OVER PRICED OR UNDER WATER
GREEN GENTRIFICATION IN GENTILLY, NEW ORLEANS

By

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DEDICATION

This thesis is dedicated to the students at Langston Hughes Elementary School and the multiple families in New Orleans who commute from all over the city to get to school and work. These families are oftentimes struggling with health effects of the inadequate housing conditions and the region's poor air quality and boiling water when the warnings occur. In addition to paying for heat and air conditioning. People are continuously fighting and struggling for better education, quality of life, a higher minimum wage, cleaner environment, and protections from the looming threat of climate change. It is also dedicated to future generations and the resistance we are encouraging within them. This writing is dedicated to the multiple social movements and Black and Indigenous organizers who are constantly inspiring me and my work and are always pulling on the threads of intersectionality throughout our movements; Blights Out and Mariama Eversley, L'Eau est La Vie Water Protectors fighting the Bayou Bridge Pipeline and Klie Bert, Take 'Em Down NOLA and Michael "Quess" Moore, my fellow organizers at the New Teachers Round Table, European Dissent, and the Gulf Restoration Network, and my friends and loved ones in New Orleans.

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ABBREVIATIONS

ACS	American Community Survey
BGI	Blue and Green Infrastructure
CAP	Community Adaptation Program
CBPAR	Community-Based Participatory Action Research
CDBG	Community Development Block Grant
CDBG-NDR	National Disaster Resilience Competition
CIA	Community Improvement Agency
CLT	Community Land Trust
CBPAR	Community-Based Participatory Action Research
CPAR	Critical Participatory Action Research
ED	Executive Director
EO	Executive Order
EJ	Environmental Justice
EJM	Environmental Justice Movement
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GI	Green Infrastructure
GI-IMI	Green Infrastructure Installation, Maintenance, and Inspection
GIS	Geographic Information Systems
GNO	Greater New Orleans, Inc.
GNOCDC	Greater New Orleans Community Data Center
GNOFHAC	The Greater New Orleans Fair Housing Action Center

GRD	Gentilly Resilience District
HANO	Housing Authority of New Orleans
HBCU	Historically Black College or University
HMGP	Hazard Mitigation Grant Program
HUD	Department of Housing and Urban Development
IL	Implementation Leads
JFF	Jobs for the Future
JPNSI	Janes Place Neighborhood Sustainability Initiative
LEED	Leadership in Energy and Environmental Design
LHA	Langston Hughes Academy
LRA	Louisiana Recovery Authority
LULU	Locally Unwanted Land Uses
NAACP	National Association for the Advancement of Colored People
NDRC	National Disaster Resilience Competition
NGO	Non-Governmental Organization
NOFA	Notice of Funding Availability
NORA	New Orleans Redevelopment Authority
NOORS	New Orleans Office of Resilience and Sustainability
ONE	Office of Neighborhood Engagement
ORS	The Office of Resilience and Sustainability
PCBs	Polychlorinated Biphenyls
SUDS	Sustainable Urban Drainage Systems
SWBNO	Sewerage & Water Board of New Orleans

UCC	United Church of Christ
UPE	Urban Political Ecology
USEPA	United States Environmental Protection Agency
ZHVI	Zillow Home Value Index
ZHVF	Zillow Home Value Forecast

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ABSTRACT

Environmental gentrification research has tracked how neighborhoods have changed over time in relation to either the transformation of a former brownfield site or the addition to a new environmental amenity like a park or greenway (Becerra, 2013; Pearsall, 2010). Additionally, the literature has built upon these findings to ask questions about the entire process of environmental gentrification (Angluevoski, 2016; Checker, 2011) and employed qualitative methods alongside a temporospatial analysis. This paper analyzes green gentrification in the Gentilly neighborhood of New Orleans, Louisiana. New Orleans is threatened by a combination of high levels of air and water pollution from years of environmental racism, rising sea levels from human-induced climate change, and sinking land from both human and geological forces. Green gentrification is the process of displacement through rising home value and associated costs (such as increased insurance, tax rates, and rising mortgages) when the neighborhood receives environmental goods and benefits that were not present formerly. Through closely examining the Gentilly Resilience District, a federally funded and city-implemented water management project in its beginning stages, this research has shown that the planning process has not been inclusive of the Gentilly residents who will be directly affected or impacted by the twelve different green infrastructure projects being implemented in Gentilly. According to the New Orleans City Government, the purpose of the Gentilly Resilience District is to "reduce flood risk, slow land subsidence, and encourage neighborhood revitalization." The city of New Orleans was awarded more than $141 million through the National Disaster Resilience Competition (NDRC) to implement elements of the Gentilly Resilience District proposal. In the summer of 2018, while a majority of the fieldwork was being completed for the thesis, participant observation and stakeholder interviews were conducted in order to understand how the voices of residents of Gentilly were or were not included in the planning of this new resilience district. Through examining the responses to survey and interview questions, this thesis also assesses whether or not consensual politics and procedural justice of the planning of the Gentilly Resilience District will impact the gentrification of Gentilly.

CHAPTER 1: Introduction

Between 2014 and 2017, I had the privilege of teaching outdoors in a garden as an environmental science teacher at Langston Hughes Academy (LHA) in New Orleans, Louisiana. During the summer of 2015, I taught a summer course for Middle School students about water management and the effects of climate change. We spent the summer in the neighborhood of Gentilly at Arthur Ashe Elementary and Middle school designing and installing a rain garden on the campus. Its purpose was to move rain away from the foundation of the building and reduce flooding in the surrounding area. The school was a public charter school, meaning students were bussed in from all over the city, with a majority coming from New Orleans East (Firstlineschools.org, 2015). While some students lived in Gentilly, the majority of families who attended Arthur Ashe could not afford to live in the surrounding area.

While Gentilly is a mixed-income neighborhood, it has been experiencing rising home values in the years Post-Katrina, with prices rising significantly over the last five years (Zillow.com). The rain garden we designed collectively was inspired by a project installed in 2014 by the New Orleans Redevelopment Authority (NORA), which was located only a few blocks away. On our many walks through the neighborhood that summer to study the Wildair Drive Rain Garden, we noticed empty lots, newly constructed homes, cars with out-of-state license plates parked in driveways, and other signals of a changing neighborhood. Single-story, 1,200 square-feet, ranch-style homes that neighbored the rain garden sold for $56,000 in 2005 (Pre-Katrina) were now listed between $140,000 and $245,000 (Zillow.com). Arthur Ashe Charter School is located within Gentilly in the Filmore neighborhood to the east of Bayou Saint John and City Park. While these environmental amenities had existed even before the

communities were built around them, access to water and greenery have continued to be selling points for real estate companies for decades (Checker, 2011).

Environmental gentrification research has tracked how neighborhoods have changed over time in relation to either the transformation of a former brownfield site or the addition to a new environmental amenity like a park or greenway (Becerra, 2013; Pearsall, 2010). Additionally, the literature has built upon these findings to ask questions around the entire process of environmental gentrification (Angluevoski, 2016; Checker, 2011) and employed qualitative methods alongside a temporospatial analysis. With guidance from the Roadmap Towards Justice in Urban Climate Adaptation Research (Shi, 2016), this thesis seeks to analyze the process of resilience planning and procedural justice via the case study of the Gentilly Resilience District.

While geospatial analysis will also provide a lens through which to analyze the different proposed projects, it is important to note that this district has not yet been entirely constructed; thus each green infrastructure installation has not yet impacted the surrounding area to the extent possible. Chapters 3 and 4 of this thesis provide a historical background to the Gentilly neighborhood of New Orleans and pay close attention to the process of how the Gentilly Resilience District has come to be. The methods and findings of this historical analysis are also crucial to understanding the results, which are expanded upon and discussed further in Chapters 5 and 6. In the summer of 2018, while a majority of the fieldwork was being completed for the thesis, participant observation and stakeholder interviews were conducted in order to understand how the voices of residents of Gentilly were or were not included in the planning of this new resilience district. Through examining the responses to survey and interview questions, this thesis also assesses whether or not consensual politics and procedural justice of the planning of the Gentilly Resilience District will impact the gentrification of Gentilly.

This thesis explores the topic of environmental gentrification, defined below, in the Gentilly neighborhood in the years after Katrina, explicitly examining the Gentilly Resilience District (GRD), which is a federally funded project designed to "reduce flood risk, slow land subsidence, and encourage neighborhood revitalization" (New Orleans Office of Resilience and Sustainability, 2018). In 2016, New Orleans was awarded more than $141 million through the National Disaster Resilience Competition (NDRC) to implement elements of the Gentilly Resilience District proposal, building on existing investments in urban water management funded through the FEMA (Federal Emergency Management Agency) Hazard Mitigation Grant Program (HMGP). The GRD is providing blue and green infrastructure to manage water more effectively by investing in rain gardens and parks, which will add environmental features to the neighborhood. As scholars have demonstrated, urban real estate values rise when in closer proximity to parks or other green amenities (Campbell, 1996; Checker, 2011; Taylor, 2014;).

Environmental justice scholars explain that the closer a property or community is to a Locally Unwanted Land Use (LULUs) such as a brownfield or Superfund site (Mohai and Saha, 2006; 2007), the lower the value is of that property. In contrast, Taylor's work (2014) explains that "people will pay more for housing to avoid risks, and they will also pay a premium once sites are cleaned up and dis-amenities are transformed into desired amenities" (p. 79). Crompton (2001) reviewed over 30 studies which demonstrate that there is a positive impact of 20% or higher on property values abutting or fronting a passive park area. Further studies show (Curran, 2012; Wolch, 2014) that urban greening efforts may cause property values to rise which can lead to gentrification and the displacement of lower-income residents.

In an era of "sustainability planning" and "greening communities," critical environmental justice scholars, such as Checker, Pearsall, Agyeman, Anguelovski, and Rice, are documenting

the rise of what they have called "environmental gentrification." Checker (2011) writes that environmental gentrification "appears as politically neutral planning that is consensual as well as ecologically and socially sensitive," yet "in practice it subordinates equity to profit-minded development" (p. 12). In the forthcoming article, *Contradictions of the Climate Friendly City: New Perspectives on Eco-Gentrification and Housing Justice*, Rice et al. write that environmental gentrification describes,

> "The vicious cycle of economic disinvestment and environmental degradation that devalues urban space, followed by subsequent reinvestment and environmental remediation that increases property values and displaces existing residents. Although many terms are used to describe this phenomenon—eco-gentrification, green gentrification, and environmental gentrification—the sum of the research demonstrates that urban environmental improvements often cause the displacement of lower income (often non-White) residents by higher income (typically White) ones.
> (Rice, 2019, p. 3)

Emerging studies are also focused on climate gentrification (Keenan, 2018) in cities like Miami, which Anzilotti (2018) defines as climate change speeding up the "process of gentrification in coastal cities by constricting the supply of livable land and rendering it very expensive due to scarcity. As that happens, lower-income people will struggle to remain in place" (p. 2). This thesis introduces the concept of hazard-mitigation gentrification, which uses blue and green infrastructure among other tactics, to reduce risks and better mitigate climate change induced hazards, but can also cause displacement. In order to fully understand this process, disaster-risk reduction, hazard mitigation, blue and green infrastructure, and equitable climate adaptation will be defined in this and following chapter in the literature review. Disaster Risk Reduction as defined by UNISDR is 'the systematic development and application of policies, strategies and practices to minimize vulnerabilities, hazards and the unfolding of disaster impacts throughout a society, in the broad context of sustainable development' (UNISDR, 2004: p3). Hazard mitigation is any action taken to reduce or eliminate long term risk

to people and property from natural disasters (FEMA.gov).Through examining the case study of the Gentilly Resilience District located in Gentilly, New Orleans, Louisiana, this thesis seeks to answer three questions that deepen the concept of hazard-mitigation gentrification.

1. How do existing green amenities such as parks and green space in Gentilly effect property value? Will the new sites of the Gentilly Resilience District impact property value in the same way?
2. How does the resilience planning of The Gentilly Resilience District embody or disregard the concept of procedural justice, and does this impact residents' perceptions of gentrification?
3. What methods of outreach and community engagement are most effective in increasing residents' participation in resilience planning?

Relevant literature (Mullenbach, 2017) has shown trends towards environmental amenities and climate adaptation techniques pushing low-income or marginalized groups out of the communities in which they live. The Gentilly Resilience District is still in the early stages of being constructed and implemented, with completion expected in 2022. The neighborhood of Gentilly is predominately Black, elderly, and low to median income, making it highly susceptible to gentrification (Zuk, 2016). As of 2016, 53.6% of homes are renter-occupied (Larino, 2017). This thesis seeks to analyze the impact of the GRD on the rate of gentrification in Gentilly. As many of the projects are still in the planning phase, and relevant literature has stressed the importance of procedural justice in resilience planning, this thesis analyzes residents' participation in this project. It also analyzes home value prices nearby to pre-existing green amenities in this neighborhood as a method to understand how the GRD will impact housing costs for this neighborhood, and therefore impact current residents' abilities to live in Gentilly.

Increasing home values are not always seen as a positive influence, especially in neighborhoods that are predominately low to moderate income, lack affordable housing options, and are mainly full of renter-occupied homes. As recently as 2009, the city was majority homeowners, but due to the foreclosure crises as well as demographic shifts, it is now a city where a majority of the population rents their home (Clark, 2017). While the exact data for Gentilly is not known, there is a correlation with homeownership and age. Gentilly has a higher number of elderly residents and about 26.5% of owner-occupied homes in Orleans Parish had a head of household is between 55 and 64 years old (Census, 2016). Over half of New Orleans renters and buyers moved in after 2010.

About 57.6% of occupied homes in New Orleans in 2016 housed people who had moved there in 2010 or later. To be clear, this figure captures residents who moved from one place to another within Orleans Parish as well as those who moved in from elsewhere (Larino, 2017). About 48.7% of the owner-occupied homes in Orleans Parish had a head of household who identified as black or African-American in 2016. About 45.3% of owned homes in the city had a householder who identified as white. The number of homes occupied by a black owner has fallen slightly over the past four years, from 36,616, or 51.1 percent, in 2012 to 34,829 in 2016. That compared with 31,170, or 43.5 percent, for white homeowners in 2012 to 32,397 in 2016 (Larino, 2017). Sixty percent of the city's renter-occupied homes had a black householder, whereas 34.7% of rented homes and apartments had a householder who identified as white.

While it is well known that higher prices increase home equity and can help increase their wealth, rising home values do not always benefit neighborhoods. One inconsistency felt across the nation is that incomes haven't kept pace with home values. While the unemployment rate has dropped from 10% in October 2009 to the 5.1% in 2016 (Census, 2016), pay growth has been

slow. In 2015, hourly earnings rose just 2.2% from the previous year (Vasel, 2015). Slow-moving wage growth makes it harder for buyers to enter the market, particularly first timers and borderline borrowers. According to Zillow, low-income households dedicate 26 cents of every dollar earned on a mortgage for a bottom-tier home. At the other end of the spectrum, high-income households spend 12 cents on the dollar on a mortgage for a high-end home. While low mortgage rates have helped maintain some affordability, paying more toward housing means cutting back elsewhere. "Existing folks can get crowded out due to rising costs, limited availability of homes or rentals that are accessible to them" says Zillow's chief economist Svenja Gudell (Vasel, 2015, p. 1). Understanding how rising home values can impact low income neighborhoods is essential to the study of environmental gentrification.

This research examines the planning process and whether or not it has been inclusive of the Gentilly residents who will be directly impacted by the nine different projects proposed in this New Orleans neighborhood. Figure 1.1 orients readers to the location of Gentilly (in shaded red) within New Orleans, showing its proximity to Lake Pontchartrain, City Park, and Bayou St. John. Figure 1.2 displays a map of the Gentilly Resilience District's nine site-based projects, which will be explained in detail in Chapter 4 of this thesis.

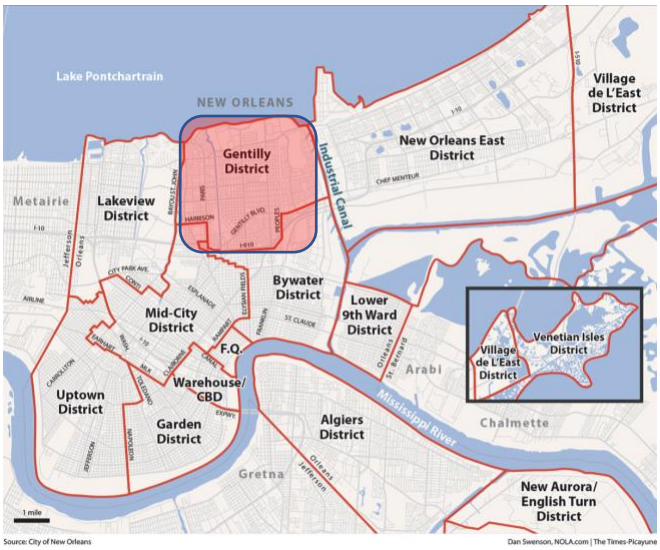


Figure 1.1: A map of New Orleans' planning districts. Source: NOLA.com, 2017

Figure 1.2: Map of the Nine Gentilly Resilience District Projects Source: Office of Resilience and Sustainability, 2018

According to the New Orleans Office of Resilience and Sustainability, the purpose of the Gentilly Resilience District is to "reduce flood risk, slow land subsidence, and encourage neighborhood revitalization." The city of New Orleans was awarded more than $141 million through the NDRC to implement elements of the Gentilly Resilience District proposal, building on existing investments in urban water management funded through the FEMA Hazard Mitigation Grant Program.

The neighborhood of Gentilly was chosen as the study site for this research as it has already experienced signs of gentrification and is now undergoing a new environmentally sustainable project to mitigate hazards related to the effects of climate change. It is promoted to encourage neighborhood revitalization amongst other goals. Gentilly is a predominately Black neighborhood with an average income of $38,681 (Census, 2018), yet compared to the rest of New Orleans this is an area that is more racially and economically diverse. There are nine smaller neighborhoods which makeup Gentilly and are inspected in this study; Dillard, Filmore,

Gentilly Terrace, Gentilly Woods, Lake Terrace & Oaks, Milneburg, Pontchartrain Park, St. Anthony, and St. Bernard Area (Greater New Orleans Community Data Center, 2016). The Zip Codes used for this area are 70122 and 70126.

Figure 1.3: Map of Gentilly and the Nine Sub-Neighborhoods Source: Greater New Orleans Community Data Center, 2016

This thesis addresses the above questions through mixed-methods research; including quantitative analysis, qualitative survey questionnaires, and ethnographic research conducted in the Gentilly neighborhood of New Orleans for four months in the summer of 2018. Bringing together scholarship on urban political ecology, climate adaptation, and environmental justice, I expand on the conversation around environmental gentrification. From May 2018 to August

2018, I used ethnographic methods including structured and semi-structured interviews with residents and practitioners either living in Gentilly or involved in the Gentilly Resilience District. I began a content analysis of any media that documented the Gentilly Resilience District in November 2017 and started having informal conversations with residents and environmental justice activists in New Orleans about their interpretations of the new urban water management plan. In May of 2018, I began conducting ethnographic research in New Orleans which included participant observation at outreach and community engagement events as well as formal interviews and surveys. I also began archival research to learn how sustainability and urban planning has produced "displacement and exclusion of politically disenfranchised residents" (Angluevoski, 2016, p. 12) and simultaneously how they "contest and resist sustainable policies that threaten their displacement" (Checker, 2011, p. 31) in New Orleans.

More specifically, I attended public GRD information sessions, community neighborhood meetings, and the meetings of city planners and landscape architects interested in green infrastructure. Finally, I read federal and city planning documents and newspaper accounts of environmental justice activism and gentrification in both New Orleans and other coastal cities nationwide and internationally. The interviews participants were found through posting flyers at local businesses, cafés, restaurants, and bus stops across all of the Gentilly communities, posting a call for participants in newspapers advertisement sections, and via Facebook groups connected to Gentilly. Snowball sampling technique guided by critical participatory action research (CPAR) and grounded theory research techniques, which were implemented after initial contact was made with participants. GIS maps were made using ArcMap software to display the rate of demographic and real estate change in the Gentilly neighborhood. The American Community

Survey (ACS) and real estate websites such as realtor.com and Zillow.com were used to collect census and housing information.

This thesis is organized as follows: Chapter 1 introduces the thesis research and a brief overview of the three interdisciplinary fields that guide this study: environmental justice, urban political ecology, and urban climate adaptation literature. Chapter 2 presents an overview and analysis of environmental gentrification literature, its underpinnings and the gaps in the research. Chapter 3 describes the historical context of Gentilly from its suburban utopic beginnings in the 1920s to the impact of Hurricane Katrina in 2005, both of which were profoundly affected by the human-made infrastructure that is heavily relied upon by the city. Chapter 4 unearths the timeline and details on the Gentilly Resilience District and its neoliberal underpinnings through public-private partnerships. Chapter 5 contains the data and a description of the mixed-method approach to the research. First by presenting a quantitative analysis of the Gentilly Resilience District projects and neighborhood demographics, then examining the data collected by the survey results and interviews. Chapter 6 describes the results of qualitative data as well as the quantitative analysis. It also includes a discussion of the results and the way the findings of this study relate to prior studies. Chapter 7 presents a summary of the thesis research and recommendations.

In order to better understand the socioeconomic implications of green infrastructure development and gentrification, it is essential to provide a brief overview of the three fields of study that guide this research: environmental justice, political ecology and the subfield of abolition ecology, and urban climate adaptation literature. Environmental justice is the spatial understanding of who gets what, how much, and why. It is grounded as both a social movement and an academic field of inquiry, which arose in the United States in the 1980s. The field of

environmental justice is an appropriate framework to analyze this thesis as it demonstrates how injustices and inequities occur in urban environmental spaces and recognize the contributions of grassroots activists in New Orleans and nationally. Understanding the parallel trajectories and intersections of the political ecology subfield and environmental justice concepts is critical to understanding the theoretical analysis of abolition ecology. Lastly, the research around climate adaptation and the literature focused on equitable approaches to climate change are presented as a further theoretical foundation for this thesis.

The literature review will continue in Chapter 2 as neoliberal environmental sustainability, and disaster capitalism will provide the economic framework to understand the public-private partnerships that finance the Gentilly Resilience District. The field of urban planning will illuminate the importance of urban climate adaptation literature and urban blue and green infrastructure (BGI) as well as storm-water management. Lastly, the environmental non-profit industrial complex and public-private partnerships will be highlighted as arms of neoliberal environmentalism and disaster capitalism systems.

Environmental Justice

The environmental justice field of research is aimed at collecting data and conducting analyses to support or refute claims of inequities or injustices in low-income and people of color communities (Taylor, 2014). Communities who lived near toxic pollution sites, or LULUs, had been experiencing inequities in health risks and contamination due to their proximity to these poisonous facilities (Bryant and Mohai, 1992; Bullard, 1990). While the Environmental Justice Movement (EJM) became more formalized in the late 1970s and early 1980s (Taylor, 2000), communities of color in the United States have experienced environmental injustices for

centuries (Taylor, 2009; 2016), and these accounts have been adopted into other bodies of study, such as sociology, anthropology, or geography (Heynen, 2016). The spatial analysis component of environmental justice in the 1980's allowed the field of study to stand on its own.

As early environmental justice scholars debated best practices of measurements and levels of analysis, activists continued to fight for the closing and remediation of these sites across the United States. A crucial moment in the environmental justice movement transpired during the 1982 Warren County protests. The protests occurred as a response to the dumping of Polychlorinated Biphenyls (PCBs) in a landfill in Warren County, North Carolina. These demonstrations authorized the study of environmental racism across the nation and specifically in the southeast (Government Accountability Office, 1983). Taylor (2000) defines environmental racism and environmental discrimination as a process by which environmental decisions, actions, and policies lead to racial discrimination. This occurs through the interaction of three factors: 1) prejudicial belief and behavior; 2) having the personal and institutional power to develop and implement policies and actions that reflect one's prejudices, and 3) privilege; having unfair social advantages over others and the ability to prioritize one group over another. Amongst other research, the well-known United Church of Christ (UCC) Commission for Racial Justice study, published in 1987, showed that minorities and low-income people experienced more environmental harm from incinerators, waste sites, refineries disposal facilities, transfer storage, and other polluting businesses than White and affluent communities.

Further, coalitions of Environmental Justice (EJ) activists and scholars in the 1970s and 1980s fought against the damaging health impacts of contaminating facilities or highway construction in urban residential areas (Anguelovski, 2014; Pellow and Brulle, 2005; McGurty, 2007; Bullard, 2005). EJ activists had close ties to the civil rights movement (Pellow and Brulle

2005; McGurty 2007), and much emphasis was on cases of environmental racism. The environmental racism context remains relevant as activists and scholars experience and document procedural injustices and market dynamics as evidence that communities of color who are of a higher socioeconomic status are still subjugated to much of the same contamination exposure as previous generations (Bullard, 2007).

Procedural equity is one of the critical components of Bullard's (2001) definition, which also includes geographic and social equity. Procedural equity is the question of "fairness," the extent that governing rules, regulations, evaluation criteria, and enforcement are applied equally upon communities in a nondiscriminatory way. Geographic equity refers to the location and spatial configuration of communities and their proximity to environmental hazards. Social equity assesses the role of sociological factors on environmental decision-making (Bullard, 1994). Keuhn (2000) elaborates on Bullard's environmental equity definitions and proposes four categories of environmental justice issues: 1) distributive justice, the equal protection from environmental risks (not the redistribution of pollution or risk, but cessation of environmental hazards); 2) procedural justice, the right to treatment as an equal; 3) corrective justice, the fairness in punishment for breaking the law and addressing damages brought upon individuals or communities; and 4) social justice. The environmental equity lens alongside a geospatial analysis of environmental hazardous facility distribution and demographics of communities near these hazards has brought the EJ framework into the national conversation (UCC, 1987; Bullard, 2007). The study of environmental inequalities in a city can provide a deeper understanding of the political, social, and economic underpinnings of injustices. This can be done through quantitative and qualitative empirical research.

The corrective justice component of Dr. Bullard and Dr. Keuhn's definitions are crucial as the literature shows that residents in communities of color and low-income neighborhoods historically received less environmental protection than privileged groups, who tended to live in more desirable and less polluted areas (Anguelovski, 2016). Governmental regulating capacity and oversight ability vis-a`-vis contaminating industries were found as traditionally weak (Pellow, 2001), with historically marginalized groups suffering from the unequal enforcement of environmental protection laws and other regulatory policies such as the Clean Air Act or the Clean Water Act (Checker, 2008; Morello-Frosch, 2002; Taylor, 2014). Distributive justice touches on multiple pieces of environmental justice, and zoning has been examined as a key perpetrator of spatial environmental inequalities. As communities have been separated by race and class, this has allowed the concentration of noxious facilities in communities of color and low-income neighborhoods (Schively, 2007; Maantay, 2002; Taylor, 2014)—even in the context of sustainability planning (Checker, 2011).

Thirty years later, despite significant and emblematic local victories and changes in federal policies with the passing of the 1994 Executive Order (EO) 12898, which was rewritten several times, the statistics are still daunting. The well-known study ''Toxic Waste and Race at Twenty'' (Bullard, 2007), which marked the twentieth anniversary of the landmark UCC study on the disproportionate presence of toxins in minority communities, shows that statistics have in some ways worsened. The higher reported concentration of people of color around hazardous waste sites in the 2007 report compared to the 1987 study is a result of improved methodologies in GIS. As a recent study in Charleston, South Carolina reveals, race and ethnicity continue to be significant predictors of disparities in the distribution of toxic facilities, in that case, Toxic Release Inventory facilities (Wilson, 2012). Similar results are found for cancer risks—not only

exposure to toxins: in Tampa, Florida, a 10 percent increase in Hispanic residents tends to increase lifetime cancer risk from major point sources by 10.2 percent (Chakraborty, 2012). Thus, these findings reveal that despite a federal government attempt to address environmental justice via E.O. 12898 and federal offices such as the United States Environmental Protection Agency's (USEPA) Office of Environmental Justice, environmental racism has not declined, it has increased. In sum, epistemology studies using spatial regression and multivariate regression methods as well as cumulative risk assessment are essential to pinpoint the remaining challenges and disparities in environmental inequalities created or exacerbated by toxic sites and facilities (Brown 2013; Chakraborty 2012).

Activists' apprehensions often aimed at locally unwanted land uses with heavy environmental and health impacts such as waste or industrial facilities (Schively, 2007). Early EJ fights were not only about stopping or reducing toxics, they were also part of a struggle to increase local communities and their long term livability and environmental quality, even if implicitly. Environmental justice activists have pushed local officials to gain new natural and recreational areas, urban gardens and farmers' markets, green and healthy housing, and improved waste management (Anguelovski, 2014).

> However, EJ in cities is now at a crossroads: as neighborhoods get cleaned up and benefit from new environmental goods, they start to revitalize and become valued again by private investors. After decades of disinvestment and abandonment, developers buy degraded buildings and transform them into high-end residences, and eventually wealthier residents start moving in and enjoying new associated amenities for which long-term residents fought for during decades. In return, low-income residents and people of color are often displaced because it seems that they cannot afford to stay.
>
> (Anguelovski, 2016, p. 23)

In many instances, neighborhood greening is formally backed by municipal policymakers and elected officials as it helps them fulfill their sustainability agenda and bring nature back into

the city. It is part of new ideas to generate more environmental urban forms which combine ideas such as compactness, sustainable transport, density, mixed land uses, diversity, passive solar design, and greening (Jabareen, 2006). The restriction in green or ecological gentrification is that under the belief that an apolitical, technical plan such as ‘‘greening’’ or ‘‘sustainability’’ (with ecological enhancements brought to the municipal biophysical environment), cities might push for projects that have a probability to be very inequitable.

The taxonomy of environmental justice is relevant to the study of climate and environmental gentrification as the Gentilly Resilience District aims to improve the environment and promote economic development. These taxonomies guide the assessment of the district's planning particularly while looking at procedural justice as it relates to the new stormwater management structures and if they will benefit everyone. Specifically, I am interested in finding out whether the Gentilly Resilience District will provide benefits to the existing residents, not just those who may be newer residents who can afford the rising housing prices and the added value brought to the neighborhood by the water management project.

Urban Political Ecology

Political ecology is one of the fields that has guided this thesis research, due to its intrinsic politicizing approach to environmental issues. "The phrase 'political ecology' combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself " (Blaikie and Brookfield, 1987). Urban political ecology (UPE) emerged as a response to political ecology's largely non-Western, rural, land-conservation lens, and turned the bourgeoning field inward on itself to examine the *socionature* (Swyngedouw,

2009) of the millennial city. As the mapping of rural areas and countryside dominated the first half of political ecology's early life, the "city was the great, uncharted frontier for analyzing the co-production of the social and the natural" (Angelo & Wachsmuth, 2015, p. 11), and became an urban science for the urban century. As UPE research contends with colonized and racialized environmental events, the examinations detail the ongoing aftermath of disasters and the subsequent unevenness in socio-ecological environments.

UPE credits much of its research to the field of environmental justice, but continues to diverge in key areas. While there have always been significant links between EJ and UPE scholarship, Ranganathan and Balazs (2015, p. 405) suggest that a liberal political philosophy underpins EJ and is at odds with the Marxist roots of UPE (Swyngedouw and Heynen, 2003). In the 15 plus years that UPE has existed (Heynen, 2014) the field has drawn a guideline on how urban environmental and social change co-determine each other and offer insights into imaginative corridors toward a more democratic urban environmental politics. The socio-natural unevenness of cities has been perpetuated by what Rob Nixon calls the "slow violence" of environmental racism, characterized by policies that benefit some populations while abandoning others.

Urban political ecology also maps environmental conflicts in cities and combines the work of urban studies scholars like Checker, Dooling, and Smith (1996) who shift their attention to the colonial frontier and neoliberal environmentalism. Safransky writes that "colonial logics shape contemporary market-based green redevelopment and animate current urban debates, and that settler colonialism is a historical structure of dispossession that continues in the modern-day" (2014, p. 33). The author then goes on to explain that "settler colonialism, as a form of productive power, is embedded in and works through institutions, discourses, culture, and spatial

practices in the 21st century. Settler colonialism is about settlement, meaning that it turns on the acquisition of land and territory. Moreover, property rights and uneven development in the United States are rooted in a racial grammar of citizenship established under settler colonialism. Historically, private property rights were used to extend state power over territory (the frontier) and make responsible and productive subjects who improved the land" (p. 34).

Coastal cities are indeed facing multiple challenges in regards to climate change, and as urban political ecology is used to understand the deeply racialized history of the United States, scholars of UPE can illuminate how "colorblind adaptation" (Heynen, 2016, p. 1) is perpetuating a colonialist settler mentality. UPE is particularly necessary to unearth the layers of environmental racism and racial inequality in coastal cities like New Orleans which has been formed from landscapes of socio-ecological racism. Racial formation theory is an analytical tool in sociology, developed by Michael Omi and Howard Winant, which is used to look at race as a socially constructed identity, where the content and importance of racial categories are determined by social, economic, and political forces. New Orleans has a history of uneven racial development of land ownership and employment, and modern-day barriers to African American participation and inclusion in adaptation planning. Heynen's "racial coastal formation's" theory is used as a guideline from UPE that has potential to make way for radical transformation in climate change science in coastal areas such as New Orleans, Louisiana. With the transition from theory to applied scholarship, the field of abolition ecology becomes ever more viable and thus too, has shaped the research in this thesis.

Abolition Ecology

While imbalanced racial advancement shaped the majority of the history of the United States, too many of these instants and experiences continue to be rendered nonexistent in the

collective geographical and political, ecological works of research. This history has been called into recent literature in the field of abolition ecology, which examines the interconnected ways property dealings are directly entangled within the more extensive system of environmental politics which can cause continued suffering through a racialized capitalism. “Marx’s political narrative was greatly influenced by the revolutionary efforts to abolish slavery” (Blackburn, 2011 p.11), “ongoing violence committed through racial capitalist logics compels contemporary scholars and activists to keep abolition at the core of antiracist, anti-colonial and anti-capitalist politics” (Woods, 2002, p. 107). W.E.B. Dubois’ (1935) discussion of “abolition democracy” is often cited as an important way to think through radical change and can act as an assertive force behind the continuing energies for the concept of “abolition ecology.”

Abolition ecology is nested inside the principles of W.E.B. Dubois, and aims to continue to evolve through informed and thoughtful organizing and sustained theorizing against and about the continuous presence of White supremacist logic that perpetuate and produce imbalanced racial expansion inside of land and property affairs. Heynen (2016) poses the question, “how can abolitionist ideals inform contemporary political ecological struggles around air quality, soil quality, water pollution, inadequate shelter, food insecurity and hunger that continue to ravage communities of color and poor communities?” He then answers in the next thought, saying that “the formation of the U.S. is territorially based in forms of oppression and violence against indigenous nations and communities of color, there are indeed many sources of insight to look to for connections between colonial and racist ideology and environmental contradictions.”

Another critical component of abolition ecology embodies the direct action customs that commenced in the anti-slavery abolitionist movement were central tactics used during the Civil Rights Movement and are vital today via Black Lives Matter, which proves that rights are only

won with a fight. Abolition ecology becomes motivated to take the ideas of abolitionist struggles and improve organizing around the racialized questions of who receives benefits and gains and who suffers and pays for the exact techniques of political ecological change.

Urban Climate Adaptation

Adaptation to climate change is fundamentally spatial; therefore the field of urban climate adaptation is primarily based on many pre-existing planning instruments (Anguelovski, Chu, and Carmin 2014). Cities around the globe are coevolving to match their adaptation needs and their disaster and hazard risk reduction efforts by updating levees and dams, building codes and zoning ordinances as well as insurance and investment policies to examine the impacts of hazards in the region (Angluelovski, 2016). There is an opportunity for municipalities to progress their efforts as a politically neutral and sustainable choice, which will produce "win-win" outcomes (While and Whitehead, 2013). While it varies in the global South, the northern hemisphere operates mainly on investment in land use planning and infrastructure at a larger scale. The North also addresses social vulnerability through employing social capital and incremental adaptation (Kates, 2012) over a radical shift, and varies the way that city governments disseminate and communicate essential disaster risk reduction information (Kates, 2006).

Changes are occurring in multisector agencies, where cities are establishing coalitions to communicate more effectively across silos and with the public. In the early 2000s, urban planning began to center community voice and better communication, and the field of adaptation planning adjusted accordingly to the shift in practice (Forester, 1999; Purcell, 2009). Many cities have "formed committees to engage public, private, and academic actors (Anguelovski &

Carmin 2011; Carmin, Anguelovski, & Roberts 2012); or made concerted efforts to include vulnerable and marginalized communities" (Archer et al. 2014; Bulkeley et al. 2013). Strategies such as inclusive or participatory planning help form relationships amongst parties mentioned above, as well as foster ground-up decisions and provide consensus around what adaptations the community prioritizes (Castán Broto, Boyd, and Ensor 2015).

While there is evidence of the above strategies being more inclusive than traditional planning strategies, Shi and others (2016) are asking if even these approaches can perpetuate uneven outcomes in climate adaptation. As this thesis explores the technocratic, and rational approaches of the Gentilly Resilience District, there have been others (Yiftachel & Huxley 2000, p. 48) who have documented how this trend "deemphasizes asymmetric power dynamics and conflict over resources" and advocates for the good of the community without more profound examination. As Anguelovski (2016) writes;

> Focusing on "climate proofing" and "win-win" solutions therefore hides tradeoffs associated with the uneven distribution of adaptation costs and benefits (Pelling, O'Brien, & Matyas, 2015). Furthermore, adaptation through technocratic interventions produces zones of greater "ecological security" or green enclaves (Hodson and Marvin 2010). There is growing evidence that urban economic actors may be employing the rhetoric of climate resilience to entrench speculative, exclusionary, or unsustainable practices, thus exacerbating historic injustices associated with infrastructure and land use development (Sovacool, Linnér, & Goodsite, 2015).

These deliberations validate how struggles to catalyze adaptation as a new policy arena may at times questionably affiliate adaptation with advancement interests by undercutting the broader reforms that are necessary to provide real change (Simon & Leck, 2015). There is a need for cities to dramatically shift towards transformative adaptation to interject economic growth paradigms to shift levels of vulnerability (Pelling, O'Brien, & Matyas, 2015). Many climate adaptation projects have acted to the best of their ability to enhance procedural justice by

including residents, non-profits and Non-Governmental Organizations (NGOs), and churches in the planning process. Teams of researchers have noticed the shift towards including equity in climate adaptation and demand that the process centers the needs of marginalized communities by enhancing access to services and infrastructure instead of threatening access and heightening vulnerability. Beyond participatory planning processes, efforts to adapt should, at a minimum, avoid maladaptive strategies that worsen existing social, racial, class, gender or ethnic injustices (Barnett and O'Neill, 2010). Scholars increasingly argue that adaptation should promote more transformative social contracts that challenge or redress underlying drivers of inequality and vulnerability (Kates, 2012; Pelling, 2014), and should prioritize the improvement of social services and protective infrastructure for marginalized groups (Pelling, 2009).

As is mentioned in the environmental justice literature, the original theoretical underpinnings of adaptation are shaped by the understanding of justice "as the fair distribution of social and material advantages among people over time and space" (Rawls, 1971, p. 4). Rather, the pursuit of justice first requires acknowledging that societal institutions dis-proportionately benefit some while denying rights and resources to others, and that the cumulative history of institutionalized oppression creates a highly uneven playing field (Young, 1990). Justice therefore entails not only the fair distribution of goods, but also recognizing cultural differences and removing procedural obstacles that prevent marginalized groups from meaningfully participating in decisions that affect their property, wellbeing and risk (Freudenberg, 2011; Shrader-Frechette, 2002; Schlosberg, 2007).

Today, as critical geographers and political ecologists argue, the planning and advertising of new parks or waterfront restoration seem to give greening some form of moral authority or economic imperative that demotes or conceals any equity issues (Quastel, 2009). In many cases,

neighborhood cleanup and ecological enhancement together with new economic development and neighborhood transformation are combined at the expenses of social and racial equity and one's ''right to their neighborhood'' (Anguelovski 2013, 2014). Chapter 2 continues the literature review by defining the concepts in environmental and climate gentrification literature. The following concepts are explained; equitable climate adaptation, resilience, technocratic adaptation, procedural justice, resilience planning, green infrastructure, disaster capitalism, and the neoliberal environmental sustainability agenda.

CHAPTER 2: Environmental and Climate Gentrification Literature

To better understand the relationship between marginalized or disenfranchised communities and climate gentrification, it is necessary first to become familiar with existing research on the various forms of climate and environmental gentrification and the historical context of other case studies. This chapter reviews the literature that will shape the results and discussion sections of this thesis and will inform the conclusion as well as next steps. The literature review begins with more in-depth analysis on urban climate adaptation through an equity and justice lens, in which to frame the social-ecological aspects of this thesis and the Gentilly Resilience District. This section will expand upon procedural justice. Following is an evaluation of the predominately technocratic research on green and blue infrastructure and stormwater management, for context into the techniques of the GRD. In order to ground the overall critiques of the GRD, an analysis of the neoliberal environmental sustainability agenda literature will be assessed, interrogating the ideas of disaster capitalism, public-private partnerships, the non-profit industrial complex and the problematic aspects of the resilience framework.

Equitable Urban Climate Adaptation and Politicizing Resilience

As the first chapter of this research has outlined, the field of urban climate adaptation has not always been examined with a focus on equity and justice. In recent research, there is a definite shift in attention towards the realization that around the world, those who often are contributing the least to climate change are those who are already experiencing the worst effects. Research has shown that income is the primary correlation of an individual's contribution and ability to adapt to climate change (Moser and Kleinhückelkotten, 2016), and as Gentilly residents

make considerably less overall than the residents of wealthier neighborhoods in New Orleans, they are more likely to feel the dangerous effects of climate change. The focus of the following research is to understand how to equitably adapt to climate change threats in cities across the globe.

Curran and Hamilton's (2012) research has been applauded for the argument that if ecological enhancements were "just green enough" (i.e., created environmental improvements, but not at a large scale which can interest substantial new investment), community transformation would be unremarkable enough to avoid key changes in real estate valuation. This process demands community input and is shaped explicitly by those concerns and desires over a formulaic approach that prioritizes the ecological needs. "Since increasing the amount of green space can create an urban greening and equity paradox through rising housing costs, planning, and urban environmental scholars now argue that urban greening interventions need to focus on ''green enough'' interventions and be accompanied by strategies to provide affordable housing, housing trust funds, and by a commitment of public officials and planners to control powerful real estate (Wolch, Byrne, and Newell 2014)" (Anguelovski, 2016, p. 23).The "just green enough" approach could be applied to the Gentilly neighborhood, yet it is difficult as the effects of climate change in this region are widespread and the strategy could be inadequate. Rice (2018, p. 2) argues that "climate change must become a more central feature of gentrification and housing justice studies," which is a goal of this thesis.

Mabon and Shih (2018) apply the "just green enough" method to the urban heat island effect in Taiwan and summarize that the challenge is to balance the justice concerns associated with urban greening with this substantial risk reduction potential. "Urban greening to foster 'resilient' communities arguably deflects from – or even exacerbates – structural causes of

vulnerability, with benefits accruing disproportionately to more affluent or empowered groups. The need for practical action on climate threats in cities is urgent, and…strategic greenspace use considered systematically across a city may mitigate effects (p. 23)". This idea, that building resilient communities can often ignore or worsen the root causes of systemic inequity, is why some Gulf Coast activists have called for the phrase "resilient" to disappear. In the context of this research, resilience pulls from the human geography concept of community resilience, which has a "strong geographical focus on human communities (villages, towns, urban areas) and their ability to cope with disturbances" (Wilson, 2017, p. 2). In Naomi Klein's book, *This Changes Everything: Capitalism vs. The Climate* and later in an interview with Amy Goodman of Democracy NOW!, Tracie Washington, a New Orleans-based civil rights attorney and the president of Louisiana Justice Institute, said

> "Stop calling me resilient. Because every time you say, 'Oh, they're resilient' that means you can do something else to me. Resiliency to me is not a natural thing. I do not think that we were born to be resilient. You are forced to be resilient when you are placed in an environment that is unnatural with manmade suffering where another actor can alleviate this condition that is forcing you to be resilient to it. I don't want to be resilient, I think that we should fix the things that are forcing us to be resilient."
>
> (Klein, 2010; Democracy NOW! Interview, 2011)

The term and concept of "resilience" is clearly central to the GRD. The Office of Resilience and Sustainability's Community Engagement Specialist Natalie Manning said in an interview that she thinks it is important to use resilience and sustainability in tandem, "because this is not just about a temporary fix, this is not just about mandating something, because… things are going to come at you. It's not that you are welcoming natural disaster, it's not that you are welcoming flooding, this is what happens in our city. It's about being proactive about it

instead of being reactive about it, setting yourself up for when these things come at you so they are not severely damaging" (N. Manning, personal communication, August 2, 2018).

While there are different definitions of the word resilient, urban climate adaptation includes this terminology as a critical component for measuring a community's ability to either mitigate or adapt (Davoudi, 2012; Leichenko, 2011). Climate justice scholars offer critiques of the term and idea, as they also say it can mask the harder decisions around reallocation of hazards, funds, and control (Brown, 2014). In addition, transformative approaches are proposed; which will provide funding to marginalized communities who experience systemic risks and vulnerabilities. This research seeks to empirically assess whether, when, and how adaptation activities prioritize the interests of the upper class or establish a new way to address long-lasting development needs of marginalized communities, avoid maladaptive reactions, and challenge the drivers of socio-economic vulnerability (Shi, 2016).

Much of urban climate adaptation literature looks at the concept through a technocratic, neoliberal lens (Foster, 2011; Kern, 2008). The role of green infrastructure in climate adaptation is applauded as a way to work within a "managerial, institutional, and market-based approach to climate change" (Foster, 2011). One example of a technocratic approach to climate adaptation is the GRD and the Community Adaptation Program (CAP) project. While these approaches to climate adaptation are valid and provide an incentive for environmental governance, the socio-ecological perspective (interpersonal, organizational, and justice-oriented) can be overlooked in much of this work. The Gentilly Resilience District has essential projects, like the CAP that targets low to median income homeowners and provides each property with manageable green infrastructure to mitigate flooding and stormwater events on-site and individually.

The CAP project will invest $5 million in residential stormwater management improvements to owner-occupied single-family homes with household incomes at or below 80% of Area Median Income located within the Gentilly Resilience District. NORA expects the program to divert and detain stormwater runoff on over 200 properties with an average grant award between $10,000 and $25,000. The improvements are designed and installed at no cost to the homeowner (NORA, 2018). This effort to prioritize low to middle-income residents of Gentilly does appear as an equitable approach to urban climate adaptation, yet more research must be done across a longer time frame to see how the green infrastructure installations impact the household, and if they 1) reduce or mitigate flooding on-site and 2) impact the property value. At the end of this chapter, the neoliberal environmental sustainability agenda and its theoretical foundation will be expanded upon.

When asked about gentrification from CAP or other similar projects, a city representative said, "You mean in terms of rising property values? Absolutely! That's definitely a byproduct right? But we haven't connected those dots in a way where we have some data to substantiate any of that, because we don't have an affordable housing component built into the grant, but for sure." Another resilience professional's response was, "I think last year was the first year since Katrina that the city saw a net loss in population. I think as that's starting to stabilize, you're not seeing as much out-of-town money coming in. I think we'll see a stabilization in property values. I think the last few years, they were really just ramping up to get on par with cities of similar size…I'm interested to see what happens. Gentilly is weird because it's in the city, but it's not in the city, so that might actually start to appeal to some of the younger generation as they're starting to have families and things like that. You want to be closer. You might need some more space." They went on to say "I don't think gentrification has been a factor yet, because the

projects aren't done, but I don't know. It's something that we're thinking about. We're constantly thinking about it. One of the big indicators in the market value analysis is displacement when you look at neighborhoods…Right now, Gentilly is one of those with a high risk of displacement based on our analysis." Figure 2.1 shows a calculation of the number of eligible homeowners this program could serve.

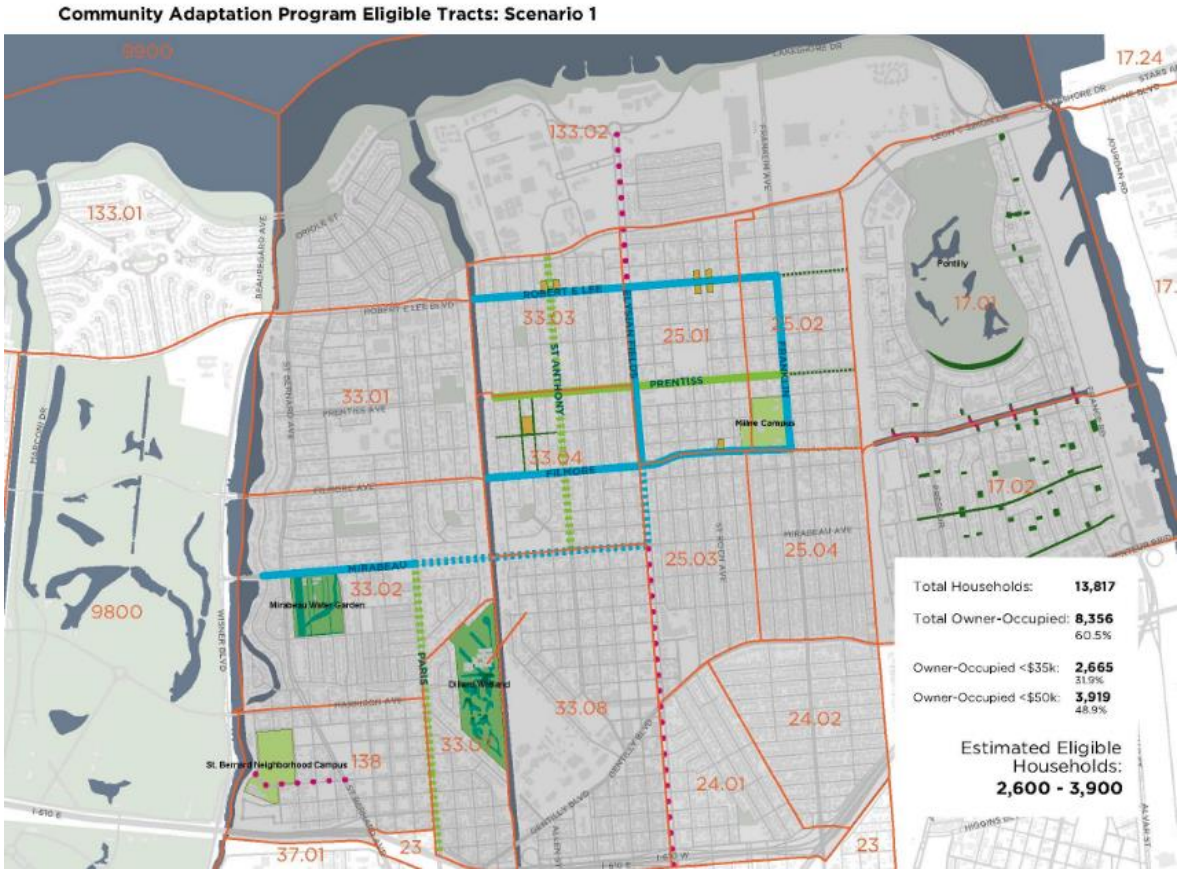


Figure 2.1: The shaded area of the map shows a calculation of the number of eligible homeowners this program could serve. Source: NORA, 2018

As the CAP project attempts to address the inequitable dimensions of urban greening in Gentilly, the eight other place-based projects will also have impacts on the surrounding property values, and the lack of affordable housing in Gentilly will undoubtedly impact the community. In the urban climate adaptation literature, this phenomenon is called "unevenness" (Anguelovski, 2014), and calls have been made for researchers to assess this occurrence in current climate

adaptation plans. Neo-Marxist academics contend that an imbalanced allocation of urban resources, such as land, infrastructure, and housing, is an essential feature of present-day methods of global economic production (Gould, 2008; Soja, 2010). Thus, the upper class gains more resources while replicating social systems that continue the uneven development (Lefebvre, 1991). Environmental justice research supports these theories by detailing how dominant practices in development situate detrimental, polluting or hazardous industries in poor, minority neighborhoods, or continue to find ways to keep these residents in low-quality areas where land is cheap (Mohai, 2009; Taylor, 2014). Instead of encouraging resiliency planning projects that propose that they are politically neutral and generally beneficial, policymakers should attend to distributive and procedural justice processes of adaptation outcomes (Shi, 2016).

Lastly, the research of Jabeen (2010) calls for scholars to remember the "built-in resilience and grassroots coping strategies for climate variability" that come from and are found within communities of the "urban poor" (p. 2). The lessons from this paper are significant as it pays attention to the ways in which these populations are "already coping with conditions of increased vulnerability induced by changing climate as well as extreme weather events such as floods, heavy rains, landslides, heat and drought, and understanding how they respond to hazards caused by them" (p. 1). Strategies that have been occurring for decades include; adjustments to the physical and built environment, storing of food and saleable assets, diversifying income sources, and the development of social support networks. While adaptation to climate change is new to city staff, those living below poverty have often been adapting to climate change incrementally or transformationally for years. Jabeen highlights that city officials and scholars have much to learn from pro-poor adaptation strategies and evidence-based lived experiences. This approach should be included in resilience planning and the GRD outreach and engagement.

The concept of procedural justice and consensual politics will be described in the following section.

Nothing About Us Without Us: Procedural Justice in Resilience Planning

Procedural justice is a critical component of environmental justice, as Bullard (2001) defines the term as "the extent that governing rules, regulations, evaluation criteria, and enforcement are applied uniformly across the board and in a nondiscriminatory way. Unequal protection might result from nonscientific and undemocratic decisions, exclusionary practices, public hearings held in remote locations and at inconvenient times, and use of English-only material as the language to communicate and conduct hearings for non-English speaking publics" (p. 77). The question of procedural justice comes alongside other important environmental justice terms such as geographic justice, and social equity. While all of these components play a role in environmental gentrification, this thesis analyzes the role of procedure and inclusion of participants voices in the planning of the Gentilly Resilience District. While most research about environmental gentrification takes a historical and longitudinal approach, as it studies change over time, the progress of the GRD is not developed enough to see the precise impact on housing value. Thus measuring and analyzing how procedurally just the process has been, is another way to measure how this process will or will not impact the gentrification of Gentilly.

As the research of Carmin (2011), and Pellow (2000) makes clear, climate change inequitably impacts historically disenfranchised residents, which can make procedural justice issues worse and lead to further political exclusion. Following Hurricane Katrina, Black residents were displaced en masse (Kates, 2006), which "can lead to the loss of social and political

networks, and a voice in decisions about where and how to rebuild" (Shi, 2016, p. 132). The research questionnaire and survey presented in Appendix A asks participants about their network connectivity by asking how well they know their neighbors and if they have family in Gentilly and New Orleans. These questions are included in the survey to better understand if residents with a more intact social and political network are those who are participating in the decision-making processes around the planning of the GRD. The results of this survey are presented in Chapter 6.

Research on anticipatory planning and public inclusion in planning for climate change, has shown that participatory tools such as games, scenarios and community dialogues have facilitated engagement and included residents in outreach events (Few, 2007; Tschakert, 2010). These simulations helps to build trust between the facilitators and the community members. GRD community partners and outreach teams have used these tactics and included a film screening and community dialogue with residents and planners (participant observation, June 2018). Resilience projects, such as the GRD amongst others, provide opportunities to address historical inequities, but if left alone without direct action to address these political and social wrongs, more harm than good can come from climate adaptation politics.

The work of procedural justice must be centralized in any type of democratic or geographic plan. The phrase "Nothing about Us Without Us" has American roots in the disability justice and public health field, but has been used historically in many contexts (Charleton, 1998). The phrase represents the idea that policies should not be decided by representatives without the full and direct participation of members of the group(s) affected by that policy (p. 1). Procedural justice must be a basis on which to move forward in resilience planning, not an afterthought or a box to check. Theories of procedural justice can aid in recognizing practical improvements and

political approaches that move the goals of vulnerable populations forward. Research by Holland (2017) explains that adaptation politics can provide a transformational shift if the role of procedural justice is included as a way to intervene in the traditional planning process. In the following section, the terminology that is often used in urban climate adaptation and green infrastructure is explained as a means to more completely comprehend the entities being used and included within the Gentilly Resilience District.

Proposing Green Infrastructure as a "Politically Neutral" Solution

In the planning of a resilient urban space, green infrastructure (GI) has become one of the most heavily proposed and accepted best practices for climate variance and water management. Blue Green Infrastructure (BGI) is "sometimes referred to as 'Low Impact Development' or 'Best Management Practices' and is a distributed approach that reduces urban stormwater runoff through on-site infiltration, storage, and evaporation to improve water quality in downstream watercourses. Examples of GI and BGI practices are rain gardens, rain barrels, tree trenches, permeable pavement, and green roofs. GI is gaining popularity due to its potential "social and economic benefits" (Environmental Protection Agency, 2010, p.1). The following paragraphs define the terminology that is used within the GRD and critiques the idea of green infrastructure as a politically neutral pathway.

Much research has been done around the technical sides of green infrastructure, which includes the phrases blue infrastructure, blue-green infrastructure, as well as turquoise infrastructure. While the phrases do have varied definitions, the purpose of this thesis is not to engage explicitly with the technical functions of GI. Thus the term GI will henceforth include all of the above terms, with an understanding that more focused research must define each word.

Blue infrastructure can support not only climate resilience but also provides a healthy, livable, socio-economically strong urban environment. Blue infrastructure can also be defined as the use of "small footprint high-efficiency devices installed and retrofitted within existing collection systems" (Winkleman, 2017, p. 12). In the context of an urbanized environment, blue infrastructure refers to all kinds of natural and semi-natural landscape features that can form a green-blue network. It can refer to blue landscape elements on various spatial scale levels that are linked to water. They can include ponds, artificial buffer basins or other natural or created water systems (Winkleman, 2017).

The GRD uses contractors from around the country and within the city to carry out each component of construction. Green infrastructure is usually installed by landscape architects, city staff, or private homeowners (Piccirilli, 2017). A report put out by the organization Jobs for the Future (JFF, 2017) states that 239,000 people were directly employed by green infrastructure nationwide in 2015. JFF included 30 occupations in their definition of green infrastructure installation, maintenance, and inspection (GI-IMI) work. The GI-IMI workforce is made up of 30 distinctive jobs that exist in a very minute sector of the interconnected industry. There are only a low number of these occupation participants in each sector that are invested in the GI-IMI work. The sectors that are invested are people who work in landscaping, construction, urban forestry, ecological restoration, and others. Overall, the number of workers who are participating in green infrastructure installation, maintenance and inspection work in these 30 jobs are about 6% of that overall number (JFF, 2017).

The GRD has proposed installing rain barrels, rain gardens, and permeable pavement through the CAP program. A rain barrel is a system that collects and stores rainwater from a roof that would otherwise be lost to runoff and diverted to storm drains and streams. A rain garden is

a garden of native shrubs, perennials, and flowers planted in a small depression, which is generally formed on a natural slope. It is designed to temporarily hold and soak in rainwater runoff that flows from roofs, driveways, patios or lawns. Rain gardens are effective in removing up to 90% of nutrients and chemicals and up to 80% of sediments from the rainwater runoff. Compared to a conventional lawn, rain gardens allow for 30% more water to soak into the ground. Permeable pavement is a specific type of pavement with a high porosity that allows rainwater to pass through it into the ground below (Environmental Protection Agency, 2018).

In other projects, "Green Streets" and "Water Gardens" are proposed as part of the GRD's hazard mitigation work. A green street is a stormwater management approach that incorporates vegetation (perennials, shrubs, trees), soil, and engineered systems (e.g., permeable pavements) to slow, filter, and cleanse stormwater runoff from impervious surfaces (e.g., streets, sidewalks). Green streets are designed to capture rainwater at its source, where rain falls. Whereas, a traditional street is designed to direct stormwater runoff from impervious surfaces into storm sewer systems (gutters, drains, pipes) that discharge directly into surface waters, rivers, and streams (EPA, 2018). A water garden is less common in green infrastructure, thus the following definition is from Waggoner and Ball, the architects who are working on the Mirabeau Water Garden project in the GRD. "The project will divert stormwater from the city's drainage system, store and clean up to 24 acre-feet of diverted stormwater, allow stormwater to infiltrate into the ground, capture runoff from neighboring streets" (Waggoner and Ball, 2018, p. 1).

The literature around Sustainable Urban Drainage Systems (SUDS) takes a more holistic approach to GI implementation and is comparable to the GRD neighborhood-wide approach. SUDS are another attempt to incorporate green infrastructure in post-industrial cities like Copenhagen, which must include adaptation to climate change. This technique has been

suggested to provide a way to offset urban decay and pollution, and may "revitalize the urban milieu and improve livability" (Mguni, 2015, p. 73). As is written in research such as that on SUDS and others, green infrastructure, often like the term "sustainability," is intended to paint the work of the environmental and climate adaptation field as politically neutral and thus, harmless. This thesis seeks to understand the role of green infrastructure, specifically when implemented at a neighborhood-wide scale, as a catalyst for green gentrification.

Research on New York's High Line and other investments in large green infrastructure projects show that these projects have contributed to displacing long-term low-income residents (Rigolon, 2018). Similar research has come to the same results around Atlanta's High Line project the Chicago infrastructure flip in the "Rails to Trails" project (Curran, 2018). Hardy (2017) refers to this type of adaptation planning as "colorblind" meaning that there are projects which intend to mitigate hazard or vulnerability and also overlook or dismiss the systemic causes of racial inequality. The reappearance of disaster capitalism and public-private partnerships and their roles in perpetuating environmental injustice will be presented in the following section of the literature review.

The Resurfacing of Disaster Capitalism and Public-Private Partnerships

As a framework for understanding environmental gentrification, these terms and concepts can provide clarity around the underpinnings that precede and perpetuate different forms of environmental injustice, environmental racism, and environmental gentrification. Naomi Klein defines disaster capitalism in her book *The Shock Doctrine* as "the ability of a crisis to delegitimize power and authoritative relationships, (which) increases the likelihood of policy change particularly in comparison to normal conditions (Klein, 2007, p. 6). The Post-Katrina

world of New Orleans was studied in excess in Klein's work amongst others and has been analyzed through this lens as an outstanding example of what can occur after a natural disaster, and its historical roots. Luft (2016) puts forth in the article *Racialized Disaster Patriarchy: An Intersectional Model for Understanding Disaster Ten Years after Hurricane Katrina* an intersectional analysis using a gender- and race-conscious structure which embeds Klein's (2007) use of the term "disaster capitalism," and transforms it deeper into an intersectional formation called "racialized disaster patriarchy." This phrase indicates that the practices upheld and perpetuated by political, institutional, organizational, and cultural practices have united before, during, and after a disaster to produce injustice.

While the primary focus of this thesis looks forward into the change of neighborhood after the installation of the Gentilly Resilience District projects, the historical episodes of Post- and Post- Post-Katrina must be thoroughly understood as the location in which this project and others like it function within. The disaster capitalism mentality, while prominent in the leadership and authority in Post-Katrina New Orleans, has also been applied to other places around the globe. Octavianti (2018) documents the politicization of a sea-wall project in Jakarta amongst a sinking coastline also facing subsidence issues. Meijerink and Huitema (2010) examined 16 water policy transition cases worldwide to come to the same conclusion about a significant political shift driven by capitalism becoming realized only in the wake of a disaster. The writing of McBride (2016) poses the question of community development and public power in a "World Risk Society" in the aftermath of Katrina and the disaster relief and recovery efforts that followed.

Octavianti and Charles (forthcoming), explain the idea of a safety narrative being largely marketed towards the public which overrides any concern or critique that community members

offer. This safety narrative mostly matches the media and official language around the GRD, which says in the description:

> The Gentilly Resilience District is a combination of efforts across Gentilly to reduce flood risk, slow land subsidence, improve energy reliability, and encourage neighborhood revitalization. The city's first Resilience District uses various approaches to water and land management that have been successfully piloted throughout New Orleans and, when implemented together, are intended to create even greater neighborhood benefits—such as improved health, economic opportunity, environmental education, and recreation.
>
> (Office of Resilience and Sustainability, 2018)

This explanation, provided by the city government, can facilitate an idea of safety as the antithesis of the fear of disaster. When fear of disaster is exploited to facilitate entry for a capitalist project, this becomes a pathway for disaster capitalism (Octavianti, 2018). Public-private partnerships and nonprofits are also hosts for disaster capitalism projects. As Abou-bakr (2013) writes in the book *Managing Disasters through Public-Private Partnerships*, the public-private partnerships that manage disasters such as Hurricane Katrina are increasingly relied upon in the United States. Research around this type of structure has shown that historically, community input and engagement has not been prioritized nor holistic (Kerahroodi, 2016). The details around funding for the GRD will be included in Chapter 4 and later in the results and discussion in Chapter 6, which will illuminate questions around the public-private partnerships and work of grant-funded resilience projects that come from a federal office. The final section in this chapter will explain the neoliberal environmental sustainability agenda and the embodied projects in New Orleans and around the US.

The Neoliberal Environmental Sustainability Agenda

An examination of the neoliberal environmental sustainability agenda will take place to close out this chapter. Neoliberalism can be described as "a politically guided intensification of market rule" in the public realm (Brenner et al., 2010, p. 184). Alternatively, sociologist Pierre Bourdieu explains that neoliberalism is a "programme for destroying collective structures which may impede the pure market logic" (Bourdieu, 1998; Gareau, 2013, p. 42; Ciplet, 2017). Emerging scholarship around environmental governance after the Paris Agreement has examined solving environmental problems through privatization, commercialization, and commodification of natural resources and ecosystems (Bakker, 2005).

Next, the work around the history and neutralization of sustainability is described by Tulloch and Neilson (2014) as a shifting concept that has now dominated global political language. While the phrase has been used in significant decision-making concepts, the original roots and radical origins of this concept have been primarily co-opted and stripped of meaning. The radical critique of capitalism that came along with this concept in the global environmental movements of the South and North has been largely nullified. The word and concept have now fused with the neoliberal capitalist project (Tulloch and Neilson, 2014). The authors of this piece call for the re-articulation of sustainability to a new counter-hegemonic 'reimagining' of nature, while studying post-Marxist, neo-Gramscian inspired discourse analysis of the critical documents of a global intergovernmental agreement.

Similar to regarding the issue of green infrastructure as neutral and perpetuating colorblind adaptation, neoliberal environmentalism works to "depoliticize," or, "remove issues from political contention" (Jaeger, 2007, p. 258). The lens of environmental sustainability continues to be painted as rational or impartial; whereas considerations of race, equity, and

justice are represented as subjective, radical, and thus, political. Neoliberal environmental messages will shy away from the issues mentioned above to continue to try and stay in this "apolitical" lens.

This use of language and depersonalization of an environmental issue or threat can disempower those with lived experience that is context specific, and give credit to those deemed to possess expert knowledge, including market actors (McCormick, 2006). As Gupta argues, "information (including scientific information) is neither valueneutral, nor universally valid, and thus information alone is not likely to resolve normative and political conflicts" (2008, p. 5). Neo-Marxists are exceedingly incredulous about the likelihood of successful environmental reform of contemporary market societies. It is thought that ecological problems cannot be solved within the capacity of capitalism. In the following chapter, the history of Gentilly will be examined with these perspectives in mind.

CHAPTER 3: History of Gentilly, New Orleans

"Trying to define New Orleans is like trying to hold water in your hands, like trying to walk through a wetland, like trying to draw a coastline that keeps shifting." (Solnit, 2013, p. 34). In 1718, when a French trading company founded the southern city on a riverbank 95 miles north of where the Mississippi River met the sea, they were faced almost immediately with this challenging task. Only four years after the earliest attempts to establish New Orleans, a hurricane flattened the first settlement. The city rebuilt itself quickly as a nine-by-six block grid with the first few thousand earliest enslaved Africans and French colonizers settling in by the mid-1720s. Since its inception, New Orleans has faced similar challenges to those that have plagued all of America's cities, and its own uniquely individual mishaps and struggles that have helped to define the city's essence (Mince, 2002).

Being one of the oldest cities in the nation, reaching its tercentennial year, New Orleans has always been a city of contradictions. It is a place where both "firm racial divides and enthusiastic racial mixing" occur, and one that holds "poverty that can be measured by statistics and an extraordinary wealth of festivity and memory that cannot be quantified" (Solnit, 2013, p. 4). In terms of its historic neighborhoods, New Orleans hosts one of the country's oldest African American neighborhoods, Faubourg Treme. It was also home to Ruby Bridges, the city's first Black child to desegregate the New Orleans school district. New Orleans is also the home of 1896 case of *Plessy v. Ferguson,* in which the Supreme Court upheld the constitutionality of racial segregation laws that are now known as the "separate but equal" doctrine (*Plessy v. Ferguson,* 163 U.S. 537, 1896). After the Jim Crow era, these laws were deemed unconstitutional, but they and many others are an essential backdrop on which to understand the housing laws, market, and population that inhabited the city. Following is a more in-depth

analysis into the city's comprehensive zoning ordinances, racially restrictive covenants, and the deeply racialized housing market that has formed the Crescent City as we know it today.

Early Development of the City

The development of New Orleans required a handful of ad-hoc rules which helped to build the city. The French Quarter was created first, in the early and mid-1700s. The first rule was to be immediately adjacent to an already urbanized area, so the Faubourg Saint Marie in was built in 1788, followed by Faubourg Marigny in 1805, and Faubourg Treme in 1810, using the first rule as guidance. In Figure 3.1, the earliest developments are shown on the banks of the Mississippi River.

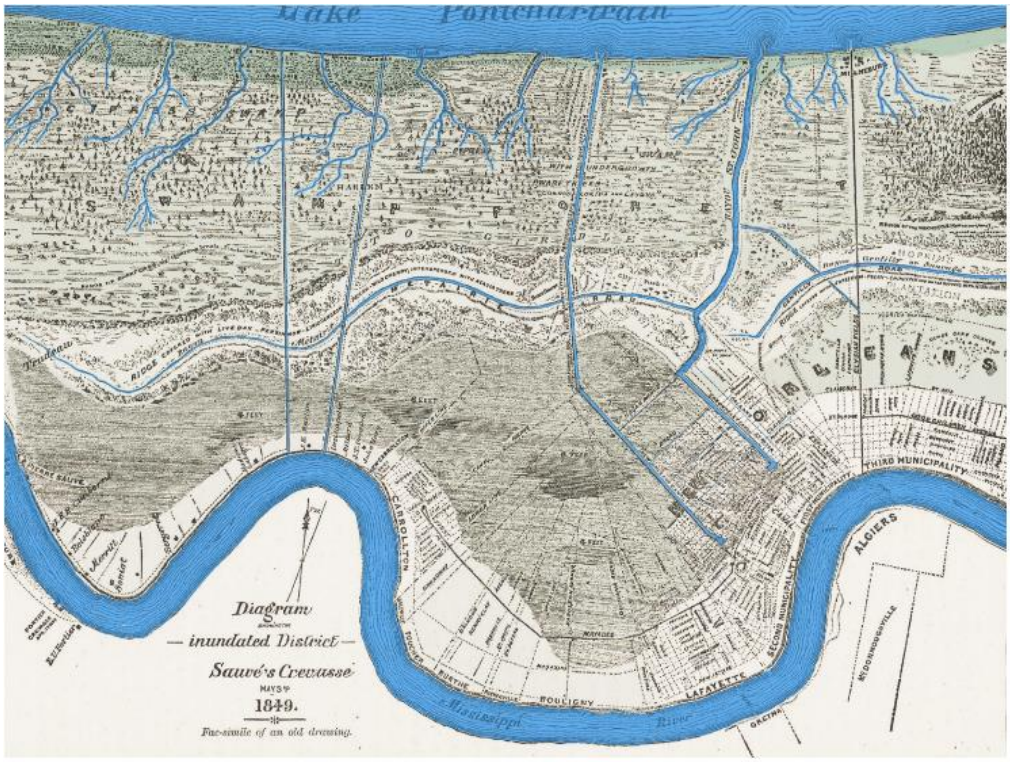


Figure 3.1: Large swaths of New Orleans were once marsh and swamp. Source: Louisiana Digital Map Library

A second rule that shaped the city was accessibility, and as the development continued to be shaped by roads, canals, streetcars and railroads, Faubourg St. John was added to the city in 1810. Next came the Uptown neighborhoods of Lafayette, Jefferson, and Carrollton, built in

1835 (Kates, 2006). A third fundamental land use planning rule and a distinction of this particular city, is that New Orleans consistently faces the challenge of finding topographically elevated places to build. This challenge restricted development to the crescent-shaped natural levee of the Mississippi River, Esplanade Ridge, and the Metairie/Gentilly ridges. This growth of urbanization is shown in Figure 3.2 below (Campanella, 2013).

The divide between the Uptown and Downtown neighborhoods, separated by the French Quarter was stark, both culturally and amenity-wise. Uptown had access to a broader natural levee system based on the meander of the river and grew faster and with more prosperity due to this hydrological advantage. Whereas downtown New Orleans, with its rich historical ties to France, Spain and Afro-Caribbean culture, inherited much of the sewage, debris, and pollutants from the wealthier, Whiter, Uptown neighborhoods. As one of the earliest sites of environmental justice discrimination; nuisance and hazardous areas –such as flood plains, railroads, industrial development, and canals – were located next to low-income and African American neighborhoods. These areas were geographically separated and located near large wharves or cut off by other amenities such as canals or railroads (Campanella, 2013).

Figure 3.2: This map shows the trend of urbanization over time between 1722 and 2000. Source: Campanella, 2013

Comprehensive Zoning Ordinances

New Orleans' neighborhoods were segregated by race and class due to economic and class mobility from the legacy of slavery, the Reconstruction Era, and the Jim Crow south. White residents were able to move closer to Lake Pontchartrain and form neighborhoods like Lakeview and the town of Metairie when wooden pumps were installed across the city in 1917 and drainage improved dramatically. In the same year, the Supreme Court case of *Buchanan v. Warley* made it illegal to use a racial zoning ordinance to segregate cities (*Buchanan v. Warley,* 1917*)*. Figure 3.3 below shows the growth of majority Black neighborhoods between 1910 and 1930. Racially segregated city planning and public policies and racialized planning processes continued to shape New Orleans just like it shaped multiple other cities across the South, even though it was legally rejected (Silver, 2007).

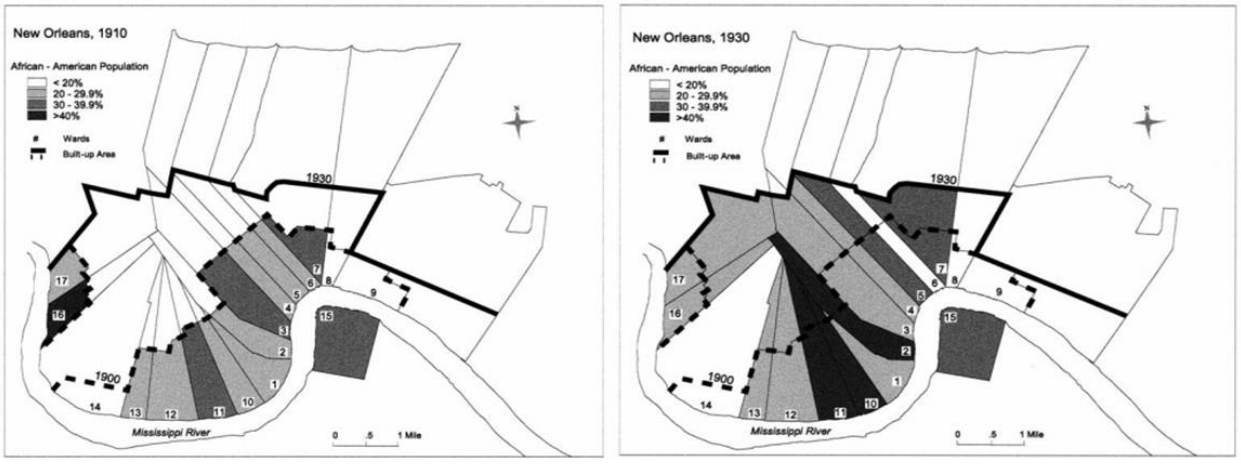


Figure 3.3: Increase of Majority Black Neighborhoods, moving closer to the area soon to be developed as Gentilly.
Source: US Census

In 1923, New Orleans became the first city in the Southern region of the US to produce an official city planning commission (Silver, 2007). The city planning commission and was shaped by ideas from nationally renowned urban planners such as Charles Knight, whose work

influenced community development strategies and played into the "separate but equal" ideology shaped by the *Plessy v. Ferguson* case just 27 years before (Silver, 2007). Two years after implementing their first zoning ordinance, they hired the Boston-based Harland Bartholomew firm after they completed their work in St. Louis. Bartholomew was to work on the "Vieux Carre" or Old Town commission in order to protect the old city from newer construction and industry. Bartholomew was criticized for his work in St. Louis and other cities as being a proponent of racial, economic, and social segregation (Benton, 2017).

Before the first comprehensive zoning ordinance was agreed upon in 1929, Buchanan and his team went through several drafts of the zoning plan with ten public hearings, and over thirty meetings in the four years (Silver, 1997). The city planning and zoning commission received 415 petitions from property holders and recommendations from various associations (Jones-Correa, 2000). Some of these particular recommendations stated that there were to be specific rules separating White and Black residents. Using a tried and true method of segregation, giving "equal treatment" to both races, the property holders that submitted petitions demanded that "Blacks could not occupy a house in a White block or a White person in a Black block unless the prospective occupant obtained written permission of a majority of the residents already in the block" (Silver, 1997, p. 219).

The back and forth that followed this rule started in a lower court, moved to the Louisiana Supreme Court, then was finally deemed unconstitutional by the national Supreme Court when it was challenged by the local National Association for the Advancement of Colored People (NAACP) (Connerly, 2005). "New Orleans attempted to frame its defense in terms of planning to achieve social rearrangement, not just property protection. New Orleans argued that zoning and comprehensive planning should join the host of legal Jim Crow strategies being

employed to transform the racially integrated Southern city into a bifurcated racial world" (Silver, 1997, p. 221). In the 1930s and 1940s, Federal initiatives in public housing and slum clearance, or what Color of Law author Richard Rothstein says is also known as "Black removal" (2017) provided additional resources for reconstructing the social landscape, and Southern and non-Southern cities eagerly participated in these efforts. The resources separated Black sections of the city in various ways and continue to ignore the legalities of the Buchanan decision.

Racially Restrictive Covenants and Redlining

"Redlining," a policy initiated by the creation of the Federal Housing Administration in 1934, in which the process was to overtly deny the distribution of loans to Black people or other residents living in majority Black neighborhoods, became popular after racially restrictive covenants were banned (Greer, 2012).

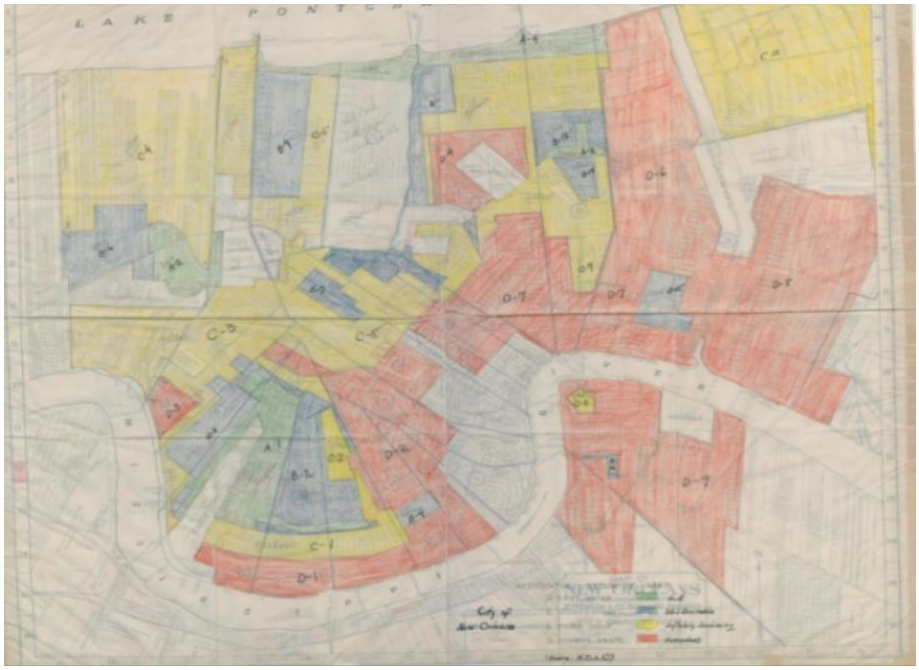


Figure 3.4: This map was made by the City Planning Commission in 1935 to delineate the differently graded neighborhoods. Source: New Orleans City Planning Commission, 1935

Figure 3.4 demonstrates not only the neighborhoods where only African Americans were allowed to live, but also outlines the Green, Blue, and Yellow neighborhoods – effectively showing first grade, second grade, third and fourth (Red) grade districts. This map was drawn in 1935. It is shown in Figure 3.5 just how little these maps have changed with regards to racial segregation.

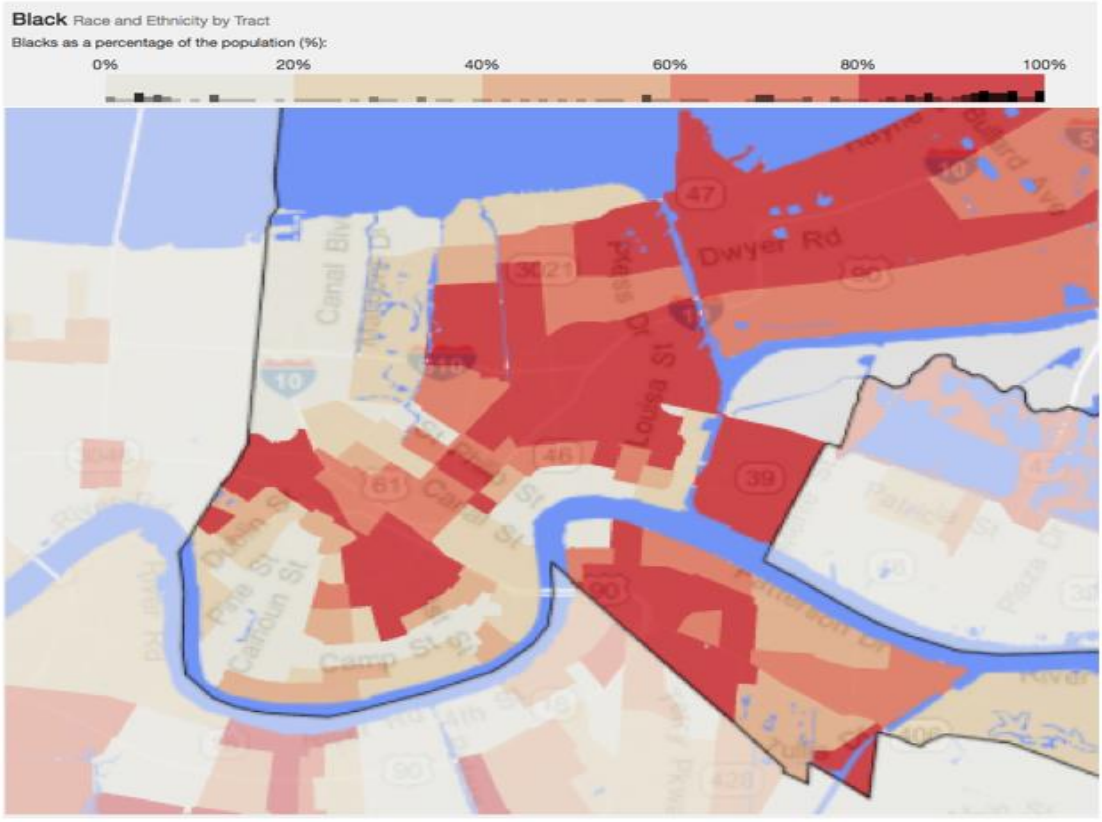


Figure 3.5: This map is created from the US Census Data of 2012 and shows where Black residents are concentrated in New Orleans. Source: Campanella, 2013

In 1937 the Housing Act was passed by the Louisiana Legislature and encouraged the development of the first public housing projects in New Orleans. The first of what is known as the "Big Four" housing developments — Magnolia, Calliope, Lafitte and St. Bernard – were completed in 1941. Figure 3.6, below, shows where they are located within the city. These four were built specifically for African American New Orleanians and totaled 2,309 units. Two housing complexes were built for White residents, St. Thomas and Iberville. Three additional

projects, Florida, Desire and Melpomene that also housed African American residents predominately, were completed by 1963 (Florida, 2011). Housing projects and previous legislation ensured that African Americans were more likely to rent than to own their home, (25% vs. 44% of Whites), and when they did own, the property was significantly valued lower (average value of $3,800 vs. $10,000 for Whites) (Florida, 2016).

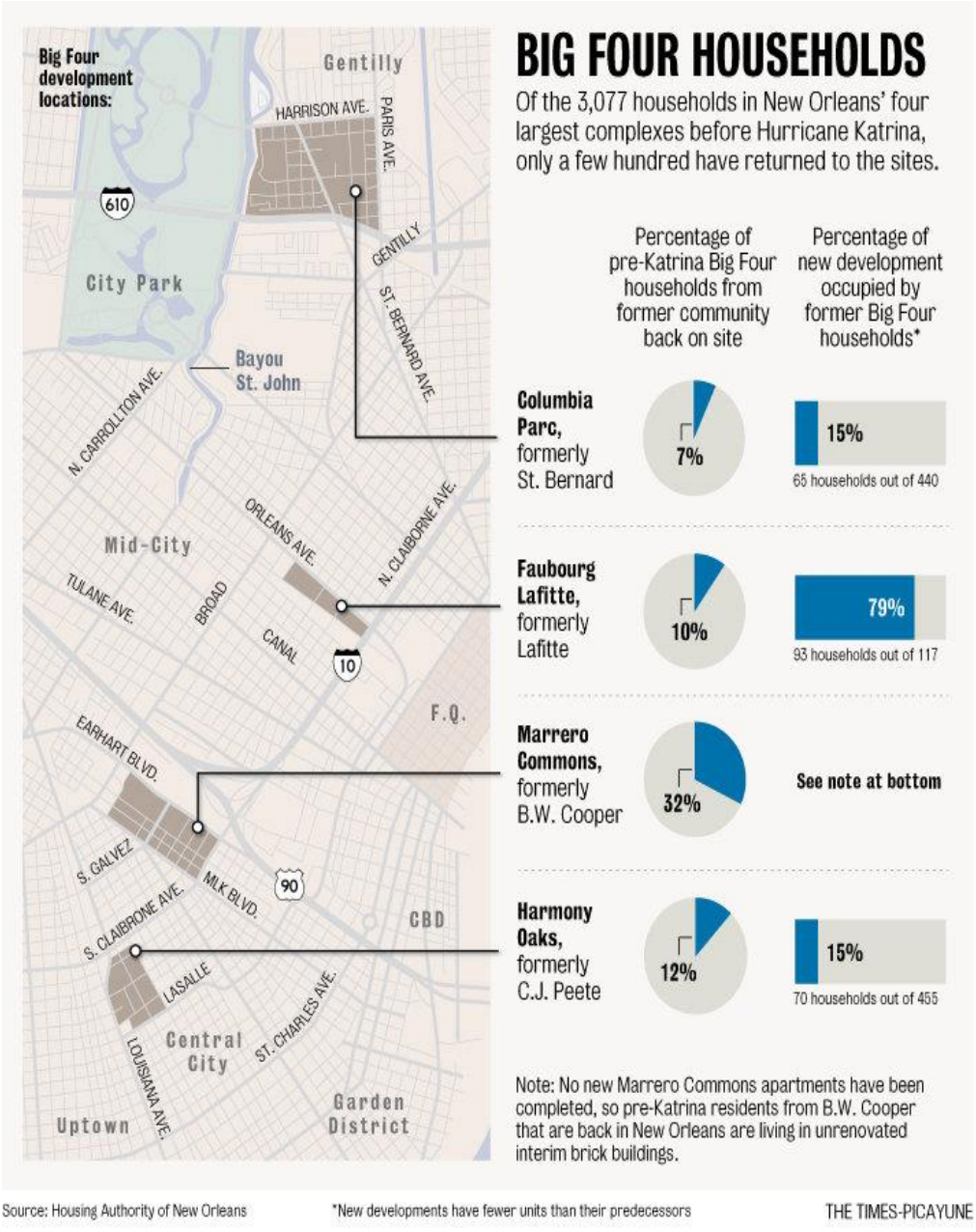


Figure 3.6: A Map and data from the New Orleans' primary newspaper, The Times-Picayune, shows where the "Big Four" Housing Projects are located throughout the city. Source: Housing Authority of New Orleans, 2016

Construction of I-10 and the Fair Housing Act

In the Treme, one of the nation's oldest Black neighborhood, where much of the New Orleans' culture began, the construction of I-10 caused a disturbance. The highway was first funded starting in 1957 and completed in 1972. Residents of Treme organized against the decision to build the highway right through their community, but they lost to a predominately White group of French quarter preservationists. The elevated expressway took the place of ancient oak trees, azalea bushes, and over 500 homes Black-owned businesses. "The construction of the interstate is believed to be directly responsible for the economic slump and crime in the neighborhood that followed" (Johnson, 2017, p. 14). In the midst of this construction injustice, the Fair Housing Act was passed on April 11, 1968, as a part of the Civil Rights Act. It prohibited discrimination based on race and addressed renting or buying a home, securing a mortgage loan or purchasing homeowners insurance. The housing choice voucher program, a rental-assistance program was also administered by the Department of Housing and Urban Development (HUD). Public Housing and project-based Section 8 subsidies were formed, and low-income housing tax credit were all relatively successful wins from this decade (Seicshnaydre, 2011).

The Beginnings of Gentilly

While the parts of New Orleans that had access to a broader natural levee system, based on the meander of the river, grew faster and with more prosperity, these areas also had more protection from flooding and storms. The region east of the French Quarter inherited much of the sewage, debris, and pollutants from the wealthier, Whiter Uptown neighborhoods. Nuisance and hazardous areas – such as flood plains, railroads, industrial development, and canals – were

located next to low-income and Black neighborhoods. These areas were geographically separated by industrial necessities such as canals or railroads and located near large wharves or other trade-route amenities (Solnit, 2013). North of the river and neighborhoods like the seventh and ninth ward, the neighborhood of Gentilly was built in one of the areas immediately south of Lake Pontchartrain. It had initially been considered inhospitable due to the swampy terrain.

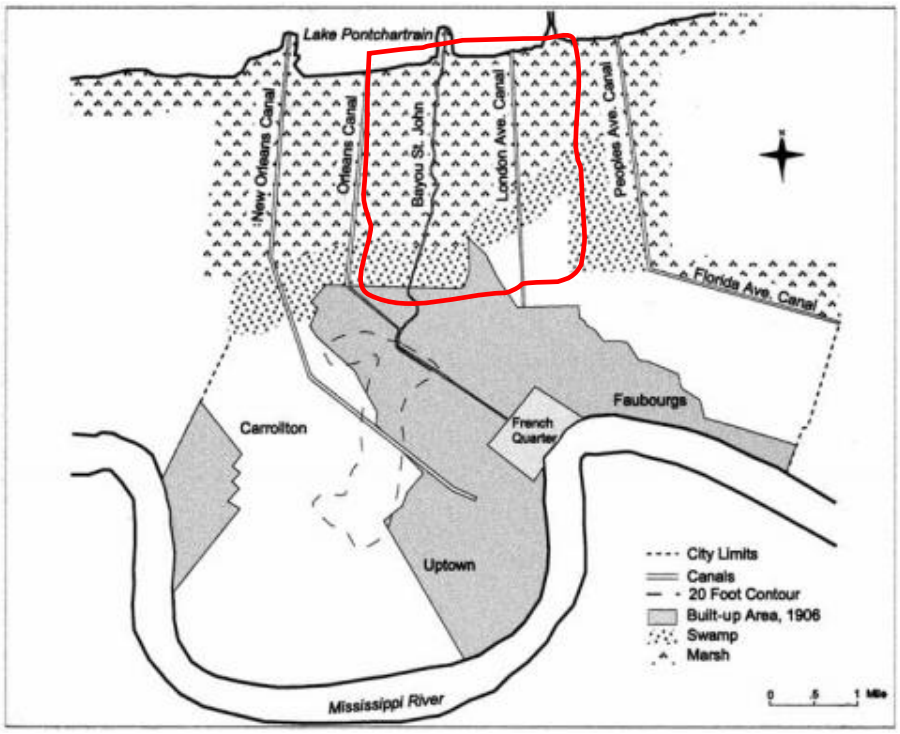


Figure 3.7: New Orleans built-up area and environmental conditions, c. 1906. The Gentilly area is outlined in red. Source; Campanella, 2013

When drainage improved dramatically, and wooden pumps were installed across the city in 1917, White residents moved closer to Lake Pontchartrain and formed new neighborhoods like Lakeview and Metairie. Although the Supreme Court deemed racial zoning ordinances illegal that same year, Jim Crow Laws still precluded Blacks from taking advantage of this urban expansion. White middle-class citizens settled into these trendy low-lying suburbs, further accelerating racial segregation in the city. Drainage was also synonymous with sewage & plumbing, so the disparity in municipal planning between White and Black communities had

serious health implications as poor sanitary services led to the spread of disease. In 1926, the Louisiana Department of Health estimated that the death rate from typhoid among Blacks in the city was more than three times higher than the rate among Whites (Solnit, 2013).

As interstate expansion in the 1950s continued to assist White residents who wanted to move into the suburbs, the Gentilly neighborhood shifted from a predominately White neighborhood to attracting the Black middle class, mirroring many of the other eastern wards in the city. White philanthropists funded the construction of Pontchartrain Park, the first modern suburban subdivision for Blacks in 1955, the spread of the Black middle class in this eastern area continued. In the 1970s and 1980s, this transformation led to the departure of many Whites from Gentilly, which allowed more excellent housing stock for middle-class Black families to become available. Over 130,000 predominately White residents moved to nearby suburbs during the period of White flight (Rothstein, 2017).

White Flight and a Shrinking Metropolis

As the I-10 made the suburban areas of Metairie, Kenner, and Chalmette more accessible, White residents fled the city. With school integration and newer homes offered to White residents, the pull to leave was strong. Although the practice of redlining was made illegal in 1968, African Americans were still not able to move to the suburbs, and the loss of wealthier pockets of the population hurt many New Orleans neighborhoods as retail businesses. Manufacturing businesses also moved out of the New Orleans parish, and middle-class jobs went with them. A larger wage gap spread throughout the country, and middle-income jobs were reserved for those with higher education (Seicshnaydre, 2011). Deeper and longer-lasting poverty continues to shape the city's housing market and neighborhood segregation. In 1965,

Hurricane Betsy caused significant damage to the city and negatively impacts home values and structural conditions (Betty, 1969). Black residents were also displaced when public amenities were built. In the 1940s the civic center pushed Black residents into predominantly Black sections of the city (Seicshnaydre, 2011). Thirty years later, in 1975 the Superdome was built, and a similar pattern followed (Dixon, 2008).

New Orleans in the Decades of 1980 and 1990

Between 1980 and 2000 New Orleans became even more segregated by race. At the beginning of the 1980s, Louisiana's population rose, and unemployment in the state was only 6.2%, which was the lowest it had been in ten years (US Census, 2018). New Orleans hosted The World's Fair in 1984 and hotels, and office buildings were built in the Central Business District to accommodate new oil business and the increase in tourism (King, 1984). The development of new racially segregated suburbs continuously destroyed marsh and forest land. As oil prices dropped, New Orleans could feel the national recession, and Louisiana's unemployment rate rose to the highest in the country in 1986 (US Census, 2018).

In the 1990s, the population of the city was 496,938 (US Census, 2018). New Orleans was only emerging from a severe recession that cost the metropolitan area almost 10,000 jobs. Murder rates were the highest in the country, corruption in the city and state government was rampant and unchecked, and in May of 1995, the Louisiana flood devastated the city and state (Roth, 2010). In 2000, the average Black resident lived in a location where 82% of the fellow residents were Black Roughly one-quarter of New Orleans's neighborhoods had at least 40% of resident's family incomes below the federal poverty line. The rate of poverty for low-income African Americans was four times higher than low-income Whites, at 42.6% and 10.9%

respectively (Seicshnaydre, 2011). Leading up to 2005, a notable year in New Orleans' history, the population was 480,256 (Rothstein, 2017). New Orleans had lost over 130,000 residents since 1960, many of them White residents who exited to the suburbs (Seicshnaydre, 2011).

Hurricane Katrina

Now widely regarded as one of the supreme examples of environmental, social, and structural injustices, Hurricane Katrina clearly showed how the city was divided across race and class lines. The hardest hit areas were the predominantly Black, low-lying neighborhoods of the Lower 9th Ward, the Bywater, and New Orleans East. While 43% of White residents' homes were impacted by the hurricane, 68% of African American residents suffered from the storm (Michaels, 2015). The injustice displayed by the lack of immediate help and recovery aid from FEMA and the federal government was matched by the racist insurance and housing policies that prevented so many Black residents from returning home. Although there were displaced residents from all across the city, those who could return home and were able to rebuild were mainly White, wealthy and did not have children. In 2010, the population of New Orleans was 343,829. It rose to 389,617 in 2015, but the racial makeup of the city is barely recognizable to its former makeup (US Census, 2018).

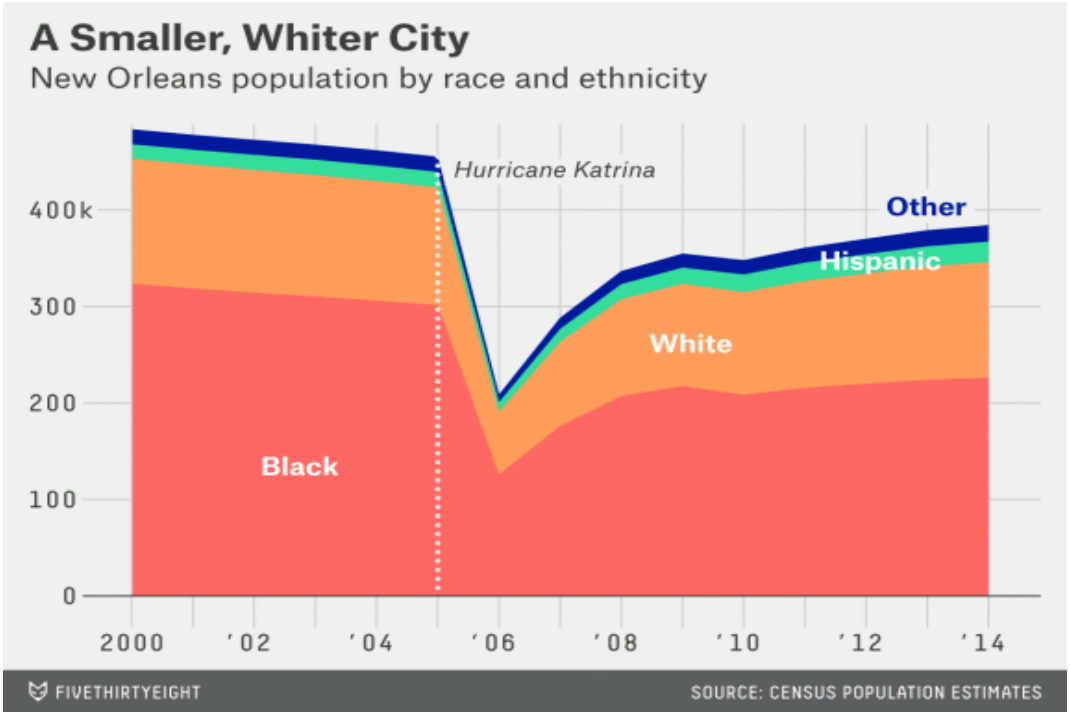


Figure 3.8 : Casselman made this graph using US Census Data from 2014. It shows the rate of return by demographic of residents post-Katrina. Source: Casselman, 2015

As the disaster made waves globally, many news outlets illuminated the disproportionate effects of those impacted as a product of historical spatial correlations between class, race, and topography. In September 2005, *The New York Times* wrote that it was “not a coincidence that many of those hard-hit, low-lying areas have had poor and predominantly Black residents” (p. 29). The article also quoted a local activist who commented that "Black people only moved to low-lying Gentilly and eastern New Orleans because all the good high ground had been taken." It was a common understanding nationwide as well as globally that this storm disproportionately impacted low-lying neighborhoods like Gentilly, mainly due to failures in infrastructure like the London Avenue Canal levee breach and collapse. Figure 3.9 below shows the exact area where the levee failed and the subsequent flooding of the surrounding streets.

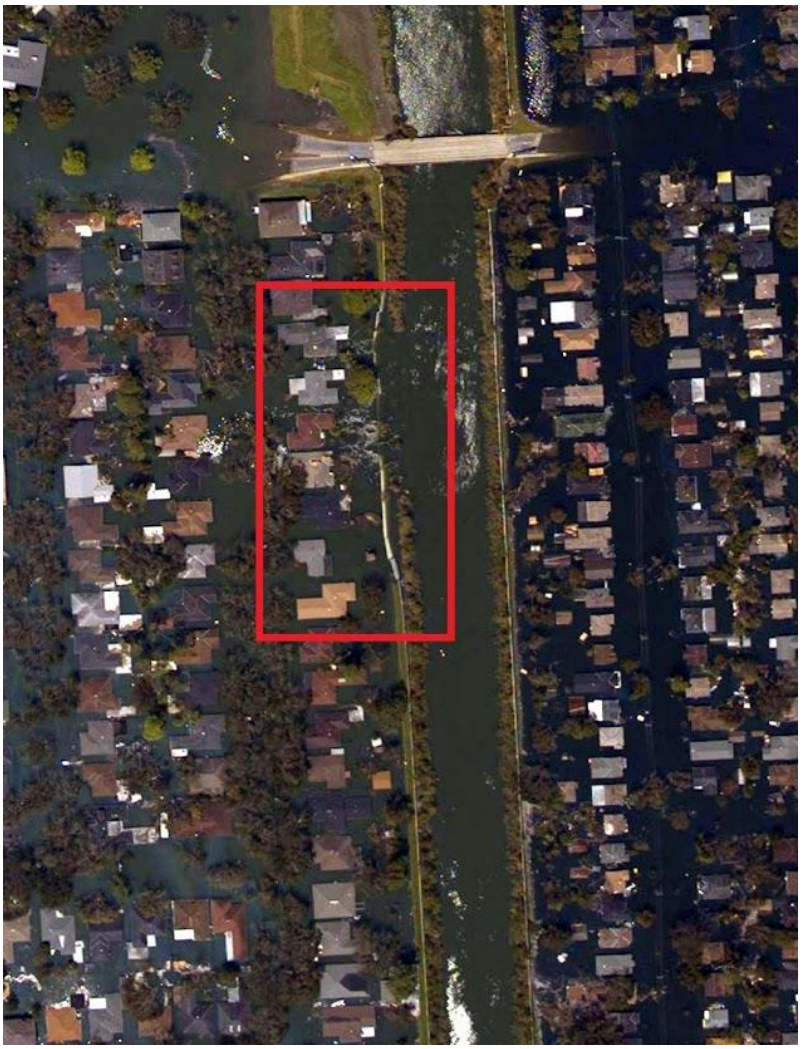


Figure 3.9: The London Street Avenue Canal collapsed, flooding the Gentilly residences with stormwater from Lake Ponchartrain. Source: NOAA, 2005

It is widely reported in the literature (Klein, 2005), that the disaster of Hurricane Katrina and the subsequent recovery or lack of recovery has disproportionately impacted Blacks throughout New Orleans. Instead of pushing for the prompt rebuilding of homes and communities, then-Mayor Ray Nagin advocated for highly controversial plans like the "Green Dot Map." This plan suggested demolishing lower-lying, predominately Black neighborhoods and replacing them with floodplains (Anguelovski, 2016). Many more people of color died in the immediate aftermath of Katrina. The following table highlights the disproportionate impact of Hurricane Katrina on Black, Hispanic, and Asian community members in Gentilly.

Table 3.1: Demographic Characteristics of New Orleans and the Impacts of Katrina

	White	Black	Hispanic	Asian
Total Population pre-Katrina	134,012	323,868	14,663	10,751
Population Living in Flooded Area	57,469	220,970	7,826	7,753
% of Population that Flooded	43%	68%	53%	72%
Pre-Katrina Population and Flood Victims Overall	28% and 20%	67% and 76%	3% and 3%	2% and 3%
Deaths	31% of all deaths	66% of all deaths	No Data	No Data

Source: Campanella, 2013.

Post-Katrina, decision-makers took advantage of zoning laws that restricted public housing projects and multi-family dwellings, keeping many Black families out of newly gentrified neighborhoods. In 2010, the population of New Orleans was 343,829. It rose to 389,617 in 2015, but the racial makeup of the city is barely recognizable to its former makeup. Today, nearly 100,000 fewer African Americans live in New Orleans than in 2000 – compared to only 11,500 fewer White residents (Fussell, 2007). Prior to Katrina, more than two in three New Orleans' residents were Black. A year later, fewer than half were, as shown in Figure 3.10. Recovery and rebuilding were slow in many Black neighborhoods, Gentilly being a perfect example.

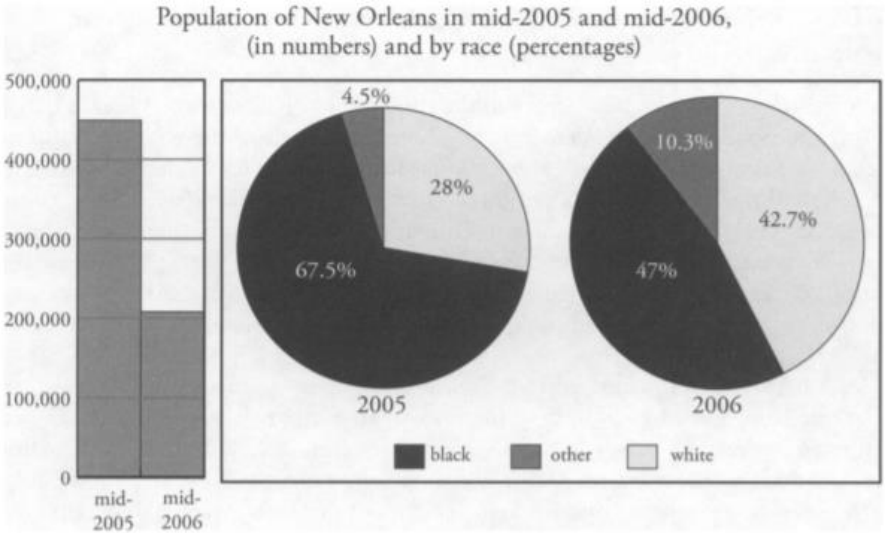


Figure 3.10: Population of New Orleans in mid-2005 and mid-2006 by race. Source: Fussell, 2007

A Post-Katrina Reality

In the 14 years following Katrina, the city of New Orleans is a smaller, wealthier and more diverse, but also more unequal place to live. The worry about rising rents, gentrification and the erosion of the culture that made New Orleans special in the first place is present in many media pieces and conversations around the city. Immediately after the storm, the Federal Road Home rebuilding project was shown to have discriminated against Black residents by basing payments on the appraised value of damaged properties, not on the cost of repairing them (Morse, 2008). "In Louisiana, homeowners are 66% of the population, but received 79% of housing funds; renters are 34% of the population, but funding for rental housing was only 20% of the total" (Morse, 2008). There was also a 30% penalty for uninsured homeowners who were disproportionately lower-income and minority households (Morse, 2008). Local government also had a hand in furthering displacement of Black residents, with three separate plans calling for destruction of complete neighborhoods instead of any rebuilding at all. Finally, in 2007 the

Unified New Orleans Plan was passed, in which the decision to rebuild all of the neighborhoods was upheld (Morse, 2008).

Public Housing also dramatically changed in the years following Hurricane Katrina, in which many of the older projects were torn down and replaced with mixed-income developments. In theory, the redeveloped properties would deconcentrate poverty and increase the quality of life of tenants. In practice, the conversion permanently displaced low-income tenants who were then unable to locate private market landlords willing to accept housing vouchers (Plyer, 2015). The new housing developments are for communities of varying incomes, with a third of the property reserved for public housing occupants, a third for affordable housing and a third for renters who pay market prices (Plyer, 2015). All of these practices ensured that of the 175,000+ Black residents who were forced to leave the city in the year following the storm; over 75,000 of those residents never came back (Casselman, 2015).

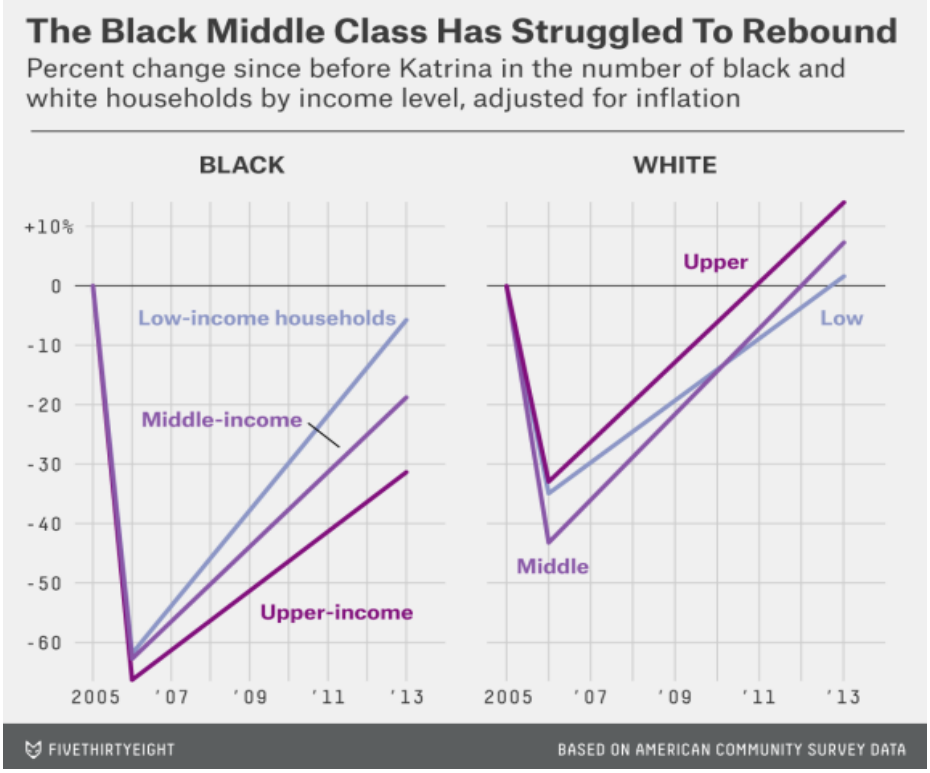


Figure 3.11: Casselman also put together this graph to show % change since before Hurricane Katrina in the number of Black and White households by income level. Source: Casselman, 2015

Even though in many ways the city's economy is stronger today than in 2005, the African Americans who still make up the majority of its population, have been systematically excluded from this success. There is a higher percent unemployment and poverty rate for Black residents than before the storm, those who are employed are seeing a lower wage than pre-Katrina numbers, and the income gap is growing between White and Black residents. The African American share of the population is down to 59.8% in 2016, from 66% in 2005 (US Census, 2018). Housing costs are increasing although wages are not, and according to The Data Center, a New Orleans research group, 37% of New Orleanian renters spend more than half their pre-tax income on rent and utilities (Plyer, 2015).

In 2016, the Housing Authority of New Orleans (HANO) announced a strategy to fight segregation and gentrification in New Orleans, which have both become worsened in the years after Hurricane Katrina. According to the 2016 report, neighborhoods like New Orleans East and Gentilly on lower ground that had high numbers of Black residents before the storm had even higher numbers of Black residents after. However, neighborhoods on higher ground—including what used to be a majority Black Bywater, Treme, St. Roch, and St. Claude—"are now majority-White or moving in that direction" (Laborde, 2016).

The Office of Resilience and Sustainability (ORS) was formed in August 2015, after the City released its initial overview of its strategies in a document titled, "Resilient New Orleans, Strategic Actions to Shape our Future City" (ORS, 2015). The three original goals of the city fit into the taglines; "Adapt To Thrive," "Connect to Opportunity," and "Transform City Systems,"(ORS, 2015, p. 29). New Orleans has committed to achieve these visions by 2050 through specific actions such as "investing in comprehensive and innovative urban water management, incentivizing property owners to invest in risk reduction, creating a culture of

environmental awareness at every stage of life, committing to mitigating our climate impact and expanding access to safe and affordable housing" (ORS, 2015).

The ORS now has the obligation to execute the strategy outlined above by coordinating with partners and agencies. The ORS must also advise the Mayor issues of environmental policy, prioritizing tasks, and providing regional vision and leadership. ORS also works closely with the City Planning Commission and Hazard Mitigation Office to guarantee uniformity with Master Plan and Hazard Mitigation Plan (D'Arcey, 2017). As discussed in Chapters 1 and 2, ORS has acted in various capacities on projects such as the Gentilly Resilience District, amongst others water management projects. Four clear goals of each ORS project must 1) reduce risk of flooding and subsidence, 2) beautify neighborhoods and develop the economy, 3) provide recreation & health benefits, and 4) work towards an increased environmental awareness city-wide. These goals and other more tailored ones guide the practice of the Gentilly Resilience District.

A Post-Katrina Gentilly

This thesis and any subsequent research need to incorporate the broader environmental considerations of the city of New Orleans and also the disappearing coast of Louisiana, as well as the environmental sacrifice zone that the entirety of the Gulf Coast has become. Yet it is focused specifically on Gentilly as a neighborhood in the city because of the Gentilly Resilience District and the process of adaptation and resilience that the neighborhood is undergoing. Today the population of Gentilly is about 17% more Black than the city total, with 77.77% percent of residents identifying as Black. The total population in the nine sub-neighborhoods that make up Gentilly is 40,384 according to the 2016 US Census. It is 58.46% female, with 57.9% under the age of 18 and over 50 years old. 23.76% of Gentilly lives below the poverty line. There are nine

sub-neighborhoods; Gentilly Terrace, St. Bernard Area, Lake Terrace and Oaks, Gentilly Woods, Ponchartrain Park, St. Anthony, Milneburg, Filmore, and Dillard. See the tables below for a full breakdown of the neighborhood demographics.

Neighborhood	Gentilly Terrace	St. Bernard	Lake Terrace and Oaks	Gentilly Woods	Pontchartrain Park	St. Anthony	Milneburg	Filmore	Dillard	Gentilly Total
Year	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	**2012-2016**
Black	78.40%	92.20%	24.00%	79.10%	95.20%	76.70%	90.20%	72.80%	91.30%	**77.77%**
White	15.40%	2.50%	57.20%	17.90%	2.90%	14.10%	6.70%	21.30%	3.40%	**15.71%**
Asian	0.50%	0.20%	8.50%	2.10%	0.00%	1.20%	0.00%	2.50%	0.30%	**1.70%**
American Indian	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	**0.03%**
Other	0.50%	0.60%	0.90%	0.00%	0.00%	1.80%	0.40%	0.40%	0.20%	**0.53%**
2 races	1.20%	0.30%	6.10%	0.30%	0.50%	0.10%	0.60%	0.70%	0.30%	**1.12%**
Hispanic	3.80%	4.20%	3.30%	0.60%	1.30%	6.10%	2.10%	2.20%	4.40%	**3.11%**

Table 3.2 Race in Present-day Gentilly ACS Data 2016

Gentilly Total	Dillard	Filmore	Milneburg	St. Anthony	Pontchartrain Park	Gentilly Woods	Gentilly Terrace	Lake Terrace & Oaks	St. Bernard Area	Neighborhood
2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	**Year**
40,384	5181	5649	4659	4754	2186	3170	10169	2098	2518	**Population**
14,788	2103	2004	1640	1770	602	973	3865	823	1008	**Total Households**
8,838	1112	1282	983	1058	439	632	2241	574	517	**Family Households**

Table 3.3: Population, ACS Data 2016

Gentilly Survey Results	Gentilly Total	Filmore	Milneburg	St. Anthony	Pontchartrain Park	Gentilly Woods	Gentilly Terrace	Lake Terrace & Oaks	St. Bernard Area	Neighborhood
2018	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	**Year**
58.46%	54.99%	50.80%	50.40%	52.50%	58.50%	55.20%	58.50%	51.10%	62.90%	**Female**
42.46%	45.01%	49.20%	49.60%	47.50%	41.50%	44.80%	41.50%	48.90%	37.10%	**Male**

Table 3.4: Gender, ACS Data 2016

Gentilly Total (Survey Data)	Gentilly Total (ACS Data)	Dillard	Filmore	Milneburg	St. Anthony	Pontchartrain Park	Gentilly Woods	Gentilly Terrace	Lake Terrace & Oaks	St. Bernard Area	Neighborhood
2012-2016	**2012-2016**	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	**Year**
Under 40 41%	**23.70%**	19.40%	24.00%	24.20%	27.90%	23.40%	24.70%	20.70%	16.00%	33.00%	**Under 18**
40-60 29%	**42.80%**	41.30%	39.80%	43.90%	49.70%	39.60%	46.10%	45.20%	38.00%	41.60%	**18-50**
Over 60 30%	**34.20%**	39.50%	37.60%	32.70%	22.80%	38.70%	30.70%	34.50%	45.70%	25.60%	**Over 50**

Table 3.5: Age, ACS Data 2016

Gentilly Total	Dillard	Filmore	Milneburg	St. Anthony	Pontchartrain Park	Gentilly Woods	Gentilly Terrace	Lake Terrace & Oaks	St. Bernard Area	Neighborhood
2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	2012-2016	**Year**
23.76%	25.90%	13.40%	21.80%	31.90%	28.40%	18.10%	21.10%	9.40%	43.80%	**Percent Below Poverty**

Table 3.6: Below Poverty, ACS Data 2016

Zoning laws in both New Orleans and Gentilly specifically, have truly been instrumental in shaping the Crescent City. Where and how development has happened impacts everything from port functionality to hurricane risk management. In a 300 year-old city that has faced multiple difficulties, the housing market and the infrastructure are in need of major overhauls. The Gentilly Resilience District planning committee and the Office of Resilience and Sustainability have recognized pieces of this crucial New Orleans history, and yet, as is displayed in Chapter 6, there are members of the community who do not feel as if their Post-Katrina concerns are being met through this project. Before the Results and Discussion are introduced into this thesis, Chapter 4 outlines the timeline, history and agenda of the Gentilly Resilience District.

CHAPTER 4: The Gentilly Resilience District

The Gentilly Resilience District (GRD) arises from a myriad of efforts to reduce flood risk, slow land subsidence, and encourage neighborhood revitalization (Office of Resilience and Sustainability, 2018). This will be the first Resilience District New Orleans has seen, yet it relies on several methods of water and land management that have been conducted previously throughout the city and when combined, are envisioned to generate even greater neighborhood benefits. The multiple projects of the Gentilly Resilience District will work to provide various solutions and speak to multifaceted concerns such as collapsing streets, overloaded drainage systems, and sinking soils. The Gentilly Resilience District projects will incorporate streets, neutral grounds or medians, parks, schoolyards, open lots, and private homes. Each site is intended to decrease risk from flooding and subsidence by constructing areas to capture rainwater in the urban landscape. The GRD is intended to "beautify neighborhoods, improve health, and provide opportunities for recreation, as well as…reduce risk and enhance development potential" (ORS, 2018).

Local and national media outlets alike began covering the Gentilly Resilience District in late January of 2016. With headlines like "New Orleans is Done Fighting Water" (Spector, 2016) published on the globally recognized CityLab's site, or "A New Vision for Water" (Morris, 2017), issued by the local New Orleans' paper *Pelican Bomb*, the Gentilly Resilience District and its forward-thinking strategies were making a splash. This chapter details the years following Hurricane Katrina and the multiple water coalitions, planning commissions and adaptation plans that prefigure the creation of the Gentilly Resilience District. The details of the creation of the GRD are relevant to the results and following discussion, and the emphasis on procedural justice or lack of it that this thesis explores. While the media developed the story on the Gentilly

Resilience District in 2016, the planning for sustainable water management in New Orleans was extremely heightened after the devastating effects of Hurricane Katrina, 11 years prior. Figure 4.1 is a timeline from the Office of Resilience and Sustainability, that presents the multiple plans after Hurricane Katrina up until 2015 and the arrival of the "Resilient New Orleans" plan. Not included in this timeline is The Climate Action Plan, one of the first documents brought forth by the Office of Resilience and Sustainability and the Mayor's Office in July 2017.

Within the report, the phrase "climate change" is written 44 times. The goals outlined in this report are to reduce the annual greenhouse gas pollution by 50% in 2030 from what it is today. In order to do so, the plan outlines ways to keep greenhouse gas pollution below 1.8 million metric tons, by modernizing the energy being used to include more renewables, improving the transportation system, reducing the amount of waste created, and encouraging a culture of awareness and action (ORS, 2018).

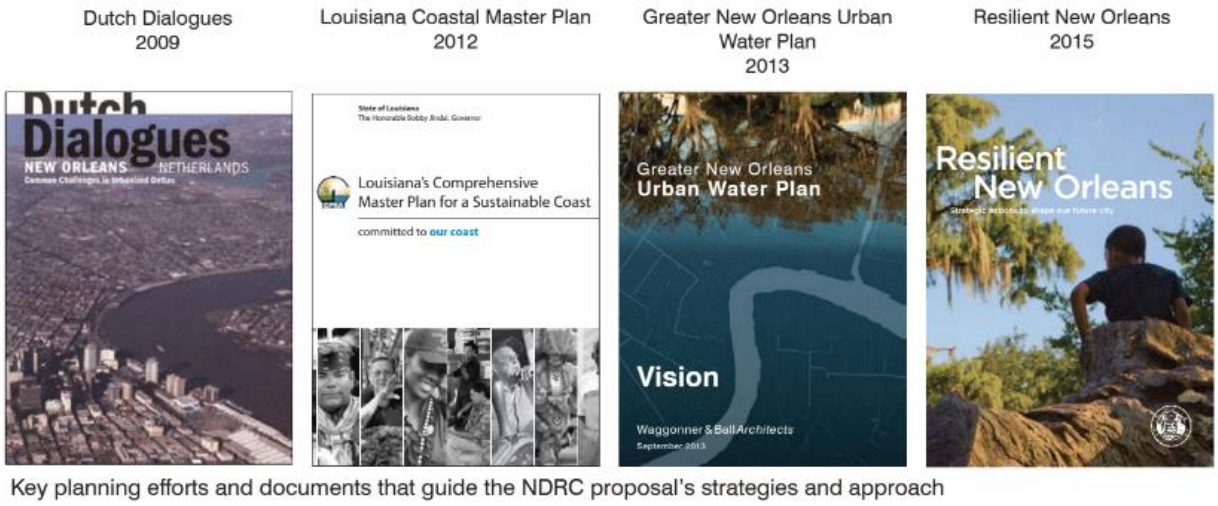


Figure 4.1: Key Planning efforts and documents that guide the NDRC proposal's approach. Source: City of New Orleans, 2015

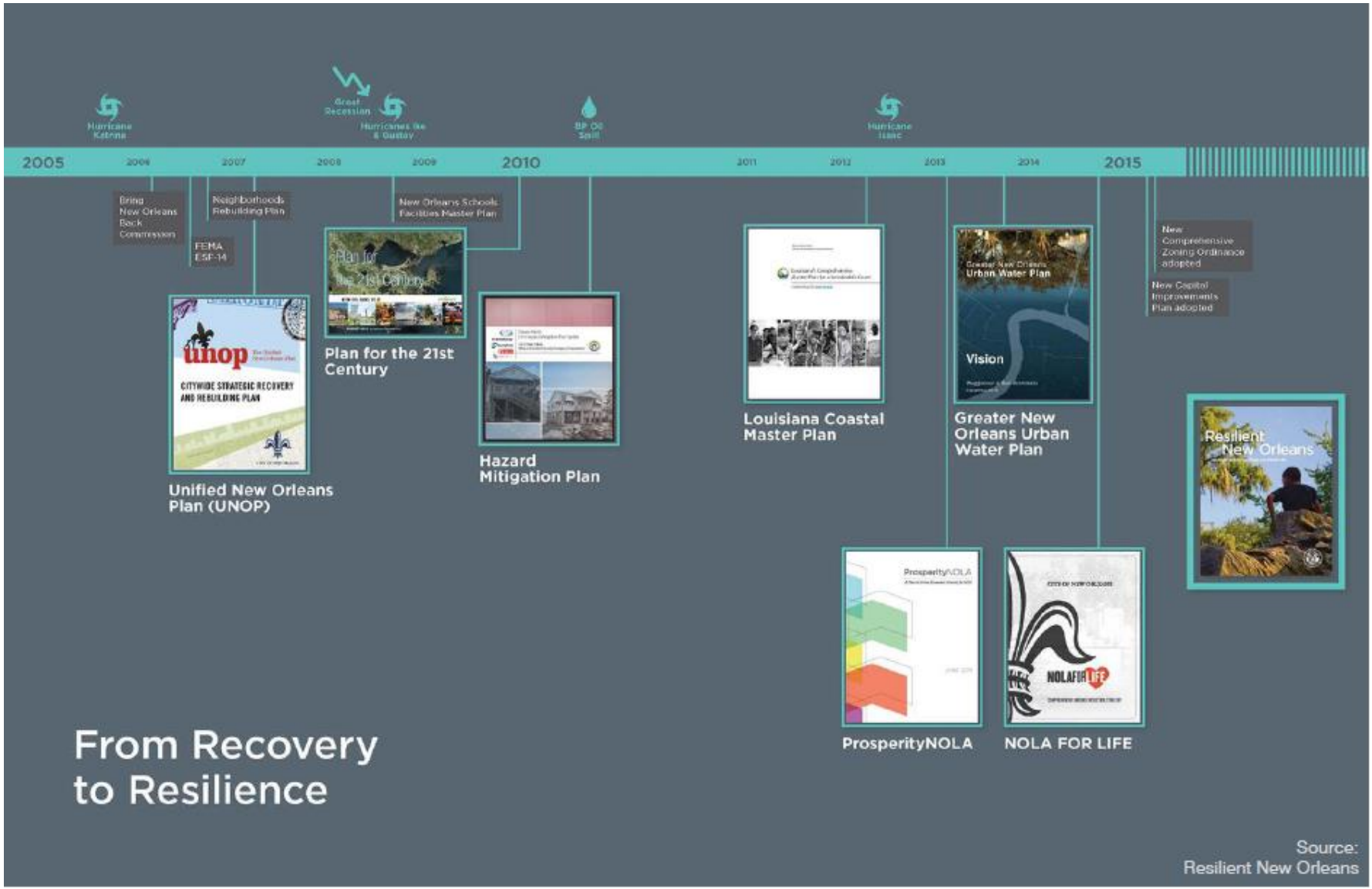


Figure 4.2: The Office of Resilience and Sustainability published a timeline of the multiple recovery and resilient environmental planning documents written post-Katrina.

Also mentioned within the Climate Action Plan is the first mention of the Gentilly Resilience District in any official city document. As written in previous chapters, The Gentilly Resilience District is a federally funded and city-implemented flood reduction project in its early stages. According to the New Orleans City Government, the purpose of the Gentilly Resilience District is to "reduce flood risk, slow land subsidence, and encourage neighborhood revitalization" (ORS, 2018, p. 1).

In 2016, the city of New Orleans was awarded more than $141 million through National Disaster Resilience Competition to implement elements of the Gentilly Resilience District proposal, building on existing investments in urban water management funded through the FEMA Hazard Mitigation Grant Program (HMGP).

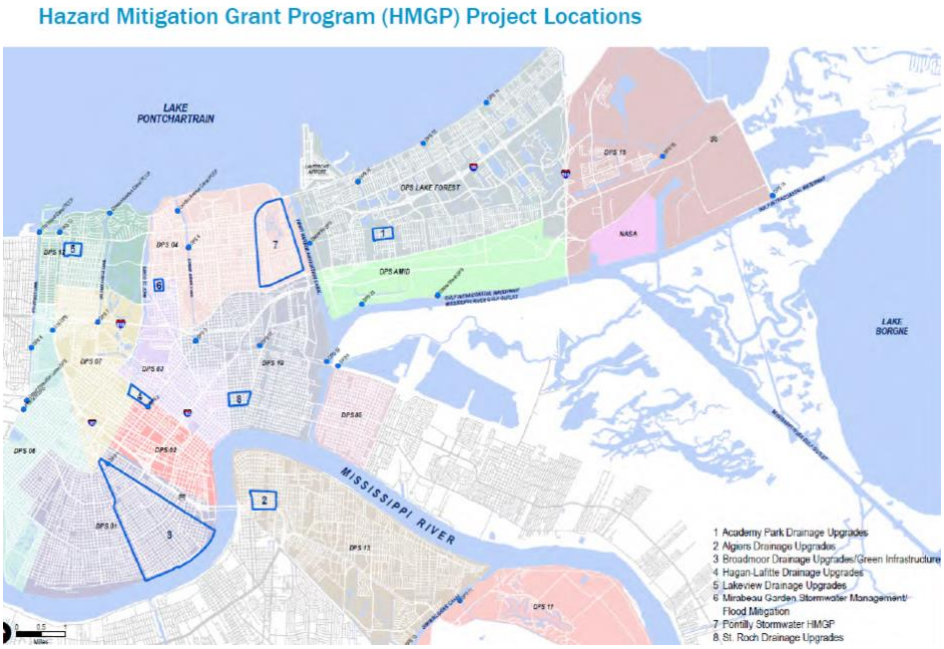


Figure 4.3: Source: Office of Resilience and Sustainability, City of New Orleans. 2018

The city decided to focus on the implementation of building resilience at a neighborhood level, in order to develop a network of integrated solutions to social and environmental challenges. "The creation of the city's first Resilience District combines various approaches to

water and land management that have been successfully piloted throughout New Orleans and, when implemented together, are intended to create even greater neighborhood benefits" (ORS, 2018, p. 1). The projects of the Gentilly Resilience District are interdisciplinary and work to address multiple issues in infrastructure, streets, and drainage in one project. The various projects that comprise the Gentilly Resilience District taking place in streets, in neutral grounds, in parks, on schoolyards, on open lots, and in front yards. "The projects are designed to reduce risk from flooding and subsidence by creating spaces to capture rainwater in the urban landscape. They are designed to beautify neighborhoods, improve health, and provide opportunities for recreation" (ORS, 2018, p. 1).

The New Orleans Redevelopment Authority and The Office of Resilience and Sustainability

As mentioned in Chapter 3, the Office of Resilience and Sustainability was created in August, 2015, with Jeff Hebert transitioning to the role of Chief Resilience Officer from his previous position as the Executive Director (ED) of the New Orleans Redevelopment Authority (NORA), the public agency tasked with putting properties left dormant post Katrina back into commerce. Before NORA, Hebert served as the director of blight policy and neighborhood revitalization for the city government, and earlier lead community planning for the Louisiana Recovery Authority following Hurricane Katrina. Mayor Mitch Landrieu also had a hand in the hiring of Hebert to lead NORA. From 2012 to 2016, he was both the ED at NORA and was appointed by the Mayor to be the city's first-ever Chief Resiliency Officer. The position was formed through a Rockefeller Foundation grant and allowed Hebert and his team, Colleen McHugh, David Lessinger and Jared Genova, to craft New Orleans' resilience strategy (N. Satterfield and C. McHugh, personal communication, August 5, 2018).

NORA is a "City Board group that works with public and private partners to redevelop and revitalize New Orleans neighborhoods" (Winfield et al., 2015, p. 4). The State of Louisiana created NORA in 1968 as the Community Improvement Agency (CIA). It is a public agency charged with revitalization of underinvested areas in the City of New Orleans (NORAworks.org, 2019). The CIA began operating in 1969 and in the 1970s, the Agency was executing federal Urban Renewal agendas, which concentrated on the eradication of physical blight. Near the end of the 1970s, the CIA was finishing its urban renewal chapter and commenced to concentrate on citywide housing improvements using the Department of Housing and Urban Development (HUD) funds. In 1994, the CIA reorganized itself as NORA and combined its assets to focus on neighborhood revitalization. Currently, "NORA does get state funding, but they also get other types of funding, so they no longer fall under the purview of a state agency, so they are aligned with the city, but they are governed by a board and… they have a 501C3 non-profit arm which is New Orleans Redevelopment Unlimited. New Orleans Redevelopment Authority is a non-profit, but they are not a 501C3" (N. Manning, personal communication, August 2, 2018).

In late 2006, as an outcome of the catastrophic destruction caused by Hurricane Katrina in 2005, the agency shifted into its role as a critical entity in implementing citywide recovery initiatives. NORA moved away from the alleviation of singular blighted properties, primarily through auctioning off homes and land and became "focused on comprehensive, data-driven neighborhood redevelopment" (Winfield et al., 2015). NORA then became the primary entity to handle the disposition of nearly 5,000 properties acquired by the state following Katrina (former Road Home Properties), and tasked with implementing the Lot Next Door ordinance. The Road Home program was created by the Louisiana Recovery Authority (LRA) and the United States Department of Housing and Urban Development (HUD) to assist homeowners in Louisiana

affected by Hurricane Katrina and/or Hurricane Rita in rebuilding their homes. Over $11 billion was allocated by Congress, and close to 230,000 people applied for assistance (Perry, 2010). The Lot Next Door program also began after Hurricane Katrina in an effort to reduce blight reduction and assist homeowners in purchasing the property next door to their homes for market price or less. Originally it did not apply its services equally across the city, excluding neighborhoods like the Lower Ninth Ward. It has sold more than 3,000 properties since its inception (Wendland, 2016). The vacant lots are managed through NORA, which is also the city's landbank (NORAworks, 2019).

On NORA's website and publicly accessible documents, which claim to "support holistic neighborhood recovery" there is no mention of the critiques on the Road Home program, which was the subject of a lawsuit beginning in 2008. The Greater New Orleans Fair Housing Action Center (GNOFHAC), alongside five named plaintiffs and the National Fair Housing Alliance, filed a class action lawsuit against the LRA and HUD over the Road Home program. The lawsuit claims that the Road Home program defies both the Fair Housing Act of 1968 and the Housing and Community Development Act of 1974 (NAACP, 2010). The Fair Housing Act requires housing programs to produce equitable results, regardless of their intent, and data collected by GNOFHAC and other sources suggest that the program was discriminatory against Blacks.

The recovery program was deemed discriminatory by Judge Henry Kennedy in the Washington D.C. appellate court, as it assessed the housing assistance that was available per home to the depressed values of Black families' pre-storm segregated housing. According to the terms of the Road Home program, rebuilding grants were calculated based on the lower of two figures: the pre-storm market value of the home, or the cost to repair the storm damage to the home. Residences in Black neighborhoods of New Orleans typically have lower appraisal values

than homes in White neighborhoods, mainly because of the decades of racial discrimination in the Louisiana housing market that has produced and fortified segregation in housing (Perry, 2010). Due to the success of the lawsuit, the State of Louisiana and HUD must offer an additional $62 million in rebuilding grants to thousands of homeowners, and allow more time to rebuild without penalty from the state.

The lawsuit and controversy surrounding The Road Home program and NORA's implementation of the project has been remembered "in the popular imagination mostly for the pain that it caused" (Hammer, 2015, p. 1). As introduced in Chapter 2, the implementation of public-private partnerships and a disorientation of the public following a crisis are pieces of what Naomi Klein calls "disaster capitalism" (Klein, 2007). While most public policies are implemented through continuity or incremental changes (Thelen & Steinmo, 1992), a post-crisis moment is often exploited. In the aftermath of a crisis, the potential to fundamentally change policies is increased as players or policy entrepreneurs abuse the 'fluid' moment (Kingdon, 2014). "Countries are shocked by…natural disasters. Then they are shocked again – by corporations and politicians who exploit the fear and disorientation of this first shock to push through economic shock therapy" (Klein, 2007 p. 25). The capacity of a crisis to delegitimize power intensifies the probability of policy change especially in comparison to regular conditions (Klein, 2007). Meijerink and Huitema (2010) observe that reforms in 16 cases of water policy transitions "tend to occur only after the existing paradigm … has been put to the test by disastrous events". The Road Home program's paradoxical outcomes and NORA's involvement in leading the recovery effort fit within the description of disaster capitalism and its discontents.

The Dutch Dialogues

The ORS did not exist until 2015, which left the environmental planning of New Orleans in the hands of private architecture and landscape architecture firms, urban planning and design practices, foundations, public-private partnerships, and global water experts. This thesis sets out to understand the relationship between community outreach and the implementation of the Gentilly Resilience District and thus must demystify and map the history of collaboration between different entities across the city, country, and world. The Dutch Dialogues workshops began in early 2006 as a partnership between the New Orleans-based architecture firm Waggonner & Ball and Dutch water management experts. It was co-sponsored by the Royal Netherlands Embassy and the American Planning Association. Residents of Netherlands are also surrounded by water in a delta region and have faced a remarkable loss of life, the devastation of land and community infrastructure, and massive interference of economic activity from flooding. As a result, the Dutch have adapted to the continuous threat of flooding, death, and economic disaster from water (Nemes, 2014).

David Waggonner, principal and founder of the aforementioned firm, traveled to the Netherlands in early 2006 as part of a delegation led by U.S. Senator Mary Landrieu and witnessed the Dutch approach to stormwater management and climate adaptation. These collective efforts and extensive interactions between Dutch and American architects, engineers, urban designers, landscape architects, city planners, and soils/hydrology experts and formed the belief that a fundamental water management shift must occur for New Orleans to survive and prosper in the coming century. In 2008, there were two more Dutch Dialogues workshops. In the first workshop, the Dutch and Americans traded information to explain how water issues were addressed in each region. In the second, the conversation continued about ways that Louisiana

could improve its relationship with water, in new and innovative ways. “The Dutch are geniuses in urban design and water design,” says Waggonner. “We needed to learn from them how to talk to each other and agree on how to solve our water problem” (Nemes, 2014).

Photograph 4.1: Participants in the third Dutch Dialogues workshop, held at Tulane University’s School of Architecture. Source: Nemes, 2014

While the collaboration between the two countries is a unique approach to water management, only younger professionals and university students from New Orleans could participate in the process, and public outreach and community engagement was much less of a priority of these conversations. There is no mention in the Dutch Dialogues workshops and subsequent reporting of any effort to engage members of the Gentilly neighborhood, or residents from other areas in New Orleans. Many of the same parties involved continued this collective effort and formed the Project Team for the Urban Water Plan.

4.3 The National Disaster Resilience Competition

In 2010, the "State of Louisiana's Office of Community Development - Disaster Recovery Unit funded Greater New Orleans, Inc. (GNO, Inc.) to develop the Greater New Orleans Urban Water Plan using federal Community Development Block Grant - Disaster Recovery funds from HUD" (Waggoner, 2010). Waggoner and Ball took the lead in design while working alongside local and international water management experts in developing the Urban Water Plan. The Greater New Orleans Urban Water Plan was published in September 2013 as three separate documents; *Vision*, *Urban Design*, and *Implementation*. Two years later, the first *Resilient New Orleans: Strategic Action to Shape Our Future City* was published, containing the first mention of the Gentilly Resilience District. These two plans inform one another and concentrate on the expansion of an integrated living water system.

The GRD is a "new model for managing stormwater, surface water, and groundwater collectively, rather than as isolated phenomena" (Waggoner and Ball, 2013). It is built to simultaneously slow, store, and utilize stormwater and decrease the region's reliance on pumping. These steps help with the circulation and recharging of surface water and groundwater. There are seven key infrastructure recommendations in the plans that combine the green and grey elements of what the region had to offer. They are; (1) Small Scale Retrofits, (2) Circulating Canals, (3) Strategic Parklands, (4)Waterfront Development Zones, (5) Integrated Waterworks, (6) Integrated Wetlands, and (7) Regional Monitoring Networks. Figure 4.2 offers a more detailed explanation of each of the essential elements mentioned here, as well as example images to provide an in-depth understanding.

1. **Small Scale Retrofits**. Interceptor streets on high ground (backslope neighborhoods) are a critical subset of small scale retrofits. Running perpendicular to the flow of water, interceptor streets function as speed bumps, absorbing and slowing water as it moves downslope, in order to alleviate localized flooding and lessen the load on drainage systems downstream.

2. **Circulating Canals**. In the region's bowls and lowlands, circulating canals sustain local habitats and recharge groundwater. During wet weather, they continue to serve as drainage conduits. Circulating canals with flowing water and improved banks can be beautiful public spaces, as seen in this example from the Netherlands.

3. **Strategic Parklands**. Strategic Parklands are multi-acre areas located at key junctures of the integrated living water system that are designed to contain vast quantities of stormwater during heavy rains and provide invaluable open space and recreational amenities. Wally Pontiff Park in Jefferson Parish is an example of an existing parkland.

4. **Waterfront Development Zones**. Waterfront Development Zones around key waterways and parklands anchor the development of higher-density, multi-use districts defined by urban water assets. Shown is a multi-use development along the Industrial Canal.

5. **Integrated Waterworks**. Integrated waterworks are the water treatment plants, drainage pumps, siphons, sluices, and gates that draw, redirect, and filter stormwater, surface water, groundwater, drinking water, sewage, and industrial wastewater. They are the engines that establish the flows of the living water system. Shown here is a weir in City Park.

6. **Integrated Wetlands**. Wetlands located within strategic parklands and distributed throughout the region store and filter both stormwater and dry weather flows. Existing wetlands are restored with treated wastewater and filtered stormwater.

7. **Regional Monitoring Networks**. Surface water and groundwater provide system managers with real-time data that are necessary to address immediate drainage needs and long-term trends in water levels and water quality, and to maintain higher water levels without compromising safety.

Figure 4.4: The Greater New Orleans Urban Water Plan is largely based on the pairing of green and grey infrastructure, which are inspired by the series of Dutch Dialogues workshops. Examples of each are shown above.
Source: The Greater New Orleans Urban Water Plan, 2013

As the water management resilient plans evolved over time and the team at NORA became interested in resiliency, the earliest beginnings of the Gentilly Resilience District were taking shape. In an interview with current Enterprise Fellow and Community Adaptation Program Manager at NORA, Nicholas Satterfield, he comments on NORA's first step towards environmental resiliency work:

> I think they started to see the need for resilience. What they were trying to do through these pilot sites, was think of alternative solutions to vacant land use. They wanted to prove that these things could work, both for some of the larger initiatives they have in the Gentilly Resilience District, but also to pilot these ideas internally so that we could actually put some of these vacant lots to use, so it's not just an empty lot that gets mowed twice a month.
>
> (N. Satterfield, personal communication, July 16, 2018)

As Jeff Hebert and his team were beginning to focus on environmental work at NORA, they became aware of the opportunity to apply for the National Disaster Resilience Competition and wrote the grant that began the Gentilly Resilience District. On September 17, 2014, HUD announced a Notice of Funding Availability (NOFA) for the Community Development Block Grant (CDBG) - National Disaster Resilience Competition (CDBG-NDR). The Competition granted nearly $1 billion in funding for disaster recovery and longstanding community resilience through a two-phase competition procedure. All states and units of common local governments with significant disasters acknowledged in 2011, 2012, and 2013 were qualified to partake in Phase 1 of the competition (HUD, 2019). During this phase, appropriate applicants could join in on resilience workshops presented by the Rockefeller Foundation. These workshops afforded an extensive range of information and expertise to help communities understand resilience and recognize numerous threats, hazards, economic stresses and other probable shocks that could affect each community. The resilience workshops presented eligible applicants tools and ideas to better identify and evaluate their condition, involve their communities, select resilience building opportunities, and advance robust applications for the NDRC (The Rockefeller Foundation, 2015).

Created after a review of the Phase 1 application, 40 states and communities were asked to compete in the second and final phase of the National Disaster Resilience Competition. Candidates were necessitated to connect their proposals back to the eligible disaster from which they were recuperating. Additionally, hopefuls needed to complete a benefit-cost study for the future projects. On January 21, 2016, HUD publicized the eight state CDBG-NDR finalists; (1) California - $70,359,459, (2) Connecticut - $54,277,359, (3) Iowa - $96,887,177, (4) Louisiana - $92,629,249, (5) New Jersey - $15,000,000, (6) New York - $35,800,000, (7) Tennessee -

$44,502,374, and (8) Virginia - $120,549,000. The five cities/counties which were awarded were (1), New York City - $176,000,000, (2) New Orleans - $141,260,569, (3) Minot, ND - $74,340,770, (4) Shelby County, TN - $60,445,163, and (5) Springfield, MA - $17,056,880 (HUD, 2019). The NDRC grant money of $141,260,569 is the official amount received in funding for the Gentilly Resilience District project.

Appendix B shows the NDRC Exhibit A – Executive Summary for New Orleans. Appendix D shows the NDRC Grantee Profile for New Orleans. The Rockefeller Foundation lists this endeavor as a "Public-Philanthropic Partnership" and writes;

> The strategic partnership between the Rockefeller Foundation and HUD draws on the best of the Rebuild by Design competition, where the Rockefeller Foundation provided lead support for administration of the competition and community engagement…These projects serve as models of how philanthropic resources and federal funding can be leveraged to support the design of innovative resilience projects which not only protect people and property from future disasters but also provide highly desirable community amenities like parks and recreation areas. Rebuild by Design encouraged communities to use both traditional "gray" and green infrastructure solutions to recurrent flooding, spurring best thinking to move beyond traditional sea walls to more attractive and sustainable solutions.
>
> (HUD, 2016)

A public-philanthropic relationship is the "cooperative relationships between foundations and local, state, and federal governments" (Abramson et al., 2014; Toepler, 2018). Toepler presents concerns over rearranging responsibilities, labor distribution, and traditional roles between government and the private sector. Noting that local governments are "fiscally-strapped" and that state and federal governments are newly more open to collaboration, research has shown that the trend of public-philanthropic or public-private relationships is on the rise (Toepler, 2017, p. 658). When funding comes from these types of partnerships, how do the community engagement and outreach components weigh on the checklist of importance in order to receive the grant? Are these funding schemes inherently undemocratic in their nature as a

small minority in the public entity controls them and the foundation? In this case, the staff members at NORA, an already public-private organization itself, wrote the grant, and the Rockefeller Foundation, which is not based in New Orleans, collaborated with HUD to provide the award. Where does the community voice come into the picture and why? These questions are further explored in Chapter 5, Results and Discussion. There is still more work to do to understand where the balance ought to lie in all kinds of government-nonprofit relationships (Toepler, 2017, p. 668).

Proposed Sites and Partners

The grant application was submitted in two phases to the National Disaster Resilience Competition, an overview was completed in March of 2015, and a more specific proposal made it into the second round in October 2015. At this point, the Gentilly Resilience District proposed eleven different projects, nine of which are physically located in Gentilly, with the last two focusing on smart grid monitoring and workforce development respectively. Figure 4.6, below, maps the proposed nine site-based projects throughout the Gentilly neighborhood.

Figure 4.6: This image depicts the Gentilly Resilience Districts nine site-based projects, from Green Streets to water gardens. Source: NORA and the ORS, 2018

The Gentilly Resilience District Factsheet, which has been used as the primary educational tool for public meetings and online resource, can be found as Appendix C. The eleven projects and programs that currently comprise the Gentilly Resilience District are as follows. The first site is the Mirabeau Water Garden, which has been used as a pilot example site for educational tours. The Mirabeau Water Garden is situated on a 25-acre vacant parcel placed in the low-lying Filmore community of New Orleans, amid Bayou St. John and the London Avenue Canal. The preliminary chapter of this project is sponsored by a FEMA Hazard Mitigation Grant Program (HMGP) and the second chapter is part of the Gentilly Resilience District financed by HUD's National Disaster Resilience Competition. The plot will become an area for water research, determining best practices for water management infrastructure in one of the city's lowest-lying and most vulnerable neighborhoods. "The project will divert stormwater from the city's drainage system…allow stormwater to infiltrate into the ground, capture runoff from neighboring streets, and provide an educational and recreational amenity that demonstrates how natural processes can be harnessed to enable more sustainable forms of water management" (Waggoner and Ball, 2018). The architectural drawings of the site dry, at a 2-year flood, and at a 10-year flood are depicted in Figure 4.7.

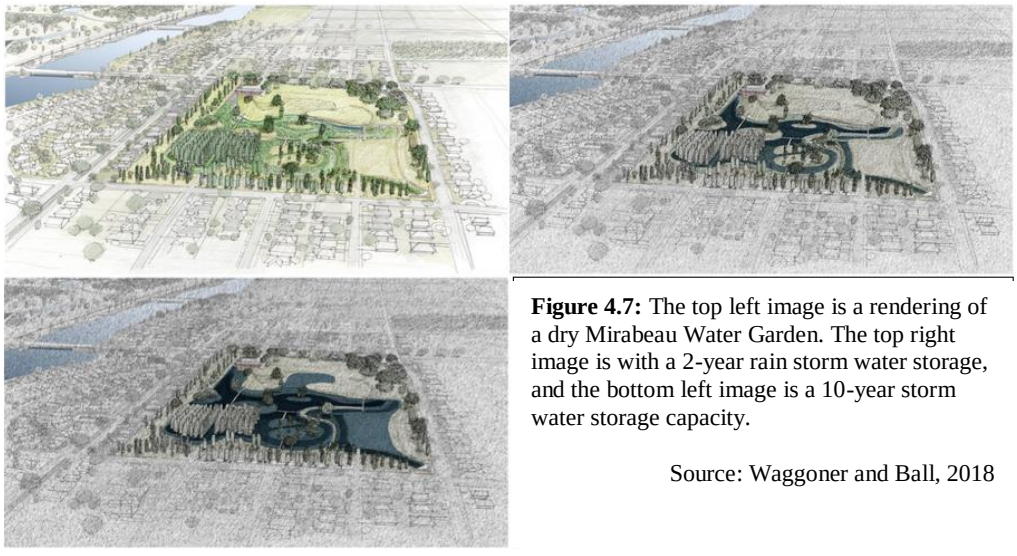


Figure 4.7: The top left image is a rendering of a dry Mirabeau Water Garden. The top right image is with a 2-year rain storm water storage, and the bottom left image is a 10-year storm water storage capacity.

Source: Waggoner and Ball, 2018

The Mirabeau Water Garden is indeed the flagship project for the GRD as the funding had been established through the FEMA money first, and will be completed as a part of the HUD NDRC grant. The second site, Pontilly Neighborhood Stormwater Network has a similar funding scheme, as it was first funded by the HMGP and is now being finalized within the GRD timeline. It will consist of enhancements to canals in the area, and capture stormwater through the use of vacant lots, streets, and alleyways. It is also designed to "beautify the Pontchartrain Park and Gentilly Woods neighborhoods" (ORS, 2018). While the other sites have been proposed, they are still in their earliest stages. The grant money must be used by 2022, "which may sound far off, but when you are thinking about design changes, construction, weather delays, 2022 will be here quickly" (N. Manning, personal communication, August 2, 2018). The third site is a comprehensive look at "Blue & Green Corridors" which are neutral grounds (medians) of main roads in Gentilly which will become concave instead of the convex shape many are today. These changes will slow and store stormwater as well as provide places to recreate and commute safely.

Figure 4.8: A depiction of the Filmore Canal Neutral Ground. Source: Waggoner and Ball, 2015

Sites four and five are the St. Bernard Neighborhood Campus and Milne Campus respectively. The first will integrate green infrastructure and recreational improvements at McDonogh 35 High School and Willie Hall Playground 2, and the second will similarly improve recreation and infrastructure in addition to providing water-focused education, economic, and workforce development activities. The Milne Campus was once the Milne Boy's Home, a juvenile detention center where a nine-year-old Louis Armstrong had spent a year and a half for firing a pistol in the air in 1913. It was named the "Colored Waif's Home for Boys" at that time (Karst, 2014). After Hurricane Katrina, the site was abandoned for seven years before being renovated as the headquarters for the New Orleans Recreation Development Commission (NORDC) (Rainey, 2013). This location will allow the education and workforce development programs to be easily incorporated into NORDC's programming.

During the period of data collection for this thesis, I attended three community planning workshops for the sixth project, the St. Anthony Green Streets. These events were led by Natalie Manning, the Community Engagement Specialist for the GRD, and Aron Chang, an urban designer, and educator. Chapter 5 in this thesis will discuss the findings of these workshops. The St. Anthony Green Streets are meant to incorporate stormwater management into playground and street revitalization and hence, enhance the surrounding neighborhood. Dillard University is an Historically Black College or University (HBCU) located in Gentilly and will be the site of the seventh project. The Dillard Wetlands are meant to retrofit existing woodlands to redirect water from adjacent zones and operate as a nature preserve as well as an on-campus environmental learning center. The Dillard Campus makes up the eighth site, where green infrastructure and drainage improvements will occur throughout the campus.

I also interviewed Nick Satterfield of NORA, who is leading the ninth project, the Community Adaptation Program (CAP). CAP is a multifaceted approach for private homeowners to invest in redirecting stormwater on their property. He refers to it as a "first touchpoint in the most intimate way that we can engage people around stormwater…it is a small-scale sister or brother to these larger ideas" (N. Satterfield, personal communication, July 16, 2018). The program is meant to provide education as well as reduce risk for the homeowner. CAP is one of the earliest programs to take shape within the GRD as it is meant as a tool to increase engagement and understanding for residents, as well as take them through their own green infrastructure projects.

The first two goals of CAP are as follows; first, to demonstrate the benefits of interventions to reduce stormwater runoff on privately owned residential property, and second, to collect data that assists in the development of successful, cost-effective tools to manage storm-water runoff on residential properties that can be scaled citywide. A third goal is to support New Orleans as a partner in a workforce development program that will help build skilled labor capacity in the 'green' infrastructure industry. Fourth, CAP must maintain an efficient and useful, customer friendly pilot program that incentivizes residents to manage stormwater, and lastly, it will work to enhance and improve household assets for low to moderate income homeowners (NORA, 2019). The Community Adaptation Program specifically targets the low to moderate income household, which is defined by HUD as the household incomes must be less than or equal to 80% of the median income of the area. Eligible participants must own a home within the GRD and are also required to either already have or get flood insurance for their property. According to Nick Satterfield, 2,100 households are eligible in Gentilly and meet the three requirements of the program. The program is "hoping to hit 10% of those. We are trying to

get 200 properties. Our budget for our program implementation is about $5 million. That includes costs to install, costs to design, costs to monitor. So, we hit 200 properties, and we will put the cap at $30,000 per property, so it's pretty substantial" (N. Satterfield, personal communication, July 16, 2018).

The final two projects within the GRD are the Reliable Energy & Smart Systems project, which will escalate energy and water effectiveness through undertakings in micro-grids, energy redundancy at critical water infrastructure sites, and a water monitoring network. Finally, the Workforce Development program is meant to train and prepare local residents to build water management projects and develop increasingly vital skills in water infrastructure development and maintenance. There are "3 million dollars dedicated to workforce development in this grant" according to Natalie Manning (personal communication, August 2, 2018). The workforce development capacity comes from The Network for Economic Opportunity (the Network), which focuses on uniting disadvantaged job seekers and businesses to prospective growth. The anticipated GRD projects will use The Network to connect unemployed and vulnerable jobseekers to the openings produced by the sponsored projects.

Partnerships

When the grant was written in 2015, many of the partnerships were written into the application itself. In addition to working with NORA, the Sewerage & Water Board of New Orleans (SWBNO) is also a key participant in the Gentilly Resilience District, in order to leverage existing investments in Gentilly. Shifts in the city government have changed much of the leadership as a new mayor was elected in November 2017. Mayor Latoya Cantrell, the city's first ever Black woman to hold the position, assumed office May 7th, 2018. She is a strong advocate for this project and has brought new people into leadership roles, with some finishing

their commitment to GRD as the previous administration of Mitch Landrieu came to a close. The following flow chart demonstrates the departments within city government that are invested in the completion of the Gentilly Resilience District, and while some of the names have changed since the grant was accepted, the structural aspects of this image are still incredibly important for understanding how the city has envisioned the operation of this resilience project.

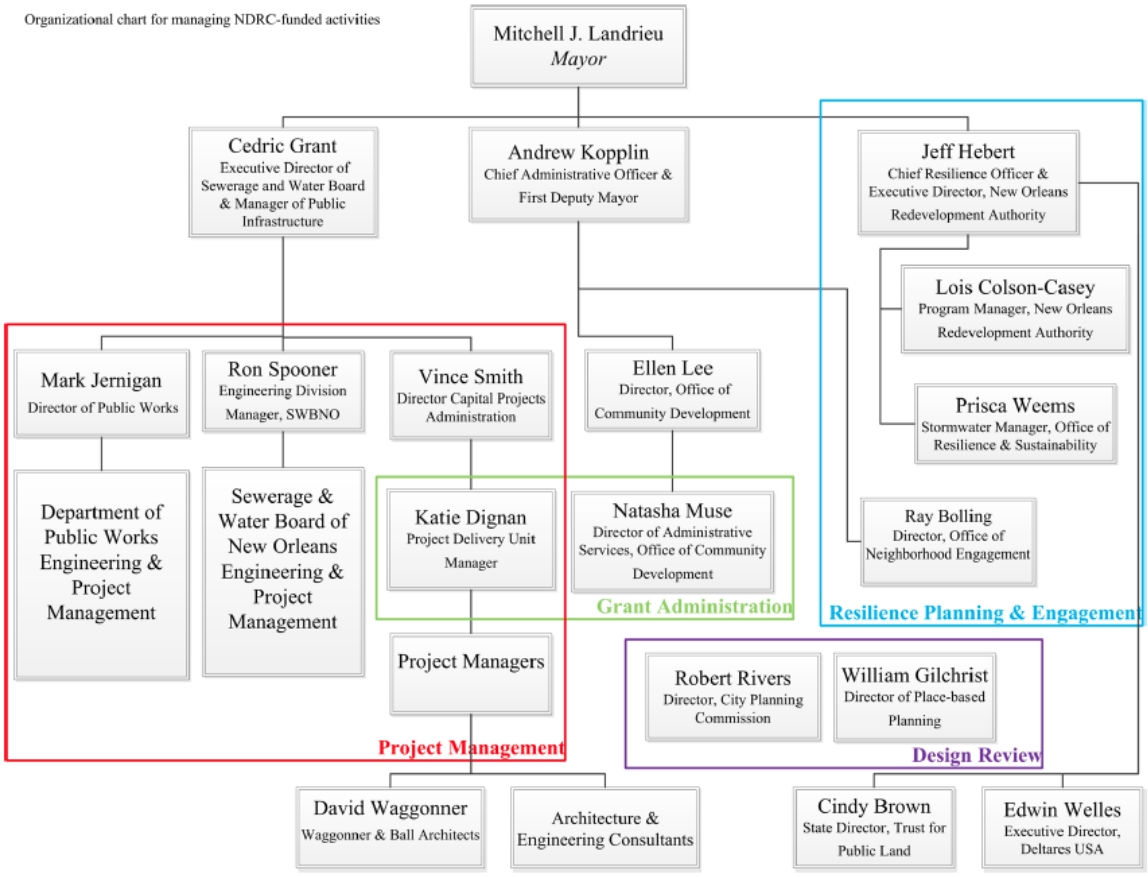


Chart 4.1: The organizational chart that was built into the grant application. Source: NORA, 2015

In addition to the city's internal partners, the Trust for Public Land and Delares USA were also written in as consultants for the project. The Trust for Public Land is a national non-profit focused on preserving land for people's use. Delares USA is an international research organization that specializes in coastal and deltaic cities (NORA, 2015). Partnerships continue to

grow in this project, from landscaping companies to engineering firms and community leaders. The extent to which local leaders and others were consulted as partners in this work will be expanded upon in the discussion section of this thesis. Public-private partnerships have allowed this project to take shape in creative and unique ways, yet the question of public participation and consultation of the community must remain a clear focus for the leaders of this project.

Community Outreach and Engagement

The community outreach and engagement of Gentilly residents must be taken into consideration for the equitable completion of this project. Community engagement is mentioned in the grant is within the term "Social Resilience Needs" (City of New Orleans, 2015 p. 27). This section acknowledges the "high levels of poverty, unemployment, and violence" as well as the inequitable development that has led to gentrification in the "post-Katrina economic boom (that) has not benefited all residents" (City of New Orleans, 2015 p. 27).

Citing research from The Data Center, a New Orleans based data research center, and the 2013 American Community Survey, the grant application explains that "there is no evidence that the economic gains enjoyed in New Orleans since 2005 have improved poverty and jobless rates of Black men. The median income of $25,102 for Black households is less than half of that for White households in New Orleans. According to the 2013 American Community Survey, 27% of New Orleans residents are living in poverty—a figure that exceeds 40% for children and 53% for single mothers. Over one-third of working-age New Orleanians are jobless, and more than half of working-age Black men are jobless" (City of New Orleans, 2015 p. 27). The grant also speaks to the uneven risk and vulnerability that Black New Orleanians face as the lowest-lying area are usually where communities of color and those in poverty live, as explained in Chapter 3.

While these facts are presented in the grant, they are not intended to be the focus of this project. During an interview with a city official, they commented anonymously "Sometimes we literally drown out everything else because we are so focused on water, and it is important, that is our main shock and stressor for the city, but it is not the only. I think sometimes that conversation can drown out the others, like social justice resiliency, economic resilience, affordable housing, those conversations need to start happening in tandem with the water conversation. This particular grant is very specific to that type of work (water), it's not really inclusive to social justice, not really inclusive of affordable housing" (Personal communication, 2018). In addition to understanding the "social vulnerability" of the city and the Gentilly neighborhood, the application also notes the importance of a "sound process" and their "community engagement capacity."

The Sound Process (City of New Orleans, 2015, p. 36) section explains the "robust stakeholder engagement process that examined shocks, stresses, challenges, and opportunities for New Orleans and the region and built upon existing plans and projects." The application says that it is built upon a "decade of community-driven planning processes in which tens of thousands of New Orleanians have participated and crafted visions for the future city" (p. 36). It explains that hundreds of individuals, including community leaders, partook in dialogues leading up to the application, but it does not explicitly mention residents of Gentilly as participants in these conversations. The discussion around community engagement (p. 15) explains that it is "core to New Orleans' mission and will be integral to project development rather than just a step in the process" (City of New Orleans, 2015, p. 15). As the application was written, residents participated in a "day of engagement" tour of the potential resilience areas, as well as hosted discussions with those who were interested.

The City has plans to team up with the numerous non-profit and community-based organizations that are playing an active role in environmental awareness, education, and research. Local universities and schools that have integrated resilience into their curriculum will also be called upon as potential partners. Another principal office within the city government is the Office of Neighborhood Engagement (ONE), who has been very involved in outreach and facilitation of events and educational materials (field observations, Summer, 2018). ONE coordinates the engagement between the City's various branches and its people. ONE staff appear at neighborhood and civic association meetings as well as informally meet residents throughout the city. The Pontilly Café, located in Gentilly near the Ponchartrain Park neighborhood, is the site of weekly check-ins between the ONE representative and Gentilly residents (field observations, Summer, 2018). There are advancements in accessibility surrounding language barriers and grassroots leadership trainings that the city offers. In close collaboration with the Department of Public Works, ONE developed a participation plan in order to bridge the department's legal and procedural responsibilities with public engagement.

Recently, New Orleans has also joined the Resilience AmeriCorps program, where the employees focus exclusively on community engagement concerning the common hazards and prospects New Orleans' communities face. In further efforts to increase accessibility, an animated video describing how integrated water management can be used to reduce flood risk and improve water quality was made by ORS. In the "Soundness of Approach" discussion projected in the 2015 grant, there were multiple proposals around further avenues of community engagement. Some of the ideas were; tours of homes using green infrastructure on their property, festivals around storm-water education, and "citizen-science opportunities" for youth in local schools. From the research, I conducted over the summer of 2018, and a continued media

analysis including email updates from the implementation leads, very few of these efforts have been carried out, and interviews with residents demonstrate a lack of awareness generally about the GRD. Chapter 5 will provide an overview of the methods used to conduct research, and more detail around the thesis questions will be provided and discussed in Chapter 6; Results and Discussion.

CHAPTER 5: Data and Methods

This thesis engages a mixed-methods approach. Johnson and Onwuegbuzie (2004) describe mixed methods research as the middle area on the spectrum of research that falls between qualitative and quantitative research. It "draws from the strengths and minimize the weaknesses of both in single research studies and across studies" (Johnson & Onwuegbuzie, 2004, p. 1). The qualitative research methods will be described in detail below, followed by the quantitative approaches.

Between the months of May and August 2018, a survey was made available to any resident of Gentilly. The flyer publicizing the study and the survey link was distributed at libraries, cafes, local businesses, and bus stops. I also advertised the study and survey when I attended public GRD information sessions, community neighborhood meetings, and the meetings of city planners and landscape architects interested in green infrastructure. I engaged in participant observation at over 13 meetings, including planning charrettes, facilitated panels film screenings, and community engagement meetings that the Office of Neighborhood Engagement facilitated. My participation allowed me to understand the logics that undergirded redevelopment plans for the Gentilly Resilience District and the community reaction to them. The survey was made using a Google survey platform, and included questions on demographics, neighborhood connectivity, experiences with the Gentilly Resilience District, and perceptions of gentrification, climate change or other phenomenon's within their community. The survey questions were designed in consultation with local inhabitants and academics, with the options of flexibility and additions by the respondents.

A total of 63 responses were collected via the online survey. In addition to the survey, interviews were held with community members in an effort to increase accessibility for all

residents. I completed 9 in-person interviews of community members and activists using a semi-structured format loosely based on the questions within the survey. I first interviewed leaders in these groups and then used snowball sampling to identify other key actors within their networks. Lastly, there were four interviews conducted with resilience professionals or Implementation Leads (IL), who were employed by or affiliated with the Gentilly Resilience District associates. My interview guide for residents and activists focused on conceptions of outreach and engagement, neighborhood changes, and other concerns. My interviews with city officials and planners responsible for the programming of the GRD focused on how they made decisions about the planning and engagement of community members. In total, 70 people were included in the qualitative research interviews and survey data. Interviews took approximately 60–90 minutes. See the full interview and survey questionnaire in Appendix A. The 9 interviews were transcribed by the researcher.

Responses from the completed questionnaires were compiled and analyzed using Microsoft Office Access, Excel, SPSS, and NVivo. The NVivo and SPSS analysis took place for four months between September and December 2018, where the interviews and survey results were coded for dominant themes and strong quotes to strengthen the argument of this thesis. The constant comparison technique (Glaser & Strauss, 1967) helped to develop an open coding analysis, which identified local concepts, principles, and structural features of the resident's experiences around the creation of the Gentilly Resilience District and the research concepts.

Finally, I supplemented participant observation and interviews with document analysis. I gathered media on Gentilly and the GRD on a daily basis from local and national news outlets, documentaries and films, websites, and books. I also gathered material generated by the master planning process, which included policy audit reports, plans, and maps. I analyzed these plans

for how they presented the issues and needs of "social resiliency" and presented the GRD as a part of the solution. This mixed-method approach allowed me to triangulate between representations, plans, what was actually happening on the ground, and people's understandings of these changes.

Quantitative Methods

While scholars understand that quantitative data only explains part of story, this approach remains the best basis for assessing relative patterns and changes throughout neighborhoods over time (Anguelovski, 2018). Discrepancies remain common in the literature around the best measures through which to study the process of gentrification, but most can agree that changes across numerous indicators, not just one, are necessary in order to prevent generalization (Bostic & Martin, 2003; Hammel & Wyly, 1996). Sometimes the multiple variables are both quantitative and qualitative, and can be triangulated to better represent the complex development of gentrification. By looking at the multiple indicators a more comprehensive analysis of the process will occur (Pearsall, 2010).

In addition to the qualitative results published in this thesis, I evaluate the effects of creating the nine green infrastructure developments at the block level in the socially vulnerable sub-neighborhoods of Gentilly since 2000 until today. I examined the progression over time of six socio-demographic gentrification markers that are commonly used in related research (Anguelovski, 2018; Barton, 2016; Bostic & Martin, 2003; Freeman, 2005; Gould & Lewis, 2012; Hammel & Wyly, 1996; Walks, 2008) in the areas close to GRD projects in comparison with all of Gentilly. The period of data collection focuses on the five years pre-Katrina and then the 14 years post-Katrina, with an emphasis on the past three years since the announcement of

the GRD has been made public. Within this period, the city has experienced high levels of gentrification between the years of 2006 and 2016 (Van Holm & Wyczalkowski, 2018) in the wake of Hurricane Katrina.

For this study, in order to assess the most recent trends in housing data, sources like Zillow.com and Realtor.com were used to track recent housing prices and trends in the sub-neighborhoods are within Gentilly. I assessed income per sub-neighborhood through the use of the New Orleans Data Center's neighborhood statistics, which are sourced from the American Community Survey, from the 2000 Census, 2010 Census, and the 2012-2016 Census.

Figure 5.1: Map of the GRD projects inside of each sub-neighborhood of Gentilly. Source: GNOCDC, 2016; Reid, 2019

In order to examine probable gentrification tendencies in the zones neighboring the installations, I collected the highest resolution data obtainable. During the period of study, Gentilly was divided up into its nine sub-neighborhoods, and the demographic data was examined at this level. Data for all indicators were not available for each of these neighborhoods because of the relatively short period of data collection since the GRD has been public. As a result, I gathered data at the street-level using the available real estate data for home sale values. I collected data at the census tract level for percent of population with a bachelor's degree or higher; percent of population over 65 years old living alone; percent Black, median household income, and below poverty. I extracted this data from the New Orleans Data Center. While home sale values, household income, and population with a bachelor's degree or higher are common variables within gentrification studies, the other variables reflect unique aspects of New Orleans in terms of context and available data. I also used data collected from my survey to track whether people have lived in Gentilly before or after Hurricane Katrina, and to see where they have moved from or where they would move to.

Analysis methods

First, I examined how the population trends changed over the past 14 years post-Katrina in all of the Gentilly neighborhoods. Second, I examined how housing trends changed over the past three years in the neighborhoods that are experiencing green infrastructure investments via the GRD. I used regression techniques to analyze whether distance to the proposed green infrastructure is the principal cause of this change or whether the detected variances over time are solely a product of the greater socio-demographic circumstances. I examined differences in housing and population markers near the green infrastructure sites by averaging the values for

the homes within 1 block radius and compared that to a neighborhood level. For the purpose of analysis, I examined 2 existing green sites and 2 future GRD sites.

CHAPTER 6: Results and Discussion

This thesis seeks to answer three questions: 1) How do existing green amenities such as parks and green space in Gentilly effect property values? Will the new sites of the Gentilly Resilience District impact property values in the same way? 2) How does the resilience planning of The Gentilly Resilience District embody or disregard the concept of procedural justice, and does this impact residents' perceptions of gentrification? 3) What methods of outreach and community engagement are most effective in increasing residents' participation in resilience planning? Historically, New Orleans is one of the most segregated cities in the U.S. As explained in Chapters 3 and 4; this is due to widespread institutionalized racism that is a function of zoning laws, high-priority elevated land, redlining practices, and restrictive covenants. Taking this into consideration, it is essential to analyze Gentilly's urban transformation through a quantitative as well as a qualitative lens as history, space, and place matter. This chapter is organized as follows.

The first two sections examine quantitative data from the American Community Survey (ACS). The third section provides an in-depth analysis of the survey data. The fifth and final section of this chapter discusses the results. Chapter 7 presents the conclusion and recommendations for policy and future research.. The first section of the results present graphs of median home values from 2013 to the forecasted year ahead (2019-2020) for each sub-neighborhood in Gentilly. In the second section, property values around the perimeter of two existing green amenities and two future project sites of the GRD will be analyzed using data available between 2016 and 2019. These serve as an example for understanding the impacts of the GRD project sites on future median home prices. In the third section, survey results are analyzed and supported by qualitative responses from residents about their perceptions of neighborhood change and the planning of the Gentilly Resilience District. These results and

subsequent analysis speak to the concept of procedural justice throughout this planning process, as well as the effectiveness of outreach. The final section provides a discussion and analysis of the critical findings, their implications, and limitations.

Section One: Median Home Value Trends for Gentilly's Sub-Neighborhoods

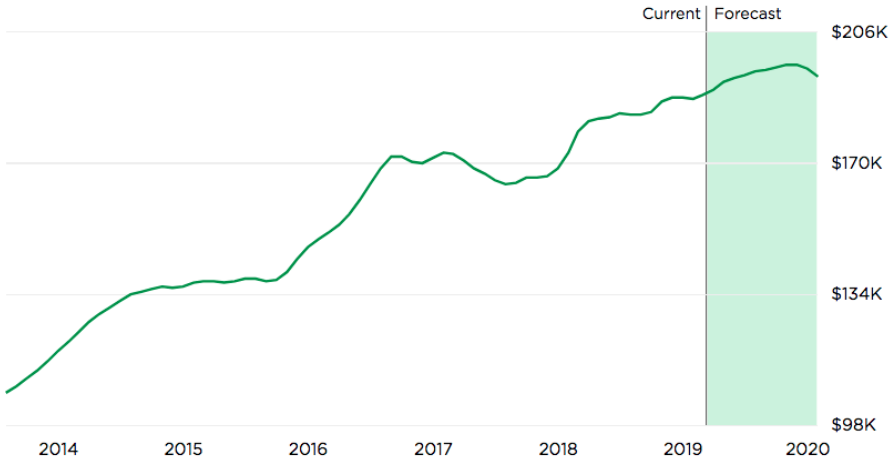
The median home values of each sub-neighborhood were collected from real estate website prices, with data provided by Zillow.com and Realtor.com, using the Zillow Home Value Index (ZHVI) and the Zillow Home Value Forecast (ZHVF). The ZHVI is the median value of a home for an area. The ZHVF is Zillow's prediction of what the ZHVI will be one year from now. Substantially, it extends the ZHVI one year into the future. The ZHVF is based on a statistical model using a variety of economic data. The model takes into account economic and housing data that might have an impact on future home values. The housing indicators include the mortgage interest rate, property tax rate, construction costs, number of vacant homes, the percentage of loans that are subprime, the percentage of delinquent loans and supply of homes for sale. The general economic indicators include the change in household income, population growth and the unemployment rate (Zillow, 2019).

Each neighborhood has a different data collection period. Lake Terrace and Oaks had the earliest available data beginning in February of 2009, with the St. Anthony neighborhood data becoming available in January 2012. In July 2013, Filmore and Gentilly Terrace housing values began being reported online, followed by Milneburg data in January of 2014. In July of the same year, Ponchartrain Park housing data came online, and lastly, in January 2015, Dillard and Gentilly Woods median housing values were reported online by Zillow. St. Bernard Area data is not recorded on Zillow, but Realtor.com has housing information for this community beginning

in January 2016. The most recent data collection for all home values in each neighborhood is current until January 2019 and Zillow's forecasted trends are projected into 2020. The median housing value data was analyzed starting in 2016 when the GRD went public. Since then, the home values have increased in Gentilly Terrace, Dillard, St. Bernard Area, Milneburg, Lake Terrace and Oaks, and St. Anthony. In Gentilly Woods and Pontchartrain Park, there was a small decline in home values, but a predicted increase of 10.2% and 10.3% respectively for the next year (Zillow.com, 2019). In the Filmore neighborhood, there was no change for home value, and the property values are expected to fall -1.1% between January 2019 and January of 2020 (Zillow.com, 2019). The median home values and predicted forecast for each neighborhood are listed in the following paragraphs.

Gentilly Terrace

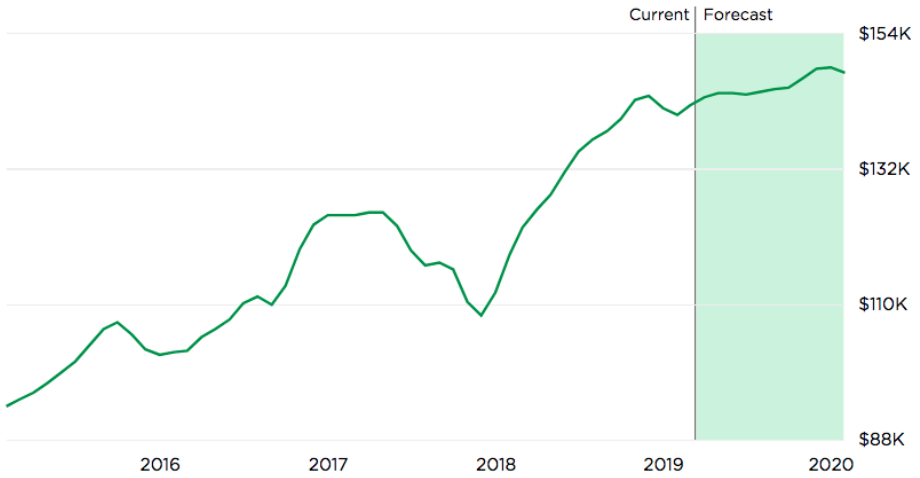
As of January 2019, the median home value in Gentilly Terrace is $188,300. Gentilly Terrace home values have gone up 8.5% since 2014 and Zillow predicts they will rise 3.2% within the next year. The median list price per square foot in Gentilly Terrace is $144, which is lower than the New Orleans average of $211. The median price of homes currently listed in Gentilly Terrace is $240,950.



Graph 6.1: Median Home Values for the Gentilly Terrace area, and the 1-year forecast. Source: Zillow.com

Dillard

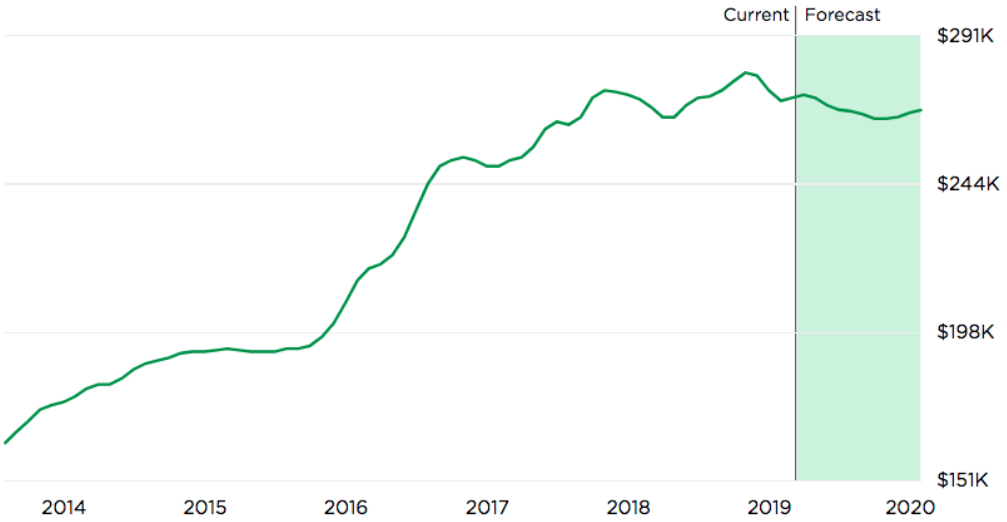
As of January 2019, the median home value in Dillard is $141,400. Dillard home values have gone up 19.2% since 2016 and Zillow predicts they will rise 4.9% within the next year.



Graph 6.2: Median Home Values for the Dillard area, and the 1-year forecast. Source: Zillow.com

Filmore

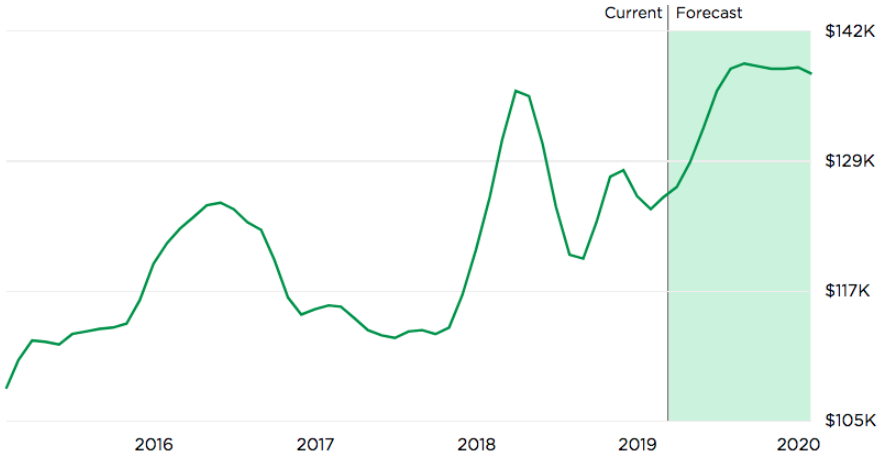
As of January 2019, the median home value in Filmore is $271,100. Filmore home values have declined -0.0% since 2014 and Zillow predicts they will fall -1.1% within the next year. The median list price per square foot in Filmore is $146. The median price of homes currently listed in Filmore is $325,000.



Graph 6.3: Median Home Values for the Filmore area, and the 1-year forecast. Source: Zillow.com

Gentilly Woods

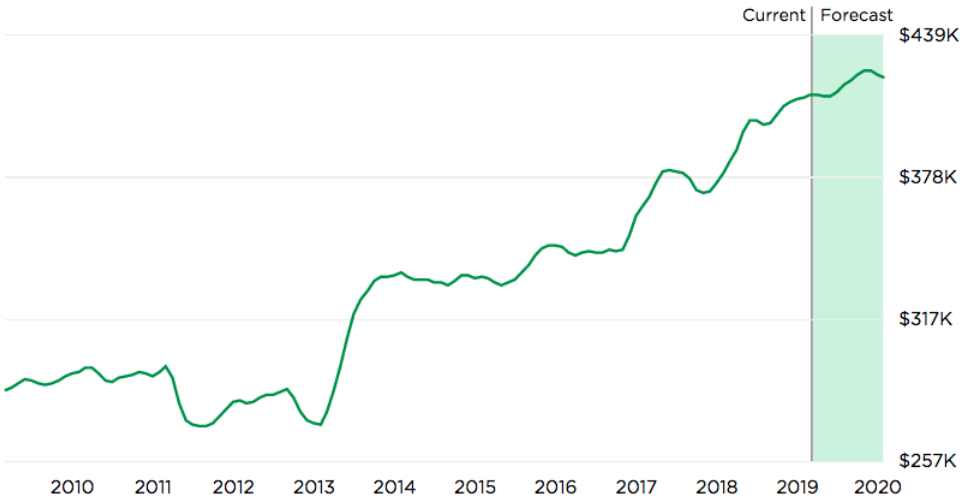
As of January 2019, the median home value in Gentilly Woods is $125,200. Gentilly Woods home values have declined -0.9% since 2016 and Zillow predicts they will rise 10.2% within the next year.



Graph 6.4: Median Home Values for the Gentilly Woods area, and the 1-year forecast. Source: Zillow.com

Lake Terrace and Oaks

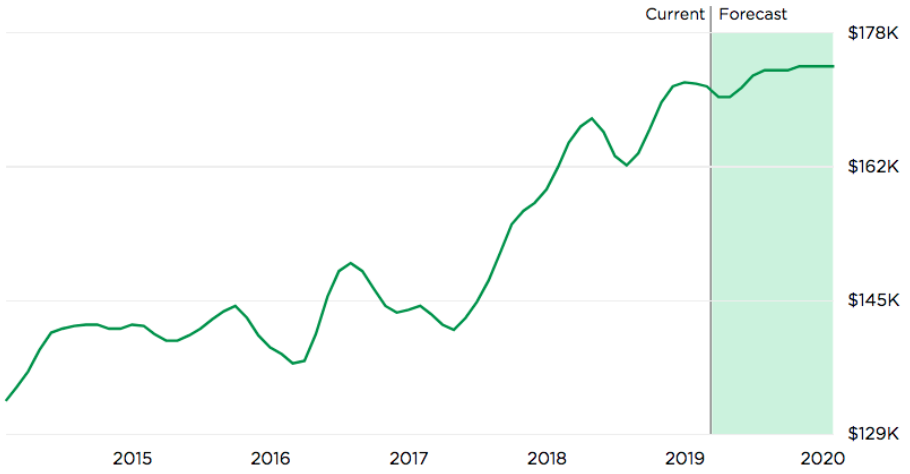
As of January 2019, the median home value in Lake Terrace and Oaks is $412,400. Lake Terrace and Oaks home values have gone up 8.5% since 2010 and Zillow predicts they will rise 2.1% within the next year.



Graph 6.5: Median Home Values for the Lake Terrace and Oaks area, and the 1-year forecast. Source: Zillow.com

Milneburg

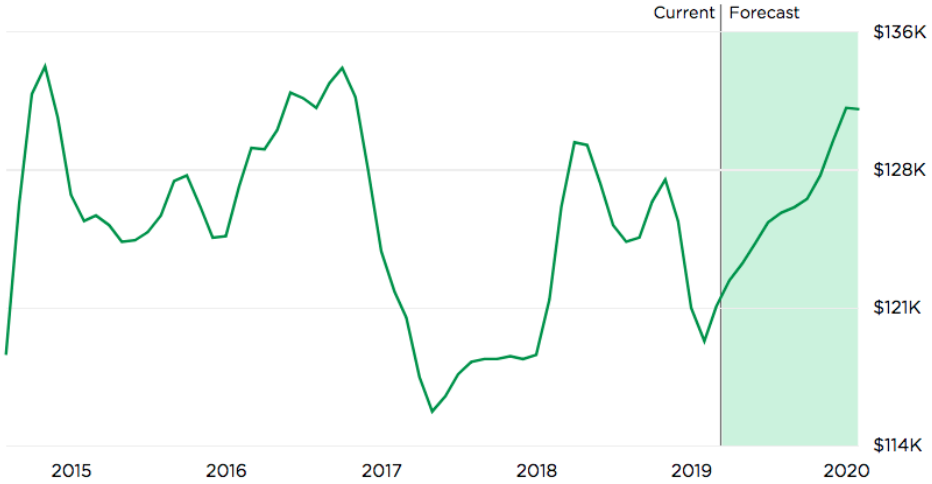
As of January 2019, the median home value in Milneburg is $172,200. Milneburg home values have gone up 6.3% since 2015 and Zillow predicts they will rise 1.2% within the next year.



Graph 6.6: Median Home Values for the Milneburg area, and the 1-year forecast. Source: Zillow.com

Pontchartrain Park

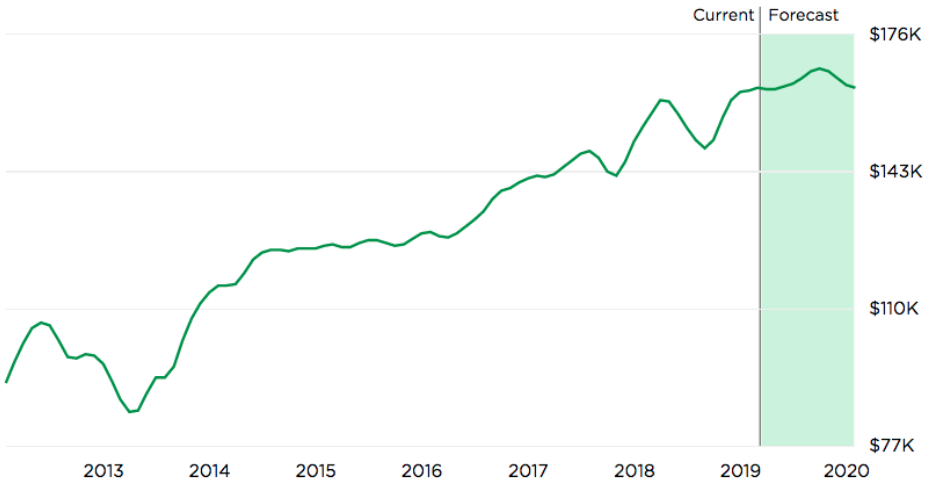
As of January 2019, the median home value in Pontchartrain Park is $119,800. Pontchartrain Park home values have declined -1.8% since 2015 and Zillow predicts they will rise 10.3% within the next year.



Graph 6.7: Median Home Values for the Pontchartrain Park area, and the 1-year forecast. Source: Zillow.com

St. Anthony

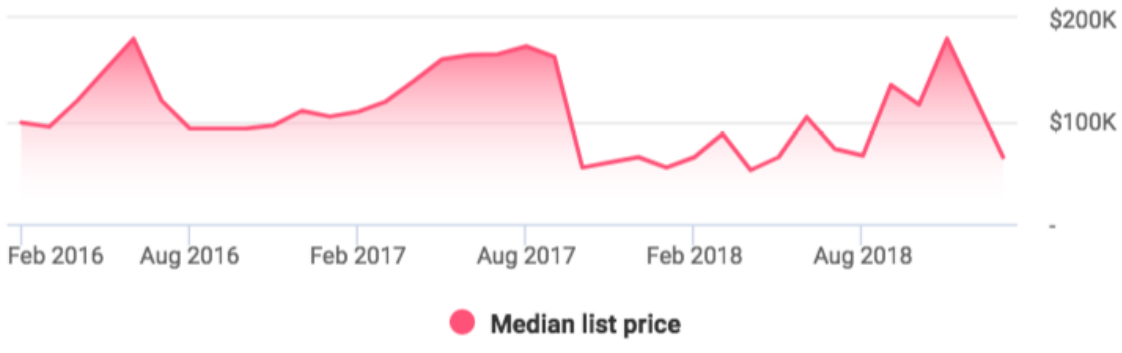
As of January 2019, the median home value in St. Anthony is $163,100. St. Anthony home values have gone up 5.7% since 2013 and Zillow predicts they will rise 0.3% within the next year.



Graph 6.8: Median Home Values for the St. Anthony area, and the 1-year forecast. Source: Zillow.com

St. Bernard Area

As of December 2018, the median home value in St. Bernard Area is $65,000. St. Bernard Area home values have trended up 18.4% since 2016. The median listing price per square foot was $162.



Graph 6.9: Median Home Values for the St. Bernard area. Source: Realtor.com

Section Two: Median Home Value Trends for Site-Specific Green Amenities

In order to assess the indicators of environmental gentrification at an even more microscopic level, I have examined housing data around the perimeter of four site-specific green amenities. Two existing green spaces, Rome Park and Wildair Rain Garden are compared with two forthcoming GRD sites, the Milne Campus and the Mirabeau Water Garden. The price data is collected twice for those homes around the perimeter of the environmental feature; once in 2016, and then again with the Zillow estimated value as of March 2019. This method draws on the spatial analysis presented in *Assessing green gentrification in historically disenfranchised neighborhoods: a longitudinal and spatial analysis of Barcelona* (Angluelovski et al., 2018). The data collected in that study also examines the median income and age of residents directly around the parks, but data is not available at this level for Gentilly. Although multiple sub-neighborhoods will host the GRD's green infrastructure projects, Filmore, St. Anthony, and Milneburg were chosen for this specific analysis. The map below illustrates the location of Rome Park (1) and the Milne Campus (2), which are located within Milneburg. The Mirabeau Water Garden (3) is located within Filmore, and the Wildair Rain Garden (4) is located within St. Anthony.

Figure 6.1: This map of Gentilly shows the four sites of green amenities. Source: Greater New Orleans Community Data Center, 2016

Rome Park is an open lot maintained by NORA and NORDC. It is located on each side of the intersection of St. Roch Avenue and Robert E. Lee Boulevard. On the NORDC website it is not listed to have any amenities.

Photograph 6.1: Facing southeast on Robert E. Lee Boulevard near the intersection of Lee and St. Roch Avenue looking out over Rome Park. Source: Google Maps, 2018

The Milne Campus, home to NORDC, will become an underground water storage facility and educational programming tool (field observation tour, July 9, 2018). It is located in the Milneburg sub-neighborhood. The construction on this project has just begun, which will provide data for understanding the housing trends around this facility before adding green infrastructure.

Photograph 6.2: Facing northwest on Filmore Avenue looking out over the Milne Campus behind the New Orleans Recreation Development Center. Bioswales have been installed near the parking lot towards the right side of the photo. Source: Google Maps, 2018

The Mirabeau Water Garden, which has been proposed as the pilot project for the GRD, is located in the sub-neighborhood of Filmore. The site will also provide an area to conduct water research, best practices for construction and water management, and host educational tours. The project will divert stormwater from the city's drainage system into the 24-acre field.

Photograph 6.3: Facing Southeast on Mirabeau Avenue looking out over the proposed site of the Mirabeau Water Garden.
Source: Google Maps, 2018

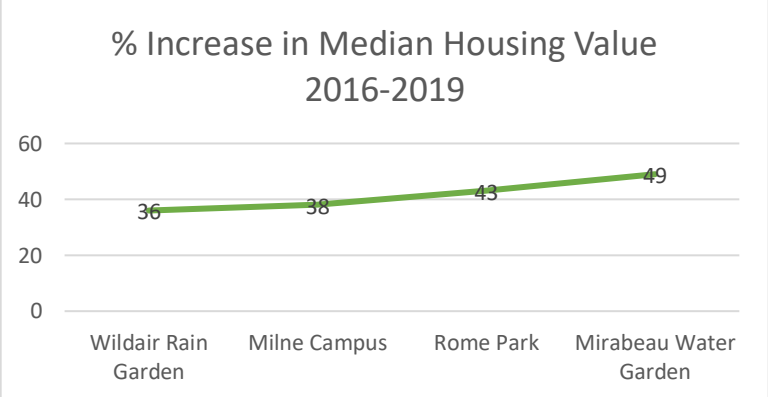
The Wildair Rain Garden is the first and only fully completed installation of green infrastructure through the Living With Water Plan, which was finalized in 2010. The rain garden was built in 2014 through funding from the NORA. The installation is intended to collect, temporarily store, and clean up to 500 gallons of rainwater and allow it to gradually flow into the city's drainage system (McConduit, 2014).

Photograph 6.4: Facing northwest at the corner of Filmore Avenue and Wildair Drive looking out over the Wildair Rain Garden.
Source: Google Maps, 2018

Assessing the housing costs on this perimeter of these four amenities will provide a more detailed look at how the green infrastructure projects can impact housing costs directly adjacent to the property. In order to assess these four sites, the homes with available real estate data in 2016 are evaluated and compared to the value of homes in 2019. The two future GRD sites will serve as a proxy for the other projects proposed through the GRD, as they are the two sites that are the furthest along in planning and construction (field observation tour, July 9, 2018). The results are shown in the table and graph below.

	Rome Park	**Milne Campus**	**Mirabeau Water Gardens**	**Wildair Rain Garden**
Average Value homes around perimeter (2016)	$129,666	$134,833	$164,323	$159,556
Average Value homes around perimeter (2019)	$185,266	$186,000	$245,529	$217,181
Change in Median Home Value in Dollars	↑ +$55,600	↑ +$51,167	↑ +$81,206	↑ +$57,626
Change in Median Home Value in Percent	↑ +43%	↑ +38%	↑ +49%	↑ +36%

Table 6.1: The results in this table show the change in Median Home Value in four green amenities in Gentilly.



Graph 6.10: The results in this graph show the percent change in Median Home Value in four green amenities in Gentilly.

The results show that the average percent change for all property value over the three year measurement is a 41.5% increase. The established green sites, Rome Park and Wildair Rain Garden increased property value around the perimeter by 39.5% between 2016-2019, and the new proposed GRD sites, Milne Campus and Mirabeau Water Garden increased property value around the perimeter by 43.5% between 2016-2019. In order to be consistent with the analysis, these numbers are compared to the change in median home value per neighborhood over the same time frame. Rome Park and Milne Campus are both located in Milneburg, in which housing values have increased by 6.3% since 2016 and are predicted to rise 1.2% over the next year. Wildair Rain Garden is located in St. Anthony, in which home value has risen by 5.7% since 2016 and is predicted to climb 0.3% over the next year. Lastly, the Mirabeau Water Garden is located in Filmore, which has changed by -0.0% since 2016 and is predicted to fall by -1.1% over the next year. Overall, the green spaces have inflated the median home value over time, and the proposed GRD sites are expected to continue to facilitate an increase in price. Results and limitations to this approach will be discussed thoroughly at the end of this chapter.

Directly around the perimeter of Rome Park, there are 33 homes. Robert E. Lee Boulevard and St. Roch Avenue cut through Rome Park, so there are four separate pieces of land on each corner of the intersection maintained as one property. Spain Street is to the west, Mexico Street is to the north, Music Street is to the east, and Madrid street is to the south. All four of these streets are primarily residential and do not have much traffic. St. Roch Avenue and Robert E. Lee Boulevard are larger streets with more regular car traffic. As of March 2019, there were two homes on the market, one for sale at $338,000 and one foreclosure for $157,000. They are both located on Spain Street. There were 31 available data points for the 2016 data.

There are 39 homes around the perimeter of the Milne Campus on Mendez Street to the north, Music Street to the west, Filmore Avenue to the south and Franklin Avenue to the east. Both Filmore and Franklin Avenue are busier roads with neutral grounds (medians) whereas Mendez and Music Street are smaller residential roads with less traffic. As of March 2019, Zillow listed one home on Mendez Street for sale at $375,000 and another for sale at $370,000 on Music Street. On Franklin Avenue, one home is listed as an auction for foreclosure at $136,000. The median price of the homes with available data around the Milne Campus is $195,667. The house that is listed for $375,000 in 2007 for $15,000, and again in 2018 for $56,000. It is listed as new construction and is selling with an increase of 569.5% in price per square foot. The home for sale on Music Street was built on a lot that cost $43,500 to buy in 2018 and is selling for an increase of 750.6% in price per square foot. There were 35 available points of data for the perimeter data from 2016, with a median price of homes and available land averaging to $80,565. For one of the homes that sold in 2017, a selling point in the description included the phrase, "located across from a beautiful green space" (Zillow, 2019).

There are 51 homes around the perimeter of the Mirabeau Water Gardens. Mirabeau Avenue is to the north, St. Bernard Avenue to the west, Owens Boulevard to the south, and Cartier Avenue to the east. Mirabeau Avenue and St. Bernard Avenue are both busier, main roads with neutral grounds. Owens Boulevard and Cartier Avenue are quieter, residential roads. It is important to note that this area is only three blocks east of Bayou Saint John, a popular recreation trail, and some of New Orleans' most expensive homes. As of March 2019, there were no homes listed available for sale on this exact block. The median price of the homes with available data around the Mirabeau Water Gardens is $252,392. There were 37 available points of data for housing costs in previous years to calculate the impact of the Mirabeau Water Garden

green infrastructure installation. The GRD project was used three times as a selling point for the calculated homes with phrases like “Close to City Park”, “Enjoy this excellent home…across the street from the future Mirabeau Water Garden and close to City Park” and “ACROSS FROM A HUGE MANICURED PARK” (capital letters in original text) (Zillow, 2019). As shown in the results presented in the table and chart above, the median home values around the Mirabeau Water Garden installation have increased the most out of the four sites.

The Wildair Rain Garden has 11 homes located around the immediate perimeter, on the streets of Filmore Avenue to the south, Wingate Drive to the west, and Wildair Drive to the east. Filmore Avenue is a more heavily traveled road with a neutral ground (median) whereas Wingate and Wildair are residential streets. It is located on a corner lot, so the two homes located to the north of this smaller size green installations are included in the analysis as well. There were nine total data points for available home value in 2016. There was no mention of the rain garden in any real estate listing. It is important to note that while the rain garden is located in this area, these streets are also three blocks away from the exact location where the London Avenue Canal broke, so the infrastructure failure post-Katrina heavily impacted these homes.

The majority of literature and research on environmental gentrification has been through a longitudinal or geospatial analysis. This thesis uses similar methods to scholars such as Pearsall (2011), Checker (2012) to understand the spatial change that takes place both within the demographics of a neighborhood, and with median home values specifically. Researching the Gentilly Resilience District takes on its own challenges due to the time-frame of the implementation of the green infrastructure projects. As most projects are in the planning phases of their process, the geospatial analysis can only show so much difference. Yet, with the above analysis, it is possible to answer how existing green amenities such as parks and green space in

Gentilly affect property value, and how the new sites of the Gentilly Resilience District will impact property value similarly. While more deliberation will follow in the discussion section of this chapter, the results show that green amenities such as Rome Park and the Wildair Rain Garden have increased property value over time and have been used as selling points for real estate sites. The results also show that projects such as the Mirabeau Water Garden and the Milne Campus are following a similar trend as the established green spaces.

Section Three: Demographic and Qualitative Results

In this section, two data sources are analyzed. First, I analyzed ACS data provided at a neighborhood level from The Data Center, an independent data analysis firm based in New Orleans. Second, survey results and interview quotes are analyzed to provide a more in-depth explanation of events and changes that are occurring in Gentilly. As environmental justice scholars have concluded (Pearsall, 2011), there are several indicators which can help us identify gentrification over time. These are percentage White, percentage Black, percentage In Poverty, percentage 65+ (Smith, 2017), and percentage with a Bachelor's Degree (Anguelovski, 2016). Other indicators to consider in future studies are the change in the percentage of a college educated resident, change in percentage of population moving in who are higher income, and population moving out who are lower income. I have included vacant homes in the neighborhood to understand the transformation of urban spaces in Post-Katrina neighborhoods, and the impact that the flooding has had on homes in Gentilly. This indicator can also signify gentrification because when a space is blighted or vacant, investors are more likely to purchase property in order to "flip" it, or build a newly constructed home on a vacant lot (M. Eversley, Blights Out Historian, personal communication, July 29, 2018).

In order to understand how percentage White becomes an identification factor for a gentrifying neighborhood, one must comprehend the concept of "Whiteness as Property" (Harris, 1993). Harris postulates that racial identity and property are deeply interrelated concepts, and that whiteness "initially constructed as a form of racial identity, evolved into a form of property, historically and presently acknowledged and protected in American law" (p. 1709). Dr. Harris acknowledges the roots of whiteness as property in the similar classifications of control over Black and Native American peoples out of which were created "racially contingent forms of property and property rights" (p. 1709). After slavery and during Jim Crow whiteness was identified as privilege, which afforded the allocation of both private and public societal assistances.

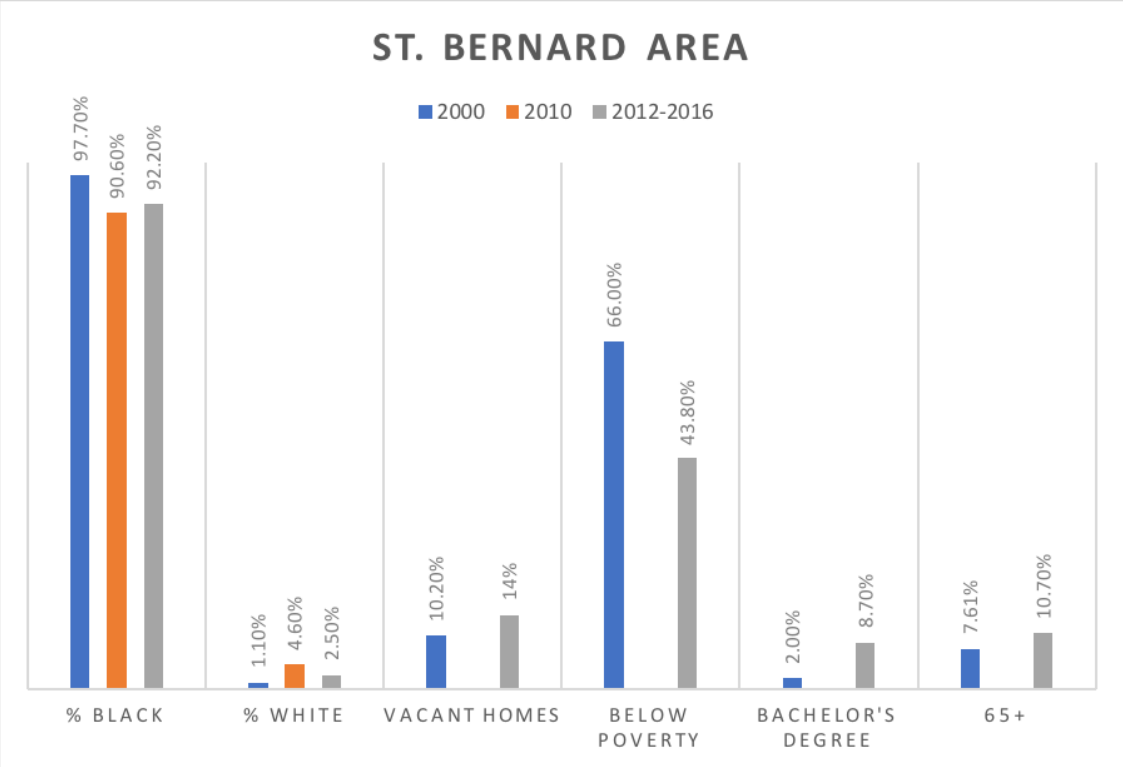
"These arrangements were ratified and legitimated in law as a type of status property. Even as legal segregation was overturned, whiteness as property continued to serve as a barrier to effective change as the system of racial classification operated to protect entrenched power" (p. 1709). The idea is furthered as an understanding of current perceptions of racial identity, in the law's misperception of group identity and in the Court's reasoning and decisions in the arena of affirmative action. This idea is concluded by arguing that distortions in affirmative action doctrine can only be attended to by challenging and revealing the property interest in whiteness and by recognizing the distributive justification and function of affirmative action as imperative. This concept and history are central to the underpinnings of gentrification studies.

Each graph provides data from the Census of 2000, and 2010, and the ACS data from 2012-2016 for percentage White and percentage Black. For the other indicators studied, data was only available for 2000 and 2012-2016. Data for Latinx and Asian-American are excluded from this analysis but should be included in future research. The graphs show the percentage of the

whole for the available years. This information can help determine whether or not the neighborhood is showing signs of gentrification. In the following table, each indicator will be given a score of 0 or 1, based on if the indicator signifies a gentrifying neighborhood. These will then be added together for a final score. The highest score is a six, with the lowest score being a zero. If the neighborhood has a score between a zero and three, it has not shown a clear indication of gentrification between the years of 2000 and 2016. If the neighborhood has a score between three and six, it has shown a clear indication of gentrification between the years of 2000 and 2016. The following graphs will first be analyzed individually, and then in a comprehensive overview.

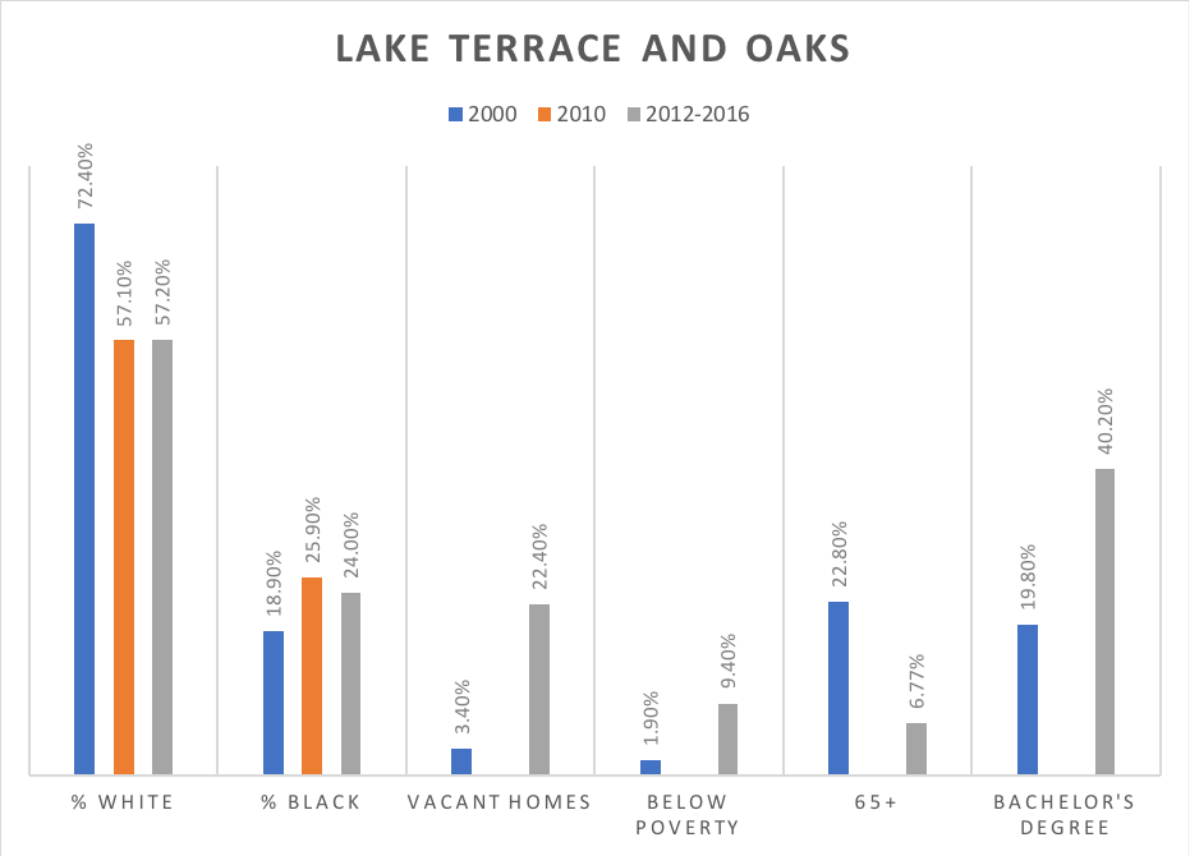
Neighborhood	Percentage White *Increase = 1 Decrease = 0*	Percentage Black *Increase = 0 Decrease = 1*	Percentage in Poverty *Increase = 0 Decrease = 1*	Percentage 65+ *Increase = 0 Decrease =1*	Percentage with a Bachelor's Degree *Increase = 1 Decrease = 0*	Percent Vacant Homes *Increase = 1 Decrease = 0*	**Total Score**
St. Bernard Area	1	1	1	1	1	1	**6**
Lake Terrace and Oaks	0	0	0	1	1	1	**3**
Gentilly Terrace	0	0	0	N/A	N/A	1	**1**
Gentilly Woods	0	0	0	1	1	1	**3**
Pontchartrain Park	1	1	1	1	0	1	**5**
St. Anthony	0	0	0	1	1	0	**2**
Milneburg	0	0	0	1	0	1	**2**
Filmore	0	0	0	1	1	1	**3**
Dillard	0	0	0	0	1	1	**2**
Gentilly Total	**2**	**2**	**2**	**7**	**6**	**8**	

Table 6.2: The dichotomous variables are scored for each neighborhood and represented in the table above, providing a score.



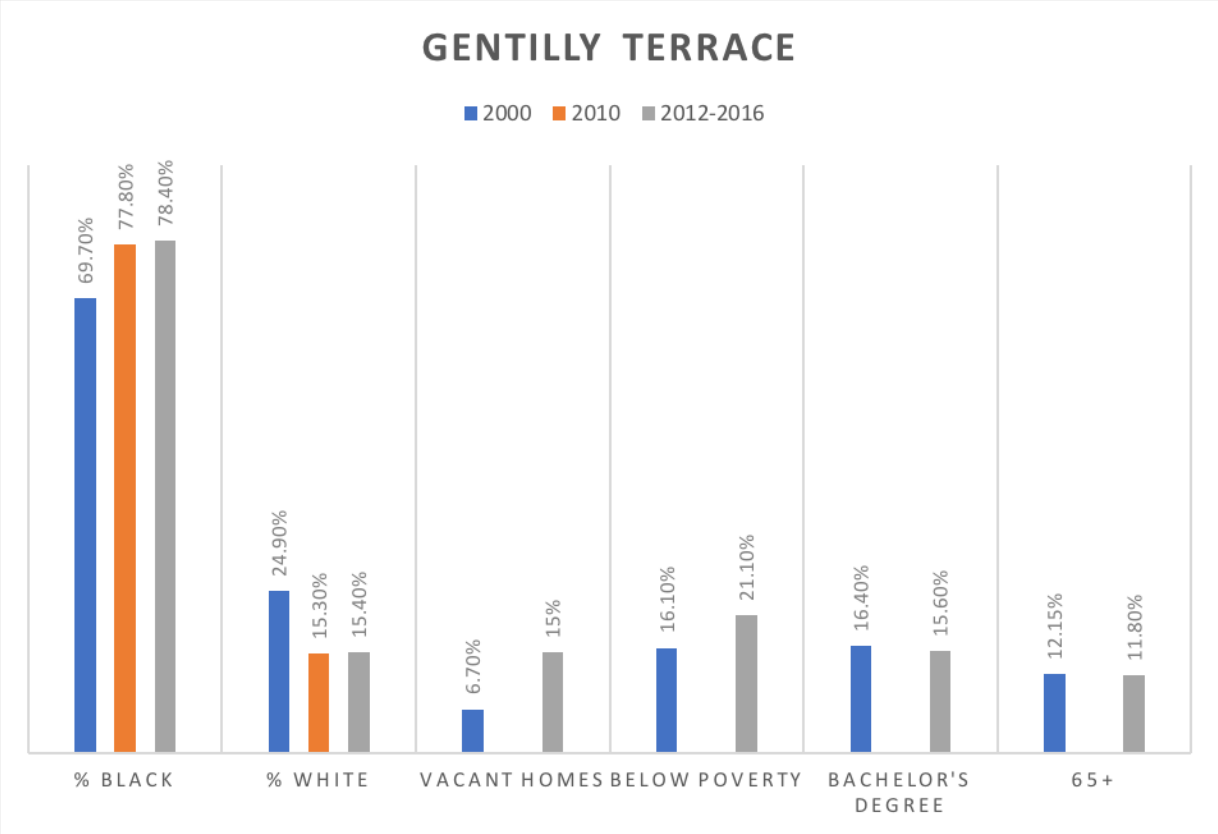
Graph 6.11: St. Bernard Area Demographics over time. Source: ACS, 2018

The St. Bernard Area has seen a decrease in its Black population over time and an increase in its White population. The percentage of vacant homes has increased over time, while the percentage in poverty has decreased. The percent of the population to obtain a Bachelor's Degree has increased as well as the population over 65. The final score for this neighborhood is 6, which indicates that gentrification is occurring.



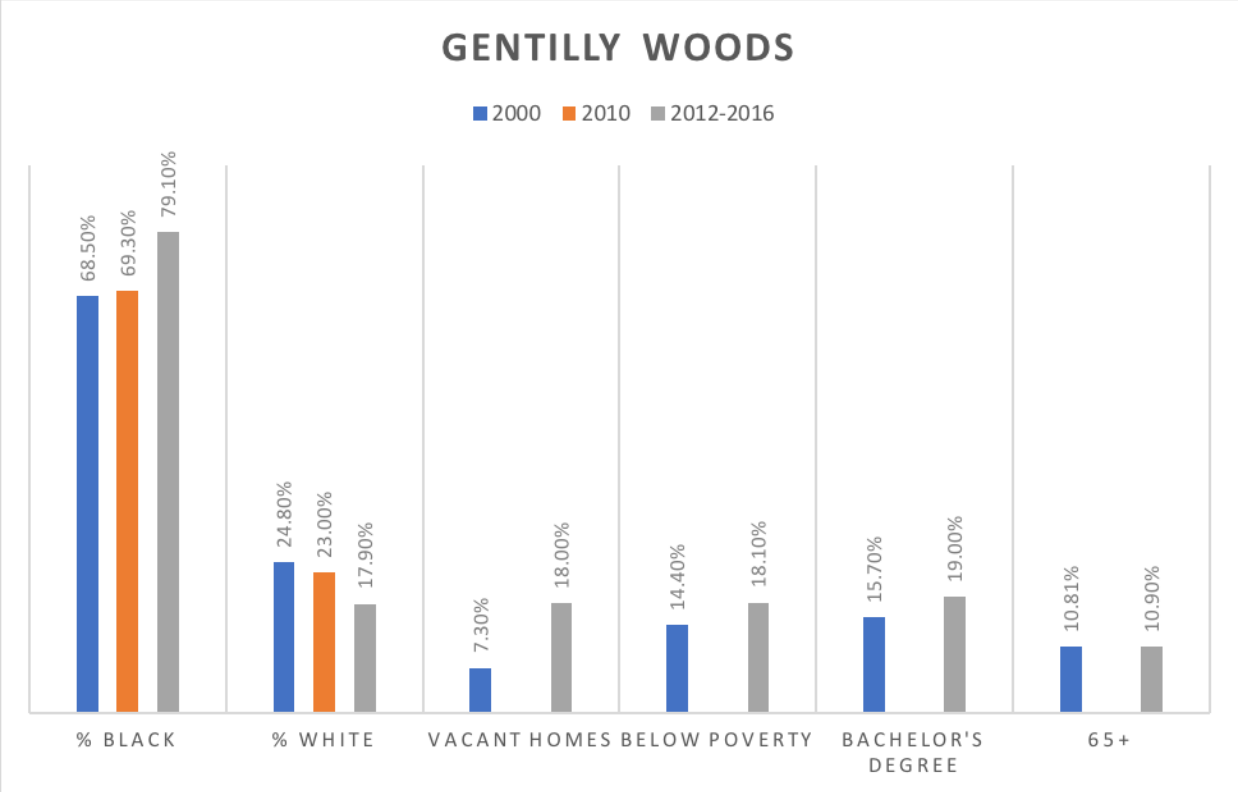
Graph 6.12: Lake Terrace and Oaks Demographics over time. Source: ACS, 2018

The Lake Terrace and Oaks neighborhood is an anomaly from the other neighborhoods in Gentilly, being that is racially different from the other neighborhoods. Even so, the percentage of White residents has decreased and the Black population has increased. The percent of vacant homes has increased. The percent of residents living in poverty has increased, and the percent of residents over 65 years-old has decreased. The increase in the percent of residents with a Bachelor's Degree has increased. The final score for this neighborhood is 3 for the data studied.



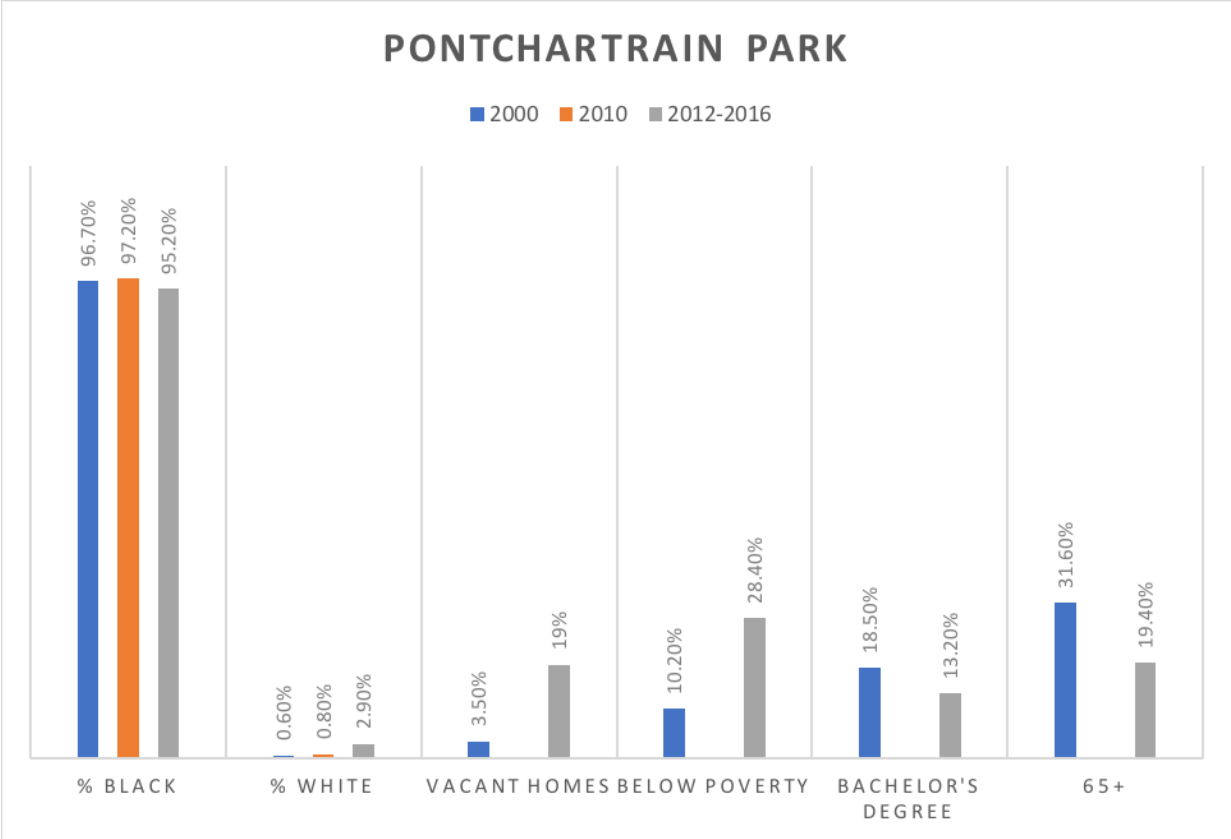
Graph 6.13: Gentilly Terrace Demographics over time. Source: ACS, 2018

Gentilly Terrace is another interesting neighborhood to examine. The percentage of Black residents has risen over time, and accordingly, the percentage of White residents has decreased overall, with a slight increase between the years of 2010 and 2012-2016. The percent of vacant homes has increased, and the percentage of people in poverty has also increased. The percentage of Gentilly Terrace residents with a Bachelor's Degree and over 65 has only slightly decreased, each by less than 1%. Thus, these data points are moot. This breakdown gives Gentilly Terrace an overall score of 1, meaning it has not shown an indication of gentrification between the years of 2000 and 2012-2016.



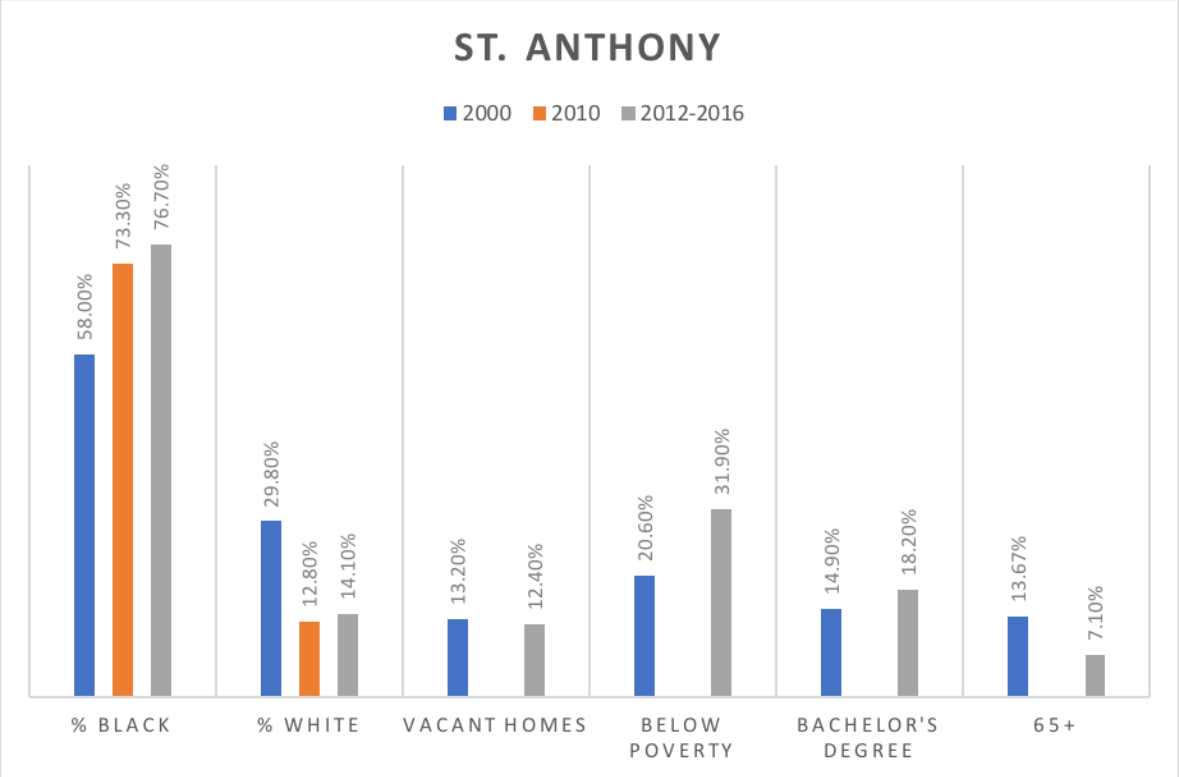
Graph 6.14: Gentilly Woods Demographics over time. Source: ACS, 2018

Gentilly Woods has an increase overall in the percentage of Black residents, and a decrease in White residents. The percentage of vacant homes has increased, and the percent of residents living below poverty has also increased. The number of residents with a Bachelor's degree has increased, and the percentage of residents over 65 has increased, but just barely. This breakdown gives Gentilly Woods the final score of 3, which means the neighborhood has not yet shown signs of gentrification between 2000 and 2016, although it is closer to gentrifying than Gentilly Terrace.



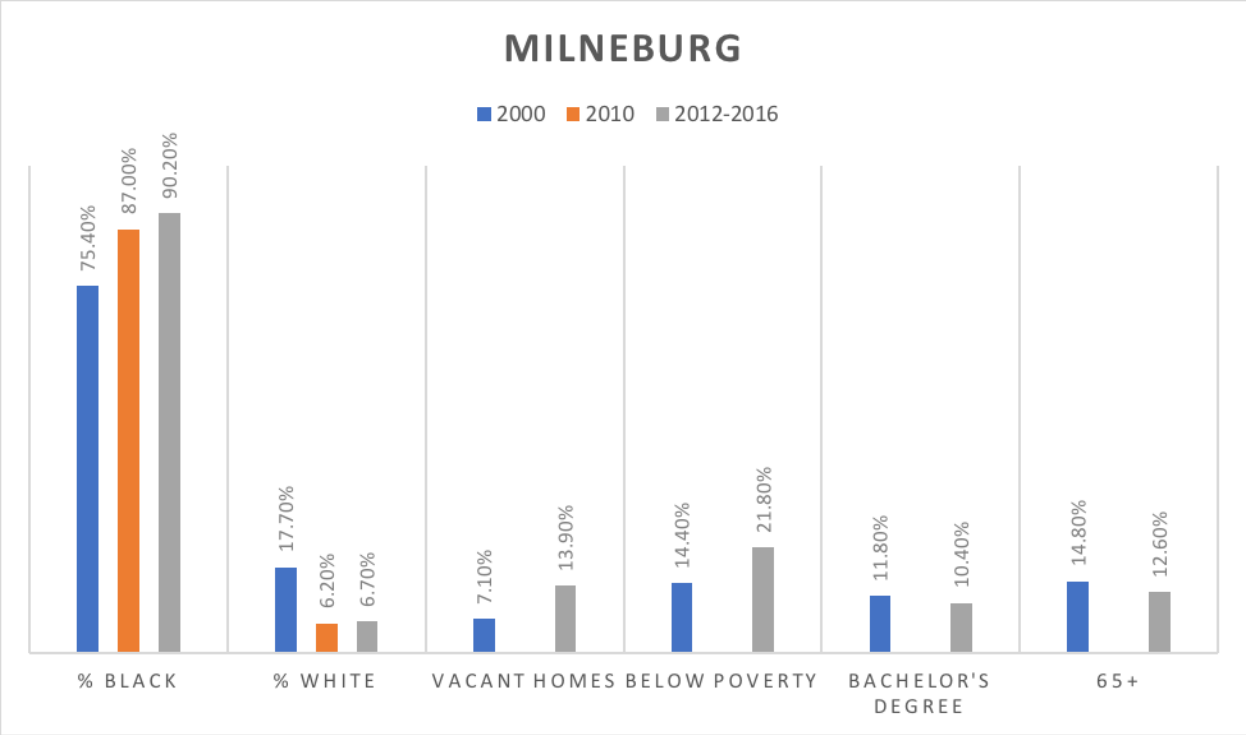
Graph 6.15: Pontchartrain Park Demographics over time. Source: ACS, 2018

The Pontchartrain Park neighborhood has two essential indicators of gentrification, namely a decrease in the percentage of Black residents and an increase in the percentage of White residents. The number of vacant homes has also increased, and the number of bachelors has decreased. The percentage of residents over 65 has decreased, which is another indication of gentrification. The percent of those living below poverty has also increased. This breakdown gives Pontchartrain Park a final score of 5, which is comparable to the St. Bernard Area neighborhood, and means that this neighborhood has experienced indicators of gentrification during the studied timeframe.



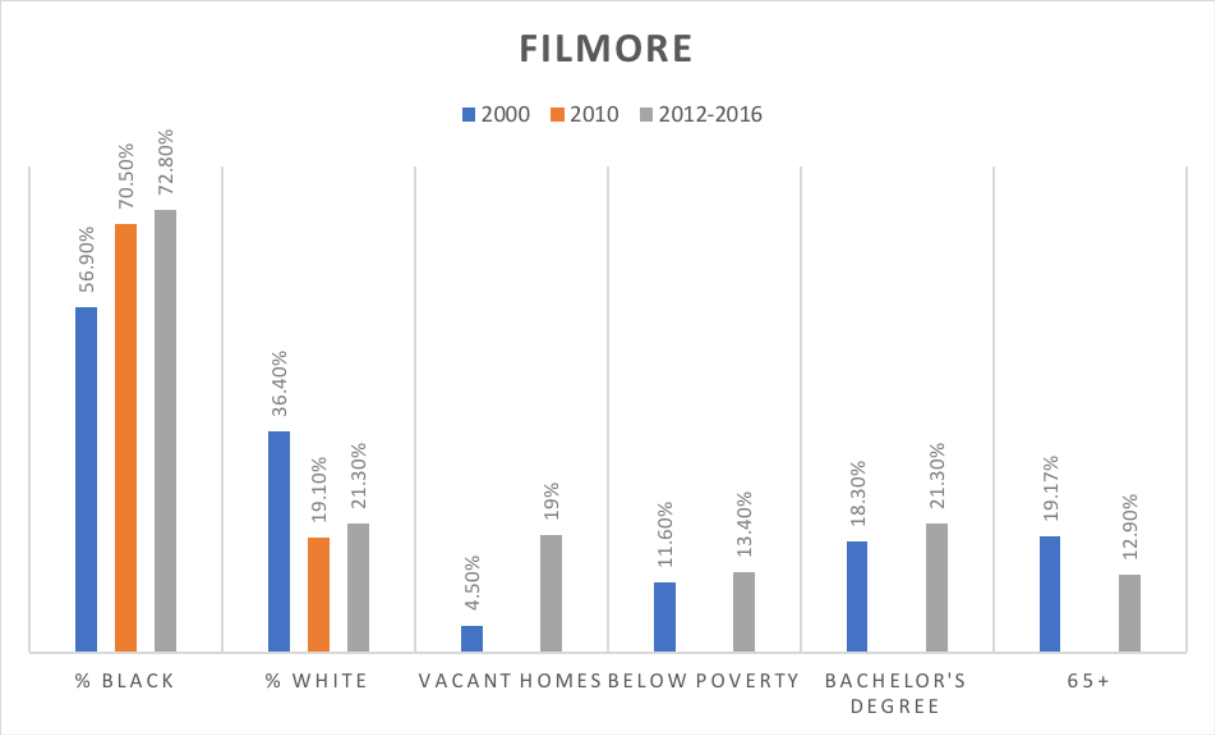
Graph 6.16: St. Anthony Demographics over time. Source: ACS, 2018

The St. Anthony neighborhood has experienced an increase in the percentage of Black residents between 2000 and 2012-2016, and a decrease in the number of White residents, though between 2010 and 2012-2016 that percentage has increased. The number of vacant homes in this neighborhood is the first so far to show a decrease in vacant homes over time, meaning that this area may have already been experiencing an increase in gentrification in the period studied. There is an increase in percent poverty, and an increase in residents with a Bachelor's degree. Lastly, there is a decrease in residents over 65 years old. The total number of indicators for gentrification for the St. Anthony neighborhood between the years of 2000 and 2012-2016 is a 2.



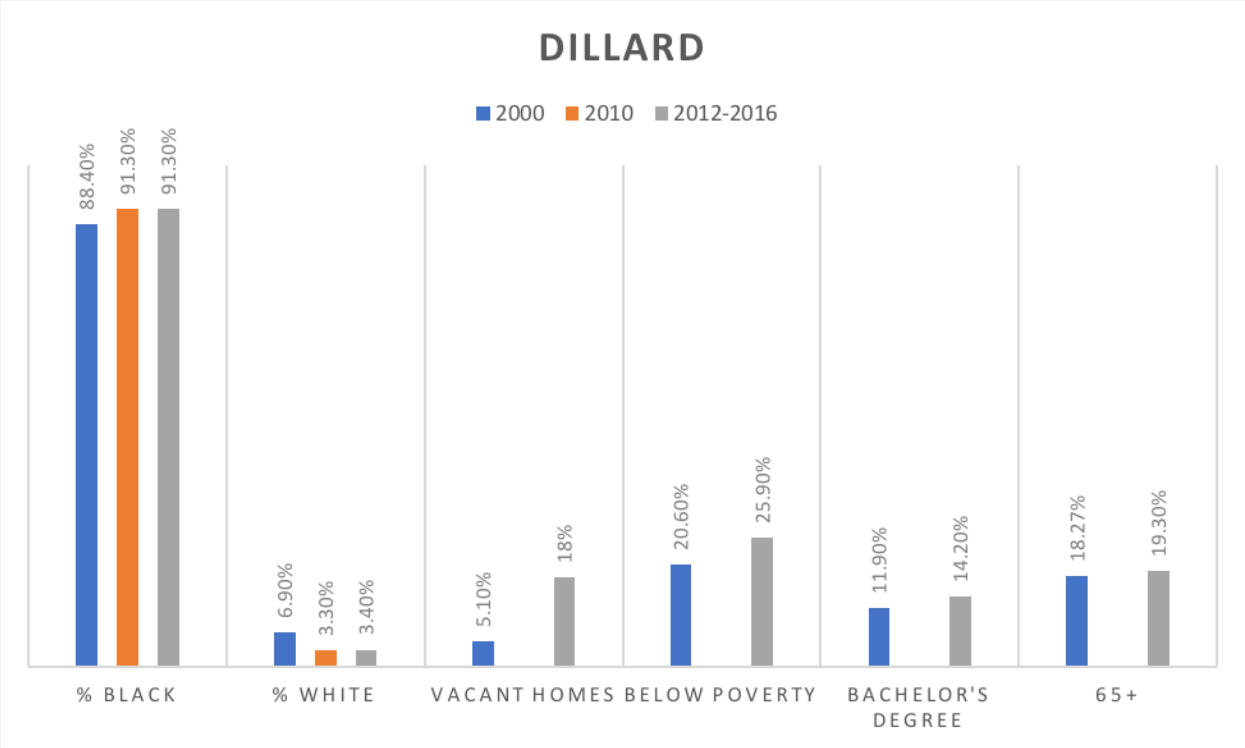
Graph 6.17: Milneburg Demographics over time. Source: ACS, 2018

The Milneburg neighborhood has experienced a steady increase in the percentage of Black residents between the years of 2000 and 2012-2016. Between the years of 2000 and 2010, the White population decreased, but between the years of 2010 and 2012-2016, it increased. The percentage of vacant homes increased. The percentage of residents increased, and the percentage of residents with bachelor's degrees decreased. The population of residents over 65 also decreased. The residents living below poverty increased. This score is similar to the Gentilly Woods neighborhood, with three indicators of gentrification noted between the years 2000 and 2012-2016.



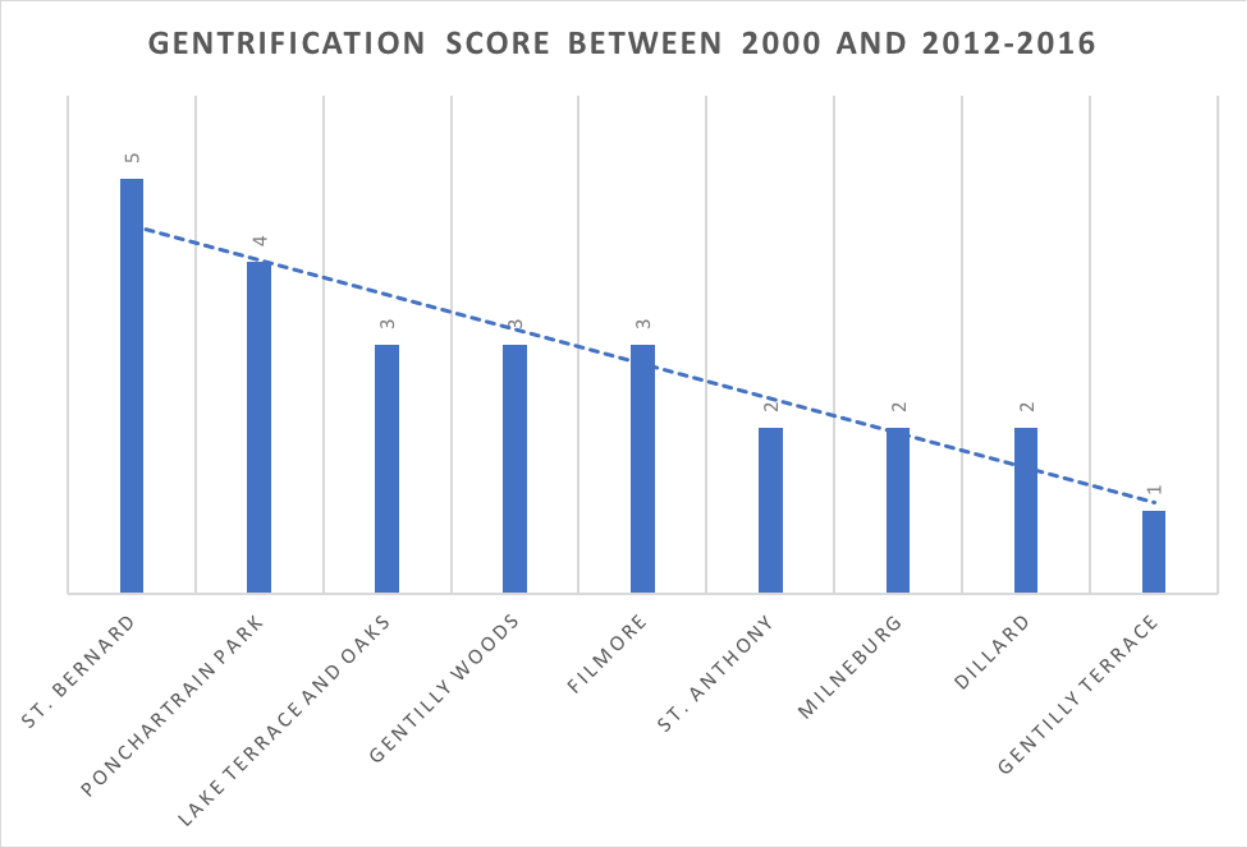
Graph 6.18: Filmore Demographics over time. Source: ACS, 2018

The Filmore neighborhood has the second highest percentage of White residents in Gentilly, with an increase in this population between 2010 and 2012-2016. Overall since 2000, the percentage of White residents has decreased, and the population of Black residents is increasing. The number of vacant homes also increased, while percent poverty increased only slightly. The percentage of residents living in Filmore with bachelor's degrees has increased, and the number of residents living in Filmore over 65 has decreased. The overall score for the Filmore neighborhood is a 3, meaning it is showing signs of gentrification over the 16 years of data collection.



Graph 6.19: Dillard Demographics over time. Source: ACS, 2018

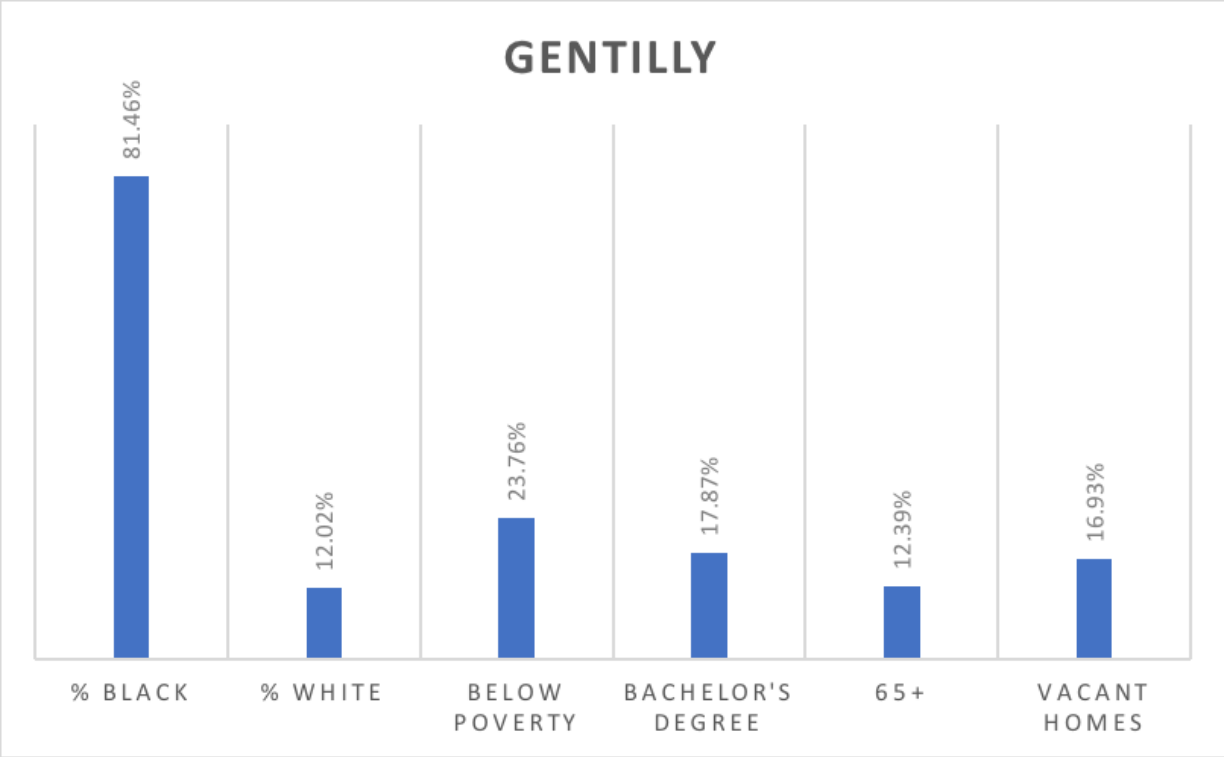
The last neighborhood in the analysis, Dillard, has shown an increase in the percentage of Black residents living in the community, and a decrease overall with the White residents, although there is an increase of .10% between 2010 and 2012-2016. The number of vacant properties has increased, and the percent of those living below poverty has also increased. The number of residents who have obtained a bachelor's degree has also increased, and the percentage of residents living in the Dillard area over 65 has increased as well. This neighborhood has a score of 2 for indication of gentrification between 2000 and 2016. Following is a scale showing where the neighborhoods fall in terms of indicators of gentrification for this period of the data analysis.



Graph 6.20: Gentrification Scores for each Sub-Neighborhood of Gentilly. Source: Reid, 2019

This graph organized each neighborhood by the indicators of gentrification previously presented. This graph shows that St. Bernard Area has the highest number of indicators between 2000 and 2012-2016, where Gentilly Terrace has the lowest number of indicators. This method of examining demographic change is only one approach to understanding gentrification. It is important to note that there are others, and the drawbacks and strengths of this approach will be discussed in Chapter 7. In the final section of the results chapter, the survey and interview results will be analyzed. These results provide a critical component to understanding how residents living in the area perceive changes in their communities, the Gentilly Resilience District and its effectiveness in outreach and engagement, and the connection between the two. In order to

understand the survey results, the total demographic data of Gentilly is displayed in the graph and table below. The data presented is from 2012-2016, which is the most recent available data.



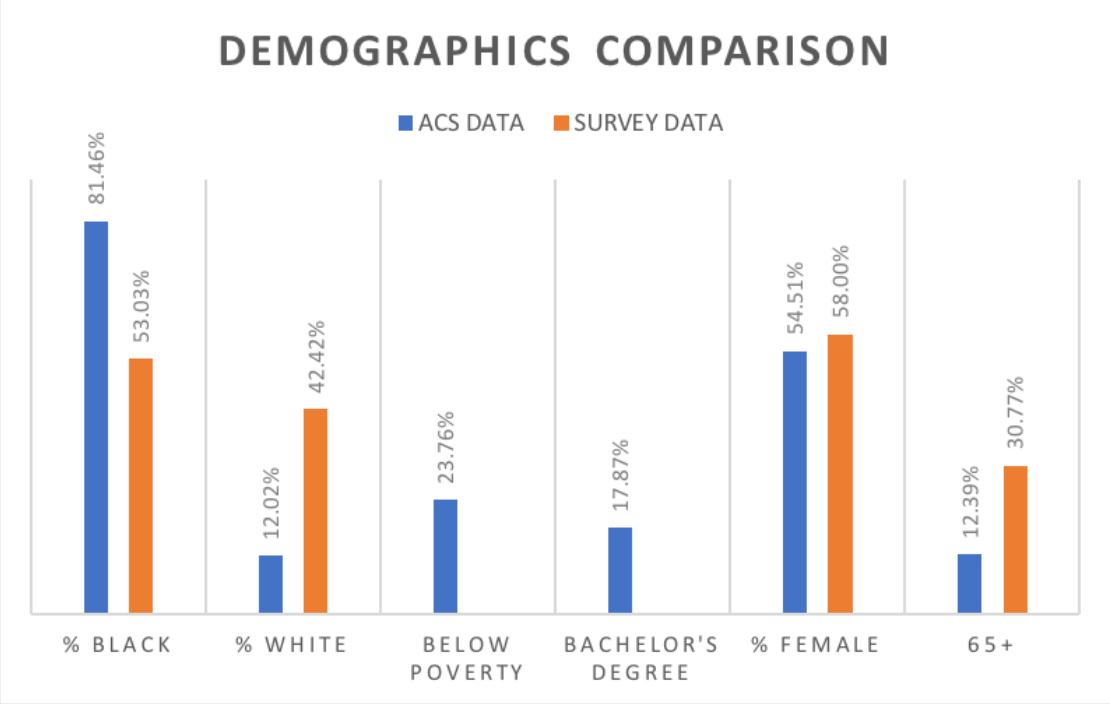
Graph 6.21: Demographic Data for Gentilly. Source: ACS, 2016

Dillard	Filmore	Milneburg	St. Anthony	Ponchartrain Park	Gentilly Woods	Gentilly Terrace	Lake Terrace & Oaks	St. Bernard Area	All of Gentilly	
91.30%	72.80%	90.20%	76.70%	95.20%	79.10%	78.40%	57.20%	92.20%	81.46%	% Black
3.40%	21.30%	6.70%	14.10%	2.90%	17.90%	15.40%	24.00%	2.50%	12.02%	% White
25.90%	13.40%	21.80%	31.90%	28.40%	18.10%	21.10%	9.40%	43.80%	23.76%	Below Poverty
14.20%	21.30%	10.40%	18.20%	13.20%	19.00%	15.60%	40.20%	8.70%	17.87%	Bachelor's Degree
19.30%	12.90%	12.60%	7.10%	19.40%	10.90%	11.80%	6.77%	10.70%	12.39%	65+
18%	19%	13.90%	12.40%	19%	18.00%	15%	22.40%	14%	16.93%	Vacant Homes
$40,633.38	$84,560.18	$45,790.85	$42,269.44	$43,360.80	$48,333.40	$52,275.14	$135,642.04	$28,765.08	$57,958.92	Average Household Income

Table 6.3: Demographic data of Gentilly total and per sub-neighborhood. Source: ACS, 2018

Survey Demographics:

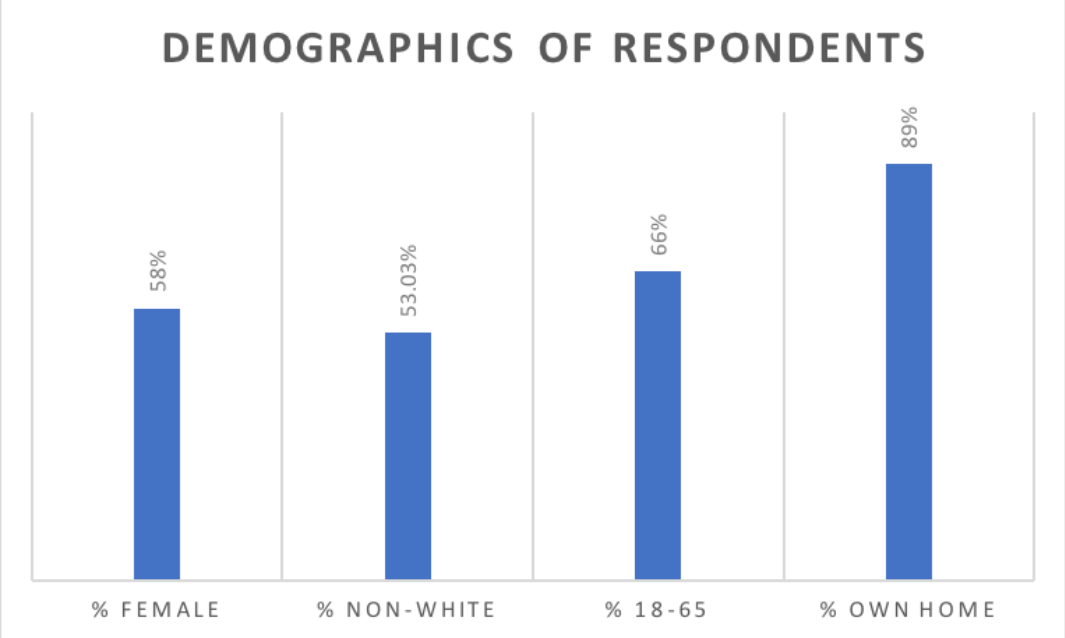
Readers are now familiar with the demographics of each neighborhood in Gentilly, as well as Gentilly as a whole. The following graph compares the most recent available data of Gentilly with the survey data. The complete questionnaire for the survey is attached in Appendix A. The survey did not ask about median household income, or highest level of education completed, so these data points are not displayed. Overall, the survey respondents are female, older, and Whiter than the rest of Gentilly. As written in the methods, the survey was available online and in person, and many of the participants were drawn from participants at community meetings or found out about the survey from online websites. The total number of surveys completed was 63.



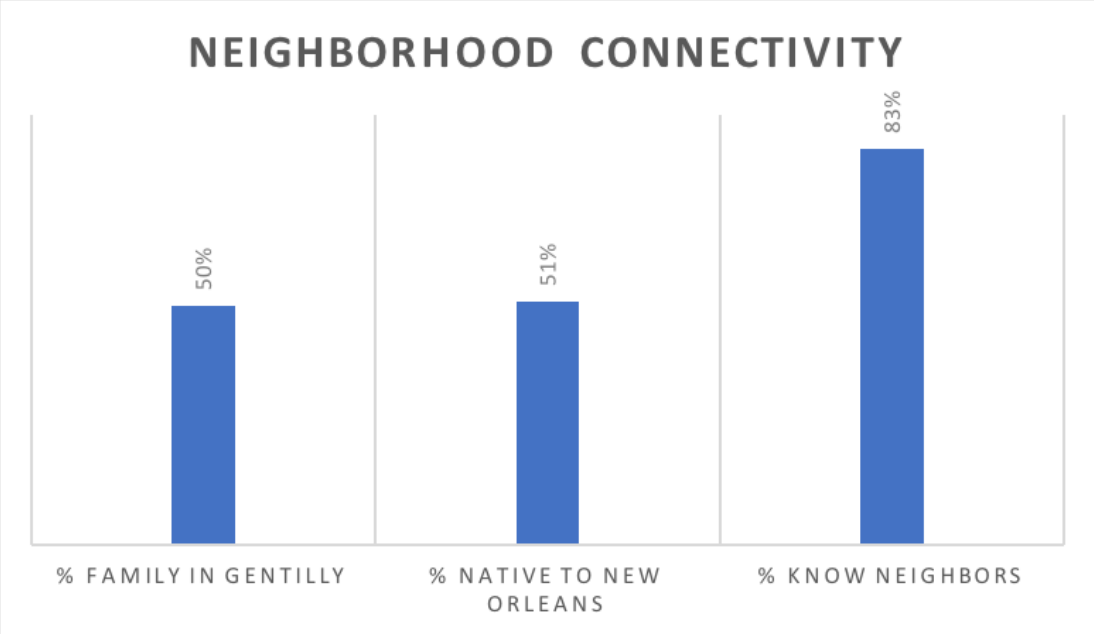
Graph 6.22: A comparison of two data sources showing the key indicators of gentrification. Source: ACS, 2018; Reid, 2019

The next three graphs display other information that survey respondents provided, which cannot be compared to the ACS data. They are organized by demographics of respondents, neighborhood connectivity, and environmental perceptions. Graph 6.23 shows that the majority

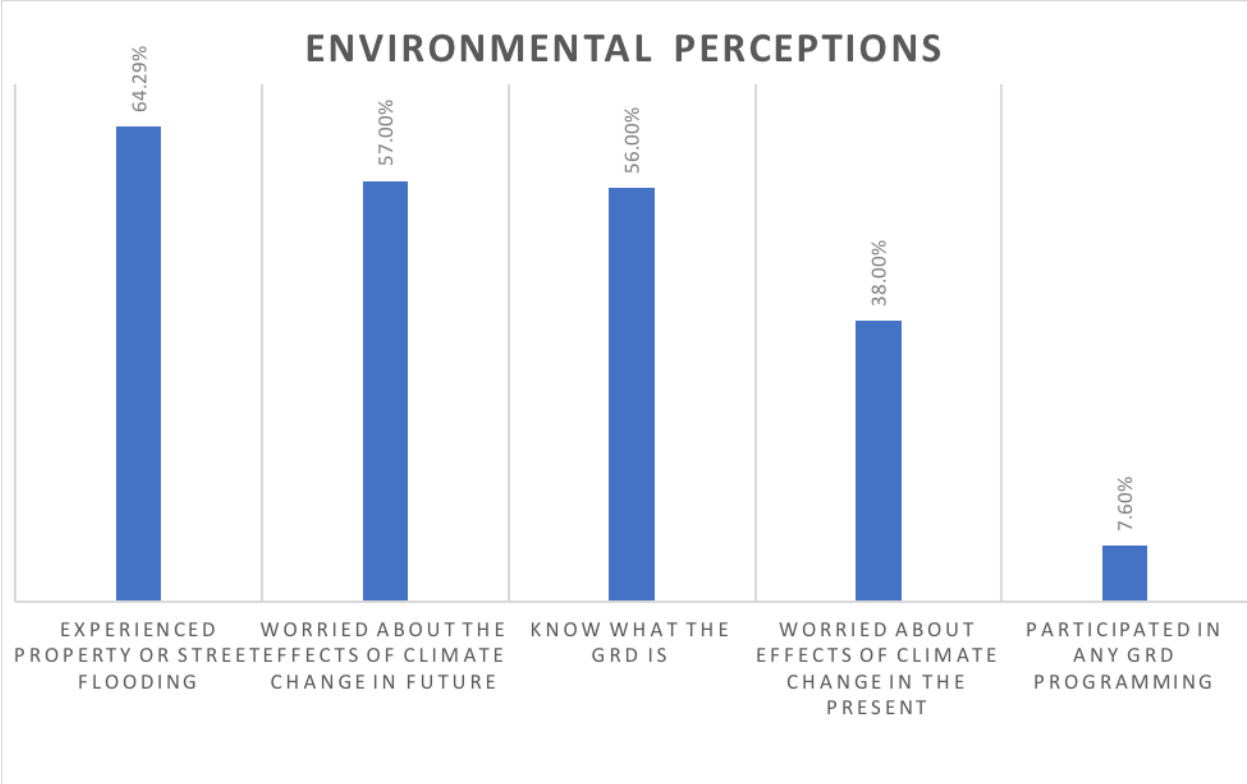
of respondents are non-White, female, between the ages of 18-65, and own their own home. Graph 6.24 shows that the majority of respondents are native to New Orleans, know their neighbors, and have family who also lives in Gentilly. Graph 6.25 shows that the majority of residents have experienced either or both their street and property flooding, are worried about climate change in the future and know about the Gentilly Resilience District. Only 38% are worried about climate change in the present, and only 7.6% of respondents have participated in any programming around the GRD.



Graph 6.23: Demographics of respondents from Survey data. Source: Reid, 2019



Graph 6.24: This graph shows three different results related to neighborhood connectivity. Source: Reid, 2019



Graph 6.25: This graph displays the results of all survey-takers around issues of environmental concerns. Source: Reid, 2019

With these preliminary survey results showing the breakdown of the participants for this thesis research, the next section of qualitative results will continue to build on the survey data

and results. It will also answer how the resilience planning of The Gentilly Resilience District embodies or disregards the concept of procedural justice and how this impact residents' perceptions of gentrification. As well as what methods of outreach and community engagement are the most effective in increasing residents' participation in resilience planning.

Residents Knowledge and Perception of the Gentilly Resilience District:

In order to study the connection between environmental gentrification and knowledge of the Gentilly Resilience District, I asked a series of questions about residents' participation, understanding, and any positive or negative associations with either the events or the promotion of the District itself. The responses are as follows.

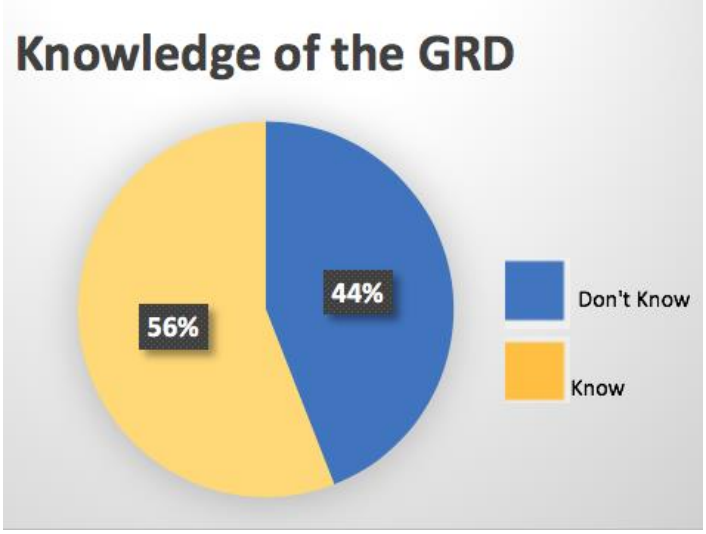


Chart 6.1: Gentilly Residents who have heard of or knew what the Gentilly Resilience District is.

The results show that 56% replied "yes" when asked if they knew what the Gentilly Resilience District was, out of that group, only 33% described it. Sixty-seven percent either did not answer or said they didn't know what it was. The 33% of residents who did offer an answer had various levels of knowledge. These responses are recorded in Chart 6.2. Forty percent of

residents could provide a simple description. This is exemplified in the definition and supporting quotes below.

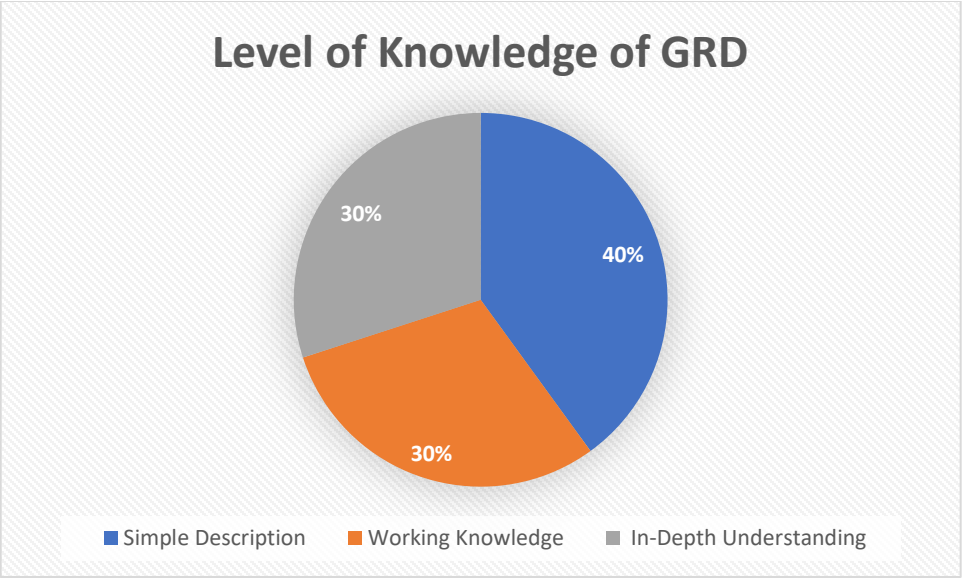


Chart 6.2: The level of understanding varied between not knowing and having an in-depth understanding of the GRD. Source: Reid, 2019

No Knowledge	Simple Description	Working Knowledge	In-Depth Understanding
"No idea. There have been so many 'resilient' groups to come and go in Gentilly since Katrina that it seems this organization has been lost in the crowd."	"A new way of managing water naturally." "A system to contain water runoff from heavy rain." "I saw the little water park on Fillmore, maybe that is part of it? I didn't remember the name "Gentilly Resilience District."' "I read about Mirabeau Gardens and knew that there were other projects, but wasn't aware of where they were." "A water control plan." "I've heard of it and I'm guessing its related to the local water management projects." "I think it has to do with rain/water drainage." "Flood Control project." "It is water management." (2) "A way to manage rain overflow."	"It's monies for alternative stormwater process for New Orleans." "Help prevent subsidence and flooding." "Green Light NOLA installed a rain garden in our yard for free because we live within the resiliency district. We are a block away from the big drainage park project on Mirabeau." "Grant received by the city to study flooding." "Reducing flooding with trees and infrastructure."	"My understanding is that it is an effort to find creative solutions to rainwater management so our neighborhood doesn't have to rely solely on the city's dated pump system." "Basically, more bioswales and a giant retention pond at the Mirabeau water garden." "It's an effort to keep the area from excessive flooding and to revitalize personal and commercial properties." "A multimillion dollar grant funded project to bring more stormwater infrastructure to Gentilly." "It's a community learning how to live with water instead of fighting it."

Table 6.4: Respondents description of the GRD. Source: Reid, 2019

While the chart examines the ways that survey-takers explained the GRD, I included the "No Knowledge" category because the quote demonstrated a unique and relevant perspective. This column meant that respondents wrote that they did not know or expanded upon that. The "Simple Description" label meant that the respondent either expressed uncertainty about their answer or included at least one reference to water management in their answer. In the "Working Knowledge" category, the answers included recognition of the monetary component or referenced the terminology contained with the GRD official description. The final category, "In-Depth Knowledge" meant that the answer was comprised of more than one "resilience term" and was able to expand upon the description of the GRD in new and correct ways. I also asked how people heard about it in order to track the types of outreach that the GRD implementors were using, and out of those, which were reaching the residents of the neighborhood.

Knowledge of the GRD varied by race, gender, age, neighborhood, and whether or not the resident lived in Gentilly before or after Hurricane Katrina. The following results show the breakdown of each demographic. In order to analyze the connection between participation and gentrification, it is essential to understand the dynamics of which residents' are prioritized in participation, or what elements of the community demographics influence their participation in outreach and engagement with the GRD.

Out of the 56% of residents who said they knew what the Gentilly Resilience District was, 45% were White, 37% were Black, 18% were of another race (Vietnamese-American or Hispanic/Latino self-identified).

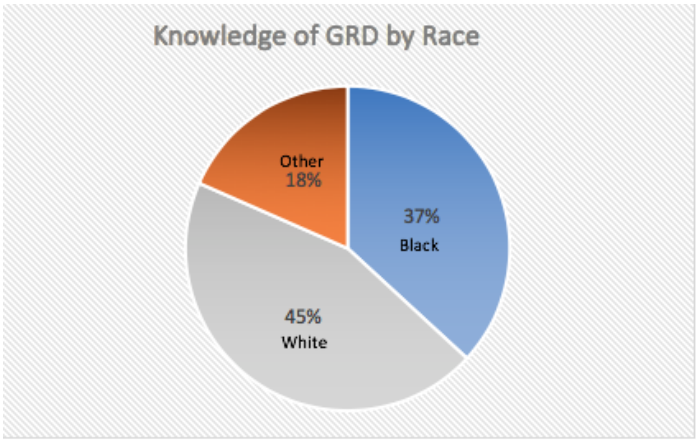


Chart 6.3: Knowledge of GRD by race. Source: Reid, 2019

Regarding gender, 58% self-identified as women, and 42% self-identified as men, with 0% self-reporting as non-binary.

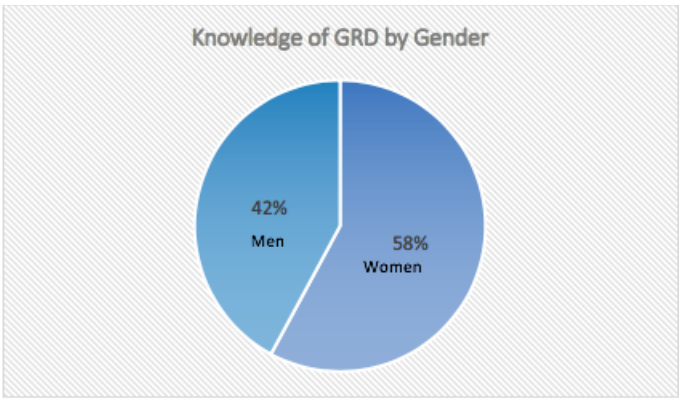


Chart 6.4: Knowledge of GRD by gender. Source: Reid, 2019

Of the residents who were aware of the GRD, 37% were ages 18-40, 21% were 40-65 years old, 42% were 65+.

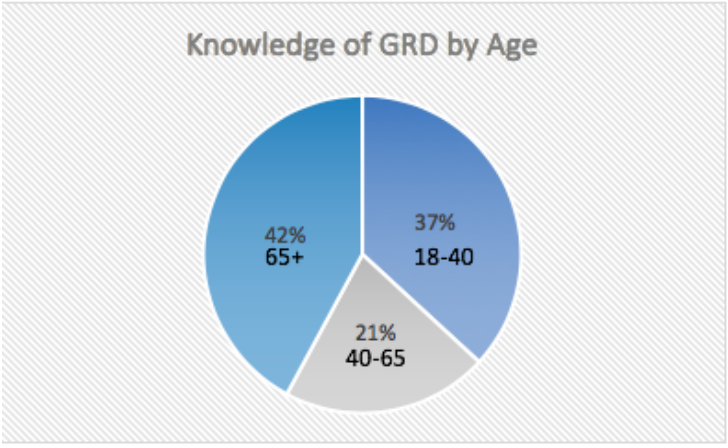


Chart 6.5: Knowledge of GRD by age. Source: Reid, 2019

There is also a difference in knowledge of the GRD between residents who were living in Gentilly before Hurricane Katrina and those living in Gentilly after Hurricane Katrina. Of those who are classified as "Pre-Katrina residents" via the survey results, 44% were familiar with the GRD, 12% less than the 56% of "Post-Katrina residents" familiar with the GRD.

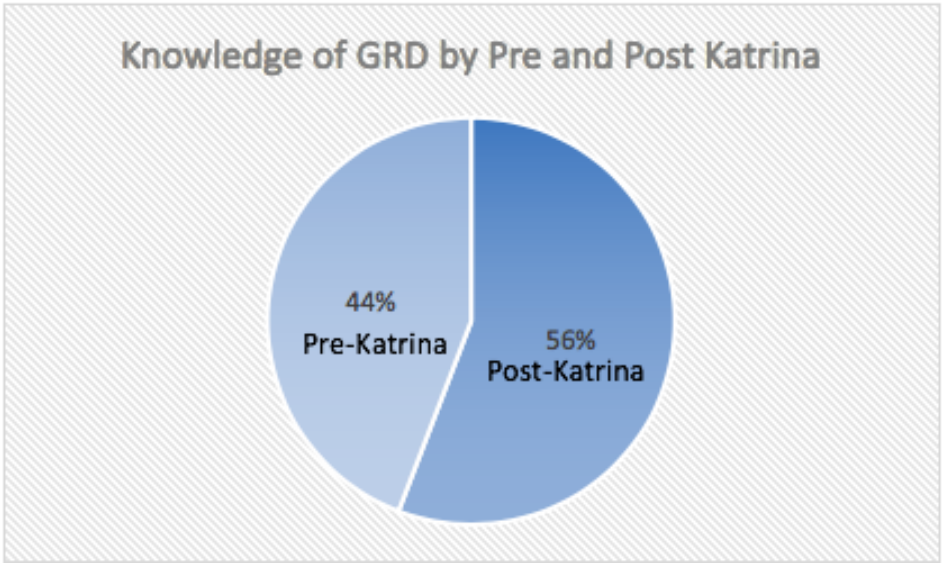


Chart 6.6: Knowledge of GRD by time. Source: Reid, 2019

The sub-neighborhood with the highest number of people participating in outreach or planning events was the Gentilly Terrace community, with 43% of those surveyed with knowledge of the GRD living in that neighborhood followed by 20% of those surveyed with knowledge of the GRD living in Filmore. The sub-neighborhood with less interaction with the GRD, in terms of understanding what it is, or being a part of any of the events was St. Bernard Area community and St. Anthony sub-neighborhoods, with 5% of those surveyed living in the area and having knowledge of the GRD. There were no residents from Pontchartrain Park, Gentilly Woods, or Dillard who participated in the survey.

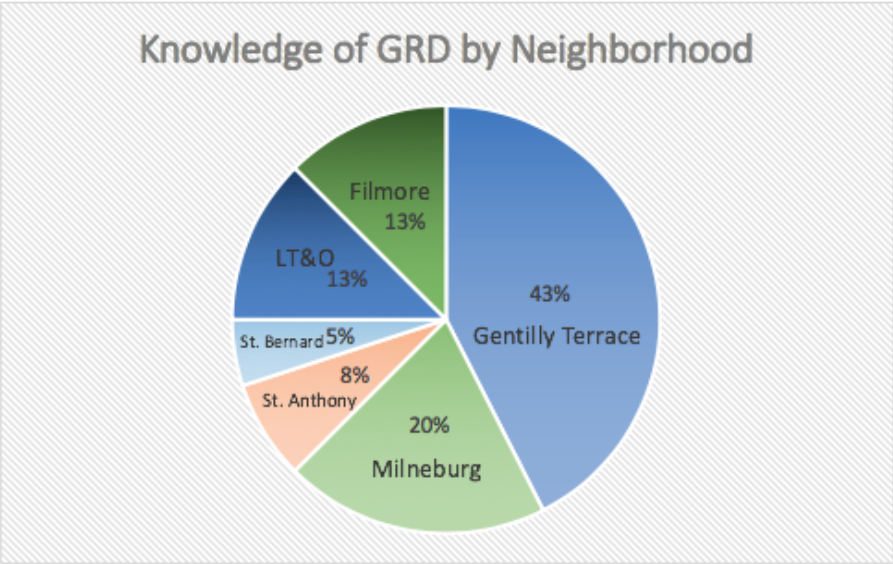


Chart 6.7: Knowledge of GRD by neighborhood. Source: Reid, 2019

Understanding the resident's knowledge of the Gentilly Resilience District is vital to measure and quantify by the above demographic characteristics, as the first question of this thesis seeks to understand the connection between participation in planning and knowledge of resilience work and the rate of gentrification in the neighborhood. The concept of collaborative planning, which is an "interactive process of consensus building and implementation using stakeholder and public involvement" (Margerum, 2002, pg. 1) is assessed and deemed relevant for the analysis of the Gentilly Resilience District. Procedural justice is a crucial component of environmental justice (Bullard, 2005), and the four pillars are 1) being fair in processes, 2) being transparent in actions, 3) *providing an opportunity for voice*, and 4) being impartial in decision making (Tyler, 2014). In both collaborative planning and procedural justice, the practice must be inclusive and accessible to residents, therefore comprehending the statistical outcomes of the outreach and community engagement with residents of various backgrounds is key to understanding the potential for environmental gentrification. There will be a more in-depth analysis to follow in the discussion section of this chapter, which will include analyzing what types of outreach and engagement were the most effective based on participation.

What types of outreach were the most effective in engaging residents?

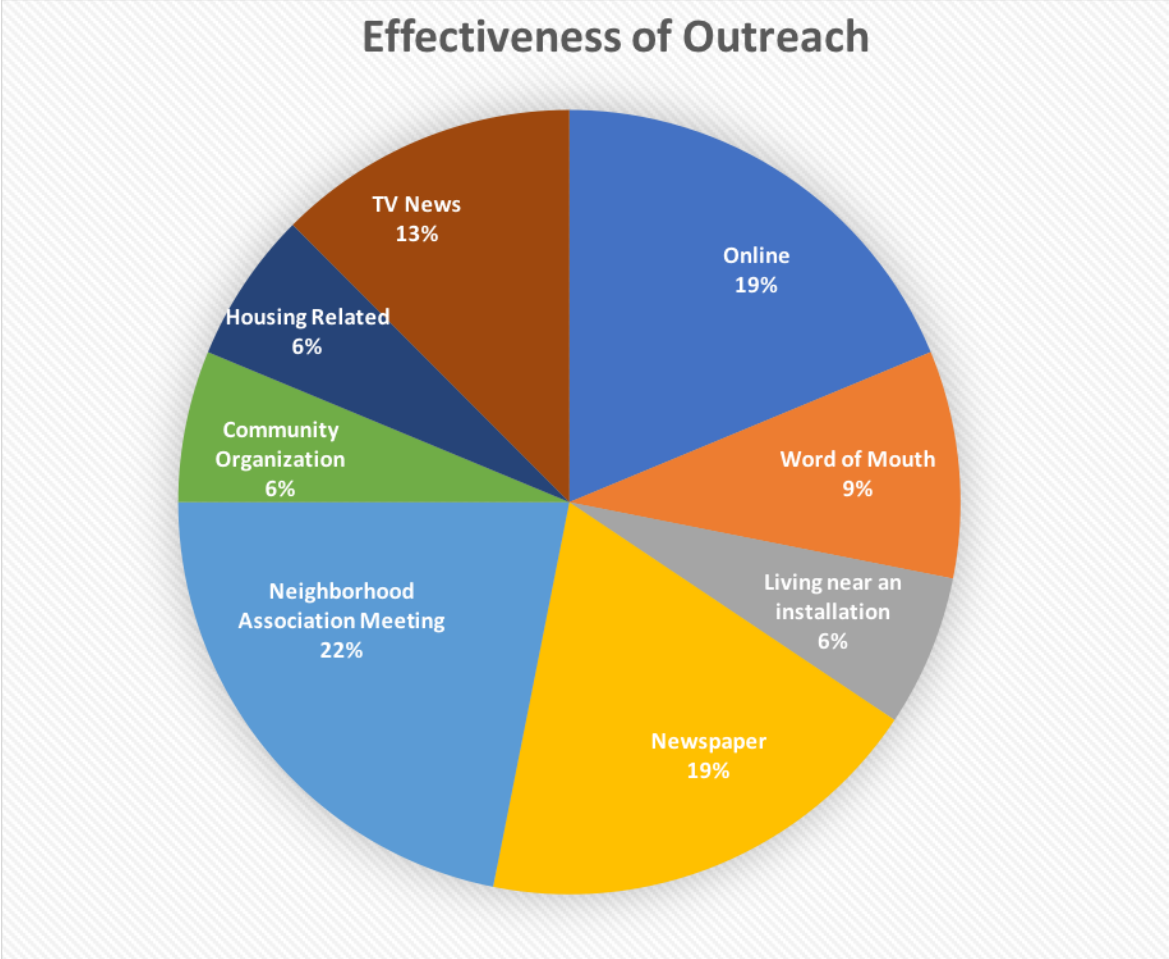


Chart 6.8: The types and effectiveness of each outreach method is tracked and highlighted above. Source: Reid, 2019

The majority of survey respondents heard about the Gentilly Resilience District at a Neighborhood Association Meeting, 22% of respondents cited this source. Obtaining information from online sources as well as newspapers were reported at 19%, the second-most-common source. Watching news on television provided 13% of respondents knowledge of the GRD, with communication from a family member, neighbor or friend providing information to 9% of survey-takers. Lastly, only 6% of survey-takers found out about the GRD by living near the site of a current or future installation, through a community organization, or by being informed from a real estate agent or through other housing-related methods.

Though 56% of residents said that they knew what the Gentilly Resilience District was, the overwhelming majority of residents had not participated in any aspect of the planning or outreach events meant to include their perspective. Yet during the course of this research, there were five participatory planning or outreach events that were either meant to deepen residents understanding of the GRD or include their wishes and ideas in the projects. I conducted participant observation during two of these planning events; a film screening and presentation, and one neighborhood meeting in which a representative of the GRD came to speak with the residents of Gentilly Terrace. There were 23 residents and 41 residents respectively at each of the meetings. Some of these residents participated in the survey or an interview, while most did not.

In all there were eight participatory planning or outreach events that took place between May 2018 to March 2019. While some were GRD-wide, most were for individual projects such as the St. Anthony Green Streets. These events have been announced via a city email list-serve, Facebook events, the "ResilienceNOLA" Twitter handle and via an Instagram account by the same name, run by the ORS. As Natalie Manning, the Community Engagement Specialist of the New Orleans' Office of Resilience and Sustainability notes, engagement "will look different based on our community partners for each project… a lot of this is getting the message out…to reach the masses. So there will be lots of social media outreach, and a lot of those project specific activities. That will be on-going through every phase until 2022" (N. Manning, personal communication, August 2, 2018).

The results of this study show that 7.6% of the respondents participated in either an outreach or planning event. The study also shows that 92.4% of residents did not participate in a planning event or attend an outreach meeting. Out of the 7.6% of respondents who participated

in a GRD event, the types of participation are recorded in the pie chart below. In Table 6.4 below, the qualitative results of their experiences with these occurrences are displayed.

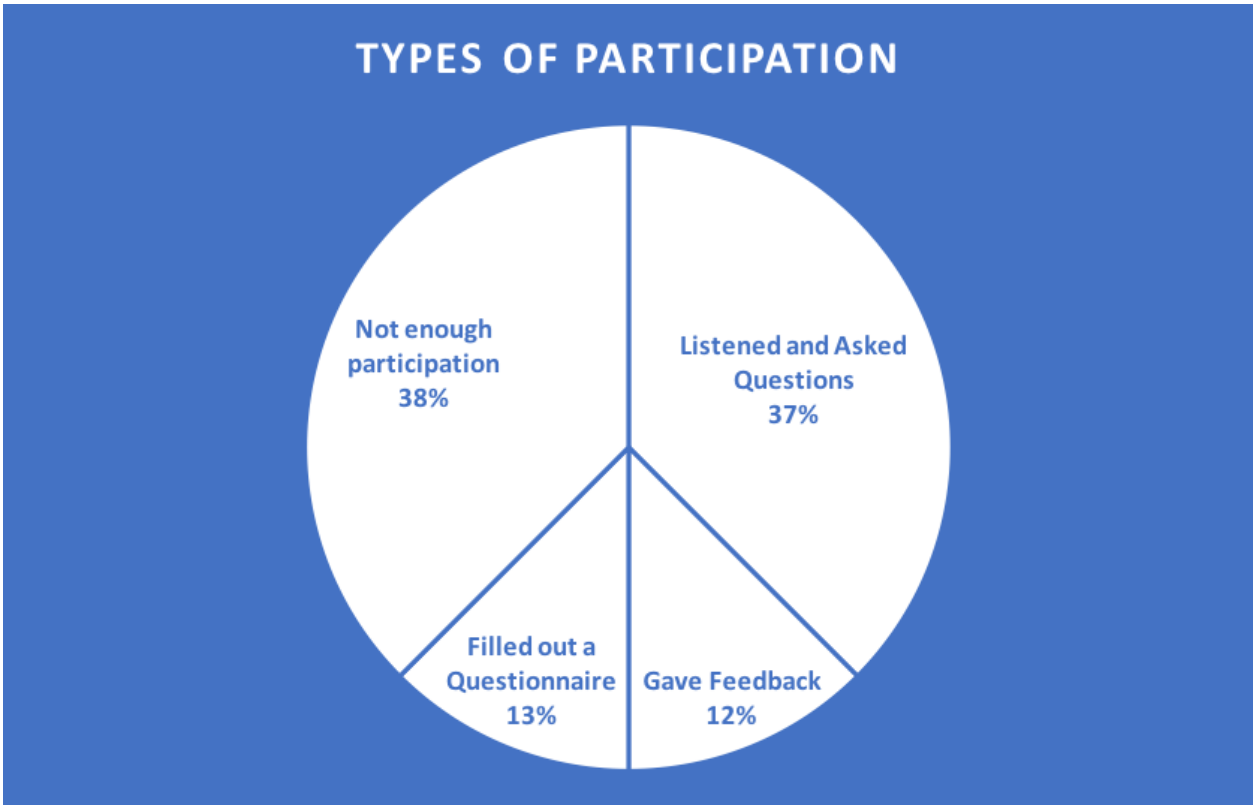


Chart 6.9: The types of participation included those who expressed there was not enough participation. Source: Reid, 2019

Positive Aspects of the Event	Negative Aspects of the Event
"The hope."	"Multiple neighbors and myself could not apply for water management funding because our household incomes were too high."
"Not involved in planning but my home had a rain garden installed."	"There really weren't any meetings for people that work in service industry/late hours."
"Informed, concerned."	"I don't know if I had any say in the project, really. I've been telling my family about it as an unmitigated good."
"I am excited about the water garden happening in Paris Oaks."	"Living between MS and LA prevented me from hearing about this and so could not participate in the planning stages."
"Opportunity for input."	"No up-to-date progress on the status at the present time."
"Just getting started."	"Location of the meetings."
	"Campus tore up."
	"Need to see the project get started."
	"Not enough home-owners involved."

Table 6.5: Respondents were asked to share how they viewed the GRD outreach event or process in general. Source: Reid, 2019

Who Participated in GRD Planning and Why?

Overall, the most effective means of reaching residents was for the representatives of the Office of Resilience and Sustainability and the Gentilly Resilience District to present at a neighborhood meeting. This data shows us that those residents who attend neighborhood meetings are informed of the neighborhood happenings and are also able to participate in the events. Out of the 7.6% of residents who participated in a GRD outreach event, 50% of them found out about the outreach or engagement event through a neighborhood meeting.

All of the residents who participated in an outreach event either self-identified as Creole or Black, which for this study and due to a small sample size is quantified as 100% of participating residents are Black. Men made up 25% of those participating in the events, and women made up 75% of those participating in events. All of the participating residents were ages 65 or over and owned their homes, and had lived in their home for an average of 33.25 years. These participating residents had all been born in Louisiana, with 50% being born in New Orleans, Louisiana. The survey asks where residents moved from, and while they had all lived in this neighborhood for multiple decades, 75% of the participating residents had moved from the Uptown/Broadmoor area. They all lived between the Filmore and St. Bernard neighborhoods, in a smaller residential area informally called Bayou Vista, Oak Park, or Paris Oaks. Harrison Avenue borders this area to the south, Paris Avenue to the east, Mirabeau Avenue or Filmore Avenue to the north (data results differ), and St. Bernard Avenue to the west. Notably, this area is home to the future site of the Mirabeau Water Gardens, which was analyzed as a source of environmental gentrification previously in this chapter.

One participant noted that they felt "informed yet concerned," which presents the duality of adding an environmental good to a neighborhood. This same individual said that there were

"not enough home-owners involved" and that they were "worried about gentrification, and (having) no laws regarding short-term rentals and leasing." The survey asks if the respondent would ever move out of New Orleans, and for what reason. The same respondent says that they would move "due to an increase in taxes and home-owners insurance." Out of the residents that participated in events, another respondent wrote that an increase in the "the cost of living" would cause her to move.

I also assessed neighborhood connectivity and if that was a factor in increased participation for residents, meaning, if those who participated in an event have family living in Gentilly or New Orleans, and how well they knew their neighbors if at all. Of those who participated in an outreach event, 100% knew their neighbors. The responses varied between "pretty well," "very well," "some of them, planning a meet and greet," and "yes, been neighbors for YEARS." These results indicates that the residents who have participated in an outreach or engagement event were those who knew their neighbors well, and if they did not, were already engaged in planning an event in order to build community connections. Seventy-five percent of participants had family in New Orleans, and fifty percent had family who also lived in Gentilly.

When asked if they had seen the neighborhood change, 100% of those who participated in a GRD outreach event said that they had. They named the following ways amongst other responses; "the neighborhood has become more diverse," "younger people are moving in," and "more new homes are being built". When asked what change they would like to see in their community they responded "more affluent Black people," "implement more green space between homes, and have a working vibrant neighborhood association that encourages monthly cleanups." Those who have participated in outreach events have said they would like the "ambience," "friendliness of neighbors," and the "quiet neighbors and well-kept landscape" to

stay the same in their neighborhood. None of the respondents named climate change as a present concern, though 50% named flooding as a concern, and 50% named gentrification as a concern. When asked about concerns for the future, 100% of the GRD event participants named climate change, and 50% named gentrification and relocation.

While there are other survey results that continue to illuminate the trend of Gentilly residents understanding the change in neighborhoods, the following data analysis will look at movement tendencies for Gentilly residents. The survey asked residents of Gentilly to name where they were born, where they had most recently moved from, and where they would move if they had to leave. This exercise in understanding displacement helps illuminate ideas of other neighborhoods in New Orleans which had already faced geographic displacement and gentrification, and named locations where survey participants had come from where they would move. The following charts, summarized by race and neighborhood, show where residents had moved from, and where they were born. While 51% of the total sample were born in New Orleans, this analysis shows that by race, 38% of White residents were born in New Orleans, and 62% of non-White residents were born in New Orleans. The following charts show various patterns of residential migration, both within and outside of New Orleans.

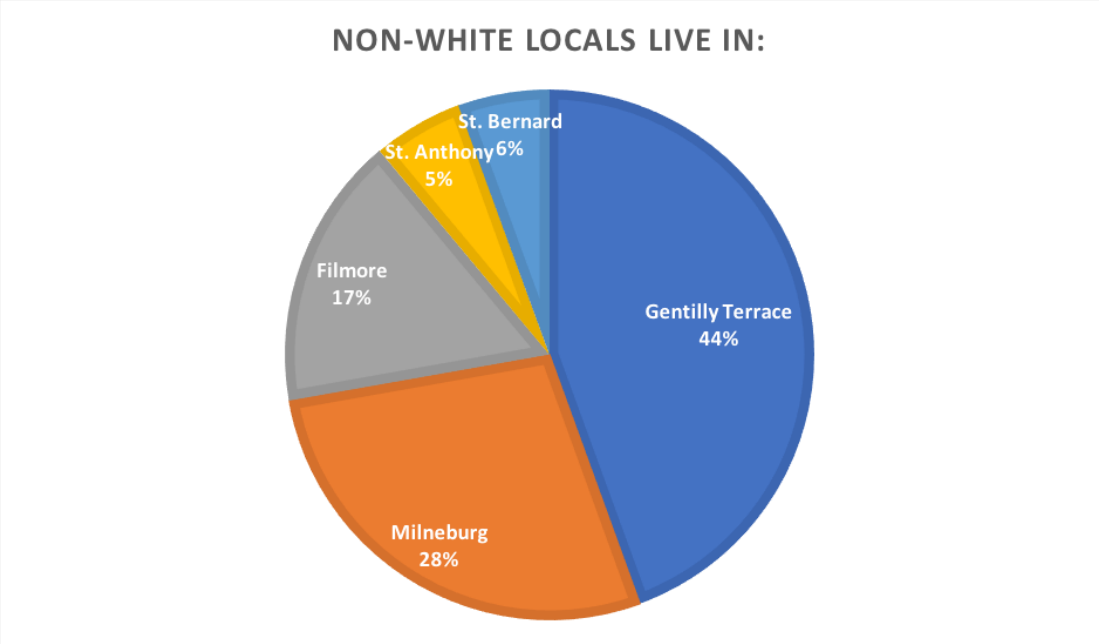


Chart 6.10: Shows that a majority of Non-White residents live in Gentilly Terrace and Milneburg from the survey.

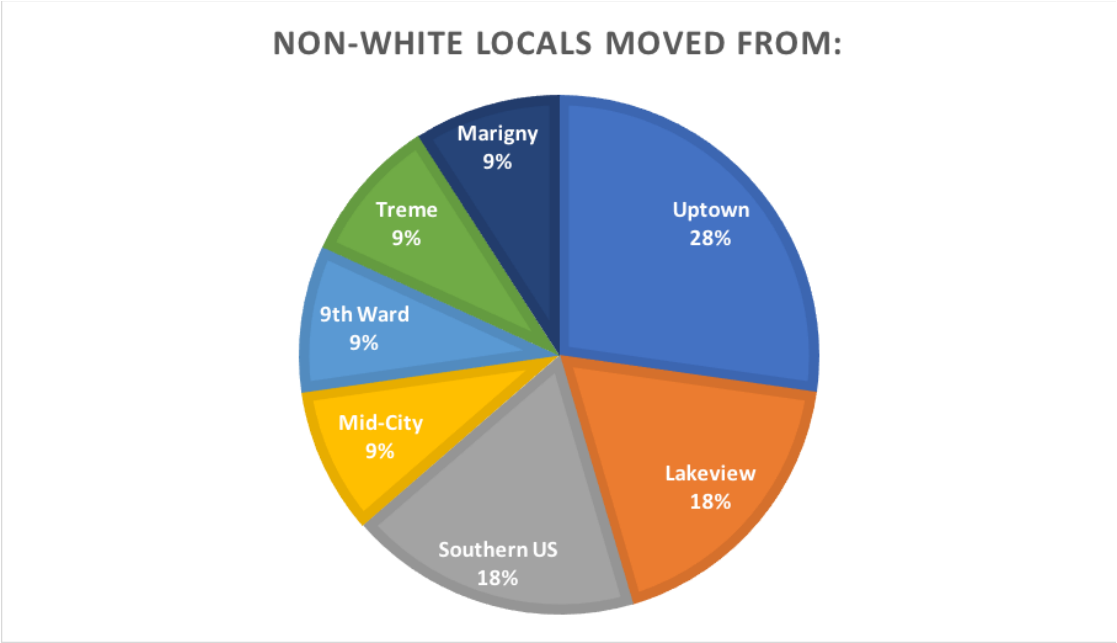


Chart 6.11: Shows that many non-White locals in Gentilly moved from other neighborhoods before settling in their current location.

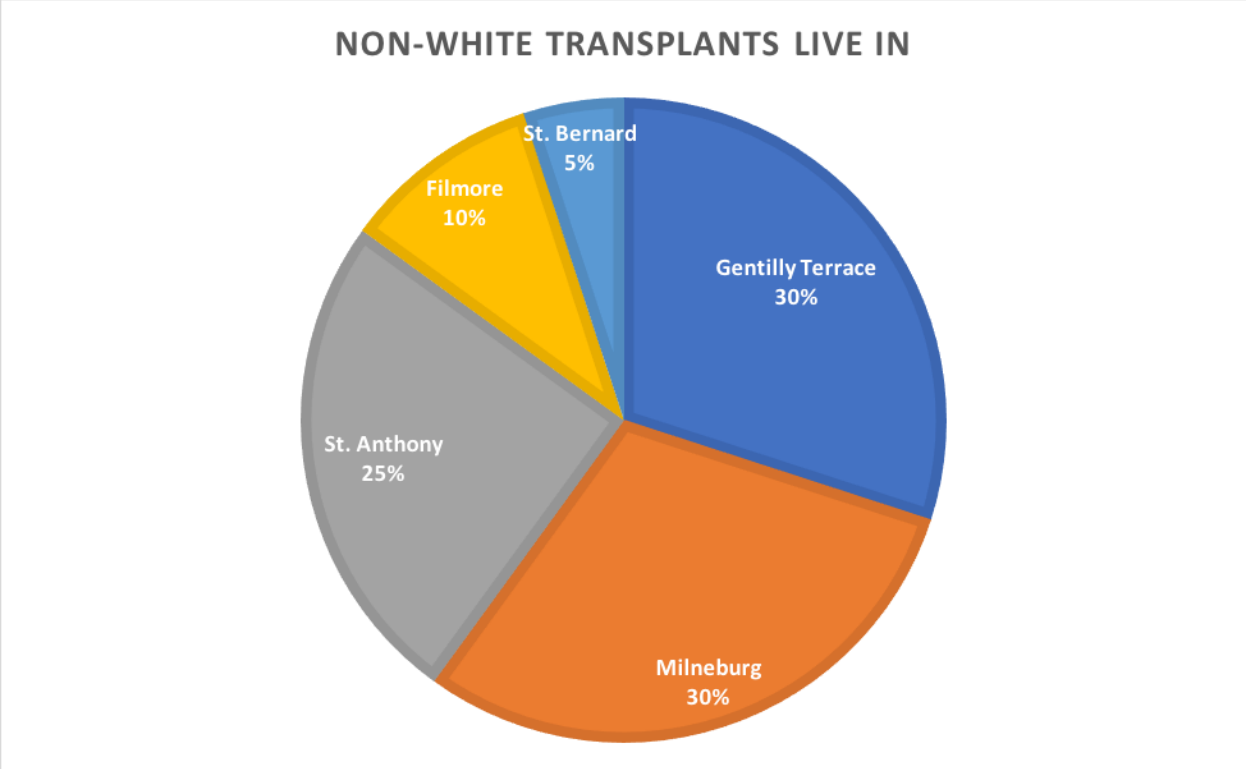


Chart 6.12: Shows that residents who are non-White and moved from somewhere else primarily settled in Milneburg, Gentilly Terrace and St. Anthony.

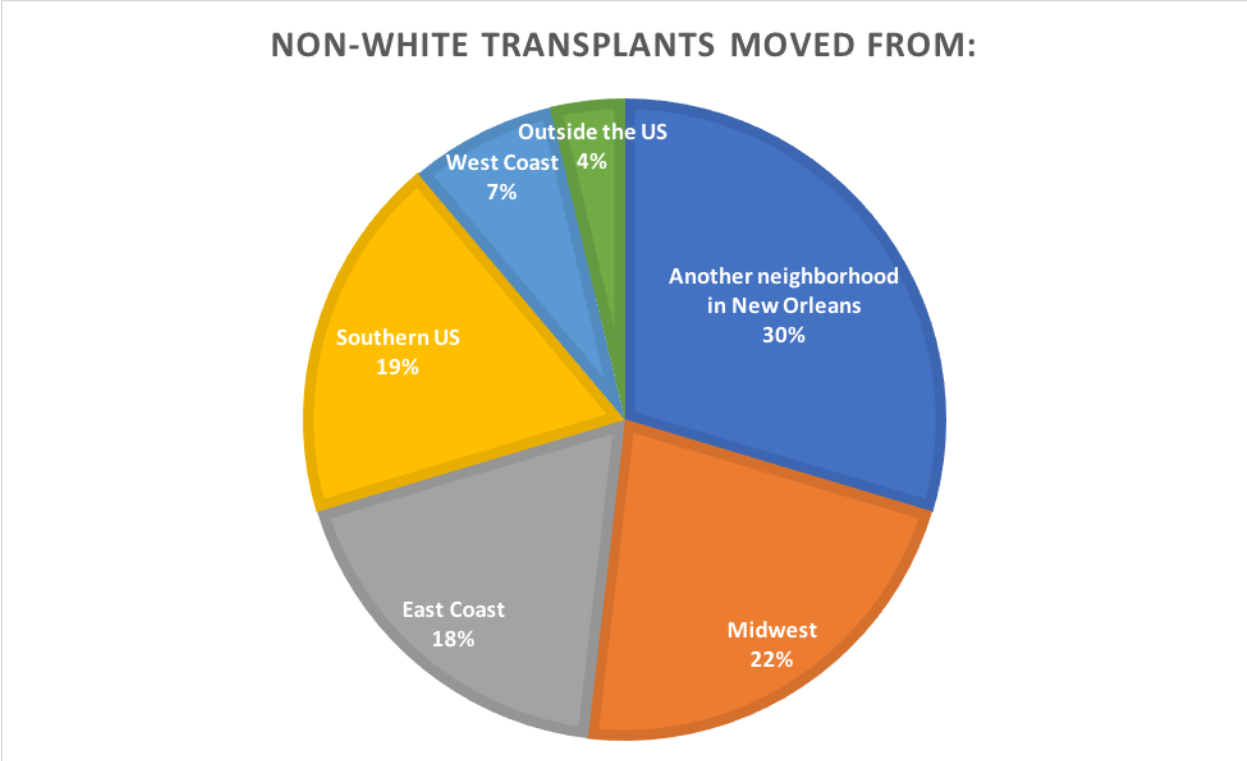


Chart 6.13: Shows that most non-White transplants lived in another neighborhood in New Orleans before moving to Gentilly.

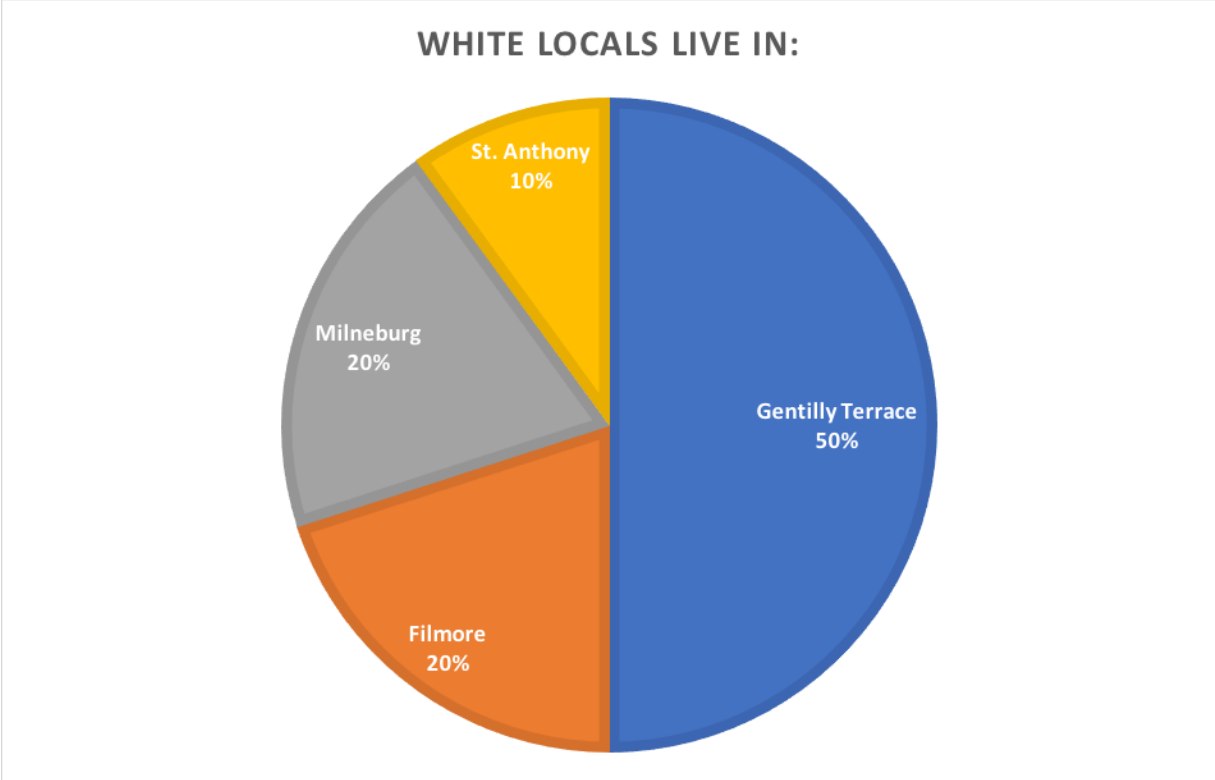


Chart 6.14: Shows that a majority of White locals live in Gentilly Terrace.

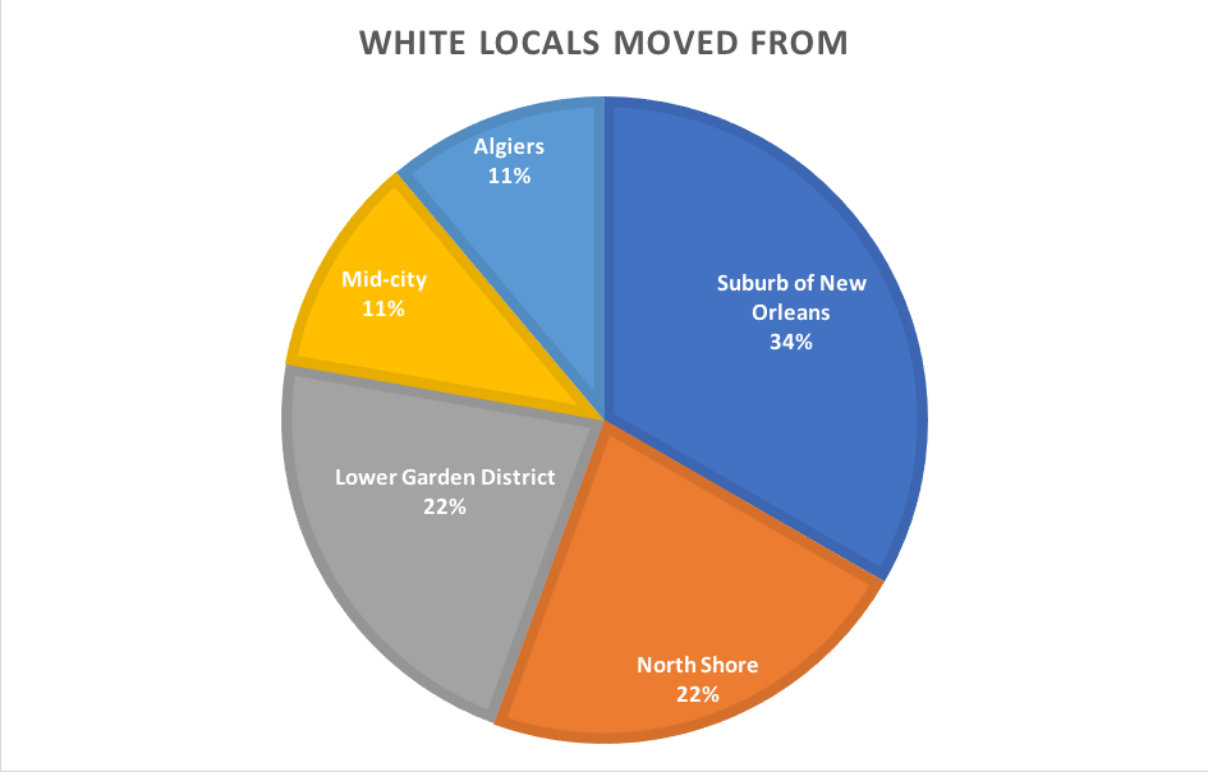


Chart 6.15: White locals moved from suburbs or other neighborhood within the city.

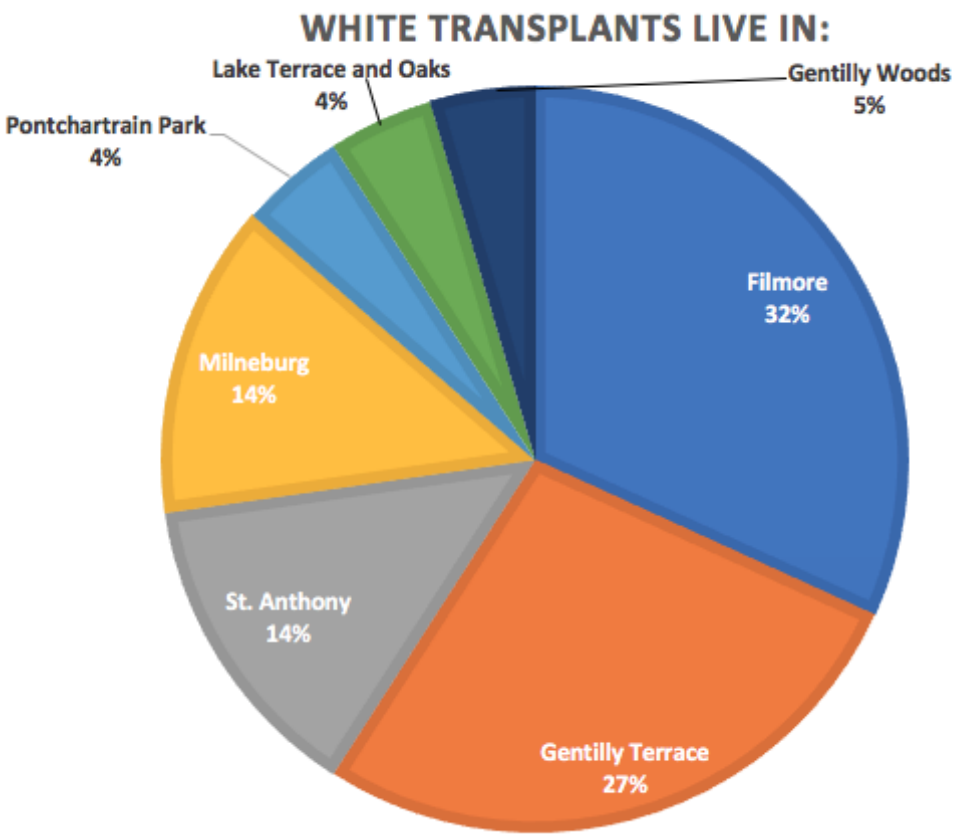


Chart 6.16: A majority of White transplants live in Filmore.

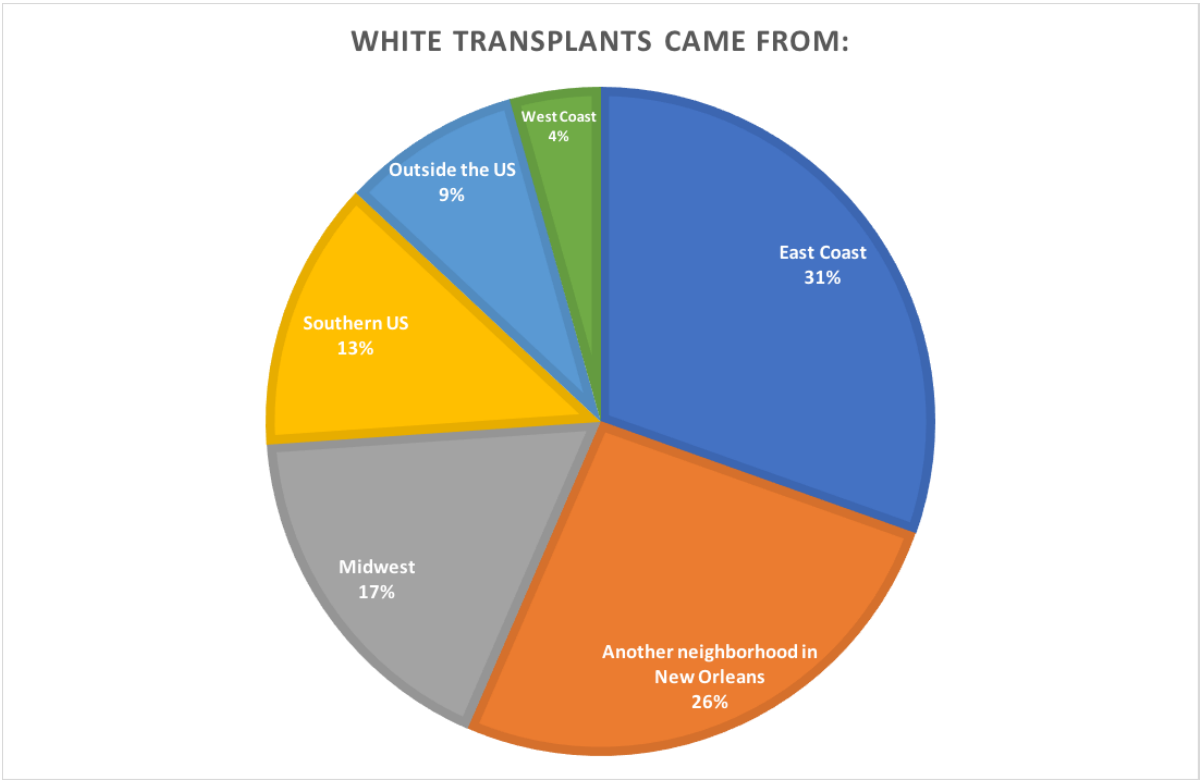


Chart 6.17: A majority of White transplants came from the East Coast and lived in another New Orleans' neighborhood before Gentilly.

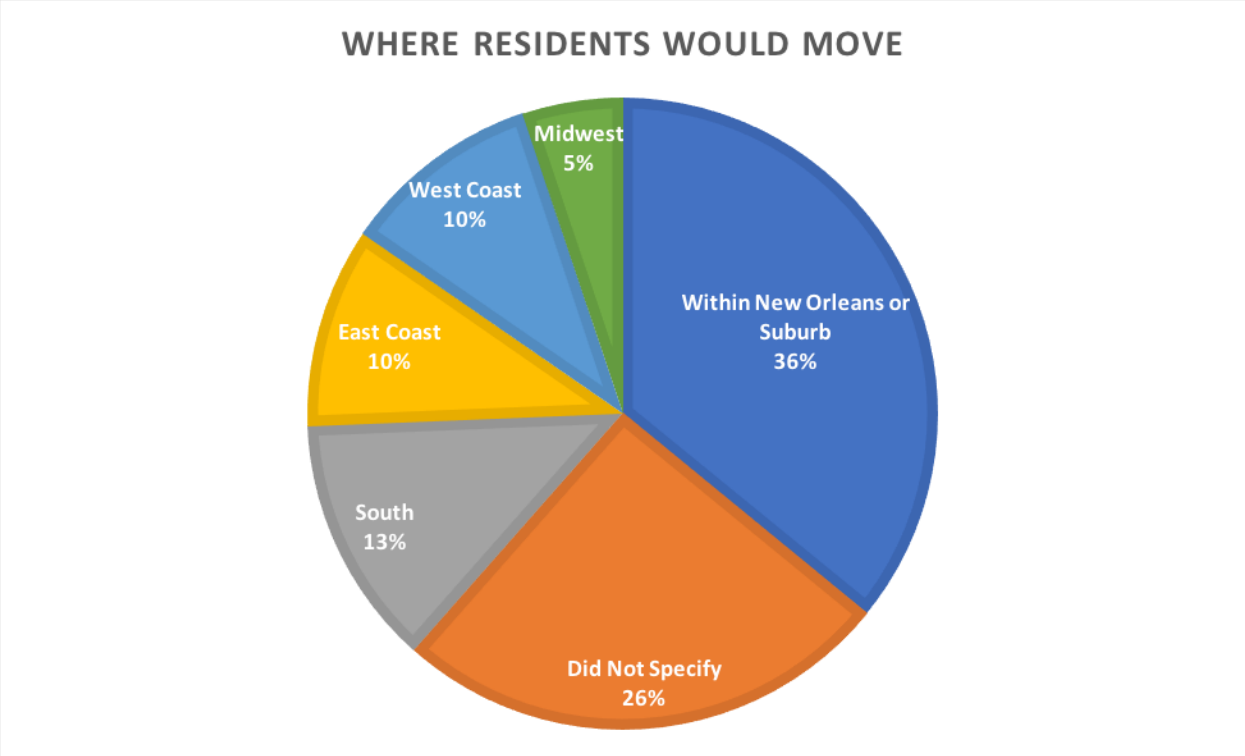


Chart 6.18: Out of those who say they would move, a majority would still like to live in New Orleans or close by.

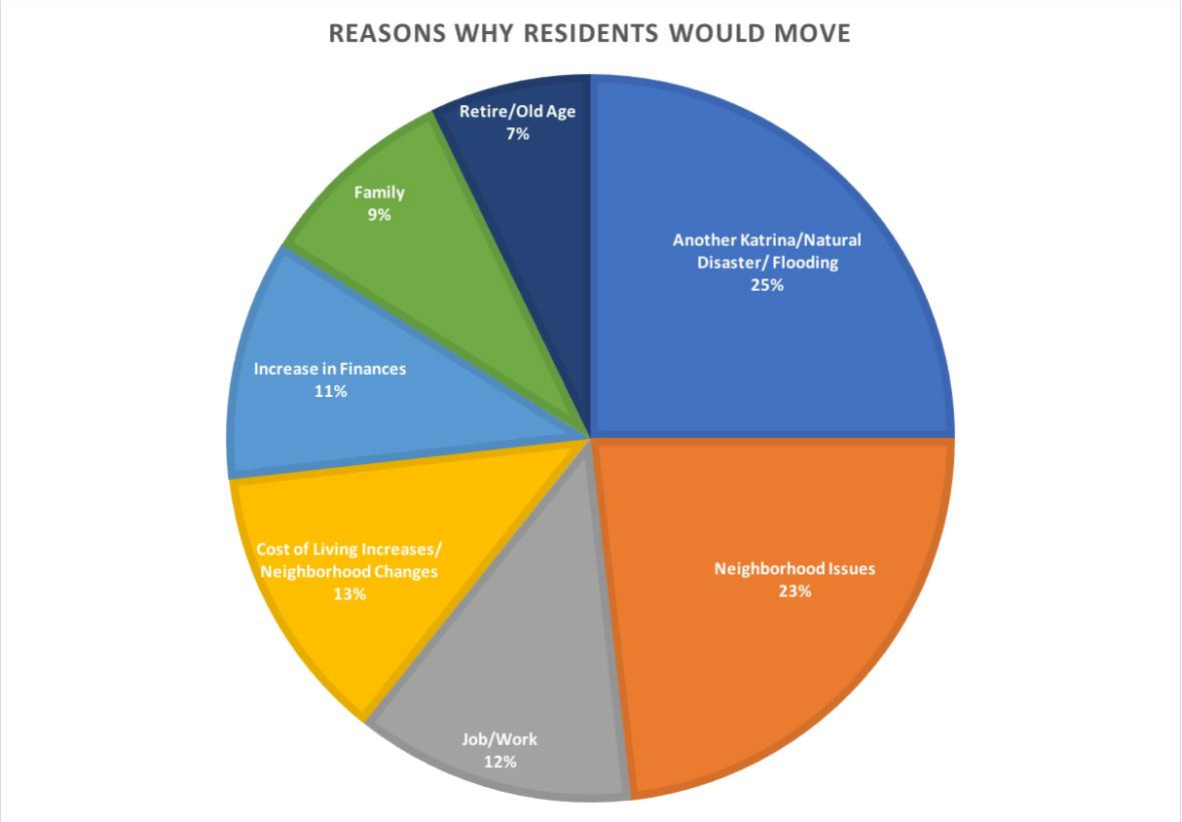


Chart 6.19: A majority of Gentilly residents would move due to environmental issues, which can also be seen as the effects of climate change; "Another Katrina", Natural Disaster, or Flooding. Thirteen percent of residents would move due to an increase in the cost of living.

Discussion and Limitations

The following section will discuss the answers to the thesis questions in numbered order, beginning with the quantitative data analysis. For each question discussed there will be an acknowledgement of limitations before the summary of findings and further research recommendations is presented in Chapter 7. In order to answer how existing green amenities such as parks and green space in Gentilly effect property value, a geospatial analysis was performed for two existing green spaces that were used as either a water management system or a park. These two sites, Rome Park and Wildair Rain Garden were examined in order to see if they impacted the median home values of homes bordering the site. The data showed that they did increase the property value over time, almost twenty percent more than the median home value for neighborhood overall. The proposed sites of the Gentilly Resilience District that were analyzed were the Milne Campus and the Mirabeau Water Garden. These sites similarly impacted the surrounding property value by site and neighborhood.

The data concluded that overall, the percent increase in median home value from 2016-2019 was 41.5%, with the proposed GRD sites having a higher increase than the existing sites. While a direct comparison can be made between the host neighborhood data, presented in section one of this chapter, and the green amenities perimeter housing data, there are certainly many other factors that can influence these factors. One large limitation in this study is that all houses on the perimeter of each site with available data points were included. This means that houses of different square footage were compared against each other, thus the home values were not standardized. The decision to collect all available data was made because the data sample was already very small. This brings up another limitation about the number of green spaces that were analyzed and the method. Most environmental gentrification studies have analyzed demographic

change over time in relation to different radius around either an environmental good or an environmental bad. The data for this level was not available in Gentilly, and most importantly, the assessment of future GRD sites is only possible once they are constructed and completed. The thesis was able to supplement this limitation by providing qualitative results and survey data and examining the aspects of procedural justice and collaborative planning as an element of environmental gentrification that has not been widely examined in the literature at the time of this research.

This leads to the analysis of the second question, which has relied on historical analysis, interview data, and survey data. The question of how the resilience planning of the GRD embodies or disregards the concept of procedural justice was answered through both historical media analysis and interviews with residents and resilience professionals. In Chapter 4, the history of the Gentilly Resilience District and its earliest beginnings, as well as the community's perception of the project, were analyzed through media articles. It is clear that while the resilience professionals are intent on providing opportunities for community input, there are still ways in which community members have felt ignored and were left unable to engage. The Gentilly Messenger newspaper interviewed Gentilly resident Helen Howard, who has lived in Gentilly Terrace for 46 years and said "I'm an involved person, we as individual neighborhoods and individuals want to maintain our voices, we want to represent ourselves" (Baum, 2018, pg. 1). The level of engagement, as shown in the results of this section, are very low, with only 7.2% of those interviewed ever participating in an outreach event.

Through a historical perspective, the results have shown that there are trepidations around planning for community members instead of planning with community members. As mentioned in Chapter 2, the technocratic approach to neoliberal environmental sustainability oftentimes

does not include residents perspectives and instead imposes top-down planning techniques. The post-Katrina landscape has left many New Orleans' residents, especially those who are lower-income and people of color, hesitant to trust outside interests or even city officials (Holtzman, 2016). While many of the staff of the GRD are native to New Orleans, there is concern around the process of inclusion and input from the very beginning (personal communication with anonymous interviewee, July 5, 2018). In Chapter 4, a detailed description of the Dutch Dialogues in 2010 and the earliest beginnings of the application for Hazard Mitigation Grant Program in 2014 was presented. In 2016, an article with the title "How New Orleans' plans to fight sinking left its own residents out" was published on TheGroundTruthProject.com. This article lays out concerns from community leaders and sites a study (Keys, 2014) which suggests that policymakers will benefit from enabling public engagement around climate issues that will directly impact the community.

While it can be argued that when writing an application for grant funding city officials may be reluctant to include input from residents for fear that the grant application may not be successful. This still doesn't answer the question about why input had been collected from experts living in Holland, and not residents from Gentilly. These public-private partnerships, which include funding from federal government and hiring of private firms to carry out the project, can be exclusive of community participation. In the aforementioned article Reverend Lionel Davis, who lives in the St. Bernard Area, says "If the government is going to bring confidence to the communities, then the conversation must be inclusive with the community. If not, they'll be speaking for us without ever speaking to us. That is where the folks in Gentilly are upset" (Holtzman, 2016, pg. 1). While the outreach events are also required through the grant, there is concern even from city officials that these engagement opportunities are not being

carried out properly (personal communication, July 5, 2018). Interviews with resilience professionals also show that an attempt to include residents voices has been made. Based on residents responses to the survey and interview questions, there is an understanding that these attempts may feel like "too little too late" for Gentilly community members. In the literature review presented in Chapter 2, the disability justice research and phrase is certainly applicable to the concept of procedural justice in resilience planning, it reads; "nothing about us without us" (Charlton, 2000, p. 1), and is echoingly similar to quotations provided through media, interview, and survey data.

While the research was conclusive on what methods of outreach and community engagement were most effective in increasing residents' participation in resilience planning, the connection between lack of procedural justice and perceptions of environmental gentrification remains inconclusive. Due to a small data pool, and the timing of data collection, there were only a small percentage of residents who participated in the both the outreach events and the research survey. The qualitative responses should not be dismissed though, and through collecting residents' perspectives and opinions on how Gentilly is changing, a deeper base of knowledge is provided. With quotations suggesting residents perception of the neighborhood becoming Whiter, younger and more expensive, there is certainly an acknowledgement of the potential threat of gentrification. There were also twenty-three percent of respondents who understood that the impacts of climate change ("Another Katrina," "Natural Disaster," or "Flooding") could be a potential source of displacement, or reason to move. Thirteen percent of residents would move due to an increased cost of living. While these results do not conclusively link the two elements, residents perceptions of change and gentrification were represented. Future recommendations suggest that continued research on the Gentilly Research District and environmental

gentrification would be able to study the hypothesis that green infrastructure will be a catalyst for demographic change and an increase in housing value, and include residents voice.

One major trend to expand upon is the role of the Mirabeau Water Gardens and Filmore residents participation. The Mirabeau Water Garden is mentioned 27 times in local media sources between 2016 and today, thus it has one of the largest public acknowledgement and has been shown to be a link between resident participation and green gentrification. One hundred percent of those who participated in an outreach event live within the neighborhood which will host the Mirabeau Water Garden. This area also has the largest increase in median home value between the years of 2016 and the 2019 forecast. It is also used three times as a selling point for real estate companies, as recorded in section two of this chapter. The Mirabeau Water Garden foreshadows the potential trends within the GRD projects and sites. There was both an increase in median home value and resident participation around this site. There were also residential concerns about neighborhood change, gentrification, and climate change collected from those who participated in the outreach who live near this green infrastructure project.

Other limitations include the analysis of gentrification scores per neighborhood. It is suggested that this method be refined for future research analysis, with an inclusion of historical context of each sub-neighborhood of Gentilly. While these scores showed a trend towards gentrification in a majority of the neighborhoods, a geospatial longitudinal analysis would continue to refine the results. Table 6.3 shows the average household income for each neighborhood and for Gentilly overall in 2016, yet in future research, this point of data could be expanded upon and included in the gentrification score. While the literature review speaks to race and capitalism in the US, a deeper analysis per neighborhood on these subjects would also benefit this research going forward.

Further limitations include difficulties with evenness in data collection per sub-neighborhood. The Gentilly Terrace Neighborhood Association was well-organized and publicized their monthly meetings, thus there was an increase in participation in the survey questionnaire from residents in this neighborhood. Difficulty in data collection from all neighborhoods within Gentilly speaks to the short timeframe (four months) in which the data collection took place. Further recommendations include collecting data for over a year, using critical participatory action research methods that draw on the fields of anthropology and human geography. This will increase accuracy and better represent perspectives from all neighborhoods and residents.

CHAPTER 7: Conclusion and Recommendations

The purpose of this study was to determine if existing green amenities such as parks and green space in Gentilly effect median home value and if the new sites of the Gentilly Resilience District would impact property value similarly or differently. Through this research it was shown that the median home value has increased significantly (almost twenty percent) more for those homes neighboring green spaces than the median home value for the neighborhood overall. There was also a similar impact for the new green infrastructure that will be implemented by 2022, according to the GRD timeline. This study also answered how the resilience planning of The Gentilly Resilience District attempted to include input from residents, but many felt their perspective had been disregarded along the way, or they had not come into contact with the project in any way. The lack of inclusivity and procedural justice impacted the residents' perceptions of gentrification and neighborhood change. There is a correlation between the ongoing historical processes that have made it difficult for underrepresented residents of New Orleans to decide their own future, and the future of their city. Lastly, this study determined that various methods of outreach and community engagement were most effective in increasing residents' participation in resilience planning. In person engagement events such as attending and presenting at neighborhood meetings, and reading about the GRD online and via newspaper media increased participation and engagement for Gentilly residents who participated in the resilience planning.

This research allowed for a historical perspective and qualitative results to highlight the inequities and concerns that residents had about the process of community engagement in the planning of the GRD. Setbacks to this research include the timing and the location of the researcher to attend every outreach and engagement event that the GRD and ORS staff held

between 2017-2019. It must be understood that this research was conducted during the summer of 2018, in the earliest stages of the outreach for specific projects hosted by GRD staff. It is also important to note that during interviews with city officials and planners that there were attempts to address the inclusivity of the process and creative efforts were being used to increase participation. As with any research, further survey and interview data would be beneficial for future planning projects in order to continue to track which types of outreach increased participation for community members.

Policy recommendations must be made in order to slow environmental gentrification in Gentilly and in other coastal cities that are facing the current and ongoing effects of climate gentrification. There is oversight in the FEMA and HUD grant applications for resilience planning when there is no mention of affordable housing or increased economic potential for local residents alongside green infrastructure implementation mandates. There is also the potential for mistrust in these processes if resilience professionals do not examine how past mistakes in environmental planning can impact future projects. Local leaders and activists from the community must be included in the earliest steps of any planning process. In New Orleans specifically this looks like forming partnerships where they have been lacking historically. Anti-gentrification groups such as Blights Out, an artist and activist architecture collective lead by Black New Orleanians should be included in decision making procedures. Janes Place Neighborhood Sustainability Initiative (JPNSI) is a Community Land Trust (CLT) and housing rights organization committed to creating sustainable, democratic, and economically just neighborhoods and communities in New Orleans. For nearly 10 years JPNSI has worked to increase the range of affordable housing options available to low and moderate income residents and advocating for housing justice across the city.

The CLT model is an increasingly popular tool to protect low- and moderate-income residents against displacement due to the rising cost of living in their neighborhoods. JPNSI purchases and holds land in perpetuity, and leases or sells homes on the land to residents at an affordable rate. CLT housing is permanently affordable, protecting the public investment and recycling the subsidy for generations of residents and families. In addition to developing permanently affordable housing, JPNSI is a strong advocate for the rights of renters and low-income homeowners in New Orleans.

While JPNSI has historically worked in Mid-City to form the city's first CLT, the organization is active in fighting short-term rentals (such as Airbnb) across the city, including within Gentilly. In their report *Short-Term Rentals, Long-Term Impacts: The Corrosion of Housing Access and Affordability in New Orleans* (March, 2019) they identify policy changes and calls to action for the tourism industry, local residents, and housing rights advocates and providers. The policy recommendations include; requiring permits for short-term rental platforms, streamline the data-sharing process across platforms, and expanding support for affordable housing. These policy recommendations can be transformed and applied to green infrastructure projects, with obvious modification.

First, a call to expand support for affordable housing must come alongside any flood resistant or stormwater management plan. If the people of New Orleans are to withstand another infrastructure collapse such as that after Hurricane Katrina, they must first have a home in which to live in and create community. Second, the grant application process and relevant data must also be streamlined across platforms and incorporate resident voice before securing the funding. Once again, without residents being front and center in planning for the future survival of New Orleans, those who are most vulnerable could face the worst consequences of another

catastrophe. There must also be a call to action for environmental and city planners as well as the myriad of resilience professionals involved in the implementation of green infrastructure projects. This call can also apply to scholar-activists, urban environmentalists, and residents moving to a new neighborhood. First, center the voice of those that live in the community that is changing. Second, support community connectivity and strong neighborhood organizations and associations that are inclusive and diverse. These organizations are able to amplify residents voices, decrease vulnerability to the effects of climate change, and create awareness of issues that are facing coastal communities, such as environmental gentrification. Third, push for more community land trusts across the nation that ensure affordable quality housing to renters and home-owners alike, and make environmental and resilience planning truly intersectional in its approach.

Future recommendations for related research include expanding upon the results around neighborhood connectivity and engagement. More research should be done to understand the relationship between concerns about the effects of climate change and residential engagement in resilience planning as well. For environmental gentrification studies with a longer timeframe for data collection, Critical Participatory Action Research (CPAR) or Community-Based Participatory Action Research (CBPAR) methods should be incorporated in the geo- and temporospatial analyses. In the Holtzman (2016) article Keith Twitchell, president of the Committee for a Better New Orleans, a local nonprofit that promotes citizen engagement across the city says, "in a perfect world, as soon as the city decided to apply for this [grant], they would have gone out and gone to the neighborhood association meetings in Gentilly and said, 'This is what we're thinking about, here's some ideas were throwing out, let me know what y'all think.'"

Reverend Davis adds "We listen to leaders saying, 'This is a lot of money to help the Gentilly area but with this project, you don't need to know what it is, just trust that we know'" (p. 1).

Another Gentilly resident, Gretchen Bradford explains, "suppose all these projects don't work, and we're more flooded, we don't know" (p. 1). Twitchell recommends a "citizen participation program" which would facilitate a permanent feedback structure for citizen engagement. This proposal has been in the works since 2010, as he believes that there must be "much higher levels of community engagement and …something in place to sustain it" (p. 1).

"I hope we'll end up, a few years from now, looking back at these projects and say, 'Wow, this was great, this was transformational.' But it still needs to be done the right way, which is in true partnership with the community, not by saying 'Here's what we're going to do for you,' partnership is saying let's do this together" (Twitchell, p. 1). This spirit of collaborative, community-driven, and procedurally-just planning is not a sentiment felt by a few. It is clear from this research that the resilience planning engagement levels must continue to rise in order to truly be inclusive and just. More research must be done in order to understand how the GRD will continue to impact median home values and neighborhood demographics in the future. Using the mixed-method data analysis, environmental gentrification studies will continue to evolve, and should try and center residents voices in the research approach as much as possible. As coastal cities continue to feel the effects from climate change (rising sea levels, and increase in frequency and intensity of storms), equitable climate adaption must include procedural justice at the earliest stages. Resilience planning must also incorporate housing justice advocates and affordability plans into their efforts, and acknowledge that green infrastructure projects must equitably protect residents from climate changes' impacts, not just those who can afford the rising cost of living.

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APPENDIX A:

Survey Questionnaire

What is your name and email? (Required only for Gift Card Raffle Entry)

Your answer

What gender do you identify as?

Your answer

What race do you identify as?

Your answer

What age group do you fall into?

- ○ 0-9
- ○ 10-19
- ○ 20-29
- ○ 30-39
- ○ 40-49
- ○ 50-59
- ○ 60-69
- ○ 70-79
- ○ 80-89
- ○ 90+
- ○ Prefer Not to Say

How long have you lived in your current home?

- ◯ Less than a Year
- ◯ Between a year and 3 years
- ◯ Between 3 and 5 years
- ◯ Between 5 and 8 years
- ◯ Between 8 and 10 years
- ◯ Between 10 and 15 years
- ◯ Between 15 and 20 years
- ◯ Over 20 years
- ◯ Over 30 years
- ◯ Over 40 years

Are you renting or do you own the property?

- ◯ Rent
- ◯ Own

How many years have you lived in Gentilly?

Your answer

In which Gentilly neighborhood do you reside?

Your answer

Where were you born?

Your answer

If you moved to the Gentilly neighborhood, where did you move directly from?

Your answer

Do you know your neighbors? If yes, how well do you know them?

Your answer

Do you have any family that lives in New Orleans? In Gentilly?

Your answer

If you could change something about your neighborhood what would you change?

Your answer

What are some features about the neighborhood you want to stay the same?

Your answer

Have you seen the neighborhood change? If so, how?

Your answer

Have you noticed subsidence in your neighborhood? Subsidence is the act of sinking or falling land (can be seen most obviously in roads or home foundations).

- ◯ Yes
- ◯ No
- ◯ Maybe

Have you noticed a change in rainfall?

- ◯ Maybe
- ◯ Yes
- ◯ No
- ◯ Other: _____

Have you noticed a change in flooding?

- ◯ Maybe
- ◯ Yes
- ◯ No
- ◯ Other: _____

Has your property or street ever flooded? How many times in the past 13 years?

Your answer

What other changes in weather have you noticed since living in this area?

Your answer

Are you aware of the Gentilly Resilience District? (If not, find out more here: http://www.nola.gov/resilience/resources/fact-sheets/gentilly-factsheet)

- ◯ Yes
- ◯ No
- ◯ Maybe

What is it? How did you hear about it?

Your answer

Were you apart of the planning process? What was it like? What did you do?

Your answer

Please share the most positive aspect about your participation.

Your answer

Please share the most negative part about your participation.

Your answer

Thinking about the present, do you have any concerns about your neighborhood/home/community?

Your answer

Thinking into the future do you have any concerns? (Climate change? Gentrification? Being relocated?)

Your answer

Would you ever move?

- ◯ Yes
- ◯ No
- ◯ Maybe
- ◯ Other:

What would make you move if you were to? Where would you move if you wanted to?

Your answer

Is there anything else you would like to add?

Your answer

Is there anyone else you know who would like to talk to me?

Your answer

How did you hear about this survey?

Your answer

APPENDIX B:

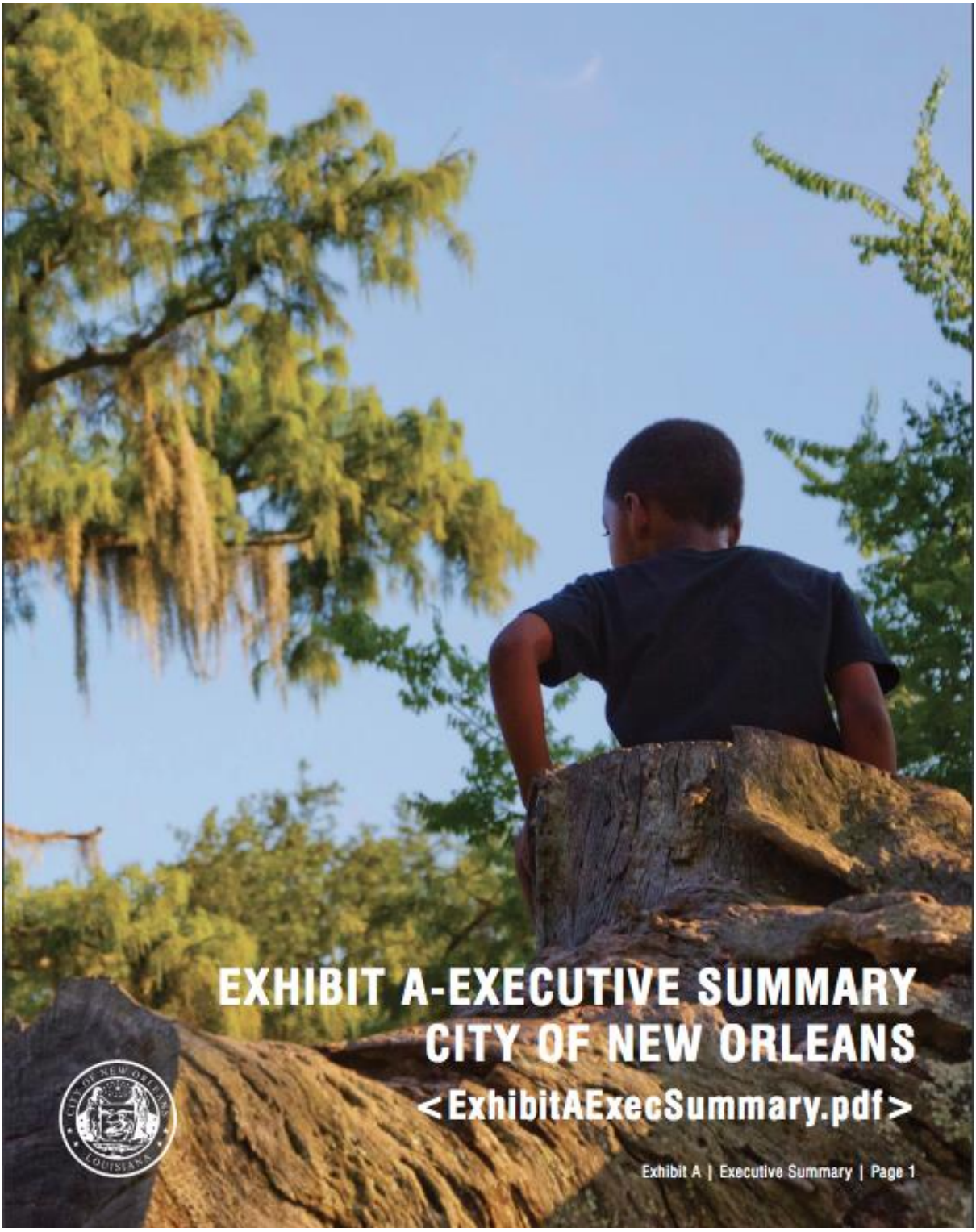


EXHIBIT A-EXECUTIVE SUMMARY
CITY OF NEW ORLEANS
<ExhibitAExecSummary.pdf>
Exhibit A | Executive Summary | Page 1

New Orleans is a coastal city founded on deltaic soils that has provided opportunity for generations of families. The city's location between the Gulf of Mexico and the Mississippi River is of strategic economic and cultural importance to the nation (*Att.EGraphics.pdf*, page 230, http://bit.ly/1k4bqkr).

The identity of the city is defined by water. The city was founded in 1718 because of its site as an accessible portage through marshlands between the Mississippi River and Lake Pontchartrain—an estuary connected to the Gulf of Mexico. New Orleans is still a city of three distinct waterfronts—the river, the lake, and the coastal wetlands that make up a third of the city's land area—and each is essential to the city's economy, ecology, safety, and culture (*Att.EGraphics.pdf*, page 230, http://bit.ly/1k4bqkr).

For the first two centuries of the city's existence, development was constrained to higher elevations, nestled against the river and on the natural ridges that traverse the landscape (*Att.EGraphics.pdf*, pages 232 and 240, http://bit.ly/1k4bqkr). When constructed in the early 20th century, canals and the pumping technology that supported them revolutionized drainage and sanitation in New Orleans and provided a model for the rest of the world (*Att.EGraphics.pdf*, pages 236-238, http://bit.ly/1k4bqkr). This new technology also created newly drained land for development in low-lying former cypress swamps. The pumps and canals that drained the swamps and made possible the postwar American Dream of homeownership for many New Orleanians worked to dry the delta soils underfoot and accelerate subsidence throughout the city (*Att.EGraphics.pdf*, page 241, http://bit.ly/1k4bqkr). This subsidence, the compacting and sinking of soils, is most acute in low-lying neighborhoods and disproportionately impacts low income areas and communities of color (*Att.EGraphics.pdf*, page 246, http://bit.ly/1k4bqkr).

New Orleans shares with the overall region the physical risks of subsidence, coastal flooding, flooding from intense rainfall events (*Att.EGraphics.pdf*, pages 242-243, http://bit.ly/1k4bqkr), and loss of power and damage from high-speed wind events. These shocks are exacerbated by the physical stresses of coastal erosion and sea level rise which compound the risk of coastal storm surge (*Att.EGraphics.pdf*, page 235, http://bit.ly/1k4bqkr). However, New Orleans' resilience needs differ from much of the region in that its social stresses are more extreme. This raises the importance of connecting New Orleans' physical resilience with its social resilience by focusing on how flood risk is a matter of environmental justice and how the economic growth potential of physical adaptation can be a driver for building

income equality and employment opportunity.

Building off of the work of the city's recently released resilience strategy for the city, *Resilient New Orleans: Strategic actions to shape our future city*, as well as a decade of recovery and resilience planning (*Att.EGraphics.pdf*, page 228, http://bit.ly/1k4bqkr), the New Orleans approach is grounded in the belief that the positive transformation of urban social and physical networks is indelibly linked to local geography and history as a delta city. Future outcomes of improved quality of life, economic prosperity, and reduced disaster risk, particularly for vulnerable communities, will be realized through a multi-faceted and integrated approach for *Reshaping the Urban Delta* represented in the following four proposed initiatives:

1. Urban Water – transforming water from a threat into an asset in the public realm; (*Att.EGraphics.pdf*, pages 260-274 and 282-283, http://bit.ly/1k4bqkr)
2. Community Adaptation – adapting private property for stormwater management; (*Att.EGraphics.pdf*, pages 275-276, http://bit.ly/1k4bqkr)
3. Reliable Energy and Smart Systems – enhancing grid reliability and asset monitoring; (*Att.EGraphics.pdf*, pages 277-278, http://bit.ly/1k4bqkr)
4. Coastal Restoration – supporting coastal protection and restoration projects. (*Att.EGraphics.pdf*, pages 279-280, http://bit.ly/1k4bqkr)

The proposed projects begin to adapt the human environment to harmonize with the changing natural environment—transforming those areas of risk into landscapes of opportunity at various scales: region, city, district, and neighborhood (*Att.EGraphics.pdf*, page 229, http://bit.ly/1k4bqkr).

Adapting to a changing environment is no small task—it requires significant and integrated infrastructure investments and generational change. It is therefore critical to focus the investments possible today so as to have a transformative impact and set a replicable precedent for the investments of tomorrow. In order to develop a network of integrated solutions to social and environmental challenges, the City is geographically focusing the implementation of resilience-building activities at the scale of the

district (*Att.EGraphics.pdf*, page 254, http://bit.ly/1k4bqkr).

New Orleans is requesting NDR funds to implement the city's first ever Resilience District in Gentilly (*Att.EGraphics.pdf*, pages 255-259, http://bit.ly/1k4bqkr). The area is a prime example of 20th century urban expansion into drained cypress swamps. In many ways, Gentilly is a microcosm of New Orleans and the greater region. Its history as a place of opportunity for low- and moderate-income households and people of color, combined with its elevated environmental risks, make it an ideal place to combine interventions that build equity, reduce risk, and adapt the city to its natural environment.

The City of New Orleans is committed to working with community partners to foster widespread public engagement that facilitates community education, empowerment, and behavioral adaptation to help create a social commitment to resilience and "living with water" that is long lasting.

The four initiatives proposed within this application address the core goals of the competition—they leverage one another to realize long-term improvements in physical adaptation, economic opportunity, and social cohesion, while addressing the unmet recovery needs of the Qualifying Disaster. Together, decisive and collective action on Urban Water, Community Adaptation, Reliable Energy and Smart Systems, and Coastal Restoration will assist our most vulnerable communities to meet critical challenges around flood risk, climate change, energy interruptions, and economic wellbeing at the household, district, and citywide levels while also providing a replicable template for other districts and cities.

Attachment E: Maps and Graphics can be acessed at this link: http://bit.ly/1k4bqkr

Appendix C:

Projects

1. Mirabeau Water Garden: 25-acre site of a former convent of the Sisters of Saint Joseph designed to store up to 10 million gallons of stormwater while also serving as a space for recreation and environmental learning

2. Pontilly Neighborhood Stormwater Network: enhancements to the Dwyer Canal combined with vacant lots, streets, and alleyways designed to capture stormwater and beautify the Pontchartrain Park and Gentilly Woods neighborhoods

3. Blue & Green Corridors: neutral grounds of major boulevards improved to slow and store stormwater while facilitating safe and comfortable spaces to travel and recreate

4. St. Bernard Neighborhood Campus: integrated green infrastructure and recreational improvements at McDonogh 35 High School and Willie Hall Playground

5. Milne Campus: integrated recreational enhancements and water management features combined with water-focused education, economic, and workforce development activities

6. St. Anthony Green Streets: establishes a new standard for neighborhood streets and playgrounds that incorporates stormwater management as a key component of neighborhood revitalization

7. Dillard Wetlands: retrofit existing woodlands to capture water from neighboring areas and serve as a nature preserve

8. Dillard Campus: green infrastructure and drainage improvements on the campus of Dillard University

9. Oak Park Green Infrastructure: green infrastructure on vacant lots near Lake Area High School in Oak Park

10. Community Adaptation Program: investments in stormwater management and other resilience features for Gentilly homeowners

11. Reliable Energy & Smart Systems: increase energy and water utility resilience through investments in micro-grids, energy redundancy at critical water infrastructure sites, and a water monitoring network

12. Workforce Development: train and prepare local residents to build water management projects and develop increasingly vital skills in water infrastructure development and maintenance

For more information, visit nola.gov/resilience/gentilly or

APPENDIX D:

CITY OF NEW ORLEANS, LA

SUMMARY

In 2012, Hurricane Isaac exposed gaps in New Orleans' resilience and major risks for vulnerable communities through failures of water and energy infrastructure, environmental degradation, and a subsequently slow recovery. The city faces physical risks of compacting and sinking soils, coastal flooding, flooding from intense rainfall events, and loss of power and damage from high-speed wind events. These risks are compounded by coastal erosion, sea level rise, and underlying social stressors of concentrated poverty and income inequality. NDRC funding will enable the establishment of New Orleans' first-ever Resilience District in the Gentilly neighborhood. Several integrated initiatives will seek to turn this neighborhood into a national model for retrofitting post-war suburban neighborhoods into resilient, safe, and equitable communities of opportunity.

PROJECTS AND PROGRAMS

- **Urban Water –** Construction of a series of interventions that reduce the risk of flooding by creating parks and green streets that capture rainwater and provide new amenities to the community.
- **Community Adaptation –** Subsidize small-scale investments in stormwater management, home elevation, and other resilience features for low- and moderate-income homeowners.
- **Reliable Energy and Smart Systems –** Increase energy and water utility resilience through investments in micro-grids, energy redundancy at critical water infrastructure sites, and a water monitoring network.
- **Coastal Restoration –** Restoration of vital eco-system services, such as wave attenuation and water filtration, provided by coastal wetlands.
- **Workforce Development –** Train and prepare unemployed individuals to build NDRC-funded projects and develop increasingly vital skills in water infrastructure development and management.
- **ResilienceSTAT –** Creation of a citywide performance management program to track all of its resilience initiatives and pilot the City Resilience Index.

LEAD AGENCY & PARTNERS

City of New Orleans (lead), New Orleans Redevelopment Authority, Trust for Public Land, Deltares, Waggonner and Ball Architects

NDRC FUNDING

HUD is awarding $141,260,569 to the City of New Orleans.

LONG-TERM COMMITMENTS TO RESILIENCE

- In March 2016, the City will adopt a new Hazard Mitigation Plan that aligns with its Resilience Strategy and factors in increased risk due to climate change.
- In August 2015, the City adopted its Living Wage Ordinance to increase the financial stability and resilience of low- and moderate-income wage earners.

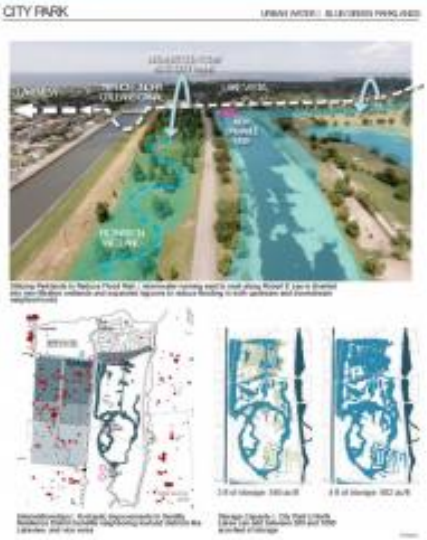
- In 2015, the City adopted a new Comprehensive Zoning Ordinance that included stormwater management requirements for all large commercial development or redevelopment.

WEBSITE

http://www.nola.gov/resilience/national-disaster-resilience-competition/

MAPS AND GRAPHICS

Gentilly Resilience District



Blue/Green Parklands Concept

Regional Vision for the Greater New Orleans Urban Water Plan

APPENDIX E:


Lake
BEACH
RESEARCH + TECH PARK
LAKESHORE DRIVE
Dwyer
Canal
City
Park
PARK
RIDGE
DILLARD
NOPL
Dillard
University
FAIRGROUNDS
Bayou
St. John
Elysian Fields
Lafitte Greenway

Maps from the NDRC Proposal showing the green space and drainage systems in Gentilly, New Orleans.

APPENDIX F:

Photos of Outreach and Engagement Events held by the GRD officials.