



# Economic Opportunity through Green Infrastructure: Equitable Access to Jobs and Contracts in Greater New Orleans



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Wildair Bioswale and Fillmore Rain Garden, project of New Orleans Redevelopment Authority, Credit: Justen Williams

# FOREWORD

Since 2010, the Greater New Orleans Foundation (GNOF) has worked to build the movement to “live better with water.” In a city where persistent flooding, antiquated drainage infrastructure, and soil subsidence continue to have adverse structural, social, and economic impacts, the need for innovative and just solutions is critical to our region’s future prosperity. To help build the green infrastructure we need, the City of New Orleans has undertaken more than \$260 million worth of projects, including those within the Gentilly Resilience District. With these funds and many more anticipated in future years fueling the growth of the water economy, GNOF knew there would be an opportunity to ensure that new jobs and contracts resulting from these investments could go to benefit disenfranchised populations in the region, including the 54% of African American males in New Orleans who are jobless. In 2017, GNOF, the City of New Orleans, and New Orleans Business Alliance identified four initiatives to address this need:

- The establishment of a Disadvantaged Business Enterprise (DBE) Mobilization Fund, a loan fund that would increase DBEs access to financial capital so they could improve their ability to bid for and successfully manage bigger City contracts.
- The development of an entry-level certificate program for green infrastructure jobs for those without high school diplomas or GEDs.
- The development of a small business certificate of conformance program for green infrastructure projects.

The fourth initiative was to develop a green infrastructure economic impact research study, to provide data on job creation and other economic impacts, identify career pathways, and make recommendations on policies, programs, and projects. Recommendations focused on providing disenfranchised populations with better access to the jobs and contracts enabled by these federally-funded green infrastructure projects.

This study provides insights into green infrastructure job forecasts, the current inventory of workers trained for these jobs, workers available versus projected demand, and the capacity of local training providers to quickly upskill and reskill the workforce to meet future demand. Included are recommendations for policy changes within the local ecosystem that would allow for rapid deployment of contracts and ensure equity in the awarding of contracts so that there are more opportunities for small businesses and minority-owned businesses to compete. With these things in mind, we at GNOF believe this study is both timely and relevant. It is our hope that as you read this report you are inspired by the work being done in this sector to ensure increased access to green infrastructure jobs for some of our most marginalized residents as well as to increased access to economic opportunities for our local small and minority-owned businesses.

It is important to acknowledge that this work was the effort of many who are committed to bolstering our region. Various members of the Coastal Action Table (now the Climate Justice Action Table) of the Greater New Orleans Funders' Network provided funding for these initiatives. The Greater New Orleans Funders' Network is a network of local, regional, and national funders who work to inspire and optimize philanthropic investments in the Greater New Orleans region to promote equity and increase justice. Additionally, we are especially grateful to The Kresge Foundation for funding this green infrastructure economic impact research as well as the convenings we held among experts and community members to help formulate the recommendations contained in it.

Because of this work, and other efforts by partners in the region, we are optimistic that the green infrastructure sector will be a vehicle for training and employing many unemployed and underemployed people in our region and will lead to fruitful careers that pay family sustaining wages, something even more critical these days in the midst of the economic downturn caused by the COVID-19 pandemic.



**Andy Kopplin**

President and CEO

Doris Z. Stone Chair in Philanthropic Leadership  
Greater New Orleans Foundation

# EXECUTIVE SUMMARY

The Greater New Orleans Foundation engaged BW Research Partnership to examine the green infrastructure industry and its workforce in order to provide an adequately skilled and representative workforce to carry out the more than \$218 million in green infrastructure work around the City of New Orleans. These projects, primarily funded through federal grants, represent a catalytic stimulus that will provide well-paying jobs and jumpstart sustainable careers for hundreds of New Orleans residents.

The findings in this report could not be more timely. Inequality is at the fore of the national conversation, and the employment crisis fueled by the Coronavirus pandemic is a dramatic illustration of the disproportionate impact of the virus on communities of color. Black workers in the U.S. have lost jobs at a significantly higher rate than White Americans since the start of the pandemic, with the official unemployment rate for Black Americans now at 15.4%, compared to 10.1% for White workers. As of June 2020, unemployment in New Orleans sits at 12.9%,<sup>1</sup> higher than the national average, largely the result of the sharp decline in jobs in the Leisure and Hospitality sector. Now is a critical time to focus on new job creation, training pipelines, and equitable distribution of opportunity.

This report quantifies the economic effects of new green infrastructure projects on the demand for regional workers. The research team supplemented this quantitative analysis by co-hosting together with GNOF human-centered design convenings with four different groups of local stakeholders, which revealed important trends and opportunities to increase participation of the local labor force, especially among underrepresented populations. This report also highlights the green infrastructure labor market ecosystem and training systems, underlying barriers and impediments to accessing employment, and closes with conclusions and strategies to maximize the participation and benefits for underrepresented residents. The main key findings and insights discussed throughout the report are summarized below.

**The projects covered in this report are estimated to create and support approximately 3,306 job-years or approximately 1,102 jobs within the Greater New Orleans region.**<sup>2</sup> As the 26 projects are required to be completed over a three-year period, an estimated 1,102 jobs will be created or sustained over that three-year period. Most of these jobs are general landscaping and construction laborer roles. It is also worth noting that the expected expenditures are projected to generate nearly \$14.6 million in state and local taxes over the course of all the projects.

**The green infrastructure industry would benefit from increased marketing and accessibility initiatives for jobs and training opportunities.** Participants in our convenings who currently work in green infrastructure roles discovered green infrastructure training exclusively through either peers or job placement services. A number of participants suggested that outreach and exposure to green infrastructure should start earlier in a person's career exploration—at least by high school. Additionally, some employers feel that stigmatism of green infrastructure roles exacerbates hiring difficulty. Promoting green infrastructure as a way to improve a community's resilience, environmental impact, and aesthetics may help mitigate this issue and help attract younger talent to the sector.

**The number of existing First-Line Landscaping and Groundskeeping Supervisors and crew chiefs may be a bottleneck and hamper the completion of projects.** Projections show that the number of First-Line Landscaping and Groundskeeping Supervisors needed to complete all projects is up to 23% higher than the current number

<sup>1</sup> Data as of June 2020. U.S. Bureau of Labor Statistics. Data retrieved August 5, 2020.

<sup>2</sup> This includes the 13 parishes of: Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, Lafourche, Terrebonne, Assumption, Tangipahoa, and Washington.

of supervisors. Given that supervisors and crew chiefs are positions that require considerable experience and management capabilities, quickly scaling up the number of people working in these areas may prove difficult. Programs that fast-track or provide clear milestones in career pathways towards supervisory roles may help decrease this potential gap in workers.

**Increasing ‘hands-on’ experience for current and potential trainees would benefit a range of stakeholders.** Nearly all participants of the convenings reported that more hands-on experience—particularly early in any training or introductory program—is highly valuable. Employers would benefit from a better-prepared workforce, training providers would benefit from more engaged and interested participants, and program participants would benefit from learning the daily activities of ‘green infrastructure’ while also gaining valuable and engaging experience in the early stages of their programs.

**Revising certain City policies may have notable positive effects on the green infrastructure industry and the broader workforce.** These adjustments include the swift deployment of capital (including Federal grants), smaller and more accessible contracts for green infrastructure projects, enacting policies that mitigate “cliff effects,” and implementing Disadvantaged Business Enterprise (DBE) requirements or incentives that are difficult for firms to circumvent.

**Gaps in support services allow some of those who need them the most to fall through the cracks.** In the absence of sufficient support services, disenfranchised populations may face decisions that require them to choose between survival in the short term or advancement in the long run. For example, for a family already struggling to get by, forgoing a paid job for an unpaid or low-paying training program is infeasible. Training programs that offer competitive wages while students learn and work may help lower program attrition rates. Better connection to other support services, such as childcare or transportation, may similarly alleviate some of the pressures that result in students dropping out of training programs.

**New metrics would better appraise the successes of training providers.** The reliance on cohort input-output metrics creates an adverse incentive for training providers to graduate as many participants as they can through the training program. This may create negative feedback, where employers may become frustrated with the quality of training program graduates and cease to participate or hire training graduates. A system where training providers are instead incentivized to have greater stake in training participants’ career goals (even if it involves transferring to another program) may realize positive returns.

**A network of green infrastructure stakeholders would help eliminate inefficiencies, promote collaboration, and bolster the growing sector and its talent pipeline.** A number of stakeholders mentioned that communication between relevant parties would help alleviate many of the issues they face. A formal network that allows for green infrastructure trainers, employers, employees, City officials, and support services to share ideas and events would increase collaboration and efficiencies across stakeholders and allow the green infrastructure sector to develop more robustly.

**To increase awareness of green infrastructure projects, mitigate access and transportation challenges for workers. One solution is to locate projects across a range of communities in the City.** Green infrastructure project siting decisions should include equity considerations, ability to access job sites, and access to the economic, environmental, and health benefits of projects. It was noted that green infrastructure projects were absent in certain areas, particularly the Lower Ninth Ward. Siting projects across a range of communities may also help draw local talent to green infrastructure. Residents are more likely to be interested in green infrastructure as a career if they can see tangible improvements in their neighborhoods.



Planter Box at the Treme Recreation Community Center, project of Greater Treme Consortium, Dana Brown & Associates, Waterwise Gulf South, City of New Orleans, Water Environment Federation, SWBNO; Credit: Justen Williams

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We would like to acknowledge once again Philip Jordan and Nate Hunt for designing and facilitating the convenings organized to inform this report. Thank you to Jessica Allen for her logistical support during these convenings. Lastly, we would like to express our gratitude to the employers, nonprofit and community partners, training providers, government partners, and alumni of training programs for sharing their insights and participating in the convenings. A list of all the participants can be seen in Appendix D.



# INTRODUCTION

Hurricane Katrina was a traumatic and deadly warning that sent a clear message to New Orleans: new strategies and infrastructure are needed to manage and mitigate rising seas and stormwater in order to better protect the City and its people. The current and proposed green infrastructure projects seek to improve the City's livability and resilience to more intense rainstorms and loss of coastal land. These projects not only improve the City's ability to brave future storms but offer gainful employment opportunities across a range of communities.

**Green Infrastructure is a range of measures that uses ecological systems and landscapes to reduce flows to sewer systems or surface waters.** This includes trench digging, constructing rain gardens and bioswales, drainage pumps, permeable pavement, rain barrels, and related aspects of green stormwater management. Green infrastructure projects often require water line management or repair as well.

There is more than \$218 million across 26 planned or active projects to upgrade the green infrastructure of New Orleans. These projects are funded predominantly through federal grants, though the Sewerage and Water Board of New Orleans is leading several projects as well. There are two primary objectives of this research:

1. Quantify the job creation and economic activity of green infrastructure projects. This includes the use of economic impact models to extrapolate the simulative effects of additional spending and wages in the Greater New Orleans Economy.
2. Examine steps that can be taken to ensure that these new jobs are filled by workers who are representative of New Orleans population. Data shows that people of color are under-represented in many roles, particularly so among higher-paying roles (See Appendix A: Occupational Profiles for details).



Permeable pavement on the Green Block, project of Healthy Community Services, Credit: Justen Williams

## THE IMPACTS OF COVID-19

The Novel Coronavirus Pandemic has led to economic disruption and unemployment increases at scale and velocity not seen in decades. While the effects of COVID-19 are felt universally, the magnitude of these impacts are not uniform. Black communities have been hit particularly hard by the pandemic. *Nationwide, Black Americans are more likely to be frontline workers, to lose their job due to shutdowns, and are more likely to die from COVID-19.*<sup>3</sup> These disproportionate effects of the pandemic add importance to the ideas and recommendations outlined in this report. Opportunity through green infrastructure training and employment offer a chance to bolster vitalization efforts that will have lasting positive impacts across communities.

Specific industries and occupations are bearing the economic brunt of quarantines and social distancing as well. Leisure and Hospitality industries are particularly impacted; the year-over-year (YoY) change (June 2019-2020) in total non-farm employment in the New Orleans-Metairie-Kenner MSA was a decline of 12.7%, the YoY change in Leisure and Hospitality was a 33.4% decline.<sup>4</sup> Given that Leisure and Hospitality make up a substantial proportion of the New Orleans economy, the loss of a third of Leisure and Hospitality jobs is catastrophic.

Given the deep economic pain felt across New Orleans—particularly in the Black, Latinx, Asian-American, and Indigenous communities—creating sustainable-wage employment opportunities that are accessible to all is paramount. This report includes critical data on the potential for job creation and strategies to foster inclusion and equity in the training and hiring of local residents.

3 Elise Gould and Valerie Wilson. Economic Policy Institute. June 1, 2020. <https://www.epi.org/publication/black-workers-covid/>

4 U.S. Bureau of Labor Statistics. Economy at a Glance, New Orleans-Metairie-Kenner MSA. Extracted August 5, 2020.

# ECONOMIC IMPACT OF GREEN INFRASTRUCTURE SPENDING

To determine the economic effects of the \$218 million in green infrastructure spending to the Greater New Orleans labor market and broader economy, the research team developed a series of models that were then categorized and used to estimate the amount of spending in respective industries. Once these estimates were determined, the research team used IMPLAN and EMSI input-output economic modeling to forecast the number and types of jobs created, as well as the expected additional taxes generated as a result of new and increased incomes. For more information about the research methodology, please see Appendix B of this report.

The economic impact models assume that all economic activity occurs within a one-year timeframe. This means that job figures should be interpreted as job-years. Thus, 3,306 job-years means that about 1,102 jobs are estimated to be created or sustained over a period of three years (the estimated time for completion of these projects). The other figures (labor income and taxes) are also based on a one-year completion period. Dividing these values by three will estimate the annual impact (over a three-year period) in each of those categories. These figures are estimates that provide a strong approximation of the magnitude in economic activity generated, but it is impossible to forecast with certainty the exact extent of economic impacts.



Agapanthus plant, native to Louisiana, Credit: Justen Williams

**3,306 job-years ÷ 3 years =  
1,102 jobs supported  
over a three-year span**

Economic impact modeling provides forecasts of three types of jobs created: direct, indirect, and induced. These effects are defined below.

### **DIRECT EFFECTS**

show the change in the economy associated with the initial job creation and capture how the targeted industries experience change. An example of direct jobs would be the jobs that are a direct result of the federal spending (i.e. a green infrastructure worker).

### **INDIRECT EFFECTS**

include all the backward linkages or the supply chain responses as a result of the initial job change. An example of an indirect job would be a construction equipment rental agent, or a job at a local horticultural nursery that supplies projects with grasses, shrubbery, and trees.

### **INDUCED EFFECTS**

refer to additional household spending and are the result of the direct and indirect workers spending their wages on new or additional services. An example of an induced job would be a new nurse who is hired due to increased demand for healthcare, or a real estate agent who is hired because of increased housing sales.

# ECONOMIC IMPACT OF GREEN INFRASTRUCTURE PROJECTS

The green infrastructure projects are estimated to support 3,306 job-years, 2,435 of which would be direct employment (meaning these workers would be primarily green infrastructure or construction related roles). This equates to 1,102 jobs sustained over the course of a three-year period.

Green infrastructure projects alone would also generate substantial state and local taxes. These projects are estimated to bring in about \$4.9 million every year for three years or about \$14.6 in total state and local taxes (Table 2).

*Table 1 Estimated Economic Impact of Only Green Infrastructure Projects*

IMPACT TYPE	EMPLOYMENT	LABOR INCOME
DIRECT EFFECT	2,435	\$75,776,910
INDIRECT EFFECT	469	\$31,338,057
INDUCED EFFECT	403	\$31,338,057
<b>TOTAL EFFECT</b>	<b>3,306</b>	<b>\$125,262,329</b>

*Table 2 Estimated Impact on Taxes of Only Green Infrastructure Projects*

TAXES	IMPACT ON TAXES
STATE AND LOCAL TAXES	\$14,643,126
FEDERAL TAXES	\$22,565,241

# ECONOMIC IMPACT BY OCCUPATION

The research team identified 11 primary occupations that make up the majority (82%) of the additional direct jobs which may be created through the green infrastructure projects covered in this report. Landscaping and Groundskeeping Workers are by far the most common occupation demanded by these projects, accounting for more than two-thirds (70%) of all new direct employment. First-line Supervisors of Landscaping, Lawn Service, and Groundskeeping workers are the next-most common occupation, accounting for 175 new direct jobs (Table 3).

*Table 3 Estimated Top Occupations Resulting from Green Infrastructure Projects*

OCCUPATION TITLE	DIRECT EMPLOYMENT
Landscaping and Groundskeeping Workers	1,394
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	175
Construction Laborers	129
Tree Trimmers and Pruners	128
First-Line Supervisors of Construction Trades and Extraction Workers	42
Operating Engineers and Other Construction Equipment Operators	42
Construction Managers	33
General and Operations Managers	32
Cement Masons and Concrete Finishers	8
Welders, Cutters, Solderers, and Brazers	7
Excavating and Loading Machine and Dragline Operators	5

### First-Line supervisors of landscaping and groundskeeping workers may be a critical bottleneck.

Understanding how the additional demand as a result of the green infrastructure projects compares to the current workforce is vital to understanding if and where any potential gaps in the labor force exist. As Table 4 shows, tree trimmers and pruners are the occupation that requires the greatest increase in workers relative to the current number of workers in that occupation<sup>5</sup>; an estimated 27% more tree trimmers and pruners will be needed to complete the green infrastructure projects.

More troubling is the 24% increase in need for first-line supervisors of landscaping and groundskeeping workers. These roles require experience, leadership, management capabilities, and specific skillsets that are likely not easy to scale up. Conversely, general landscaping and groundskeeping workers, which will require an estimated 21% increase in number of workers, will likely be an easier hiring task, as these roles rarely require extensive training or certifications. In fact, the blossom of demand for these occupations presents an opportunity to present individuals with a clear career pathway that begins at the entry-level. The Center for Watershed Protection (CWP) in partnership with the Water Environmental Federation (WEF) are developing an entry-level green infrastructure certificate program funded by GNOF, Foundation for Louisiana (FFL), and The Kresge Foundation that will be used to prepare residents in the Greater New Orleans region.

Table 4 Estimated Increase in Demand for Top Occupations

OCCUPATION TITLE	DIRECT EMPLOYMENT <sup>6</sup>
Tree Trimmers and Pruners	27%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	24%
Landscaping and Groundskeeping Workers	21%
Operating Engineers and Other Construction Equipment Operators	2%
Excavating and Loading Machine and Dragline Operators	2%
Cement Masons and Concrete Finishers	1%
Construction Laborers	1%
Construction Managers	1%
First-Line Supervisors of Construction Trades and Extraction Workers	1%
General and Operations Managers	0%
Welders, Cutters, Solderers, and Brazers	0%

These figures emphasize the importance of training programs and certifications that build knowledge, experience, and interest in green infrastructure. These training programs and certifications may serve as a crucial step, or in some cases, a launching point, for workers who are interested in the industry and have aspirations of becoming a first-line supervisor or crew chief.

<sup>5</sup> Current number of workers within the Greater New Orleans region as defined by the 13 parishes previously noted.

<sup>6</sup> These increases are over a one-year time frame. If projects are completed over a span of three years, the change from the status quo will be considerably lower.

# EQUITY AMONG GREEN INFRASTRUCTURE OCCUPATIONS

With so much time, effort, and funding going into these projects, it is important that the green infrastructure workforce is representative of the City's population. Unfortunately, an analysis of the most numerous occupations shows that the workforce is disparate among race and ethnicity and even more disparate across gender; females make up 50% of the workforce population but only account for 13% of the landscaping workforce in the Greater New Orleans region.

Disparities are even greater among management roles. White individuals make up 70% of the First-Line Supervisors of Landscaping, while only accounting for 58% of the overall workforce. Conversely, Black or African American individuals make up 32% of the regional workforce but account for only 22% of the First-Line Landscaping Supervisors in the region. Gender gaps exist in management as well; females only make up 16% of the First-Line Landscaping Supervisors despite comprising half of the overall regional workforce (Table 5). For more information on representation across key green infrastructure occupations, see Appendix A.

Table 5 Occupation and Workforce Demographics

	HISPANIC OR LATINO	WHITE	BLACK OR AFRICAN AMERICAN	FEMALE
Landscaping and Groundskeeping Workers	13%	50%	35%	13%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	7%	70%	22%	16%
<b>OVERALL REGIONAL WORKFORCE</b>	<b>6%</b>	<b>58%</b>	<b>32%</b>	<b>50%</b>





Rosa Keller Library Bioswale;  
Credit: Justen Williams

## GREEN INFRASTRUCTURE LABOR SUPPLY AND DEMAND

Most employers felt that specific experience with green infrastructure was something that could be learned on the job. Many cited that it was common to attract employees from other roles (even those in unrelated roles, such as a barista) who demonstrate work ethic and were trainable. This suggests that the available labor supply for green infrastructure work is relatively fluid and could be drawn from other industries. Additionally, the low credentialing and educational barriers to enter most green infrastructure jobs suggests that a sizable green infrastructure workforce could be developed rather quickly. Employers most frequently cited awareness of green infrastructure and, in few cases, the commitment to work outside while performing difficult manual labor in high heat and humidity were the greatest limiting factors on labor supply.

Conversely, demand for labor appeared to be a greater concern for many green infrastructure companies. A few employers cited frustration with the messaging that “green infrastructure work was coming down the pipeline and was needed.” Employers indicated that the projects often failed to materialize over recent years. This uncertainty in the future of the green infrastructure labor market likely dampens hiring efforts.



Gaillardia pulchella flower, native to Louisiana, Credit: Justen Williams

# GREEN INFRASTRUCTURE CAREER PATHWAYS

## **STARTING A CAREER IN GREEN INFRASTRUCTURE**

Nearly all interviewed training program alumni had heard of the training program they attended through craigslist postings or word-of-mouth from friends, family, and job placement professionals. This suggests that there is substantial opportunity to expand the range of current training recruitment strategies, including social media advertising (Instagram, Snapchat, etc.), ambassador or mentorship programs, and even high-school internships and apprenticeships.

## GREEN INFRASTRUCTURE OCCUPATIONS

When presented with the formal occupation codes (such as those seen in the occupational profiles in Appendix A), most employers revealed that their workers typically had general titles and covered a range of tasks outlined across many of the occupations. This means that many green infrastructure workers are generalists capable of completing an array of tasks; workers may be landscaping one minute and working on more technical pipelaying the next. With the guidance of employers, the research team concluded that most green infrastructure tasks can be categorized into three groups:

**HARDSCAPING:** this includes activities such as porous concrete or finish grading.

**GREENSCAPING:** this includes all landscape activities that pertain to planting, replacing, and maintaining living landscapes such as grasses, bioswales, and trees.

**HEAVY CONSTRUCTION:** These activities include deep trench digging, pipelaying, and bulldozing.

## ADVANCING GREEN INFRASTRUCTURE CAREERS

Opportunities for advancement within green infrastructure often center around crew leadership and eventually project management. For these positions, experience, leadership and management capacities, and work ethic are the primary requirements desired. Our convening with current workers highlighted that advancement from an entry-level role could occur as quickly as within a couple of months, provided the candidate had demonstrated the adequate knowledge and dedication. There was no mention of explicit educational or certification requirements. This suggests that upward mobility has relatively few barriers.

## TYPICAL CAREER PATHWAY WITHIN GREEN INFRASTRUCTURE

Our convenings with green infrastructure workers, trainers, and employers suggest that there is generally only one pathway that leads to a career in green infrastructure. Most entrants into green infrastructure did not have previous relevant work experience. Instead, as many employers stated to the research team, the most important factors for an entry-level green infrastructure worker were hard work, consistency, and the will to work outside in the hot and humid climate. The rest could be learned through relevant training programs and/or on-the-job training. In fact, one employer shared an anecdote about hiring a barista because they saw their desire to work hard.

The next step for an entry-level worker within green infrastructure is a field crew leader. This individual is responsible for leading a team of workers and ensuring the work is timely and of good quality. In order to be promoted to field crew leader, an individual must demonstrate proficiency in knowledge, dedication, reliability, and accountability. In one case, a worker had gone from entry-level to field crew leader within a few months. For others, the process may take longer.

After serving as a field crew leader, the next progression along the green infrastructure career pathway is a project lead or project manager. This individual has substantially greater management responsibilities, including overseeing all the workers on the site, ensuring project timelines and quality and safety standards are met. The individuals in these roles generally had years of experience in construction and green infrastructure. The final career progression within green infrastructure seemed to be business ownership and entrepreneurship, though most business owners had experience from other fields, such as construction and architecture.

It is also worth noting that workers in industries such as construction and landscape architecture have significant overlap in the knowledge, skills, and abilities required in green infrastructure. Because of this overlap, there may be potential for workers to transition from one industry to another, presenting an opportunity for expanded pathways. As the green infrastructure industry develops and matures, these inter-industry transitions may become more common career transitions and lead to a greater number of more established entry and exit points for green infrastructure workers.



Groundwork New Orleans team member, Credit: Groundwork New Orleans

# TRAINING PROVIDER LANDSCAPE

While there are a number of specific green infrastructure training programs, a number of traditional construction training programs in the region offer training that have substantial overlap. While some of these training programs have relatively high entrance costs or barriers (such as high certification fees or union-membership requirements), others offer relatively accessible training and experience.

## UNCOMMON CONSTRUCTION

### High school paid and credited internship

Apprentice-style program offers paid opportunities for high school aged youth to earn hourly pay, school internship credit, and the potential to earn a matching “Equity Award Scholarship” that can be used towards furthering education, getting industry certification, or tools for employment. The 100-hour semester-long apprenticeships offer participants a chance to gain valuable technical, “soft”, and leadership skills as well as experience, school credit, and pay.

[UNCOMMONCONSTRUCTION.ORG](http://UNCOMMONCONSTRUCTION.ORG)

## GROUNDWORK NEW ORLEANS

### Nationally-affiliated local organization working at the intersection of the environment, equity, and civic engagement

Groundwork New Orleans offers a range of programs for nearly all ages. For those ages 18-25, the Ground CREW offers employment opportunities to install and maintain rain and roof gardens. For those 18 and under, the Green Team offers opportunities to maintain rain gardens, explore the science behind green infrastructure, understand local water history and issues.

[GROUNDWORKNOLA.ORG](http://GROUNDWORKNOLA.ORG)

## NATIONAL GREEN INFRASTRUCTURE CERTIFICATION PROGRAM (NGICP)

### Cohort training available by request. \$500 training fee and \$200 examination fee.

NGICP trainings are scheduled by WEF and its partners, or available to larger cohorts (such as a business). These mid-level trainings cover a wide range of green infrastructure aspects, including permeable pavement, bioretention, rainwater harvesting, and stormwater wetlands. The most recent training in New Orleans was March-April 2019.

[NGICP.ORG](http://NGICP.ORG)

## LOUISIANA GREEN CORPS

### Available to youth aged 18-25

Program participants have the opportunity to learn about stormwater management and green infrastructure over a 14-week course. The program works with public, v, and private industry partners to help teach youth and develop the next generation of green infrastructure workers. Additionally, Louisiana Green Corps offers additional support in areas like financial literacy, resume writing, and other life skills.

[LAGREENCORPS.ORG/TRAINING](https://LAGREENCORPS.ORG/TRAINING)

## BOH BROS CONSTRUCTION

### Four-year apprenticeship program

While this program exposes participants to a broader range of construction activities beyond green infrastructure, completing this program will likely provide a strong career path and upward mobility. The first two years of the apprenticeship cover core skills and heavy carpentry, while the latter two years cover rigging, pile driving, and welding. The program also includes over 600 hours of classroom training, along with a paid job located on worksites. Participants are expected to have their own transportation as well as a TWIC.

[BOHBROS.COM/APPRENTICESHIP](https://BOHBROS.COM/APPRENTICESHIP)

## LOUISIANA TRANSPORTATION RESEARCH CENTER

### Certifications available for \$800 (\$100 for city or parish employees)

This program offers a number of certifications relevant to green infrastructure. There is an “Embankment and Base Course” certification as well as an “Asphalt Concrete Paving” certification. Certification is not for entrants with no experience; requirements include six months of experience, prerequisite courses, written exam and performance evaluation, and recommendation by a supervisor.

[LTRC.LSU.EDU/CERTIFICATION](https://LTRC.LSU.EDU/CERTIFICATION)

## INTERNATIONAL UNION OF OPERATING ENGINEERS - LOCAL 406

### Available to union members only

This program offers IUOE members training or apprentice-style learning opportunities to master heavy equipment operations. These programs are typically sponsored and promoted by federal, state, or provincial agencies and involve written and practical assessments as well as field-training. Local 406 has a training center located in Robert, Louisiana. The apprenticeship programs typically last three to four years.

[IUOE.ORG/TRAINING/HEAVY-EQUIPMENT-OPERATOR](https://IUOE.ORG/TRAINING/HEAVY-EQUIPMENT-OPERATOR)

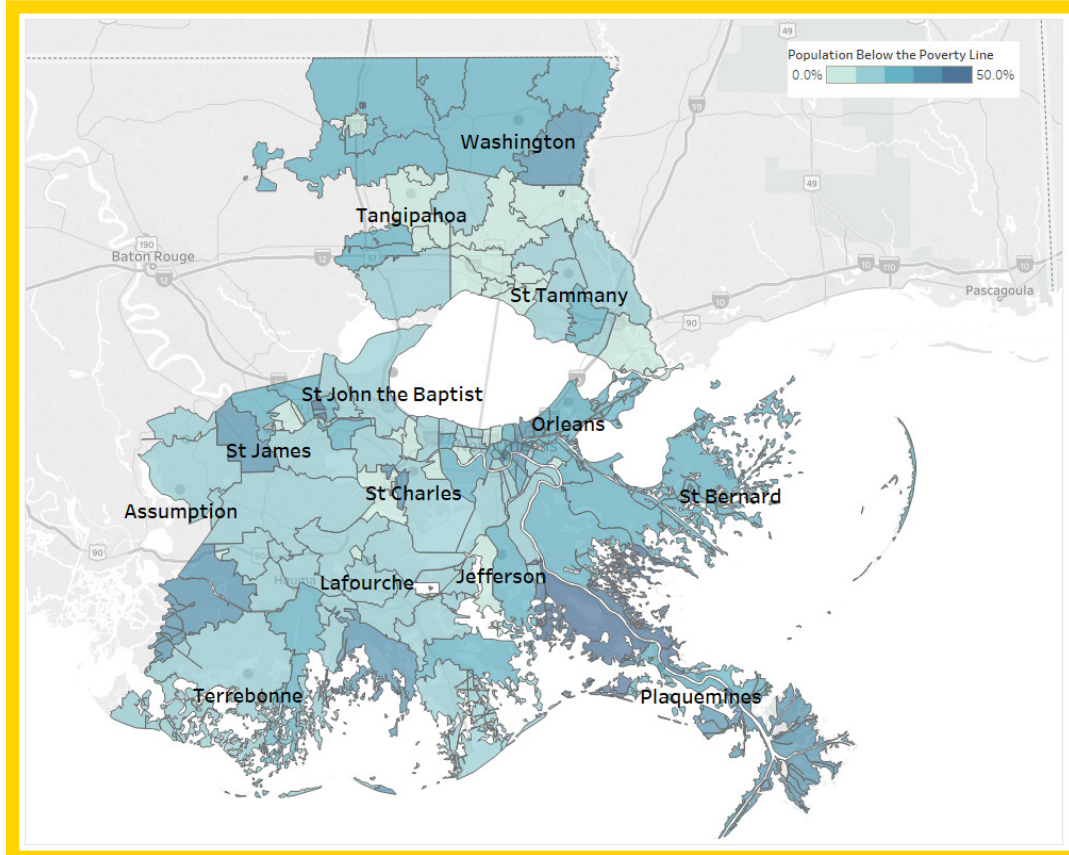
# BARRIERS, ACCESS, AND EQUITY

This section outlines some of the challenges facing substantial portions of the population in the Greater New Orleans region. Recognizing the scale, geography, and affected populations of these challenges provides greater context to why targeted efforts and support services are needed to help potential green infrastructure workers successfully complete trainings and transition to the field.

## POVERTY

Poverty limits opportunities all across the United States and New Orleans is no exception. The trauma of poverty presents significant challenges to accessing education and training, healthcare, housing, and employment. This cycle of poverty is difficult to escape, as issues compound and feed back into one another. Nearly one in five individuals within the study region<sup>7</sup> lived below the poverty line in 2017. The poverty rate is not uniform across the study region; some zip codes have as much as 65% or more of the population living below the poverty line. 26% of the populations in Orleans and Washington parishes live below the poverty line. Even the parishes with the lowest proportions living below the poverty line—St. Tammany and St. Charles—have more than one in ten individuals living below the poverty line.

*Figure 1 Population Living Below the Poverty Line, 2017*



<sup>7</sup> This includes the 13 parishes of: Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, Lafourche, Terrebonne, Assumption, Tangipahoa, and Washington.

Figure 2 Black or African American Population Living Below the Poverty Line, 2017

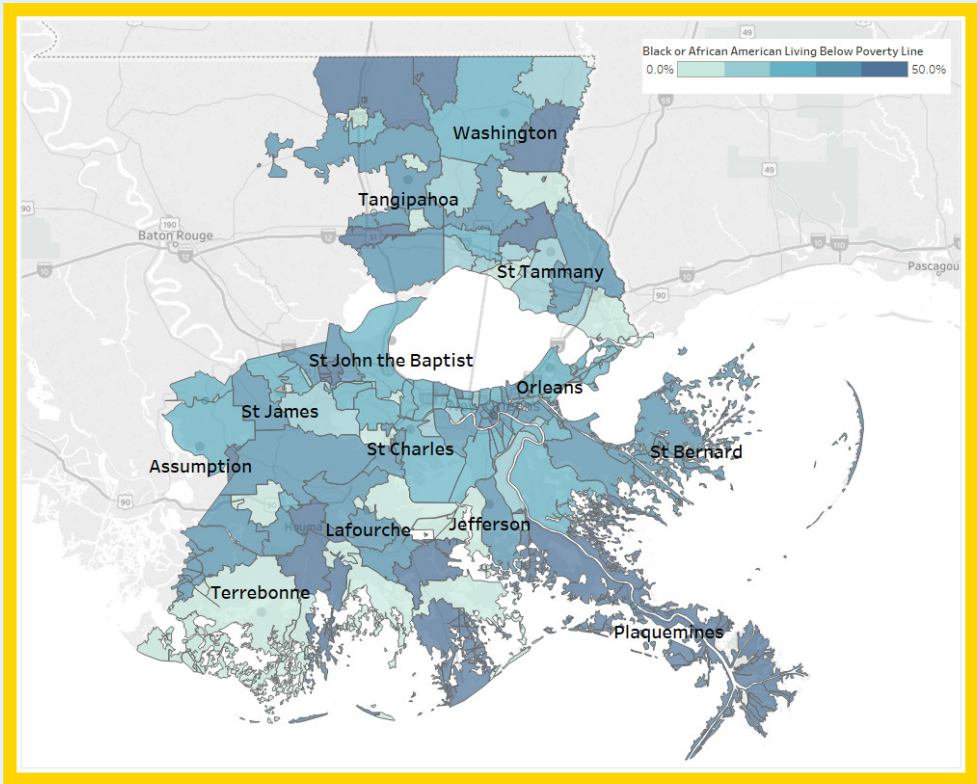
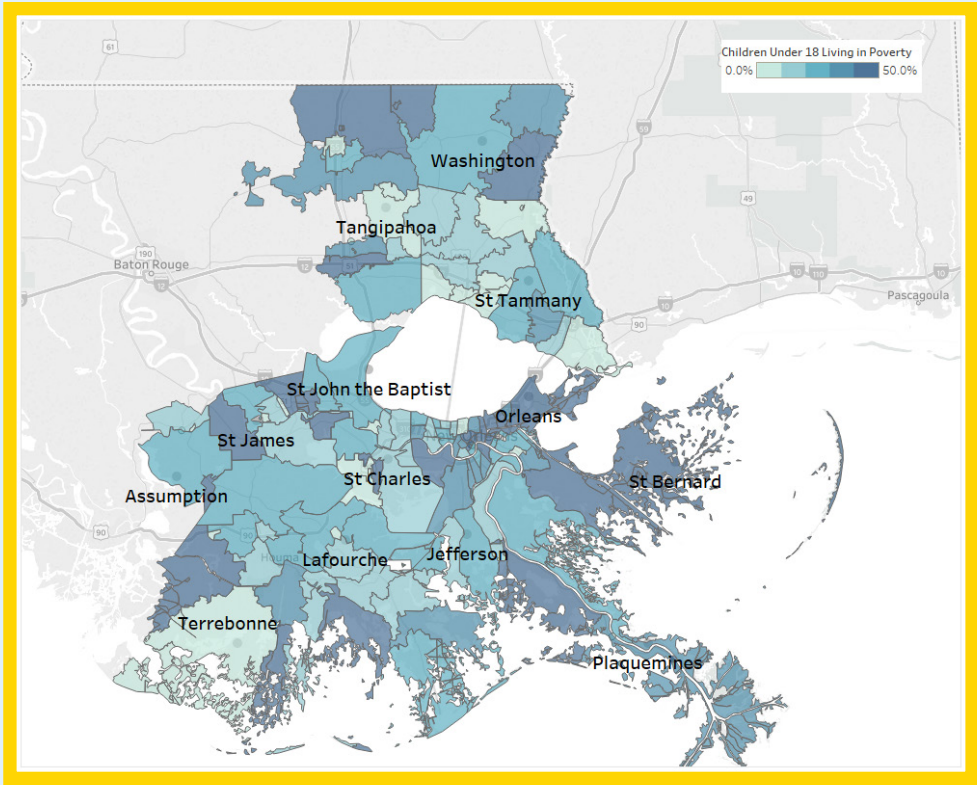


Figure 3 Population Under 18 Living Below the Poverty Line, 2017





## POVERTY AMONG BLACK OR AFRICAN AMERICAN RESIDENTS

Poverty rates among Black or African American individuals in the study region are nearly 70% higher than the broader population (18.5% overall vs 31.3% Black or African American). This disparity is common across all parishes in the study region; the parishes with the lowest poverty rate for Black or African Americans are St. Tammany and St. James, with 21% and 23% of the Black or African American population living below the poverty line. The parishes with the highest rates are nearly double these rates; in Tangipahoa, Terrebonne, and Washington, 39% of the Black or African American population live in poverty (Figure 2).

## POVERTY AMONG CHILDREN UNDER 18

While poverty often has negative effects on individuals, the effects can be more pronounced on those who are young. Poverty rates among children across the 13 parishes in the study region are relatively high; about 27% of the population under the age of 18 lives in poverty. In the parishes of Orleans and Washington, these rates are as high as 40% and 35%, respectively. As Figure 3 shows, many zip codes have poverty rates for children that approach or exceed 50% (Figure 3).



TRUE GRID Permeable Pavement at Ruby Slipper Cafe, Credit: Justen Williams

## UNEMPLOYMENT

The unemployment rate across the 13 parishes averaged 7.3% in 2017. Unemployment among Black or African Americans was notably higher—13.9% on average across the study region. The parishes of Washington and St. Bernard were notably high, averaging 26.2% and 21.3% unemployment among Black or African American individuals. In fact, about 35% of the 110 zip codes in the 13 parishes had Black or African American unemployment rates that were at least twice as high as the unemployment rate for that zip code (Figure 4). The unemployment rate only measures those actively looking for work. The jobless rate among Black or African Americans aged 18-64 is 55% across Greater New Orleans. In some parishes, such as Washington and Lafourche, joblessness among working aged males is as high as 69% and 66%.

The Coronavirus Pandemic has also had a disproportionate effect on Black residents; nationwide, unemployment among white workers was 10.1% and 15.4% among black workers in June of 2020.<sup>8</sup>

## EDUCATIONAL ATTAINMENT

Educational requirements are often poor proxies for determining an individual's capabilities. A high school diploma may not be a direct indicator of work ethic, nor willingness or ability to learn. Educational or certification requirements often end up serving as barriers and can result in regional and racial inequalities. On average, 16% of the population 25 years and older do not have a high school diploma or equivalent. These rates are 21% and 27% among Black populations and Hispanic/Latinx populations respectively. This highlights that education requirements reinforce barriers along a racial basis and perpetuate inequalities.

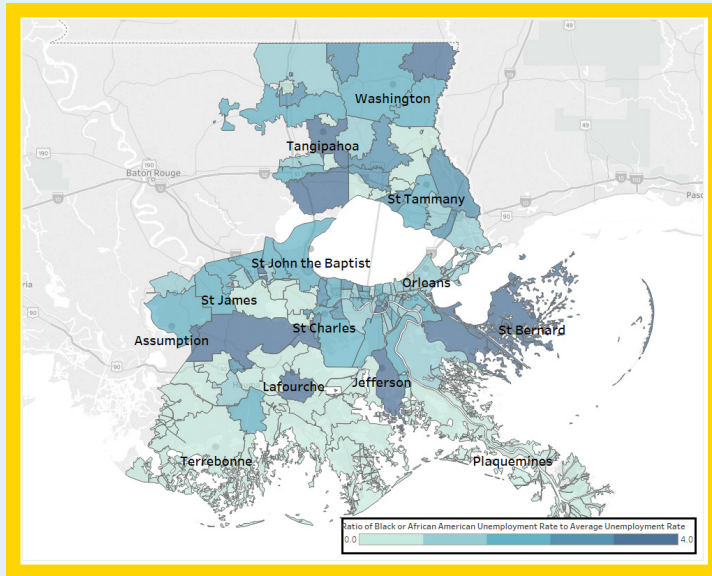
## CLIFF EFFECTS

Cliff effects are when an individual's new additional income means that they (or their family) lose eligibility for certain benefits (i.e. SNAP, WIC, housing subsidies, ect.) that are in excess of their gained income. This means that the loss of benefits financially outweighs the gains of new income. Faced with the potential of losing these benefits that they cannot live without, individuals forgo the additional income opportunity. Policies that allow for more gradual decreases in benefits will mitigate this effect.

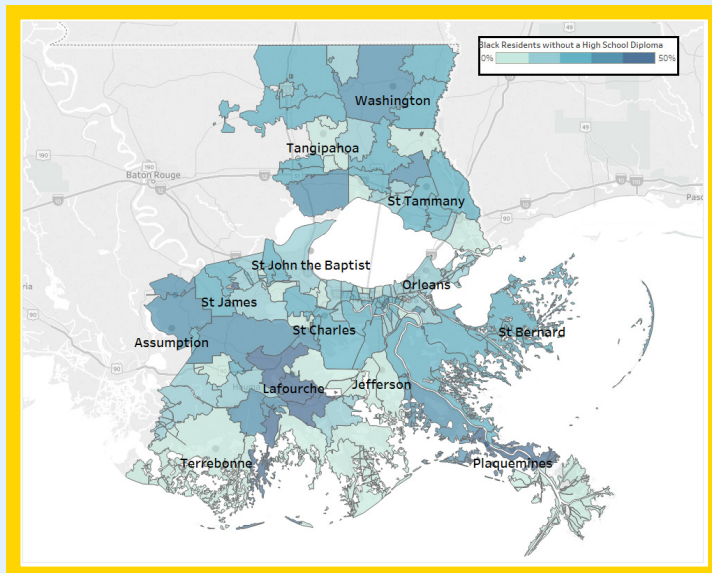
For more information on cliff effects, Susan Crandall, Director at the Center for Social Policy at University of Massachusetts Boston, and her team have put together a presentation that outlines key aspects and remedies to cliff effects. The presentation can be found here: [https://www.umb.edu/editor\\_uploads/images/centers\\_institutes/center\\_social\\_policy/DOL\\_ETA\\_Oct\\_11.2018.REV.pdf](https://www.umb.edu/editor_uploads/images/centers_institutes/center_social_policy/DOL_ETA_Oct_11.2018.REV.pdf)

<sup>8</sup> References data from the U.S. Bureau of Labor Statistics. Table A-2 Employment status of the civilian population by race, sex, and age. Seasonally-adjusted Unemployment.

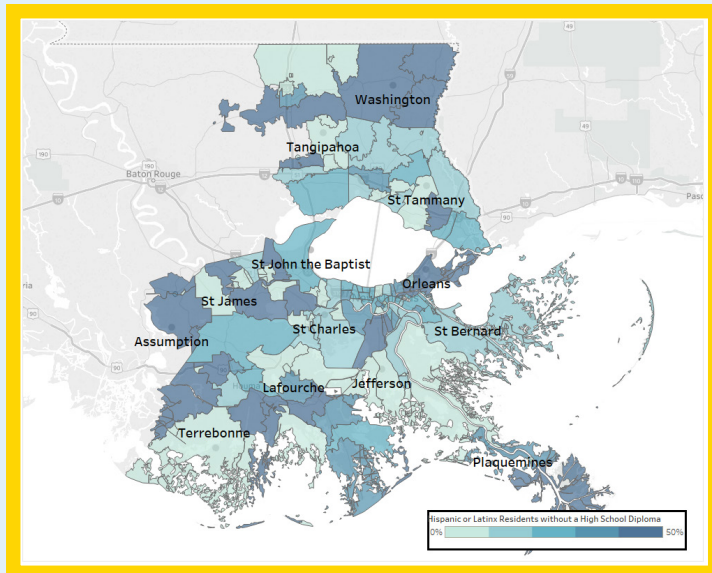
**Figure 4**  
*Ratio of Black or African American Unemployment Rate to Overall Zip Code Unemployment Rate, 2017*



**Figure 5**  
*Black or African American Residents 25 Years of Age or Older Without a High School Diploma*



**Figure 6**  
*Hispanic or Latinx Residents 25 Years of Age or Older Without a High School Diploma*



# PROMISING PRACTICES AND MODELS

Many of the workforce-related troubles cited throughout this report are not unique to New Orleans. Cities around the country have piloted a number of innovative programs to help remedy many of the very issues cited. This section of the report highlights some of these best practices and program models that show promise.

## **Green City Force Co-Located Housing**

Housing is typically a household's largest single expense. As the costs of housing increase and minimum wages remain stagnant, housing is becoming increasingly expensive and difficult for individuals and families. Further compounding this problem, the most affordable housing available may not be close to where an individual works, and so transportation becomes another area of concern. Thus, poverty and lower wages can cascade into a vicious cycle that results in a system that is difficult to escape.

Co-located housing, which is subsidized on-site housing that allows workers to reside close to their worksite, is an innovative idea that has taken roots in a number of communities around the United States. For example, Green City Force in New York City has partnered with the New York City Housing Authority to provide program participants and their families with affordable housing. This system ensures that housing and transportation-related difficulties are mitigated, increasing participant's ability to break the cycle of poverty.

## **California SlingShot Initiative**

The SlingShot Initiative, launched in 2014, provided regional workforce development boards across the state of California with grants to identify and address major regional employment challenges. These grants were provided with maximum flexibility to allow regions, which can best identify their unique challenges, to come up with creative solutions that were tailored to their region's needs. The initiative resulted in an array of creative programs across the state, including strategies to support and develop specific career pathways, training co-investment programs, and platforms for network development.

### **Neighborhood Jobs Trust**

The Neighborhood Jobs Trust (NJT) in Boston was created in 1987 in order to aid in the development of the local workforce. Commercial projects over a certain square footage are legally required to contribute to the NJT at a fixed rate.

The funds generated are then distributed to a number of workforce development programs that prepare workers for industries ranging from tech and finance to hospitality and locksmithing. Between 2017-2018, over \$2.68 million in funding was disbursed to over 2,000 residents. Eighty-eight % of participants were people of color, and graduates of training programs funded through NJT earned an average wage of \$15.37 per hour.

To learn more about the Neighborhood Jobs Trust, visit [OWD.BOSTON.GOV/NEIGHBORHOOD-JOBS-TRUST](https://www.owd.boston.gov/neighborhood-jobs-trust)

### **Boston Healthcare Consortia**

The Boston Private Industry Council (PIC) connects Healthcare employers with students in Boston Public Schools as well as Boston's two- and four-year colleges. These connections lead to a variety of outcomes, including paid summer employment opportunities for high school students, career navigation activities (such as mock interviews and job shadows), and other activities that drive career exploration and development among youth.

### **CUNY Accelerated Study in Associate Programs**

CUNY's Accelerated Study in Associate Programs (ASAP) helps students earn associate degrees within three years by providing a range of financial, academic, and personal supports including comprehensive and personalized advisement, career counseling, tutoring, waivers for tuition and mandatory fees, MTA MetroCards, and additional financial assistance to defray the cost of textbooks. ASAP also offers special class scheduling options to ensure that ASAP students get the classes they need, are in classes with other ASAP students, and attend classes in convenient blocks of time to accommodate their work schedules. As students approach graduation, they receive special support to help them transfer to 4-year colleges or transition into the workforce, depending on their goals.

The ASAP program has had notable success; the historic 3-year graduation rate from CUNY community colleges in New York City ranged from 6-11%. In 5 years, completion rates overall have increased to 24% system-wide and at or above 50% for ASAP cohort demographics. The program also includes a data accountability platform that tracks students and services and ensures accountability and progressive monitoring, various financial supports (need-based tuition waiver, book waiver, metro card), and intensive advising and counseling that creates a "family" atmosphere.

### **Georgia State University**

Georgia State University (GSU) has a number of student success programs that are designed to maximize student retention and academic performance. GSU's Early Alert program allows faculty to report students who may be struggling with issues in or outside of the classroom. Once reported, appropriate faculty reach out to this student and get them into contact with relevant campus resources that may help remedy their situation. These early interventions can help students regain their footing and ensures that campus resources are better utilized. Training providers may try to implement this sort of proactive intervention effort.

# CONCLUSIONS AND RECOMMENDATIONS

BW Research and the Greater New Orleans Foundation have developed conclusions and recommendations across five key areas to enhance the strength and diversity of the green infrastructure workforce pipeline in New Orleans. These recommendations will require a range of efforts from an array of stakeholders, but cooperation and coordination across all parties will promote a stronger, better prepared workforce that is more representative of the City's population.

**1. Increase accessibility for workers and training program participants.** This effort can comprise of two efforts:

- Ensure transportation is available and sustainable for students and workers. If public transportation is relied upon, investigate the possibility of transportation deserts, inadequate scheduling and routes, or insufficient transportation vouchers or other funding support.
- Site future projects and develop a workforce in communities in need. A few convening members mentioned that green infrastructure projects were absent in certain parts of the City—most notably in the Lower Ninth Ward and New Orleans East neighborhoods.

**2. Investigate and remediate gaps in support services.** Support services range from bus passes to counseling to career navigation and flexible scheduling. Much of the disenfranchised population faces substantial opportunity costs to attend unpaid trainings, which essentially requires a potential trainee to choose between providing for themselves and their family in the immediate term or attending a training program which might result in employment in the long term. Most cannot afford to sacrifice in the short term. While many training providers already offer support in a variety of forms, the financial burden of offering a range of support often exceeds the tight budgetary constraints imposed on training providers.

**3. Assess and revise policies surrounding City contractors.** Each of these policy areas would have notable impacts independently, and all—especially in concert—would boost the number of DBE and disenfranchised workers hired for these jobs.

- **Communicate accurate and realistic timelines to employers.** Most employers cannot, and will not, train or hire workers in anticipation of work if they do not know when it will materialize. The City has provided updated schedules on its website and should continue to market the opportunities to small businesses and minority owned businesses. See Appendix D for the most recent schedule as of the date of print.
- **Revisit DBE requirements.** The research suggests that a number of contractors never intend to fulfill the City's guidelines for hiring DBE's and/or disenfranchised workers and instead price the presumed violation fees into their bids. To remedy this, stronger enforcement mechanisms or changes in the structure of the RFP process would likely be required. For example, one such change could be a 'three strike' policy, which would prevent a company from competing for any future City contacts after it had received three violations.

- **Continue to make more contracts accessible to small and minority-owned businesses.** A number of small and minority-owned businesses relayed that bids were often so large that the projects were only available to a limited number of large construction companies. Writing these large green infrastructure projects as multiple smaller bids allows small, specialized green infrastructure firms to serve as the primary contractors. The City’s current efforts related to de-bundling of contracts is an excellent example of increasing accessibility and allows more small and minority-owned businesses to competitively bid. Evidence suggests that this will increase the number of minority residents hired for projects. Continuing and expanding practices like de-bundling is critical for increased access and equity in contracting.
- **Revise or eliminate policies that lead to “cliff effects.”** Cliff effects are when new income results in the loss of benefits that are still necessary for a household to get by. The potential loss of these benefits forces some to forgo employment opportunities to avoid the sudden loss in support services for housing, childcare, and other necessities. While the City may be limited in impacting state or federal policies around income levels and cliff effects, additional funding streams, in the form of enhanced support services or some of the best practices highlighted in this report, would also help alleviate the potential for cliff effects.
- **Require prevailing wages to be paid to workers on infrastructure projects.** The best opportunity to eliminate cliff effects is to ensure workers are paid a wage that can support a household. While FEMA- and HUD-funded current projects are required to follow Davis-Bacon Act wages, and the City has a living wage ordinance for other projects, many of the landscaping, hardscaping, and construction labor positions pay wages that require workers to remain on other public benefits. Requiring a higher minimum wage for these projects can alleviate many of the impacts of the trauma of poverty and increase participation among the City’s lower-income residents.
- **Consider requiring City contractors to cosponsor driver’s license courses and registration for relevant staff.** Driver’s licenses are important for applying to many jobs yet are relatively difficult to obtain for some applicants. Due to factors ranging from prohibitively expensive driving courses or previous driving infractions, many workers cannot get a driver’s license. For example, courses at state-approved facilities can exceed \$400 and require one’s own vehicle. These requirements make a driver’s license unobtainable for many.
- **Increase hands-on and “in-the-field” experience.** A combination of classroom and hands-on application have historically provided better outcomes for participants and employers. Outlined below are some benefits experienced by each stakeholder:
  - **Employers**
    - Receive better signals of the skills and abilities training programs provide new hires.
    - Know that training program graduates “know what they signed up for” and are actually interested in green infrastructure work.
  - **Training Providers**
    - Many employers noted that training providers do not provide adequate competency screening, meaning that employers cannot determine which graduates are likely to be able to meet the demands of the job. Employers participate directly in the programs, typically not to inform curriculum, but to identify which students are capable and hireable. Developing metrics that signal quality to employers will be helpful to build relationships and ultimately lead to higher placement.

- **Training Participants**

- Experience in what green infrastructure is.
- Get valuable experience they can leverage when looking for green infrastructure jobs.
- Decrease reliance on support services if training programs offer pay for in-field work.
- Potential to circumvent trouble with criminal backgrounds. If someone demonstrates strong work ethic, a previous violation may be a less important signal to potential employers.

**4. Create an economic network for the green infrastructure sector.** A network of trainers, employers, city officials, and support service providers focused around green infrastructure would provide opportunities for synergies and collaboration, increase matching across training providers and employers, and increase efficiency and problem solving. A network would allow for better collaboration between training providers and greater transparency and accessibility to potential entrants to green infrastructure. Organizations like philanthropic foundations and economic intermediaries could be partners in collaborating and convening the network.

**5. Improve the accessibility and marketing of green infrastructure jobs.** This includes a few potential changes:

- An “ambassador” program that uses current and graduated training program participants to advertise the careers and trainings available.
- Creative and non-traditional ways of reaching potential training participants may be useful. One suggestion was social media (i.e. Instagram, Snapchat, etc.).
- Increase accessibility to wider age audiences. Participants of the convening of training program alumni also mentioned that interest in green infrastructure could be higher if individuals were aware of potential career choices at an earlier age. Some potential opportunities include programs that work with high-school aged students to introduce them to the field of green infrastructure.
- Target training opportunities to specific underserved communities (i.e. young adults, veterans, and others who face barriers to employment) that can take advantage of their potential as entry points into the workforce. Using resources like on the job training (OJT) coupled with classroom instruction could provide an opportunity for GI employers to partner with community based organizations (CBOs) & nonprofits to diversify the workforce. City projects could be used to provide OJT and skill development resulting in earned industry credentials and/or certifications.
- Market green infrastructure as a way to enhance one’s community by adding resilience in the event of storms, increasing the natural beauty, and making the community more environmentally friendly and sustainable.

**6. Leverage green infrastructure training programs and certifications to strengthen the pipeline for crew chiefs and first-line supervisors.** Emphasizing the benefits of becoming a supervisor and easing the path to get there will have benefits that are two-fold. First, current and potential workers may be more attracted to, and more likely to stay with, the industry and entry-level roles knowing that higher wages and upward mobility are within reach. Second, increasing the number of qualified and experienced workers will help meet the increased need for first-line supervisors.



## APPENDIX A: OCCUPATIONAL PROFILES

### LANDSCAPING AND GROUNDSKEEPING WORKERS

- 6,602 jobs in the Greater New Orleans area
  - Additional 385 jobs sustained over three years
  - Median annual earnings: \$24,330 (\$11.70/hr)
  - No formal education required (entry-level)
  - No work experience required (entry-level)
  - Farmworkers, Farm, Ranch, and Aquacultural Animals
  - Pipelayers
  - Tire Repairers and Changers
- RELATED OCCUPATIONS
- Nursery Workers



### TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Customer and Personal Service</li> <li>• Public Safety and Security</li> <li>• Mechanical</li> </ul>	<ul style="list-style-type: none"> <li>• Operation and Control</li> <li>• Critical Thinking</li> <li>• Speaking</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-limb Coordination</li> <li>• Manual Dexterity</li> <li>• Trunk Strength</li> </ul>

## CONSTRUCTION LABORERS

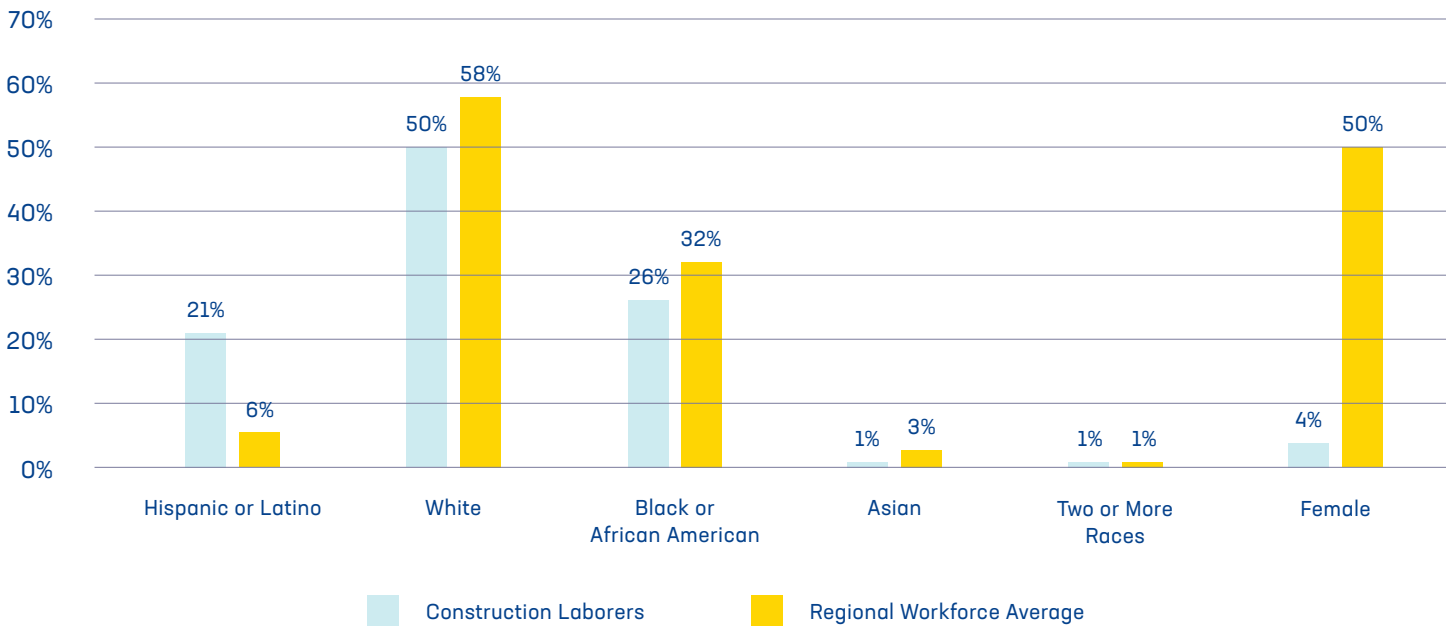
- 10,608 jobs in the Greater New Orleans area
- Additional 36 jobs sustained over three years
- Median annual earnings: \$31,773 (\$15.28/hr)

- No formal education required (entry-level)
- No work experience required (entry-level)

- Helpers–Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters
- Helpers–Carpenters

### RELATED OCCUPATIONS

- Terrazzo Workers and Finishers



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Building and Construction</li> <li>• Mechanical</li> <li>• Administration and Management</li> </ul>	<ul style="list-style-type: none"> <li>• Active Listening</li> <li>• Reading Comprehension</li> <li>• Operation Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Manual Dexterity</li> <li>• Arm-Hand Steadiness</li> <li>• Static Strength</li> </ul>

## FIRST-LINE SUPERVISORS OF LANDSCAPING

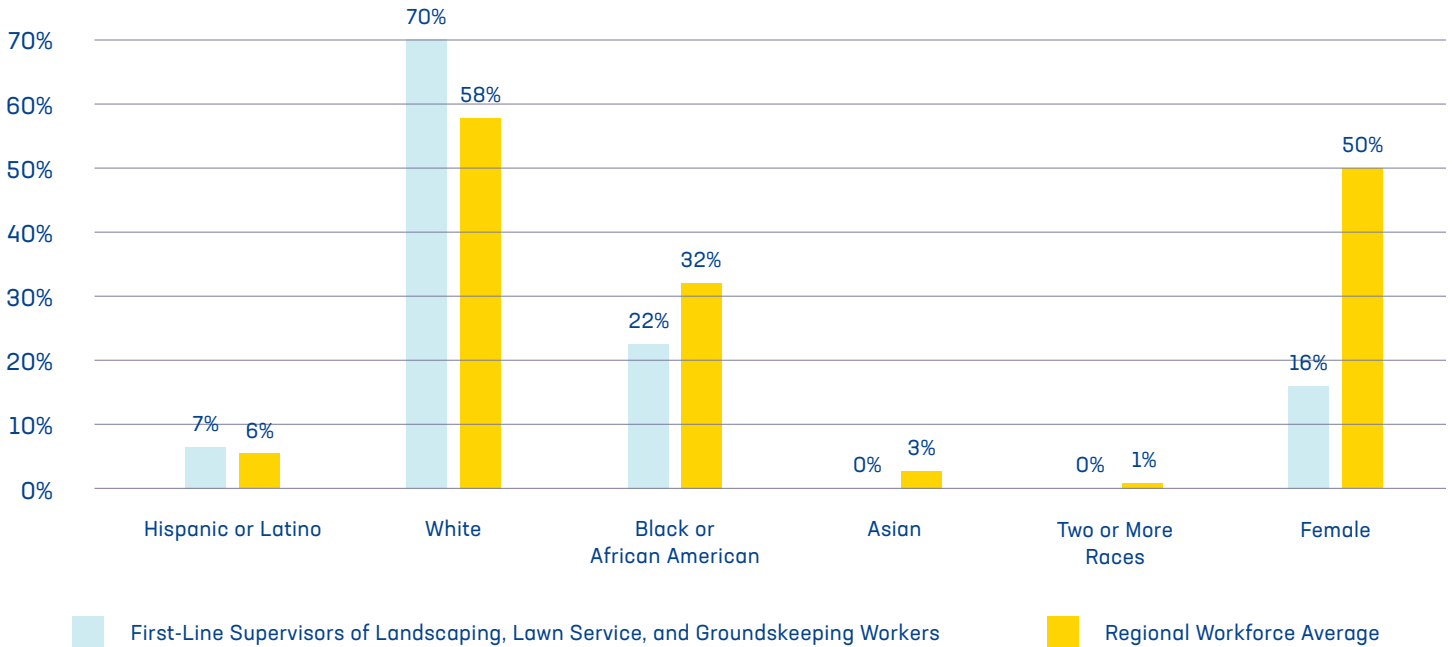
- 742 jobs in the Greater New Orleans area
- Additional 48 jobs sustained over three years
- Median annual earnings: \$43,309 (\$20.28/hr)
- High school diploma or equivalent

- Less than five years of experience

- First-Line Supervisors of Construction Trades and Extraction Workers

### RELATED OCCUPATIONS

- First-Line Supervisors of Housekeeping and Janitorial Workers
- First-Line Supervisors of Agricultural Crop and Horticultural Workers



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• English Language</li> <li>• Administration and Management</li> <li>• Customer and Personal Service</li> </ul>	<ul style="list-style-type: none"> <li>• Active Listening</li> <li>• Critical Thinking</li> <li>• Coordination</li> </ul>	<ul style="list-style-type: none"> <li>• Oral Comprehension</li> <li>• Oral Expression</li> <li>• Problem Sensitivity</li> </ul>

## TREE TRIMMERS AND PRUNERS

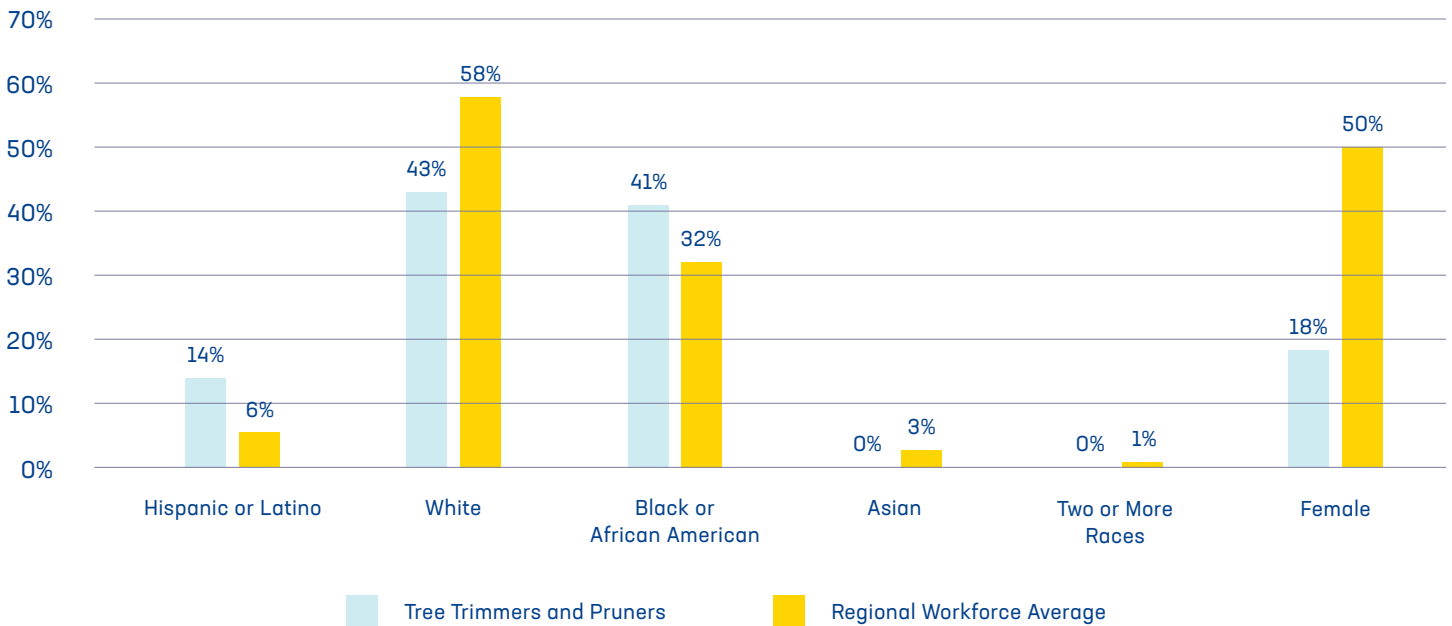
- 468 jobs in the Greater New Orleans area
- Additional 35 jobs sustained over three years
- Median annual earnings: \$42,749 (\$20.55/hr)

- High school diploma or equivalent
- No work experience required (entry-level)

### RELATED OCCUPATIONS

- Pile-Driver Operators

- Helpers–Extraction Workers
- Rail-Track Laying and Maintenance Equipment Operators



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Customer and Personal Service</li> <li>• Mechanical</li> <li>• Public Safety and Security</li> </ul>	<ul style="list-style-type: none"> <li>• Operation and Control</li> <li>• Operation Monitoring</li> <li>• Critical Thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-limb Coordination</li> <li>• Manual Dexterity</li> <li>• Trunk Strength</li> </ul>

## FIRST-LINE SUPERVISORS OF CONSTRUCTION

- 5,120 jobs in the Greater New Orleans area
- Additional 25 jobs sustained over three years
- Median annual earnings: \$60,155 (\$28.92/hr)

- High school diploma or equivalent
- Five years or more of experience

### RELATED OCCUPATIONS

- First-Line Supervisors of

Landscaping, Lawn Service, and Groundskeeping Workers

- Forest and Conservation Technicians
- Pipefitters and Steamfitters



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Production and Processing</li> <li>• Building and Construction</li> <li>• Customer and Personal Service</li> </ul>	<ul style="list-style-type: none"> <li>• Active Listening</li> <li>• Critical Thinking</li> <li>• Coordination</li> </ul>	<ul style="list-style-type: none"> <li>• Oral Comprehension</li> <li>• Oral Expression</li> <li>• Problem Sensitivity</li> </ul>

## OPERATING ENGINEERS AND OTHER CONSTRUCTION EQUIPMENT OPERATORS

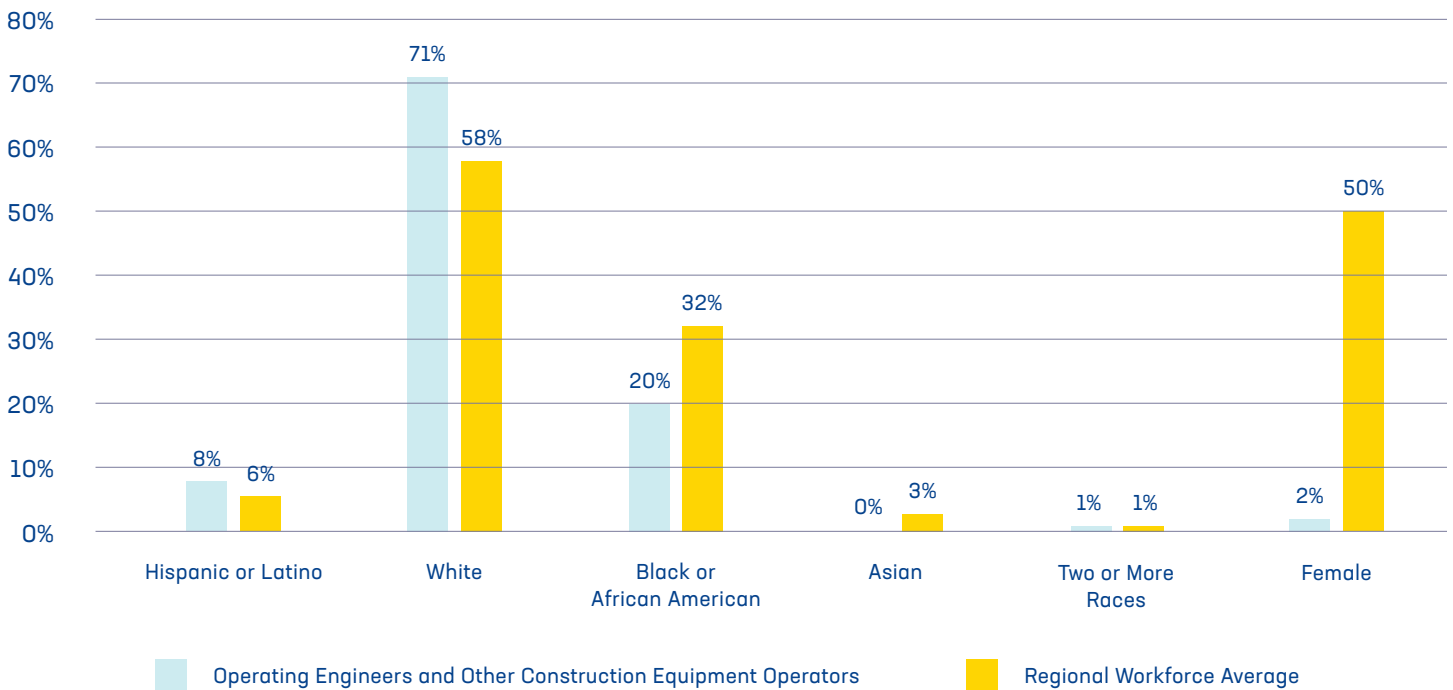
- 2,107 jobs in the Greater New Orleans area
- Additional 12 jobs sustained over three years
- Median annual earnings: \$42,473 (\$20.42/hr)

- High school diploma or equivalent
- No work experience required (entry-level)

### RELATED OCCUPATIONS

- Paving, Surfacing, and Tamping

- Equipment Operators
- Highway Maintenance Workers
- Excavating and Loading Machine and Dragline Operators



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Building and Construction</li> <li>• Mechanical</li> <li>• Administration and Management</li> </ul>	<ul style="list-style-type: none"> <li>• Operation and Control</li> <li>• Operation Monitoring</li> <li>• Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Control Precision</li> <li>• Multi-limb Coordination</li> <li>• Depth Perception</li> </ul>

## CONSTRUCTION MANAGERS

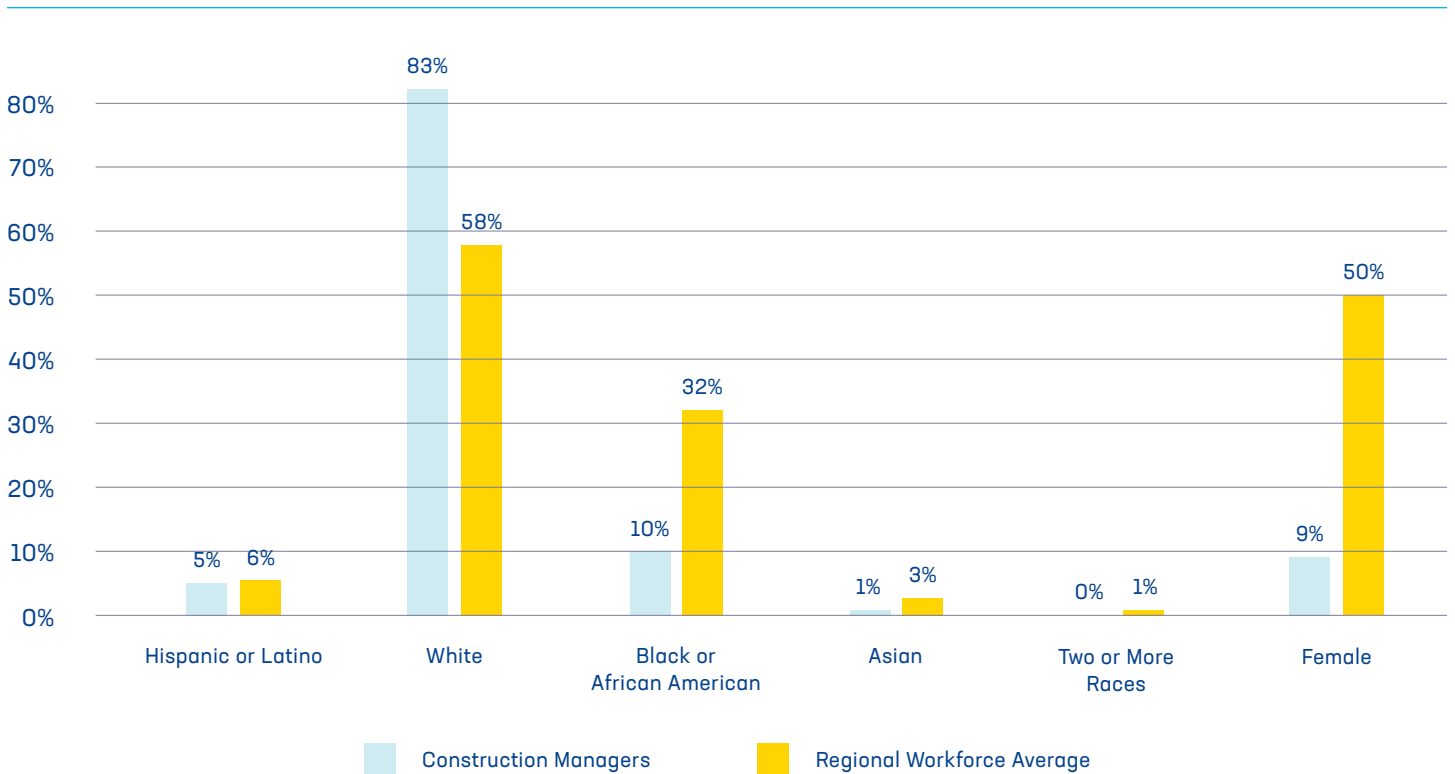
- 3,310 jobs in the Greater New Orleans area
- Additional nine jobs sustained over three years
- Median annual earnings: \$92,269 (\$44.36/hr)

- Bachelor's Degree
- No experience required

- Fire-Prevention and Protection Engineers

### RELATED OCCUPATIONS

- Civil Engineers
- Transportation Engineers



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

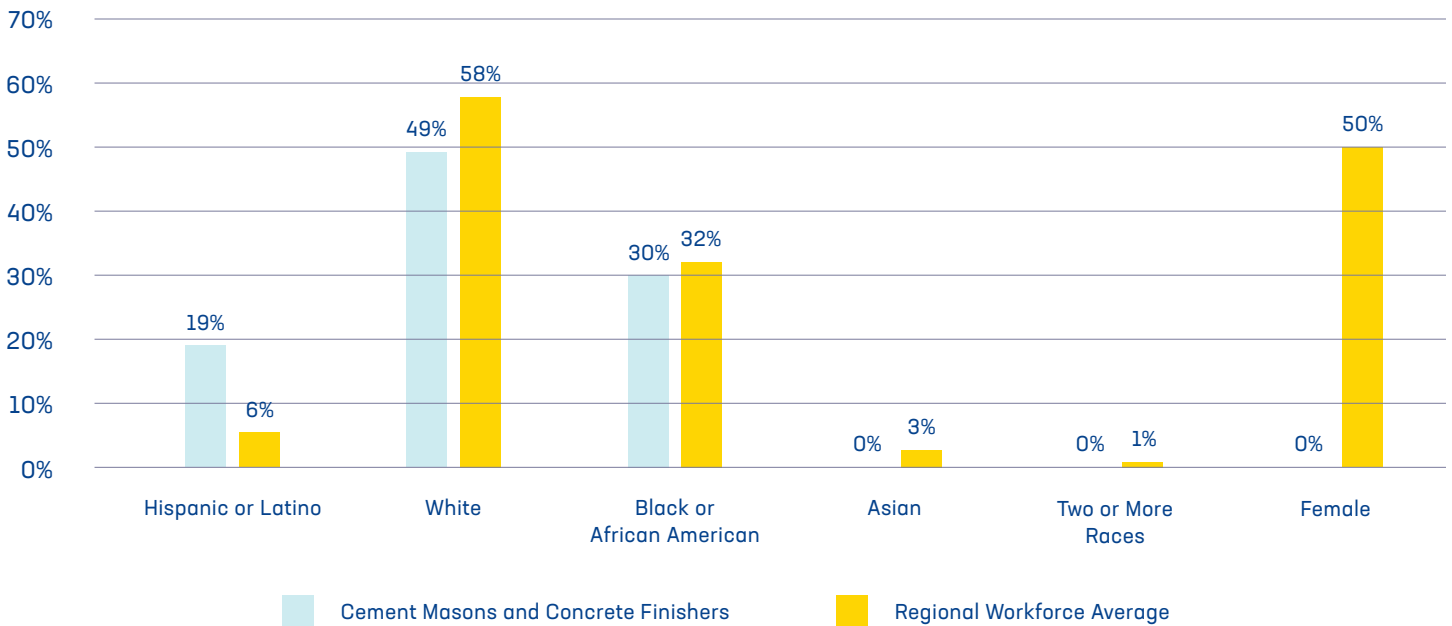
KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Building and Construction</li> <li>• English Language</li> <li>• Engineering and Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Active Listening</li> <li>• Speaking</li> <li>• Critical Thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Problem Sensitivity</li> <li>• Information Ordering</li> <li>• Deductive Reasoning</li> </ul>

## CEMENT MASONS AND CONCRETE FINISHERS

- 606 jobs in the Greater New Orleans area
- Additional two jobs sustained over three years
- Median annual earnings: \$34,441 (\$16.56/hr)
- No formal education requirements
- No experience required
- Terrazzo Workers and Finishers

### RELATED OCCUPATIONS

- Brickmasons and Blockmasons
- Construction Carpenters



## TOP KNOWLEDGE, SKILLS, AND ABILITIES

KNOWLEDGE	SKILLS	ABILITIES
<ul style="list-style-type: none"> <li>• Building and Construction</li> <li>• English Language</li> <li>• Mathematics</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring</li> <li>• Time Management</li> <li>• Quality Control Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Manual Dexterity</li> <li>• Trunk Strength</li> <li>• Multi-limb Coordination</li> </ul>



## APPENDIX B: METHODOLOGY

The data for this report were collected through a variety of methods and sources. Each of these methods are outlined below.

### SECONDARY RESEARCH

Employment, demographic, and poverty figures at the zip code level were obtained from the U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates.

BW Research utilized EMSI for demographic information across occupations. EMSI was also used to determine staffing patterns across the three primary NAICS codes: Other heavy and civil engineering construction (237110), Landscaping services (561730), and Highway, street, and bridge construction (237310).

#### Definitions

- NAICS are the North American Industry Classification System that is standard to federal agencies dealing with employment data. These codes allow industries to be categorized and quantified.
- EMSI is a labor market analysis tool that provides employment data.
- IMPLAN is an online input-output economic impact model that approximates the effects of current or additional economic activity within a given region.

## ECONOMIC IMPACT MODELING

### Green Infrastructure Projects

With the help of the Greater New Orleans Foundation as well as the City of New Orleans and Sewerage and Water Board of New Orleans staff, 26 green infrastructure projects were identified, totaling \$241 million. These 26 projects are listed in Appendix C. After consulting with several green infrastructure contractors, the research team reduced this amount to \$218 million to account for the architectural and design fees included in the original contracts. The projects were then classified into three categories based on the composition of the work they required; primarily landscaping, primarily construction, or a more equal mix of both landscaping and construction. To develop budget allocations for each of these project categories, the research team used several national and local projects that reflected the broad range of green infrastructure projects. These sample projects were then categorized in the same manner of the New Orleans projects, and their segmented budgets were used to get an approximate share of spending across each type of activity. These estimates were then used to approximate the spending share of New Orleans projects. The research team then aggregated the spending of each activity (i.e. hardscaping, landscaping, and water management infrastructure) and used these values as inputs for the IMPLAN economic modeling. Initial estimates were based on project completion over a one-year timeline. Both IMPLAN and EMSI input-output modeling were used to attain the staffing patterns of the projects.

## APPENDIX C: GREEN INFRASTRUCTURE PROJECTS

The list below contains all 26 projects that are active or planned to take place within the next three years. The list of projects were provided by the City of New Orleans, the Sewerage and Water Board of New Orleans, and other project partners.

### Green Infrastructure

- Oak Park
- Lakeview<sup>9</sup>
- Hagan Lafitte
- Pontilly
- St. Roch
- Broadmoor
- Mirabeau Water Garden
- Lakeview City Park
- Blue Green Corridors
- Dillard Wetland
- Microgrids
- Milne Campus
- Pontilly Neighborhood Green Infrastructure
- St. Anthony Green Streets
- St. Bernard Stormwater Management (Willie Hall Playground)
- Energy Redundancy and Monitoring
- Water Monitoring Network
- NORA Community Adaptation Program
- Pontilly Neighborhood Green Infrastructure (Canal Park)
- Aurora Rain Gardens - 2019/2020 Maintenance
- SWB Downtown St. Joseph St. Administration Building Green Roof 2019/2020 Maintenance
- Paul Habans Charter School Educational Stormwater Center
- 2020-2021 Aurora Gardens Maintenance
- 2020-2021 Saint Joseph Green Roof maintenance
- Bayou St. John GI Demonstration Project

Note: The Economic Impact modeling does not include any permeable pavement projects that will come out of the Permeable Pavement Ordinance approved by the New Orleans City Council in May 2020, which mandates the use of permeable paving materials on any public works project involving the permanent installation of paving on public property. As of the publication of this report, we do not have details on how this ordinance will be operationalized. This ordinance may lead to an increase in jobs involved in installing and maintaining permeable pavement.

## APPENDIX D: CURRENT AND PROPOSED GI PROJECT TIMELINES

### COMMUNITY BASED AND NONPROFIT ORGANIZATIONS

Attendee	Organization
Katherine Prevost	Bunny Friend Neighborhood Association
Sherry Callaway	Limitless Vistas, Inc.
Elizabeth Cornell	Limitless Vistas, Inc.
Jeanie Donovan	Louisiana Department of Health
Angela Shiloh- Cryer	New Orleans Business Alliance
Patrick McManus	NextOp Vets
Chuck Morse	Thrive NOLA
J Kelly Terry	Total Community Action
Cherie LaCour-Duckworth	Urban League of Louisiana
Toya Crosby	Urban League of Louisiana
Ronnie King, Jr	Urban League of Louisiana
Jeffrey Supak	Water Wise Gulf South

### PROGRAM ALUMNI

Attendee	Organization
Allison L. Chapital	Deep South Center for Environmental Justice
Isaac Julian	Deep South Center for Environmental Justice
Kermit Borden	Deep South Center for Environmental Justice
Denzal Peters	GroundWorkNOLA
Derrick Copelin	GroundWorkNOLA
Shamone Marshall	LA Green Corp
Tokia Gray	LA Green Corp
Joshua Carter	LA Green Corp
Eric McMorris	unCommonConstruction

### PRELIMINARY FINDINGS CONVENING

Attendee	Organization
Courtney Stuckwisch Wong	City of New Orleans
Jeffrey Schwartz	City of New Orleans
Tammie Washington	City Of New Orleans Office of Workforce Development
Danielle Duhe	DBA
Kim Tubre	Delgado Community College
Dan Johnson	Greenman Dan, Inc.
Kim Rugon	Goodwill Industries
Todd Reynolds	Groundwork New Orleans
Glen Armantrout	JMH Hospitality
Sherry Callaway	Limitless Vistas, Inc.
Monique Pilie	Louisiana Green Corps
Willie Autman	Louisiana Green Corps
Arien Hall	Mastodonte LLC
Luisa Abballe	Mastodonte LLC
Sunae Villavaso	Mayor's Office of Workforce Development
Ben Armstrong	NextOp
Chuck Morse	Thrive NOLA
Cherie LaCour-Duckwoth	Urban League of Louisiana

### EMPLOYERS

Attendee	Organization
Anthony Kendrick	Construction Ecoservices
Dan Johnson	Greenman Dan
Cedric Patin	JC Patin Group
Luisa Abballe	Mastodonte
Arien Hall	Mastodonte
Josh Torregano	Wingate Engineers

### TRAINING PROVIDERS

Attendee	Organization
Danielle Duhe	Dana Brown & Associates
Kim Tubre	Delgado Community College
Todd Reynolds	Groundwork New Orleans
Monique Pilie	Louisiana Green Corps
Aaron Frumin	unCommon Construction
Taylor Holloway	unCommon Construction



**Center for Philanthropy**

919 St. Charles Avenue  
New Orleans, Louisiana 70130

504.598.4663 | [www.gnof.org](http://www.gnof.org)