2020

The Living Community Challenge: An unCase Study in Biophilic Master Planning

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In partial fulfillment of a Bachelor of Arts Degree in Environmental Analysis,
2019-2020 academic year, Pomona College, Claremont, California

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"Beautiful, benevolent, and soul restoring, nature waits for us to bring her home."

– E.O. Wilson

Acknowledgements

I would like to thank my first thesis reader, Teresa Spezio, for her support and endless knowledge of environmental history. Thank you also to my second reader, Char Miller, who wears many hats in my life and helped make this thesis possible with his unwavering support and encouragement. Thank you to everyone else who took the time to give me thoughtful feedback, including Walker Wells, Molly Freed, and my dad. Thank you to Pomona College for believing in my research and making this past summer possible through the Pomona College Undergraduate Research Program. Thank you to the Mt. Baker Hub Alliance for connecting me with resources and patiently and thoughtfully answering all of my questions. Thank you to the International Living Future Institute for its incredible work and leadership in making this world a better place. The ten weeks I spent at the Institute were invaluable to my professional and personal growth. Lastly, an enormous thank you to the Environmental Analysis Department at the Claremont Colleges for setting me up for a lifetime of stewardship and critical inquiry.

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Introduction

In 1954, Guy Debord, a member of Letterist International, a Paris-based collective of radical artists and theorists, introduced the "Theory of Dérive," revolutionizing the conceptualization of the urban experience. Dérive, which literally translates to "drifting," is the idea dropping all of your obligations and, instead, letting yourself be drawn by your intuition to whatever attractions you may find in the city ("Situationist International Online," n.d.).

Dérive is exactly what led me through Barcelona in the spring of 2019. This intuition driven by curiosity, freedom, and joy pulled me like a magnet through the city's "superblocks" where cars are exiled and pedestrians linger, past the legendary Gaudì's nature-inspired architecture, and through the pocket parks where you forget you are in a city of 1.615 million people. I felt as if Henry David Thoreau could have written his essay, "Walking" (1862), in Barcelona instead of in the forests of Massachusetts. Here was a city where I felt the same wondering and wandering that I do when on hikes in my beloved Eastern Sierras. Unfortunately, I have yet to experience this feeling in Los Angeles (let alone most other American cities), a city that bows to cars and curates a pedestrian experience that can be unpleasant and even life-threatening.

Perhaps it was the experience of wandering through Barcelona that led me to the International Living Future Institute (ILFI), an environmental nonprofit based in Seattle that envisions a "Living Future"—a future that is "social just, culturally rich, and ecologically restorative" ("Living Community Challenge 1.2," 2017, p. 7). Much preferring this kind of future over the dismal and depressing one I see projected in the headlines every day, I began a ten-week internship at ILFI to learn as much as I could about biophilic design, green certification models, and how to build a movement towards a more sustainable future. Of particular interest was

ILFI's Living Community Challenge (LCC), "a framework for master planning, design, and construction" that can be used by everyone from city governments to college campuses to neighborhood groups ("Living Community Challenge," 2016). The LCC can be viewed as a model for sustainable development *and* as an alternative to historical, hegemonic, and conventional planning practices as it is a model designed to promote community-driven processes. Following one of ILFI's central tenets of biophilia, the idea that humans have an innate love for nature (Wilson, 1984), the LCC is intended to "create communities that are as connected and beautiful as a forest ("Living Community Challenge," 2016).

While the idea of creating cities like forests may seem to be a purely whimsical notion, it is also pertinent to the current state of global demographic trends and the increasing threat of climate change. There are currently 7.53 billion people on the planet and, according to the United Nations, 55 percent of the 7.53 billion live in cities or urban areas and this number is expected to increase to at least 68 percent by 2050 (Meredith, 2018). Such drastic increases in urban populations could correspond with drastic increases of resource extraction and consumption and waste production if we are not highly intentional about ensuring that this growth is done in a sustainable way. Despite decades of studies, warnings, and scientific consensus on the climate crisis, action to reduce greenhouse gas emissions have not been commensurate to the threat. The alarm bells went off again in October 2018 with the Special Report on Global Warming by the United Nations Intergovernmental Panel on Climate Change (UNIPCC), which found that we may have as little as twelve years to reduce global carbon emissions below the critical threshold of two degrees Celsius warming ("Summary for Policymakers of IPCC Special Report" n.d.). With such a small window of opportunity and such a gargantuan task, focusing effort on the globe's cities and urban areas may be the most effective way to mitigate emissions, due to their

higher population densities and, correspondingly, higher energy and resource intensities, thus creating unique opportunity for impact at a significant scale.

Aside from being one of the most effective places to concentrate mitigation strategies, cities and urban areas also serve as strategic centers for change, as they have historically been important sites and incubators for the modern environmental movement, especially in the United States. As Washington Statue University historian Jeffrey Sanders argued, throughout the second half of the twentieth century, cities have acted as the foreground for the "drama" of environmentalism that took hold in the American experience (Sanders, 2010, p. 15). The daily lives of city dwellers and urbanites are increasingly disconnected from nature, and people are even experiencing such phenomenon as Nature Deficit Disorder or behavioral issues resulting from a lack of exposure to nature, especially among children (Louv, 2008). There are also concerning trends in environmental apathy—a lack of interest and concern towards environmental issues (Juneman and Pane, 2013)—at a moment when humans need to act more than ever. A 2010 Gallup Poll found that Americans are feeling substantially less threatened by climate change than they did in 2007-2008, indicated by a drop of ten percentage points from 63 percent to 53 percent (Pugliese and Ray, 2011). Thus, creating flexible, widely applicable models for planning biophilic cities—cities with abundant nature and natural systems that are visible and accessible to urbanites (Beatley, 2011)—becomes as crucial to addressing climate change as policy and technological breakthroughs by fostering an environmental ethic and deepening a sense of place and community through increased interactions with nature in urban settings.

Seattle, Washington, home to the ILFI, has been an important stage from which these major collisions of environmental ethics, urbanization, and globalization have occurred. Perhaps

one of the most well-known examples of this drama was the protest against the World Trade Organization (WTO) ministerial conference in Seattle in 1999. Also known as "The Battle in Seattle," protesters who represented a wide variety of industries and interests from the Sierra Club to the United Steelworkers Union and took to the streets to voice their frustrations with the mounting socioeconomic disparities and ecological issues that an increasingly globalized world was creating (Sanders, 2010). The protest grabbed the world's attention and even led then-Mayor Paul Schell in 2000 to create Seattle's Office of Sustainability & Environment.

This demonstration was fueled by the major strides made by the environmental movement during the 1980s and 1990s, namely the Brundtland Report of 1987, which created a working definition of sustainable development as well as the Rio Earth Summit of 1992 and formalized the topic at an international level (Sanders, 2010). These early conceptions of sustainability rested upon three major pillars, also known as the "Three Es" (Environment, Economy, and Equity), originally conceived in John Elkington's *Cannibals with forks: The triple bottom line of 21st century business* (1998).

Despite serving as the headquarters for several of the world's largest corporations, including Microsoft, Amazon, and Starbucks and experiencing record-setting growth rates several years in a row (Balk, 2019), Seattle has frequently been named one of the "greenest" cities in the U.S.—challenging the conventional belief that growth must come at the cost of the environment.[1] Thus, I chose Seattle as the best city for my case study due to its efforts to balance rapid urban development with a tradition of environmental activism and values. Within the city, I focused on two particular neighborhoods: North Rainier Mt. Baker ("North Rainier"), which registered for the LCC (the first stage in the master plan certification process, see Figure 1), and

[1] In 2011, Seattle was ranked 4th on a list of U.S. and Canadian cities according to the Siemens Green City Index.

Fremont, my "control" neighborhood, which does not have a master plan that contains any sustainable goals or initiatives. Both neighborhoods are classified as "Urban Villages" (areas of medium-density housing, mixed used zoning, and often transit-oriented development)—a term which also has its roots in Seattle.

Figure 1: LCC 1.2 Pathways to Certification. Reprinted from Living Community Challenge 1.2 Standard, 2017, (p. 15), Retrieved from https://living-future.org/lcc/.

However, my case study of the application of the Living Community Challenge in Seattle as a model for sustainable master planning quickly became an "*un*case study" when I realized that no certified Living Community exists due to the extended certification process and relative youth of the program. Thus, the value of this case study stems from its discussion and analysis of the obstacles and challenges associated with pursuing certification (as well as incentives) that were identified in interviews with ILFI staff and members of the Mt. Baker Hub Alliance, North Rainier's neighborhood association that is leading the pursuit of the LCC. I also conducted 60 anonymous surveys in the respective neighborhoods, which will provide crucial baseline data for potential future research as North Rainier continues along its certification path. I conducted statistical analysis of the survey data and GIS mapping to gain a quantitative perspective and a

spatial comparison. The collection of survey data also sought to address identified gaps within the emerging discipline of biophilic research related to the physical and psychological effects of humans being in biophilic settings, including how their relationships with nature impact their long-term versus short-term orientation and their likelihood to care about the global environment versus their local environment. The surveys sought to determine if there were any differences between the two communities in terms of perceptions of local public and environmental health, rates of stewardship activity, concern towards the global environment, and feelings of connection and pride towards the community.

To fully evaluate the LCC—its strengths, weaknesses, philosophy, and structure—deep context must first be given to the patterns of urbanization in the U.S., the ecological and sociopolitical legacies of conventional urban planning, and the evolution of the environmental movement and perceptions of nature. As Dixon and Eames (2013) assert, "to bring about the sort of systematic change that is needed, cities must be considered as they are: the product of centuries of evolution" (p. 500). Through an exploration of these densely intricate histories as they relate to the LCC, this paper asks the following questions: Why was this model created? Is the LCC program an effective model for sustainable development? What makes it effective? What obstacles or shortcomings are hindering its effectiveness? How does it compare or contrast to similar urban assessment tools?

The first five chapters will give an overview of distinct eras in U.S. urban developmental history from the beginning of the seventeenth century to today. Date ranges are not exact but are provided, rather, to give the reader a rough estimate of the time period in question. The first five chapters are linked together by evolving perceptions and definitions of nature and the ecological, social, as well as the planning implications for these shifts, which will be crucial to the

understanding of the LCC and similar urban assessment tools. The sixth chapter will feature my case study, which includes an in-depth analysis of the LCC, a comparison of perceived strengths and weaknesses with similar models (EcoDistricts and LEED for Neighborhood Development), and a discussion of the findings from the surveys and interviews.

Chapter One: Colonial and Pre-Industrial (1600-1850)

"Then God blessed them and said, "Be fruitful and multiply. Fill the earth and govern it. Reign over the fish in the sea, the birds in the sky, and all the animals that scurry along the ground."
-Genesis 1:28

The history of urbanization in the U.S. tells a story of contentious, ever-evolving perceptions of nature—how we have defined it and how we have valued it—many of which have had disastrous consequences for ecological and human communities alike. However, where this "story" begins is another complicated matter. Some may begin at The Beginning, or the Book of Genesis. After Adam and Eve were expelled from Eden, it seems humans have been on a constant search for this highly idealized vision of nature, for utilitarian, spiritual, or aesthetic motives, or something in between—and what a fruitless (no pun intended) search it was. The colonists did not find it, the pioneers heading west did not find it, and the suburbanites did not find it. But what is "it"? What were they all searching for?

In third grade, I was taught that early European explorers were looking for The Three G's: God, Gold, and Glory. John Winthrop (1588-1649), first governor of the Massachusetts Bay Colony, an early Puritan settlement in New England, was at least looking for God and Garden. Quoting Genesis 1:28, Winthrop wrote before he set sail, "the whole earth is the Lord's garden" and God instructed man to "increase, multiply, replenish the earth and subdue it" (Merchant, 2004, p. 27). However, the America the colonists "found" was a lot less nice than Eden. It was scary, in fact. Terrified by the "wild and savage" landscape, the Pilgrims began to think about the relationships between nature and culture and between wild and civilized in a dichotomous way. These dichotomies lasted until the early environmental movement of the 1960s when definitions of nature broadened to include humans, but arguably still remain prominent today (Merchant, 2004, p. 26).

However, it is important to note that these dichotomies were extended beyond that of the natural world to include the First Nations people who inhabited the land. New England Indians were skilled horticulturalists, cultivating complex, polycultural agricultural systems and managing forests and resources through prescribed burning (Merchant, 2004). In addition to diversifying crops and promoting forest health, New England Indians' practice of mobility (seasonally changing locations of their villages) minimized impact on the ecosystems that they lived within, resulting in an overall stable relationship between humans and the environment (Cronon, 1983). These social and agricultural practices differed greatly from those of the colonists', who had stationary settlements and monocultures that degraded the soil and placed sustained pressure on the environment. And yet, New England Indian communities and practices were deemed as wild and savage as the landscape.

Despite the colonists' conflicting perceptions of nature as Edenic or frightening, they could agree on one thing: America's nature seemed *abundant*, especially in the eyes of those who sailed from England where scarcity and famine were engrained in collective memory. With this "new" cornucopia of a country and an insatiable desire to establish new territory and economy, "almost anyone who wanted land could get some" (Kuntsler, 1993, p. 25). Of course, this anyone did not include slaves from Africa, women, or First Nations people. The concept of land then began to be increasingly exclusive as it became synonymous with ownership and status, which had major ramifications for American society and politics.

It was precisely this sense of ownership and exclusive status derived from private land ownership perpetuated among early Yeoman farmers that formed the foundation of American democracy and the nation's capitalistic economy (Merchant, 2004). As the triangular trade (trade between Europe, North America, and Africa) began to take shape, nature (and labor) became

completely commodified and was considered "first and foremost a commodity for capital gain" (Kunstler, 1993, p. 26). However, commodification of the landscape did more than build an extractive, exploitative economy. This type of capitalistic thinking formalized the practice of treating components of an ecosystem as singular, extractable units (Cronon, 1983).This mercantile paradigm and approach to land management would dominate until the rise of the field of ecology in the second half of the nineteenth century, which sought to realize the complex *connections* within ecosystems.

The American Revolution (1765-1883) doubled the amount of the new nation's land, stretching its territory to the Mississippi River. Ships of people began arriving more frequently and the government warmly welcomed them with cheap, highly productive land to grow the country's new booming economy. The U.S.' land laws were, at the time of their establishment, the most "liberal" property laws in existence (Kunstler, 1993, p.26), laying a strong foundation for a culture of rapid development *and* individualism that remains one of the most formidable obstacles to affecting environmental and social change today.

The land grab frenzy of the late eighteenth and early nineteenth centuries eventually became the patchwork of squares seen from airplane window seats, also known as: the grid. By the 1820s Congress was selling land for as low as $1.25 an acre and adopted a rational, mathematical, "democratic" system for selling subdivisions that began approximately 200 years prior by the Puritans (Kunstler, 1993, p. 29). This was the equation:

$$1\ midwest\ town = \frac{6\ miles\ x\ 6\ miles}{36\ sq.mile\ \text{sections}\ of\ 640\ acres\ each}$$

The grid's simple, one-size-fits-all applicability quickly became the preferred method of city planners. It made orientation easy and provided flexible traffic patterns with four-way

intersections at every block (Kunstler, 1993). If the curves, bends, and topography of nature did not fit inside these neat squares, they were either bent into shape or ignored.

However, the railroad, a British technological innovation, did much more than bend the landscape. The railroads *cut* deep scars in the landscape. They cut down forests at unprecedented rates to feed the themselves with timber for ties and trestles, and they cut deep underground for coal and iron for laying tracks and powering their engines (Merchant, 2004). The train whistles, which could be heard from coast to coast with the completion of the transcontinental railroad in 1869, announced a transportation and market revolution in America. The market revolution would bring with it unparalleled destruction to the environment (even by today's standards) and major changes in American society and its values (Merchant, 2004). However, the mechanistic, capitalistic worldview that dominated this period amplified the beginnings of an environmental consciousness that had begun towards the end of the eighteenth century with imported notions of nature and the sublime.

These ideas of nature were brought over from France, England, and Germany, most notably of which were Edmund Burke's *Origins of Our Ideas of the Sublime and the Beautiful* (1757) and Immanuel Kant's *Observations on the Feeling of the Beautiful and the Sublime* (1761). The perception of nature as sublime profoundly changed the way people thought about the environment. No longer frightening or wicked, nature began to be seen as awe-inspiring and beautiful (Cronon, 1996).

However, the new association of nature with sublimity magnified the dichotomy between wild and civilized created by the Pilgrims and Puritans, especially as the commodification of land led to the increasing disappearance of the newly revered forests. Thus, nature largely became sanctified because it was "virgin" land that had not yet been touched by humans (even

though it had been for thousands of years by Native Americans). It was this idealization of unaltered nature that became *the* defining American experience until the late nineteenth and early twentieth century, when the U.S. was becoming increasingly urbanized and people became more disconnected from nature (Marx, 2008).

At the core of the sublime is transcendentalism or the idea that nature is the source of spiritual insight or the earthly divine. Transcendentalism, in turn, largely coevolved with Romanticism, which held that spirituality and spiritual truths emerged from nature (Merchant, 2004). Transcendentalism and Romanticism gave birth to a prolific period in environmental writing and art. Ralph Waldo Emerson and his protégé Henry David Thoreau's countless essays shaped early American environmentalism and conservationism, as did the Hudson River School of painting, whose idealized landscapes added a more visceral dimension to these ideas.

Although seemingly harmless, the rise of Romanticism and the sublime had a darker side. Perceptions of Native Americans continued to evolve with the changing perceptions of nature, as they had earlier with indigeneity's association with savagery. Artists such as Swiss painter Carl Bodmer, and American painter, George Catlin, enveloped Native Americans within the Romantic movement, portraying them as "lords of the forest," while simultaneously depicting them as vanishing like the nature they lived in (Merchant, 2004, p. 76). Even though the Native American population had dropped from an estimated 10 million (prior to European explorers' arrival in the fifteenth century) to an astounding *maximum of 300,000* by 1900 ("Atrocities Against Native Americans," n.d.), the narrative of "the vanishing Indian" perpetuated the dangerous myth that they were practically extinct.

The Romantic movement and ideas of the sublime paved the way for yet another conception of nature: the wilderness. In the early nineteenth century, for the first time in history,

one could live and travel extensively without coming into contact with "wild" nature (Nash, 1982). Thus, the early thinkers of wilderness were among the urban elite and intellectuals—writers, artists, scientists, travelers—who did not live in the "rugged" landscapes of the pioneers and Native Americans (Nash, 1982). From an urban perspective, perceptions of the wilderness became distorted and the imagination of the gentility began to fill it with adventure and sport (Nash, 1982). In a deeper, more existential sense, the wilderness also offered a sort of primitivism and "return to simpler times" that urbanites felt had become lacking in their "civilized" lives (Nash, 1982; Cronon, 1996, p. 13). However, opinions towards wilderness were still very much in flux by the end of the nineteenth and beginning of the twentieth centuries, as its associations of fear, hostility, and desolation had not completely faded away (Nash, 1982).

The perceptions of nature during the Colonial and Pre-Industrial periods profoundly shaped the foundation of the relationship between humans and the built environment in the U.S.— from the privatization of land, to the dichotomy between society and the environment, and to the commodification of nature. These periods also demonstrated how such perceptions were far from benign, especially when certain conceptualizations were extended to include particular demographic groups. We also saw how changes in the built environment informed changes in the perception of nature and vice versa, illuminating a dynamic, intricate, and multidirectional relationship between how we manipulate the environment and how we perceive and value it. In the next period, Early Urbanization and Industrialization, we will see how these perceptions of wilderness continued to evolve within the context of the urban elite and how that dually informed the preservationist movement and perpetuated violence towards Native Americans. The next chapter will also discuss a major restructuring in the built environment

related to public health infrastructure as well as the emergence of new urban planning movements that sought to reject the dichotomy between nature and society.

Chapter Two: Early Urbanization and Industrialization (1850-1920)

"The yearning to escape the new industrial cities for a better life elsewhere was a reenactment of the same drama that had brought the Pilgrims to Plymouth Harbor: the flight from human wickedness and rottenness into nature, the realm of God."

-James Howard Kunstler (1993)

The second half of the nineteenth century and the first half of the twentieth century saw the fastest rates of urbanization the United States had ever experienced. By 1860, the population of American cities grew by 552 percent to a total of 6.2 million people (Melosi, 2008). By 1920, half of the U.S. population lived in cities (Marx, 2004) and the nation had massively expanded its territory from 13 to 48 states. However, with these high rates of urbanization came new challenges to public health as people lived in denser conditions and knowledge of the connections between waste and health did not yet exist. Cities quickly became centers of poor sanitary conditions, epidemic diseases, and pollution. Picture Washington, D.C., as late as the 1860s: pigs roaming the streets freely, residents dumping garbage and slop into the alleys and streets, slaughterhouses emitting noxious fumes, and a vermin-infested White House (Melosi, 2008). The burden of pollution and disease fell heavily upon the new industrial working class located within the slums and tenement structures, where conditions would not improve (at least in New York and other major cities) until the passage of the Tenement House Law in 1901, which set regulations to improve air and light quality for residents (Kuntsler, 1993; ("Planning History Timeline," n.d.).

Advancements in knowledge and systems dedicated to promoting public health were stymied by ambiguous governmental responsibility throughout the nineteenth century and by religious understandings of disease as punishment for sin (Melosi, 2008). Perceptions of disease also had racist and xenophobic tones, such as cholera's moniker of "the poor man's disease," in

reference to the newly arriving immigrants or in southern cities where it was known as a "race disease" in reference to African-Americans (Melosi, 2008, p.41).

The transatlantic trade and urbanization exacerbated the public health challenges U.S. cities faced, circulating a wide variety of infectious diseases, including (but not limited to): smallpox, cholera, yellow fever, typhoid, and tuberculosis (Melosi, 2008). However, the transatlantic trade also promoted the exchange of breakthroughs in public health. Relatively speaking, European cities developed earlier and much faster than U.S. cities, which tended to grow in stages over longer periods of time, giving U.S. cities the advantage of learning from the advancements in European sanitation practices (Kunstler, 1993).

In the mid-to-late nineteenth century, U.S. cities saw their first "major sanitary awakening" as theories and knowledge of public health were exchanged through the transatlantic trade and ongoing relations between the U.S. and Great Britain (Melosi, 2008, p. 40). The prevalent theory on public health at the time was the miasma theory, pioneered by English social reformer Edwin Chadwick and advanced by English physician John Snow, which held that diseases were spread by noxious air emitted by decomposing organic matter (Melosi, 2008, p. 40). City-wide waste management and water supply systems began to be implemented by local governments as the connections between environmental conditions and public health became increasingly understood (Melosi, 2008). In fact, the foundation of many of today's zoning and regulatory practices was formed during this period by the early efforts made to separate residences from businesses and industry to improve public health and sanitation (Melosi, 2008; Wilson, et. al., 2008).

The idea of public health and sanitation was well established within U.S. institutions by the end of the 1870s as new entities were created, such as the American Public Health

Association (1872) and the National Board of Health (1879), to oversee regulations, services and research (Melosi, 2008). The institutionalization of public health coincided with the emergence of the profession of civil engineering, which expanded beyond the more traditional canal and railroad projects to include environmental sanitation programs and new sanitation technologies (Melosi, 2008).

By 1920, most large U.S. cities had systemic refuse collection and disposal systems as well as more advanced water-supply and sewerage systems (Melosi, 2008). However, the rise in civil-engineered systems for water supply and refuse management during this period initiated a cultural norm of disconnect between people and environmental services as infrastructure became increasingly invisible to the public's consciousness.

Despite the advancements in public sanitation, the decades of disease and pollution branded cities as very undesirable places to live, making natural areas more appealing, especially to the urban elite who had the money and resources to escape the filth and chaos. Ironically, the call for the preservation of natural spaces was led by those who had also benefited from its destruction (Cronon, 1996). The male urban elite realized the urban-industrial capitalistic societies they were building were destroying the very spaces to which they wanted to escape. The nation's emerging preservationist movement was also fueled by the prevailing association of wilderness as sublime and sacred. George Perkins Marsh's *Man and Nature* (1864) added another key element to the preservationist movement by arguing for the utilitarian benefits of protecting nature, thus rejecting what had been the prevailing belief that economic progress was inversely related to environmental preservation (Nash, 1982).

However, America's first officially preserved spaces, Yellowstone National Park (designated in 1872 by President Ulysses S. Grant) and the "Forest Preserve" in the Adirondack

Mountains of New York, a state park of 715,000 acres, were not initially set aside for aesthetic, recreational, or spiritual purposes. Instead, they were created to prevent private acquisition and exploitation and to preserve an adequate water supply (Nash, 1982). It was not until later that people began to realize one of the most significant (perceived) benefits of establishing these spaces: preserving *wilderness* (Nash, 1982). This shift from preserving wild spaces for purposes ranging from utilitarian to cultural, is exemplified by the passage of the Antiquities Act of 1906 (signed into law by President Theodore Roosevelt), which gave the president the ability to create national parks and monuments. The Antiquities Act also signified an unprecedented shift in the assumption of land preservation under governmental purview and responsibility (Squillace, 2006).

However, federal acquisition of land for utilitarian use certainly continued and would mature to become the conservationist movement, led by the nation's first chief of the National Forest Service (1905-1910), Gifford Pinchot. Additional governmental entities were established to oversee the management of the nation's natural resources, such as the National Conservation Congress, which met for the first time in 1909 in Seattle, Washington. The two movements can be distinguished as follows: conservationists sought to regulate human use so as to efficiently manage resources for "the greatest good of the greatest number in the long run ("Wilson Letter," n.d.)," whereas the preservationist movement sought to eliminate human use altogether to maintain the "untouched" quality of nature. The early 1900s saw heated clashes between the two factions, which came to a head in a standoff over the construction of Hetch Hetchy Dam in Yosemite Valley. Ultimately, the conservationists won and construction of the dam was completed in 1913.

The preservationist motives underlying the nation's new national parks rested upon a key element of the fallacy of wilderness: that the parks were "virgin" landscapes that had never been inhabited. To maintain this façade, however, designating lands as national parks required the expulsion and removal of the Native Americans who had been living there for thousands of years. Tourists could believe they were walking in pristine landscapes, or even back in time to the "original" nature (Cronon, 1996, p.15). As Cronon reminds us, the forceful removal of Native Americans from national parks shows us just how invented and *un*natural the idea of wilderness truly is (Cronon, 1996). The ironies of national parks continued, as the wilderness that preservationists sought to protect became increasingly domesticated and impacted when wilderness tourism became increasingly popular (and accessible due to new road construction and the later advent of the automobile). These protected spaces also worked to paradoxically reinforce the perception of the dichotomy between society and nature even further. The appeal of the wilderness was that it was outside of the human realm and, so it followed, humans' entry into nature represented its fall (Cronon, 1996). In short, people were escaping to something/somewhere that did not truly exist and when they thought they had finally arrived, the wilderness effectively disappeared.

As city planning as a profession and discipline in the U.S. began to emerge in the early twentieth century, planners sought to confront the implications of this rigid dichotomy between humans/environment and city/rural. Troubled by the social and environmental ills plaguing industrial London, British urban planner Ebenezer Howard (1850-1928) founded the Garden City Movement, a city planning model of the late nineteenth and early twentieth centuries that bridged the two "Magnets" of "Town" and "Country" (p. 8). According to Howard, the Town

and Country each had advantages and disadvantages, so by creating a Town-Country hybrid (a third Magnet), only the advantages of both would remain (Figure 2).

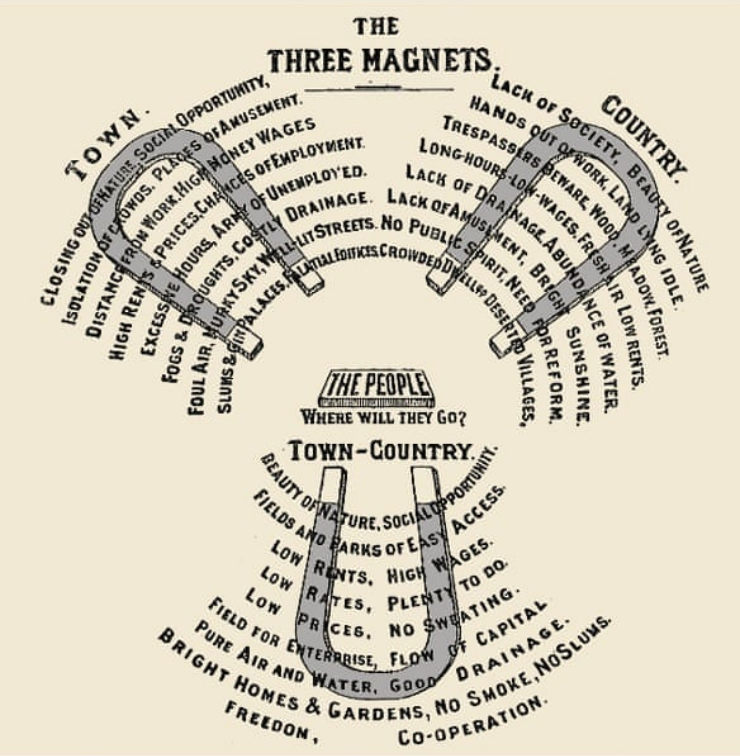

Figure 2: "The Three Magnets" in Howard's *Garden Cities of Tomorrow* (1898). Reprinted from *The Guardian*, (n.d), Retrieved from https://www.theguardian.com/cities/2014/dec/05/ebenezer-howards-three-magnets.

After returning to England from the U.S., Howard successfully founded two Garden Cities, Letchworth (1903) and Welwyn (1919), both of which are now London suburbs. Interestingly, the current residents of the two suburbs reportedly are in better health than the rest of the population (Forgotten Books 2008). After the success of the Garden City Movement in England, it became widely popular in the U.S. and the model was implemented by eminent American planners, such as Frederick Law Olmstead's Forest Hills Gardens (1909) in Queens, New York City, and Clarence Stein and Henry Wright's unincorporated community of Radburn, New Jersey (1923).

The Garden City was a utopian society that separated residential areas from various land uses, including agriculture and industry, in a series of concentric circles that built out from a

central park (Figure 3). The model featured several advanced urban planning elements for its time: limits to growth (a new city would be created at the edge of the current city when the population reached 32,000), a rapid transit railway system, relatively equal access to public parks, and public amenities (i.e., libraries, lecture halls, theaters and museums). With specific regard to limiting growth within the context of the Garden City, the idea of expansion was revolutionized, as it was never intended to lessen or destroy but, instead, to *add* to the city's social opportunities, beauty, and convenience (Howard, 1898). The model also attempted to promote community and civic engagement, which was severely lacking in typical American cities and towns, through central gathering spaces and a decentralized, socialistic self-governance structure. However, despite Howard's assurance that the Garden City only included advantages, it certainly had its pitfalls. For instance, as prominent American urban planner Lewis Mumford argues, the model is very difficult to implement in "old-settled" countries where railroad systems and towns are for the most part already constructed ("Garden Cities of Tomorrow," n.d.).

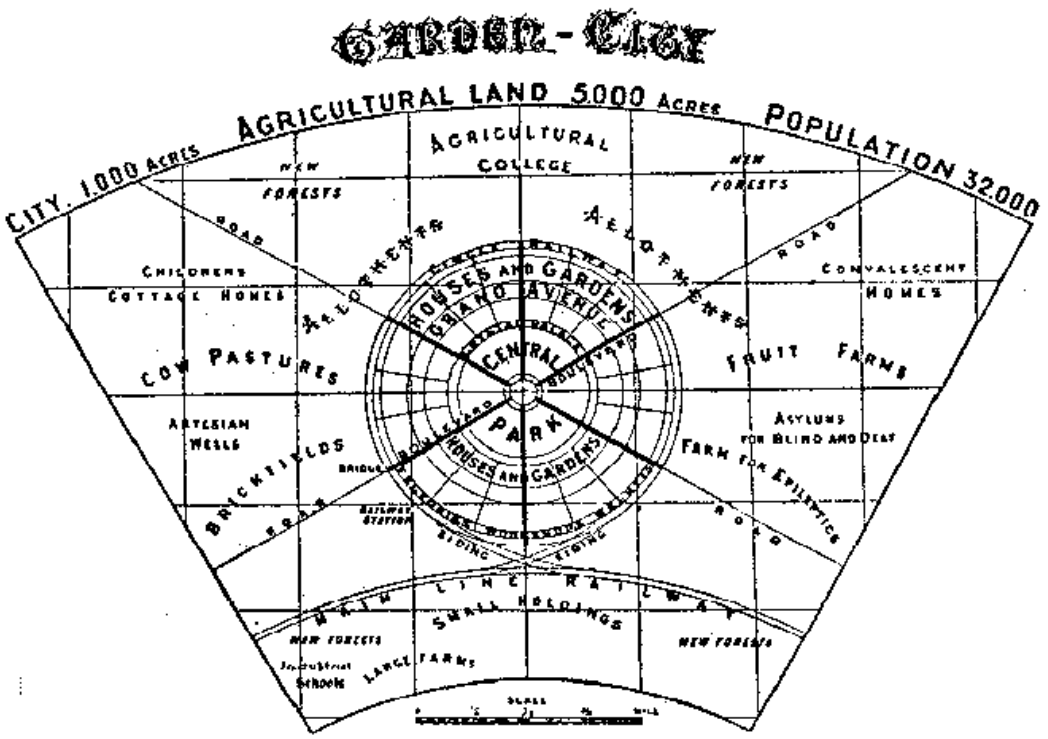

Figure 3: Aerial view of the "Garden City" in Howard's *Garden Cities of Tomorrow* (1898). Reprinted from Cornell's Urban Planning Library, (n.d.), Retrieved from http://urbanplanning.library.cornell.edu/DOCS/howard.htm.

Overlapping with the Garden City Movement was the City Beautiful Movement, launched by American architect and urban designer, Daniel Hudson Burnham, at the World's Columbian Exposition of 1893. The Movement was a result of the rise of classicism (appreciation of ancient Greek and Roman architecture and literature) and the realization of the monotony and lack of public commons that the capitalistic, privatized, grid system had created (Foglesong, 1986). In an effort to link American cities with the great cities of the past, the aesthetics of the City Beautiful Movement strived for urban beautification and European-derived embellishment: grand boulevards, fountains, monuments, civic centers, and civic art (Foglesong, 1986). The rise of classicism in city planning models suggests a dual hubris and insecurity of those who were shaping the industrializing American cities—were they as great as the Greeks? Or were they so far from it that they had to build an overcompensated façade?

While the City Beautiful Movement had a rather short lifespan of two decades (Kunstler, 1993), it certainly had a lasting impact. The Movement called for the social reform of city planning by placing public controls over private development in the shaping of the built environment, which lead to the creation of quasi-governmental planning commissions (Foglesong, 1986). According to American author and social critic James Howard Kunstler, it also left the country with some of its most beautiful and enduring public monuments (Kunstler, 1993).

The rapid urban development of the industrial era led to several key changes in American society and the built environment: the creation of new social classes (the urban elite and the urban poor), increase in governmental responsibility and scope (at the city, state, and federal level) for public health, the federal preservation of land for cultural rather than utilitarian purposes, and the emergence of the field of city planning.

The Garden City Movement began to challenge the dichotomies between city/rural and nature/society, which would become short-lived as the post-war Modernist Era re-abstracted nature and increased its cultural detachment from society, albeit in different ways than the wilderness-loving urban elite of the Industrial Era. The City Beautiful Movement emerged out of the disgust for the monotony and capitalistic hold on city planning and aimed to rectify the lack of central gathering spaces in U.S. cities and towns. The theme of utopian city planning movements continued into the interwar years as people remained displeased with the state of their urban environments and yearned for more hopeful realities.

Chapter Three: Interwar Years and Modernism (1920-1950)

"Let us say that before the advent of universal and standardized mechanization, the city was more human. Its life as well as its proportion was more humane."

-Frank Lloyd Wright (1932)

This 30 year time span, 1920 through 1950, can be considered one of the most momentous and trying periods in the United States' history—its bookends were two World Wars and in between was the Great Depression. These major events would reshape American society, values, and the built environment. The desperation and fear of the interwar period, combined with technological advancements, inspired an outpouring of new utopian visions for U.S. cities as people yearned for a more hopeful reality. The New Deal funneled millions of dollars into capital projects, one of them being large hydroelectric dams. In 1936 alone, four of the biggest dams in the world today were under construction. Without fear of drought, the West's new dams allowed the desert to bloom with year-round agriculture, supporting unprecedented population booms in cities such as Los Angeles, Phoenix, and Las Vegas. These infrastructural feats were regarded with great awe as they expressed the power of humans to conquer their environment and bend it to their will (Melosi, 2011). The now widely available automobile allowed motorists to visit these new industrial monuments, inspiring a new era of tourism and recreation. While the U.S. landscape was being reorganized, it was also becoming increasingly racialized and segregated under the New Deal's exclusionary housing policies. Such deep changes in the built environment beg the questions: How did this period change people's relationship with the environment? What were the ecological and social consequences of these changes? What was the significance of the role of city planners during this period?

Perceptions of nature during the interwar years were dominated by the conservationist mindset and ethic, manifested by the construction of big dams. The Hetchy Dam (1913) was the

harbinger of the Big Dam Era (and its opposition) and a long tradition of American conservationism. Controlling rivers meant efficient resource management. Many conservationists heralded these large-scale hydroelectric projects for their multipurpose functionality: water storage, flood control, irrigation, conservation of soil, improved waterway navigation, and generation of electrical energy (Melosi, 2011). Additionally, the regional development plans of Big Hydro truly encompassed the "greatest good" ethic of conservationism through the perceieved economic and social benefits the dams provided, especially poor and rural communities (Melosi, 2011). This socioeconomic framing of large-scale hydro projects demonstrates the merging of the social reform ideals from the Progressive Era, a period of social activism and political reform (1890s-1920s), with the utilitarian-focused ideals of the conservationist movement, creating a more dynamic view of infrastructure.

The Great Depression and New Deal programs, such as the Civilian Conservation Corps (CCC) and Works Progress Administration (WPA), meant a steady workforce and funding for big dam construction, resulting in the construction of 26 dams in the East by the Tennessee Valley Authority (TVA), the Hoover Dam (1936) in Nevada, and the Grand Coulee Dam (1941, pumps and plant ready to operate in 1951) in Washington (Melosi, 2011)—to name a few. Such a prolific, almost grandiose, period of construction was undoubtedly loaded with symbolic significance, especially in the interwar years when patriotism was high on the homefront. Paul Zucker, in his book *American Bridges and Dams* (1941), wrote that "no other achievement of peaceful civilization during the last two decades on this war-torn earth has contributed more to the welfare of future generations than the building of dams in this country" (p. 14). Zueker even compared dams to "God's immovable mountains" (p. 14), thus elevating the status of American engineers—who could turn "wild" and "untamed" rivers into "calm,""docile" waterways—to

that of the gods. (Melosi 2011, p. 79). The engineers' triumph over nature also demonstrated how dams served as "beacons of hope" for those who placed faith in the power of technology and the ability of humans to mold the natural environment to suit their needs (Duchemin, 2009, p. 60).

The diversity of uses and benefits of dams extended further to include new opportunities nation-wide for leisure, recreation (swimming, camping, fishing, boating etc.), and tourism—activities which were traditionally associated with national and state parks. Tourism to these new industrial monuments, particularly in the West, was aided by an intricate consortium of stakeholders, including motel and restaurant owners, oil corporations, road-building contractors, car manufacturers, and state and federal engineering agencies (Duchemin, 2009). Maps made by companies such as Rand McNally, and even newly established organizations such as the Automobile Club of Southern California encouraged the rise of the automobile as a new form of transport and an experience in and of itself. This new type of "industrial tourism" marked a shift in reverence from natural to built spaces *and* affirmed a culture of consumerism politically, economically, and socially (Duchemin, 2009).

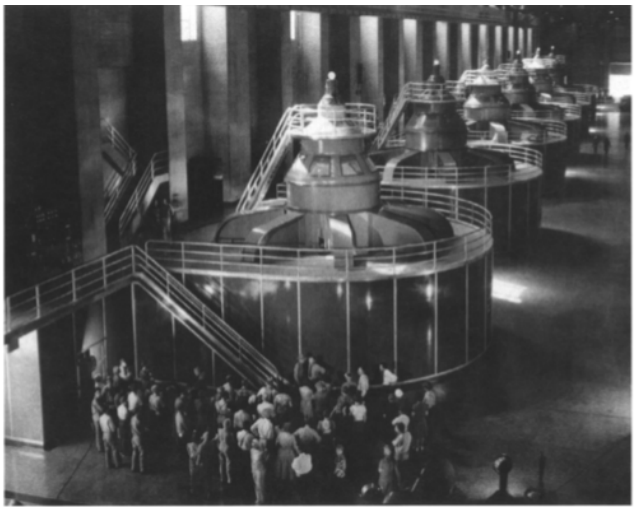

Figure 4: An example of "industrial tourism"- Hoover Dam visitors go "behind the scenes" to observe a generator unit. Reprinted from "Water, Power, and Tourism: Hoover Dam and the Making of the New West," by M. Duchemin, 2009, *California History, 86*(4), 77.

In addition to the steady streams of income from the booming tourism industry, large hydro projects supported the growth of Western and Southwestern cities with reliable, relatively cheap sources of power and water. A steady water supply combined with the elimination of the fear of flooding *or* droughts also meant reliable irrigation and crop yields (sometimes as many as three harvests a year from the same acreage), which further enabled population growth (Duchemin, 2009). Thus, California counties like Los Angeles, Ventura, and Orange began their steady march of urbanization outwards, creating new development along the Pacific coast (Duchemin, 2009). Big dams thus drastically transformed formerly arid, low-density Western and Southwestern landscapes into urban and agricultural spaces. City populations also expanded due to cultural shifts as urban centers grew and the agribusiness marginalized small farmers, making rural areas less attractive or lucrative places to live (Melosi, 2011). The rapid urbanization rates of the mid-twentieth century illuminate these demographic and cultural shifts: between 1920 and 1940, the United States' urban population increased by approximately 20 million from 54.2 million to 74.4 million (Melosi, 2011). Looking at individual towns, the numbers are even more striking. For instance, between 1930 and 1970, the size of Phoenix, Arizona increased from 10 square miles to 247 (Melosi, 2011).

Similar patterns of rapid expansion were seen in the Pacific Northwest, which was transformed by the surplus of energy, low rates maintained by the Bonneville Power Authority, and elimination of distance from source to end user that the Grand Coulee Dam provided (White, 1995). The transformation of the region, magnified by the Columbia River's connection to dams in Canada in the 1960s, brought prosperity the formerly poor region's major cities, such as Portand, Vancouver, and Seattle, and decreased economic reliance on the East (White, 1995).

However, the tremendous growth that big dams helped drive did not come without a great ecological and social price. The rural poor, small farmers, Native American communities, and Latinx communities who were displaced prior to inundation and construction of dams certainly did not enjoy the benefits of these projects. For instance, the construction of the Kinzua Dam (1965) in Pennsylvania took 9,000 acres of Seneca land along the Alleghany River (Melosi, 2011). Native American tribes, including the Sanpoil, Nespelem, and Colville, who relied heavily on fishing for cultural and subsistence uses for over 11,000 years were deeply affected as dams blocked fish migration patterns, particularly salmon ("Grand Coulee Dam Cultural History," n.d.). Other ecological consequences included increased water temperatures (which placed even more strain on fish populations), habitat destruction and fragmentation from inundation, algal growth (which decreases dissolved oxygen levels in the water and causes the release of carbon dioxide as other plants die and decompose), increased fresh water loss to evaporation, and the list goes on.

These environmental issues sparked new cries from the preservationist movement. Lawsuits were filed in federal courts, congressional hearings were held, and membership in groups such as the National Wildlife Federation, the Sierra Club, and the Izaak Walton League increased dramatically (Melosi 2011). The preservationists would manage some wins against large-scale hydro, although much later, such as the blocking of construction of the the Echo Park Dam in Colorado in the mid-1950s (Harvey, 1994).

Parallel to the Big Dam Era, U.S. cities and landscapes were being shaped by another Big Machine: the car. Henry Ford's breakthrough in 1908 of the mass production of the Model T (more than a million a year) and major government subsidies for roads, including the $75 million Federal Road Act of 1916 and the second Federal Road Act of 1921 (which improved 200,000

miles of state highways and established a national highway network), increased the accessibility of cars in terms of price and travel (Kuntsler, 1994). In 1925 alone, a record-setting $1 billion was spent on highways (Kunstler, 1994).

However, the rise of the automobile meant the demise of the electric streetcar. Streetcar lines were typically publicly funded and did not receive nearly the same level of support and subsidies as the auto industry, making it difficult to stay competitive in terms of service and fares as the car grew in popularity. By the 1920s, the car industry had gained serious momentum, and an auto lobby lead by the General Motors Corporation (GM) formed to squash the streetcar almost entirely in several major cities. In the 1930s, the GM joined forces with Standard Oil of California, Firestone Tire and Rubber, and the Omnibus Corporation to dismantle streetcar lines in major cities, such as Los Angeles, New York City, San Jose, Stockton, and Fresno, converting over 100 streetcar lines to bus lines (Kunstler, 1994). With so many major corporations involved, the near extinction of the electric streetcar was clearly far from coincidental and in 1949 GM was indicted by a grand jury for criminal conspiracy for its meddling in Los Angeles. However, the corporation only ended up with a $5,000 fine—*the equivalent of selling five Chevrolets* (relative to its net profits) (Kunstler, 1994).

Seattle's electric streetcar system (established in the late 1800s) would meet a similar fate. Post World War I, the city's 48 miles of streetcar lines and 22 miles of cable railways began to decline in condition and service quality due to fares capped at a nickel, strikes, and the increase in competition from cars and buses (Baruchman, 2018). Additionally, Seattle was struggling to pay back debts after its purchase of the streetcar system in 1918 as part of a last-ditch effort to save the system. By 1936, the city had accumulated $4 million in debt and by 1941, the tracks were abandoned and sold for scrap (Baruchman, 2018). Meanwhile, gasoline-

powered buses spread throughout Seattle and its suburbs. Later attempts to revive the electric streetcar were made in 1968 with a vision plan called “Forward Thrust” that would have built a 47-mile streetcar system, but the plan was ultimately rejected by voters (Baruchman, 2018). In 1970, a second attempt to bring back the streetcar by the Forward Thrust committee would again be voted against (Baruchman, 2018).

In Seattle and elsewhere, city planning boards, which were often dominated by realtors, car dealers, and others who had a stake in the automobile business, saw the development opportunity for cars to fill in the streetcar corridors as people were no longer restricted to living within walking distance of public transit stops (Kunstler, 1994). Thus, a massive restructuring of cities ensued as planners and politicians sought to accommodate the car into a new city fabric. The biggest challenge, perhaps, was to figure out the ideal relationship between people and automobiles as pedestrian safety was becoming a major concern. For instance, a monograph of the neighborhood unit in New York drawn by city planner Clarence Arthur Perry diagrammed the locations where 200 children died from street vehicle accidents in Manhattan in 1929 alone (Shelton, 2011).

Prominent city plans of this time, such as the Le Corbusier’s Radiant City (1935) or Frank Lloyd Wright’s Broadacre City (1932), illustrated this struggle of reconciling the spatial relationships between cars and pedestrians. Although the plans offered very different solutions, Le Corbusier and Wright both shared the technological optimism characteristic of the Big Dam Era in their respective “automobile utopias” (Shelton, 2011, p. 63). Such plans captured the public’s imagination in part due to the excitement of technological advancements but beneath the surface, the plans only superficially alleviated fears of the glaring social dislocation, economic collapse, and violence of the interwar years (Shelton, 2011).

French-Swiss architect Le Corbusier's "Plan Voisin" for Paris (1925) and "Ville Contemporaine" (1929) proposed to separate cars and people completely by creating three levels of pedestrian-only spaces or "streets of repose" (Shelton, 2011, p. 65). It was a "vertical" plan, which referred to the massive blocks along a grid. Each block had a massive skyscraper for living, leaving much open space for parks and more room for cars. However, the streets were extremely wide and designed for high-speed traffic—conditions which did not exactly cater to pedestrian safety and leisure. Furthermore, the Plan Voisin insinuated that the existing city of Paris had to be essentially eliminated and replaced with infrastructure that was designed completely around car (Shelton, 2011). Le Corbusier had a third plan, "Ville Radieuse" (or "Radiant City"), which expanded on his ideas from Plan Voisin/Ville Contemporaine (Shelton, 2011). In this updated plan, the surface level was to be reserved for pedestrians and the cars were vertically separated above the ground according to speed. Again, the pedestrian zones were rendered extremely uninviting as they cowered under the upper networks of streets and cars. In all three of Le Corbusier's plans, the city was forced to arrange itself to the car instead of the car fitting into the existing city fabric. Seen from an aerial view, the Radiant City, in its embrace of the automobile, appears as though it had become a machine itself (Figure 5).

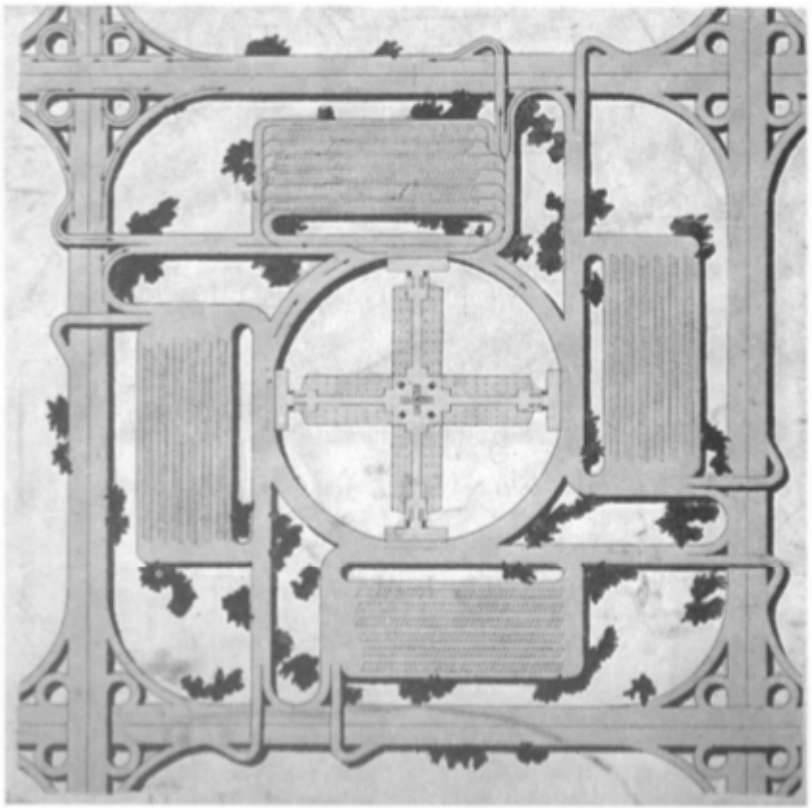

Figure 5: Aerial view of Le Corbusier's "Radiant City" depicting automobile access to the skyscrapers. Reprinted from "Utopias and Traditional Urban Infrastructure: Visions of the Coming Conflict, 1925—1940," by T. Shelton, 2011, *Traditional Dwellings and Settlements Review*, *22*(2), 72. 967). © 2011 Artists Rights Society ADAGP, Paris /F.L.C.

Heavily influenced by Tony Garnier's "Une Citté Industrielle" plan (1917), American architect Frank Lloyd Wright's Broadacre City model similarly aimed to separate vehicle traffic from pedestrians, although horizontally as opposed to vertically (Figure 6). According to Wright, horizontal distribution (now possible with the rise of the car) would allow citizens to spread out and claim their "rightful" plot of land, allowing them to lead more "moral" lives free from the soulless and utilitarian centralized city (Shelton, 2011, p. 70). However, Broadacre City's proposed pedestrian passageways, which transected the grade-separated intersections of high-speed traffic remained hostile to the pedestrian. Wright rejected Le Corbusier's vertical Radiant City on the grounds that, with its intense emphasis on verticality, it blocked citizens' access to light, fresh air, and the earth itself (Shelton, 2011). Wright's focus on reconnecting city dwellers with nature (morally *and* spatially), as well as his emphasis on entitlement to individual plots

harkened back to elements from Puritan society that seemed to have been lost during industrialization.

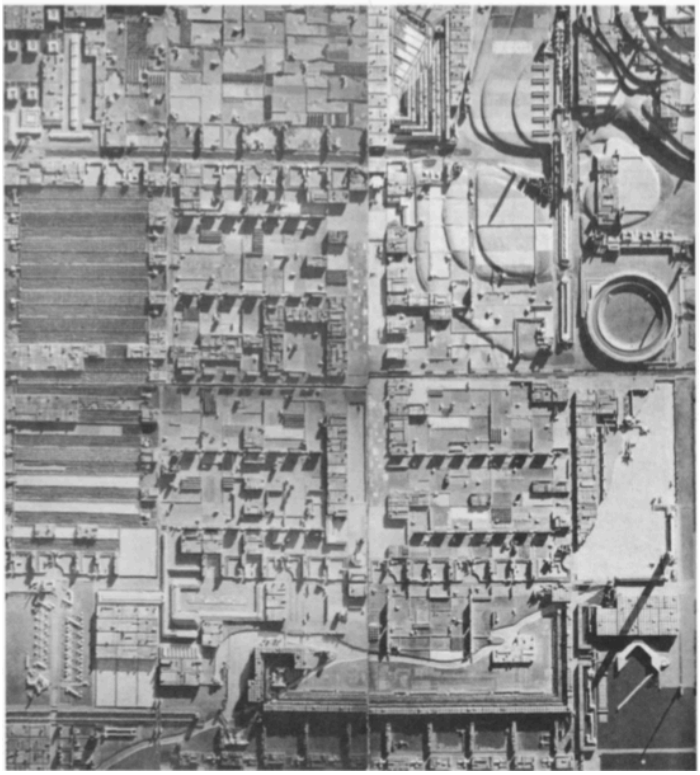

Figure 6: Aerial view of Wright's Broadacre City model. Reprinted from "Utopias and Traditional Urban Infrastructure: Visions of the Coming Conflict, 1925—1940," by T. Shelton, 2011, Traditional Dwellings and Settlements Review, 22(2), 70. 967). © 2011 Frank Lloyd Wright Foundation, Scottsdale, AZ/ Arists Rights Society (ARS), NY.

Both Wright and Le Corbusier seemed to be unphased by the practically complete restructuring of the existing city fabric that would have been required to make room for their new utopias. University of Texas American Studies Professor Jefferey Meikle argued that the futuristic plans of this period rested upon an early notion of America as a "tabular rasa" (which literally translates to "blank slate") (Meikle 2014, p. 193). Meikle cited John Locke's famous quote, "in the beginning all the world was America." The same rhetoric of "tabular rasa" can be found in architect and University of Tennessee Knoxville professor Ted Shelton's analysis of the automobile utopias of 1925-1940 (Shelton, 2011). We can see, then, how the invented construct

of wilderness from the eighteenth and nineteenth centuries as “empty” and “pristine” was so potent that it bled into perceptions of even the most urbanized spaces centuries later.

I concur that the hubris of the city planners of the Interwar Era, with their complete rejection of the existing city fabric, was partially explained (even if subconsciously) by this “tabluar rasa” view of the U.S. landscape. Similar to the engineers of the Big Dam Era, city planners appeared to have almost a god-like authority and influence in the shaping of U.S. cities during the interwar years. The image below of Le Corbusier’s hand hovering over his Radiant City model has a sort of divine interventionist quality in the way it resembles God’s hand in Michelangelo’s “Creation of Adam” (1512), aptly creating a visual metaphor of the power dynamics between planners and cities (Figures 7 and 8).

Figure 7 (left image): Le Corbusier gestures to his Radiant City model (1964). Reprinted from *Phillyhistory.org*, by Steven U., 2012, Retrieved from https://www.phillyhistory.org/blog/index.php/2012/04/le-corbusier-dynamites-the-drexel-block/.

Figure 8 (right image): Zoomed in image of God (right) and Adam's hands touching in Michelangelo's "Creation of Adam" (1512). Reprinted from *Art.com*, (n.d.), Retrieved from https://www.art.com/products/p14101737036-sa-i6632561/michelangelo-buonarroti-creation-of-adam-detail-hands.htm.

Other power dynamics were certainly at play in the reconfigurations of U.S. urban areas through the racist and exclusionary practice of redlining. Redlining, a form of discrimination in credit markets where lenders deny loans to people living in neighborhoods deemed “high risk,” (Dwyer, 2007), grew out of the Great Depression when home mortgage foreclosure rates rose

from 68,000 per year in 1926 to 1,000 homes per day in early 1933 (Gordon, 2005). To stabilize the housing market and to provide a way for Americans to build long-term assets, the federal government established the Federal Housing Administration (FHA) under the Federal Housing Act of 1934 as part of President Franklin Delano Roosevelt's New Deal. The FHA revolutionized home ownership in the U.S. by reducing mortgage down payments to as low as three percent and extending mortgages for up to 30 years, making it vastly more affordable to the middle-class (Gordon, 2005). Such low rates were possible by eliminating risk for lenders through the promise that all defaulted loans would be backed by a federal reserve fund and bought by the Home Owners' Loan Corporation (HOLC), which refinanced the loans under more favorable conditions (Gordon, 2005). Through the new lending schemes under the FHA, home ownership became the primary means through which middle class Americans could build assets, a pattern which very much still holds true today. (Gordon, 2005). As of 2010, 62 percent of the total assets of middle-class Americans were tied up in home ownership (Neal, 2013).

On the surface, the new financing schemes of the FHA seemed benign but in reality were packed with racial coding that excluded African-Americans from accessing these new opportunities for home ownership and, thus, a means of establishing long-term assets. The term "redlining" refers to the maps of urban and suburban neighborhoods drawn by the HOLC with an associated quality rating of "A", "B", "C', or "D," the lowest rating, which was represented by red coloring. The FHA's rating system was heavily influenced by Homer Hoyt's "pseudoscientific" model of neighborhood change, which theorized that neighborhoods start out new and White, then over time as housing stock deteriorates, eventually transition to becoming Protestant, then Jewish, and finally all African-American (Gordon, 2005). This racist methodology, in fact, appears blatantly in the language of the FHA *Underwriting Guidelines*

recommendation for how lenders and developers can maintain neighborhoods at the "A" status: "If a neighborhood is to retain stability, it is necessary that properties shall continue to be occupied by the same social and racial classes" (Gordon, 2005).

Over the next thirty years, redlining would become gradually illegal. Between 1948 and 1962, the FHA adopted a supposedly "neutral" policy of issuing loans regardless of whether or not they were open to purchase by African-Americans, but the discretion was still up to private developers who were not held to any legal obligations. It was not until President John F. Kennedy signed Executive Order 11,062 in November 1962, which recognized that "discriminatory policies and practices based upon race, color, creed, or national origin…operate to deny many Americans the benefits of housing financed through Federal assistance," that redlining became officially illegal (Exec. Order No. 11,063, 3 C.F.R. 652 (1959-1963)). Despite redlining's official illegal status in 1962, the practice left a legacy of historic and systemic dispossession of low-income communities of color. Today, median White household income is ten times greater than that of median African-American household income (Gordon, 2005). While this disparity is certainly due to other factors, the fact that home ownership is the primary means of building assets contributes greatly to the wealth gap. However, literature on redlining and its effects tend to focus on the White/African-American relationship and it is important to acknowledge that this racist financial practice extended to all non-White ethnic and racial groups.

A very similar pattern can be seen in Seattle. Figure 9 shows a map drawn by the HOLC of Seattle and Figure 10 shows a heat map of a displacement risk index rendered by the City of Seattle's Department of Planning & Development. Notice the overlap between red areas ("D" or "Hazardous Areas") in Figure 9 and the red areas (areas with the highest risk of displacement) in

Figure 10. According to University of Washington historian James Gregory, any neighborhood in Seattle that allowed non-Whites to live there was automatically zoned as “hazardous” for lenders and investors ("The History of Redlining in Seattle," 2018). In addition to redlining, Seattle had extremely explicit racial covenants in the zoning terms of many of its subdivisions’ zoning terms. In an inventory of *less than half* of the property records between 1923 and as late as 1950 when restrictions were still enforceable, the Seattle Civil Rights & Labor History Project found *well over 150* subdivisions that had strict racial covenants that prohibited any other race or nationality other than “Caucasian” or “White” to live there, with the exception of domestic servants (“Seattle Segregation Maps,” n.d.).

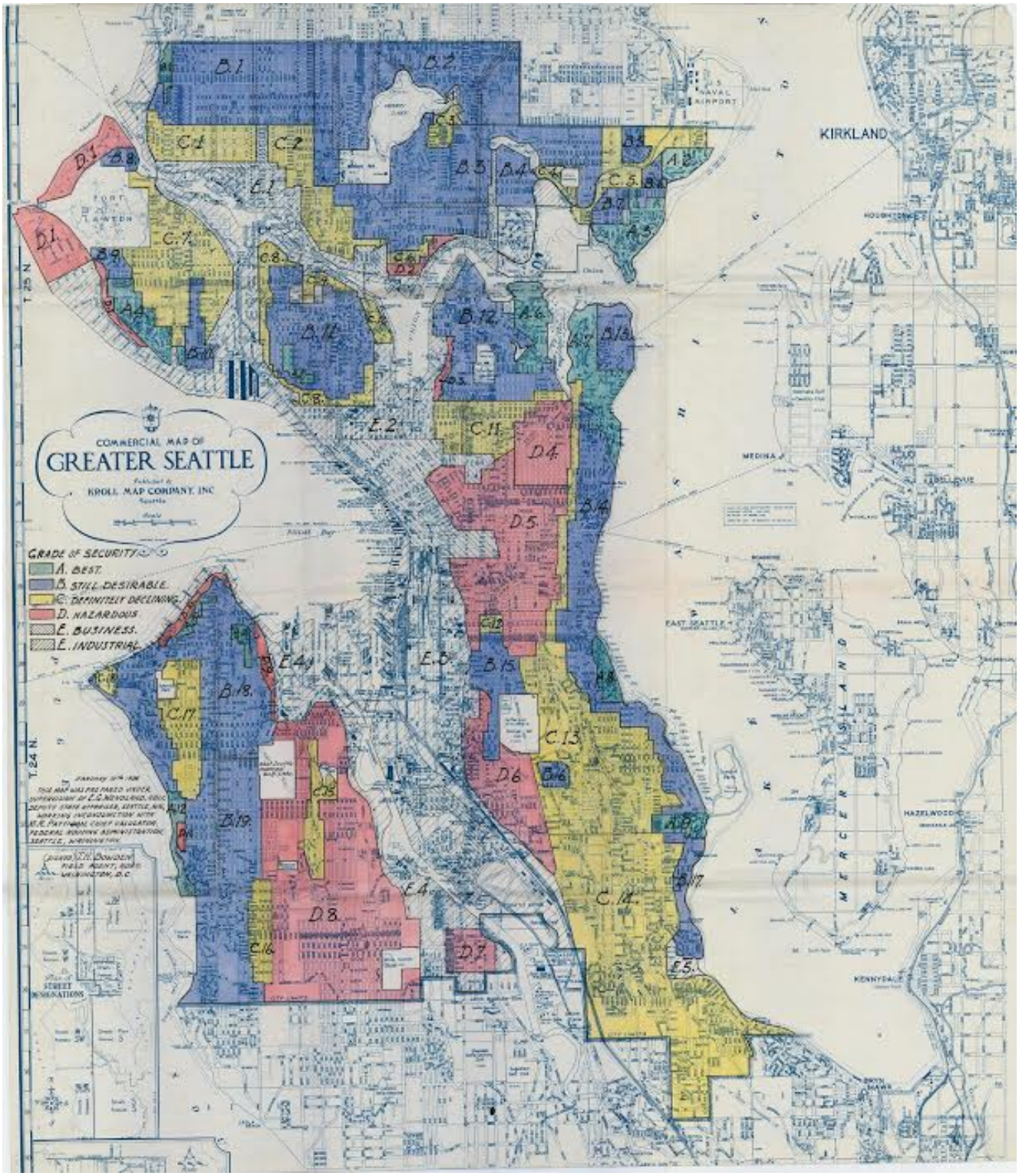

Figure 9: HOLC redlined map of Seattle (1934). Reprinted from *Seattle for Growth*, by Roger V., 2016, Retrieved from http://www.seattleforgrowth.org/tale-two-maps-mayor-councils-new-redline/.

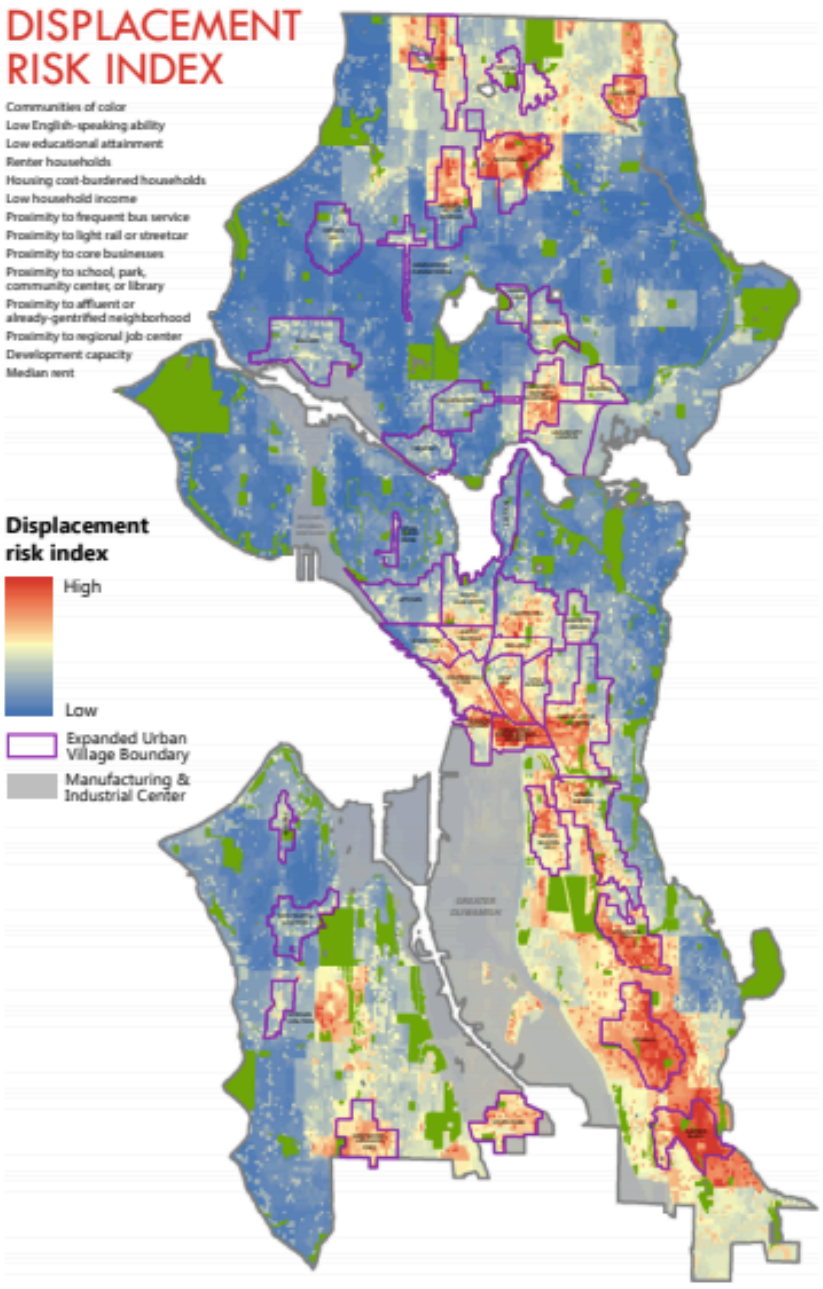

Figure 10: "Displacement risk index" map from City of Seattle Department of Planning & Development's "Growth and Equity" report (2015). Reprinted from Seattle for Growth, by Roger V., 2016, Retrieved from http://www.seattleforgrowth.org/tale-two-maps-mayor-councils-new-redline/.

Seattle's Central Valley, a historically Black neighborhood, continues to be of central concern. In 1970, Central Valley was 73 percent Black; in 2019, this percentage has fallen to *14 percent* in 2019 ("23rd Avenue Action Plan Rezones," n.d.). Rainier Valley—where North Rainier, one of the neighborhoods of focus for this study, is located—was another racially

targeted area, inspiring a report, “Redlining and Disinvestment in Central Seattle: How the Banks are Destroying our Neighborhoods” (1975) by the Central Seattle Community Council Federation. The report concluded that the ratios of deposits to loans in the Central branch area to those of the suburban branch area was 24 percent to 97 percent respectively. The legacies of sprawl and continued dispossession of non-White communities will be further elaborated in the following chapters.

With phenomena like Big Hydro and the New Deal, the scale and magnitude of the interwar years’ infrastructure and planning is arguably unmatched by any other period in U.S. history. Mass produced cars, federally funded highways, and expanded energy grids and water lines from large-scale hydro allowed unprecedented horizontal urbanization, particularly in the West and Southwest. The proliferation of the car and safety concerns for pedestrians inspired an outpouring of futuristic automobile utopias, elevating the role of the city planner to practically that of divine intervention. Furthermore, technological advancements of this era fundamentally changed the relationship many Americans had with nature. Celebration of Big Hydro and the advent of industrial tourism symbolized the shift in reverence and conceptions of sublimity from mountains to machines. However, the benefits from these Big Projects were far from equitably distributed.

The New Deal’s Federal Housing Administration made home ownership a new reality almost exclusively for the White middle-class, leaving deep legacies of economic, health, and educational disparities for many non-White communities, the full effects of which we are still seeing today. The horizontal urbanization and racialization of space established during the interwar years would continue through the next era as “White flight” to the suburbs, which created “urban blight” in the inner cities. Federal attempts to address the deteriorating conditions

in cities would be based in racist “pseudoscience” similar to redlining. Such approaches to urban renewal and the continuation of sprawl would lead to a reckoning of conventional urban planning with new insights from the emerging modern environmental movement.

Chapter Four: Sprawl and Suburbanization (1950-1980)

"What are you doing out?"
“Walking," said Leonard Mead.
"Walking!"
"Just walking," he said simply, but his face felt cold.
"Walking, just walking, walking?"
"Yes, sir."
"Walking where? For what?"
"Walking for air. Walking to see."
-Excerpt from Ray Bradbury’s short story “The Pedestrian” (1951)

Inspiration for Bradbury’s short story “The Pedestrian” (which later evolved into his classic *Fahrenheit 451*) came from the author’s experience getting stopped by a police officer for no apparent reason while going for a walk one night with a friend (Beley, 2006). In the story, which takes place in 2053, “walking anywhere, at any time, under any circumstances is considered a criminal offense” (Bradbury, 1951; Beley, 2006, p. 2). While set in a dystopian future, Bradbury’s short story speaks to the very realities about the role of the car in deeply transforming urban life in the 1950s and for decades onwards. To understand the context for “The Pedestrian” and how the very act of walking could be seen as suspicious, the complexities of major highway construction during the 1940s through 1970s must first be unraveled. Road building in the mid-twentieth century tells a story of a mass exodus from cities to new suburban developments, urban sprawl, segregation, war, conspiracy, the modern environmental movement, an emerging grassroots ethic for public and environmental health, a reckoning for urban planners, feminism, racism, and almost everything in between.

Thus, major highway construction of the mid-twentieth century is clearly a convoluted topic and World War II (1941-1945) seems as logical a place to start as any. Factors contributing to the rise of the automobile and establishment of the federal highway system pre-WWII, including technological optimism, New Deal programs, and the GM-led auto lobby, largely came

to a halt—or at least stalled— when the war began. In the mass mobilization for WWII, industrial production and materials were funneled towards the war effort and car manufacturers switched gears to produce tanks, trucks, jeeps, and munitions (Kay, 1997). Within the first year of the war, car sales dropped by three million (Kay, 1997). Propaganda encouraged people to car pool or reduce speed to conserve gasoline—and guilted those who did not— with slogans such as "When you ride ALONE you ride with Hitler! Join a car-sharing club TODAY!" (Kay, 1997, p.222). As car production and use was discouraged, public transportation saw a brief revival. One third of U.S. commuters took public transport and for the first time in fifteen years, passenger train companies were making profit (Kay, 1997).

The war effort also contributed to the urbanization of the South, Southwest, and West that had begun during the Big Dam Era through federal war contracts issued to places that were further out of reach of German bombs and had clear land for building (Kay, 1997). In the Pacific Northwest, military contracts revived Seattle's Boeing Company, established in 1916, after its financial issues during the 1930s, which reinvigorated the company and boosted the number of jobs in the city. The company's fighter planes production plant along the Duwamish River employed 50,000 people by 1944 (Kershner, 2015).

As the U.S. neared victory, the federal government was faced with a new crisis: housing the returning veterans in cities that were overcrowded and had decaying housing stocks (Kay, 1997). The answer to this crisis would come in June 1944 when President Franklin Delano Roosevelt signed the GI Bill of Rights into law, which enabled the Veterans Association (VA) to guarantee 16 million veterans housing loans (Kay, 1997). In addition to the VA funding, more money was funneled into the FHA's new-and-improved home mortgaging schemes from the New Deal Era (Kay, 1997).

Brothers William and Alfred Levitt saw the opportunity for housing veterans and in 1947 began transforming their father's real estate development into the first mass-produced suburb in the U.S., "Levittown," on New York's Long Island, which would become known as the "birthplace of modern suburbia" (Sellers, 2012, p. 48). Close to New York City and surrounded by three of the (in)famous master builder Robert Moses' highways, Levittown was in a tactical location for a suburban boom (Sellers, 2012). After buying out approximately 3,000 contiguous acres from 55 small farmers and completely clear-cutting and levelling the land, Levitt and Sons began their revolutionary "Model T" assembly-line type of production of single-family homes, constructing 3,000 houses in 1949 alone (Sellers, 2012). Levittown was by no means the only suburban development on Long Island. The Levitts' 3,000 homes represented only *16 percent* of what Nassau County built in the same year (Sellers, 2012). Mass production of housing was made possible in part by Levitt and Sons' innovative construction approaches such as prefabricated structures and in part by the war's legacies of streamlined construction techniques and standardization of building materials (Lewis, 1997). It is important to note that this trend and style of suburbanization was not specific to Levittown. Similar developments were being replicated along the "sunbelt" states (the southern region stretching from Southern California to Florida) of the U.S. (Kay, 1997).

Figure 11: Aerial image of Levittown lots slabbed for construction captures its "assembly line"construction model. Reprinted from *Statemuseumpa.org*, by Jack R., (n.d.), Retrieved from http://statemuseumpa.org/levittown/one/d.html.

The addition of the category of "suburb" to the U.S. Census in 1950 confirmed the post-war horizontal development explosion (Sellers, 2012). As suburban populations steadily rose (doubling from 1950 to 2000), suburbs of cities continued to push outward, frequently running into those of another city and creating urban corridors, such as the one extending 700 miles from Norfolk, Virginia to Portland, Maine by the end of the twentieth century ("The First Measured Century," n.d.). This growing trend of amorphous sprawl merited new names, such as "exurbia", "megalopolis", "metroplex", and even "pepperoni pizza" as people attempted to describe the boundlessness of suburbanization (Kay, 1997, p. 61).

No matter what one called it, "suburbia" transcended its definition of a spatial description to mean a new *way of life* for the American middle class (Sellers, 2012). The complete dependence on the car was central to this lifestyle, which was perpetuated by the rise in Euclidean zoning practices that segregated land uses, placing amenities, entertainment, necessities, etc. further out of walking distance from peoples' homes (Wilson et. al., 2008; Sellers, 2012).

The lack of autonomy and rise in single-use zoning had tremendous health and social implications, especially for women and children. Author James Howard Kunstler ironically points out that despite the suburbs being touted as ideal places to raise children, children were in fact "the biggest losers" of sprawl (Kunstler, 1993, p. 115). A study comparing ten-year-olds in a small, walkable town in Vermont to those in a new suburb in Orange County, California found that the children in Orange County, who were much more restricted in terms of mobility (i.e., variety of destinations within walking distance) watched four times as much television than the children in Vermont (Kay, 1997). Many suburban women, the majority of whom did not work outside their homes by 1970, became "entrapped" in their role as caregivers as "chauffer slaves" due to the necessity of driving their children virtually everywhere for everything (in addition to their personal shopping and excursions) (Lewis, 1997, p. 244). Overall, car dependency created a new norm of a sedentary lifestyle, which has contributed to an emergence of public health crises of chronic diseases related to inactivity such as diabetes and heart disease (Wilson et. al., 2008). The rise of *chronic* disease crises marked a major shift from the *infectious* disease crises that plagued industrializing cities in the U.S. in the mid-to-late 1800s and early 1900s, suggesting that the reorganization of the built environment had become deadlier, in many ways, than pathogens.

Simultaneously, the federal government expanded its national network of limited-access highways, the hallmark of 1950s road building, that would set out to dually relieve urban congestion and provide access to the new suburban developments (Kay, 1997). Subsidies for highway building reached a new level in 1956 with the passage of the Interstate Highway Act, which provided federal funding for 90 percent of the cost of nation-wide highway construction (Baruchman, 2018). The same year, the National Interstate and Defense Highways Act (NIDHA)

was passed, which established the Interstate Highway System, the "greatest and longest engineered structure every built" in the U.S. (Lewis, 1997, p. ix).

The massive scale of highway expansion had drastic social and ecological effects. Highway construction went hand-in-hand with the mass production of concrete—pouring the equivalent of a wide sidewalk extending from Earth to a point in space five times farther than the moon (Lewis, 1997). Concrete, the most widely used human-made material in existence (second to water in terms of overall resource consumption), is made from cement (Rodgers, 2018). Primary materials that are used to make cement, including limestone, shells, and chalk, contain calcium carbonate, which, when burned during the cement production process, emits carbon dioxide. Thus, with such a massive production scale and the chemical composition of its composite materials, cement is now the source of 8 percent of the world's CO_2 emissions (Lehne and Preston, 2018). Concrete is also an impervious surface (meaning liquids cannot pass through it), which prevents rain from percolating into the ground and recharging groundwater sources *and* it channels toxic runoff from roadways that contain heavy metals, petroleum products, and other pollutants into local waterways. It is important to note that the burdens of public and environmental health consequences (i.e., higher asthma rates) of highway expansion were by no means evenly distributed as highways were typically chosen to cut through low-income communities of color (Lewis, 1997). Highways were also typically sited to cut through open spaces and water ways where land was cheaper, such as the elevated Alaskan Way viaduct paralleling Seattle's waterfront (currently being demolished), which obstructed views and compromised the ecological integrity of parks and marine life (Kay, 1997).

By 1960, 78 percent of American households owned at least one car, which rose to 83 percent by 1970 and 87 percent by 1980 ("Census Questionnaire Content, 1990," n.d.). Thus, in

addition to highway construction, local and state governments poured increasing amounts of concrete in cities and suburbs to create more parking lots and paved surfaces to accommodate the influx of cars. We now know that concrete and pavement are the largest contributors to the "urban heat island effect," the phenomenon of urban areas having higher air temperatures as compared to air temperatures in surrounding areas, due to the effectiveness of the materials in absorbing the sun's energy (Brian et. al., 2001). Higher ambient temperatures associated with the urban heat island effect can cause a range of health impacts, including respiratory difficulties, heat cramps and exhaustion, and even heat-related mortality, which are especially dangerous for vulnerable populations, including children and older adults (Brian et. al., 2001).

In an ironic juxtaposition to the increase in time people spent indoors and in cars, great care went into the curation of outdoor spaces in suburban developments. Levitt and Sons lured in city dwellers by taking full advantage of the American homestead tradition and the increasingly unattractiveness of the inner city, marketing Levittown as a "Garden City", a reference to Howard's Garden City model from the late 1800s (Kay, 1997, p. 276). The real estate moguls constructed public green spaces, invested heavily in landscaping, and imposed an aesthetic uniformity of setback, manicured front yards—all of which stood in ironic contrast to the development's earlier bulldozing and clear-cutting, revealing the high degree of superficiality of the suburban environment that claimed to be the countryside (Kay, 1997). Levittown can also be seen as a nod to Wright's Broadacre City model with an intentional low-density community density maximum of 500 residents per square mile (Kay, 1997).

Indeed, the labor and pesticide-intensive custom of lawncare would muddy the conceptions of what was "natural" and what was "wild" for suburbanites (Sellers, 2012, p. 82). Despite urban developers' great efforts to maintain the countryside aesthetic, the rise in

landscaping and horticulture and domestication of animals as pets led to "nature" becoming increasingly associated with spaces deemed as untouched" or undomesticated by the human hand, similar to the preservationist movement's conception of wilderness (Sellers, 2012). Such spaces were not necessarily confined to the suburban fringes. They could be found, to the great delight and curiosity children, in vacant lots (Sellers, 2012). Ideas of what qualified as "natural" were also extended to gardening practices. Growing concerns over the heavy use of chemicals and pesticides sparked the popularity of the organic gardening movement in the 1950s as suburbanites sought "natural" methods for home cultivation and pest management (Sellers, 2012).

The rise of the organic gardening movement signaled the growing inquiry into the links between land use (and care) and public health (Sellers, 2012). On Long Island, concerns over chemicals were heightened before Rachel Carson's revolutionary *Silent Spring* (1962), which drew national attention to the public and environmental health effects of the widespread use of the pesticide DDT. In 1957, the U.S. Department of Agriculture joined forces with the state of New York to enact "the largest single-spray operation ever conducted" to eradicate the invasive, forest-destroying gypsy moth (Sellers 2012). In three months, a total of 65 planes flew over Suffolk and parts of Nassau County, dumping DDT at a rate of one pound per acre where trees were clustered and making as many as thirteen passes over a single residence (Sellers 2012).

Disasters such as the 1957 spray campaign over Long Island and Carson's *Silent Spring* led to a public outcry that marked a shift from elite, land-based suburban environmentalism (i.e., creating more "nature parks") to a broadened movement that called for expanded definitions of the environment to include the backyard and even the human body (Sellers 2012, p. 99). The inclusion of public health in the emerging environmental movement led to two significant

paradigm shifts, the first being the democratization of the environment. For instance, clean drinking water concerns *everyone*—not just the upper-class suburbanites. Secondly, in the court battles between suburbanites and state/federal governments, it became clear that the burden of proof fell on the citizen, which drastically invalidated the rise in chronic diseases and every day experiences of suburbanites by the "experts'" stubborn insistence on the innocuousness of chemicals and pesticides (Sellers, 2012, p. 272). Feelings of frustration and deceit fueled new movements for a "popular epidemiology" and "popular ecology" (which today are known broadly as "citizen science") that called for the validation of the layperson's experiences and observations in data collection—especially as it applied to legal proceedings and policy decisions (Sellers, 2012, p. 284). As Sarathy and Hamilton summarize in their book, *Inevitably Toxic*, "broader patterns of scientific education and communication," including scientific, medical, and engineering fields becoming increasingly professionalized and specialized, have barred most people from participating in the production of scientific knowledge (Sarathy and Hamilton 2018, p. 8).

Jane Jacobs, author of the seminal book, *The Death and Life of Great American Cities* (1961), similarly called for a power inversion, but within the top-down style of conventional ("orthodox") city planning, which she defined loosely as an agglomeration of the City Beautiful, Radiant City, and Garden City models. Jacobs herself had no professional background or training in city planning, making the legacy of her work and the nature of her critique that much more powerful. Based in New York City, she described a typical experience at the bi-weekly public hearings on proposed measures by the city chief's governing body, the Board of Estimate. Citizens who lost a day's pay or made arrangements for childcare or *brought* their small children to the hearing often sat for hours at a time only to voice their say on something that had "all been

decided before they [were] heard" (Jacobs 1961, p. 406). Jacobs admonished the Board members, refusing to call them public servants and instead referring to them as "rulers" as they looked down literally and figuratively on the citizens. This power dynamic between planners and citizens, Jacobs argued, prevented city planning from truly meeting everyone's needs. Poetically, she wrote: "Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody" (Jacobs 1961, p. 238). However, Jacobs' call for incorporation of community input was directed not solely at planners. Her call was also directed at *citizens themselves* because they had just as much of a role to play in terms of being critical observers and becoming more intimately familiar with the places in which they lived, worked, and played.

Written the year before Carson's *Silent Spring*, *The Death and Life of Great American Cities* reflected the rise in environmentalism and ecological thinking of the 1960s. Jacobs criticized conventional planning for its highly rational approach to cities and instead called for the "life sciences" approach, which treated cities holistically as issues of "organized complexity" and strove for "city vitality" (Jacobs 1961, p. 433). Put simply, Jacobs saw cities as organisms and not machines. She also argued that conventional planning isolated humans from the environment. Jacobs, along with Carson and the modern environmental movement's linking of public health and the environment, highlighted monumental shifts in the field of city planning and popular perceptions of nature: humans were *a part of* and not *apart from* it—and cities must be planned accordingly.

Written at the end of the decade, Ian McHarg's *Design with Nature* (1969) offered innovative mapping techniques—similar to how GIS is commonly used as a planning tool today—as a way to use natural assets, systems, and ecology to inform city design. Through

several case studies, McHarg demonstrated that planned growth (meaning that private *and* public interests are involved and that environmental conditions are seriously considered) was more desirable than unplanned growth (sprawl) *and* just as profitable (McHarg, 1969). Furthermore, he challenged sprawl's prerogative of building practically anywhere there was open space. More specifically, he argued that there were certain landscapes that are inherently unsuitable for urbanization depending on soil type, flood zones, groundwater sources, and a range of other environmental parameters.

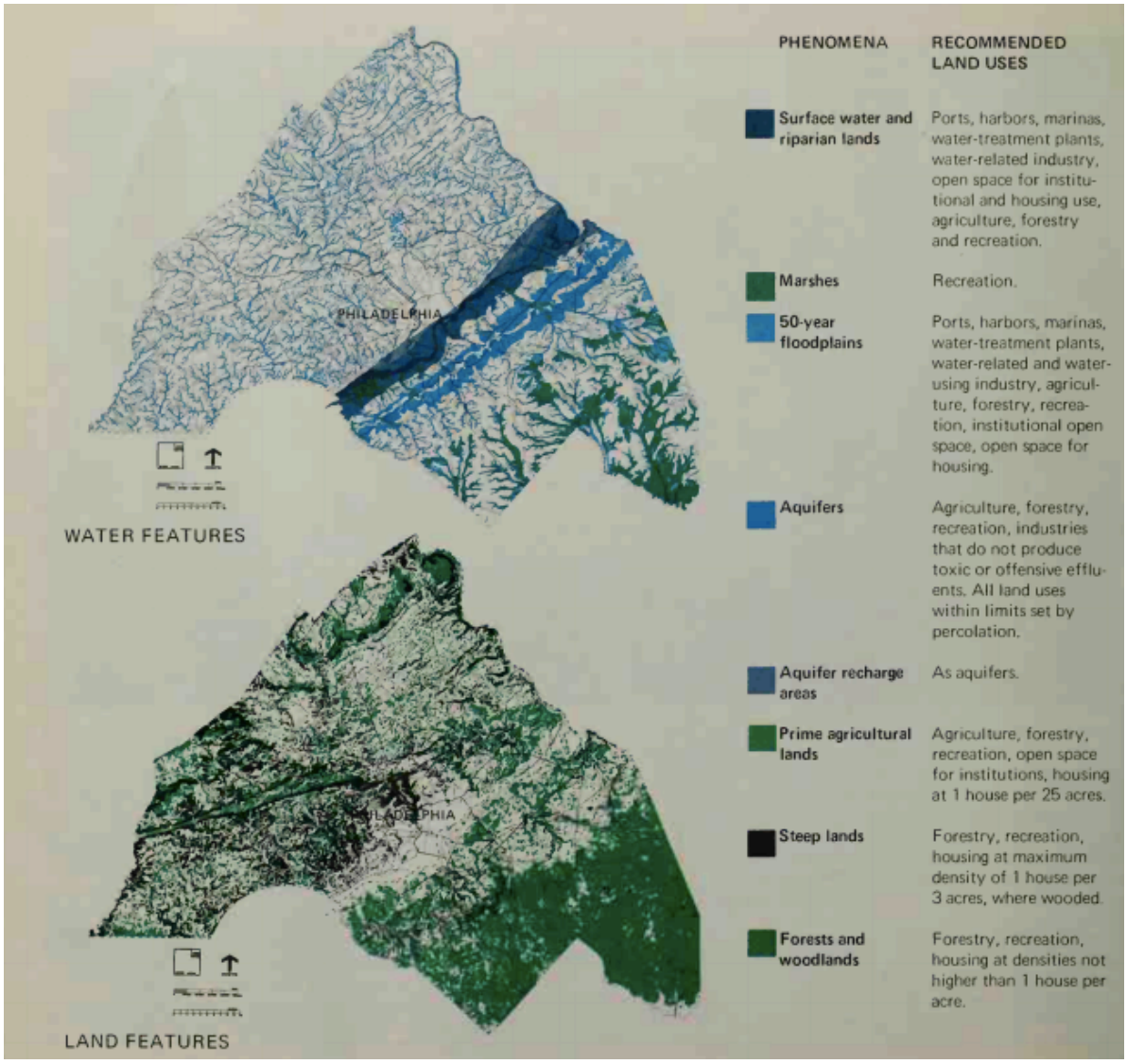

Figure 12: "Summary Map of Water & Land Features for Part of the Metropolitan Area" of Philadelphia. Reprinted from *Design with Nature* (p. 62), by Ian M., 1969, Garden City, NY: Doubleday & Company, Inc.

McHarg and Jacobs, in their respective analyses of cities from a systems or ecological lens, critiqued the social systems that had been thoroughly strained by conventional city planning and sprawl. Between subdivisions, cars, and infinite roads, people were segregated and isolated, which had greatly contributed to the erosion of social interactions and sense of community (Jacobs, 1961). As McHarg pointed out, conventional planning falsely assumed that community was formed through the sum of subdivisions, or a group of suburbs, or even a metropolitan region. Instead, as Jacobs argued, it grew through "many little public sidewalk contacts" and other daily interactions that gradually build trust and interpersonal relationships (McHarg, 1969; Jacobs, 1961, p. 56). Jacobs further contended that spontaneous interactions on the street between strangers were just as crucial to city vitality as those between neighbors. Single-use zoning separated residential and commercial uses, concentrating people in certain areas at certain times of the day. This impeded economic activity and public safety, as there were inherently times and places during the day when practically no one was out. Mixed-use zoning, on the other hand, is a strategy used to combat these issues and will be discussed further in the next two chapters.

With the mass exodus from cities to suburbs, commonly known as "White flight," the economic and social erosion of the inner city was especially devastating for low-income communities of color. Between the FHA's exclusive home mortgaging schemes and racial covenants embedded within many of the new suburban developments, including Levittown, lower-income families and people of color did not have the same freedom and opportunity to move out of the city. Along with the mass migration of people to the suburbs, businesses, medical, social, and other services fled the cities, leaving the inner city with declining institutions or none at all (Kay, 1997). The economic decline and continued decay of the building

stock left cities in a great state of disrepair, initiating the Housing Act of 1949 and subsequent campaigns to initiate "urban renewal" to end blight in the city (Kay, 1997, p. 230). In the name of "urban renewal", city governments and planning commissions demolished "slums" (referring to housing projects, neighborhoods of color) immediately by bulldozers or crushed slowly through credit blacklisting that became "self-fulfilling prophecies" of destruction (Jacobs 1961, p. 301).

Another racist scheme, the "life cycle theory" (also known as "stage theory"), a real estate appraisal concept originating within the HOLC and fully developed by Chicago's Real Estate Research Corporation under the leadership of Homer Hoyt and James Downs, justified the demolition and dispersal of such communities through pseudoscientific studies and economics, including a "community desirability" rating system, similar to redlining (Metzger 2000, p. 10). Life cycle theory, used from the city to federal level, emerged from the FHA's loan risk rating system based on the "constant lifecycle" or "decline" from new, White neighborhoods to deteriorated, Black neighborhoods (Gordon, 2005; Metzger 2000, p. 10). Stage theory purported that the cycle could only be reversed by demolition or rehabilitation (code for attracting middle class White people back into the neighborhood) at its early stages (Metzger 2000). In addition, many highway construction projects were disguised as urban renewal schemes, such as Robert Moses' tactical framing of his highway campaigns (many of which were protested by Jacobs herself) in New York as "the solution to a myriad of social problems" (Lewis, 1997, p.83). The life cycle theory's influence on planning and infrastructure in consistently benefiting White, middle and upper-class citizens demonstrates the dominance of White, male (a pattern that can be seen elsewhere, such as in the legacies of redlining), and corporate interests in city planning

commissions prominent during this era, elevating Jacobs' call for power inversions within the field *and* the significance of her status as a woman.

Nathan Hare, sociologist and "father of Black studies," in his article "Black Ecology" (1970), connected the deterioration of the inner city for people of color to a critique of the emerging environmental and ecological movement. He argued that the ecological movement and Black people "[stood] at contradiction with each other," as the "White environment" (including its issues and solutions) was fundamentally different from the "Black environment" (p. 2). The "white environment" concerned such issues as the pollution of beaches that prevented recreation and ignored the "social and political revolution" that the "Black environment" demanded (Hare, 1970, p. 2). Furthermore, he pointed out that the environmental movement, as its focus and conception were rooted in predominantly White suburban spaces, ignored the environment within cities, where people of color were disproportionally exposed to industrial pollution and other toxins. However, this is not to say that environmental injustice was specific to the inner city as similar disparities in concentrations of phosphates and other pollutants could be found in lower-income, communities of color in the suburbs (Sellers, 2012). Hare's critique of the "White environment" challenged dominant narratives that the emerging environmental movement was beginning to broaden its scope and participation.

Occurring the same year as Hare published "Black Ecology", the nation's first Earth Day took place on April 22, 1970. The inaugural event was organized by none other than Denis Hayes, then-president of the Bullitt Foundation, whose office would eventually become the first-ever Living Building Challenge certified commercial building *and* headquarters of the International Living Future Institute in Seattle ("Earth Day 2018," 2018). A true grassroots movement, over 20 million people who ran the spectrum of age, profession, background, and

political leanings (although perhaps not race and ethnicity) poured onto the streets across the country to protest the host of environmental issues that were becoming ever more part of the public's consciousness, including sprawl (Sellers, 2012). Earth Day would be followed by an unprecedented wave of federal environmental policy under the Nixon Administration, including the National Environmental Policy Act of 1970, the Clean Air Act Amendments (1970), the Clean Water Act (1972), and the establishment of the U.S. Environmental Protection Agency (1970).

This decade of environmental reckoning would coincide with increasing hostility towards highway construction, leading to the passage of major pieces of legislation, such as the Federal-Aid Highway Act, which assured full consideration of social, environmental, and economic effects of federally constructed highways (Lewis, 1997). In Seattle, an unlikely coalition comprised of Black Panther members and "society ladies" successfully added the proposed construction of the R.H. Thompson Freeway to the ballot in a 1972 referendum. Nearly 71 percent of Seattleites voted against the project (Lewis, 1997; "R.H. Thompson Expressway," n.d.).

There is a broad consensus among planners, architects, historians, and urban scholars that the three major systems outlined above—the interstate highway system, the FHA, and urban renewal—cumulatively had a "decisive influence on metropolitan form" (Kirkman, 2010, p. 125). To summarize, the metropolitan form was, by the end of the 1970s, sprawling and intensely segregated with a vast majority of the White population migrating to the suburbs and low-income communities of color concentrated in the "blighted" inner cities. The social, political, and environmental concerns of these new patterns and practices of development coalesced to form the emerging environmental movement, which influenced new city planning

critiques, the wildly successful Earth Day, and a wave of federal environmental policy. The momentum gained by the modern environmental movement would build throughout the rest of the twentieth century and inspire new planning movements centered around the emerging concept of "sustainable development" to counteract the socially and environmentally unsustainable practices of conventional planning. As I will unpack in the next chapter, Seattle would come to earn the titles of "Ecotopia" and "Emerald City," demonstrating its position at the forefront of this new vision for green cities and suburbs.

Chapter Five: Sustainable Development and Seattle (1980 – present)

"Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

-United Nation's Report of the World Commission on Environment and Development (1987)

With a loss of over 63,000 people from suburbanization and White flight between 1960 and 1980 (Sanders, 2010), Seattle and its economically and socially deteriorating urban condition were by no means unique. The same cannot be said, however, for the city's response to an increasingly sprawling, globalized society. A group of farmers, urban gardeners, and activists called "Tilth" (meaning "soil prepared for cultivation") was founded in the late 1970s and catalyzed Seattle's urban agriculture movement, which would play a formative role in shaping its brand of sustainability and sustainable development. Tilth envisioned a "whole earth ecology" for the Pacific Northwest region that holistically emphasized urban agriculture, co-operative organizing (such as Seattle's famous Pike Place Market and Puget Consumers Cooperative), alternative energy production, and urban land reform (Sanders, 2010). Urban agriculture wove together food and energy, epitomizing the group's call for self-sufficiency and fundamentally challenging the massive scales of food and energy production in the U.S. The demand for systemic downscaling was consistent with the counterculture environmental movement of the 1970s' emphasis on bioregionalism and development of a "locally appropriate set of practices" (Sanders, 2010, p. 139).

Tilth laid the groundwork for Seattle's major community gardens, including the wildly successful P-Patch, Home of the Good Shepherd, the Danny Woo Community Garden, as well as the renegade gardens in all of the "green pockets and crannies" of the city (Sanders, 2010, p. 160). In some cases, like in Capitol Hill, parking lots were depaved to make room for urban

agriculture (Sanders, 2010). These gardens represented much more than reestablishing a connection to the land in an urban environment. They also served to combine "nutritional, aesthetic, economic, and political" aspects that demonstrated the power of grassroots organizing and community building (Sanders, 2010). In addition, Seattle's urban gardens of the 1970s and 1980s represented social and cultural empowerment, especially those located in predominantly low-income communities of color, such as the Danny Woo Community Garden in the International District, which remains beautifully and lovingly maintained today (Sanders, 2010, p. 171).

The success of the urban agriculture movement in Seattle during the latter half of the twentieth century can, in part, be attributed to the relatively high level of institutional support that many groups and gardens enjoyed. For instance, city and federal grants, including funding from the Department of Energy, supported Tilth, which was then better equipped to continue to build public support and interest in urban gardening (Sanders, 2010).

With city-sponsored gardening programs, a public school system using agriculture to teach children about nature and citizenship, urban gardens sprinkled throughout the city, and citizens raising algae in their backyards to feed tilapia, Seattle was beginning to resemble Ernest Callenbach's *Ecotopia* (1975). Set in the post-industrial, post-apocalyptic Pacific Northwest, *Ecotopia* imagined the region seceding from the Union and governing itself according to ecological principles (Sanders, 2010). The Pacific Northwest's urban gardeners and activists' skill in organizing a new system for regional production and consumption provided a "useful mythology of place" that could be found in the utopian novel's bioregional focus (Sanders, 2010, p. 139). This "myth" would be echoed by Seattle's popular association with the Wizard of Oz's "Emerald City" (Klingle, 2007, p. 264). However, Seattle also resembled some of the darker

themes of Callenbach's *Ecotopia*. In the utopia *and* in reality, society was, for the most part, racially divided and "surprisingly few dark-skinned faces" took part in the idyllic and natural activities and spaces of daily life (Klingle, 2007, p. 139).

Seattle's tech boom in the 1990s led by Microsoft inspired a massive reinvisioning for the city that would be framed by the city's "ecotopian" brand of urban form and politics. New development schemes for Seattle were also set within the global context of the emerging language and concept of "sustainable development," an area in which Washington would be an early leader (following Oregon in the 1970s) with the state legislature's passage of the Growth Management Act in 1990 (Sanders, 2010). These environmental, economic, and political factors materialized into one hotly contested plan for the Cascade and South Lake Union neighborhoods north of downtown called the "Seattle Commons" (Sanders, 2010).

The plan aimed to revitalize the downtown area by creating a park and by preserving employment. On either side would be a planned neighborhood featuring moderate-, low-, and market-rate apartments and housing, a new transportation system (rerouting streets and establishing a rail link), and a cleaner lake with a new sewer system (Sanders, 2010). As Sanders argued, the "intellectual underpinnings" for the Seattle Commons were based in an emerging planning movement known as "New Urbanism" (Sanders, 2010, p. 220). New Urbanism, originating in the U.S. in the early 1980s, generally promotes "walkable, mixed-use neighborhoods and transit-oriented development, seeking to end suburban sprawl and promote community" (Lehman, 2010, p. 1). Transit-oriented development (TOD) would also become a method of transportation and land use planning in and of itself, similarly seeking to promote walkable, mixed use, high density neighborhoods (Jacobson and Forsyth, 2008). A third planning movement emerged in the 1990s to complete the umbrella of sustainable development (Freilich

and Popowitz, 2010), Green Urbanism, which places a higher emphasis on zero emissions and zero waste solutions.

The Seattle Commons was envisioned as a sort of incubator for New Urbanism and the new concept of urban villages, devised by Washington University's Department of Urban Planning (Sanders, 2010, p. 220). Despite the appeal of the Commons to Seattleites' love for urban nature and community spaces, the plan was met with great pushback from the public. Citizens wanted to protect the "crumbling," predominantly immigrant neighborhoods of Cascade and South Lake Union from being paved over. Activists formed a community council and citizens voted down the city's plan—twice. The tension between neighborhood councils and the city government that arose during this period remains part of the political dynamic today, according to a member of the Mt. Baker Hub Alliance in an interview (Alliance Member B, personal communication, August 9, 2019) .

However, protest against the Seattle Commons occurred within a "new framework that favored private efforts over public" (Sanders, 2010, p. 224). Members of the city planning commission threw up their hands in exhaustion from "the Seattle way of doing things" (meaning intensively involved public processes) and gave up on the Seattle Commons, but the plan would persist nonetheless thanks to Microsoft co-founder, Paul Allen (Sanders 2010, p. 230). Allen was an early, anonymous investor in the plan, but decided to out himself and see the plan through once it was clear that private development was the only option if the project was to be built. Allen's version of the plan, the Alycone Apartments, were faithful to the New Urbanists' urban village concept and the city's counterculture heritage of "healthy and nearby nature" (Sanders, 2010, p. 232)—although its rooftop garden sent a different message. With privatized rather than public green space, higher income intellectuals and "techy" residents, and one of the city's first

LEED (Leadership in Energy and Environmental Design) buildings, the Alycone resembled a new kind of "corporate Ecotopia" in Seattle (Sanders, 2010, p. 233).

From the emerging environmental movement of the 1960s to the end of the twentieth century, Seattle would lead the way in redefining urban politics and exemplified what sustainable development at the local level could look like. The city's transition from community to rooftop gardens literally and figuratively captured a shift of its brand of sustainability from grassroots and participatory to increasingly privatized. Despite the trend towards corporatized development, Seattleites would continue to push back and demand local systems of production and consumption and public process, ending the decade where this paper has started: with the WTO protest in 1999.

Although New Urbanism, Green Urbanism, and Transit-Oriented Development offer promising alternatives, theoretically, to unsustainable and conventional planning, they have not been met without criticism. This is key to note because elements from these three planning movements can be found within the Living Community Challenge. As equity becomes a larger part of the conversation surrounding sustainable development, many of these critiques focus on the social justice aspects of these increasingly commonplace planning methods. New Urbanism, for instance, has been sardonically called "New Suburbanism" due to claims that, in practice, it ironically contributes to sprawl and "socially exclusive communities (Trudeau, 2011, p. 4). However, several studies have negated or at least provided nuance to such claims (Trudeau and Malloy, 2011; Ellis, 2002). TOD projects (which commonly focus on rail transit) often redirect funding away from bus lines and divert resources away from other infrastructural improvements (at least during construction) that are essential to the daily lives of many lower-income people (Pendall et. al., 2012). Significantly less literature can be found on Green Urbanism compared to

the other planning movements—perhaps because it is the least concretely defined or institutionalized of the three. I would argue that a major critique of Green Urbanism is that its prioritization on zero emissions and zero waste can limit its ability to think about or understand social systems in a holistic or dynamic way. Focusing on material inputs and outpouts can lead to simplifications or ignorance of the sociocultural systems that resource production and consumption practices are embedded within.

A unifying critique of the three planning methods, in their respective positions under the umbrella of sustainable development, is their tendency to result in environmental gentrification or the displacement of low-income people due to "sustainable" construction or infrastructural improvements (Checker, 2011, p. 212). Professor of Urban Studies at Queens College, Melissa Checker, made the argument that greening can often become synonymous with "Whitening" in many cases (Checker, 2011, p. 216). When environmental gentrification occurs, it becomes an issue of environmental justice as *all* communities deserve to access the numerous social, environmental, economic, and mental and physical health benefits that sustainable development can provide.

Now that the sociopolitical context of sustainable development in Seattle and the key elements (and critiques) of planning movements that emerged in the late twentieth century have been discussed—including the near 400 years of history that preceded them—I will unpack the Living Community Challenge, similar models for community-driven planning, and an "uncase" study in Seattle in the following chapter.

Chapter Six: The Living Community Challenge

"What does good look like?" -The International Living Future Institute

I. Questions of Scale

As climate change becomes an increasing threat to human and ecological communities around the world, the need to transform the built environment to support a more sustainable future intensifies. This is especially true for the United States, which is the second largest carbon emitter in the world behind China, according to a recent report by Statista (Wang, 2019). The continued rise of sustainable development practices, including Green Urbanism, New Urbanism, and TOD from the 1980s and 990s, demonstrates an increasing awareness of this necessity (Freilich and Popowitz, 2010). However, this transformation fundamentally requires a great deal of "undoing"—structurally, economically, politically, and socially. As Dixon and Eames explain in their paper "Scaling up: the challenges of urban retrofit" (2013), "[t]o bring about the sort of systematic change that is needed, cities must be considered as they are: the product of centuries of evolution" (p. 500). Summarizing nearly 400 years of developmental history in the U.S. (and Seattle) gave context to the current moment and to the deeply systemic issues facing society and the built environment.

In tackling the question of deep green retrofits, many questions arise: At what scale should retrofitting occur? Nationally, regionally, state-wide, city-wide, or even community-by-community? This question of scale begs yet another question: Who should be responsible for retrofitting? The federal government, city planning commissions, private developers, or neighborhood associations? With political gridlock and the nature of short-term political cycles (two-to-four years, generally, for the Executive and Legislative branches), employing long-term urban planning strategies and policies at the federal level can be extremely difficult (Dixon and

Eames, 2013). However, federal policy has the advantage of bringing about more sweeping change and widespread benefits. For instance, if the U.S. were to engage in a national-scale retrofit, it could yield as much as $1 trillion in energy savings and create as many as 3.3 million new jobs over ten years (Dixon and Eames, 2013). Similar pros and cons can be argued for such action on the state-by-state level.

In this chapter, the focus is on the neighborhood-to-city scale and a combination of actors: neighborhood associations, city government, private developers, and non-profit organizations. The Living Community Challenge (LCC) is one of several models of planning at the neighborhood-to-city scale. While the LCC is the primary focus of this chapter, I will also give a brief overview of similar models in the U.S.—Leadership in Energy and Environmental Design for Neigbhorhood Development (LEED-ND) and EcoDistricts—as well as a comparitve analysis of their perceived strengths and weaknesses. I will then conclude the chapter with the case study of the North Rainier and Fremont neighborhoods. However, before delving into the LCC, I must first discuss one of its core tenets, biophilia.

II. Biophilia and Biophilic Design at the Building-to-City Scales

The term "biophilia" was coined by a Harvard entomologist, Edward O. Wilson, in his book *Biophilia* (1984) after spending time observing ant colonies. Wilson defined biophilia as "the innately emotional affiliation of human beings to other living organisms"—"innately" meaning "hereditary and hence part of ultimate human nature" (Wilson, 2013, p. 32). The biophilia hypothesis contests that this inherent need to connect with other organisms is a result of the human species having coevolved with nature as hunter-gatherers for most of human history (Beatley, 2011; Figure 13). Wilson argued that it is highly unlikely that we have lost the

"complex of learning rules" we developed during our coevolution with nature in post-industrial society and thus, our brains remain mapped with such instincts (Kellert and Wilson, 2013, p. 32). As biophilia is an innate quality that all humans share, according to Wilson, sustained disconnect from nature can detract from our mental and physical wellbeing (Beatley, 2011).

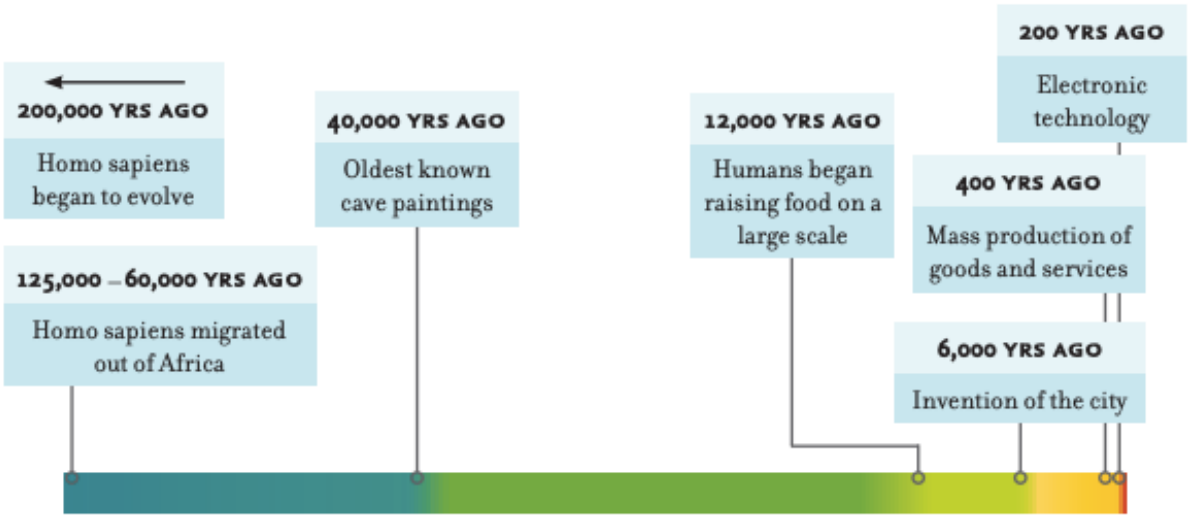

Figure 13: Approximate timeline of human history. Reprinted from "The Practice of Biophilic Design," (p. 3), by Steven F. and Elizabeth C, Image by Keith P., 2015, Retrieved from http://www.bullfrogfilms.com/guides/biodguide.pdf.

In 2005, green building architect Jason McLennan expanded Wilson's biophilia hypothesis and applied it to building design, creating the Living Building Challenge (LBC), a building certification standard established by the Cascadia Green Building Council, which evolved to become the International Living Future Institute in 2011 ("Living Building Challenge 4.0", 2019). Since its inception, the LBC has remained the most rigorous performance standard for buildings in the world and continues to push the green building movement, which has recently received criticism for being greenwashed and "too incremental," especially as the climate crisis becomes more urgent (McLennan, 2012, p. 9-10). These criticisms are not without basis. The dominant green building standard in the U.S. is the U.S. Green Building Council's (U.S.GBC) LEED standard (established in 1998), and it is not entirely performance based, which

often results in significantly less efficiency than modeled or projected. Several studies have shown that LEED certified buildings often significantly underperform relative to standard code buildings (Scofield, 2013; Navarro, 2009; Turner, 2010). Discussing green building is extremely relevant to sustainability at the neighborhood, city, state, and nation-wide scales as buildings in the U.S. (residential and commercial combined) represent *40 percent* of the nation's carbon emissions, according to the U.S. Energy Information Administration (2018). If humans are to reduce global emissions so they remain below the UNIPCC's critical threshold of two degrees Celsius warming, addressing the building sector's carbon footprint must be a top priority in the creation of a more sustainable built environment. Discussing green buildings is also relevant to the analysis of the LCC because it has requirements related to the LBC embedded within the standards for two of its certification pathways, Living certification and Petal certification.

Biophilic buildings are impactful in many more ways than reducing environmental footprints, including promoting physical and mental health, improving cognitive function, and providing economic benefits. This is largely due to the fact that biophilic buildings can maintain a connection to the *outdoors* while people are *indoors* through a variety of strategies, including incorporating views and natural forms and functions (Figure 14). Humans are inherently multisensory as our brains have been "mapped" according to our coevolution in nature. Thus, sensory variations—which are typically not intentionally incorporated into conventional buildings—can improve moods and cognitive functioning as they mimic instinctually preferred environmental conditions (Browning et. al., 2014). Several of these benefits are summarized in Figure 14 below, which is taken from the report on "14 Patterns of Biophilic Design" (2014) by the environmental consulting and strategic consulting firm Terrapin Bright Green. According to the Environmental Protection Agency, Americans spend an average of 90 percent of their time

indoors (“Indoor Air Quality,” n.d.), underscoring how crucial the quality of our indoor environments is to mental and physical health. However, literature on the benefits of biophilic design predominantly focuses on the building scale, and more research is needed on the perceived benefits of biophilic design at larger scales.

	14 PATTERNS	*	STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE
NATURE IN THE SPACE	Visual Connection with Nature	***	**Lowered blood pressure and heart rate** (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)	**Improved mental engagement/ attentiveness** (Biederman & Vessel, 2006)	**Positively impacted attitude and overall happiness** (Barton & Pretty, 2010)
	Non-Visual Connection with Nature	**	**Reduced systolic blood pressure and stress hormones** (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)	**Positively impacted on cognitive performance** (Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004)	**Perceived improvements in mental health and tranquility** (Li, Kobayashi, Inagaki et al., 2012; Jahncke, et al., 2011; Tsunetsugu, Park, & Miyazaki, 2010; Kim, Ren, & Fielding, 2007; Stigsdotter & Grahn, 2003)
	Non-Rhythmic Sensory Stimuli	**	**Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity** (Li, 2009; Park et al, 2008; Kahn et al., 2008; Beauchamp, et al., 2003; Ulrich et al., 1991)	**Observed and quantified behavioral measures of attention and exploration** (Windhager et al., 2011)	
	Thermal & Airflow Variability	**	**Positively impacted comfort, well-being and productivity** (Heerwagen, 2006; Tham & Willem, 2005; Wigö, 2005)	**Positively impacted concentration** (Hartig et al., 2003; Hartig et al., 1991; R. Kaplan & Kaplan, 1989)	**Improved perception of temporal and spatial pleasure (alliesthesia)** (Parkinson, de Dear & Candido, 2012; Zhang, Arens, Huizenga & Han, 2010; Arens, Zhang & Huizenga, 2006; Zhang, 2003; de Dear & Brager, 2002; Heschong, 1979)
	Presence of Water	**	**Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure** (Alvarsson, Wiens, & Nilsson, 2010; Pheasant, Fisher, Watts et al., 2010; Biederman & Vessel, 2006)	**Improved concentration and memory restoration** (Alvarsson et al., 2010; Biederman & Vessel, 2006) **Enhanced perception and psychological responsiveness** (Alvarsson et al., 2010; Hunter et al., 2010)	**Observed preferences and positive emotional responses** (Windhager, 2011; Barton & Pretty, 2010; White, Smith, Humphryes et al., 2010; Karmanov & Hamel, 2008; Biederman & Vessel, 2006; Heerwagen & Orians, 1993; Ruso & Atzwanger, 2003; Ulrich, 1983)
	Dynamic & Diffuse Light	**	**Positively impacted circadian system functioning** (Figueiro, Brons, Plitnick et al., 2011; Beckett & Roden, 2009) **Increased visual comfort** (Elyezadi, 2012; Kim & Kim, 2007)		
	Connection with Natural Systems				**Enhanced positive health responses; Shifted perception of environment** (Kellert et al., 2008)

Figure 14: Seven of the 14 "Patterns of Biophilic Design". The table “illustrates the functions of each of the 14 Patterns in supporting stress reduction, cognitive performance, emotion and mood enhancement and the human body. Patterns that are supported by more rigourous emphirical data are marked with up to three asterisks***), indicating that the quantity and quality of available peer-reviewed evidence is robust and the potential for impact is great, and no asterisk indicates that there is minimal research to support the biological relationship between health and design, but the anecdotal information is compelling and adequate for hypothesizing its potential impact and importance as a unique pattern.” Image and table reprinted from 14 Patterns of Biophilic Design, (p. 12), by © Terrapin Bright Green, LLC, 2014, Retrieved from http://www.terrapinbrightgreen.com/wp-content/uploads/2014/04/14-Patterns-of-Biophilic-Design-Terrapin-2014p.pdf.

In professional settings, these psychological and physical benefits can translate into savings or profits for businesses, providing an economic argument for biophilic design (in addition to energy savings and the value provided by ecosystem services). High employee absenteeism rates, increased stress levels, and decreased productivity can quickly increase costs

for businesses. A 2012 report by Terrapin Bright Green ("The Economics of Biophilia") found that over 90 percent of companies' operating costs are related to human resources, and financial losses due to absenteeism. Thus, fostering interior biophilic environments can keep employees happier and healthier, which can, in turn, reduce the proportion of companies' budgets spent on human resources-related costs and increase overall profit margins.

Biophilia and biophilic design can also be applied to the neighborhood-to-city scale. According to Tim Beatley, author of *Biophilic Cities: Integrating Nature into Urban Design and Planning*, a biophilic city can be described as a city with abundant nature and residents who are active and engaged with the nature around them (Beatley, 2011). While Beatley's description of biophilic cities is largely idealistic, there are many domestic and international examples of cities that have begun to embrace some aspect(s) of biophilic design. Seattle exemplifies several indicators of a biophilic city, including the established goal of the P-Patch community program of at least one community garden per 2,500 city residents (Beatley, 2011). Another indicator is the city's Living Building & 2030 Challenge Pilot programs, which collectively provide benefits and incentives to developers to construct Living Buildings as well as encourage the architecture and planning community to set reduction targets for energy, water, and transportation ("Living Building & 2030 Challenge Pilots," n.d.). Lastly, there are monthly community park and beach cleanups organized by the Mt. Baker Hub Alliance. Together, these programs and initiatives represent three (out of four) of Beatley's key "Indicators of a Biophilic City": Biophilic Conditions & Infrastructure, Biophilic Activites, and Biophilic Institutions and Governance (Beatley 2011, p. 47-49).

In theory, biophilic cities (and buildings) demonstrate a deep knowledge of a place's unique culture, history, climate, and ecology, which make these features extremely relevant to

climate change resiliency from a social and environmental perspective. To achieve the LBC's and LCC's rigorous requirements for their Water and Energy Petals, project teams must first give considerable attention to a site's local climactic conditions (i.e., average rainfall, solar photovoltaic capacity, temperature ranges, etc.). Additionally, the LBC's and LCC's Imperative 01, Limits to Growth, mandates respecting the local environment by prohibiting construction in developed countries on undeveloped land or land adjacent to certain ecologically-sensitive habitats (i.e., wetlands and old growth forests), thereby checking sprawl and maintaining the integrity of local habitats.

From a social perspective, the LCC's Imperative 10, Resilient Community Connections, requires project teams to "ensure resilience through infrastructure, community resources and social interactions" ("Living Community Challenge 1.2," 2017, p. 38). Knowledge of the local social context is developed through the LCC's mandatory Biophilic Plan, which requires "historical, cultural, ecological, and climatic studies that thoroughly examine the site and context for the Community" ("Living Community Challenge 1.2," 2017, p. 37). The LCC's linking of climate change resilience and community bonds is consistent with recent trends indicating community resilience—especially as it relates to a community's ability to "withstand and recover from natural disasters"—is a key policy issue at the local, state, and federal levels (Chandra et. al., 2010, p. 1). However, the LCC and LBC frame knowledge of local social context as more than a resiliency strategy by encouraging project teams to determine how they can approach their designs as a *celebration* of a community's unique cultural strengths and connections ("Biophilic Design Exploration Guidebook," 2017).

Challenges to the creation of biophilic cities in the U.S. include previously mentioned political factors (short-term cycles and gridlock) as well as two key paradigm shifts among

governing bodies, planning commissions, and citizens—both of which require the reimagination of our current built environment. The first paradigm shift calls for the recognition and embrace of the abundant "local, every day nature" in urban spaces (Beatley, 2011, p. 15). Biodiversity and natural processes often go unnoticed in urban environments when, in reality, these places are teeming with life. For instance, King County (where Seattle is located) is home to 220 species of breeding and non-breeding birds, 69 species of mammals, 50 species of native fish, 1,248 species of vascular plants, and countless other land and marine species ("King County Biodiversity Report," 2008).

Increasing awareness of local nature can (re)establish individuals' connection with nature in urban settings, thereby promoting biophilic activities and knowledge—key factors in fostering Nature-Relatedness (an individual's connection with the natural world). Nature-Relatedness can be critical to reducing environmental apathy and increasing climate change advocacy (Nisbet et. al., 2009). Findings from a study by Nisbet et. al. (2009) found that increased time spent in nature correlated with higher "environmental concern and endorsement of pro-environmental attitudes," as well as higher levels of self-reported environmental behavior (p. 733).

Fostering Nature-Relatedness is especially critical for building future climate leaders among younger generations who will bear the brunt of climate change. However, concerning trends suggest that children's' relationships with natural areas appear to be declining, as indicated by increasing reports of children expressing fear in nature and an inability to name common wildlife species (Hand et. al., 2017). Such trends are concerning for the future of the climate movement *and* for health impacts among children, including links to higher obesity rates and reduced ability to problem solve and evaluate risks (Hand et. al., 2017). While fostering environmental stewardship and activism among adults and children is crucial for affecting

change and altering individuals' behavior, systemic change at the national and international scales is also very necessary to achieve the daunting level of transformation needed to minimize present and future effects of climate change.

The second necessary paradigm shift that must occur to promote biophilic cities is approaching and understanding cities as if they were complex living organisms—just as Jacobs had called for the "life sciences" approach to conventional planning in the 1960s (Beatley, 2011; Jacobs, 1961, p. 433). This "closed loop" approach calls for a drastic reinvisioning of cities from "linear resource-extracting machines" to "metabolic systems" where traditionally negative outputs such as solid waste and wastewater are instead treated as "productive inputs" that can be inserted back into the city's metabolism as food, energy, and clean water resources (Beatley, 2011, p. 56).

III. The Living Community Challenge: An Overview

This section is meant to provide a basic overview of the Living Community Challenge, including its history, main intent, processes, and requirements.[2]

The LCC was launched in 2014 at the annual Living Future unConference in Portland, Oregon. Despite the relative success of its flagship program, the Living Building Challenge, the Institute recognized that incremental change at the building scale was no longer viable if this planet is to remain habitable for human and ecological communities for generations to come. Thus, the LCC and its requirements can be seen as an attempt respond holistically to the myriad

[2] More detailed information can be found within the Living Community Challenge 1.2 Standard and Living Community Challenge 1.2 Handbook, which are free to access and download on the International Living Future Institute's website at livingfuture.org/lcc/resources. The Institute recommends that both of these documents be read together, as the Standard provides a detailed discussion of intent and requirements, while the Handbook elaborates on and addresses "questions, process, and nuance" ("Living Community Challenge 1.2 Handbook," 2017, p. 1).

of complex and systemic issues facing the built environment. Since the program's launch in 2014, there have been no fully certified Living Communities, nor Petal or Zero Energy certified communities (Figure 15). However, there are currently 21 project teams that have officially registered for the Challenge (two are in the process of registering), two Vision Plan Compliant communities (meaning their Vision Plan has been reviewed and approved by the Institute) and three submitted Vision Plans/Master Plans, for a total of 28 communities in the Living Community Challenge pipeline on the path to certification.

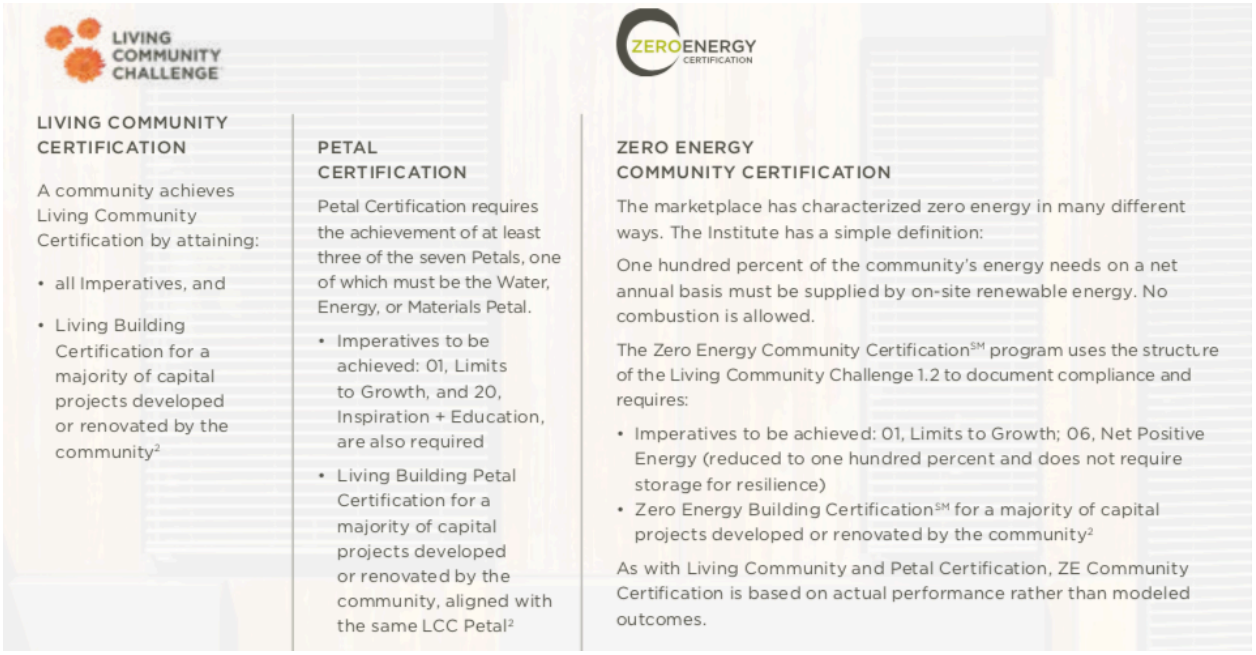

Figure 15: Living Community Challenge Certification Pathways. Reprinted from Living Community Challenge 1.2 Standard, 2017, (p. 11), Retrieved from https://living-future.org/lcc/.

The LCC's overall intent is to create new communities (or redesign existing ones) that respect their carrying capacity in terms of food, energy, and water given their population size, local climate, and ecology, all while ensuring equitable access for the complete spectrum of occupants across age, socioeconomic status, race, and physical ability. This intent is part of the Institute's larger mission to create a Living Future that is "socially just, culturally rich, and ecologically restorative" ("Living Community Challenge 1.2," 2017, p. 7).

The LCC serves multiple functions as a philosophy, advocacy tool, and certification program in one cohesive standard that sets the most rigorous measure of sustainability for the built environment today and strives to minimize the gap between current limitations and ideal solutions ("Living Community Challenge 1.2," 2017). The LCC is a framework for master planning, design, and construction to be used by a wide range of practitioners and stakeholders from neighborhood associations, to governments, to developers, to college campuses. It borrows several elements from Green Urbanism (i.e. an emphasis on zero waste and zero emissions), New Urbanism (i.e. "Transects" created by a New Urbanist-focused architecture and planning firm, Duany Plater-Zyberk ("Living Community Challenge 1.2," 2017, p. 17)), and Transit-Oriented Development (i.e. high density, emphasis on active and public transportation). The transect, which the LCC has adapted as the "Living Transect", is a classification system of the built environment from L1 ("Natural Habitat Preserve") to L6 ("Urban Core Zone"), which sets boundaries for appropriate development and promotes the transition from suburban to higher density areas ("Living Community Challenge 1.2," 2017, p. 18). Between the Living Transects and its core tenet of biophilic design, the LCC makes the claim that a Living Community can exist almost anywhere and in almost any environment.

And almost anyone can pursue it. The LCC has only three initial criteria for a community to be considered eligible to register. Communities must have: a diversity of uses, multiple buildings, at least one multi-modal street, and shared infrastructure (i.e., water and energy), which is optional but suggested ("Living Community Challenge 1.2," 2017). The LCC recognizes that depending on the scale and nature of the project (i.e., new vs. existing communities, single ownership vs. multiple ownership), the process for pursuing certification can look very different and some project teams may face more challenges than others. The LCC

1.2 Handbook outlines these different types of communities and provides recommendations for which certification pathways are likely to be most suitable. For existing communities with multiple ownership and hundreds to thousands of constituents—the vast majority of communities—the Living Community Vision plan may be as far in the process as the community can get without leadership and participation from the local government (Figure 16). Actual implementation of the Vision Plan in pursuit of Community Master Plan certification is difficult, if not impossible, for registered communities without municipal partners, as local authorities controls rights of way, public infrastructure permitting, code compliance, etc. However, the Vision Plan, or even the initial step of registering, can still be a very useful tool for such communities to educate constituents and gather consensus and cohesion in developing sustainability goals, as was noted by a member of the Mt. Baker Hub Alliance in an interview.

Figure 16: Living Community Challenge Certification Process. Reprinted from Living Community Challenge 1.2 Handbook, 2017, (p. 21), Retrieved from https://living-future.org/lcc/.

To achieve Living certification, a community must meet all 20 Imperatives that are categorized under the Challenge's seven Petals: Place, Water, Energy, Health & Happiness, Materials, Equity, and Beauty. The LCC is a performance-based standard, meaning projects must undergo a third-party audit organized by the Institute after the community has been in operation for twelve months with "85 percent of the development occupied as intended" ("Living Community Challenge 1.2," 2017, p. 16).

IV. LCC: Analysis and Comparison with Other Models

The LCC was chosen as the focus for this case study because of its unparalleled rigor and unique biophilic approach. However, attention must also be given to the two other main urban assessment tools in the U.S., EcoDistricts and LEED-ND, and their relative effectiveness at addressing issues related to sustainability and sustainable development.

Several studies have shown that zip code and income are the best predictors of life expectancy in the U.S.—with environmental health as a major contributing factor (Chetty et. al. 2016). While human and ecological health is a global concern, such jarring statistics clearly suggest that focusing on remediative and regenerative planning efforts at the local scale should be a top priority. Therefore, these three urban assessment tools must be evaluated critically for their strengths in addressing public and environmental health disparities *and* for the areas in which they fall short if communities are to commit to enacting these time and resource-intensive plans in the hopes of improving the wellbeing of their constituents and environment.

In 2013, Rob Bennet founded EcoDistricts as a pilot program in Portland, Oregon with the idea to situate neighborhoods at the center the global sustainability movement ("2013-2018 Five Year Report," 2018). Since its founding, there have been sixteen projects pursuing certification in sixteen cities (including Capitol Hill in Seattle) and in two countries ("2013-2018 Five Year Report," 2018). The EcoDistricts Protocol is currently on version 1.3 and is structured as such: Three Imperatives (Equity, Resilience, and Climate Protection), six Priorities (Place, Prosperity, Health and Wellbeing, Connectivity, Living Infrastructure, and Resource Regeneration) that each have a Goal and Objective, and three Implementation Phases (Formation, Roadmap, and Performance). To achieve full certification, a community must follow an initial strict timeline (i.e., submission of Imperatives Commitment within one year of

registration) and then transparently report its chosen performance targets according to its own Road Map. To maintain certification, communities must submit biennial progress reports to EcoDistricts. The EcoDistricts Protocol can be used for new or existing developments at the neighborhood or district scale and targets three main sectors: Government, Community Organization, and the Private Sector.[3]

LEED-ND was established in 2007 by the U.S.GBC, National Resource Defense Council, and the Congress for New Urbanism with the intention to "inspire and help create better, more sustainable, well-connected neighborhoods" ("LEED for Neighborhood Development," n.d.). Partially because it is the oldest of the three models—it is currently on version 4.0—LEED-ND stands as the most widely recognized rating system for evaluating sustainability at the neighborhood-to-city scale in North America (Szibbo, 2015). The standard has two different pathways to certification: Plan (projects in any phase of the design process with no more than 75 percent of total floor area constructed) and Built Project (already constructed project). As of late 2019, there are 133 certified LEED-ND Plan certified projects and 196 LEED-ND Built Projects certified in the U.S ("Projects," n.d.). Projects pursuing LEED-ND Plan or Built are assessed by third-party auditors according to a point-system under three main categories (Smart Location and Linkage, Neighborhood Pattern and Design, and Green Infrastructure and Buildings). There are four certification levels corresponding to total points earned (lowest to highest): Certified, Silver, Gold, Platinum. For a project to be eligible to register, there are certain requirements under each of the three categories (i.e., Floodplain

[3] The full Protocol and other resources can be found on the EcoDistricts website at www.ecodistricts.org.

Avoidance, Walkable Streets, and Indoor Water Use Reduction). Beyond these basic requirements, a project of any scale can apply for certification.[4]

Despite each of the models' different structures, histories, and intents, they share many common limitations and barriers. Firstly, each model, from registration to certification, can be cost prohibitive, which a member of the Mt. Baker Hub Alliance mentioned to me in an interview as a key challenge they faced in pursuit of the LCC (Alliance Member A, personal communication, July 2, 2019). LEED-ND is the most expensive certification with a total cost of up to $45,500, then comes the LCC with a total cost of up to $36,200, and EcoDistricts with the least expensive total cost of up to $13,100.[5] For any of these certifications, these costs do not reflect additional costs often associated with pursuing master plans, including hiring sustainability consultants, which can typically cost between $20,000 and $60,000 (Szibbo, 2015). ILFI offers in-house technical services, which come at additional costs to project-related fees. High price tags can make it difficult for these certifications (and their perceived benefits) to be accessed by many of the groups they aim to serve, such as neighborhood associations and non-profit developers, without the support of outside funding such as grants or foundations. In effect, community-driven processes are not well suited for such models. This barrier is especially significant for communities experiencing environmental injustices (which are disproportionately low-income communities of color (Bullard, 2001)), which would theoretically benefit the most

[4] More details on the certification process and point system can be found on the U.S.GBC's website at www.usgbc.org.

[5] (LEED-ND) This cost reflects projects of up to 100 acres pursuing full certification (all credits) and pay for fully expedited process. Full pricing details can be found at: https://www.usgbc.org/articles/leed-pricing-update-effective-december-1; (LCC) This cost reflects of 25-100 acres pursuing full Living Certifcation and includes the registration fee of $1,200. This cost does not reflect the supplemental fee for communities with significant existing buildings and/or infrastructure of $5,000. Full pricing details can be found at: https://living-future.org/lcc/certification/; (EcoDistricts) This cost reflects the full certification process from "District Registration" to "Progress Report Endorsement." A discounted price is given for "Bundled Certification Pricing." Full pricing details can be found at: https://ecodistricts.org/certified/the-certification-process-fees/.

from achieving these certifications. On the other hand, because each of the three issuing bodies are non-profit organizations themselves—although there are some who are critical of the U.S.GBC's "non-profit" status ("It Isn't Easy—or Cheap—Being Green," 2013)—they could not exist without such fees that sustain them, further complicating the matter. In fact, an ILFI staff member mentioned that the Institute "barely breaks even" after third party auditors have been paid to complete projects' performance reviews (ILFI staff member B, personal communication, November 21, 2019).

As the LCC recognizes, human behavior and attitudes pose the most significant barriers to transforming the built environment ("Living Community Challenge 1.2," 2017). Just as our cities are "products of centuries of evolution" (Dixon and Eames, 2013, p. 500), so is our "frontier mentality," ("Living Community Challenge 1.2," 2017, p. 22), entitlement to private property, psychological disassociation from waste, extreme individualism, Not in My Backyard-ism (NIMBYism), a materialistic culture, capitalistic values, stigmas around public transportation, sedentary lifestyles, and lack of imagination.

Each of the models also has requirements or awards points for renewable energy. While renewable energy technology has significantly improved in efficiency and decreased in cost in recent decades—especially solar photovoltaics ("Solar Industry Research Data," n.d.)—upfront costs can still be prohibitive to many households and communities. In addition, high costs, lower efficiencies, and even questions of safety are major concerns for renewable energy battery storage methods, particularly regarding older Lithium-Ion batteries (Amrouche, 2016). However, exciting developments are underway with mechanical and non-chemical batteries for renewable energy storage, such as potassium-oxygen batteries and even more basic but creative approaches like lifting giant blocks of cement up and down with a crane (Hornigold, 2013). If such

aggressive standards and targets for renewable energy are to be made, battery storage remains a significant barrier to overcome.

A final key barrier that is specific to the LCC is its high standards, which can also be considered as a strength. Many of the LCC's standards are *so* high that they are actually technically illegal according to many state and city codes. For instance, in accordance with ILFI's precautionary principle, the Water Petal (which consists only of Imperative 05, Net Positive Water) requires that "100% of the Community's water needs must be supplied by captured precipitation or other natural closed loop water systems, and/or by recycling used community water, and must be purified as needed without the use of chemicals" ("Living Community Challenge 1.2," 2017, p. 29). The "use of chemicals" essentially refers to the use of chlorine as a standard practice for water treatment of municipal potable water in the U.S. This practice dates back to the the emerging public health movement in the early 1900s as the federal government sought econonomical methods for eliminating water-borne illnesses ("History of Drinking Water Treatment," n.d.). While chlorine proved to be successful in effectively eliminating water-borne illness in municipal water, several recent studies have found concerning evidence of potential links between chlorine exposure in drinking water and various cancers, among other health risks (El-Tawil, 2016; Villanueva, 2007). Despite these studies, chlorine is still required as a treatment method in most (if not all) jurisdictions in the United States. Additionally, the Water Petal requires that "all stormwater and water discharge, including grey and black water, must be treated and managed at the Community scale either through reuse, a closed loop system, or infiltration" ("Living Community Challenge 1.2," 2017, p. 29), a practice which can be illegal in many municipalities. However, ILFI acknowledges that such standards present major challenges to project teams and the LCC allows an exception to be made for this

Imperative if local health regulations deem them illegal, after the project team pursues all advocacy short of a legal appeal.

Despite these significant barriers, the LCC, LEED-ND, and EcoDistricts have stepped up to the challenge in many ways. Table 1 identifies the strengths that each of these models possesses and briefly describes how the strength is exemplified in that particular model. Strengths (and weaknesses below) were identified through a combination of interviews conducted with members of the Mt. Baker Hub Alliance, research, and my personal analysis. It is important to note that the three models are relatively new and there is little scholarship and data to measure the effectiveness of many their perceived strengths and benefits. However, as I will discuss below, the LCC (which is a performance-based standard) and EcoDistricts (which requires transparent reporting on performance targets) will be inherently helpful in tracking the relative successes of these models.

Strength	LCC	EcoDistricts	LEED-ND
"Gain/Loss" Framing Hybrid: "framing can be an important tool to help gather attention, legitimize, and provide a concrete understanding of abstract concepts" (Bourk et. al., 2018, p. 109). The hybrid of the "loss" (negative) frame followed by the "gain" (positive) frame in messaging has strongest positive influence on advocacy behavior (Nabi et. al., 2018).	(loss frame) "We are entering a peak oil, peak water world that is globally interconnected yet ecologically impoverished" + (gain frame) "This standard is an act of optimism" ("Living Community Challenge 1.2," 2017, p. 9-10)	(loss frame) "Cities now contribute to a vast and growing equity gap — the postal code a child is born into has a bigger role in determining their future than any other single factor." + (gain frame) "Here is the good news" ("EcoDistricts Protocol 1.3," 2018, p. 3)	(loss frame) "Why? Sprawl is a scary thing" + (gain frame) "Here's the antidote" ("LEED for Neighborhood Development," n.d.)
Explicit Emphasis on Imagination: "Our failure to address environmental issues is not a failure of information but a failure of imagination" -Professor John Robinson reporting to the American Association for the *Advancement of Science* annual meeting ("Top Scientists Go Beyond Acience," 2012)	"Imagine an entire community designed and constructed to function as elegantly and efficiently as a forested ecosystem" ("Living Community Challenge 1.2," 2017, p. 4)	Not applicable.	Not applicable.
Multiple Certification Pathways or Levels: each of the models' full certification or highest certification level is very difficult to achieve. Having various pathways to certification rewards and recognizes progress that project teams have made	LCC certification levels: Zero Energy certified, Petal Certified, Living Certified. An ILFI staff member reported in a webinar that offering multiple pathways to the LBC has actually	Not applicable.	LEED-ND certification levels: Certified, Silver, Gold, Platinum. LEED-ND certification pathways: Plan and Built.

even if it is not the highest level of achievement.	encouraged program growth ("Achieving Healthy Materials Webinar," 2017).		
Strength	**LCC**	**EcoDistricts**	**LEED-ND**
Flexibility: Similar to offering multiple certification pathways, allowing for flexibility in meeting requirements encourages more project teams to pursue the various certifications and adjusts for local political, economic, environmental contexts. Flexibility can also be expressed in permitting project teams to choose their own performance indicators.	The LCC offers "scale jumping" to "accommodate communities of varying sizes to operate in a cooperative state" for many of its Imperatives" ("Living Community Challenge 1.2," 2017, p. 19) and makes exceptions for many of its Imperatives given local context and code ("Living Community Challenge Handbook 1.2," 2017).	Indicators are expressions of values. The Protocol only sets priorities but communities are free to determine the "how." Allowing communities and districts to choose their own indicators allows them to uniquely express how they value progress from an environmental, social, and economic standpoint. A member of the Mt. Baker Hub Alliance mentioned in an interview (Alliance Member B, personal communication, August 9, 2019) that they used EcoDistricts alongside its pursuit of the LCC due to its greater flexibility.	LEED-ND does not require a certain amount of points from any of the three categories. Instead, certification is based on a total score. However, this can also be seen as a weakness (see "Equity" in Table 2 below).
Community-driven: Residents can be considered as local experts on where they live and they know what plans serve their communities best. Too often, communities are locked out of the planning process or superficially included. As James Charleton famously stated, "Nothing about us without us!" (Charlton, 2000). EcoDistrcts and LCC require community involvement to varying degrees in order to achieve full certification.	Imperative 09, Biophilic Environment, requires the community to hold a minimum of one day exploration to discuss how it will fulfill this Imperative. Additionally, the Vision Plan stage of certification is designed to encourage consensus building and facilitate conversation among stakeholders.	The Protocol's Formation Stage requires collaborative formation in three steps, including drafting a "Declaration of Collaboration" ("EcoDistricts Protocol 1.3," 2018, p. 23). The community is also involved during the Performance and post-Certification stage as progress reports must be shared biennially with all stakeholders (see "Performance-Driven" Strength below).	Not applicable.
Checks on Sprawl: each of these models does not allow development on land that was previously undeveloped and allows or even rewards development on brownfield sites (a former commercial or industrial site). Therefore, each certification works to limit sprawl and encourage denser, transit-oriented communities.	Prohibits development on previously undeveloped sites (in developed countries).	Prohibits development on previously undeveloped sites.	Brownfield Remediation (under Smart Location & Linkage) awards 2 points.
Iterative Process: Despite each of these certifications' relative novelty, they are all on a version greater than version 1.0, demonstrating their commitment to adapting to new conditions and project teams' feedback	The LCC standard is currently on version 1.2.	The EcoDistricts Protocol is currently on version 1.3. The Protocol also requires an iterative process of its project teams for the Required Action under Step 3 ("Learn from Performance") for the	The LEED-ND standard is currently on version 4.0.

in pursuit of creating the most ideal models possible.		Performance Reporting stage in the certification process ("EcoDistricts Protocol 1.3," 2018, p. 27).	
Strength	**LCC**	**EcoDistricts**	**LEED-ND**
Explicit Emphasis on Resilience: Resilience is manifested implicitly in each of the models goals of creating more sustainable communities. However, resilience is explicitly stated in the LCC and EcoDistricts certifications through specific requirements that approach it in a holistic way.	Imperative 10, Resilient Community Connections, requires project teams to "incorporate design features, strategies and community-based programs to ensure resilience through infrastructure, community resources and social interactions in order to weather disruptions or disasters of any type" ("Living Community Challenge 1.2," 2017, p. 38)	Resilience is one of the Protocol's three main Imperatives. The Protocol requires project teams to approach resilience holistically by preparing for "social, economic, and environmental shocks and stresses" ("EcoDistricts Protocol 1.3," 2018, p. 9).	Not applicable.
Domestic & International Collaboration: Climate change is a global issue and so are unsustainable built environments. Encouraging domestic and international collaboration leverages different perspectives and aids in affecting widespread change. Each of these certifications can be pursued around the world and each organization sponsors domestic and/or international conferences and workshops. When project teams register, they become part of these collaborative domestic and international networks.	ILFI hosts the annual Living Future Unconference, among other conferences. The organization also has an international Ambassador Network and Living Future Collaboratives across 70 countries to spread its mission of achieving a Living Future around the world.	EcoDistricts has hosted an annual Summit since 2010. 2018 Summit attendees represented a total of 16 countries ("2013-2018 Five Year Report, 2018). Additionally, the organization has hosted the EcoDistricts three-day Incubator for the past seven years.	The U.S.GBC issued a call for proposals in July 2019 to "solicit concepts and feedback for the future of LEED." The call for proposals is a new feature of the process of developing LEED. The 2018 call for proposals yielded over 250 "significant ideas" for the evolution of LEED (Baker, 2019). Additionally, the U.S.GBC offers virtual LEED-ND International Feedback sessions for international project teams.
Advocacy: Sustainable development in general and the specific, rigorous requirements of these three certifications face many political and policy obstacles. Either through the larger issuing body of the certification or through the certification's requirements, each model facilitates advocacy intended to break down barriers and to create the conditions necessary for its standards to proliferate.	Imperative 11, Living Materials Plan, states that "for all community facilities, common infrastructure, and landscapes that the Community controls and is in charge of developing" full LBC standards must be met ("Living Community Challenge 1.2," 2017, p. 41). *Within* LBC 4.0 (2019), several Imperatives require advocacy action, including Imperative 07, Energy + Carbon Reduction, and Imperative 14, Responsible Sourcing. ILFI also has several policy tools and	Government is one of the three key sectors targeted by the Protocol. "For municipalities, redevelopment agencies, and housing authorities, the Protocol is a comprehensive framework for neighborhood- and district-scale policy development, planning, and project delivery. The Protocol provides an important process for measuring impact related to public participation, transparency in government, stewardship of public investments, and public policy objectives" ("EcoDistricts Protocol 1.3," 2018, p. 17).	U.S.GBC has over 164 advocacy briefs, reports, public policies, and market reports, which are all freely accessible under the Resource section on the U.S.GBC website.[7]

[7] Link to Resources page on U.S.GBC website: https://www.usgbc.org/resources

	resources, including a "Toolkit for Policy Leadership."[6]		
Strength	**LCC**	**EcoDistricts**	**LEED-ND**
Education & Capacity Building: This strength is especially key for "nonprofessionals" in the design and construction fields as well as any neighborhood associations that are pursuing these three certifications. Each of the organizations provides educational resources and professional accreditations for project teams and anyone who has general interest, preparing people and communities for the growing green economy. EcoDistricts and ILFI provide additional technical services to aid in building the capacities of project teams. However, many of these services and resources come at additional costs.	ILFI has a wide range of webinars and educational videos and issues the Living Future Accreditation. The organization also has an entire research library on its website, the Ecotone Bookstore (its in-house publication company), detailed case studies, and TrimTab, an online magazine—all of which all aim to increase knowledge and strategies surrounding biophilic and regenerative design.	The EcoDistricts Accelerator provides capacity building and technical assistance supported by its EcoDistricts Faculty. EcoDistricts features case studies, the "Information Exchange," and several informational videos. People can also take online and in-person courses to become an EcoDistricts Accredited Professional.[8]	U.S.GBC has a slew of articles on each of its certifications, including LEED-ND, to further elaborate on their respective processes and requirements. U.S.GBC issues the LEED Green Associate and LEED AP with specialty professional accreditations. It also offers educational resources for K-12 educators and higher education instructors.
Performance-Driven: Certification for the LCC and EcoDistricts are both enirely based on actual rather than modeled performance, unlike LEED-ND. As previously mentioned, many LEED certified buildings underperform relative to their modeled performance. Thus, performance-driven models are key to ensuring that tangible and substantial progress is being made and which areas may be falling short so that project teams can adjust accordingly.	In order to achieve certification for any three of the LCC's certification pathways, project teams must undergo a third-party audit after 12 months of operation to ensure all Imperatives have been met. Certification, once achieved, is indefinite.	Performance targets must be met and shared biennially to achieve *and* maintain certification—a unique strength.	Not applicable.
Recognition of Certification: each of these models allows communities to express their values and commitment to sustainability and be recognized for their tremendous achievement.	An interview with a member of the Mt. Baker Hub Alliance mentioned that they hoped that even *registering* for the LCC would attract investors, developers, and funding and support from the city to their community because it is such a unique and rigorous standard (Alliance Member A, personal communication, July 2, 2019).	Refer to Strength column.	Refer to Strength column.

Table 1: Identified strengths of the three models.

[6] Link to "Toolkit for Policy Leadership": https://living-future.org/wp-content/uploads/2018/04/Policy-Leadership-Toolkit-v-1.0.pdf

[8] Link to EcoDistricts' "Information Exchange": https://ecodistricts.org/join-the-movement/information-exchange/

Despite the strengths of each of the three models, their effectiveness in addressing certain areas of sustainable development, especially equity, falls short. Additionally, some of the strengths listed above can also be seen as weaknesses. A comparison of each model's relative weaknesses and critiques are summarized in Table 2 below.

Weakness/Critique	LCC	EcoDistricts	LEED-ND
Rigor: Recognition of achieving a rigorous standard can be considered a strength. However, how quickly can change be made if the standards are so high? How can we find balance between making substantial progress and meeting communities, industry, and policy makers where they are at?	The LBC's standards are so high that only 23 buildings in 12 years have achieved Living Certification and this is at the *building* scale. How can a master plan (which already typically operates on longer time scales) with such rigorous standards make substantial progress if it is extremely difficult to achieve?	Refer to Weakness/Critique column.	(Critique as it applies to LEED-ND Platinum certification, the highest certification level) - refer to Weakness/Critique column.
Stasis: Certification for the LCC and LEED-ND is indefinite. Thus, continuing to respond and adapt to new environmental changes, markets, and sociopolitical conditions is not acknowledged once certification is achieved.	Adapting the LCC's simile of imagining communities "function as elegantly and efficiently as a forested ecosystem," ("Living Community Challenge 1.2," 2017, p. 4), the forest in its climax state (the final stage in ecological succession) can be used as a metaphor for full Living certification. In the field of ecology, the concept of the "climax state" in ecological succession has been disproven (Christensen, 2014) because forest ecosystems are always changing and actually benefit from disturbances (which could be metaphors for continuous and adaptive planning).	Not applicable.	Refer to Weakness/Critique column.
Equity: While each of these models addresses equity, "equity" is not required, or it is required but does not include measures that specifically address socioeconomic equity. With no requirement for affordable housing or related measures, these models provide no assurance that these communities will truly be equitable *or* that existing community members will not be	The LCC strives for a future that is "socially just" and "culturally rich" ("Living Community Challenge 1.2," 2017, p. 7) and requires achieving the Equity Petal for full certification. However, the standard makes no mention of affordable housing or related measures.	Equity is one of three of Protocol's Imperatives, but because communities decide their own indicators, affordable housing or similar measures are not required.	The Housing Types and Affordability credit is worth seven points (less than 0.09 percent of the total 80 points), but it is not required. Szibbo (2015) concluded in a study that only 40 percent of LEED-ND certified projects included affordable housing.

displaced if gentrification does occur during or after certification.			
Weakness/Critique	**LCC**	**EcoDistricts**	**LEED-ND**
Standardization: Each of these models can be used around the country and world. Thus, the LCC and LEED-ND's standardized requirements may not always be appropriate for certain local or regional contexts.	The LCC does standardize social, environmental, and even aesthetic measures. However, its biophilic design requirement gives some assurance that all of these measures are locally appropriate.	Not applicable.	LEED-ND has frequently been criticized for imposing broad national standards that are bioregionally insensitive (Black 2008). Its Neighborhood Pattern and Design category prerequisites have also been criticized for imposing standards of "livability" that often do not align with a community's unique interpretation of what "livability" looks like (Aranoff et. al., 2013, p. 162).

Table 2: Identified weaknesses and critiques of the three models.

Perhaps one of the biggest shortcomings of these three models is that they are opt-in. Without policy requiring or incentivizing these programs (or adopting some or all of their standards) at the city or state levels, these rigorous standards can only go so far. A few states and municipalities have required or incentivized green building standards, such as Seattle's Living Building Pilot Program ("Living Building & 2030 Challenge Pilots," n.d.) and California's CALGreen policy, a state-wide mandatory green building standards code that adopted several of LEED's Building Design and Construction requirements ("CALGreen," n.d.). Similar regulatory initiatives must be established for sustainable development at the neighborhood-to-city scale. Futhermore, none of these models provide any structure to encourage adjacent communities to pursue certification, which, in turn, does not promote regional networks of EcoDistricts, LEED Platinum Neighborhoods, or Living Communities where benefits would be maximized.

V. An unCase Study in Seattle: North Rainier and Fremont

This section is called an "uncase" study because it does not evaluate the success of a certified Living Community since no existing community has met the criteria. The North Rainier

Mt. Baker ("North Rainier") neighborhood is registered for the LCC and was chosen for this study because of its participation in the LCC and its proximity to ILFI's headquarters, where I was based for my ten-week internship in the summer of 2019. For the study, I compared North Rainier with another neighborhood in Seattle, Fremont. Fremont was chosen because it does not have a master plan with any sustainability goals or initiatives (functioning as a "control"), and it is also classified as an "Urban Hub Village" by the City of Seattle's Department of Planning and Development, making it a comparable study location.

Methods

For each neighborhood, I conducted 30 anonymous surveys with neighborhood residents. Surveys were conducted online through listservs and community Facebook groups and in person at neighborhood association meetings, community organization meetings, and local businesses.[9] I conducted tests of statistical significance for quantitative survey responses using r Studio. Additionally, I conducted semi-structured interviews with two members of the Mt. Baker Hub Alliance, the community organization that oversees North Rainier's pursuit of the LCC, and one semi-structured interview with an ILFI staff member on the LCC team. As the LCC requires performance data only during the performance review *after* communities have been in operation for at least twelve months, the surveys, interviews, and maps below will serve as crucial baseline data that can be used to evaluate the community's progress and observe any environmental, social, or economic trends.

To begin, I will give a brief overview of the two neighborhoods. I will then go through a series of maps adapted from the Washington Environmental Health Disparities Map created by the Washington State Department of Health, to give further spatial context to the neighborhoods.

[9] Participants were only asked the initial question of "Do you live in this neighborhood" to ensure the integrity of my results.

Next, I will go into a discussion of the survey data, including statistical analysis of their quantitative results and a discussion of the qualitative responses.[10] To close, a discussion of the findings from the interviews will be put into context with larger trends and developments happening in Seattle.

GIS Analysis

Fremont is located in north Seattle along the shores of Lake Union with an approximate population of 19,021.[11] VisitSeattle.org describes it as a "quirky slice" of Seattle that is "home to creatives, foodies, and techies alike, with public art, craft cocktails, and funky finds around every corner" ("Fremont," n.d.). North Rainier is located in southeastern Seattle in the Rainier Valley inland of Lake Washington with an approximate population of 13,138.[12] North Rainier is described as "culturally and ethnically diverse" by the Seattle Office of Planning & Community Development with relatively large percentages of African American, Filipino, and Southeast Asian populations ("North Rainier," n.d.). Fremont appears to have a stronger cohesive neighborhood identity than North Rainier. For instance, North Rainier could not be found on the list of 18 neighborhoods on VisitSeattle.org. "North Rainier" appears to be more so defined by Seattle's city departments and planning commissions. During my field research, "North Rainier" appeared to be a less familiar term used by residents (see footnote 5 above). Instead, "Mt. Baker" or "Rainier Valley" seemed to be more common place names.

The nuances in terminology demonstrate how neighborhoods can be defined socially just as much as they can be spatially. For the purposes of this study, North Rainier was spatially defined as Census tracts 94 and 95, and Fremont as Census tracts 48, 49, and 54, according to

[10] The complete list of survey questions and responses can be found in Appendices A and B.
[11] Population based on 2017 Census data for census tracts 48, 49, and 54.
[12] Population based on 2017 Census data for census tracts 94 and 95.

Seattle's Department of Planning and Community Development map of "Census Tracts and Urban Centers and Villages" (2010). Below are a series of maps adapted from the Washington State Department of Health's Environmental Health Disparities Map, an online tool that collects and spatially displays data by Census tract according to 19 indicators that are categorized under four themes: Environmental Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors.[13] The legend in the top right of each map indicates the calculated indicator score for each Census tract. The scores for each indicator were calculated by multiplying the Environmental Exposures & Effects indicators by the Sensitive Populations & Socioeconomic Factors indicators. The maps below reveal significant disparities across multiple indicators and themes between North Rainier (which was given a "C" grade or "Definitely Declining" according to the HOLC's 1934 redlined map of Seattle), and other neighborhoods that received higher grades. Thus, North Rainier's registration for the LCC, which in and of itself is an "act of optimism," ("Living Community Challenge 1.2," 2017, p. 10), highlights the potential for the LCC and similar models to be used by historically redlined communities to challenge such legacies. Furthermore, as Richard White writes, "planning is an exercise of power" (White, 1995, p. 64), and empowering communities to direct and oversee their own master plans inverts the traditional hierarchy of historically imposed top-down planning to bottom-up, community-driven planning.

[13] Citation for *Figures 17-20* (below): Environmental Health Disparities. Published on Washington Tracking Network: 2019, 15 January). Obtained from the Information by Location tool. Retrieved from https://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/WashingtonTrackingNetworkWTN/InformationbyLocation/WashingtonEnvironmentalHealthDisparitiesMap

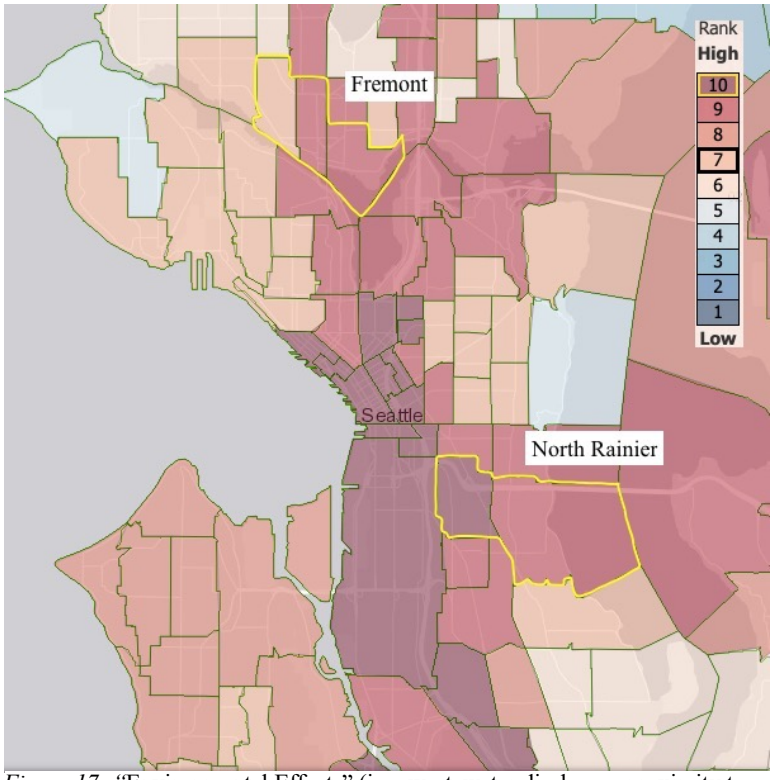

*Figure 17: "*Environmental Effects" (i.e., wastewater discharge, proximity to Superfund sites, lead risk from housing %) in Seattle. Map adapted from Washington State Department of Health's Environmental Health Disparities.

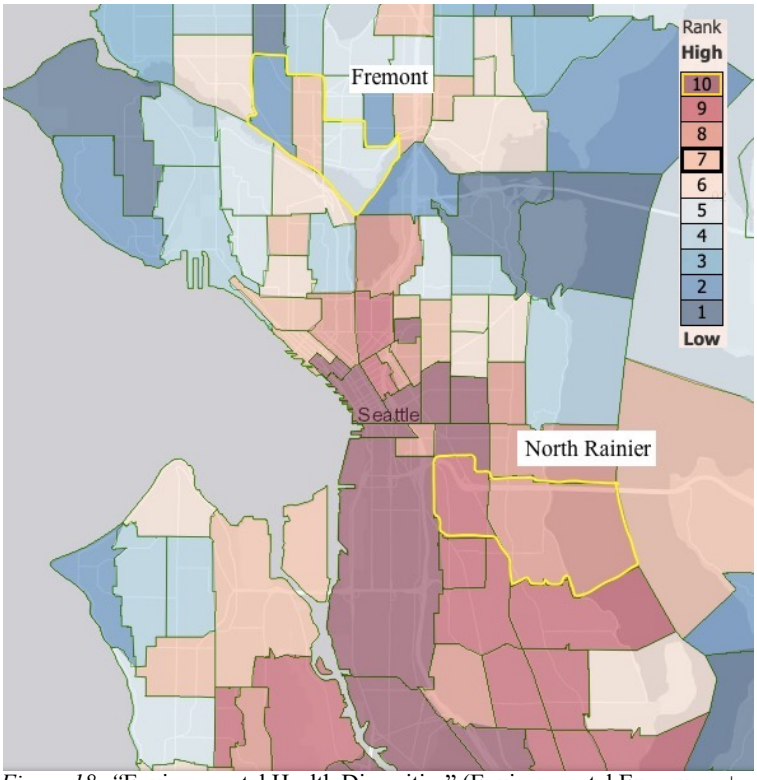

*Figure 18: "*Environmental Health Disparities" (Environmental Exposures + Environmental Effects + Socioeconomic Factors + Sensitive Populations) in Seattle. Map adapted from Washington State Department of Health's Environmental Health Disparities.

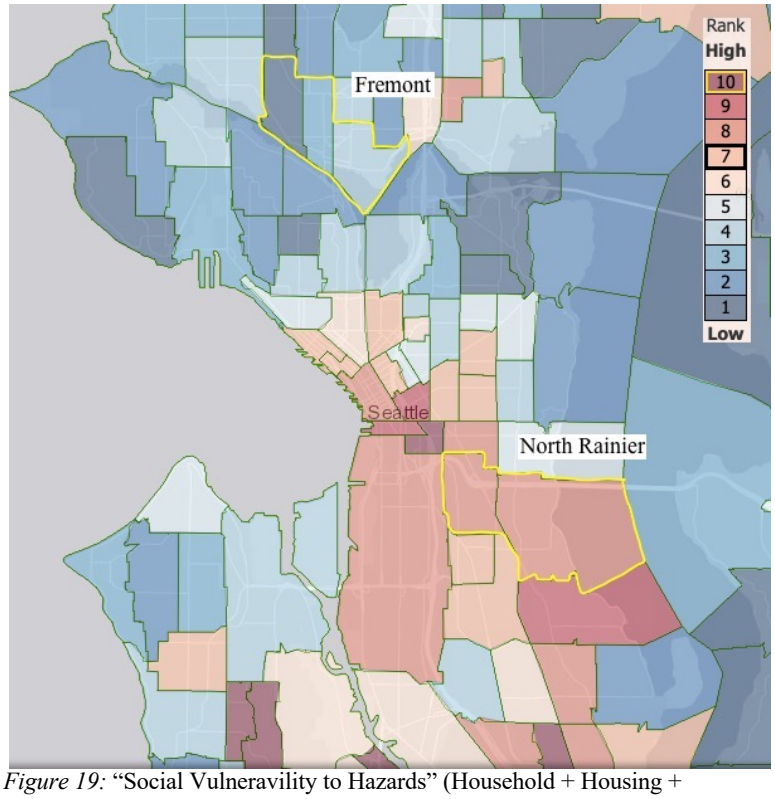

Figure 19: "Social Vulneravility to Hazards" (Household + Housing + Socioeconomic indicators) in Seattle. Map adapted from Washington State Department of Health's Environmental Health Disparities.

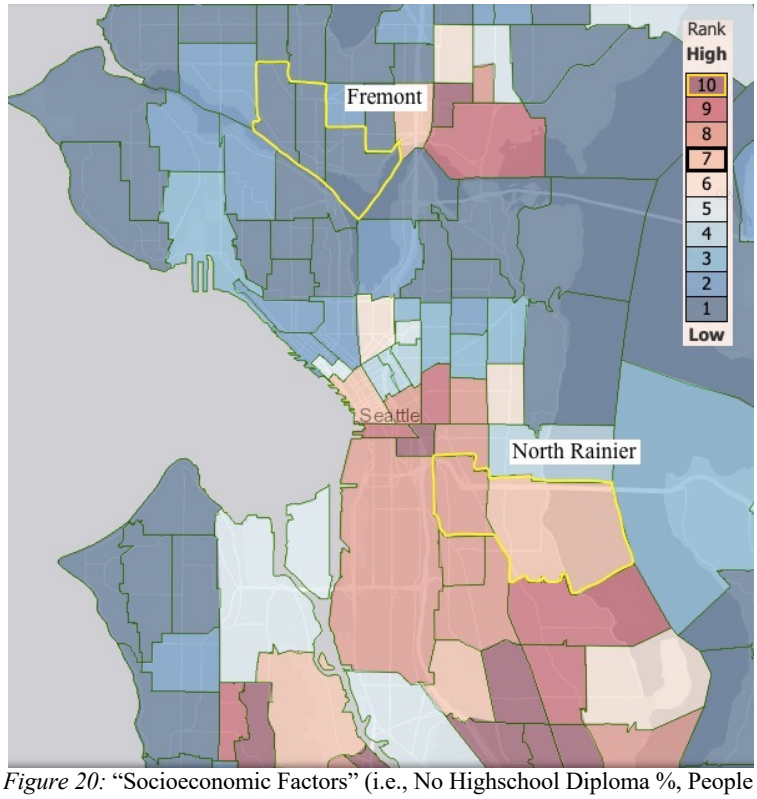

Figure 20: "Socioeconomic Factors" (i.e., No Highschool Diploma %, People of color, Unemployed %) in Seattle. Map adapted from Washington State Department of Health's Environmental Health Disparities.

As I referenced in the discussion of redlining in Chapter 3, exclusionary zoning practices from the New Deal have had significant legacies of environmental, economic, educational, and health-related disparities—many of which can be seen when comparing the maps above to the HOLC redlined map of Seattle (Figure 9). The legacy of redlining's fear of declining property values with the arrival of non-White neighbors (Gordon, 2005) has created segregated communities across the U.S. and, along with it, serious educational and health disparities. As author Ta-Nehisi Coates argues, housing determines access to a vast range of services and institutions from transportation, to green spaces, to decent schools, food, and jobs (Coates, 2014). A 2018 study by the National Community Reinvestment Coalition found that 64 percent of neighborhoods marked as "hazardous" by the HOLC 80 years ago are predominantly minority neighborhoods today and 74 percent of the "hazardous" neighborhoods are currently moderate to low-income, demonstrating the deep persistence of redlining's racial segregation from the 1930s to today (Mitchell and Franco, 2018). North Rainier's environmental and public health disparities appear to be consistent with numerous studies that have found evidence for harmful health outcomes for residents in historically redlined communities. Residence of these communities face higher asthma rates (especially among children), increased cortisol levels (which can lead to higher blood pressure), and increased exposure to toxic air pollutants, such as particulate matter (Saret, 2016; Bravo et. al., 2016; Manke, 2019). The correlation between health disparities and the racial/ethnic and socioeconomic composition of a neighborhood is defined as environmental justice or environmental racism.

Potential remedies for undoing the economic, educational, health, and social legacies of redlining include: more inclusive zoning practices (i.e., Seattle's move to ban single-family residential zoning with House Bill 1923); affordable housing policies (i.e., density bonuses and

subsidies), tightening existing zoning codes in low-income communities of color to decrease or prohibit industrial and hazardous waste facilities; mandating environmental reviews and impact analysis prior to development; and generally amplifying the voice and participation of community members in planning processes (Rothstein, 2014; Baptista et. al., 2019). Such potential remedies are consistent with the requirements of the LCC and EcoDistricts for community and stakeholder participation.

Surveys

The survey data, however, did not reflect the disparities in environmental and public health shown in the maps in terms of having statistically significant responses. The only survey question that resulted in a statistically significant response (p-value =0.0097) was the first question, "On a scale of 1 to 10 how physically healthy do you feel (10 being very healthy, 1 being not healthy at all)?" (Appendix A). The average for the North Rainier surveys was higher (8.33) than the average for the Fremont surveys (7.37), which is inconsistent with the GIS data.

Responses to the question "What are three words you would use to describe your community?" (Appendix B) perhaps generated the most fruitful observations of the two neighborhoods. Survey responses were consistent with demographic differences in racial composition between Fremont and North Rainier. Nine out of thirty survey participants in North Rainier responded "diverse" in their descriptions of the neighborhood, while no participants in Fremont responded with "diverse." Several participants in North Rainier and Fremont described their neighborhoods in terms of development trends in their respective communities with words such as "changing" or "gentrifying." This appeared to be of equal concern in both neighborhoods, with four out of 30 participants including either or both of these two terms. Concern for gentrification in North Rainier is consistent with the Displacement Index map from

Chapter 3 (Figure 10), which indicates that the area was at highest risk of displacement. Thus, between resident responses and the displacement index, the lack of measures within the LCC to prevent or minimize environmental gentrification is especially concerning if North Rainier continues to pursue certification. Survey responses in North Rainier were consistent with the two interviews conducted with members of the Mt. Baker Hub Alliance, indicating a perceived lack of support from the city that was not reflected in responses from the Fremont surveys. For instance, several North Rainier participants' responses indicated feelings of neglect from the city with several mentions of "trash", "crime," "too many crackheads", "forgotten" and "lacking city support." Lastly, several respondents in Fremont described their neighborhoods as "active", "walkable," and "healthy," none of which words were mentioned in responses in North Rainier. Therefore, this perceived disparity in active lifestyles suggests that North Rainier should prioritize Imperative 08, Healthy Neighborhood Design, in its pursuit of certification.

Interviews

I conducted anonymous, semi-structured interviews with two members of the Mt. Baker Hub Alliance and one anonymous, semi-structured interview with one ILFI staff member on the LCC team to hear personal narratives and to form a better idea of the experience of communities (in this case, a neighborhood association) who are pursuing the LCC.

The interview with the members of the Mt. Baker Hub Alliance provided me with more insight into the organization's history, as well as the history of the community's sustainable development goals dating back to its Neighborhood Plan in 1999. The Mt. Baker Hub Alliance emerged out the Mt. Baker Business Association, which was initially funded by Seattle's Office of Economic Development. According to the staff member, even though the Alliance began as a business association, it had really "morphed" into a community outreach group that helps to

support local businesses. The group is also working with many different groups, including the local high school and local nonprofits, and is doing outreach to organizations, such as the Asian Council and Referral Services Group (Alliance Member A, personal communication, July 2, 2019). The Mt. Baker Hub Alliance has been intent on forming these local partnerships as a response to "the massive wave of development that is coming towards [t]he area that people really do not understand" (Alliance Member A, personal communication, July 2, 2019).

The Mt. Baker Hub Alliance's decision to register for the LCC in 2013 followed nearly two decades of the neighborhood's commitment to sustainability that began with the North Rainier Neighborhood Plan Vision in 1999. Since then, the Alliance released the 2010 North Rainier Neighborhood Plan Update as it was one of three neighborhood plans chosen by the Mayor and City Council to be updated after the arrival of the light rail station in the community. The updated plan was created as part of the Seattle Comprehensive Plan Initiative, which sought to preserve the quality of the city's neighborhoods while simultaneously responding to the pressures of change and growth ("North Rainier Neighborhood Plan Update," 2010), demonstrating the history of interplay between the city and neighborhood associations. The Alliance is currently partnering with the Seattle Department of Transportation on "Accessible Mt. Baker," a comprehensive plan to identify walking and biking connections by 2040 ("Accessible Mt. Baker," 2019), as well as working with the Seattle Office of Planning & Community Development on a plan to create a "vibrant town center" around the light rail station ("North Rainier," n.d.). However, a member of the Mt. Baker Hub Alliance mentioned that the funding for the transportation plan through the Move Seattle Levy was cut by the city. She mentioned that the funding cuts could have been due to funding issues at the federal level, but she suspected that a great deal was due to the city's recent prioritization of development in the

waterfront and downtown areas. This was echoed by the other member, who mentioned that "there has been a great deal of disinvestment in the area" (Alliance Member A, personal communication, July 2, 2019).

However, the interview with the LCC staff member offered nuance to the Mt. Baker Hub Alliance's feelings of neglect from the city in terms of supporting the neighborhood's sustainability goals (and, thus, the neighborhood in general). She explained how city governments typically are constrained by tight budgets and do not have the capacity to decide to fund a single community's pursuit of the LCC (ILFI staff member A, personal communication, August 15, 2019). Additionally, she mentioned that the city was supportive of the Mt. Baker Hub Alliance and has attended meetings discussing the LCC with city officials and North Rainier residents. This level of engagement, she argued, is somewhat atypical of cities. One of the members of the Mt. Baker Hub Alliance also pointed out that almost everything the group does is funded through the city's Office of Economic Development "Only in Seattle Initiative" grant program, which strives to create vibrant and racially equitable neighborhood business districts ("Only in Seattle Grants," n.d.).

The tension of the Mt. Baker Hub Alliance with the city government is characteristic of the larger dynamic between the city and its "fiercely proud" and "historic" neighborhoods, according to a member of the Alliance (Alliance Member B, personal communication, August 9, 2019). This strained relationship, she explained, is rooted in the debate over the Seattle Commons plan for South Lake Union, which remains a battleground because the plan's development "has been a driver of gentrification in that area" (Alliance Member B, personal communication, August 9, 2019). Things escalated in March 2019 with the City Council's passage of the Mandatory Housing Affordability measure. While on the surface, this may seem

like a progressive and much needed move as most Seattleites would agree that the city needs more affordable housing, the Alliance member explained that the city struck a bargain with private developers who demanded a lower fee than the policy required. She said that it became known as “the grand bargain” and “it has looked bad to communities ever since” (Alliance Member B, personal communication, August 9, 2019).

She also explained how the landmark policy was characteristic of the city’s practice to begin a project with altruistic motives that communities agree with, but then rolls out policies citywide instead of making them neighborhood specific. She summarized the misalignment between the city and community groups’ work: “We have tons of neighborhood organizations, but instead of going specifically and trying to work with each of those organizations, even when it may not have seemed like they overlapped, the work that the city has been doing has set the organizations back. This created an adversarial attitude. The city feels like ‘we know what we're doing and we're trying to do the right thing’ […] But then [the city] actually get[s] to doing it, and people are pissed off…that the [city] didn’t do engagement” (Alliance Member B, personal communication, August 9, 2019). Thus, at a time when cities need to maximize and leverage collaboration with neighborhood groups (who know intimately how citywide issues can be addressed specifically and effectively in their own communities), interviews with members of the Mt. Baker Hub alliance suggest that tensions are escalating.

The LCC stands in the crossfire for the Mt. Baker Hub Alliance. Interviews with members revealed just how difficult it can be for neighborhood associations to lead LCC certification efforts in communities that are “historic,” “well established” and have little-to-no control over ownership in the way a college campus with effectively a single owner would, for instance (Alliance Member B, personal communication, August 9, 2019). On top of this

challenge, the Alliance only has one paid staff member—the rest of the Alliance is comprised of volunteer board members. The Alliance also does not have the luxury of focusing solely on pursuing the LCC, as it balances it alongside many other programs, services, and initiatives. Due to the extremely low capacity of the Alliance and the perceived lack of support from the city, one member of the Alliance frequently mentioned during the interview that the group desperately needs more private developers and architects to support carrying out its vision of becoming a Living Community. She was hopeful that the Alliance's decision to register for the Challenge and pursue its "beautiful aspirations" would attract investors (Alliance Member A, personal communication, July 2, 2019).

Another major challenge that the members of the Mt. Baker Hub Alliance identified was the difficulty in engaging the community. One member explained that North Rainier does not have a "traditional residential community" (Alliance Member B, personal communication, August 9, 2019) with an easily identifiable constituency, which is consistent with the results of the surveys in North Rainier. Furthermore, she mentioned that there are communities within North Rainier that are "pretty insular," such as the Vietnamese community, which typically "[goes] to its own community for resources" (Alliance Member B, personal communication, August 9, 2019). While the racial and ethnic diversity of North Rainier is a quality that many community members value, language barriers have also been another challenge for the Mt. Baker Alliance to engage residents around the LCC.

Despite these hurdles, the Alliance continues to pursue the LCC because it supports the community's longstanding mission to support "equitable, affordable, sustainable, and healthy environments" (Interview with Alliance member A, July 2, 2019). While certification appears to be aspirational at this point, the process of registering has ignited conversations with community

members around forming common goals and values. The interview with the LCC staff member identified additional benefits or incentives that she observed from her experience working with communities pursuing the Challenge. She noted, "They want this kind of stewardship. They want healthy, vibrant, connected communities and this is the only standard that has the highest level of net positive energy, net positive water, removing the worst-in-class toxins from the environment" (ILFI staff member A, August 15, 2019). She echoed the comment of the member of the Alliance that the LCC aligns well with communities' livability and resilience goals. In theory, she argued, it is a great way to unify overarching goals of communities and cities'climate commitments.

Finally, a common theme from the responses of the Mt. Baker Hub Alliance members and the LCC staff member was the need for proof of concept. Just as the first Living Building proved to the world that such a high level of sustainability was possible, the same needs to be done at the neighborhood-to-city scale. Communities need a tangible example to look to for direction and lessons learned. A "proof of concept" Living Community simultaneously inspires *and* demonstrates to the world that "an entire community designed and constructed to function as elegantly and efficiently as a forested ecosystem" ("Living Community Challenge 1.2," 2017, p. 4) is within reach.

Conclusion

According to the UNIPCC, we may have as little as 12 years to keep global warming below the critical threshold of two degrees ("Summary for Policymakers of IPCC Special Report" n.d.). We desperately need a proof of concept. So, how do we get there?

As Albert Einstein famously said, "The world will not evolve past its current state of crisis by using the same thinking that created the situation" (Braungart and McDonough, 2002, epigraph). The LCC, EcoDistricts, and LEED-ND have laid promising foundations for sustainable development at the neighborhood-to-city scale, but we need to find creative ways to leverage their strengths and minimize or eliminate their weaknesses. This effort must include searching not only for creative solutions, but also for creative *questions*. As the ILFI has asked, "What does good look like?"

Environmental education must be emphasized in classrooms from an early age. If children are exposed to the outdoors and taught to be engaged with their natural surroundings, they will be equipped with knowledge of the realities of climate change *and* will be more likely to become stewards and activists (Nisbet et. al., 2009). If business continues as usual, the young people of today and future generations will bear the brunt of climate change. Thus, they must be able to advocate for the environment and for a sustainable future.

Strategic cross-sectoral partnerships must be formed. Neighborhood associations, nonprofit organizations, private developers, policy makers, and city planning departments each bring unique and crucial knowledge and resources to the table. Any one institution or entity cannot effectively bring about the scale of change that is needed on its own. Uniting a range of actors also combines bottom-up and top-down approaches, ensuring that change is made equitably and effectively.

In recent decades, the academic discipline of urban planning has become more interdisciplinary (Sies, 2003; Ward et. al., 2011) and this is a trend that must continue. As for the planning profession, the systems thinking approach (holistically focusing on the interrelations between a system's components and how they fit within the context of larger systems and temporal scales) has become increasingly popular, but not widely applied (Davidson and Venning, 2011). Issues facing the built environment are extremely complex, and creative solutions will not be attained if a range of disciplines and holistic thinking are not incorporated into planning research and decisions. Another promising trend, as Ward et. al. (2011) have identified, is that American planning historians have demonstrated a growing tendency to connect meaningfully with historical themes. Recognizing historical themes and patterns of planning is key to informing planning practitioners who are positioned to ensure that systemic issues do not persist.

However, there are a few concerning trends in the academic and professional fields that must end. Ward et. al. (2011) also identified that planning history has been dominated by the top-down narrative, neglecting community-based organizations and grassroots efforts. Room needs to be made for bottom-up narratives in planning research, if we are to better understand how local approaches can be leveraged to advance equitable sustainable development. In addition, the discipline of planning history has traditionally been dominated by White, middle and upper-class men (Ward et. al., 2011). The urban planning profession, unfortunately, shares a similar history, and the numbers do not look much different today. According to the 2010 census, 81 percent of American planners are White, four in ten planners are women, and only 16 percent of members of the American Planning Association identify as racial minorities (Owens, 2015). As White wrote, "planning is an exercise in power," (White, 1995, p. 64) and if meaningful equity is to be

achieved in cities, planning commissions and academics must represent (in terms of race, gender, socioeconomic background, etc.) the communities they serve.

Furthermore, we all must answer Jacobs' call to action. Every person has the power to be a critical observer of the built environment. Planning commissions, governments, private developers, and neighborhood associations can all benefit from the intimate knowledge citizens hold about the places in which they live, work, and play.

After my review of four centuries of U.S. developmental history, field research in a registered Living Community, GIS analysis, and a comparison with other urban assessment tools, the fundamental question that I initially posed regarding the LCC's effectiveness as a model for sustainable development can finally be addressed. Even without a proof of concept Living Community, the model's theoretical effectiveness can still be assessed based on its requirements. The Imperatives for the LCC's Water, Place, Materials, Energy, and Health and Happiness Petals do, in theory, address many of the systemic issues identified in this paper, including the erosion of public space, health outcomes related to sedentary lifestyles, dependence on automobiles and fossil fuels, sprawl, and cities developing beyond a locality's carrying capacity in terms of water, energy, and food. However, despite its vision for a socially just and culturally rich future, the LCC—specifically the Equity Petal—does not offer a guarantee that displacement of low-income and communities of color and/or environmental injustices will not be perpetuated. Future research should continue to follow the North Rainier community and other communities that are pursuing LCC certification, so that the model's theoretical effectiveness (and its concerning gaps) can actually be assessed.

Lastly, it should be noted that this paper has a US-centric focus and a Western bias. Every country has a different historical context for its issues related to sustainability and the built

environment and, thus, every country's solutions and models will (or should) look different. However, sustainable development is a global issue, and international collaboration must be emphasized if we are to achieve a collective future that is "social just, culturally rich, and ecologically restorative" ("Living Community Challenge 1.2," 2017, p. 7).

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Appendix A: Quantitative Interview Questions, Averages, and p-values

Question	Average	p-value
1. On a scale of 1 to 10 how physically healthy do you feel (10 being very healthy, 1 being not healthy at all)?	North Rainier: 8.33 Fremont: 7.37	0.0097
2. On a scale of 1 to 10 how happy/positive do you feel (10 being very happy/positive, 1 being not happy/positive at all)?	North Rainier: 7.9 Fremont: 7.83	0.85
3. On a scale of 1 to 10 how healthy do you think the environment is in your community is (10 being very healthy, 1 being not healthy at all)?	North Rainier: 6.5 Fremont: 7	0.30
4. On a scale of 1 to 10 how connected do you feel towards your community and fellow community members (10 being very connected, 1 being not connected at all)?	North Rainier: 7.4 Fremont: 6.67	0.18
5. On a scale of 1 to 10 how much do you agree with the following statement (10 being completely, 1 being not at all): "I live in a healthy coexistence with nature in my community."	North Rainier: 6.77 Fremont: 6.5	0.62
6. What are three words you would use to describe your community?	(See Appendix B)	
7. Have you ever participated in a community cleanup (i.e. park, beach, etc.)? If yes, how many times? If no, please respond with "no."	North Rainier: 2.9[14] Fremont: 2.77	0.39
8. On a scale of 1 to 10 how much do you agree with the following statement: "I think in the long-term rather than the short-term when making decisions and plans." (1 being not at all and 10 being completely)	North Rainier: 7.63 Fremont: 7.33	0.54
9. On a scale of 1 to 10 how much do you agree with the following statement: "I believe that my actions as an individual have an influence on the environment and climate change."	North Rainier: 7.7 Fremont: 8	0.62
10. On a scale of 1 to 10 how much do you agree with the following statement: "I am proud of my	North Rainier: 7.93 Fremont: 7.67	0.6

[14] Interview responses reflected ranges in numbers or yes/no answers. For the purposes of statistical analysis, a code was created: 1=no/never, 2="No, but I do it individually", 3="No, but I would like to", 4="Yes, frequently (participation is greater than or equal to 5), 5="Yes, but infrequently" (participation is less than 5)

neighborhood." (1 being not at all and 10 being completely)		
11. On a scale of 1 to 10 how much do you agree with the following statement: "I care about the environment outside of my community or region (i.e., the national or global environment)." (1 being not at all and 10 being completely)	North Rainier: 9.03 Fremont: 8.9	0.79

Appendix B: Qualitative Interview Responses

Survey Question	North Rainier	Fremont
6. What are three words you would use to describe your community?	green interesting trash changing, diverse, uncertain Changing with homeless Lacking City support forgotten, misjudged, thriving Fortunate, beautiful, connected diverse, quiet (considering it's the middle of a large urban area), welcoming Busy congested chaotic open, caring, nurturing Diverse, friendly, progressive Engaged, aware, close knit diverse, passionate, wonderful too many crackheads so-so, ok, diverse individually, self-absorbed very good Nice solve problem, help each other, clean at this time comparative peace, less crime, and people focus on business peaceful, pretty diverse, inequitable not too good rich, white, isolationists diverse, gentrifying, authentic diverse, vibrant, inner city diverse, changing, private diverse, accepting, welcoming Home! crowded, cement, not enough trees	Quirky, friendly, fun dense, funky, expensive dense, changing, dynamic vibrant, involved, expensive progressive, isolating, dispassionate quirky, lively, innovative gentrifying, green, noisy involved, mixed, fun changing very fast Liberal Urban Gentrified Walkable friendly fun Educated, wealthy, DINKs Fun eclectic hip Unique, urban, evolving Fractured, vibrant and active Kind, creative, active Artsy, walkable, busy White, Liberal, Change-averse funky, changing, lively Loyal, Inclusive, Conscientious Lively, Fun, Neighborhood Vibrant, accepting, loving friendly, dog crazy, diverse Hip, social, active active, social, conceiting active, supportive, young humble, friendly, chill healthy, nourishing, open

11. "Are there any other thoughts or comments that you would like to add about your community?"

North Rainier Survey Responses:

- "I live in a well designed and diverse residential community, that includes an Urban Village that for years has failed to receive critical investments by the city. In these boom times, we Can only hope that city leadership will fulfill its promises for the vision of the North Rainier neighborhood plan, and the important values served by equitable investment and development. This is a pivotal moment in the direction of our community. Without the cities support, development patterns are likely to follow directions which are inconsistent with the plans for growth that have been so carefully prepared, without the opportunity for coordinated development of various governmental parcels that remain

blighted and the weight for those current and future generations living around the light link station."

- "Community Member in White Center"
- "Mt. Baker is a wonderful place to live, it's out of the way yet close to a meaningful, diverse culture."
- "I wish it were still as diverse, racially, as when I first moved in."
- "There are so many ways and sizes to think of community. I m thinking small- just a couple blocks."
- "I am grateful for the experience of living in a racially culturally economically diverse neighborhood."
- "more food open late"
- "As they say "when in Rome" meaning people need to assimilate while perceiving other culture"
- "Social diversity is great but a unified sense of community would be greater."
- "light rail station is far from my neighborhood but we need to rethink between orcas & grahm st on MLK jr."
- "No. It's beautiful just how it is."
- "I really wish the Blue Angels would go away, given climate change and other problems we have in Seattle. The litter and homelessness is heartbreaking."
- "diverse"
- "It's changing really fast! Too many entitled and detached folks."
- "many changes happening"
- "[elaboration of question 9 RE: individual actions]: "I believe I affect it but my impact is minimal compared to large corporate entities"
- "It is great to see the amazing variety of cultures and nationalities and religions coexisting in the community."

Fremont Survey Responses:

- "Fremont is undergoing very rapid change--some very exciting, some quite troubling. We have a great history of fending off the troubling without those creates community."
- "Fremont cannot be separate for city/state/U.S./Earth"
- "Interesting mix of proposed 'counter culture' with obvious gentrification and displacement BUT I wouldn't live anywhere else."
- "If we are talking environmental, we need a commongoodandco.com store."
- "Fremont is pretty NIMBY sometimes."
- "My answers reflect the fact that I am a newcomer to this community/region"
- "Fremont (or at least its politically active community) follows a typical pattern of wealthy, white, liberal homeowners who purport to care about affordability and homelessness, but is unwilling to welcome any development in the neighborhood that could alleviate those problems."
- "though fremont itself has relatively few parks, the community definitely cares about its public spaces and keeping them clean and art-filled. with increasing rent prices, however, i have doubts about the new condo owners and their investment in community."
- "It's a great place to live! It's great being able to walk and bike to places we need to go."
- "It's one of my favorite Seattle neighborhoods."