaces to play more than three times during my field visit that spanned over three months. The frequency helps identify spaces used in their daily routine. The orange polygon shows the areas where children of color played while the purple polygons show spaces used by their white counterparts.

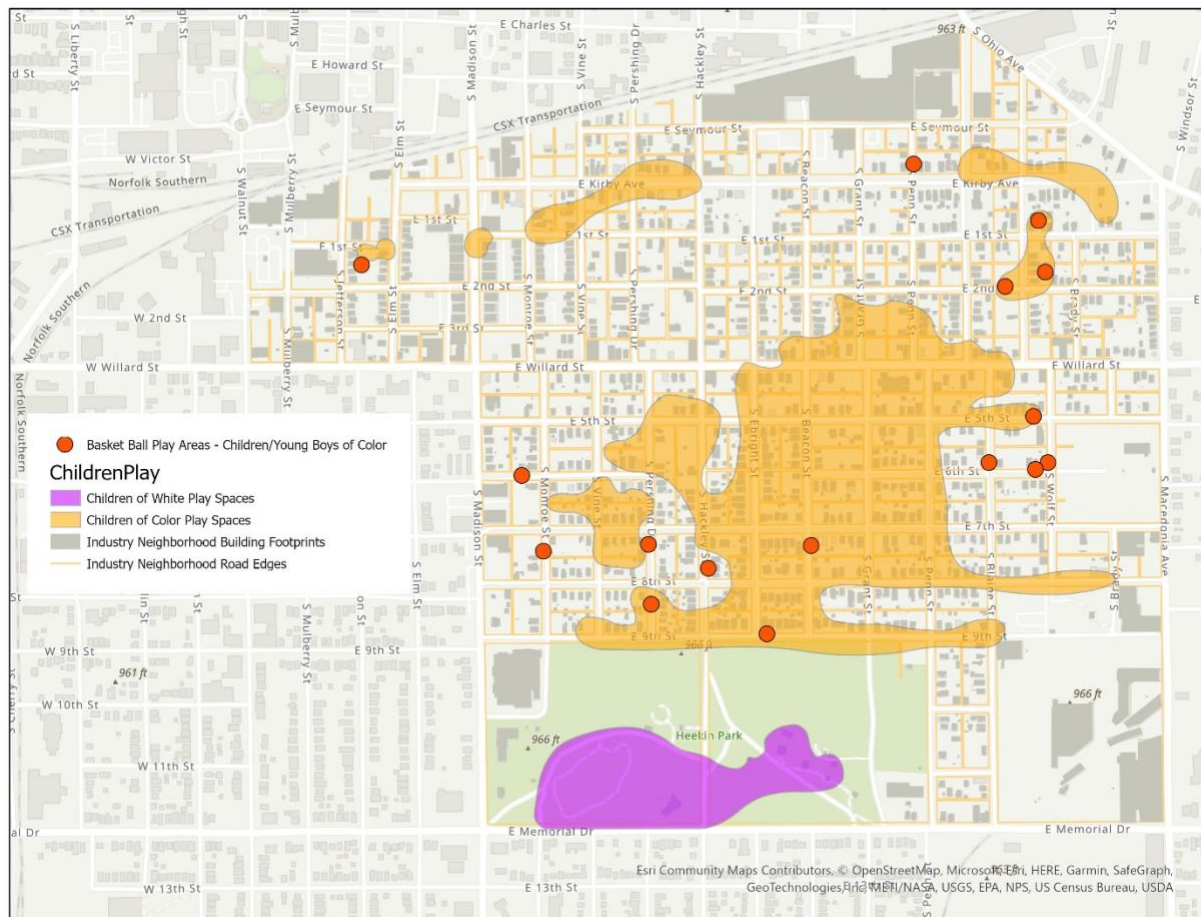


Figure 17: Children play-areas.

When I was preparing this map, I expected (may be a bias) to see the two polygons overlap at some points. However, polygon indicate that these two groups of children use different spaces in the neighborhood.

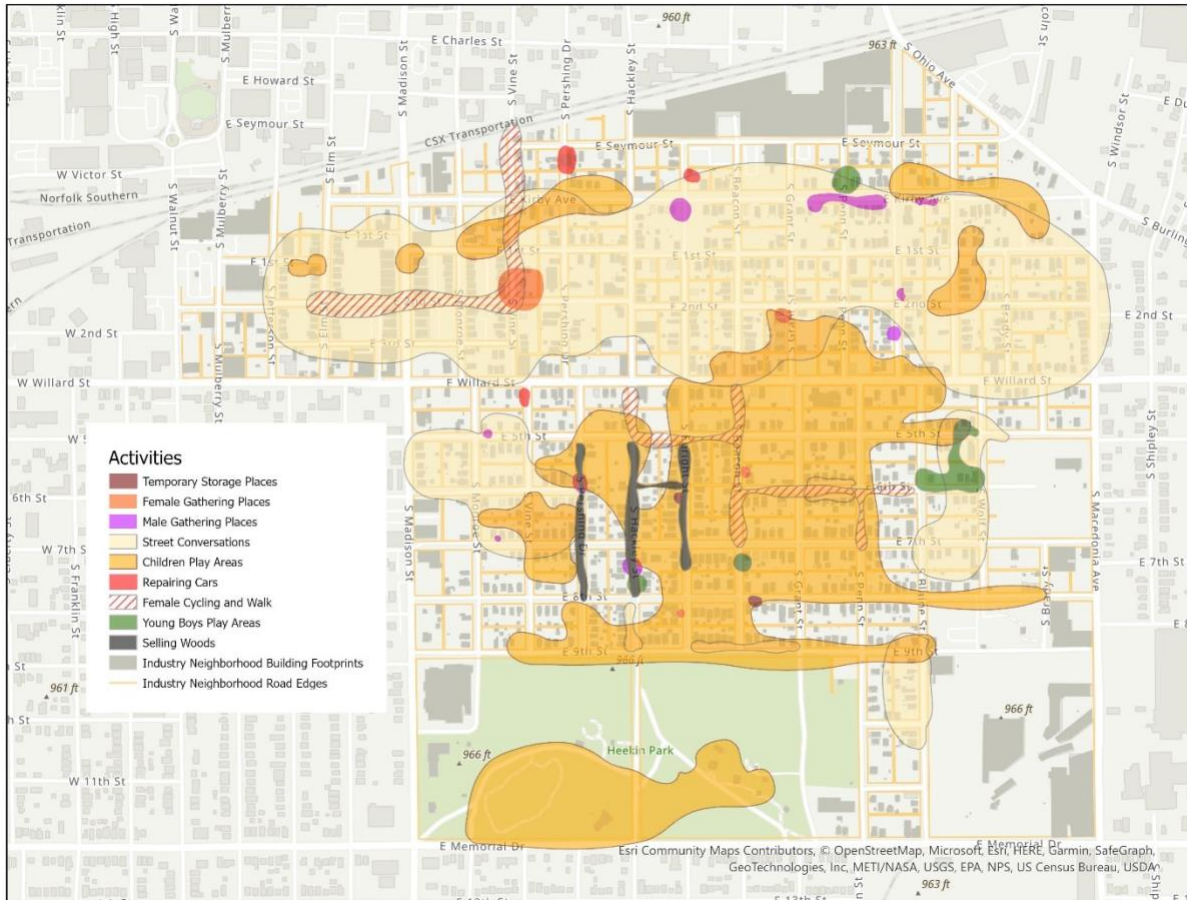


Figure 18: Activity map

Figure 18 presents a condensed representation of the activities that were observed in the neighborhood. Instead of using points to indicate activities on the map, I chose to create polygons based on the clusters of points. This method was more effective in visually conveying the significance of the activity based on the map scale.

Through observation, I noticed that residents in the north of Willard Street engaged in more conversations on the streets and sidewalks than those to the south of the street. This led me to conclude that people in the north of the neighborhood had a closer relationship compared to those in the south. However, the streets on the south side of the neighborhood were primarily occupied by children, women, and teenage boys. To gain better understanding of these social spaces and their patterns, it would be necessary to conduct ethnographic interviews with the inhabitants themselves. Although an activity map is a powerful tool for identifying patterns, it should be complemented by ethnographic methods to fully capture the narrative. Unfortunately, due to Covid-19 research guidelines aimed at promoting the safety and security of neighborhood

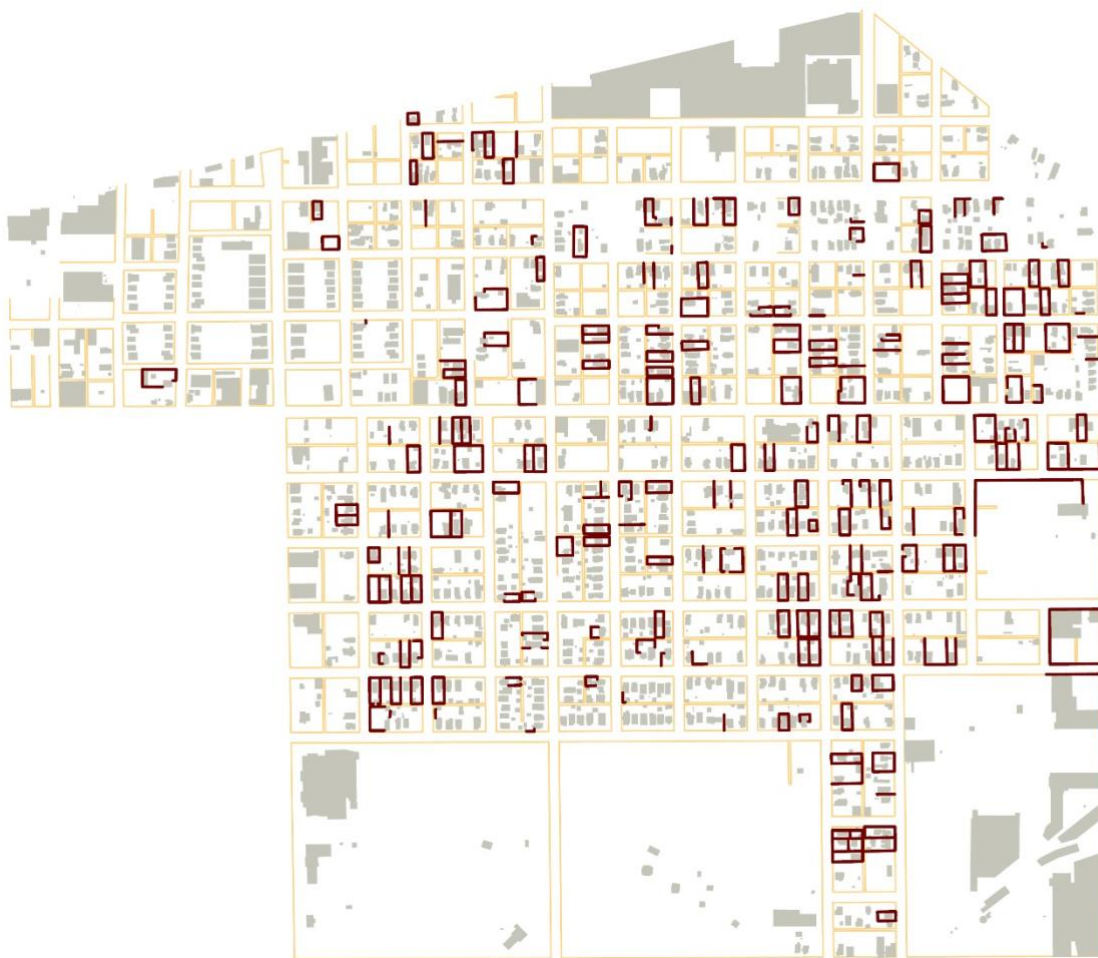


Figure 19: Fences

communities and the Ball State University community, I was unable to conduct the necessary ethnographic research.

One distinctive feature of this neighborhood is the prevalence of fences demarcating land lots, whether they have houses on them or not. I did not observe as many fences in any other Muncie, Indiana neighborhood that I visited. When I asked about the reason, outsiders informed me that the residents have erected these fences due to the lack of security in the neighborhood. I decided to map all the fences in the neighborhood to better understand their distribution and prevalence.

During my fieldwork, I realized that the stories about fences in the Industry Neighborhood differed slightly from what I was told. Fences serve many purposes, with safety being a primary concern for residents. In addition to safety from intruders, they were also concealing some activities. Many of them run businesses that offer services like house cleaning, furniture and woodwork repair, and electrical work. They store machinery and other equipment in their backyards where some workspaces are also located even though this violates existing zoning ordinances. Fences are therefore used to protect their equipment and businesses from thieves and to minimize disturbances to their neighbors.

Another (ordinary) reason for fences is to demarcate property lines, especially in the case of vacant lots. Without a fence or another boundary marker, it can be challenging to determine the boundaries of one property from another, especially if weeds or other vegetation overgrow the lot. The majority of people in the Industry neighborhood are born and raised within specific zoning blocks. As a result, they are familiar with the zoning ordinance and understand the need to comply with its guidelines. Despite this awareness, people still create their own spaces that do not conform to the zoning regulations to conduct their own activities. Lines, borders, and polygons drawn by the zoning ordinance are legal but not just.





Figure 21 is the most recent land use map of the Industrial neighborhood. Land use maps is a key spatial tool in the planning discipline, as they are considered to provide an overall reflection of the ground. However, using land use maps as a mirror to reflect the real world is not always helpful, especially when the mirror reflects a present reality that only exists because of centuries of bias. In this particular map, some of the land use categories are different from the standard ones. I did not change the original data to match with the standard categories, however, the map is not drastically different from its standard version.

Land use maps have the ability to extrapolate data, which is a statistical characteristic used in quantitative studies to estimate unknown variables from known variables. From a statistical point of view, extrapolation is used to predict the future based on historical data. However, the "extrapolation characteristic" that I referred to in land use maps is not necessarily about predicting the future. It is more about estimating the unknown from known knowledge.

The existing knowledge about prominent physical elements is used as the basis for deciding land use. For example, houses and apartments indicate residential use, while shops and grocery stores are categorized as commercial use. Both supermarkets and mom-and-pop stores are considered commercial, regardless of whether they belong to an international chain or a local grocery store.

Land use map is a key spatial tool in the planning discipline, as they are considered to provide an overall reflection of the ground. However, using land use maps as a mirror to reflect the real world is not always helpful, especially when the mirror reflects a present reality that only exists because of centuries of bias.

## **Inaccuracies in the Formal Map**

The land use map of the Industry neighborhood (above) does not reveal anything about its residents or their social spaces. It does not distinguish the streets and alleyways that children use to play, or the places people use to create small carpenter shops in their backyards. A green-colored residential block does not solely indicate people living in houses. Some people have their own small shops, while others have storage places where they rent out space to their neighbors. Additionally, vacant land on it is not completely abandoned on the ground. Young boys use these spaces to meet and have parties with their friends. I have seen adjoining vacant lots being used to install temporary shelters like tents for birthday parties.

As I mentioned before, streets are not only for vehicles, but they are also for children to play basketball, and young adults to meet with each other. Sidewalks are occupied by children doing artwork. Generalizing all these different types of activities into a single category called “Residential” eliminates not only the differences, diversity, and variations in the production of social spaces, but also the complexities.

Land use maps embed categories of knowledge that are used to generate them. Therefore, when using them as a communicative or analytical tool, the subjective nature of land use maps produces limited knowledge that complies with the same categories of knowledge that maps employ. The land use mapping process is affected by the embedded scientific authority that is wielded to persuade the truthfulness of a community's people.

## CHAPTER FIVE: CONCLUSION

The study aligns with two objectives, including exploring critical cartographic spatial mapping techniques through existing literature and applying selected spatial mapping techniques to the Industry neighborhood to obtain a better understanding of people's spatial narratives. Therefore, the study remains exploratory in nature.

Critical cartographic scholars, as described in the literature, continue to develop a strong theoretical framework by drawing upon theories and concepts mainly from social sciences, political sciences, and geographic disciplines and keep them branching out. However, practical applications and the development of critical cartographic spatial mapping techniques emerged largely after the initial theoretical groundwork had been laid and have since continued to evolve through the reciprocal development of both theory and application.

Additionally, questioning of map (what is a map) and act of mapping as an act of agency has been largely questioned in the latter 20<sup>th</sup> century whereas prior to that mainly the scholars have applied discourse analysis to critique maps. Nancy Peluso's Counter mapping, Denis Wood's Deep mapping, and techniques such as Activity mapping and Participatory mapping remain prevalent in the field of mapping. However, when compared to other mapping techniques, Deep mapping stands out for its greater adaptability to various fields, including architecture, media studies, spatial anthropology, landscape, human geography, and the arts. This makes it a highly flexible mapping approach that can be applied across multiple discourses.

The second or the latter objective of this study can be further decomposed into mapping process, results and application as follows.

Critical urban practice requires a critical planning approach. The recent technocratic shift in planning practice, occurred in mid to late 20<sup>th</sup> century, however, has flipped the agency of mapping from subjective or community-driven perspectives planning tool to highlight efficiency and/or deficiency. In result, mapping has swung from one end of the spectrum to the other, displaying better spaces to the worst rather than discovering the essence of it. planners see problematic areas that necessitate control over efficient spaces and growth over deficient spaces, leading planners to overcome problems that they have created. The fundamental concept in contemporary urban planning practice solely depends on “growth.” Planners envision quantifiable and continuous growth in every space at a positive rate. They employ tools that orient and facilitate towards it. As a result, instead of being a space to understand, people's spaces have become a planning tool that must be supportive in order to facilitate the growth of the built city. This demonstrates that mapping is not a single objective scientific tool for representing the ground, but rather an act with agency that is inextricably linked to the planning process.

The first lesson I learned from this study is that, in map making, it is neither the starting point nor the destination that matters the most, but the process. The mapping process transforms and translates the ground truth into the representational truth. The transferring of “material” data into the representational tool (map) involves many steps in decision-making, inclusion, and exclusion. However, in this study, I attempted to map everything I saw without considering their relationships or providing meaning and then think about (analyze) the map. It was like notetaking on a base map. The inventory includes physical elements, conversations, and my own experience, and when I took a break from the process, and examined the process I followed, I wondered whether I see, hear, or feel anything that I had not noticed before, I did notice things I

would previously noticed, implying that my pre-constructed knowledge framed my observations due to the agency of presence. Similarly, I noticed things I had not noticed before as well. My larger question in this study, related to the mapping process, was which agency provides better positionality for the mapper to conduct a successful critical mapping exercise. I could not see clear line between the agency of presence and agency of absence as each of them resulted due to the presence of absence and absence of presence in pre-conceived knowledge, politics, culture I grew up, and personal biases.

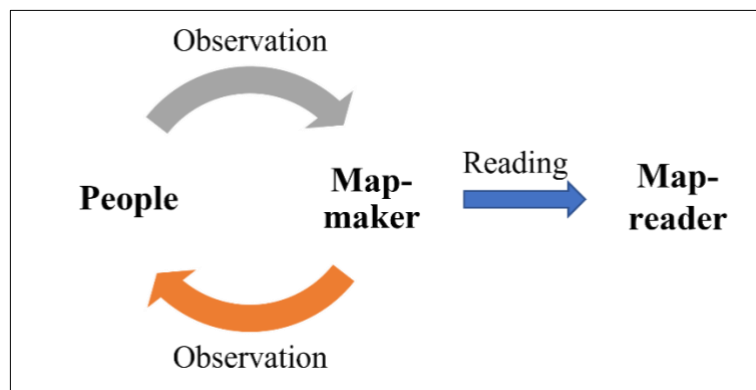


Figure 22: Mapping Process

I went through a cyclical observation process (Figure 22) with myself. The local people (subjects) observed me when I walked around the neighborhood while I was observing them. However, I lacked the ability to understand the extent to which this observation cycle influenced our (mine and others') behavior, activities, and conversations. Therefore, the maps I created using observations and conversations are questionable at some point. The results produced through the cyclic observation process are then presented on a map to the map reader and user through a mono-directional process. Concisely, the ultimate social identities are largely determined by the map maker (myself in this study), who is situated in the middle while engaging in both processes. The map reader and user also create spaces, judgments, and social identities, re-interpreting the data on the map. These distortions of realities produced through the

creation of social identities could be minimized by replacing the mapper or mapmaker with people, as shown in Figure 23. When the map reader is replaced by the same group of people who were being observed, and similarly, the map-maker is also replaced by the same group of people, there is limited space to distort social identities. Providing more stakes to the people (the mapped) to map themselves and create their plans is a major part of counter-mapping (Peluso, 1995).

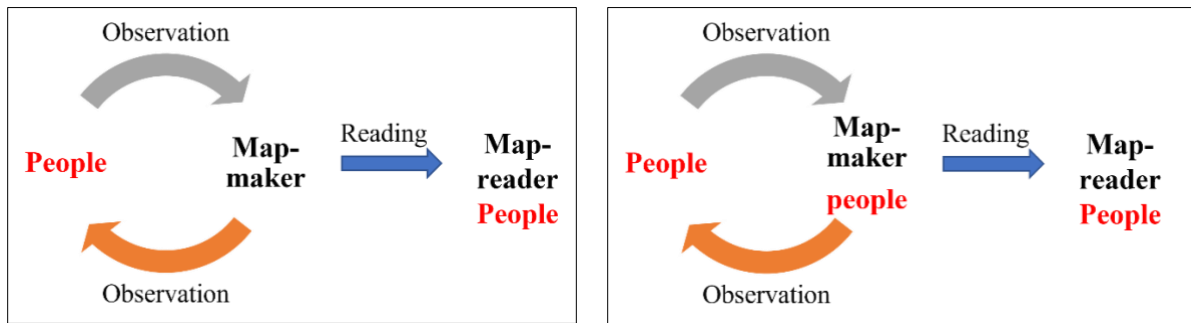


Figure 23: Alternative Mapping Process 2

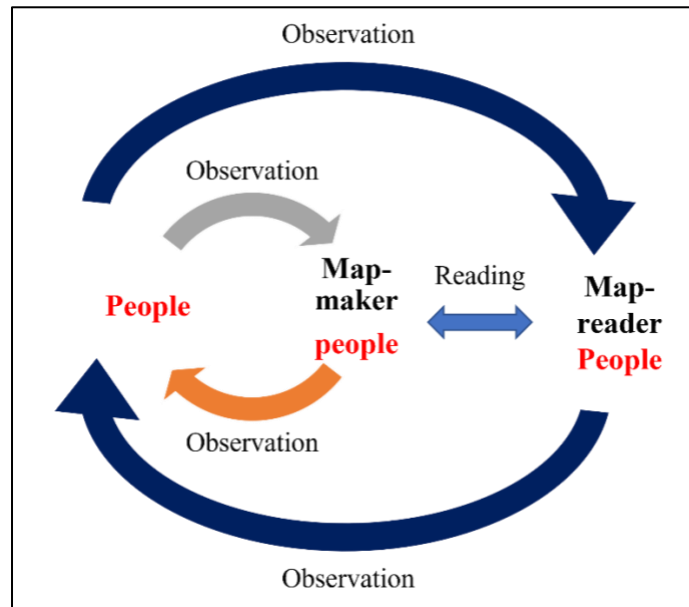


Figure 24: Alternative Mapping Process 3

Visually understanding people's spaces through maps, this study adopts an inductive approach. People's spaces are usually enriched with intangible values and qualities that maps can only attempt to capture. This study attempts to grasp only a few of them, which can be transformed into a 2D layer by collecting data on the ground. In urban planning, mapping is a temporary connected phase used to understand the complex and long-term relationship people have with their spaces. Therefore, Figure 23 and 24 [Mainstream] maps are for comparison purposes only, not to find the uniqueness of the place.

The maps resulting from the study offer better spatial narratives compared to traditional quantitative maps. They provide unique and diverse perspectives on the utilization of space that go beyond numerical interpretations. However, the current spatial mapping practices used in urban planning are often hostile in nature. They tend to exclude considerations for potential, diversity, justice, and the visibility of the spaces where people actually live. Spatial narratives produced through resulted maps further could be enriched through an ethnographic study. Additionally, a discourse analysis using historical maps and relevant literature would have provide a solid background for the existing condition of the neighborhood and to reveal its untold stories.

While this study provides evidence that alternative spatial mapping techniques can be used to better understand people's spaces, it remains a challenge to integrate the resulting maps with the dominant quantitative maps used in urban planning. The inputs from these two categories of maps can be placed at different levels, making it necessary to conduct further research on how to bring them together into a comprehensive analysis framework. Additionally, there should be more testing and application of different spatial mapping techniques for producing narratives of people's spaces.

Maps are used as a key analytical tool, with a significant impact on the outcomes of the planning process and the policies put in place in the city. Even when planners acknowledge their subjectivity and advocacy powers, they are still used to persuade other actors involved in or affected by the planning process of the benefits of certain actions by leveraging their embedded scientific authority. Maps are used to persuade people of the veracity of a city vision. It is true if it is depicted on a map. If the map is also a plan, a new reality is emerging. Maps are frequently used but rarely critically examined. Planners should therefore acknowledge both the subjectivity and power of maps in their practice, elevating the critical approach to mapping to a more prominent position within the profession.

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