



Complete



Streets for



Health



Equity



An Evaluation of New Orleans and Jefferson Parish

bikeeasy



Smart Growth America
Improving lives by improving communities



National Complete
Streets Coalition



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We would also like to thank the members of both the New Orleans and Jefferson Parish Complete Streets Coalitions for taking the time to review and refine the content of this report. Additionally, we are grateful to the following organizations for their willingness to share data with us as well as for the great efforts extended to collect these data and review some of our analyses. This includes the City of New Orleans Department of Public Works, Office of Resilience and Sustainability, Health Department, and Office of Performance and Accountability; the Jefferson Parish Engineering Department and Planning Department; the New Orleans Regional Planning Commission; and the Louisiana Department of Transportation and Development. These organizations are not responsible for any errors existing in the data or for any errors arising from alterations that we made to the data.

PROJECT TEAM

This report was prepared through a collaborative effort by staff at the National Complete Streets Coalition and Bike Easy. Heather Zaccaro, Health Program Associate at the National Complete Streets Coalition led the analysis, writing, and layout of this report under the guidance and leadership of Emiko Atherton, Director of the National Complete Streets Coalition. Smart Growth America staff also contributed to this report by assisting with data cleaning and reviewing the content of the report including Geoff Anderson, President and CEO; Steve Davis, Director of Communications; Michael Rodriguez, Director of Research; Samuel Sklar, Program Associate; and Brian Lutenecker, Program Fellow.

The initial vision for this report came from Dan Favre, Executive Director of Bike Easy who contributed extensively to its production by compiling much of the data and providing feedback on the content and analysis every step of the way. Other Bike Easy team members who played a significant role in refining and rewriting this report include Robert Henig Bell, Campaign Organizer and Oliver Anderson, Campaign Assistant.

Cover photo courtesy of Thomas Chapin.



I. FOREWORD FROM BIKE EASY

At Bike Easy, we believe in the power of bicycling to help create a healthy, resilient, and equitable future for all the people of Greater New Orleans. We know that streets safe for bicycling are also safe for walking, taking transit, and driving. As individuals, organizations, and governments work to tackle the critical issues in the region - poor health outcomes and inequity, economic development and job access, crime and public safety, affordable housing, flooding and impacts of climate change - it is becoming clear that how people move, or struggle to move, affects so many aspects of life and levels of decision-making.

Safe, convenient transportation options for everyone in greater New Orleans are essential to our vision of an equitable, vibrant future. People of all ages and abilities must be able to bike, walk, and take transit no matter how much they earn or where they live. Streets built to share and that prioritize health equity offer a path towards realizing this vision, and so we are excited to present the detailed “Complete Streets for Health Equity” framework in this report.

This approach champions a regional vision of transportation. Yet, due to time and resources, our efforts focus on the two most populous jurisdictions in Greater New Orleans. We didn’t have room for the recent achievements in other places around the region, like St. Bernard Parish and the City of Gretna. However, the framework and performance measures in this report will help any jurisdiction track their progress and chart a path to safer and more active communities.

Resilience is inextricably linked to Complete Streets. While this report suggests tracking green infrastructure and stormwater management, there is room for expanded analysis of how streets can mitigate flooding and other vulnerabilities. We also cannot ignore the real and perceived impacts of biking, walking, and transit amenities on gentrification and displacement as Greater New Orleans faces an affordable housing crisis. New ways are needed to track how housing and transportation combined impact low-income neighborhoods.

An important factor not addressed in this report is crime. Studies have found that, especially among people of color, often just behind concerns regarding traffic safety, it is fear of crime and personal safety that keeps people from biking or walking.¹ By developing systems to incorporate crime data with analyses suggested in this report, the concept of Complete Streets can grow to systematically incorporate public safety features such as street lighting.

We at Bike Easy are incredibly proud of the work presented in the following pages. When this idea was first proposed, I assumed it would be a matter of applying a general framework of Complete Streets measures to the specifics of our region. As it turned out, that framework didn’t exist, so we took advantage of our own recent history to create it. Thanks to all the people who helped make this report a reality. We look forward to working with the City of New Orleans, Jefferson Parish, the State of Louisiana - as well as advocates, organizations, and governments around the country - to build streets that improve our health, economic access, community resilience, environmental sustainability, and quality-of-life.

Dan Favre
Executive Director

II. INTRODUCTION

Complete Streets is a fundamentally different approach to transportation planning, design, and engineering than the status quo of the last half century. It requires that all aspects of decision-making and implementation consider the needs of all people who use a road, regardless of age, ability, or mode of transportation. Streets are viewed as more than ways to move as many vehicles as possible. They are public spaces that connect and contribute to everything that surrounds them.

Complete Streets are built so people walking, biking, riding public transit, and driving can safely share the road. They expand access to opportunities by improving connections between where we live and where we work, learn, play, eat, worship, shop, and socialize.

New Orleans adopted a Complete Streets ordinance in 2011.² Since then, the city more than doubled its bicycle network, and biking trips have increased. However, many of the ordinance's promises, including annual reports measuring success of the Complete Street program, remain unfulfilled. Neighboring Jefferson Parish passed a Bicycle Master Plan in 2014 and is currently investing almost \$56 million in projects that include walking and biking amenities, but there is currently no comprehensive Complete Streets program or evaluation. Major opportunities remain in both New Orleans and Jefferson Parish to create safer, healthier streets that provide more transportation choices and better connections to jobs and essential services, particularly in low-income areas.

This report demonstrates how jurisdictions, including the City of New Orleans and Jefferson Parish, can measure the performance of their Complete Streets and active transportation programs without conducting new or expensive large-scale data collection.

This report establishes an approach to evaluate Complete Streets programs with a focus on health equity for the City of New Orleans, Jefferson Parish, and other jurisdictions around the United States. The analysis identifies those populations facing the greatest health and safety risks and focuses on how Complete Streets can better serve these vulnerable communities.

This report pays particular attention to whether Complete Streets benefit people and places with high rates of poverty and chronic disease. Other communities across the country can replicate this approach, even if they have limited technical experience or strained staff capacity. We provide recommendations for how jurisdictions can scale up and improve these efforts moving forward.

Complete Streets can benefit low-income neighborhoods and communities of color that have historically not had much investment in biking, walking, and public transit facilities. Members of these communities experience disproportionate rates of chronic diseases, are at higher risk of being struck and killed by cars while walking, and are less likely to own a car. If jurisdictions implement policies that prioritize those most vulnerable to unsafe traffic conditions and health risks, the opportunities for benefits are enormous.



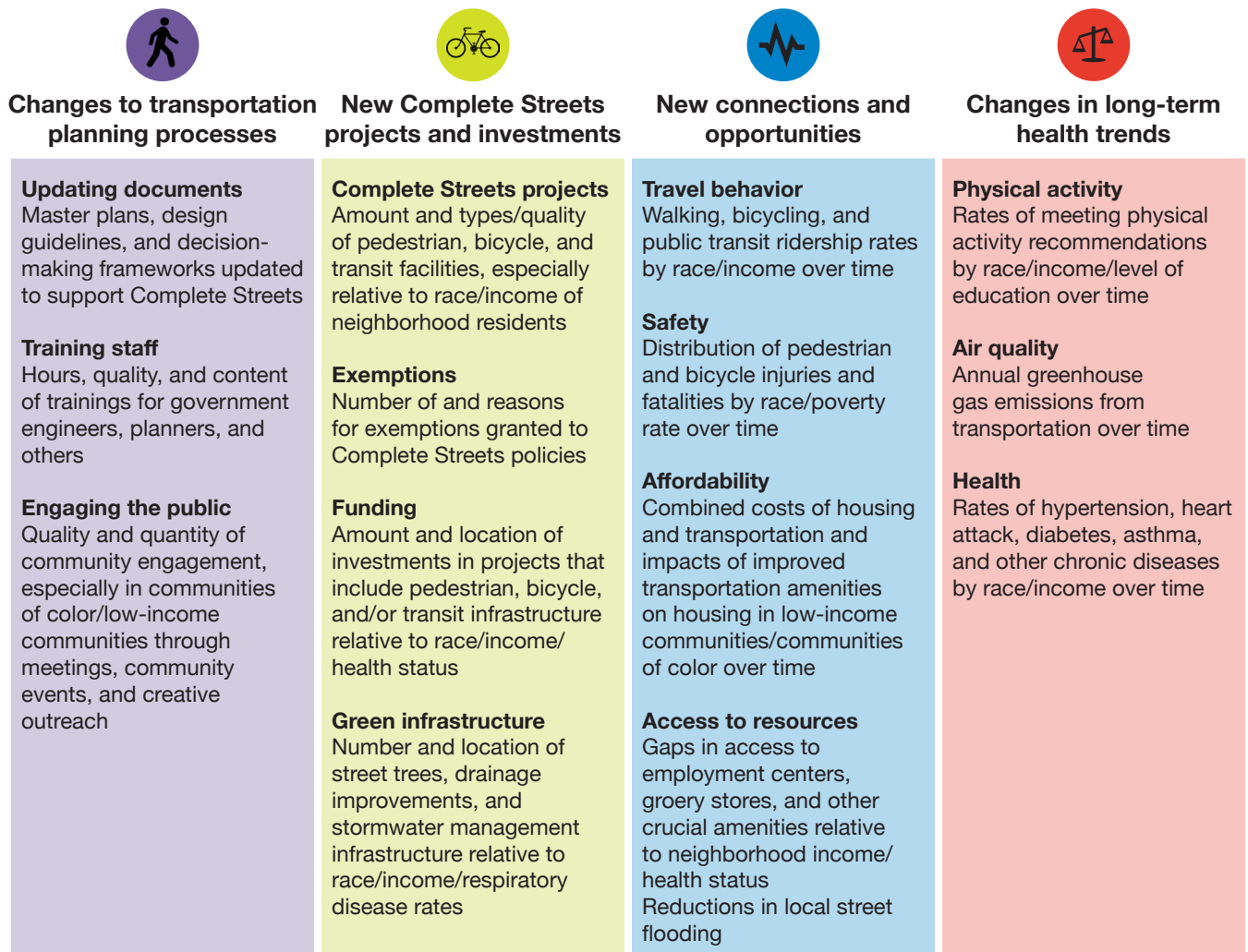
Based on the National Complete Streets Coalition’s research and experience working with state and local departments of transportation, we have compiled the following list of recommended performance measures to evaluate Complete Streets through a health equity lens. In this report, we apply this evaluation approach to New Orleans and Jefferson Parish. By doing so, we identify ways for these two jurisdictions to increase the benefits from their Complete Streets investments. We hope this approach will serve as a guide for jurisdictions around the country to measure the success of their own Complete Streets programs with health equity in mind.

In Louisiana, people earning under \$15,000 annually are approximately three times more likely to have diabetes in their lifetimes than people earning over \$50,000 annually.

In New Orleans and Jefferson Parish, 36% of people live in high-poverty census tracts yet over 67% of crashes involving people biking or walking occur in these places.

In 2015, black people took about 25% of the bike rides counted in the City of New Orleans but accounted for almost half of bicycle injuries and fatalities.

Figure 1. Recommended performance measures



III. COMPLETE STREETS FOR HEALTH EQUITY: EVALUATION APPROACH

A **Complete Streets** approach means designing and operating street networks to serve all people who use them regardless of age, ability, income, race, or mode of transportation. This requires balancing the needs of all of these groups every time decisions are made about the planning, funding, maintenance, and operation of the transportation system.

To date, over 1,300 jurisdictions across the United States have adopted Complete Streets policies. Many of these communities are doing so because they realize the health benefits of Complete Streets. By making walking and biking more convenient, Complete Streets can promote exercise and reduce pollution from vehicles. This can lead to healthier lifestyles and better air quality, reducing rates of diabetes, asthma, and other chronic diseases. Streets that function better for everyone are also safer for everyone, including people walking, biking, riding public transit, and driving.

This report provides a starting point for the City of New Orleans and Jefferson Parish to evaluate Complete Streets implementation through the lens of **health equity**, defined by *Healthy People 2020* as “attainment of the highest level of health for all people.”³ Growing up in places with less access to healthy foods, quality schools, job opportunities, healthcare, and other resources that enable people to thrive can undermine well being, leading to huge inequities in the health of residents, based solely on their zip codes. By focusing on health equity in our evaluation, we seek to better understand these disparities and how Complete Streets can help address them.

Why evaluate?



(Photo: Thomas Chapin)

Performance measures are vital to analyzing how well transportation investments are achieving their goals. Evaluating Complete Streets programs can:

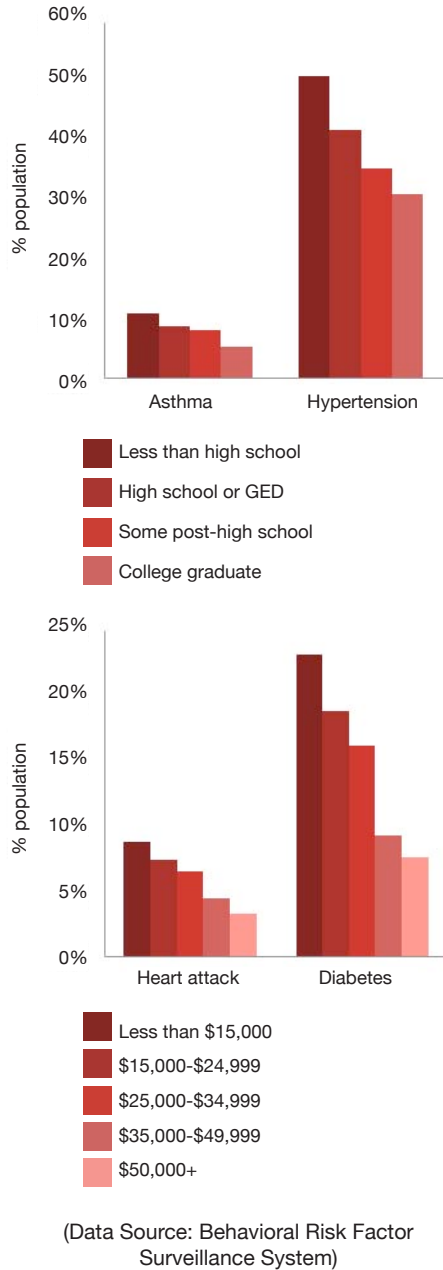
- Demonstrate progress toward goals, which can generate momentum for further improvements by reinforcing the benefits of Complete Streets to funders, decision-makers, advocates, and community stakeholders.⁴
- Identify gaps and barriers to implementation so decision-makers can prioritize future projects and investments where they are most needed.⁵
- Hold these programs accountable in order to implement Complete Streets in an equitable and efficient manner.⁶

This report focuses on developing specific performance measures that illuminate health disparities and emphasize how changes to the transportation system can help to overcome them.



Why health equity?

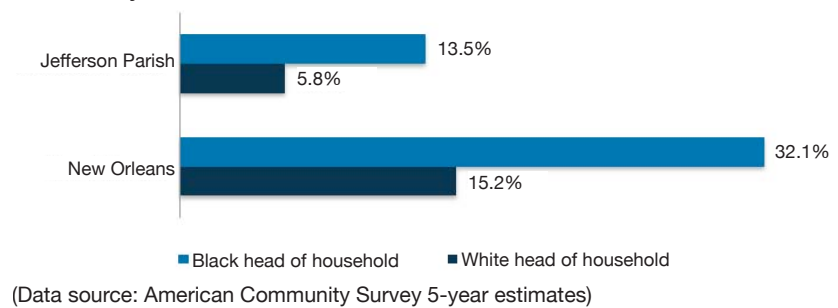
Figure 2. Statewide health disparities by education and income in Louisiana, 2015



According to *Healthy People 2020*, a federal program addressing national health priorities, “**social determinants of health** are conditions in the environment in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.”⁷ Put another way, where people live — and the built environment that surrounds them — plays a large role in determining their life expectancy and their overall health by making it easier or more difficult for people to afford or access health care, healthy foods, high-quality schools, and other vital resources.⁸

Complete Streets influence health. They provide connections to these resources, particularly for those who do not have access to a personal vehicle and depend on having safe, convenient routes to walk, bike, or ride public transit to reach these destinations. Complete Streets also promote healthy lifestyles. Recent guidance by the Centers for Disease Control and Prevention recommends Complete Streets improvements as an intervention to encourage physical activity, which reduces risk of chronic diseases.⁹

Figure 3. Percentage of households without access to a personal vehicle by race in New Orleans and Jefferson Parish, 2015



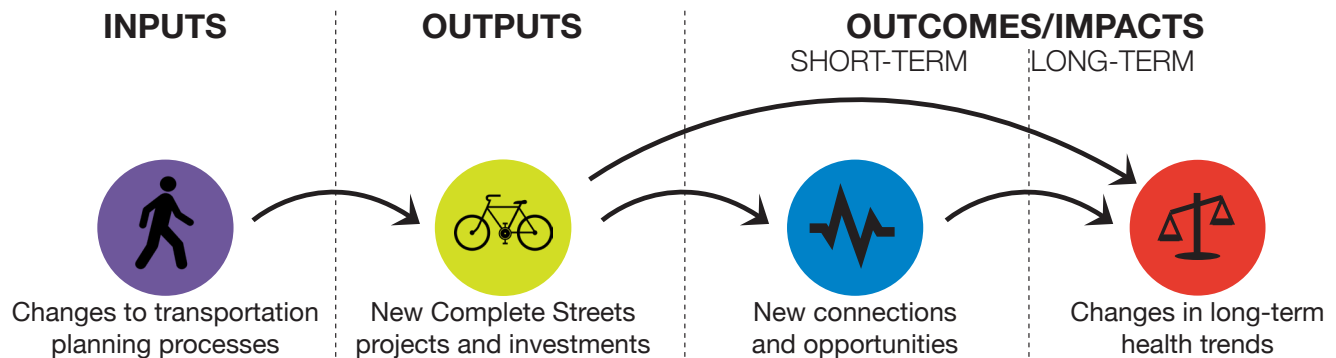
Across Louisiana and the nation, both low-income communities and communities of color experience worse overall health outcomes, including higher rates of chronic diseases such as diabetes, asthma and decreased average life expectancy.¹⁰ These same communities are also more likely to be struck and killed by cars while walking and tend to live in places without adequate sidewalks and crosswalks thanks in part to decades of discriminatory housing and transportation policies.¹¹⁻¹²

By evaluating Complete Streets through a health equity lens, we hope to bring health equity to the forefront of the conversation on transportation and highlight the importance of providing equitable access to resources and opportunities regardless of age, ability, race, income, or mode of transportation.

Evaluation approach

To evaluate Complete Streets through a health equity lens, we compiled a list of performance measures designed to help jurisdictions identify and prioritize the groups that stand to gain the most from Complete Streets implementation. For an explanation of why we chose the performance measures we did, where our data comes from, and how we analyzed these data, consult the Appendices.

Figure 4. Evaluation approach



These performance measures fall under four categories:

- Changes to transportation planning processes** are actions taken by the jurisdiction to make Complete Streets a routine part of transportation planning. Through our work at the National Complete Streets Coalition with jurisdictions around the country, we have learned that embedding a Complete Streets approach in day-to-day transportation decisions requires updating master plans, design guidelines, and project selection criteria; undertaking staff training and public engagement; and regularly reporting on progress to the public.^{4-5,13} These steps change how jurisdictions carry out their work and how they make decisions about their streets, leading to new projects and investments.
- New Complete Streets projects and investments** are how a Complete Streets program makes changes on the ground. This includes funds invested in Complete Streets improvements as well as building and improving infrastructure to support walking, biking, and riding public transit. Jurisdictions should prioritize these investments in neighborhoods with low access to opportunities and disparities in health and safety, and we measure this by examining where jurisdictions choose to invest in and build Complete Streets.
- New connections and opportunities** encompass the short-term changes to travel behavior, traffic safety, affordability, and access to community resources following improvements to the transportation network. By looking at how these benefits vary by race, ethnicity, and income, we can identify the people and places that stand to benefit the most from Complete Streets improvements.
- Changes in long-term health trends** result from many different factors, including people's lifestyles and features of the places where they live and work. Complete Streets improvements, in conjunction with other public health initiatives, can work toward improving health by promoting physical activity, which reduces the risk of chronic diseases. Complete Streets programs should prioritize the places where these diseases are most prevalent, including low-income communities and communities of color.



IV. RESULTS FROM NEW ORLEANS AND JEFFERSON PARISH

In this section, we apply our evaluation approach to New Orleans and Jefferson Parish. We analyze a subset of the performance measurements recommended in **Figure 1** wherever data were available either publicly or through local, regional, and state partners.

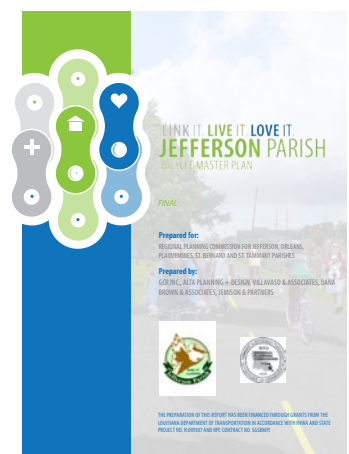
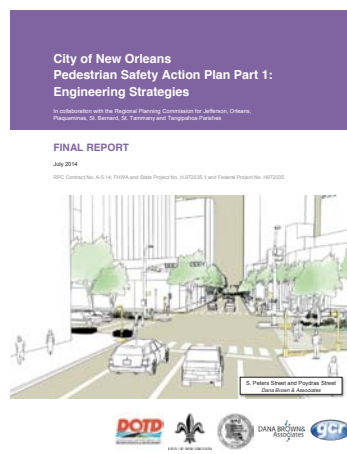


Changes to transportation planning processes

Updating documents

Adopting a Complete Streets policy is often the first step to launching a Complete Streets program in a jurisdiction. The strongest policies call for updates to master plans, design guidelines, and other guiding documents to embed a Complete Streets approach in day-to-day transportation decisions.

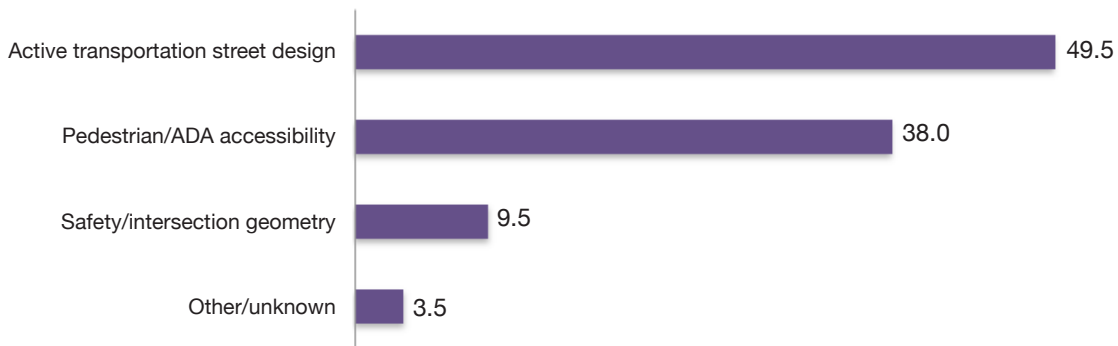
Figure 5. Timeline of document updates and related actions in New Orleans and Jefferson Parish



Training staff

Staff trainings ensure that transportation officials understand and apply best practices of designing streets built to share for people who bike, walk, drive, and take public transit. Staff training in New Orleans and Jefferson Parish have been very limited. New Orleans does not publicly record information about staff training, and in Jefferson Parish, only three staff members from the Engineering Department reported attending a few recent trainings relevant to Complete Streets implementation. Moving forward, both jurisdictions should routinely record who is attending these trainings and offer their own Complete Streets trainings to all transportation staff as standard practice.

Figure 6. Person-hours of staff training by topic in Jefferson Parish



(Data source: Jefferson Parish Engineering Department)

Figure 7. Complete Streets champion spotlight: Lillie D. Fleury



My name is **Lillie D. Fleury**, a native, Afro-creole New Orleanian who has lived here all of my life. I have been involved in educational institutions for almost all of my adult life and am presently working at Delgado Community College. I am married and am the proud mother of two exceptional young women who likewise are lifelong residents (save for our four-month forced exile after Hurricane Katrina). I'm a mentor to dozens of others and see myself as an advocate for the less fortunate through my participation in multiple religious, civic, social and political organizations and groups. I am an avid bike rider, love doing social rides, and am a Complete Streets Ambassador with Bike Easy. I am also one of the founding members of the Gentilly Riders, which is composed of about 74 bike riders between the ages of 7- 75. I am totally committed to this home of mine — my family is deeply rooted here, going back to at least the early 1800s — and my intentions are to pass this unique, cultural heritage of New Orleans on to any and all of genuine spirit with whom I come into contact.

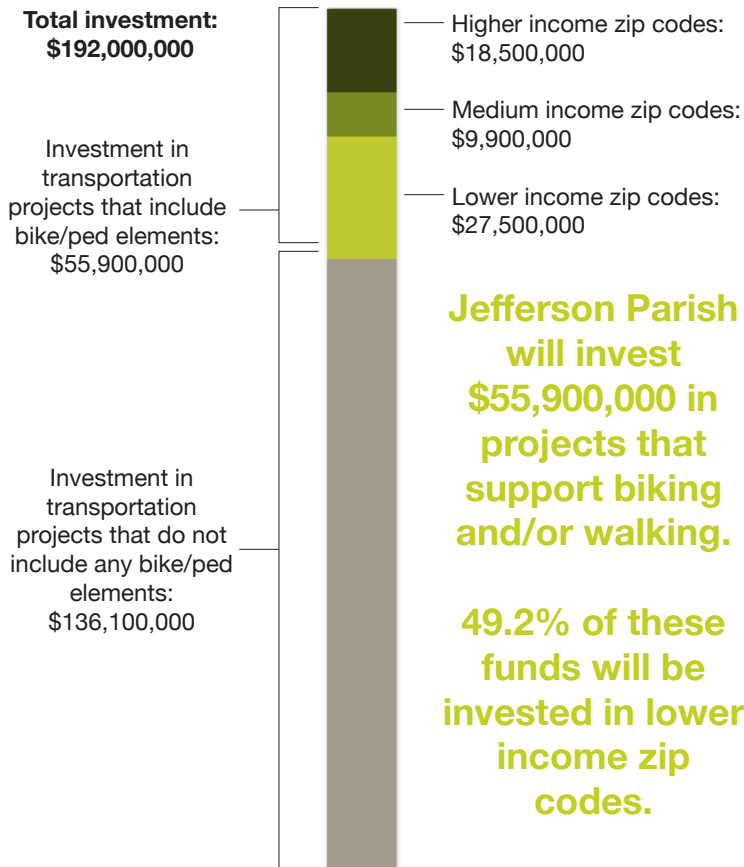


New Complete Streets projects & investments

Funding

In December 2016, Jefferson Parish voters passed a ballot measure to invest \$192 million in transportation. About 30 percent of this funding will go toward projects that include bicycle and pedestrian facilities, and just over half of those funds will be invested in zip codes where mean household income is significantly lower than the parish overall. In total, Jefferson Parish plans to spend almost \$56 million on projects that support walking and biking, though the exact amount spent specifically on walking and biking infrastructure versus other project costs is unknown.

Figure 8. Planned investment in active transportation infrastructure projects by relative income status in Jefferson Parish zip codes, 2017



(Data source: Jefferson Parish Engineering Department)

Figure 9. Complete Streets champion spotlight: Merrick Brown

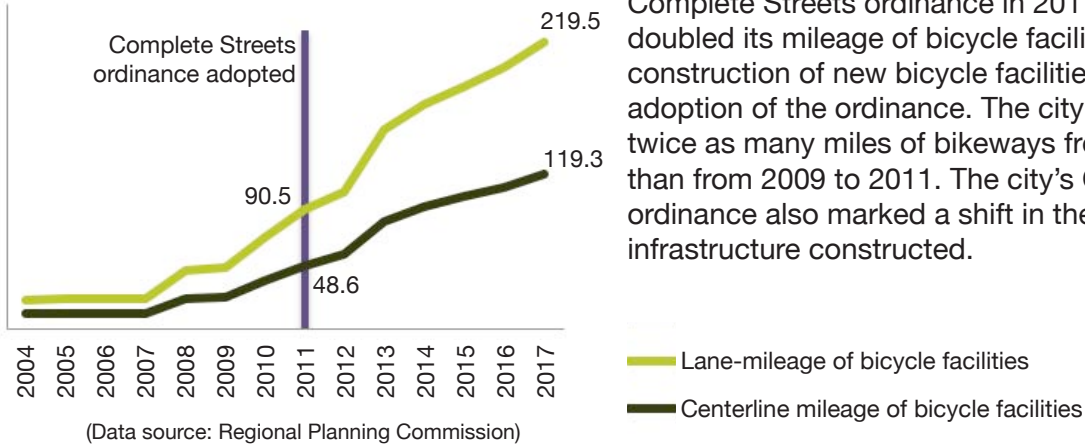


I'm **Merrick Brown**. I'm an electrician and retired from the Navy. I grew up in the Seventh Ward and currently reside there. I bike for recreation, exercise and when practical, transportation. I support protected bike lanes and Complete Streets because they enhance the biking life of New Orleans. They provide a measure of protection for bikers and reduce drivers' apprehensions. A better cycling environment and greater education of all bikers, drivers and walkers can only lead to a more vibrant community encouraging more people to bike because they feel safer. Protected lanes separating bikers from motor vehicles give us a greater sense of security and helps to reduce friction with drivers. Not to mention, more and better bike lanes encourage bikers to get off the sidewalks, making them safer for people walking.



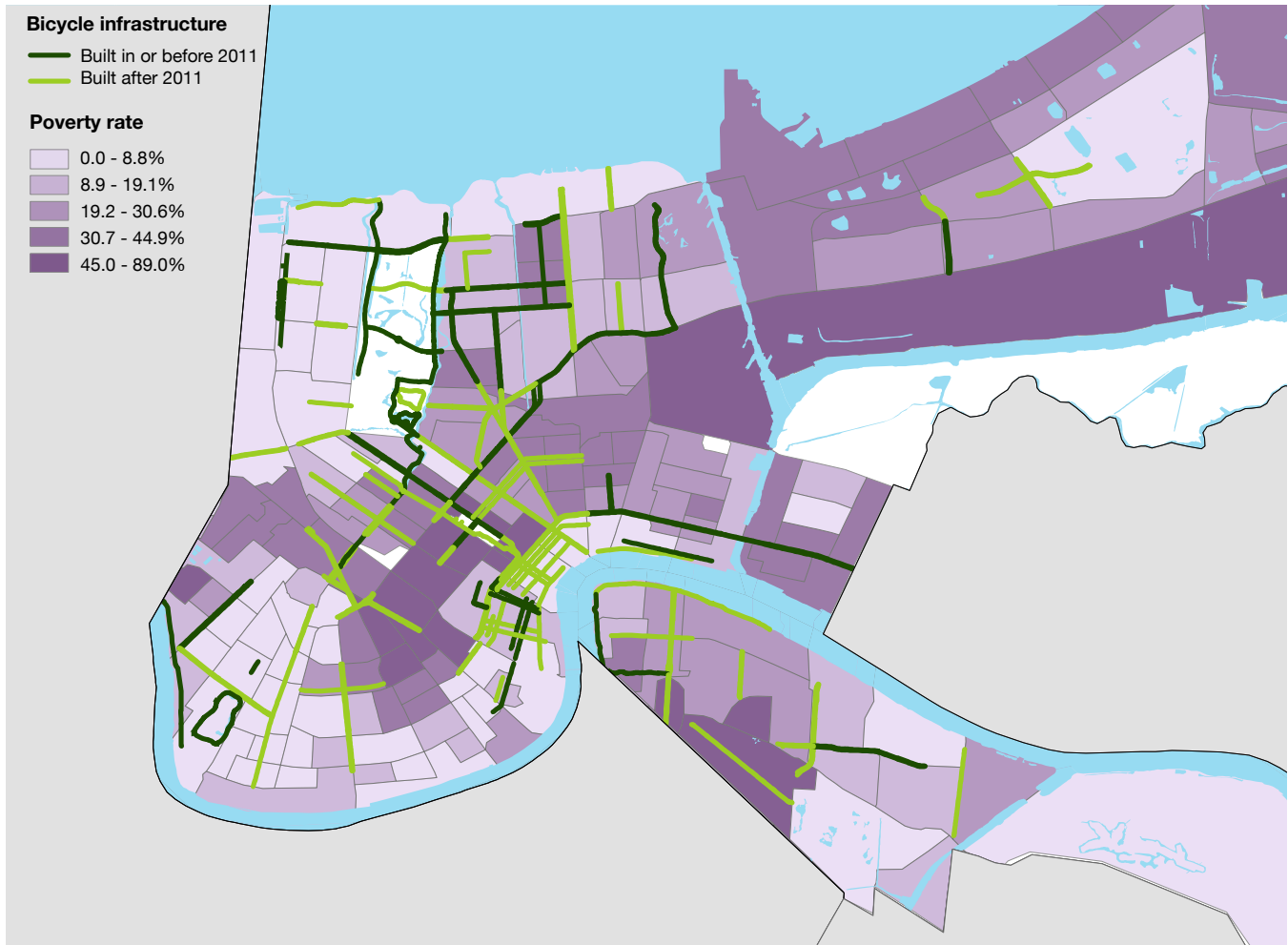
Complete Streets projects

Figure 10. Cumulative mileage of bicycle facilities in New Orleans, 2004-2017



Since the City of New Orleans adopted its comprehensive bicycle plan in 2010 and its Complete Streets ordinance in 2011, it has more than doubled its mileage of bicycle facilities. Additionally, construction of new bicycle facilities spiked following adoption of the ordinance. The city built almost twice as many miles of bikeways from 2012 to 2014 than from 2009 to 2011. The city's Complete Streets ordinance also marked a shift in the type of bicycle infrastructure constructed.

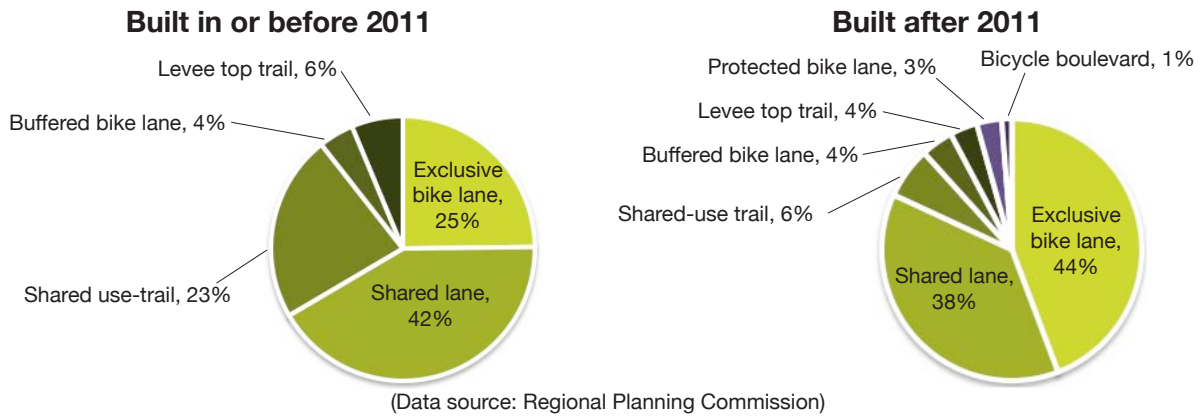
Figure 11. Bicycle infrastructure relative to poverty rate in New Orleans, 2016



(Data sources: New Orleans Open Data portal, American Community Survey 5-year estimates)

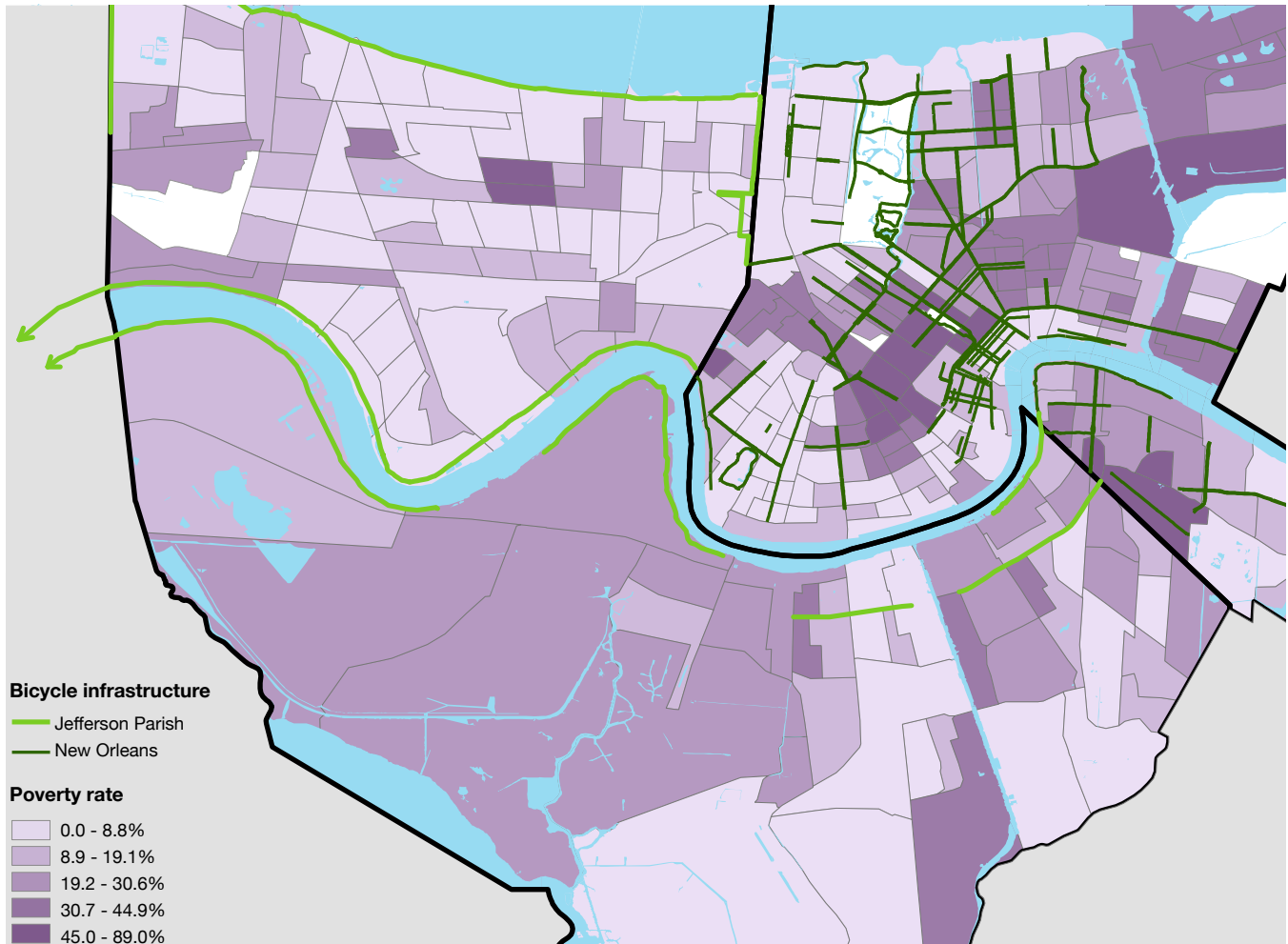


Figure 12. Bicycle facilities by type and construction date in New Orleans, 2004-2017



New Orleans’ bicycle network is most concentrated in and around the downtown area, but gaps exist in high poverty areas. Jefferson Parish’s 44 miles of bicycle infrastructure concentrate along waterways. While the network connects to bikeways in New Orleans, it does not currently reach most inland, residential areas in the parish, including many lower income neighborhoods.

Figure 13. Bicycle infrastructure relative to poverty rate in Jefferson Parish, 2016



(Data sources: Regional Planning Commission, New Orleans Open Data portal, American Community Survey 5-year estimates)

New connections & opportunities

Travel Behavior

The percentage of people who bike to work in New Orleans increased by more than 50% from 2011 to 2015. During this same time period, public transit commuting to work rose by almost 15% while rates of walking to work declined by almost 13%. In Jefferson Parish, rates of walking and biking to work remained relatively consistent from 2011 to 2015, and public transit ridership to work dropped by about 14%. These commuting modes vary substantially by race.

The percentage of people who bike to work in New Orleans increased by more than 50% from 2011 to 2015.

Figure 14. Mode of commuting to work by race and ethnicity in New Orleans, 2015

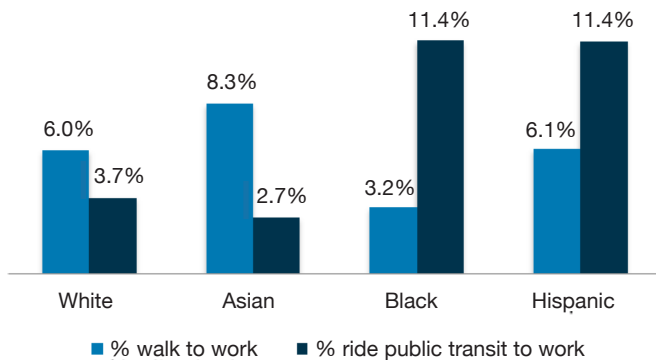
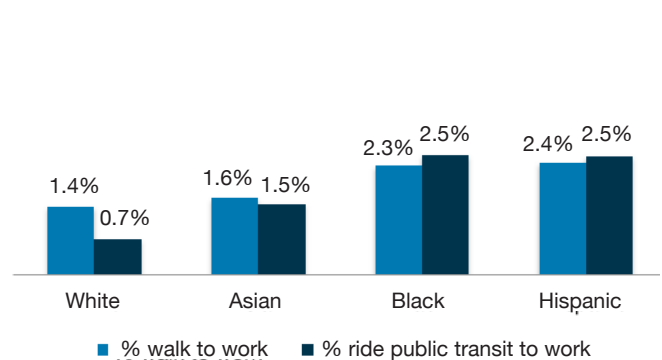


Figure 15. Mode of commuting to work by race and ethnicity in Jefferson Parish, 2015



(Data source: American Community Survey 5-year estimates)
 Note: ACS data do not report rates of biking to work by race

The number of trips taken by black bicyclists increased by 144.4% at select sites in New Orleans from 2010 to 2015.

Figure 16. Percentage increase in walking trips counted at select sites in New Orleans by race, 2010-2015

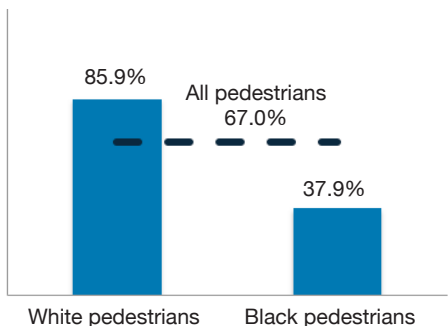
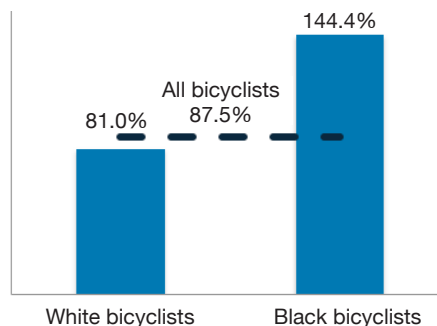


Figure 17. Percentage increase in biking trips counted at select sites in New Orleans by race, 2010-2015



The Regional Planning Commission counts walking and biking trips at select sites in the City of New Orleans. From 2010 to 2015, they observed increases in walking and biking trips overall, including trips for non-work purposes. These trends varied by race.

(Data source: Regional Planning Commission)



Figure 18. Complete Streets champion spotlight: Cheri Ben-lesau



Cheri Ben-lesau is an artist and writer who was born in Los Angeles, CA and now lives in Jefferson Parish. She joined the Coast Guard in 1986 and spent the next 25 years crisscrossing the U.S. for work. The Coast Guard brought her to Louisiana in the '90s, where, after marrying a local boy, she made New Orleans home.

Cheri's earliest memories of bikes was having to ride whatever machine she and her siblings could cobble together from junk they found. Schwinn was the name in bikes back then and a Varsity, well, that was the Rolls Royce of bikes. A complete, mechanically sound, matching bicycle was out of the family's socioeconomic scope, however. Still, early on she knew a day on a bike-any bike-was her kind of day.

Cheri has commuted by bike since her first duty station in the Coast Guard. It was in San Diego where the streets made a bike commute possible. It helped keep her in great shape for her job, was a pressure release for the associated stress, and as a bonus, she could get to work (or the beach, or wherever) faster than by car.

Years later, living in Jefferson Parish, Cheri was still commuting about 14 miles one way to work in New Orleans. She would take the levee trail the first nine miles, then up St. Charles or Prytania or Magazine on empty pre-dawn, pre-commuter streets. The ride home was a car-dodge until hitting the levee. Then she started to see bike paths. They made the commute safer and less stressful.

Cheri is working with Bike Easy as a Complete Streets Ambassador to work on increasing safety and access to bike lanes in Jefferson Parish. She would love to see, at a minimum, a few key protected lanes in Kenner to get people safely across the grid. Cheri currently "only" has four bikes and the most recent addition was, finally, that Schwinn Varsity.

Access to resources

Using Complete Streets to reduce disparities in health means prioritizing the projects that connect low-income residents to employment opportunities or neighborhoods with high rates of chronic disease to healthy foods. Mapping existing and missing bicycle connections to employment centers compared to neighborhoods with high rates of low-income residents can highlight key gaps in the network. Parts of New Orleans East, Algiers, the Upper and Lower Ninth Ward, Central City, Treme, the Seventh Ward, Hollygrove, and Leonidas have high percentages of low-income residents who lack access to employment centers via bicycle facilities.

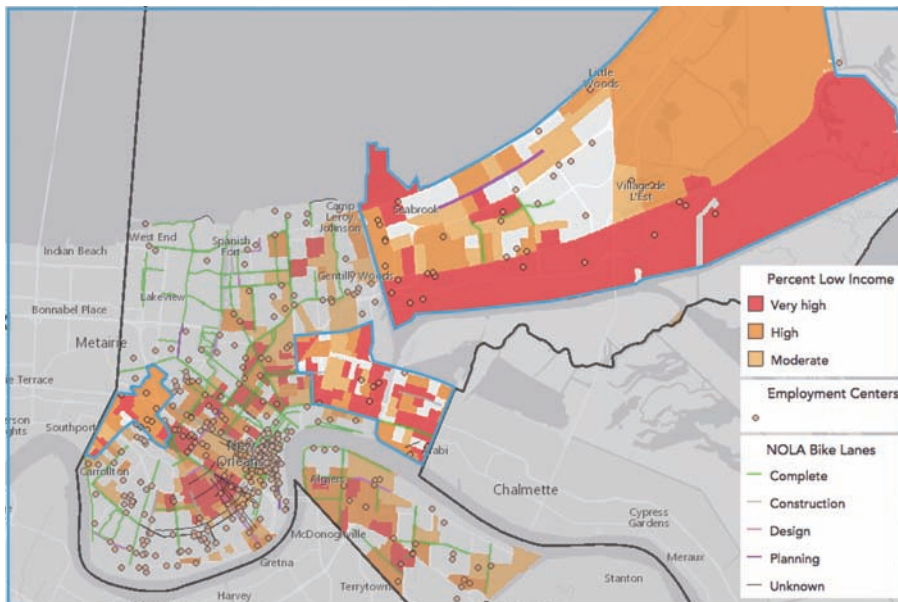


Figure 19. Access to employment centers in low-income neighborhoods in New Orleans, 2016

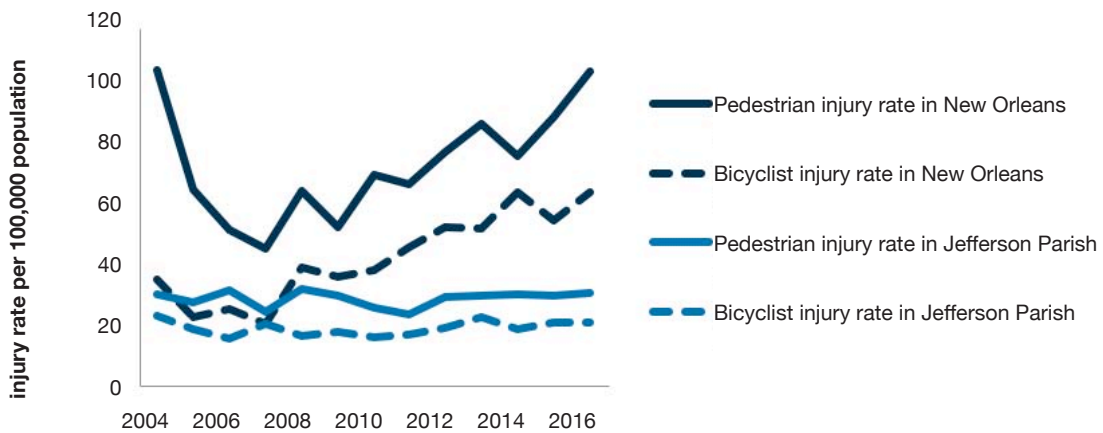
(Data source: Climate-Smart Cities Portal)



Safety

Between 2004 and 2016, 3,626 pedestrians and 2,066 bicyclists suffered minor to severe injuries in the City of New Orleans, while 130 pedestrians and 32 bicyclists were killed. Even after controlling for population changes following Hurricane Katrina in 2005, the reate of people being hurt or killed while walking or biking has risen over time. In Jefferson Parish 1,644 pedestrians and 1,082 bicyclists suffered minor to severe injuries between 2004 and 2016 while 99 pedestrians and 11 bicyclists were killed.

Figure 20. Pedestrian and bicyclist injury rates per 100,000 population in New Orleans and Jefferson Parish, 2004-2016

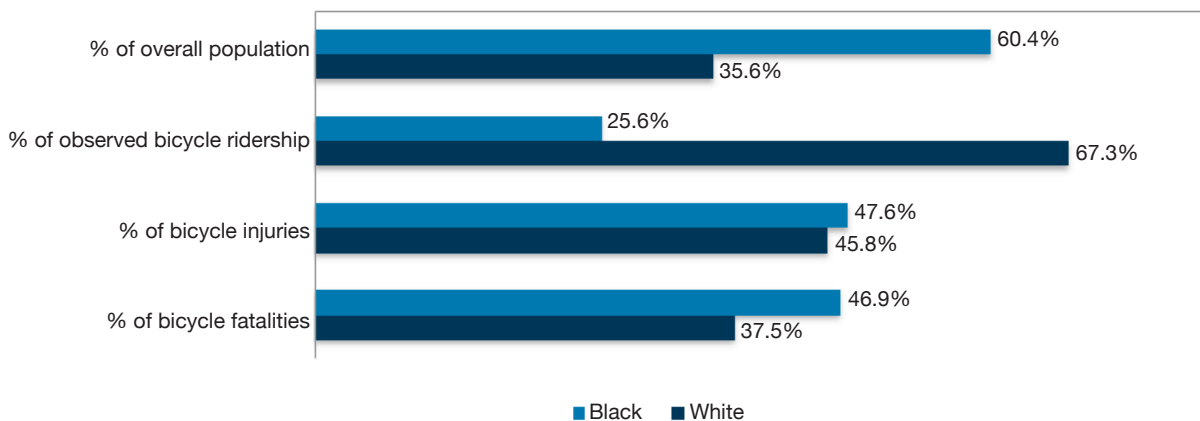


(Data source: Louisiana Department of Transportation and Development)

Black people in New Orleans and Jefferson Parish are at higher risk of being struck and killed while biking.

Black people in New Orleans are underrepresented in bike ridership but overrepresented in crashes involving bicyclists. Similarly, in Jefferson Parish, black individuals make up only about 26 percent of Jefferson Parish’s population but over 40 percent of bicycle injuries and fatalities. These crash data come from police reports, so it is also important to recognize that crashes involving black bicyclists in particular may be underreported due to tensions related to law enforcement and race.

Figure 21. Comparison of safety, ridership, and population trends by race in New Orleans



(Data sources: American Community Survey 2015 5-year estimates, Regional Planning Commission 2015, Louisiana Department of Transportation and Development 2004-2016)



Over time, more people are being struck and injured while walking and biking in New Orleans. However, the number of walking and biking trips is also changing. To understand how the risk of injury changes compared to the number of people are sharing the road, we divide injuries by population and modeshare to calculate a rate of injury per population walking or biking to work.

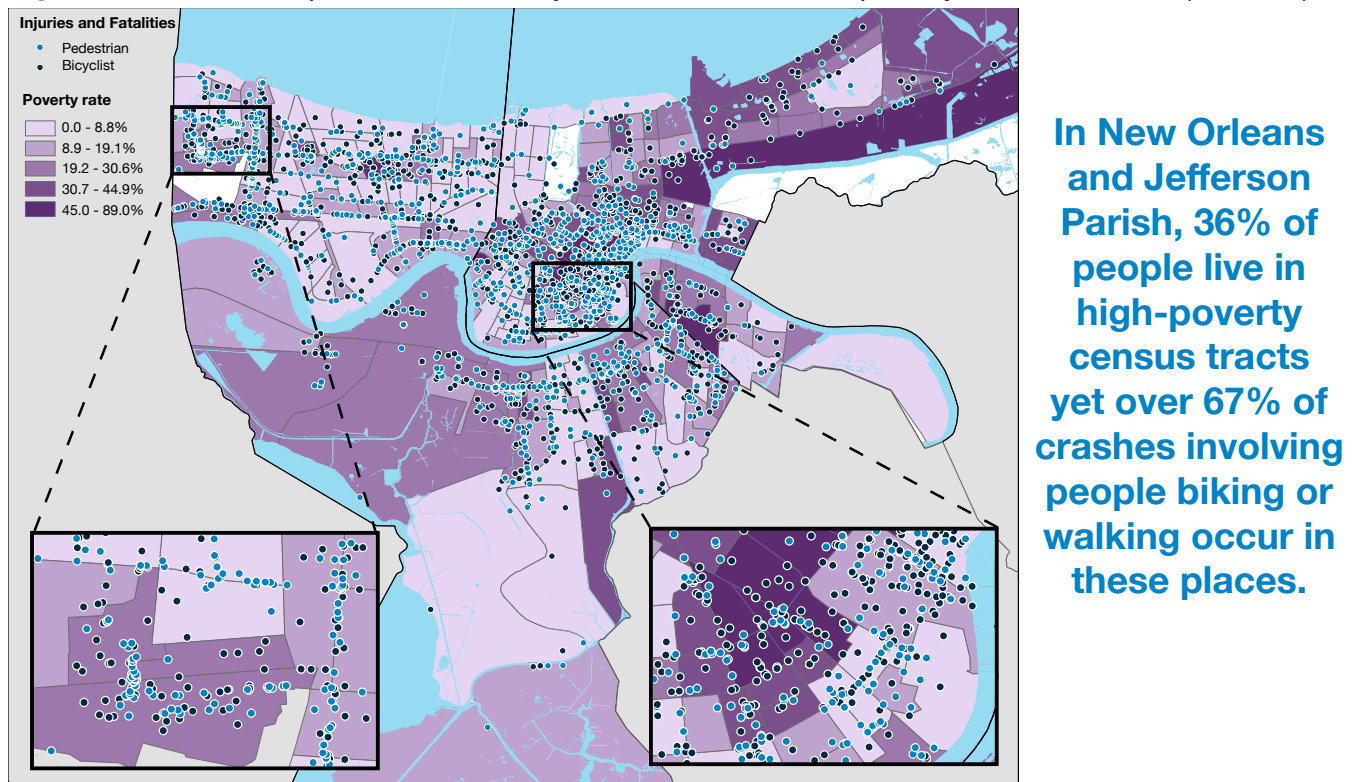
Figure 22. Pedestrian and bicyclist injuries per population walking and biking to work in New Orleans, 2009-2015



(Data sources: Louisiana Department of Transportation and Development, American Community Survey 5-year estimates)

Across both New Orleans and Jefferson Parish, people walking and biking tend to be hurt and killed in high poverty neighborhoods. About one third of the population lives in census tracts with poverty rates higher than 20%, but two thirds of crashes involving people biking or walking occur in these places. Specific areas most impacted include New Orleans East, Westbank New Orleans, and the city’s dense, downtown core. In Jefferson Parish, priority areas for safety improvements include central Metairie and Williams Boulevard.

Figure 23. Location of pedestrian and bicycle crashes relative to poverty rate, 2004-2016 (N=3,009)



(Data sources: Louisiana Department of Transportation and Development, American Community Survey 5-year estimates)



Changes to long-term health trends

Air Quality

Complete Streets may reduce harmful emissions by shifting some trips from driving to walking, biking, and riding public transit. Over time, this can improve air quality and reduce respiratory diseases like asthma. In New Orleans, households living in census tracts with bicycle infrastructure, which also tend to be dense, walkable, and centrally located, emit fewer greenhouse gas emissions from transportation than census tracts without bicycle facilities. Many factors besides Complete Streets contribute to these trends, but New Orleans should track air quality as the bicycle network extends outward from downtown areas.

Figure 24. Average annual greenhouse gas emissions per household in New Orleans census tracts with bicycle infrastructure versus without, 2015



(Data Source: Housing + Transportation Affordability Index)

Health

Complete Streets infrastructure provides opportunities for physical activity, which reduces chronic disease. Since 2011 when New Orleans passed its Complete Streets ordinance, health changes in the metropolitan region, which includes Jefferson Parish along with five other parishes, have been modest. Complete Streets can play a part in reducing these health disparities together with other public health interventions.

In the New Orleans metropolitan region, the percentage of people who get enough physical activity per week rose by 11.6% from 2011 to 2015.

Figure 25. Participation in 150+ minutes of aerobic physical activity per week over time in New Orleans metropolitan area, 2011-2015

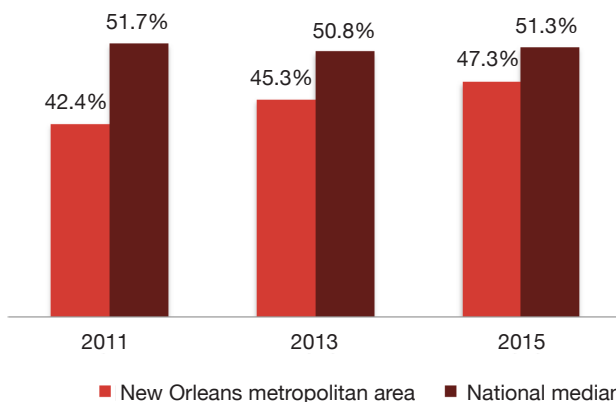
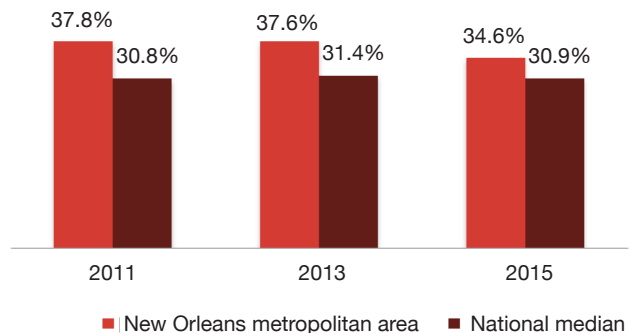


Figure 26. Hypertension rates over time in New Orleans metropolitan area, 2011-2015



(Data source: Behavioral Risk Factor Surveillance System SMART)



Forming lifelong, healthy habits can start as early as childhood. The figure below highlights lessons learned from Bike Easy's youth ambassadors. Their work explores barriers to biking for young people and identifies which Complete Streets improvements young people want to make walking and biking safer and more comfortable.

Figure 27. Biking in New Orleans: a youth perspective

N'Courage NOLA went to the library to collect stories about "Streets Built to Share."



(Photo: N'Courage NOLA - Bike Easy Youth Ambassadors)

When N'Courage NOLA went to the main library we collected stories on "Streets Built to Share." Each group had a different story to tell about their first bike ride they took, what it's like to ride bikes now, and what improvements can be made for biking to be better.

Some of the first bike ride stories were rough and tough. But most of them were fun and memorable. We heard stories of being on bike making them "street smart", happy, and eager to practice more.

Stories about current biking experiences were funny and sometimes dangerous, while others had you second guessing their life choices. Some of the stories we heard had us confused, but we did not want to pester them into telling us the whole story leading up to that point. All the stories we gathered had improvements that could be made to the city.

Improvements suggested included better-paved streets and more bike paths that can lead to places bikes can't get to now. Some of the specific streets they wanted to improve for biking and walking are Claiborne Ave, which was one of the most common, Washington Ave, and N Robertson. Participants also shared that they didn't feel as if laws necessarily prevented accidents from happening and that they could be enforced better.

A challenge echoed by most of the riders was the difficulty of getting around without using the interstate or RTA. Other people wanted to feel safer. Most of the stories we collected from people had some type of violence in them, and they felt that if they had a better network and enforcement systems they would've been able to avoid it completely.

(Source: N'Courage NOLA wrote this story collaboratively after debriefing the youth-led Summer Reading Program events)



V. RECOMMENDATIONS

Recommendations for New Orleans

Opportunities remain to make Complete Street investments in low-to-moderate income neighborhoods and communities of color that will enable greater health benefits and improve inequities in health from zip code to zip code. The City of New Orleans can take advantage of these opportunities through the following actions:

Adopt Complete Streets performance measures that prioritize health equity and publicly report progress regularly

- Using measures proposed in this report and others, create a system of on-going data collection and analysis, and then set specific goals for various indicators.
- While much of this report's analysis focuses on a single point in time, moving forward, the City of New Orleans should focus on measuring changes over time.
- Report progress to the City Council quarterly and publish an annual report that details movement on performance measures that is available to the public online and in print.
- Conduct an audit of pedestrian facilities: Much of the available data in New Orleans focuses on bicycle facilities, while information about sidewalks, crosswalks, and other pedestrian infrastructure is lacking.
- Incorporate other safety and health statistics, including crime, housing affordability, and resident displacement, to create a more robust system of measuring overall neighborhood improvements for long-time residents.

Ensure meaningful community engagement and transparency at all levels of decision-making

- Set up a formal Complete Streets design review process, that includes members of the public, for all street projects.
- Conduct qualitative surveys and interviews to better understand people's barriers to walking, biking, and taking transit. Include an evaluation of the city's public outreach efforts and work to engage vulnerable populations, particularly low-income communities and communities of color.
- Pursue creative public engagement opportunities, such as temporary "pop-up" demonstrations of proposed street redesigns, and actively seek community feedback by going to the people (rather than solely holding meetings and expecting them to come).
- Continue to make all new and existing Complete Streets data easily accessible to the public.

Create a framework to prioritize high-quality Complete Streets connections to the places they are needed most

- Proactively intervene to address on-going safety concerns, which are concentrated in low-income neighborhoods and disproportionately affect people of color, by using data analysis to target design solutions to the most problematic intersections and streets.
- Through technical analysis, robust community engagement, and collaboration with the regional transit authority, create detailed, integrated visions for a low-stress bikeway network, a pedestrian network, and an improved transit network.
- Target Complete Streets investments in low-income neighborhoods and places with high rates of chronic disease, and prioritize connections to employment centers, grocery stores, parks, and other vital resources.
- Update the routine documents and decision-making criteria transportation planners and engineers use in their daily work.



Recommendations for Jefferson Parish

Despite not having a formal Complete Streets program, Jefferson Parish has committed to invest almost \$56 million in active transportation projects, more than half of which will fund improvements in zip codes whose mean household income is significantly lower than the parish average. To move this commitment to Complete Streets into practice and continue to prioritize lower income neighborhoods, Jefferson Parish should take the following steps:

Institute a comprehensive Complete Streets Program that

- Follows the general best practices as outlined in the National Complete Streets Coalition’s “Ten Elements of a Complete Streets Policy” framework.¹⁴
- Sets up a system of Complete Streets performance measures, based on this report, that prioritizes health equity and regularly report progress to the public.
- Develops measurable goals related to health equity, safety, and connectivity.
- Ensures meaningful community engagement and transparency at all levels of decision-making, especially through the creation of a committee with members of the public and various Jefferson Parish departments to oversee implementation and evaluation.
- Builds on the vision of the Jefferson Parish Bicycle Master Plan and other planning efforts to create a framework that prioritizes high-quality Complete Streets connections to the places they are needed most.

Expand the bicycle network to high poverty residential areas

- In addition to planned investments in lower income neighborhoods, the parish should prioritize expanding its bicycle network to residential neighborhoods, particularly those with high poverty rates.

Work to embed Complete Streets in routine transportation decisions

- This includes updating master plans, design guidance, project selection and prioritization criteria, and any other documents, policies, and practices that guide routine transportation decisions.

Encourage more staff trainings

- The person-hours of staff training listed account for a very small number of planners and engineers in the Jefferson Parish Department of Engineering. Moving forward, the parish should both encourage more staff trainings on current design standards and implement a standardized process for tracking completion of these trainings.

Proactively intervene to protect vulnerable users from traffic crashes

- Pedestrian and bicyclist injuries and fatalities in Jefferson Parish have remained relatively steady. However, as the parish invests in active transportation infrastructure and more people start walking and biking, new potentials for conflict between drivers, bicyclists, and pedestrians on the roads may arise. To proactively combat this, the parish should pay particular attention to the safety of vulnerable users, especially for black bicyclists who currently experience disproportionately higher risk of being struck and killed or injured by cars.

Recommendations for the region

Many trips, whether by car, bike, or on foot, do not end at invisible city lines, and a regional approach is required. In order to create a region that fosters safety, health, and equity while providing access to opportunity for low-income, disadvantaged areas, the City of New Orleans and Jefferson Parish should collectively take the following steps:

Collaborate with local and regional health organizations

- Limitations in publicly available data make it difficult to understand specific health disparities at the local level. Partnering with local and regional health organizations can facilitate collection of data on where health conditions are most prevalent and where people do not get enough exercise. With this information, both jurisdictions can more effectively prioritize Complete Streets investments that serve neighborhoods with high rates of chronic disease.

Conduct qualitative interviews about the barriers to physical activity and wellness

- This information can inform targeted interventions to address health equity, particularly in predominantly low-income neighborhoods.

Continue to develop and refine an approach to evaluate successes in stormwater management

- The streets in New Orleans and Jefferson Parish are public spaces that need to be accessible when people need them most, especially in times of acute stress and unexpected shocks like flooding. Since New Orleans experiences up to 80 inches of rain a year, ensuring people can travel safely during and after instances of moderate to severe rainfall should be a high priority. Complete, green streets can also mitigate property damage and other health impacts of localized flooding.

Collaborate across city/parish lines

- The City of New Orleans and Jefferson Parish should work together to better connect their bicycle and pedestrian networks as well as to address safety priorities at or near their borders.

Recommendations for data collection

This report only uses preexisting data, but jurisdictions can also evaluate Complete Streets through a health equity lens by collecting their own data. The figure below lays out recommendations for how to approach data collection for each of our four types of performance measures.

Figure 28. Recommended approaches for data collection

Type of measure	Timeline	Methodologies	Potential partners
 Changes to transportation planning processes	Ongoing	Record keeping, interviews	City/parish departments
 New Complete Streets projects and investments	Ongoing	Record keeping, audits	City/parish departments
 New connections and opportunities	Annually	Direct observation, surveys, interviews	Regional planning agencies
 Changes in long-term health trends	Every 2-5 years	Surveys	Local and regional health departments/hospitals



VI. CONCLUSION

For New Orleans and Jefferson Parish to fully reap the health and safety benefits of Complete Streets, analysis and accountability need to be built into the plans, policies, processes, and guiding documents of local transportation planners and engineers. Biking in the region has increased, but, so too have injuries. Safety improvements are needed more than ever to protect the increased number of bicyclists on the road. Decision-makers should ensure regular evaluation of Complete Streets programs moving forward.

Providing connections for low-income communities with high rates of chronic diseases and low access to jobs, healthy foods, personal vehicles, and other resources should now be the priority as New Orleans and Jefferson Parish expand their active transportation networks.

As a first step in measuring effectiveness of Complete Streets performance, existing data sources should be employed and analyzed, including open source federal databases, tools, and data collected by state and regional partners. Once momentum for performance evaluation has been established, as a second step, collection of more detailed data should begin, particularly focused on disparities in health, safety, and access to resources. Original data will provide opportunities to focus where the greatest needs exist.

It is also critically important to pursue qualitative methods of evaluation, such as interviews, focus groups, audits, and open-ended questions to complement numeric indicators. These methods will help explain any barriers to public engagement or ridership, and also help to identify infrastructure and investments that best meet the needs of community members.

We recommend creating a detailed recording process to keep track of actions and projects as they are implemented. Make sure to align with regional and state agencies to routinely collect information about relevant short-term changes on an annual basis.

When it comes to long-term health outcomes, which operate on a long time horizon (across decades or even generations), agencies should partner with health departments, hospital systems, and health advocacy organizations to share and analyze data moving forward. Over the last several years, rates of chronic diseases connected to lifelong health behaviors, including diabetes, heart attack, and stroke have not yet declined in the region, yet the metropolitan area has seen modest increases to physical activity compliance and reductions in high blood pressure. These initial results are promising, although without more in-depth data over time we cannot conclude that Complete Streets caused these trends. Opportunities for improvement in Complete Streets implementation and performance measurement also remain. Department resources should remain focused on the other performance areas: instituting intra-departmental changes, tracking investments, and measuring new connections and opportunities.

We offer this report as a model for how the City of New Orleans, Jefferson Parish, and jurisdictions nationwide can create processes to systematically measure Complete Streets programs through the lens of health equity. Our data review and recommended performance measures are not exhaustive, so we look forward to working with other stakeholders in the region to continue refining our approach to measuring the success of Complete Streets. Through ongoing evaluation, New Orleans and Jefferson Parish can lead the way with a model of implementing streets built to share that advances safety, mobility, and health equity for all people who use them.

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APPENDIX 1. PERFORMANCE MEASURES

This report introduces recommended performance measures that correspond to health, safety, and equity goals and lays out attainable steps for jurisdictions to begin evaluating success in achieving these people-centric priorities.

This list includes both quantitative performance measures that describe trends using numbers and qualitative performance measures that highlight the perspectives and experiences of individuals to paint a more complete, human picture of how Complete Streets programs improve people’s lives.



Changes to transportation planning processes

Performance measures **Explanation of performance measures**

Updating documents

- | | |
|---|--|
| <ul style="list-style-type: none"> Percentage of master plans, design guidelines, and decision-making frameworks updated to support Complete Streets | <p>Updating the processes and documents used by planners and engineers in their day-to-day work is critical to embedding Complete Streets implementation in routine transportation planning and project selection processes. This includes plans, how they prioritize what projects they fund and build, the standards and guidelines they use to design roadways, and other processes that impact project funding, design, maintenance, and operations. Jurisdictions should audit all of the documents they use to make decisions about their transportation system to identify the specific plans, guidelines, and processes that must be revised to support Complete Streets implementation.</p> |
|---|--|

Training staff

- | | |
|--|--|
| <ul style="list-style-type: none"> Person-hours of staff training Percentage of staff trained Content of staff trainings Comprehension/retention tests | <p>Creating a culture that supports Complete Streets cannot occur without buy-in from the engineers, planners, and other professionals responsible for making decisions about the transportation system, including staff from local and regional government as well as transit agencies. These practitioners should receive staff trainings in topics such as how to safely incorporate active transportation into the road network, community engagement strategies, and practical skills including performance measurement and project prioritization. We recommend measuring how many staff receive training, for how long, and in what subjects. Additionally, to ensure the trainings have a lasting impact, we also recommend testing staffs’ comprehension, retention, and application of the knowledge and skills gained in the trainings.</p> |
|--|--|



Performance measures Explanation of performance measures

Engaging the public

<ul style="list-style-type: none"> • Number and demographics of participants in workshops, meetings, and community events • Number and demographics of people reached by each outreach method • Participant satisfaction with workshops, meetings, and community events • Barriers to participation in workshops, meetings, and community events 	<p>As part of the transportation planning process, jurisdictions sometimes hold public meetings and collect comments on long-range plans and transportation projects. We recommend jurisdictions go beyond keeping track of how many people participate in these opportunities by examining how they conduct outreach (i.e. are meetings held during work hours, is notice given via phone/email/flyers/tabling at community centers, etc.) as well as who the attendees are (i.e. race/ethnicity, income level, primary language) in order to identify and overcome potential barriers to engagement. To further strengthen public engagement, jurisdictions should also strive to collect input from participants about the engagement process either in the form of surveys or informal conversations to gauge whether people feel their voices are being sufficiently heard by these processes. We encourage creative engagement efforts that speak to diverse local cultures and priorities, not just bare minimum meetings and hearings.</p> <p>Community events also provide important opportunities for people to learn more about the competing priorities of the transportation system and voice their needs and desires for the transportation network. This could include events such as community-led demonstration projects, organized bike rides, and walk audits.</p>
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New Complete Streets projects & investments

Performance measures Explanation of performance measures

Complete Streets projects

<ul style="list-style-type: none"> • Cumulative mileage of pedestrian and bicycle facilities • Percentage of bicycle facilities by type • Quality of pedestrian, bicycle, and transit facilities • Location of Complete Streets projects relative to race/income of residents 	<p>While mileage of new or improved pedestrian and bicycle facilities is a useful starting point, jurisdictions should move beyond this measure. We recommend evaluating the quality and state of repair of these facilities. This could include infrastructure audits or surveys of how safe and comfortable users feel on these facilities. We also recommend examining the location of pedestrian and bicycle infrastructure relative to the social determinants of health, for example by comparing poverty rate or median household income in the census tracts immediately adjacent to the bicycle network to census tracts without access to bicycle facilities. This also includes tracking infrastructure to improve safety including crosswalks, curb ramps and cut outs, pedestrian medians. While this report does not focus on public transit projects, jurisdictions should also strive to evaluate the accessibility of transit stops.</p>
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Exemptions

<ul style="list-style-type: none"> • Number of exemptions granted to Complete Streets policies • Reasons for exemptions granted to Complete Streets policies 	<p>Effective Complete Streets policies commit to account for the needs of all people who use the road in all transportation projects, but the strongest policies have a clear, specific, accountable process for projects that cannot accommodate all users of all abilities. The National Complete Streets Coalition’s Ten Elements of a Complete Streets Policy spells out acceptable exception criteria that do not leave policies vulnerable to loopholes.¹⁴ We recommend publicly reporting the number of exemptions granted and the reasoning behind them to provide accountability for public and private investments in Complete Streets and to highlight missed opportunities to address the needs of all people who use the road.</p>
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Performance measures **Explanation of performance measures**

Funding

- | | |
|--|--|
| <ul style="list-style-type: none"> • Total funding allocated to projects that include pedestrian, bicycle and/or transit infrastructure • Percentage of funding allocated to projects that include pedestrian, bicycle, and/or transit infrastructure • Percentage of funding invested in zip codes by income level | <p>Complete Streets projects compete for limited funding with roadway maintenance and expansion projects that predominantly serve motor vehicles. To ensure accountability and incentivize investment in walking and biking, we recommend measuring the amount and percentage of funding allocated to projects that include pedestrian, bicycle, and/or transit infrastructure. We also recommend breaking out how these investments are allocated based on the social determinants of health, such as measuring the relative income level in zip codes. This ensures Complete Streets programs do not unintentionally exacerbate disparities by continuing to leave behind neighborhoods that lack active transportation infrastructure and safe connections to jobs, schools, grocery stores, healthcare, and other vital resources.</p> |
|--|--|

Green infrastructure

- | | |
|---|--|
| <ul style="list-style-type: none"> • Number of street trees • Percentage of census tract covered by green space and/or tree canopy • Distribution of street trees relative to respiratory disease rates/race/income • Quality of stormwater management infrastructure relative to race/income | <p>Street trees improve air quality, provide shade for pedestrians, and encourage drivers to slow down, creating a safer, more inviting, and more comfortable pedestrian environment, and reduce the risk of local street flooding, among other benefits. We recommend conducting an audit of how many and where street trees exist within a jurisdiction, particularly as it relates to disparities in rates of asthma and other respiratory diseases. We also recommend assessing the quality of stormwater management infrastructure. These infrastructure play an important role in preventing local street flooding, which can cause property damage and temporarily cut off access to resources. The measures listed here provide a starting point to evaluate green infrastructure, but transportation and environmental advocates should collaborate to further develop and expand these measures.</p> |
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New connections & opportunities

Performance measures **Explanation of performance measures**

Travel behavior

- | | |
|--|--|
| <ul style="list-style-type: none"> • Percentage of people who commute to work by mode over time and by race/income • Walking, biking, and public transit ridership rates across all trips over time and by race/income • Percentage of children who walk or bike to school over time and by race/income | <p>The most widely available information on travel behavior is federal commute to work data. We recommend looking at commuting trends over time to gauge changing rates of walking, biking, and riding public transit. However, we also recommend exploring more comprehensive measures of travel behavior, including rates of walking, biking, and riding public transit across all trips, not just for work. In addition, measuring how children get to and from school can highlight the formation of healthy lifestyles from an early age.</p> |
|--|--|



Performance measures Explanation of performance measures

Safety

- | | |
|--|--|
| <ul style="list-style-type: none"> • Pedestrian and bicycle injury and fatality rates per population over time • Location of pedestrian and bicycle injuries and fatalities relative to poverty rates • Percentage of injuries and fatalities by race/age/gender • Pedestrian and bicycle injuries and fatalities divided by ridership over time | <p>We recommend tracking rates of injuries and fatalities while biking or walking over time. Tracking injury and fatality rates over time, as well as the locations of collisions involving pedestrians and bicyclists, allow jurisdictions to pinpoint and address safety priorities. We also recommend examining how these injury and fatality rates vary by gender, age, and race to identify vulnerable populations whose needs jurisdictions should focus on when making safety improvements.</p> |
|--|--|

Affordability

- | | |
|--|---|
| <ul style="list-style-type: none"> • Cost of housing and transportation in census tracts with bicycle/transit infrastructure versus without over time | <p>Monitoring how housing and transportation costs change over time as Complete Streets programs move forward tells several stories. First, it shows where jurisdictions are investing their resources, and whether they are prioritizing low-income neighborhoods or leaving them behind. Second, it can show whether Complete Streets improvements make transportation more affordable by providing lower cost travel alternatives. Finally, tracking changes to housing costs after Complete Streets improvements can highlight unintended consequences such as involuntary displacement that jurisdictions can work to prevent.</p> |
|--|---|

Access to resources

- | | |
|---|--|
| <ul style="list-style-type: none"> • Gaps in employment center access by income status • Gaps in grocery store access by diabetes prevalence • Distribution of local street flooding relative to race/income | <p>To ensure the active transportation network connects vital resources including jobs, schools, and grocery stores to the neighborhoods that need them most, we recommend qualitatively evaluating gaps in the active transportation network relative to social determinants of health. Examining where low-income neighborhoods lack connections to employment centers or where high rates of diabetes and other related chronic diseases coincide with low connectivity to grocery stores can highlight priorities for future active infrastructure improvements. Without sufficient stormwater management infrastructure, local street flooding can also restrict access to resources.</p> |
|---|--|



Changes to long-term health trends

Performance measures	Explanation of performance measures
Physical activity	
<ul style="list-style-type: none"> Percentage of people meeting physical activity recommendations over time and by race/income 	<p>In the long term, Complete Streets improvements, by making other forms of travel safer and more convenient, are likely to shift trips away from driving alone in a personal vehicle toward walking and biking, both of which are valuable sources of physical activity. Complete Streets can also connect people to places of recreation such as parks, gyms, pools, and other community hubs that provide opportunities for exercise. We recommend evaluating not only improvements to physical activity over time, but also how these rates vary by income, level of education, and other social determinants of health to identify opportunities to mitigate health disparities by targeting vulnerable populations.</p>
Air quality	
<ul style="list-style-type: none"> Annual emissions from transportation per household in census tracts with bicycle/transit infrastructure versus without 	<p>By increasing the attractiveness and safety of walking and biking, as well as riding public transportation, Complete Streets improvements can also improve air quality because all of these modes produce fewer emissions than driving. Tracking this measure over time keeps this goal at the forefront of transportation decisions, which can help to incentivize investment in projects that prioritize alternative modes of transportation over conventional roadway capacity projects that increase vehicular emissions.</p>
Health	
<ul style="list-style-type: none"> Rates of hypertension, heart attack, diabetes, and asthma by race/income/level of education Qualitative distribution of respiratory illness rates relative to bicycle/transit infrastructure 	<p>Improving physical activity and air quality ultimately translates to better health and wellbeing. To capture this, we recommend tracking chronic disease rates including hypertension, heart attack, diabetes, asthma, and other cardiovascular or respiratory illnesses. These conditions often result from lifelong behaviors and exposures and consequently will change very slowly over years or even decades or generations. Nonetheless, we recommend establishing goals to improve these health outcomes as part of broader efforts that include Complete Streets improvements, then tracking progress toward achieving these goals in the long-term.</p>

Physical activity

- Percentage of people meeting physical activity recommendations over time and by race/income

In the long term, Complete Streets improvements, by making other forms of travel safer and more convenient, are likely to shift trips away from driving alone in a personal vehicle toward walking and biking, both of which are valuable sources of physical activity. Complete Streets can also connect people to places of recreation such as parks, gyms, pools, and other community hubs that provide opportunities for exercise. We recommend evaluating not only improvements to physical activity over time, but also how these rates vary by income, level of education, and other social determinants of health to identify opportunities to mitigate health disparities by targeting vulnerable populations.

Air quality

- Annual emissions from transportation per household in census tracts with bicycle/transit infrastructure versus without

By increasing the attractiveness and safety of walking and biking, as well as riding public transportation, Complete Streets improvements can also improve air quality because all of these modes produce fewer emissions than driving. Tracking this measure over time keeps this goal at the forefront of transportation decisions, which can help to incentivize investment in projects that prioritize alternative modes of transportation over conventional roadway capacity projects that increase vehicular emissions.

Health

- Rates of hypertension, heart attack, diabetes, and asthma by race/income/level of education
- Qualitative distribution of respiratory illness rates relative to bicycle/transit infrastructure

Improving physical activity and air quality ultimately translates to better health and wellbeing. To capture this, we recommend tracking chronic disease rates including hypertension, heart attack, diabetes, asthma, and other cardiovascular or respiratory illnesses. These conditions often result from lifelong behaviors and exposures and consequently will change very slowly over years or even decades or generations. Nonetheless, we recommend establishing goals to improve these health outcomes as part of broader efforts that include Complete Streets improvements, then tracking progress toward achieving these goals in the long-term.



APPENDIX 2. DATA SOURCES

This report leverages existing data from a variety of sources at the local, regional, state, and federal levels. This includes open source data the City of New Orleans open data catalog,¹ the Center for Neighborhood Technology's (CNT) Housing and Transportation (H+T) Affordability Index,² the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS),³⁻⁴ and the census's American Community Survey (ACS)⁵ and annual population estimates.⁶ We also use the Trust for Public Land's Climate Smart Cities mapping portal.⁷

Additionally, several organizations contributed to this report by providing us with access to their own data upon request. Thanks are due to the City of New Orleans Department of Public Works, the Jefferson Parish Engineering Department, the New Orleans Regional Planning Commission (RPC)⁸, and the Louisiana Department of Transportation and Development (LA DOTD).

In limiting our analysis to these pre-existing data sources, we hope to demonstrate the feasibility of launching comprehensive Complete Streets program evaluation relying on pre-existing data as a starting point before scaling up efforts to include analysis of more robust indicators and collection of more comprehensive data. While some jurisdictions may lack access to even this degree of local and regional information, these places can still benefit from publicly available, federal data sources as well as kick off the process of systematically recording information about their own implementation steps and investments according to the evaluation approach proposed in this report.

More information about our data sources can be found below:

1. NOLA Open Data: <https://data.nola.gov/>
2. CNT H+T Affordability Index: <http://htaindex.cnt.org/download/data.php>
3. CDC BRFSS Selected Metropolitan Area Risk Trends (SMART): <https://chronicdata.cdc.gov/Behavioral-Risk-Factors/Behavioral-Risk-Factors-Selected-Metropolitan-Area/j32a-sa6u#column-menu>
4. CDC BRFSS state data: <https://chronicdata.cdc.gov/Behavioral-Risk-Factors/Behavioral-Risk-Factor-Surveillance-System-BRFSS-P/dttw-5yxu>
5. ACS 5 year estimates: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtmlmlk>
6. Annual population estimates: <https://www.census.gov/programs-surveys/popest/data/tables.All.html>
7. TPL Climate Smart Cities mapping portal: <https://web.tplgis.org/nolasecure/>
8. Regional Planning Commission pedestrian and bicycle counts: http://www.norpc.org/pedestrian_and_bicycle_program.html

APPENDIX 3. METHODOLOGY

We used Microsoft Excel and ArcGIS to analyze the data. This analysis, while somewhat technical in nature, is intended as a starting point applicable to any jurisdiction, including those with strained staff capacity or limited experience conducting program evaluation. While more advanced, rigorous analytic methods are both possible and encouraged, we believe that the baseline indicators proposed here provide a feasible beginning to evaluate Complete Streets through a health equity lens which can then be scaled up and improved upon as better data become available. The table below lists data sources and methodologies for each of the indicators analyzed in this report.

Indicator	Data Source(s)	Methodology
Person-hours of staff training	Jefferson Parish records*	Keep an ongoing record of staff trainings, including who is trained, in what topic, and for how long. Multiply the number of participants in each training by the total duration of the training and add together the results. This analysis overestimates person-hours of staff training by assuming multi-day trainings have a duration of 8 hours per day. Diligent recordkeeping can improve the accuracy of this measure.
Cumulative mileage of bicycle facilities	Regional Planning Commission*	The Regional Planning Commission routinely tracks bicycle infrastructure throughout the New Orleans region. They measure mileage of bicycle facilities in terms of centerline mileage – meaning the length of all road segments that include bike infrastructure – and lane-mileage, which doubles centerline mileage wherever there are bike facilities in two directions or on both sides of the road. Depending on the nature of the analysis, centerline or lane-mile measures can be used, but the measures should not be mixed.
Percentage increase in bicycle facilities	Regional Planning Commission*	Calculate percentage increase in bicycle facilities adding together the total mileage of bicycle facilities by year then using the following formula: $(y-x)/x*100$ where y is the total mileage of bicycle facilities at the end of the time period and x is the total mileage of bicycle facilities at the beginning of the time period.
Percentage of bicycle facilities by type	Regional Planning Commission*	The Regional Planning Commission routinely tracks bicycle infrastructure throughout the New Orleans region. This includes a breakdown of mileage by type of facility (i.e. buffered or protected bike lanes, off-road mixed-use trails, sharrows, etc.)
Percentage of funding allocated to projects that include pedestrian and/or bicycle infrastructure	Jefferson Parish records*	Divide the total cost of Road Bond projects that include pedestrian and/or bicycle infrastructure by the total amount of Road Bond funding.



<p>Percentage of funding invested in zip codes by income level</p>	<p>Jefferson Parish records* ACS 5-year estimates</p>	<p>Categorize bike/ped projects by ZIP codes based on starting and ending intersections. Categorize projects that cross multiple ZIP codes according to the ZIP code in which the majority of the project falls using ArcGIS. Import ACS ZIP code-level data into Microsoft Excel or an equivalent program. Filter out ZIP codes that do not contain bike/ped projects. Calculate 90% confidence intervals for mean household income at the zip code and parish level using the formula $(x-e, x+e)$ where x is mean household income and e is Census reported margin of error. <i>High-income ZIP codes</i> are those ZIP codes where the low bound, $x-e$ is greater than the overall parish $x+e$. <i>Low-income ZIP codes</i> are those where the high bound, $x+e$ is less than the overall parish $x-e$. Add together the cost of projects by income level and divide by the total cost of all projects.</p>
<p>Percentage change of people who commute to work by mode and by race</p>	<p>ACS 5-year estimates</p>	<p>Download 5-year estimates of <i>Means of Transportation to Work</i> data from American Fact Finder for the City of New Orleans and for Jefferson Parish. For overall commuting trends, use table <i>S0801</i>. For commuting trends by race, use table <i>B08105A</i> for white commuters, table <i>B08105B</i> for black commuters, table <i>B08104D</i> for Asian commuters, and table <i>B08105I</i> for Hispanic commuters. For each year, divide the total number of people commuting with each mode by the total working population reported for that year, then calculate percentage change using the formula $(y-x)/x*100$ where y is the percentage of people commuting by each mode in 2015 and x is the percentage in 2010.</p>
<p>Percentage increase in walking and biking trips at select sites</p>	<p>Regional Planning Commission*</p>	<p>The Regional Planning Commission routinely counts walking and biking trips at select sites throughout the New Orleans region. To calculate the percentage increase in trips, add together the total number of walking and/or biking trips at select sites by year then use the following formula: $(y-x)/x*100$ where y is the total number of walking and/or biking trips at those sites at the end of the time period and x is the total number of walking and/or biking trips at the <i>same</i> set of sites at the time period.</p>
<p>Pedestrian and bicycle injury rate per 100,000 population</p>	<p>LA DOTD* Census Annual Population Estimates</p>	<p>Compile pedestrian and bicyclist minor, moderate, and severe injuries from 2004-2016 in a single dataset. To calculate injury rate per 100,000 population, use the formula $x/y*100,000$ where x is the total number of injuries in a single year and y is the population in that year.</p> <p>To calculate an average annual rate, use the formula $(\sum x)/(y*n)*100,000$ where x is the total number of injuries each year, y is the population at the midpoint of the time period, and n is the number of years in the time period.</p>

Pedestrian and bicyclist injuries compared to ridership	LA DOTD* Regional Planning Commission*	To compare increase in injuries to increase in ridership, calculate percentage increases for both metrics over the same time period using the following formula: $(y-x)/x*100$ where y is the total number of trips or injuries at the end of the time period and x is the total number of trips or injuries at the beginning of the time period.
Qualitative gaps in job access by income status	TPL Climate Smart Cities mapping portal	Turn on the following layers: <i>Analysis Results > Climate Equity > Percent Low Income, Overlay Data > Connect > NOLA Bike Lanes</i> , and <i>Overlay Data > Connect > Employment Centers > Employment Centers</i> . Observe the map for qualitative gaps where high percentages of low income residents overlap with lack of connectivity to employment centers.
Per capita emissions from transportation	NOLA Open Data H + T Affordability Index	Import <i>Bike Lanes</i> data in shapefile format and H+T Affordability Index census-level data into ArcGIS. Use the <i>Intersect</i> tool to identify census tracts that contain portions of the bicycle network. Calculate weighted averages separately for census tracts with and without bicycle infrastructure using the formula $(\sum x*y)/(\sum y)$ where x is per capita greenhouse gas emissions from transportation and y is total number of households for the corresponding census tract.
Rates of hypertension, heart attack, and diabetes	BRFSS	These rates are reported by metropolitan statistical area and year in publicly available <i>BRFSS: SMART MMSA Prevalence Data</i> .
Percentage of people meeting physical activity recommendations	BRFSS	This rate is reported by metropolitan statistical area and year in publicly available <i>BRFSS: SMART MMSA Prevalence Data</i> .
Rates of hypertension, heart attack, diabetes, asthma, and physical activity compliance by income and level of education	BRFSS	These rates are reported by state and year in publicly available <i>BRFSS Prevalence Data</i> . This report looks specifically at 2015 data.

*NOTE: Data not open source, provided by request

