Urban Green Space and Green Gentrification: The New York City High Line

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction to Green Gentrification

In just twenty six years, 71 neighborhoods in the New York City metro region transitioned from low-income neighborhoods to having a median household income of $140,000 – more than 200% of the median income of New York City ("New York - Gentrification and Displacement," n.d.). Gentrification is a phenomenon that occurs when a low value neighborhood becomes high value due to new businesses and people moving in. This shift causes a rise in rent, mortgage, and property tax which has the potential to displace residents and business owners. Resulting displacement can have serious effects on the health of those displaced; gentrified populations often have shorter life expectancy, high cancer rates, birth defects, infant mortality, and higher rates of asthma, diabetes, and cardiovascular disease (*CDC - Healthy Places - Health Effects of Gentrification*, 2017). These health risks alone are enough to encourage the consideration of all communities in urban design. Gentrification can occur as a result of the development of urban green space such as parks, green roofs, etc. These developments result in higher property values which displace residents, and in this case, it is called green gentrification. This paper aims to uncover the causes and effects of green gentrification caused by urban green space development in a case study of the High Line, a linear park in New York City.

Methods

The research question of how best to create equitable urban green space will be addressed by a literature review of studies on green gentrification and the High Line separately, as well as green gentrification in relation to the High Line. Critical background information about the causes and effects of green gentrification will be important in the consideration of urban green space and its ultimate impact. Jo Black and Richards study "Eco-gentrification and who benefits

from urban green amenities: NYC's High Line" highlights green gentrification (or as they call it, eco-gentrification) surrounding the High Line. The STS framework technological politics will help to examine the political and social implications (whether or not they are intentional) behind the reasons urban green space is inaccessible, and the result that building urban green space has in communities. In this paper, I will first establish why green space is necessary and access to it is inequitable, then use the High Line as an example of a technology which exerts political and social power over disadvantaged groups.

Urban Green Space

Neighborhood public open space has been shown to be positively associated with sense of community (Francis et al., 2012). A study on the Sunnyside Piazza in Portland, Oregon, showed that the transformation of an intersection from a place for cars into a neighborhood gathering space resulted in a greater sense of community and even improved mental health (Semenza, 2003). Urban design in US cities often leaves much to be desired; approximately one third of people in the largest 100 cities in the US have to walk over ten minutes to reach a park (Tomer, 2019). Additionally, access to parks and green space is not equitable. Income and level of education have been shown to be correlated with access to urban green space (Nesbitt et al., 2019). In recent years, urban planners have been emphasizing the importance of nature and green space in cities for these reasons. However, United States and global cities still struggle with creating these spaces – and doing so equitably.

Green gentrification

Although green spaces are less accessible to communities of color or low income, bringing green spaces to these communities also presents challenges. According to the Barcelona Laboratory for Urban Environmental Justice and Sustainability, "Green gentrification refers to

processes started by the implementation of an environmental planning agenda related to green spaces that lead to the exclusion and displacement of politically disenfranchised residents," (*Green Gentrification*, n.d.). What this means is that introduction of green spaces, while done possibly in the best interest of the community, can ultimately do more harm than good. Property values will rise when green space is introduced, which potentially prices out current residents. Since low-income residents are likely to be renting, while high-income residents are more likely to own, the low-income residents experience rising rent prices, and high-income residents experience the benefits of a higher property value, or can earn even more profit off of renters. This is what has occurred in New York City with properties surrounding the High Line.

The NYC High Line

The High Line is an elevated linear park in New York City that was built on a defunct railroad line. There are many parks that follow the same idea of turning an old rail line into public green space, including the Atlanta BeltLine and The 606 in Chicago (Hansen, 2020). Projects like these capitalize on something dense cities have plenty of: vertical space. Real estate in cities like New York is obviously expensive, and The High Line takes advantage of space that is currently being unused and turns it into public green space. The space consists of 1.45 miles of gardens of native plants, art, and performances. The High Line is also a nonprofit organization which claims it is "reimagining the role public spaces have in creating connected, healthy neighborhoods and cities," (*Overview*, n.d.). The High Line has undoubtedly provided a place for communities to gather and connect, but that does not mean that the results were all advantageous.

STS Framework – Technological Politics

Technological politics is an STS framework set forth by Langdon Winner. He explains that technologies perform not only technical work but also social and political work (Winner, 1980). The most iconic example of an application of technological politics is a number of low overpasses over highways around New York City from the 1920s through the 1970s (Winner, 1980). These low overpasses kept buses from reaching public beaches, meaning only those who can afford a personal vehicle could reach the beach, effectively banning low income and ethnic minority communities from the beach. This is only one example of a technological development having social and political effects, reinforcing and maintaining power structures and privilege among white, wealthy citizens.

Technological politics is somewhat of a compromise between social construction of technology and technological determinism. Winner proposes that social construction of technology ignores the technical design completely and focuses only on the social context in which the technology functions, and that technological determinism ignores the social and political implications that go into a technology. Criticism of technological politics include that Winner suggests that the idea is not to study the impacts of technology, but "evaluating the material and social infrastructures specific technologies create for our life's activities," and that is impossible to do without studying the effects and impacts (Donnelly, 1990; Winner, 1980). Winner also only identifies technologies which have problematic political structures by examining the results of their implementation (Donnelly, 1990).

When considering the High Line and its effects of green gentrification, technological politics is an applicable framework. When creating urban green space, whether it be a simple park, a green roof, or the New York City High Line, there are going to be social and political

consequences. If creating green space has the potential to displace residents from their previously established neighborhoods and communities, designers and planners must consider this in their building process. That may mean including communities in design to determine what is best for the neighborhood, or it may mean scaling down a project, since a project as large as the High Line is bound to bring in many tourists, create a "view" from an apartment window, and raise property values substantially.

Results and Discussion

Due to unequal access to green space, there has been a relatively recent uptick in construction of new parks. The High Line is an example of this, but has resulted in green gentrification. Since opening the High Line, the Chelsea neighborhood has experienced a great increase in property values, besides the two public housing projects on either end of the High Line. To prevent displacement of residents in low-income or non-white park-starved neighborhoods, designers need to take into account what the community needs and asks for during design.

Need for Green Space

For years it has been proven that public open space and public green space are associated with improved mood, higher levels of physical activity, and sense of community (Francis et al., 2012; Kondo et al., 2018). Public green space provides the community's residents a place to gather to socialize, exercise, and since March 2020, public parks have been one of the very few places that people can safely do so while socially distanced. Early research and studies have shown that there could be a correlation between public green space and reduction in violent crime (Shepley et al., 2019). The American Planning Association (APA) published a series of brochures meant to share with citizens the many ways that cities benefit from parks, including:

community revitalization, creating safe neighborhoods, promoting public health as well as arts and cultural programs, etc., (*City Parks Forum*, n.d.). The National Recreation and Park Association states "Parks and recreation have three values that make them essential services to communities: Economic value, health and environmental benefits, and social importance," (*How Cities Use Parks for Community Revitalization*, n.d.). Every community should have access to parks and thus access to these important aspects of their community.

Unequal Access to Green Space

Although it is clear that public green space adds to communities and has many beneficial aspects, these benefits are not equally distributed. 100 million Americans have to walk more than 10 minutes to reach the nearest park (Chapman, n.d.). The parks that do exist are heavily concentrated in white, high income, and highly educated neighborhoods (Nesbitt et al., 2019). This means that non-white, low-income, and lower education residents lack access to urban green space that white, high-income residents receive. There is a long history in the United States of redlining, which occurs when communities of marginalized people do not receive the same investments as other more privileged communities. For example, in the 1930s, the government labeled historically Black neighborhoods in Richmond, Virginia, such as Gilpin and Jackson Ward as "risky investments," and to this day due to the lack of tree canopy cover, these neighborhoods can be several degrees hotter than white neighborhoods in the area (Plumer et al., 2020). Inequality of access to nature occurs in cities all over the U.S. and the world; it is a systemic issue which demands attention and effort to diminish its effects.

These disparities in access to public green space highlight the United States' long history of issues with race and socioeconomic status. If the construction of urban green space is seen as the installation of new technology, then its effects on the social hierarchy and power dynamics

that already exist can be considered with Langdon Winner's theory of technological politics. In Winner's article "Do Artifacts Have Politics?" he uses the example of Robert Moses construction low bridges which would not allow buses on the roads, effectively banning any low-income people and minorities from accessing Jones Beach, Moses's public park (Winner, 1980). This example of technology's political effects is quite intentional; whether the inequity in access to green space was intentional or unintentional is unclear, but the consequences are equally as unjust. Parks that exist in rich, white areas but not in poor, non-white areas emphasize the already existing privilege and power dynamic between those groups. To fully evaluate the effects of urban green space, these differences must also be considered.

Building New Parks

An obvious solution to the lack of access to parks and greenery is to build new parks and create more public space. The APA cites parks as a use to promote economic development and community revitalization (*How Cities Use Parks for Community Revitalization*, n.d.). There have been movements towards building new parks in recent years, but in some instances these new parks have been too large and grand, a prime example of which is the High Line in New York City. When the West Side Elevated Line was designed and built in the 1930s by Robert Moses, the area surrounding it was redlined – the Chelsea area mostly inhabited by low-income people and people of color (Jo Black & Richards, 2020). As previously demonstrated, redlined areas and low-income or non-white neighborhoods are the most likely to be lacking in access to green space. Due to this inequality, in the 1990s when deciding how to reuse the elevated rail line, it seemed a good idea to create a linear park which would create access to green space in a place already industrially developed with minimal access to horizontal real estate.

Figure 1: Map of the High Line (Jo Black & Richards, 2020)

The first section of the High Line opened in 2009, and more opened in 2012 and 2014. The High Line is now a 1.45-mile-long park above the Chelsea area. Figure 1 shows a map of the High Line in New York City as it exists today. Katie Jo Black and Mallory Richards of Kenyon College published a study in 2020 on the eco-gentrification surrounding the High Line which explores housing values in relation to views of green space and the specific effects on the local economies and communities immediately surrounding the High Line. Their study used Geographic Information Systems (GIS) "to spatially model the effects of the High Line on residential property values," where they found that homes within 80 meters of the High Line have a 35.3% higher sale price than similar homes between 80 and 800 meters from the High Line (Jo Black & Richards, 2020). Low-income residents are more likely to rent, while higher-income residents are more likely to own their homes. This means that any rise in property values for home-owners increases their already existing wealth, but that same rise in value just increases

rent and possibly makes low-income residents' homes unaffordable (Jo Black & Richards, 2020). Figure 2 shows Jo Black and Richards GIS data which shows a 67.11% or more percent change in median gross rent in the blocks immediately surrounding the High Line between the time periods of 2009-2013 and 2014-2018 (Jo Black & Richards, 2020). This rapid change is likely to make it very difficult for low-income residents to remain in their neighborhood, while raising the property value and bolstering the real estate investments of the wealthy.

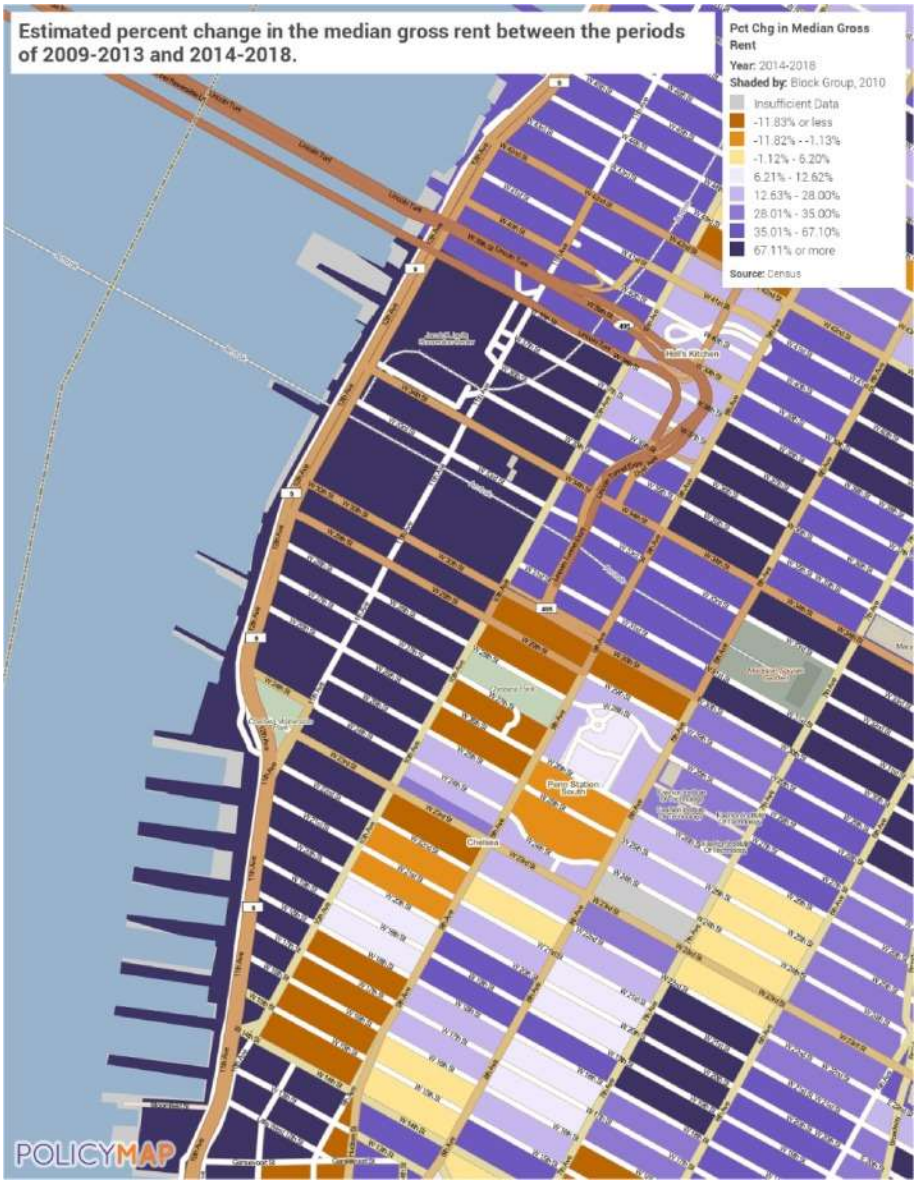

Figure 2: Percent Change in Median Gross Rent between 2009-2013 and 2014-2018 (Jo Black & Richards, 2020)

The High Line changed the demographics of renters and homeowners in the area, but it also changed the entire landscape. Karen Matthews says about it,

> In the beginning, the park was remarkable for its ability to lift visitors above the streetscape to a perch with unique vistas over mostly low-rise rooftops. It was a park in the sky. Now, it's nestled in a canyon of tall, luxury condominium buildings that have sprouted along its sides. Still cool, but different, and often choked with out-of-town visitors. (Matthews, 2019)

Jo Black and Richards also explore this change using what they call the vertical premium gradient; they concluded that highest elevated residences (those on the third floor or higher) experienced the greatest increase in value (Jo Black & Richards, 2020).

The High Line functions as an urban green space, which initially had the goal of providing green and public space to a community that was lacking it. However, it essentially did the opposite. The High Line draws in users of a higher economic status who can afford the rapidly rising rent prices, or similarly wealthy buyers of condos, while the renters in the existing low-income Chelsea area are pushed out because they can no longer afford their rent unless it is rent controlled. It can clearly be seen that the High Line's technology further emphasizes the already existing power structure between the Chelsea area neighborhoods of low-income and people of color that were initially redlined in the 1930s and the wealthy population of New York City. The High Line surely was not intended to push people out of their neighborhoods, but intentions do not matter so much as results. When using Winner's theory of technological politics, the social consequences of the High Line must be considered to fully evaluate its value. On paper, building the High Line created more green space in an area that was in a deficit of it; but the consequences that community faces may be much more significant while not even providing the benefits promised.

Part of the High Line's problem could be attributed to the scale on which it functions. When co-founders Robert Hammond and Joshua David first had the idea to create the High Line, their intention was to create a smaller park attracting around 300,000 visitors a year (Bliss, 2017). The Chelsea neighborhood is one of the most park-starved neighborhoods in New York City, and creating green space would change that (Reichl, 2016). However, the park evolved into something much larger than intended. The High Line drew in 8 million visitors in 2016, more than any other tourist attraction in New York City (Bliss, 2017). Only 6% of the High Line's visitors in 2015 were from the High Line area (Zolotarsky, 2016). Despite about a third of Chelsea residents being people of color, the High Line's visitors remain largely white (Bliss, 2017). This means that the High Line is no longer functioning to serve the community. The residents of Chelsea are not the ones reaping the benefits of this park; rather, it is high-end private developers who seek to profit off of an influx of high-income new residents, tourists, and businesses.

Robert Hammond says of the design process, "Instead of asking what the design should look like, I wish we'd asked, 'What can we do for you?' Because people have bigger problems than design," (Bliss, 2017). During design, the community was only asked about the small aspects of design, such as which color paint to use, not the bigger questions that would have allowed the park to benefit the community more (Bliss, 2017). Later, Hammond spoke with residents of the public housing communities surrounding the High Line, and found that what the community needed were jobs and an affordable cost of living (Bliss, 2017). If the right questions had been asked from the beginning, a more equitable design could have been reached. The rates for public housing developments have not gone up, but there is a constant threat of public housing being repurposed for redevelopment, such as a mixed-income community (Bliss, 2017).

There are still questions as to whether mixed-income communities work, but they definitively decrease the number of low-income housing units available, effectively pushing poor people out of their homes and neighborhoods.

Mitigating the Effects

Low-income and non-white areas are lacking access to parks, but building green space can result in gentrification. This paradox can seem impossible to solve, but it has birthed a theory of building cities to be "just green enough,"(Curran & Hamilton, 2012). Through a case study of Greenpoint in Brooklyn, Curran and Hamilton determined that the best way to avoid gentrification is to involve the community for which green space is being built. The community in Greenpoint was not looking for "parks, cafes, and a riverwalk," but rather environmental cleanup and a space they would want to use (Curran & Hamilton, 2012). "The 'just green enough' strategy organizes for cleanup and green space aimed at the existing working-class population and industrial land users, not at new development," which is exactly what the High Line did not do (Curran & Hamilton, 2012).

An ongoing example of involving the community in green design is the 11th Street Bridge Park in Washington, D.C., which will link the low-income Black neighborhood of Anacostia with the rich Capitol Hill. The nonprofit organization the Local Initiatives Support Corp. invested $50 million to work against displacement east of the Anacostia River (O'Connell, 2016). Scott Kratz, the director of the 11th Street Bridge Park project says that "Going out and getting permission, and then having the community shaping every aspect, has been critical," (Bliss, 2017). The project design is set to be finished in May of 2022 when the process to select a contractor will begin, but the community has been involved in every step of the design, and 35%

of the subcontractors will be local, minority-owned firms (*Build – Building Bridges Across the River*, n.d.).

Another tactic for creating green space that communities will benefit from is to design smaller. The High Line is a hundred-million-dollar project that no one in the community particularly asked for. It has been proposed that creating much smaller parks, incorporated into the city on a smaller scale, could diminish the effects of green gentrification (Wolch et al., 2014). Investing in parks at a smaller scale would be less likely to draw in newcomers to the community, and they become less attractive to large-scale developers looking to create a new market to make money off of. This idea has also been disputed, since Alessandro Rigolon's 2020 study found that park size across 10 U.S. cities had no statistically significant effect on gentrification. However, this study also found that "greenway parks" like the High Line and its siblings, the 606, the Atlanta Beltline, etc., are more likely to gentrify than any other type of park (Rigolon, 2020).

Limitations of this research include limited data surrounding green gentrification – the phenomenon is relatively new, only occurring in the past 30 or so years. This means that it may be too early to tell the true political consequences of constructing urban green space in some areas. At this time, most data are so preliminary that studies done across many different cities and countries result in greatly differing results. It is difficult to extrapolate one clear solution across so many differing cultural, political, and social climates all over the world. Future research will evolve as time goes on and the political implications of green infrastructure become more obvious. As researchers and planners try new strategies to mitigate the effects of green gentrification while implementing urban green space, a solution may arise.

Conclusion

Creating urban green space should be a priority in our society. Increasing access to public green space increases sense of community, mental wellness, and physical activity, and areas of non-white and low-income residents are lacking this access. To do so ethically, however, requires much more than simply building new parks. Considering the social and political consequences of new parks and repurposing space is critical to ensure that the people who need those resources are actually the people who receive them. To build a good park, the community must be involved. A designer must know what the community needs to build green space that serves those needs.

References

Bliss, L. (2017, February 7). *The High Line and Equity In Adaptive Reuse—Bloomberg*. https://www.bloomberg.com/news/articles/2017-02-07/the-high-line-and-equity-in-adaptive-reuse

Build – Building Bridges Across the River. (n.d.). Retrieved March 20, 2022, from https://bbardc.org/build/

CDC - Healthy Places—Health Effects of Gentrification. (2017, June 8). https://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm

Chapman, R. (n.d.). *Parks and an equitable recovery*. Trust for Public Land. Retrieved March 15, 2022, from https://www.tpl.org/parks-and-an-equitable-recovery-parkscore-report

City Parks Forum. (n.d.). American Planning Association. Retrieved March 19, 2022, from https://www.planning.org/cityparks/

Curran, W., & Hamilton, T. (2012). Just green enough: Contesting environmental gentrification in Greenpoint, Brooklyn. *Local Environment*, *17*(9), 1027–1042. https://doi.org/10.1080/13549839.2012.729569

Donnelly, R. W. (n.d.). *The politics of technology: A critique of the work of Langdon Winner*. 135.

Francis, J., Giles-Corti, B., Wood, L., & Knuiman, M. (2012). Creating sense of community: The role of public space. *Journal of Environmental Psychology*, *32*(4), 401–409. https://doi.org/10.1016/j.jenvp.2012.07.002

Green Gentrification. (n.d.). Barcelona Lab for Urban Environmental Justice and Sustainability. Retrieved October 25, 2021, from http://www.bcnuej.org/green-gentrification/

Hansen, K. (2020, August 13). *Not Just the High Line: 10 Lovely Parks That Used to Be Railroad Lines* (World) [Text]. Fodors Travel Guide. https://www.fodors.com/news/photos/not-just-the-high-line-10-lovely-parks-that-used-to-be-railroad-lines

How Cities Use Parks for Community Revitalization. (n.d.). 4.

Jo Black, K., & Richards, M. (2020). Eco-gentrification and who benefits from urban green amenities: NYC's high Line. *Landscape and Urban Planning*, *204*, 103900. https://doi.org/10.1016/j.landurbplan.2020.103900

Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2018). Urban Green Space and Its Impact on Human Health. *International Journal of Environmental Research and Public Health*, *15*(3), 445. https://doi.org/10.3390/ijerph15030445

Matthews, K. (2019, June 9). NYC's High Line Park Marks 10 Years of Transformation. *NBC New York*. https://www.nbcnewyork.com/news/local/nycs-high-line-park-marks-10-years-of-transformation/1646268/

Nesbitt, L., Meitner, M. J., Girling, C., Sheppard, S. R. J., & Lu, Y. (2019). Who has access to urban vegetation? A spatial analysis of distributional green equity in 10 US cities. *Landscape and Urban Planning*, *181*, 51–79. https://doi.org/10.1016/j.landurbplan.2018.08.007

New York—Gentrification and Displacement. (n.d.). *Urban Displacement*. Retrieved February 6, 2022, from https://www.urbandisplacement.org/maps/new-york-gentrification-and-displacement/

O'Connell, J. (2016, May 3). Nonprofit commits $50 million to prevent gentrification east of the Anacostia River. *Washington Post*.

https://www.washingtonpost.com/news/digger/wp/2016/05/03/non-profit-commits-50-million-to-prevent-gentrification-east-of-the-anacostia-river/

Overview. (n.d.). The High Line. Retrieved October 26, 2021, from https://www.thehighline.org/about/

Plumer, B., Popovich, N., & Palmer, B. (2020, August 24). How Decades of Racist Housing Policy Left Neighborhoods Sweltering. *The New York Times*. https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html

Reichl, A. J. (2016). The High Line and the ideal of democratic public space. *Urban Geography*, *37*(6), 904–925. https://doi.org/10.1080/02723638.2016.1152843

Rigolon, A. (2020). *Green gentrification or 'just green enough': Do park location, size and function affect whether a place gentrifies or not?* https://journals.sagepub.com/doi/abs/10.1177/0042098019849380?journalCode=usja

Semenza, J. C. (2003). The Intersection of Urban Planning, Art, and Public Health: The Sunnyside Piazza. *American Journal of Public Health*, *93*(9), 1439–1441. https://doi.org/10.2105/AJPH.93.9.1439

Shepley, M., Sachs, N., Sadatsafavi, H., Fournier, C., & Peditto, K. (2019). The Impact of Green Space on Violent Crime in Urban Environments: An Evidence Synthesis. *International Journal of Environmental Research and Public Health*, *16*(24), 5119. https://doi.org/10.3390/ijerph16245119

Tomer, J. K. and A. (2019, August 21). Parks make great places, but not enough Americans can reach them. *Brookings*. https://www.brookings.edu/blog/the-avenue/2019/08/21/parks-make-great-places-but-not-enough-americans-can-reach-them/

Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, *109*(1), 121–136.

Wolch, J. R., Byrne, J., & Newell, J. P. (2014). *Urban green space, public health, and environmental justice: The challenge of making cities "just green enough."* https://doi.org/10.1016/j.landurbplan.2014.01.017

Zolotarsky, M. (2016). *Visualizing Visitor Data* [Infographic]. https://indd.adobe.com/view/4c7159a4-7728-4f50-8154-d6ff6559afda?ref=idm