

Review

Intended and Unintended Consequences of Two Paradigms of Urban Planning, and Their Social Justice and Human Health Impacts, in Portland, Oregon

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Abstract: This article describes two contesting paradigms of urban planning employed successively in Portland, Oregon; (1) urban planning typical of the US in the first half of the 20th Century that was focused on traffic and infrastructure, and (2) progressive urban planning focused on neighborhood livability and connections. It gives a history of their implementation in Portland, focusing on issues of racial and socioeconomic justice in the Albina neighborhood. Recent knowledge about air pollution's impacts on human health, and infant and childhood development, are integrated into the discussion of urban planning. It describes racially and socioeconomically disproportionate access to urban green spaces, with the corresponding health implications. It also describes attempts to mitigate such health implications, sometimes resulting in "green gentrification" and displacement. The article asks if the results of the two paradigms of urban planning were objectively different from one another in terms of impacts on minority and disadvantaged communities. Future urban planning, and the need for human health concerns becoming central, are discussed.

Keywords: urban planning; environmental justice; pollution; children's health; green space; Portland; Oregon



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1. Introduction

Portland is considered to be one of the most sustainable cities in the US [1,2]. Progressive urban planning is generally given credit, comprised of concepts such as smart growth, the New Urbanism [3], the compact city, urban villages, creative cities, and others, with Jane Jacobs' ideas from *The Death and Life of Great American Cities* published in 1961 ultimately at the foundation of all of these types of thought [4]; her intellectual legacy is often studied [5–8]. As one review said:

Portland . . . is considered as one of the most progressive cities and metropolitan areas in the U.S. as far as it concerns urban planning . . . Planning in Portland is being executed both on regional, city and neighborhood level. As a practical example one can mention . . . approved plans, like neighborhood plans, area plans, community plans and natural resource plans. Such an approach is well embedded in the smart growth concept and its understanding of the good city [9].

In reality, the results of urban planning in Portland, and the history of Oregon, are both very complicated. This article addresses different paradigms of urban planning in Portland, the progression of thought in Oregon, racial bias and exclusion, health impacts of pollutants and parks, climate change, and the quest for a sustainable and "good" city.

2. Oregon Racial Exclusion Laws

One of the earliest influences on developing communities in Oregon, as in much of the US, was racial intolerance. Oregon has an undeniable history of racism [10–14]. The "Oregon black exclusion laws", which began in 1844, prohibited African Americans from moving to Oregon, and prohibited slavery, in order to prevent a Black population from existing in the territory and subsequently the state [15]. Later, racially biased zoning was used as a segregationist tool. In 1924, the Portland zoning code included 15 'Zone I' or

'highest quality' areas restricted to single-family homes. Racially restrictive covenants added by private developers forbade properties from being sold to minority persons, including African Americans, Japanese, or Chinese [10].

The Portland Realty Board adopted a rule in 1919 stating that it was unethical for an agent to sell property "to either Negro or Chinese people in a White neighborhood" [16]. This remained in the Portland Realty Board's Code of Ethics until 1956. The Albina neighborhood was the only place African Americans were allowed to buy homes, as stated below [10]:

The federal government's practice of redlining was used in Portland in the 1930s as a tool to reinforce racial segregation by restricting federal lending and private lending. This made it difficult or impossible for residents living in 'redlined' neighborhoods to receive residential and commercial loans . . . In 1937, an appraiser writing about Portland's Lower Albina neighborhood noted that: 'This area constitutes Portland's "Melting Pot" and is the nearest approach to a "slum district" in the city. Three-quarters of the negro population of the city reside here and in addition there are some 300 Orientals, 1000 Southern Europeans and Russians.

This racist stance, and the presence of a large Ku Klux Klan membership [11], helped produce a city of Portland with only 2000 African American residents when World War II began [17], when a much larger group of African Americans began to arrive to work in the war industry shipyards. From this point onwards, Portland's paradigms of urban planning over time had especially significant impacts for the geographic distribution, quality of life, and health of citizens who were African Americans and other racial groups and nationalities.

3. The Origins of Two Paradigms of Urban Planning Impacting Portland

Robert Moses' school of traffic-and-infrastructure-based urban planning emerged from the thought of two historic architects and planners. The first was Baron Georges-Eugène Haussmann, admired by Moses [18] for his work demolishing old Parisian neighborhoods to build the wide boulevards of Paris [19]. Haussmann tore down the homes in poor neighborhoods to build wider streets. The replacement residences along Haussmann's new grand boulevards were built for wealthier people. The second architect and planner was Charles-Édouard Jeanneret-Gris, who called himself Le Corbusier, and published *La Ville Radieuse* (The Radiant City) in 1935. In it, he proposed demolishing and replacing untidy older neighborhoods, purging the "old" city and constructing a planned modern one. These new designs inevitably produced places people did not enjoy living in. As Witold Rybczynski wrote [20]:

He called it La Ville Radieuse, the Radiant City. Despite the poetic title, his urban vision was authoritarian, inflexible and simplistic. Wherever it was tried—in Chandigarh by Le Corbusier himself or in Brasilia by his followers—it failed. Standardization proved inhuman and disorienting. The open spaces were inhospitable; the bureaucratically imposed plan, socially destructive. In the U.S., the Radiant City took the form of vast urban-renewal schemes and regimented public housing projects that damaged the urban fabric beyond repair. Today these megaprojects are being dismantled, as superblocks give way to rows of houses fronting streets and sidewalks. Downtowns have discovered that combining, not separating, different activities is the key to success.

Robert Moses began the dominant traffic-and-infrastructure-based paradigm of urban planning in the 20th century US with his enormous public works in New York City in the 1920s to the 1950s. These were designed to speed traffic, make the city's expanded surrounding parks accessible by automobile, and construct public housing projects. It is a story that is well known [21,22], including Moses' newly conceived fully divided limited-access highways with their devastating impacts on bisected minority communities, and the unevenly accessible greenspaces and amenities such as the extensive Jones Beach recreation complex. Jones Beach, located east of the city on a small barrier island of Long Island, epitomized socioeconomically and racially uneven access to amenities. It was easy to reach only if you could afford to own a car. Buses for mass transit were banned from the newly constructed highway to Jones Beach, and the new bridges over the

highway were intentionally built too low for buses to pass under them. This permanently impeded mass transit providing access to less affluent people [23,24]. A proposal to construct a railroad branch line to Jones Beach was also blocked by Robert Moses' park planners [25]. This story of urban planning leading to uneven amenity and disamenity access for different socioeconomic and racial communities was to become the archetype for traffic-and-infrastructure-based urban planning in the US.

The many highway and bridge projects central to this model of urban planning involved construction through existing neighborhoods. The routes chosen demolished minority communities disproportionately. The same destruction of minority neighborhoods was seen in the construction of the public housing projects of the second half of the 20th Century where, again, the discrimination seen in New York City became a national model [25]. Large areas of apartment buildings in poorer neighborhoods were destroyed across the US in a process of 'slum clearance'. The provisions of the Federal *Title I* program that funded the demolitions were supposed to guarantee replacement homes for people who were evicted. Across the country, many people were evicted but never provided with anything. Even for those given space in replacement public housing, it exacerbated racial segregation. Minority populations were so frequently moved to public housing towers built at the peripheries of American cities that it led to the phrase 'urban renewal is negro removal' [26]. Fullilove [27] enumerates the immediate, long-term, psychological, and medical consequences of this "urban renewal".

Robert Moses travelled the US as a consultant in the first half of the 1940s, when steel was unavailable for large domestic construction projects, to develop numerous urban plans. His plan for Portland, Oregon was developed in 1943 [28]. Traffic-and-infrastructure-based planning came to Portland at the pen of Robert Moses, the dominant urban planner in the US.

The assumptions behind traffic-and-infrastructure-based planning need to be examined. Beginning with the topic of highway construction, maximizing the efficiency of traffic flow deserves priority, even if the most direct route is through existing residential areas. In terms of housing, maximizing the number of people who can be housed in an area in public housing projects also deserves priority, even if it results in "superblocks" with no stores or other non-residential features. Finally, maximizing access to parks and recreation areas by automobile deserves priority over public transportation. Unwritten, but very real behind all of these assumptions, was an inclination to design amenities in a way that benefited wealthy (and generally white) inhabitants, and place disamenities such as highways through poorer (and generally minority) communities.

In the second half of the 20th Century, countervailing voices in the US began to arise. The first clashes were between Robert Moses and Jane Jacobs with her allies in New York City, over Washington Square Park, where Moses' plan to extend 5th Avenue directly through the park was stopped. Subsequently, the plan to name the West Village an "urban renewal district" marked for demolition was blocked. Most dramatically, it was the plan for a Lower Manhattan Expressway across a series of working-class neighborhoods that catalyzed a broad and ultimately successful resistance. Jacobs' newly published book *The Death and Life of Great American Cities* was her coalition's manifesto. The full story of this has been described elsewhere [21].

Just as Robert Moses became the archetypical traffic-and-infrastructure-based urban planner, Jane Jacobs became archetypical for a competing basic approach that branched into what became implemented under various names, including "New Urbanism", in Portland, Oregon and in many other places. This approach insisted a city was for people on neighborhood sidewalks, as they visited shops and went to employment, children went to schools, and much more, rather than highways for automobile traffic. The new approach emphasized complexity of use, connectedness and the capacity for movement of people from small "street neighborhoods" around and across the city to engage with jobs and amenities and other people, as part of " . . . thoroughgoing city mobility and fluidity of use . . . ", not a series of insular little neighborhoods. It also stressed the importance of larger

“districts” that “... help bring the resources of a city down to where they are needed by street neighborhoods ...” and which “... work as integral units of power and opinion, large enough to count ...” and are yet connected to the small street neighborhoods where people live [29]. Jacobs’ description of complex neighborhood use is poetic, but more importantly it prioritizes something other than maximizing efficiency. She wrote [29]:

Under the seeming disorder of the old city, wherever the old city is working successfully, is a marvelous order for maintaining the safety of the streets and the freedom of the city. It is a complex order. Its essence is intricacy of sidewalk use, bringing with it a constant succession of eyes. This order is all composed of movement and change ... we may fancifully call it the art form of the city and liken it to the dance ... The ballet of the good city sidewalk never repeats itself from place to place, and in any one place is always replete with new improvisations.

In Jacobs’ version of urban planning, four conditions are necessary:

(1) *The district, and indeed as many of its internal parts as possible, must serve more than one primary function; preferably more than two. These must insure the presence of people who go outdoors on different schedules and are in the place for different purposes, but who are able to use many facilities in common.* (2) *Most blocks must be short; that is, streets and opportunities to turn corners must be frequent.* (3) *The district must mingle buildings that vary in age and condition, including a good proportion of old ones so that they vary in the economic yield they must produce. This mingling must be fairly close-grained.* (4) *There must be a sufficiently dense concentration of people, for whatever purposes they may be there. This includes dense concentration in the case of people who are there because of residence* [29] (pp. 150–151).

The assumptions behind this second school of urban planning also need to be examined. First, the physical structure of existing communities and neighborhoods should be preserved. Second, protecting temporal and functional variability in activity on the sidewalks should be prioritized. Third, the existence of densely populated mixed-use neighborhoods with a mixture of structure ages should be prioritized. Unwritten, but very real behind all of these assumptions, is the notion that conserving the neighborhood in its present form should be given priority, rather than prioritizing change to redress existing injustices. This conservation is intended to preserve well-functioning neighborhoods for the benefit of their current inhabitants.

Gentrification and displacement have become one of the crucial topics today in urban planning. In light of this, what was not included in Jacobs’ four principles of urban planning was as significant as what was included. Preventing gentrification and displacement, as well as promoting racial justice, were not part of the short list of crucial planning principles. The *Death and Life of Great American Cities* says [29] ‘a saner relationship’ of supply and demand for housing in attractive neighborhoods would curb gentrification, and ‘to keep it [the middle class] as a stabilizing force in the form of a self-diversified population, means considering the city’s people valuable and worth retaining, right where they are, before they become middle class’, but these were apparently more peripheral concerns and were not included in Jacobs’ short list of critical planning principles.

This discussion of paradigms of US urban planning is greatly abbreviated, and intended merely to illustrate the origins of two schools of urban planning that were subsequently important to events in Portland, Oregon. As the focus shifts to Portland, Oregon, the preceding brief treatment should not be taken as a discussion of more recent decades of urban planning in New York City. There is a much more complicated recent history of urban planning, sustainability, resiliency, gentrification and displacement, and social justice issues in New York City than the discussion of Moses and Jacobs can suggest [30–33].

4. Portland, Oregon: A Collision of Two Types of Urban Planning in the Albina Neighborhood and Other Areas

Even the level of enforced economic and racial segregation he found present in Portland was not sufficient for Robert Moses; he wanted less land set aside in future for apartments and preference given to single-family homes, the dwellings of more affluent

people. In his 1943 “Portland Improvement Plan”, in coded language privileging people wealthy enough to purchase homes, Moses wrote:

... encroachments of business and multiple dwellings into single family residential areas have destroyed the value of many private homes.. Excessively large areas have been zoned for apartments, occupying 40% of the total area of the City. Portland is a city of single-family homes. We are therefore of the opinion that only a very small percentage of the area of the City should be set apart for multiple dwellings [17].

In the 1940s, the African American population of Portland rose from 2000 to 20,000 as people arrived to work in the shipyards [17]. Due to resistance to housing construction for them by city leaders, many African Americans lived in a separate community called Vanport built behind a dike in a floodplain and outside the Portland city limits. Vanport was destroyed by a flood in 1948; subsequently, for the former Vanport residents, there was only one area in the city of Portland, the Lower Albina neighborhood, in which African Americans were able to purchase homes [17]. Urban disinvestment and government policies all circumscribed what the future of the Albina area could be, as Gibson [16] says:

... disinvestment involves the systematic withdrawal of capital (the lifeblood of the housing market) and the neglect of public services such as schools; building, street, and park maintenance; garbage collection; and transportation ... Inner-city neighborhoods were systematically deemed unworthy of federally insured home loans by real estate appraisers ...

However, there was more to Albina than the consequences of economic disinvestment. There was a strong community:

But something else had also taken shape in Albina. Black businesses, community centers, and houses of worship had begun to spring up, as did local chapters of the Urban League and the NAACP. A vibrant cultural center not unlike a “Harlem on the Willamette” was emerging in the heart of North and Northeast Portland. At the Williams Avenue YWCA, the Oregon Federation of Colored Women hosted scholarship teas, while Bethel African Methodist Episcopal Church was often used to host formal dinners [34].

Lower Albina, which quickly became the heart of African American Portland, was soon decimated by clearances for large traffic projects and “urban renewal”. The Albina Neighborhood Improvement Plan was officially adopted in 1961. This “urban renewal” eventually involved the demolition of 117 and the renovation (primarily internal) of another 585 homes [35], many inhabited by African Americans. Many residents were forced to move from the area called Lower Albina to neighboring Upper Albina [17]. In short order, I-5, an Interstate Highway, was built through Upper Albina, and there followed the destruction of African American housing areas for large-scale construction projects, including the Memorial Coliseum, the Lloyd Center Mall (then the largest shopping mall in the US) [36], and subsequently the planned expansion of Legacy Emmanuel Hospital in 1972 flattened another 76 acres and destroyed hundreds of largely minority-owned homes [17].

The center of Portland’s black community had moved more than a mile north from its center at Union and Broadway in 1940 to Union and Skidmore in 1980. This process started with the land clearance for the Memorial Coliseum in the 1950’s and continued with the construction of the I-5 highway in the 1960’s and the Emanuel Hospital Urban Renewal Project in the 1970’s in the historic heart of Albina south of Fremont and west of 18th. By 1980, 63,000 people lived in the Albina area. Over 20,000 blacks now lived in the area representing 30% of the area’s population (US Census) The resulting density of population in old housing stock, along with the destruction of the heart of the commercial district and surrounding neighborhood by urban renewal projects of the late 60’s and early 70’s are important factors in the legacy of the deterioration of Albina [37].

Along with the impacts of racial prejudice against African Americans, other communities without much political influence also suffered in the 1960s and the beginning of the 1970s [37]. The South Portland “urban renewal” project used Federal funds to demolish existing structures on 109.3 acres of land housing primarily older Jewish and Italian residents, a kosher shopping district, other “ethnic” stores, Catholic Churches and Synagogues and a Jewish Community Center, and Chinese, Greek, and Irish residents were also forced

out. Almost 1600 residents and 289 businesses were displaced, and in many cases uprooted residents did not get help finding housing [35].

In the early 1970s, a group of Portland activists, using Jane Jacobs' work as their guidebook, gained the Mayor's seat and enough City Council seats to form a strong majority, and progressive urban planning began. They stopped the large-scale neighborhood clearances and demolition proposed to build the "Mount Hood Freeway" (planned by Moses on his 1943 consulting visit to Portland and once again designed to provide car access to a recreation area outside the city) [28]. The progressive group running the city then went on to build Portland's first light rail line, subsequently removed a highway called Harbor Drive from the city core to replace it with a riverside park, reversed the decision to build a large parking downtown garage and turned the space into an urban amphitheater often called "Portland's Living Room" [38], and began a process that eventually revitalized the construction of new American streetcar systems. The transformation of the Willamette River waterfront in the city to promote livability was especially multifaceted [39]. Portland also began to experience what was to become a global process:

Environmental gentrification . . . also called ecological gentrification . . . and green gentrification . . . characterized by the implementation of environmental or sustainability initiatives that leads to the exclusion, marginalization, and displacement of economically marginalized residents . . . [40].

5. The Population Strategy and Albina Community Plan

Despite other progressive thought and action, in a manner reminiscent of Robert Moses' preference for single-family dwellings, the Population Strategy written by the City of Portland in 1977 continued to favor wealthier residents in planning:

In 1977, the City of Portland developed the Population Strategy to guide the creation of the 1980 Comprehensive Plan and many other major infrastructure and funding plans . . . laid out a policy justification for prioritizing middle-class, educated families when making major policy decisions, investments, and plans in order to reverse the trend of "white-flight" from Portland to the suburbs. The strategy considered housing types and neighborhood character that were attractive to these priority populations at the expense of others. The document argues, "Increasingly the city is becoming a community of extremes, populated by the young and the old, the lower income and unemployed, minorities and renters [10]".

The 1977 Population Strategy led to a 1980 Comprehensive Plan that increased the areas dedicated to single-family housing in a way that would inevitably move multi-family dwellings closer to commercial traffic and its air pollution:

Portland's first Comprehensive Plan, adopted by City Council in 1980, expanded R5 single-family zoning to protect single-family neighborhoods and focused density in downtown and areas referred to as "nodes" and "noodles." These urban centers and main corridors included narrow strips of multi-family and commercial zoning [10].

The state legislature of Oregon engaged with the goal of environmental sustainability and passed legislation in 1980 that established urban growth boundaries around the state's established communities to constrain urban sprawl and protect farmland. Circumscribing the area for development is also often discussed in terms of increased housing costs in Portland [41–43]. A regional elected government named Metro was also established to coordinate things in the greater Portland area, such as mass transit and park systems, that are best managed regionally [44].

The 1994 Portland "Community and Neighborhood Planning Program" was intended in part to address inequities that emerged from the 1980 Comprehensive Plan, but it ended up accelerating gentrification and displacement through one of its components, the Albina Community Plan:

The Albina Community Plan in 1993 . . . consisted of large parts of inner North/Northeast Portland, where the African American community had historically resided . . . A history of redlining, predatory lending, and other racist practices had led to vacant homes and businesses and disinvestment in the area . . . Through the Albina Community Plan, the City tried to address its prolonged disinvestment in the area by boosting economic development and bringing investment and

improvements to Albina . . . The Albina Community Plan, however, set the stage for gentrification and displacement of African Americans years later. Gibson states, “The occupation of prime central city land in a region with an urban growth boundary and in a city aggressively seeking to capture population growth, coupled with an economic boom, resulted in very rapid gentrification and racial transition in the 1990s”. From 1990 to 2016 . . . over 4000 households and more than 10,000 African Americans were displaced from the neighborhood [10].

As the ideas of progressive urban planning encouraged areas of vibrant urban street life and livability, and Portland became a city many began to admire globally, inequitable consequences accelerated locally.

The most direct application of Jane Jacobs’ ideas was the affluent new Pearl District, created out of an old warehouse district north of the downtown. Today, the Pearl District is a mixture of old buildings, new construction, and new construction that only looks old; it features connectedness of use with access to three forms of mass transit, features the short blocks (200 feet on a side, rather than the 400-foot grid that was replaced) that Jacobs described [45], and has vibrant neighborhood life on the sidewalks. Portland viewed from afar is now famous for bicycle commuters, light rail and streetcars, large public spaces, and mixed-use walkable neighborhoods [46]. However, Portland’s era of progressive urban planning also produced myriad unintended consequences and inconsistencies.

We need to note before moving on that question of the relationship of Jane Jacobs’ thought to gentrification in general, and to the context of urban change around her as she wrote, is a substantial topic. An interesting analysis can be found in Madeleine Lyes’ chapter 6, “Jane Jacobs and Sharon Zukin: Gentrification and the Jacobs Legacy” [4].

6. Unintended Consequences of Portland’s Progressive Urban Planning

The involvement of local citizens in Portland’s planning process [47], has been uneven; some neighborhoods were able to obtain significant amenities and others were demolished or ignored. It is important to answer the following three questions: (1) Did well-intentioned urban planners and community leaders promoting progressive urban planning in Portland’s recent history do as much damage to the city’s minority and less affluent communities as the earlier type of traffic-and-infrastructure-based urban planning promoting ‘slum’ clearances, public housing projects, and highway construction? (2) How should city leaders proceed in the future in order to address the unintended consequences of urban planning in Portland? (3) What changes need to be made to deal with the forgotten issues (such as the racially disproportionate health impacts of pollution exposure) that urban planning in general has never focused upon, but which are vital to human wellbeing?

Despite the new era of progressive urban planning, disinvestment in the Albina area continued to take place, and banks still systematically refused to finance loans there, leading to plunging property values as the housing stock deteriorated, and the Albina neighborhood became less attractive and safe. Finally, around 1990, public funding began to arrive [16], but it was not a priority to use the new resources to restore the previous community. Gibson [16] quotes Charles Ford, a long-time resident:

I envisioned cleaning up the neighborhood, making the neighborhood livable for all of us . . . We never envisioned that the government would move in and mainly assist Whites. They came in to the area, younger Whites. [The Portland Development Commission] gave them business and home loans and grants, and made it comfortable and easy for them to come.

As financial resources finally became available in Albina, and progressive urban planning made the city more attractive in general, gentrification and displacement took over what blatant racism and traffic-and-infrastructure-based urban planning had begun. Home prices rose dramatically in Albina and the rest of Portland [48], and 10,000 out of 38,000 African Americans living in Portland had to move to the fringes of the city [17].

The Interstate Corridor Urban Renewal Area (ICURA) plan of 2000, running north through Albina, was the crucial event in the loss of much of the African American community in Albina. The ICURA and its accompanying investment in the heart of the African American community catalyzed the demographic and geographic movement of historically

African American communities east to the outskirts of the city, or north across the Columbia River to Vancouver, WA. With parts of the area only annexed to Portland in the 1980s into the 1990s, East Portland has a complicated and sometimes fraught relationship to the rest of the urban area, with too many aspects to describe here [13].

As the City of Portland itself now recognizes:

Another practice that has had disproportionate impacts on communities of color is uncoordinated public investment. Decision makers have not fully appreciated how the cumulative impact of public investments can harm vulnerable populations. For example, streetscape projects layered on top of transit enhancement services and commercial revitalization programs without the provision of affordable housing can make an area already experiencing gentrification become yet more desirable, leading to increased property values. Without adequate and timely affordable housing interventions, these investments exacerbate displacement [49].

It should surprise no one that the environmental justice movement, historically driven by concerns about inequitable exposures to toxic waste sites and other disamenities, has been expanded to focus as well on the impact of projects designed to promote environmental sustainability but which drive “green gentrification”. Now, “greening projects” can be a new form of locally unwanted land uses (LULUs). As Anguelovski [50] describes:

EJ research in sociology, geography, and urban planning has offered a more complex analysis of the ways in which the urban EJ agenda has evolved—to not only include demands for greater spatial and distributional equity but also improved recognition of the specific needs and conditions of communities on the ground and of their renewed call for participation in decision making on issues such as transit justice, food justice, or healthy housing.

The “green gentrification” of Albina, driven by the development of amenities that helped make the neighborhood and Portland overall more environmentally sustainable, had financial motivations as well:

In the last 25 years, Albina has been reconstructed for a new population of wealthy, white urbanites. Some developers see no problem with eco-friendly luxury apartments, expensive boutiques and overpriced restaurants morphing Albina into an ecotopia that has never historically existed. Several city officials have been on board as well. Susan Anderson, head of the Bureau for Planning and Sustainability admitted the city’s profit motive in an interview with Grist Magazine. “We’re not doing [sustainability] just to be altruistic. Part of the reason we’re doing a lot of this: there’s money to be made, to be crass . . . [51].

According to some measures, Portland’s gentrification is among the most extreme examples in the US, with Albina as the epicenter of the process. Ause [51] wrote:

Recent articles from Governing Magazine and Color Lines Magazine proved that Portland is the most gentrified city in the United States... Governing Magazine’s analysis of Portland showed (using data from the American Community Survey), that 13 of Portland’s 36 gentrified census tracts run along Interstate Avenue, Williams Avenue and Martin Luther King Jr. Boulevard . . .

Goughnour [52] summarizes the situation:

In 2011, Nikole Hannah Jones wrote in The Oregonian about this process “Those who left didn’t move to nicer areas. Pushed out by gentrification, most settled on the city’s eastern edges where the sidewalks, grocery stores and parks grow sparse, and access to public transit is limited.” Since 1990, 25 percent of African Americans have been pushed out of Portland entirely. Those that remain are increasingly marginalized and blocked from taking part in the amazing transformation of Portland into one of the most livable places in the country. Since 2000, all ten of the city’s majority minority neighborhoods have become majority white, where investment and racialized displacement resulting in net losses of over 900 African Americans. In Multnomah County, the 2014 Report Card on Racial and Ethnic Disparities warns that this pattern is only expected to continue, with losses to every community with significant numbers of Black residents.

To visualize the geography of these changes, the City of Portland Bureau of Sustainability has made maps supporting their 2018 gentrification study available online. They display data including rental market typology, economic vulnerability assessment, gentrification typology and assessment, and demographic change (<https://www.portland.gov/sites/default/files/2020-01/gentrification-displacement-maps.pdf>) (accessed on 20 August

2022)). The accompanying 2018 Gentrification and Displacement Neighborhood Typology report is available online as well (https://www.portland.gov/sites/default/files/2020-01/gentrification_displacement_typology_analysis_2018_10222018.pdf (accessed on 20 August 2022)). Posted by the City, an interactive map of redlining in Portland is available at <https://dsl.richmond.edu/panorama/redlining/#loc=12/45.513/-122.773&city=portland-or> (accessed on 20 August 2022), an interactive map of urban renewal districts that includes information on displaced families is available at <https://dsl.richmond.edu/panorama/renewal/#view=0/0/1&viz=cartogram&city=portlandOR&loc=13/45.5320/-122.6660> (accessed on 20 August 2022), and an interactive map of racial covenants on real estate in different neighborhoods is available at <https://www.google.com/maps/d/viewer?mid=1Tz4qsE1Pm-usvnLNQNnWirj41vt3lcwf&ll=45.5034832786112%2C-122.62581500000003&z=12> (accessed on 20 August 2022). For an external discussion of the Bureau of Planning and Sustainability's 2014–2018 gentrification typology map, and the Barcelona Laboratory for Urban Environmental Justice and Sustainability's posting in 2021 provides another perspective (<http://www.bcnej.org/2021/06/01/portlands-lauded-sustainability-still-falls-short-on-racial-justice/> (accessed on 20 August 2022)).

The African American community was thus largely displaced from the mid-1990s onwards from Albina primarily to East Portland, usually defined as the area east of 82nd Avenue [12]. East Portland contains recently constructed, relatively inexpensive housing, but it has less parks, crosswalks, sidewalks, bike trails, easily accessible mass transit, access to fresh food, and generally less investment than more affluent parts of the city. As Goodling, Green, and McClintock describe:

In direct violation of requirements of the federal Fair Housing Act, low-income renters receiving governmental support in metropolitan Portland have been systematically placed in the region's most impoverished, segregated census tracts . . . Under . . . the state-run rental assistance program and . . . county-led Section-8 voucher program . . . over half of African American and Latino renters in recent years were placed in units in census tracts with a poverty rate greater than 20%, most of which are located at the city's fringes, particularly in East Portland . . . Most of these newcomers to East Portland fall into one of two categories: immigrants and refugees moving from Mexico, the former Soviet Union, Somalia, Ethiopia, Bosnia, Vietnam, and Cambodia; and low-income residents displaced by rising rents in other parts of Portland . . . They have been joined by a growing number of African Americans, many of whom are intra-city migrants . . . Indeed, as much as 70% of some inner North and Northeast census tracts were made up of African American residents in 1970, whereas 40 years later . . . some tracts have lost over a third of African American residents . . . [12].

East Portland is also the part of the city with the highest exposure of vulnerable populations to the potential for flooding, as well as also encompassing a concentration of areas with the highest exposure of vulnerable populations to high-heat hazards. Many of the parts of the city with the greatest combined hazard potential, taking both of the preceding factors into account, are in East Portland [53]. In a spatial analysis of 108 urban areas in the United States, there were elevated surface temperatures in formerly redlined areas relative to their non-redlined neighbors, and of all those cities Portland demonstrated the greatest temperature differential impact of redlining [54].

In a future of climate change and more frequent extreme weather events, East Portland will become more hazard-prone. Urban climate adaptation tends towards both acts of omission and acts of commission (negatively impacting or displacing disadvantaged communities, or giving priority to wealthy inhabitants) [55], and avoiding both of these while improving the situation in East Portland will be a significant challenge. Integration of health-outcome forecasting, identification of vulnerable populations, and planning would be especially important, given the increased energy use under climate change and therefore increased pollutant concentrations in some areas [56]. Intentionally applying a conceptual framework that promotes climate adaptation strategies that simultaneously reduce environmental injustices will be necessary [57].

Displacement due to “green gentrification” increases the hazards people face. As Collin [58] noted:

Displacement does not provide opportunities to escape environmental dangers. Often it intensifies exposures by forcing displaced people toward less desirable locations and land uses because of economically limited choices. Often these undesirable uses are not residential, but are environmentally degrading, such as waste sites. Over time, exposure to environmentally degrading land uses can affect the public health of the community, and some communities have recently begun to seek redress in the courts . . .

It is worth noting that examining changes accompanying hazardous waste cleanup in Portland from 1990–2000, Eckerd (2011) [59] did not find evidence of an accompanying gentrification, however his analysis incorporated a “gentrification index” based only on the percentage of the adult population with a college education and the percentage of the adult population working in managerial and professional positions, and hazardous waste cleanup was not a focus for most environmental sustainability efforts in Portland at that time.

7. Impacts of Gentrification and Displacement

The health impacts of gentrification and displacement on existing populations encompass two different groups: prior residents who are displaced, and prior residents who manage to remain in the gentrified neighborhood. Negative consequences can be incurred by both groups. For people remaining in a gentrified neighborhood, commercial gentrification brings in the loss of previous supporting structures and the arrival of new restaurants, bars, boutiques, etc., which they often cannot afford. For those displaced to other areas, there is the shock of community loss and often cultural clashes in their new surroundings that add to the ill effects of environmental exposure challenges. Conclusions in the literature about the impact of gentrification are related to the exact outcome being assessed, time period of the study, interaction between participant race and neighborhood racial makeup, and neighborhood income level [60]. While the potential for either positive or negative health outcomes exists in theory, in practice there is a racial disparity in who benefits from gentrification and who is harmed, with Black and low-income individuals often the people who are harmed [61]. The potential harm has many attributes:

Longtime residents of gentrifying neighborhoods may experience profound change and alienation, the breakdown of informal place-based networks of exchange, the loss of gathering spaces and institutions, symbolic manifestations of socioeconomic inequality, and the increased racialization of the public space . . . Lower income residents may face difficulty affording food and other necessities, or find themselves in overcrowded housing stock . . . [62].

Reviewing a large literature on health impacts of gentrification, Anguelovski et al. [63] wrote:

All in all, the growing number of systematic reviews on gentrification and health outcomes . . . report that historically marginalized residents are more likely to experience worse mental health (i.e., higher stress, anxiety, depression, sleep deprivation) as well as physical health (i.e., increase of respiratory diseases, deterioration of nutrition and diet, or preterm birth)... Black residents in gentrifying tracts have been found more likely to report worse self-rated health; and almost 75% more likely to report poor/fair self-rated health when living in a Black gentrifying neighborhood . . . in California, among residents self-identified as Black, gentrification accounted for a 144% increase in the odds of fair/poor self-rated health . . . Gentrification has also been reported to be associated with increased likelihood of preterm birth and fair/poor self-rated health for Black residents when these are compared with Black residents in non-gentrifying neighborhoods or compared with white residents . . . Displaced residents from gentrifying areas are also likely to make more emergency department visits and experience hospitalizations due to mental health concerns . . . gentrification is associated with moderate increases in diagnoses of anxiety or depression in children living in market-rate housing, a population most at risk of housing displacement . . .

Impacts of gentrification include [64]: rising rents, landlord harassment, a change in neighbors so that previously acceptable customs (e.g., music played) are no longer accepted, resentment as unaffordable new services and amenities arrive, housing insecurity, food insecurity, homelessness, a perception of disenfranchisement, increasing taxes, and disruption of community support systems, all of which can contribute to stress leading to increases

in cardiovascular death, increased preterm births, depression, and hypertension. All of the preceding research is an improvement over earlier articles written about gentrification, where influential discussion papers entirely ignored pollution and health issues [65] or articles that did not disaggregate data by race or ethnicity [66].

While Portland now has an Anti-Displacement Action Plan [67], and a proposal for new affordable housing downtown [68], skepticism is prevalent among citizens due to decades of lax oversight and long delays in promised affordable housing actually being realized [69–72]. Some effective actions to increase local amenities without displacement, which have had positive self-reported health benefits, have been taken by citizen groups and NGOs [73–76], but in Portland these citizen groups have not had the resources to solve the larger problems.

Neither approach to urban planning discussed so far has the capacity to address the disproportionate developmental and health impacts of air pollutants on poorer inhabitants and racial minority groups in Portland. Our understanding of the seriousness of the developmental and health impacts of air pollution throughout the US has grown exponentially in recent decades, but these impacts have not been the focus of any paradigm of urban planning. We know that race and poverty are associated nationally with inequitable exposure to hazardous pollutants [77]. Cancer risks are increased by exposure to vehicular air pollution, and risks differ between different racial groups (with factors such as home ownership, a desire to live near public transit, and a desire to live among culturally similar people also being significant predictors) [78,79]. Health risks have been demonstrated in some cities with “racial/ethnic and economic inequities in the distribution of air pollutants” to show significant intra-ethnic heterogeneity between Hispanics in subcategories based on: language proficiency, national origin, US citizenship status, unemployment status, and other factors [80–82]. Census block groups in El Paso County with the highest proportion of Hispanics, the highest proportions of Spanish-speakers with limited English-language proficiency, and the highest proportion of foreign-born residents and highest proportion of non-US citizens, have been shown to have the highest cancer risks from air toxics, and there is also evidence of gender disadvantage, with block groups having more female-headed households exposed to greater cancer risk from air toxics [83]. In Houston, studies of air pollution cancer risk showed that neighborhoods with a higher proportion of Hispanic residents, fewer homeowners, or more income inequality had significantly greater exposure to chronic and acute pollution risks, and there were more non-Hispanic Blacks in neighborhoods with higher chronic cancer risk [84]. Elsewhere, it has been shown that levels of risk perception overall had racial differences, but risk perception associated with traffic-related pollution was significantly less than risk perception associated with industrial pollution [85], which complicates planning appropriate mitigation efforts. Factors such as gentrification and displacement, highway construction, and other consequences of urban planning increase toxic exposures, as does lack of trees and green spaces. The Portland Air Toxics Solutions Committee [86] says:

Different minority groups are affected by different types of emission sources. In general, DEQ found that the Hispanic/Latino population experienced the highest impacts from residential wood combustion emissions, the Asian population from on-road mobile emissions, the African American/Black population from area source emissions, and the population living below the poverty level from on-road mobile emissions. Non-road mobile emissions also significantly impact minority populations, while point sources disproportionately impact populations living below the poverty level.

For a discussion of emerging environmental justice issues that go beyond the scope of what can be covered in this article, see the 19 articles in the Special Issue of the *International Journal of Environmental Research and Public Health* [87].

8. Children's Health

What do air pollutants do to children's development and health? Brown [88] discussed “contested illnesses” due to environmental toxics exposures, and he wrote “The most rapid increase in asthma from 1980 to 1994 was among children younger than the age of four,

a rise of 160 percent. Among children five to fourteen, asthma sufferers increased by 74 percent . . . In many low- income urban areas, especially minority communities, rates are significantly higher than the national average.” Children are especially vulnerable to environmental contaminants in many contexts [89]. Strife and Downey [90] wrote:

Children are more vulnerable than adults to environmental toxins in large part because of their relatively high ratio of skin surface area to body weight and because on a weight for weight basis children eat more food, drink more water, and breathe more air than do adults... In addition, because children’s organ systems are in a constant state of development, “children absorb, metabolize, detoxify, and excrete poisons differently from adults . . . ”

Prenatal and childhood exposure to urban air pollution increases use of hospital emergency departments for psychiatric emergencies [91], increases rates of autism spectrum disorders and causes problematic changes in childhood behavioral scores [92–95], lowers cognitive function later in life [96–98], causes increased rates of asthma [99,100], causes increased rates of preeclampsia [101,102], and causes poor respiratory health in early childhood, reduced birth weight, and preterm birth [103,104]. Air pollution increases cardiovascular and respiratory disease [105] as well as lung cancer [106]. Higher exposure in six US cities to levels of either PM 2.5 or NO₂, either prenatally or postnatally, produced worse results for levels of child behavioral problems and for cognitive function at age 4–6 years [107]. People of color are more likely to live closer to Portland’s major sources of air pollution [108].

In the US, schools are often not refuges for children:

. . . in Hillsborough County, Florida, predominantly Black schools are located closer to hazardous waste sites than are predominantly White schools and that those schools that are proximate to hazardous waste sites are becoming more racially segregated over time . . . in the Los Angeles Unified School District (LAUSD), minority students are more likely than White students to attend schools that are proximate to hazardous waste facilities. Minority students in the LAUSD also face higher cancer and respiratory health risks from air toxics at school than do White students . . . [90].

This is not a phenomenon foreign to Portland. The location of Harriet Tubman Middle School in Albina, adjacent to Interstate-5, which was constructed within 50 feet of the already-established school in the 1960s, was not treated by the city as a serious health threat until 2018. At that point, a report was commissioned [109–111] and USD 18 million were spent on a new air filtration system that removes 95% of the pollutants [112]. The economic inequity at the root of this situation was clear from the moment Interstate-5 (which runs from Clark County, Washington to Portland) was constructed adjacent to the school:

. . . the huge disparity in the demographics of those who use the freeway . . . and those who attend Tubman Middle School. Peak hour, drive-alone commuters from Clark County, Washington have average household incomes of \$82,500; and 75 percent of them are white, non-Hispanic. More than two-thirds of Tubman students are people of color; and half the student body is poor enough to qualify for free or reduced price meals [113].

The circumstances of Harriett Tubman Middle School are well-documented, but perhaps they would not be considered unusual in Portland if more environmental toxics data were being collected at schools. Presently, 78 schools in the Portland area, including others in Albina, and including 56 elementary schools area-wide, are within 100 m of major roads [114]. In Albina, other schools that had high-traffic roadways built close to them include the Boise-Eliot/Humboldt Elementary School, which is very close to on- and off-ramps for Interstate-405 and is also close to Interstate-5; in the absence of methodically collected toxic exposure data, this has raised concerns for parents about pollution and their children’s health, e.g., “Ashia, Albina and Asthma—an individual neighborhood history” provides an example of the impacts of this situation [115].

Even the belated remedy of pollution filtration for Albina’s Harriett Tubman Middle School is now threatened, as Oregon Department of Transportation plans are being developed to widen Interstate-5 and bring traffic even closer to the school, and current possible Portland Public Schools relocation plans for the school have four out of eight proposed relocation sites that are also close to high traffic streets [112].

9. Racial Disparities in Harmful Exposures

Increased levels of air pollution are associated with increased susceptibility to, and mortality from, COVID-19, and this has impacted minority communities disproportionately [113–119]. In Portland, the distribution of housing makes people of color more vulnerable to chronic health conditions that exacerbate COVID-19 [120]. It is obviously an urgent and important element for any future discussion of urban planning and air pollution. As Harriet A. Washington [121] writes about the US generally:

Poverty is a risk factor for becoming unwell. But racial disparities in exposure to environmental pollutants are greater factors that remain even after controlling for income. African Americans who earn US\$50,000–60,000 annually — solidly middle class — are exposed to much higher levels of industrial chemicals, air pollution and poisonous heavy metals, as well as pathogens, than are profoundly poor white people with annual incomes of \$10,000. The disparity exists across both urban and rural areas.

During the era of traffic-and-infrastructure-based urban planning, the construction of parts of Interstate-5 and of Interstate-405 through Albina [122], the destruction of much of Albina's housing stock in other large civic infrastructure projects, the displacement of former residents north towards the industrial zone bordering the Columbia River, and displacement to the area surrounding Interstate-84 to the east and beyond that into the greenspace-depauperate reaches of East Portland, undoubtedly increased the long-term exposure of African American and other minority residents leaving Albina to increased levels of dangerous air pollutants. The following era of progressive urban planning led to gentrification and displacement from Albina to more polluted parts of the city, especially from along Interstate Avenue, where the new light rail line with its transit-oriented development was constructed, and also from Mississippi Avenue and Williams Street, which largely changed from centers of the African American residential and commercial districts, respectively, to new upscale, expensive, and largely white neighborhoods. Progressive urban planning displaced Albina residents to less healthy places, as it promoted gentrification with its imaginative sculptures at light rail stations, coffee shops, boutiques, rising rents, and soaring home prices and property taxes.

Portland is far from alone among cities in the US in racial disparities in harmful exposure to toxic pollutants [123–131]; however, for a city that prides itself on progressive urban planning, this should be an especially important issue. Mikati et al. [77] write about national PM 2.5 (the smallest and most dangerous particulate pollutants) exposure:

For PM of 2.5 micrometers in diameter or less, those in poverty had 1.35 times higher burden than did the overall population, and non-Whites had 1.28 times higher burden. Blacks, specifically, had 1.54 times higher burden than did the overall population. . . . disparities held not only nationally but within most states and counties as well . . .

These health and social impacts can be so prevalent and obvious to the people impacted that they create yet another barrier to justice in urban planning. What emerges is the potential for epistemological smothering (sometimes called rational ignorance) [132], which occurs when marginalized people become unwilling to express their views in planning discussions because of their history of being ignored, disbelieved, and treated badly by policy makers. They become epistemologically smothered into not even expressing themselves when opportunities for local input into planning processes do happen to arrive [133]. This can become a feedback loop where unfair treatment and unevenly distributed consequences leads to future silence that prevents planning from getting better. If both traffic-and-infrastructure-based urban planning and also progressive urban planning destroy existing communities of color, displacing former residents to more affordable but less desirable and healthy areas can both lead to epistemological smothering.

10. Urban Green Spaces

Parks can improve health outcomes for people living near them [134]. There is a strong correspondence between urban green space distribution and wealth and education in most US cities [135]. Children are especially vulnerable to the consequences of a deficit in their

exposure to natural settings, which can include both cognitive developmental concerns and obesity, the latter leading to long-term increases in “coronary heart disease, hypertension, Type 2 diabetes, stroke, sleep apnea, respiratory problems, and some cancers” [90] but on the beneficial side, “The positive effects of nature exposure include improved cognitive functioning (including increased concentration, greater attention capacities, and higher academic performance), better motor coordination, reduced stress levels, increased social interaction with adults and other children, and improved social skills.” East Portland has particularly poor park access according to a city report, and infill and increasing development in East Portland are further reducing the number of mature street trees, [136]. This all adds to the health impact of a deficit in parks, especially for children living in East Portland. Children who live in areas with more street trees have lower rates of asthma [137]. A relationship between maternal residence proximity to tree canopy cover and infant health, with trees reducing undesirable birth outcomes, has been demonstrated in Portland. A ten percent increase in tree canopy cover within 50 m of a mother’s home significantly reduces the risk of a child being born with a small size for their gestational age [138]. Not all green space is equivalent; the presence of more large trees was especially correlated with reducing prescriptions needed nearby for drugs to treat cardiovascular disease and mood disorders [139].

Increasing access to green spaces is one potential remedy for some of the health impacts associated with poor park access like that which is prevalent in East Portland [136]. Health benefits of urban green space include reduced levels of air pollutants, reduced attentional deficits, improvements in short-term mental health and cognition, stress reduction, increased opportunity for healthy exercise, improved sleep patterns, improved immune system function including anti-cancer activity, increases in health-inducing microbiome, longevity, healthier new-borns, crime reduction, less aggressive behavior, increased neighborhood satisfaction, and increased social cohesion and social capital [140–146]. Where parks are scarce as in East Portland [147], the development of additional green spaces would provide a potential avenue for promoting environmental justice [140,143,147,148].

Problematically, improved urban green spaces could also subsequently contribute to environmental gentrification and the displacement of existing communities. Neighborhood improvement plans that are ‘just green enough’ to help meet community aspirations without promoting environmental gentrification and displacement are being tried in various communities [140]. Wolch et al. [149] provided a review pointing out the paradoxical nature of green gentrification creating the need for a “just green enough” approach, and pointed out that this is a balancing act that requires not just “. . . urban planners, designers, and ecologists . . . ” but also “. . . collaborations between local government and disparate community groups, and a willingness of local stakeholders to contest powerful real estate interests and mainstream environmental advocates.” Wolch et al. [149] say that:

. . . ‘just green enough’ strategy depends on the willingness of planners and local stakeholders to design green space projects that are explicitly shaped by community concerns, needs, and desires rather than either conventional urban design formulae or ecological restoration approaches.

Given the unintended consequences of planning efforts in Portland, what can be said of the concepts originating with Jane Jacobs that have become a major foundation of progressive urban planning? They have done a lot to make areas of Portland and other cities more attractive and livable, but only for a subset of the population. They have often displaced minority communities and failed, especially when judged on the basis of our new knowledge about environmental health impacts, to provide healthy and safe environments for poor and minority groups.

The Death and Life of Great American Cities has been criticized as essentially ‘color-blind’ [19], but this view has also been countered. As Laurence [150] wrote:

In The Death and Life of Great American Cities, Jacobs wrote about segregation, discrimination, and racism, with special attention to African-Americans, on multiple occasions and in various ways. She called racism “our country’s most serious social problem” (p. 71). She spoke of Americans’ “tendencies toward master-race psychology” (p. 284). She wrote of housing discrimination, noting

that “colored citizens are cruelly overcrowded in their shelter and cruelly overcharged for it” (p. 274). She wrote of credit “blacklisting” (aka redlining), the denial of mortgages and business loans (pp. 299–300).

However, while concepts of progressive urban planning from their early days onward excluded the intentional and overt racial harms resulting from top-down ‘slum clearance’, ‘urban renewal’ and freeway building, and mentioned racial injustice, progressive urban planning has never provided a method to remedy gentrification and displacement, or the consequently increasing disproportionate exposure to harmful pollutants, including pollutants such as PM 2.5 and polycyclic aromatic hydrocarbons, of people displaced to industrial areas (such as the area in Portland bordering the Columbia River) or to highway-bisected neighborhoods (such as the I-5 or I-84 corridors), or to remedy the reduced access of people displaced to places such as East Portland to amenities like parks that promote human health.

In Portland, as in other American cities in the first part of the 20th century, planning came from concerns about the efficiency of traffic flow, from knocking down poorer and minority neighborhoods that did not fit the contemporary vision of what the future city should be, and replacing them with amenities such as the Lloyd Center Mall, the Civic Auditorium, the Convention Center, and facilities for higher education. In the more recent history of planning in Portland, the ideas about walkable neighborhoods connected to a vibrant downtown led to mass transit by light rail and streetcar, and urban gathering spaces such as Pioneer Courthouse Square amphitheater, the two new urban parks of the Pearl District, and the Tom McCall Riverfront Park, which arguably express a greater responsiveness to the human scale of planning. However, neither planning approach focused on questions of human health or on remedying past injustices.

11. Did Progressive Urban Planning Do Any Better for Minority Communities?

With all of the preceding, we can now answer the first of our three major questions, in brief: in Portland, did progressive urban planning do any better for minority communities, and in particular people living in Albina, than top-down planning? A very good case can be made that recent gentrification, displacement to areas with poorer air quality and fewer parks and other amenities, and the lack of positive development in East Portland, have had more continuity than it is comfortable to contemplate with the earlier consequences of racially biased road construction and neighborhood demolition for infrastructure projects. In both processes, minority communities were deprived of opportunities to accumulate wealth, they lost housing and neighborhoods, and they were moved from the city core to peripheral locations. The progressive vision of what makes a good city transformed Portland into a national model for planning, but this vision only succeeded for some of the city’s residents. This was not a result that progressive planners desired, but if two very different schools of urban planning produce much the same consequences for poor and minority citizens, in practical terms, does any distinction between them matter?

Compared to earlier ideas of traffic and large-scale infrastructure-based urban planning, progressive ideas stemming from *The Life and Death of Great American Cities*, as the foundation of perspectives such as smart growth, the New Urbanism, the compact city, urban villages, and creative cities [3,4], which are simply identified here as parts of the progressive planning legacy and lineage, did some good, but in a city like Portland they were not good enough to benefit everybody, or to protect less politically powerful and increasingly disadvantaged communities.

It needs to be acknowledged that in reacting to its past, the city government of Portland is aware of the inequities in amenities across the city, and looks towards modest and incremental change. It has made plans for more bike lanes, more crosswalks, more parks, more of the good things presently missing, to be built in East Portland. It also has plans for more affordable housing in the city core, some of which is intended to especially serve people from displaced communities. However, as already noted, the city has often failed to hold developers to account to provide the number of affordable housing

units they had promised to get their projects approved, and the time frame for any real improvement, even if current plans are accomplished, is long. An independent analysis of overall uneven investment, and especially green investment in the city core, describes how policies intended to promote sustainability “... ultimately contributed to “the demarcation of racialized poverty along 82nd Avenue ...” [12]. Today, the neighborhood disparities remain stark, and housing prices across Portland continue to rise rapidly, with even more gentrification and displacement ongoing in expanding areas. Rent control was approved in the state and is perhaps a tool for Portland’s leaders, but no one is certain yet if it will increase or decrease the supply of affordable housing. The Black Lives Matter demonstrations that began in 2020, and the deep disillusionment behind them, strongly suggest that something beyond the current incrementalism must be found. The present crisis of growing numbers of people experiencing homelessness in Portland, many of them priced out by rent increases, and often living in informal tent communities that lack basic sanitation or drinking water, adds complexity and urgency to all of the preceding discussion [151].

While the City of Portland has articulated a set of anti-displacement policies [67], it is worth noting that none of the policies to achieve the goal of equitable access to housing (impact analysis, gentrification/displacement risk, involuntary displacement, rebuilding communities) mention human health impacts, nor does the displacement typology document ever mention pollution. Similarly, the city’s “Historical Context of Racist Planning” [10] never mentions air pollution or its health impacts. These contrast dramatically with urban planner Sarah Pearlman’s [152] Environmental Justice Scorecard for Portland neighborhoods, which includes considerations of superfund site proximity, highway proximity, rail lines, food deserts, industrial zoning, lack of playgrounds, urban heat islands, and air pollution, all of which impact human health and development.

Concerns about urban planning and justice are not restricted to Portland; new ideas are needed everywhere. Green gentrification and environmental racism are real in Barcelona [153], southern California [154], Atlanta [155], Shanghai [156,157], Vancouver, B.C., Canada [158], Brooklyn, N.Y. [159] and many elsewhere [160]. Environmental gentrification (EG) activists are developing strategies to try to employ, some of which can be differentiated from those of environmental justice (EJ) activists:

... three EG strategies that differ from those used in EJ activism, as they are enabled by the intertwined processes of gentrification and urban environmental change: leveraging environmental policies and participating in neighborhood redevelopment planning, collaborating with ‘gentrifiers’, and utilizing complementary policy schemes. While EJ activists have used scientific studies to motivate public agencies and corporations to respond ... EG activists have found ways to successfully leverage environmental policies and regulations to oppose inequitable socio-economic and environmental impacts [40].

Faber and Kimelberg note that:

While a focus on the inequitable outcomes associated with top-down, elite-sponsored environmental improvement efforts is crucial, it does not obviate the need to also examine the consequences of bottom-up, community-driven struggles by people of color and working-class Whites to advocate for cleaner, healthier neighborhoods [161].

They go on to discuss four kinds of strategies to prevent green gentrification, market-based approaches that focus on the consumer, institutional approaches based on housing market interventions, activist approaches that change the narrative, and contractual approaches through community benefit agreements [161].

12. A Better Way Ahead for Planning in Portland?

We can turn our attention now to our second and third major questions, in brief: what should Portland do now, and can we think about this in a new way to achieve equitable, healthier and integrated neighborhoods for everybody? What can promote neighborhood ‘livability’ and reduce the exposure of poorer communities to pollution without simultaneously driving gentrification and displacement?

The central role of environmental toxin exposures on human health already discussed is based on a recent and rapidly growing area of knowledge. Rather than what has been tried already, planning processes based on either achieving traffic and infrastructure goals, or on promoting and preserving the kind of walkable neighborhoods described by Jane Jacobs, a planning process focused on our growing understanding of environmental impacts on human health might be able to produce more equitable results. It is worth briefly thinking about what might have been done differently if human health and wellbeing for all city residents had been Portland's central concern.

If the protection and promotion of human health had been the touchstone for earlier planning in Portland, given that air pollution from traffic has negative health impacts for people living close to a highway [162], I-5 and I-405 might not have run through the city, but been constructed as peripheral beltways to avoid increasing the pollution load of bisected residential neighborhoods. We know now that "... ultrafine particles, carbon monoxide, NO₂, black carbon, polycyclic aromatic hydrocarbons, and some metals are more elevated near roads" [162]. Identifying individual toxins near highways as having specific health impacts is difficult due to the chemical cocktail involved, but "Individually or in combination, these are likely to be responsible for the observed adverse effects on health" [162]. The potential health impacts of proximity to highways are known to include:

... negative health impacts, such as reduced lung function, low birth weights, and increased asthma and risk of heart failure, for individuals living within 300 m of major roadways ... [163].

In the US, transportation projects designated as "projects of local air quality concern (POAQC) ... through interagency consultation among federal, state, and local air quality and transportation agencies ..." are already required to undergo a transportation conformity hot-spot analysis, and a "... key factor for transportation conformity is to weigh whether background concentrations plus an expected project increment will be below the NAAQS" (National Ambient Air Quality Standards) [163]. A process of "hot spot analysis" using NAAQS compliance promotes non-deterioration of human health. It is important to note that not all similar projects would have the same local air quality impact due to very specific characteristics, including:

... the traffic mix and volume, the age of vehicles, vehicle speed, meteorological conditions, local topography, and the built environment, including roadway geometry and the presence of barriers or sound walls ... [163].

Some of these characteristics (e.g., vehicle speed, roadway geometry, presence of barriers or sound walls) are amenable to modification when initial local hot-spot analysis shows a project would have an unacceptable result for human health. Local characteristics are critical to good decision making here; Mukherejee et al. [163] showed that while many sites near roadways had significantly positive PM 2.5 increments, some had no significant change and a minority had less particulates when close to the road. The latter phenomenon could have many contributing factors:

... formation of secondary PM from on-road emissions occurring downwind (i.e. away from the road), decreased secondary organic aerosol (SOA) formation rates in the near-road environment, the prevalence of other low-volume vehicular and local, non-vehicular sources of emissions at the non-near-road sites (e.g. railyards, truck yards, ports, biomass-fueled heating, backyard barbecuing, and commercial cooking, etc) and local meteorology (e.g. wind speed and wind direction) explain this finding [164].

Using preventing human health impacts as a guideline, the infrastructure project demolitions associated with the civic auditorium, civic arena, Lloyd Center Mall, and other projects might have had to be accompanied by the construction of suitable replacement housing for displaced residents that provided greenspace access and access to other amenities and transportation options. If providing those things to the communities of residents to be displaced was too expensive, then rather than promoting benefits for some people by placing the burden of the projects on less wealthy communities (generally comprised of people of color) the city might have had to decide that it could not afford the projects.

The Interstate Avenue light rail project, where subsequent gentrification and displacement from the surrounding neighborhood were predictable, would also have required healthy and affordable housing to be constructed to guarantee continuity of housing for the local community. Perhaps a “just green enough” standard could have been applied for the new light rail on Interstate Avenue to avoid gentrification and displacement.

In neighborhood improvement projects, neither “just green enough” decisions to prevent gentrification and displacement [165], nor including replacement housing for current residents to prevent displacement due to gentrification, could reasonably be expected to prevent all the human health impacts. For the people who did decide to leave, residential displacement due to gentrification has negative impacts on healthcare access and on mental health [166]. For prior residents who remain after gentrification, there can also be negative health impacts [167]. Both of these groups would require mitigation strategies and expenditures if human health concerns were a focus of urban planning.

Conceptual models that incorporate planning decisions with environmental justice are being proposed. Cole et al. [168] presented a “Green Gentrification and Health Equity model” as a framework for deciding whether gentrification associated with green spaces will modify the effect on health of exposure to green spaces, and Oscilowicz et al. [169] based a discussion on four environmental-justice-driven policies and tools from the “Policy and Planning Tools for Urban Green Justice” report [170]. Corburn [171] described a series of frameworks using a structural racism approach to study urban environmental justice.

13. Conclusions

In Portland, minority groups have less access to healthy green space, are exposed to a higher level of air and other pollutants, and experience worse outcomes for COVID-19. Other injustices include a history of redlining, and a lack of loans and the capacity for investment for minority communities, leading to the accumulation of relatively less inter-generational wealth. Highway construction through minority neighborhoods, or demolishing them to replace them with hospitals, convention centers or performance venues, have produced dramatic injustices. Minority and less affluent communities have had less voice in planning or decision making (i.e., part of the conditions that define marginalization) as well. Gentrification leading to displacement, often “green gentrification,” remains an ongoing process that destroys established communities.

Portland has a half-century history of progressive urban planning that has, in its own way, unintentionally caused the same sorts of damage to minority communities as the preceding era of intentional displacement, fracturing, and impoverishment of the Albina neighborhood. If Portland wants to find a new path forward to an urban planning that is inclusive, it needs to engage all the stakeholders, work to remedy past damage to minority communities, and work to prevent such damage in the future. Crucially, we know enough about disproportionate health risks now that air quality, and especially the health of infants and children, could become a central focus of urban planning. None of this will be quick, simple, or painless. Structural racism embedded in elements of public administration and other parts of society might have produced many of the injuries described to Portland’s minority communities, regardless of the paradigm of urban planning employed, and a real remedy will require many sorts of systemic changes.

Portland could promote an urban planning approach that connects to both environmental health and environmental justice. The ‘contradictions and tensions’ in Jane Jacobs’ work remain worth exploring [8], but new conceptualizations of urban planning could be implemented now [169–171] and connect strongly to a focus on human health [63,140,162]. Jane Jacobs began *The Death and Life of Great American Cities* [29] by saying ‘This book is an attack on current city planning and rebuilding’. The results of decades of traffic-and-infrastructure-based planning, followed by the health and justice impacts of a half century of progressive urban planning, suggest that it is time for a new evaluation, attack, and the adoption of a different process.

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