

MIAMI-DADE COUNTY

# VISION ZERO

2021 FRAMEWORK PLAN



MIAMI-DADE COUNTY

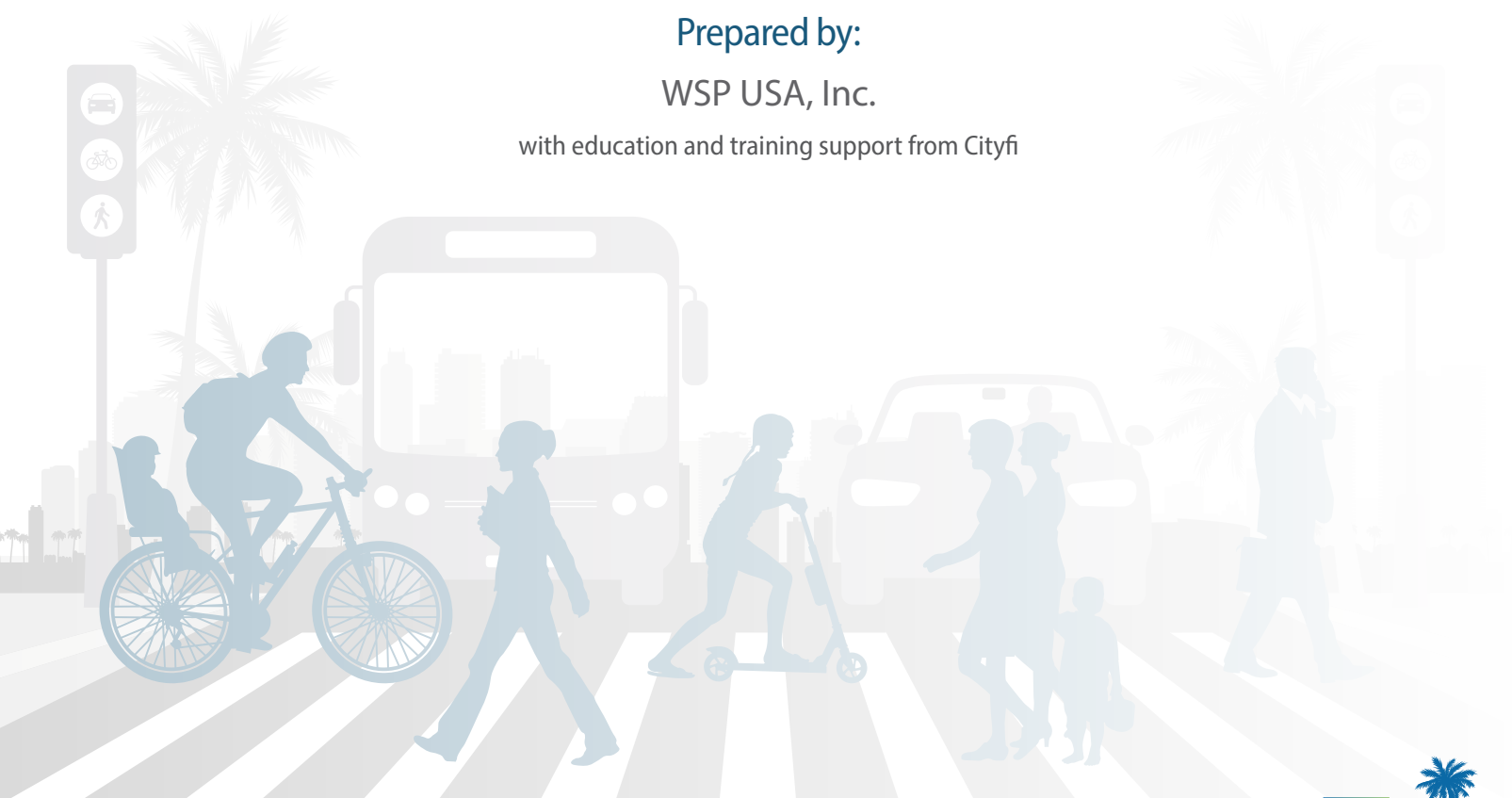
# VISION ZERO

2021 FRAMEWORK PLAN



Prepared for:  
MIAMI-DADE COUNTY  
Department of Transportation and Public Works

Prepared by:  
WSP USA, Inc.  
with education and training support from Cityfi



# PREFACE

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Miami-Dade County leadership and the Department of Transportation and Public Works (DTPW) are leading the effort to eliminate roadway crashes resulting in fatalities and severe injuries in the County. In 2017, the Miami-Dade County Board of County Commissioners (BCC) requested a Vision Zero policy feasibility study and approved Resolution No. R-383-17 with support from the DTPW, the Miami-Dade County Transportation Planning Organization (TPO), and community leaders. In 2018, the TPO published the feasibility study through the development of the Miami-Dade County Vision Zero Plan, setting the goal of eliminating all fatalities and severe injuries crashes by 2030.

The County is further advancing the program through the development of this report, the Miami-Dade County Vision Zero Framework Plan. The plan identifies current proactive efforts towards the County's Vision Zero goal within the County's various departments, agency partners, municipalities, and the Florida Department of Transportation (FDOT). The Vision Zero Plan: 1) identifies time-bound actions within the first 36 months to eliminate roadway crashes resulting in fatalities and severe injuries, and 2) provides supporting tools specifically calibrated for Miami-Dade County using practices with proven safety outcomes.

The Vision Zero Plan Report, henceforth referred to as "this report", begins with a call to action from the Miami-Dade County Mayor Danielle Levine Cava and Miami Dade County Department of Transportation and Public Works (DTPW) Director, Eulois Cleckley. The call to action is followed by a set of guiding values identified through input from multiple stakeholders from Miami-Dade County Departments, FDOT, and local municipalities. The identified values are geared to guide the decision making process from planning through of Vision Zero in Miami-Dade County.

As a first step in identifying these values, road safety indicators within the U.S. were reviewed and compared with the safety indicators in Miami-Dade County. The inferences from safety indicators, led to identification of crash-vulnerable locations, travel-mode, users and road factors impacting safety. Finally, this report identifies actions and tactics to eliminate crashes resulting in fatalities and severe injuries.

The identified time-bound strategies identified in this report considered Miami-Dade County's current transportation policies, funding prioritization, decision-making within the transportation system and the disproportionate distribution of roadway fatalities and severe injuries within Miami-Dade County. The identified actions were linked to the Office of the Mayor and/or DPTW as one of two entities responsible for taking the action. The actions were aligned with the identified guiding values and grouped by time frame, including immediate (180 days), short-term (18 months) and mid-term (36 months).

## This report is intended for system designers, policy-makers, road users

The proposed Vision Zero approach requires the collaboration of policy makers, system designers and users for successful . Therefore, this report was developed and intended for use by transportation policy makers, road designers, those who maintain the roadway, advocacy groups, and the people who use the roads within Miami-Dade County. The role of the policy makers and system designers as well as the users of the facilities are identified below.

**Miami-Dade County, FDOT, and Municipal leadership.** These entities' role is to lead policies and strategic shifts to integrate Vision Zero into the fabric of their organization and prioritize funding for safety projects which are identified in this report. Information relevant to the leadership is: summarized plan with time-bound actions, the structural shift required to prioritize safety project presented in tables and illustrated in maps.

**Transportation Designers** including planners, engineers and data scientists. Engineering tools and guidance were developed to support the systemic shift in transportation planning, design, operations decisions using a data-based approach. Information relevant to transportation designers includes: crash data-analysis methodology; the safety



indicators identified in the U.S. and in Miami-Dade County; prioritized projects; engineering countermeasures for vulnerable travel modes; and a how-to user-guide supporting systemic shift towards Vision Zero approach.

**Local Community and Advocacy Groups.** This report provides guidance for actions beyond adhering to design standards. Communities may use this report to empower themselves with information and advocate for change within their communities, and from elected representatives. The inferences of each section are illustrated at the end of the section.

**Road users** may use this report to educate and inform themselves and advocate for safety improvements with their communities.

## Terminology used in this report

Re-framing mobility users as ‘people’ brings humanity and elicits empathy when discussing the needs of roadway users. The following terms are used in this report:

- » **People walking** are those who walk or use wheelchairs or strollers for mobility, traditionally referred to as ‘pedestrians’.
- » **People biking** are those using both electric and non-motorized bicycles for mobility, traditionally referred to as ‘bicyclists’.
- » **People driving** refers to those using personal vehicles, traditionally referred to as ‘drivers’.

**Equity** - Fairness with which impacts, benefits and burdens are distributed.

The United States Administration’s Executive Order 13985 on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, defines “equity” as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

**Equitable Transportation** - Transportation systems that support the mobility needs of all users and provide multi-modal options that are affordable, reliable, and safe.

**Equity Priority Communities** - Represents populations and communities that are vulnerable to crashes resulting in fatalities and severe injuries. Also referred to as “Communities of Concern” in some U.S. cities, these communities exhibit vulnerability within current road conditions and will continue to be crash-vulnerable, until deliberate policy and engineering design changes are made.

**People of Color** - Represents people who are not White and describes people that the U.S. Census designates as American Indian and Alaskan Native, Asian, Black, Latino, Hispanic, Native Hawaiian and Pacific Islander. These populations are also referred to as BIPOC - Black, Indigenous, and People of Color.

**Linguistic Isolation** defined by the U.S. Census as person/s living in a household in which all members aged 14 years and older speak a non-English language and also speak English less than “very well”.

**People with Disability** - The U.S. Census Bureau defines disability as: hearing difficulty- deaf or having serious difficulty hearing; vision difficulty- blind or having serious difficulty remembering, concentrating, or making decisions; ambulatory difficulty- having serious difficulty walking or climbing stairs; self-care difficulty- having difficulty bathing or dressing; Independent living difficulty- because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor’s office or shopping.





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# CALL TO ACTION

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MIAMI-DADE COUNTY  
**VISION  
ZERO**

**VISION ZERO 2021 FRAMEWORK PLAN**  
MIAMI-DADE COUNTY

In Miami-Dade County,

**road crashes over the past decade  
resulted in an average of**

**4** fatalities per week

**17** severe injuries per week

**\$22 billion**

spent on emergency services, medical services, household productivity loss, market productivity loss, insurance administration, workplace costs, legal costs, congestion impacts and property damage from

**road crashes.**

*Cost calculated using: Crash Cost for Highway Safety Analysis, FHWA and Miami-Dade County 2010-19 crash data*



## CALL TO ACTION

Dear Fellow Miamians,

Public safety is a basic human right.

The term “public safety” conjures images of police, fire and emergency services teams. However, we often overlook the importance of keeping people safe while they move about our county, whether by walking, cycling, rolling in a wheelchair, or driving a motorized vehicle. Unfortunately, too many of us know the pain of having a friend or family member wounded or killed in an accident. In the United States, we have almost equal amounts of road fatalities and gun fatalities, averaging approximately 40,000 a year for both over the last few years.

In Miami-Dade over the past 10 years, 2,742 of our fellow neighbors, co-workers, friends and family members have been killed. We face an ever-growing need to stem not only deaths on our roadways and sidewalks, but also an even higher number of injuries, which are often due to distracted or drunk driving, speeding, and neighborhood design that prioritize speeding cars over protecting the residents on our streets. Beyond the unfathomable personal tragedy and social impact on our community, road crashes have resulted in over \$22 billion in economic impact to Miami-Dade in the last decade.

Vision Zero is a new vision for the future to reduce our fatal and severe traffic injuries to zero. World class cities from Oslo to London to Sydney have made huge strides. For example, Oslo had one fatal car crash and zero pedestrian or cyclist fatalities in 2019. Compare this to 299 fatal crashes in Miami-Dade in 2019, which included 110 fatalities of people walking or biking.

When we put our minds to it, Miami-Dade residents can do anything. Once we make the culture shift to realizing that these crashes are avoidable, our eyes open to the avoidable tragedies and we become no longer able to tolerate their impacts. Everyone reading this plan is a pedestrian each day, and our work on the 2021 Miami-Dade County Vision Zero Framework Plan shows that we have a disproportionate number of children, elderly individuals, low-income individuals, and people of color being impacted by traffic violence and unsafe streets simply by walking in their communities.

Those days are over! I made social justice a cornerstone of my campaign for Mayor; now that I am elected, it is time to act. Each life -- black, brown, yellow and white -- matters, and our ability to walk, bike, or drive without being injured or killed should be treated with the utmost importance.

From this day forward, my administration will work in partnership with federal, state and local jurisdictions to carry out the findings, recommendations and of highest importance, actions, as laid out in this 2021 Miami-Dade Vision Zero Framework Plan. We can do this together; our lives depend on it.



Mayor Daniella Levine Cava, Miami-Dade County



Dear Miamians,

Through adoption of this Vision Zero Framework Plan, Mayor Levine-Cava is not only committing to zero deaths by 2030 on the streets of Miami-Dade County but also providing a roadmap for our community to achieve this urgent goal. I'm honored to have this document represent the first official release in my new position as the Director and CEO of the Miami-Dade County, Department of Transportation and Public Works.

Vision Zero is a program that I have had the privilege to help implement and grow in cities across the country from Washington D.C. to Denver. It is with great honor that I accept the opportunity to operationalize the critical steps laid out in this document to protect and further the wellbeing

of all Miamians. To do this, we must embrace real, systemic change in the way we plan, design, build and operate our transportation system. The good news is that we have not only this roadmap, but examples of jurisdictions around the world that have successfully and quickly shifted their streets to favor everyday people versus the movement of cars. As a result, all of our communities will see positive impacts to their residents' health and happiness as well as productivity and economic output.

Miami-Dade is an internationally-known county and community comprising an amazing collection of cities. Although my tenure in this position is just beginning, with this letter I want to commit to work with all 34 municipalities, communities in the unincorporated area, and our state and federal partners to implement Vision Zero as quickly as possible. Why? People's lives are at stake, our ability to compete economically is at stake, and we have the moral responsibility, as succinctly laid out by the Mayor, to act now. This will require a collective effort on all of our behalf ranging from the transportation professionals to our partners in public health, philanthropies, community planning, public safety, and parks and recreation.

Elouis Cleckley, Director and CEO, Department of Transportation and Public Works



# Zero

*is the only acceptable number of fatalities and severe injuries on Miami-Dade County's streets.*



*Therefore, Miami-Dade County's goal is to*

**eliminate all road  
fatalities and severe  
injuries**

*by the year 2030.*



## CALL TO ACTION RESPONSE

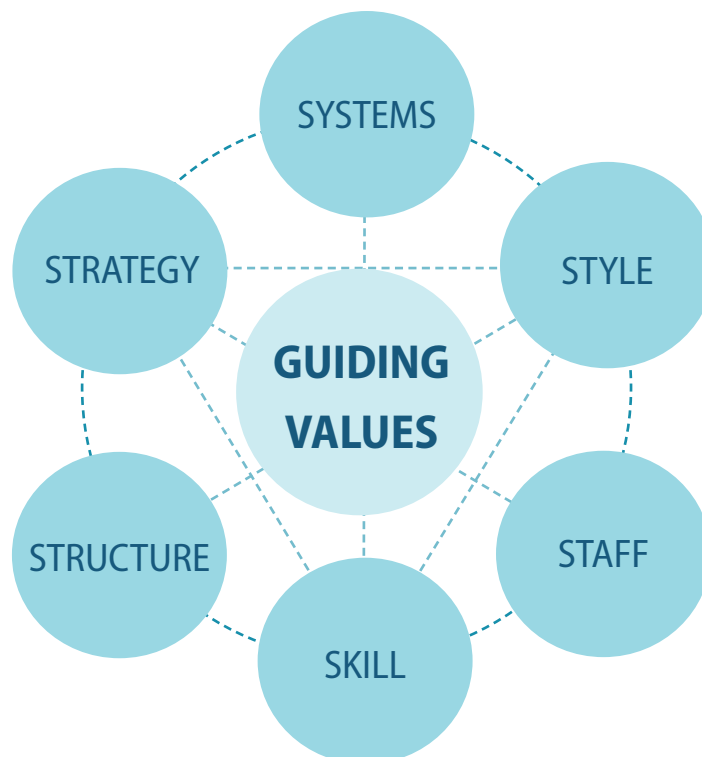
Miami-Dade County leadership set the goal to eliminate all fatalities and severe injuries crashes using Vision Zero strategies.

To achieve the bold goal of Vision Zero by 2030 requires a paradigm shift from the prevailing approach. However, the response to this call to action must work with harmony within Miami-Dade County. Therefore, the 7-S McKinsey Framework process (shown below) was used which is demonstrated to have organizational effectiveness. The framework lays out three hard elements - structure, strategy, and systems which will be the focus of this report. These elements are aligned and anchored by the guiding principles identified using a collaborative style. The three soft elements of skills, staff, and style are outside the scope of this report except when complementing the hard elements.

As the first step, the guiding values were identified through engagement with Miami-Dade County's Vision Zero Champions and Implementors and further described in the next page. Then, a blueprint was developed to identify the actions necessary to develop this framework plan. Finally, the framework plan actions were developed to support the paradigm shift, categorized under:

- » Structural leadership from the County's policy makers to the staff who implement is necessary to both energize in the immediate term, and sustain the paradigm shift in the long term;
- » Strategic shift in Countywide policies, prioritization of users, education, communication required to eliminate fatalities and severe injuries; and
- » Systemic shift required in daily decision making during project delivery required to eliminate fatalities and severe injuries.

### EVERY PART OF THE COUNTY ORGANIZATION MUST WORK IN HARMONY TO CREATE A PARADIGM SHIFT TOWARDS THE VISION ZERO APPROACH



Source: McKinsey & Company

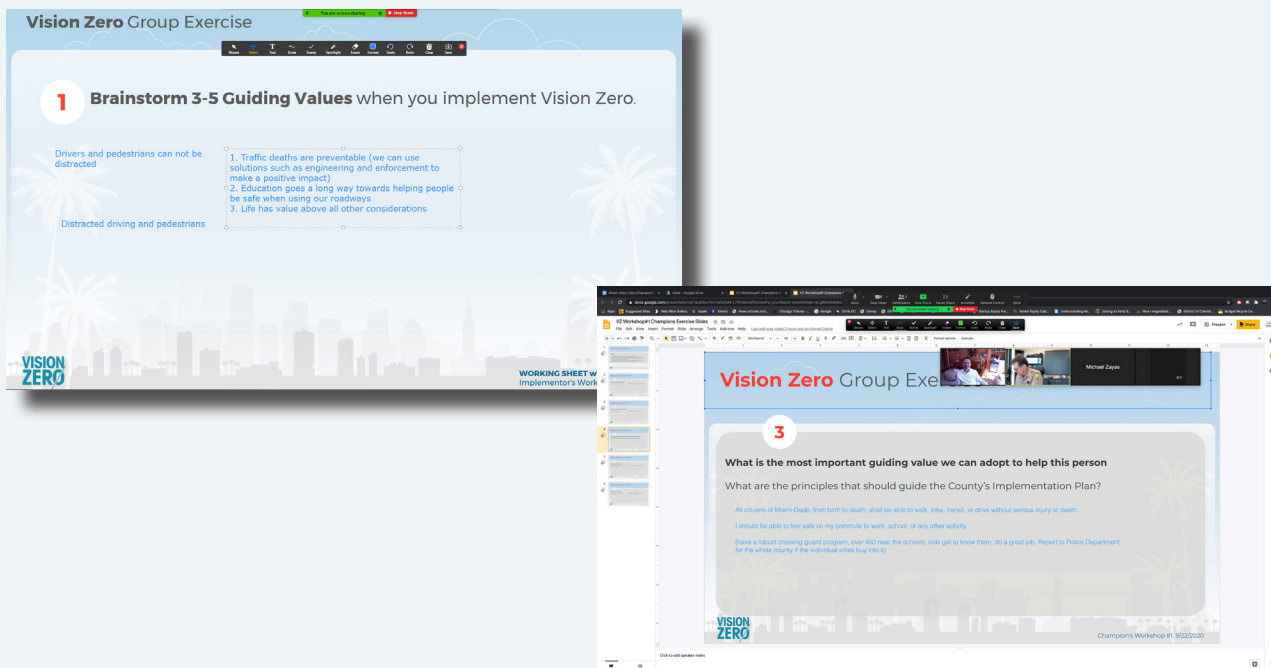


## Miami-Dade County Vision Zero Champions and Implementors

Vision Zero stakeholders were identified using the Vision Zero ideology of shared responsibility between transportation users, planners, designers, policy makers, and leadership. Stakeholders who contributed to the 2018 Vision Zero Action Plan, led by the Miami-Dade Transportation Planning Organization (TPO), were reengaged and referred to as Vision Zero Champions. The Vision Zero Champions are people in leadership roles like City Managers or Public Works Directors at partner agencies. A new stakeholder group called the Vision Zero Implementors were identified and included project managers, design engineers, transportation planners, development plan reviewers, transportation activists, and other transportation professionals. The Vision Zero Champions and Implementors workshops served as an engagement opportunity with these stakeholders. The goal of the workshops was to identify the County’s Vision Zero guiding values and strategies for the program. Also, the workshops were an educational opportunity on the safe systems approach and Vision Zero.

The identified stakeholders were engaged in two separate workshops. The Vision Zero Champions met for a half day on Tuesday, September 22, 2020 and Tuesday, October 27, 2020. The Vision Zero Implementors met for a half day on Wednesday, September 23, 2020 and Thursday, October 29, 2020. These workshops were held virtually adhering to COVID-19 safety protocols in place at the time. The stakeholders were engaged using live polls on ‘menti.com’ and facilitated breakout group discussions.

### MIAMI-DADE COUNTY’S VISION ZERO GUIDING VALUES WERE IDENTIFIED AT ENGAGEMENT WORKSHOPS



Snapshots of virtual engagement at the Champions and Implementors workshop #1.





## Guiding Values

The guiding values for the program identified by the Vision Zero Champions and Implementors were used to anchor strategies to reach Miami-Dade County's goal of achieving Vision Zero by 2030. The guiding values are:



### 1. COLLABORATION

Transportation professionals and policy makers acknowledge that the current transportation system does not address the needs of all roadway users. Collaboration between County departments and multi-jurisdictional agencies is needed to achieve the goal of a system wide paradigm shift towards safe transportation.



### 2. PRIORITIZATION OF EQUITABLE OUTCOMES

Invest where the needs are the greatest. Ensure equitable transportation outcomes for all roadway users through targeted funding and strategic policies. Even the playing field to ensure one community does not bear the disproportionate economic and emotional burden of roadway crashes.



### 3. BRAVE DIRECTION, USING SENSITIVITY

Make difficult choices to prioritize safety for the most vulnerable users. Exercise empathy for the needs of people using transit, people walking, and people biking. Do not rely on conventional processes, actions, and decisions that do not serve the needs of all roadway users.



### 4. DATA-DRIVEN DECISIONS

Use data while exercising empathy to understand the *why* through community engagement to make informed decisions. Ensure data-based decision-making does not use data to simply confirm existing assumptions, and beliefs, otherwise, known as confirmation bias.

### 5. CLEAR, TRANSPARENT COMMUNICATION

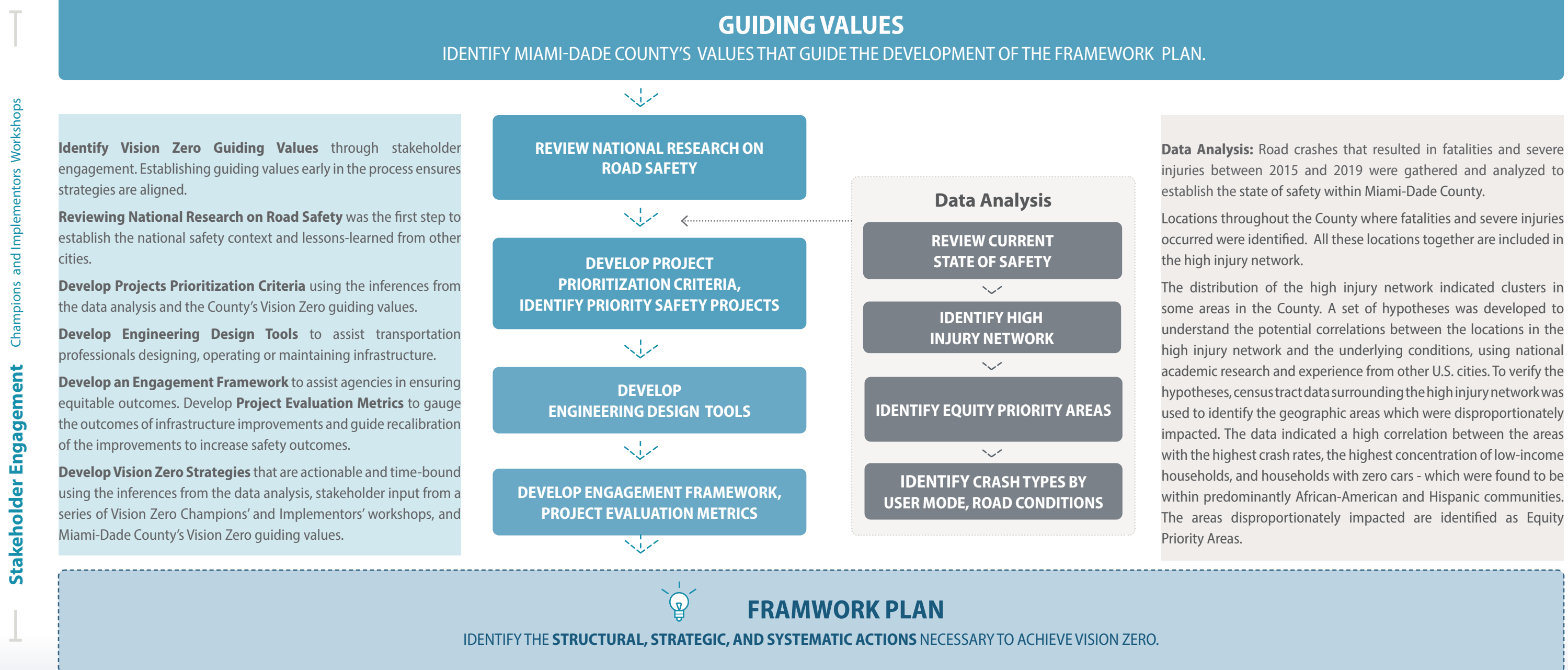
Provide regular communication on the current state of safety, the strategies, planned projects, and progress made towards achieving Vision Zero in Miami-Dade County.



## Blueprint to develop the Framework Plan

The blueprint lays out the various steps to develop the framework plan. The framework plan identifies actions by policy makers and system designers to achieve Vision Zero. Although the blueprint did not include input from the public, community involvement is anticipated in future phases to ensure long-term success of Miami-Dade County's Vision Zero Framework.

### THE BLUEPRINT INDICATES THE PROCESS TO IDENTIFY STRUCTURAL, STRATEGIC, AND SYSTEMIC CHANGES



## Framework Plan Summary

Vision Zero Framework Plan was developed with input from Vision Zero Champions and Implementors, and aligned with the identified guiding values. These actions were identified using a data-based approach. The framework plan aims to address the road safety challenges while accounting for underlying factors. Inferences from data analysis indicated that Miami-Dade County's safety challenges are directly correlated to socio-economic and demographics within an area. The chapter titled *'Who are disproportionately impacted, and where are they located in Miami-Dade County'* in this report further details the data analysis criteria and inferences.

The chapter titled *'How to reverse the current safety trajectory in Miami-Dade County'* describes in detail the data supporting the proposed actions in the framework plan. The actions are under three categories: structural, strategic, and systemic actions. Structural leadership from the County's policy makers to the staff who implement these policies is necessary to both energize in the immediate term, and sustain the paradigm shift in the long term. Structural leadership is also essential to maintaining the strategic shift in Countywide policies, prioritization of users, education, communication required to eliminate fatalities and severe injuries; and systemic shift required in daily decision making during project delivery required to eliminate fatalities and severe injuries. Then, the structural leadership actions were grouped under the office or department responsible for taking action: the Office of the Mayor Danielle Levine Cava, the Department of Transportation and Public Works (DTPW) led by Director and CEO Eulois Cleckley. The actions identified under the Office of the Mayor require strategic leadership and multi-jurisdictional and interdepartmental coordination, while the actions identified under Director and CEO Eulois Cleckley, require structural leadership within the transportation planning and engineering divisions at DPTW combined with a systemic shift in every-day activities. Finally, the actions under each category were grouped by program timeline: 180-days, the first 18-months, and the first 36-months. The 180-day action plan is intended to demonstrate a strong sense of urgency and kick-start this framework plan by identifying responsible personnel, funding, resources, processes, and collaborative teams. The 18-month plan continues the program of actions identified in the first 180-days, and the 36-month action plan identifies strategies that require continued support and investment given the longer program time frame, such as capital projects or multi-jurisdictional projects.

Recommended actions for a paradigm shift towards creating a safer system for all users are summarized below by timeline and responsible office.

### Office of Mayor Daniella Levine Cava



#### 180-Day Action Plan

1. **Cultivate internal leadership to create momentum.** Designate a Vision Zero Internal Task Force with representatives from Miami-Dade County departments to create momentum and advance the County's Vision Zero priorities, policies, and processes. A Vision Zero Lead designated by the Mayor's office may lead this task force.
2. **Establish and fund a 5-Year Vision Zero Program** to implement identified Countywide priority projects, with recurring yearly funding. Coordinate and garner support from the County Commissioners to prioritize funding for safety projects and policies.
3. **Establish a Vision Zero Equity Task Force/Steering Committee** with representatives from communities of concern, public health organizations, local universities, and the school board. The goal of the task force would be



to guide decision making for equitable outcomes from the Miami-Dade County's Vision Zero Program. For example, the task force may review opportunities to leverage existing resources to improve safety of vulnerable users and verify that the project utilized adequate and meaningful community engagement, during the project planning phase.

**4. Established Vision Zero Champions working group.**

The Vision Zero Champions' working group should include DTPW, Health Departments, the Regulatory and Economic Resources (RER) Department and the Miami-Dade Police Department and Fire Rescue. The group should meet every quarter to expedite the implementation of safety projects under their respective purview and receive updates on the Vision Zero progress.

**5. Brief elected officials** on the high-injury network Countywide and in their respective districts.

**6. Adopt a County resolution prioritizing the most vulnerable users** in the following order: people walking/ accessing transit, people biking and using micro-mobility modes, transit vehicles, as well as freight and personal vehicles.

**7. Develop and integrate policy requiring safety analysis** when proposing roadway modifications.

- » Collaborate between Miami-Dade County departments by integrating land use, health and transportation with the focus of increasing safety within the high-injury network.
- » Identify opportunities to collaborate between the County's various departments, from the Health Department to the DPTW, in areas such as community engagement, safety education, and providing and assisting with crash data from emergency centers among others.

**8. Identify resources and funding for a yearly refresher training program for County staff on the Vision Zero** efforts in the County, and update the progress based on the Key Performance Indicators. Work with the County's Marketing Department and the Department of Human Resources to provide a Vision Zero basics training for new County employees, particularly those working for DTPW or RER.

**9. Collaborate with the Police Department and Fire Rescue to identify equitable traffic enforcement strategies.**

- » Establish policies and funding to support automated speed enforcement for violations such as running red lights or speeding to reduce dangerous driving behaviors. Work with the Florida Legislature to continue to allow automated speed enforcement within Miami-Dade County.
- » Collaborate with Fire Rescue on balancing the infrastructure needs of emergency access and the safety needs of the vulnerable roadway users.

**10. Work with the Florida Legislature to reduce the default (or *prima facie*) speed limit from 30MPH to 20MPH in residential neighborhoods and 25MPH in commercial areas.**

- » Identify and replace speed management policies that exacerbate roadway safety challenges with new policies.
- » Identify corridors within the high-injury network with a posted speed limit of 35MPH or higher. Once identified, the locations' operating speed should be evaluated and speed management established to align with Vision Zero goals and objectives.
- » Work with municipalities to allow 20MPH and 25MPH speed limits within their jurisdiction. Identify and implement 'Slow Zones' with a posted speed limit of 20MPH within neighborhoods and urban areas like downtowns, or near schools and transit stations to reduce speed-related crashes.



 18-Month Action Plan

**11. Develop policies and an educational campaign to eliminate crashes resulting from driving-under-the-influence (DUI).**

- » Discourage impaired drivers from driving by providing alternate transportation options such as expanded transit service hours or on-demand micro-transit within entertainment areas. Coordinate with local alcohol serving establishments to disseminate the information.
- » Support FDOT educational campaigns targeting impaired driving and develop complimentary local educational campaigns.
- » Collaborate with public agencies and private entities such as the County Health Department, private philanthropy organizations, schools, universities, hospitals, hospitality establishments, medical insurers, and trial lawyers to share Vision Zero educational information.

**12. Expand the Miami-Dade County crashes data set to include crashes involving people using active and emerging mobility.**

- » Collaborate with FDOT for more accurate crash reporting into Signal Four Analytics the state's crash reporting system used by Miami-Dade County. The collaboration would address some of the challenges observed in the 2015-2019 years crash data such as missing location information and inconsistent naming convention.
- » Work with law enforcement to expand police reports to include incidents related to new micro-mobility modes like electric scooters and electric mopeds. For example, the City of San Francisco is successfully implementing Vision Zero and has developed a crash monitoring methodology and template to track crashes involving emerging mobility.
- » Combine hospital crash data with police incident reports to address the data gap with pedestrian and bicycle crashes. Future Miami-Dade County transportation-related injury crash analyses must include data from hospital records and transit safety records, in addition to the police incident reports.

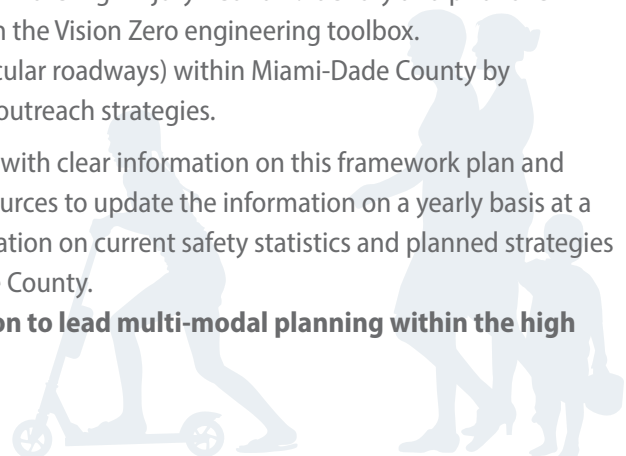


## Department of Transportation and Public Works (DTPW), Director and CEO Eulois Cleckley



### 180-Day Action Plan

13. **Identify currently funded transportation projects** along roadways in the high-injury network, and prioritize incorporating Vision Zero strategies for safety improvements as part of the projects' implementation.
14. **Conduct a series of workshops** to share the developed Vision Zero approach with municipalities and other local entities.
15. **Collaborate with other County departments to identify opportunities to implement quick-build safety solutions** within the identified high-injury network with pavement marking and signage improvements that can be implemented alongside other improvements, such as proposed utility infrastructure projects that require milling and resurfacing after construction.
16. **Develop a framework to ensure Vision Zero goals are incorporated in every transportation project during planning, engineering, and maintenance.**
  - » Establish a review process for planned roadway improvements by private developers, proposed roadway improvements to mitigate traffic impacts and use of traffic impact fees along roadways within the identified high-injury network. Coordinate with the Planning Division and Regulatory and Economic Resources Department (RER) during review of private development site plans at the Development Review Committee (DRC) to ensure Vision Zero goals are incorporated.
17. **Collaborate with transportation and transit agencies including FDOT and municipalities within MiamiDade County.**
  - » Prioritize safety audits of funded Capital Improvement Projects (CIPs) along the roadways included in the high injury network.
  - » Collaborate to identify opportunities with the various divisions within DTPW to implement quick-build safety solutions within the roadways included in the high injury network. Leverage funded transportation maintenance projects such as milling and resurfacing to incorporate low-cost safety improvements.
  - » Review traffic signal timings at intersections identified within the high injury network. Identify and prioritize opportunities for low-cost safety improvements included in the Vision Zero engineering toolbox.
  - » Initiate a Modal Priority Master Plan (vehicular or non-vehicular roadways) within Miami-Dade County by identifying funding, agency stakeholders, and community outreach strategies.
18. **Launch a Vision Zero web page on the County's website** with clear information on this framework plan and planned policies, projects, and education tools. Identify resources to update the information on a yearly basis at a minimum. The goal of the website is to provide clear information on current safety statistics and planned strategies to eliminate fatalities and severe injuries within Miami-Dade County.
19. **Identify funding for the Transportation Planning Division to lead multi-modal planning within the high injury network.**



## CALL TO ACTION RESPONSE

- » Conduct preliminary planning to identify the required countermeasures on the facilities within the high injury network.
  - » Identify and establish recurring funding for infrastructure improvements on the facilities within the high injury network. Alternative or additional funding such as federal and state grants may be considered.
  - » Identify supporting policy countermeasures that, when combined with infrastructure improvements, ensure successful project outcomes.
20. **Identify funding and integrate estimated expenses associated with community outreach and project evaluations (before and after) into transportation project costs.**
  21. **Develop Vision Zero Program Key Performance Indicators (KPIs)** to evaluate progress and lessons learned.
  22. **Adopt the identified safety priority projects as part of the Miami-Dade Transportation Planning Organization (TPO) priority projects.**
  23. **Work towards Vision Zero Network recognition for Miami-Dade County as a 'Vision Zero Community'.**



### 18-Month Action Plan

24. **Develop multi-modal priority for all roadways** within Miami-Dade County in coordination with agency stakeholders and community outreach and aligned with the Mayor's Pedestrian-First priority.
25. **Initiate planning and outreach** to implement the top fifty Countywide priority safety projects.
26. **Identify funding for planning and implementing safety infrastructure near existing bus stops and transit stations and around planned future stations along the County's Strategic Miami Area Rapid Transit (SMART) Corridors.**
  - » Conduct site audits around existing transit stations, including Metrorail, Metromover, and park-and-ride stations that have a high crash rate. Coordinate with municipalities and prioritize funding to implement safety improvements.
  - » Investigate, plan, and invest in safe road infrastructure around the future station locations along the SMART Corridors.
27. **Collaborate with the Transit Planning, Land Use Planning, and Traffic Engineering divisions in the County and the planned Transportation Planning Division.**
  - » Implement the quick-build projects identified with other County departments in the first 180 days.
  - » Coordinate the planning and implementation of safety projects (between the Transit and the Public Works Divisions) around transit stations and bus stops.
    - Implement safety improvements when new bus stops are installed or moved to a new location, particularly with the Better Bus Project program being implemented by DTPW.
    - Prioritize safety improvements within the high injury network, near high ridership routes, and near transit stations and bus stops with a high number of boardings and alightings.
28. **Develop a safety dashboard on the Vision Zero website for clear communication with transportation professionals and other stakeholders.**
  - » The dashboard, at a minimum, should be designed to be automatically updated with crash data. The dashboard may also provide the status of safety projects, educational materials and other information on the progress towards achieving Vision Zero.



- » Ensure safety data is publicly available for local agency staff and elected officials. Create an open data portal to be transparent and provide easy access to professional organizations like the *Chicago Data Portal*.
  - » Share successes and lessons-learned using before and after photographs and project evaluations.
29. **Ensure effective community engagement during project planning, particularly in underserved communities defined as Equity Priority Areas in this report.**
  30. **Evaluate the Vision Zero program based on the Key Performance Indicators** identified in the 180-day program phase.



### 36-Month Action Plan

31. **Continue implementation of the top fifty Countywide priority safety projects.**
32. **Develop a Modal Priority Master Plan.** Vehicular capacity may be prioritized along some roadways and non-private vehicular infrastructure prioritized along other roadways.
33. **Ensure that the safe, mobility and access needs of vulnerable travel mode and vulnerable users are integrated within all transportation projects.**
34. **Launch the safety dashboard with integrated crash data** developed during the first 18 months on the County's Vision Zero website.
35. **Review and update the County's design criteria and standards** aligned with the Vision Zero engineering tools provided in this framework plan. Collaborate with DTPW divisions and RER to ensure County's development codes are aligned with the Vision Zero values.







MIAMI-DADE COUNTY  
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The background of the page features a light blue gradient. In the lower half, there are faint, light blue silhouettes of various people: a child on a scooter on the left, a woman walking in the center, a small child walking next to her, and a woman walking on the right. They are positioned as if they are crossing a street with a white crosswalk. The main title is overlaid on this scene.

# What is the Current Roadway Safety Context, Worldwide and in the United States?

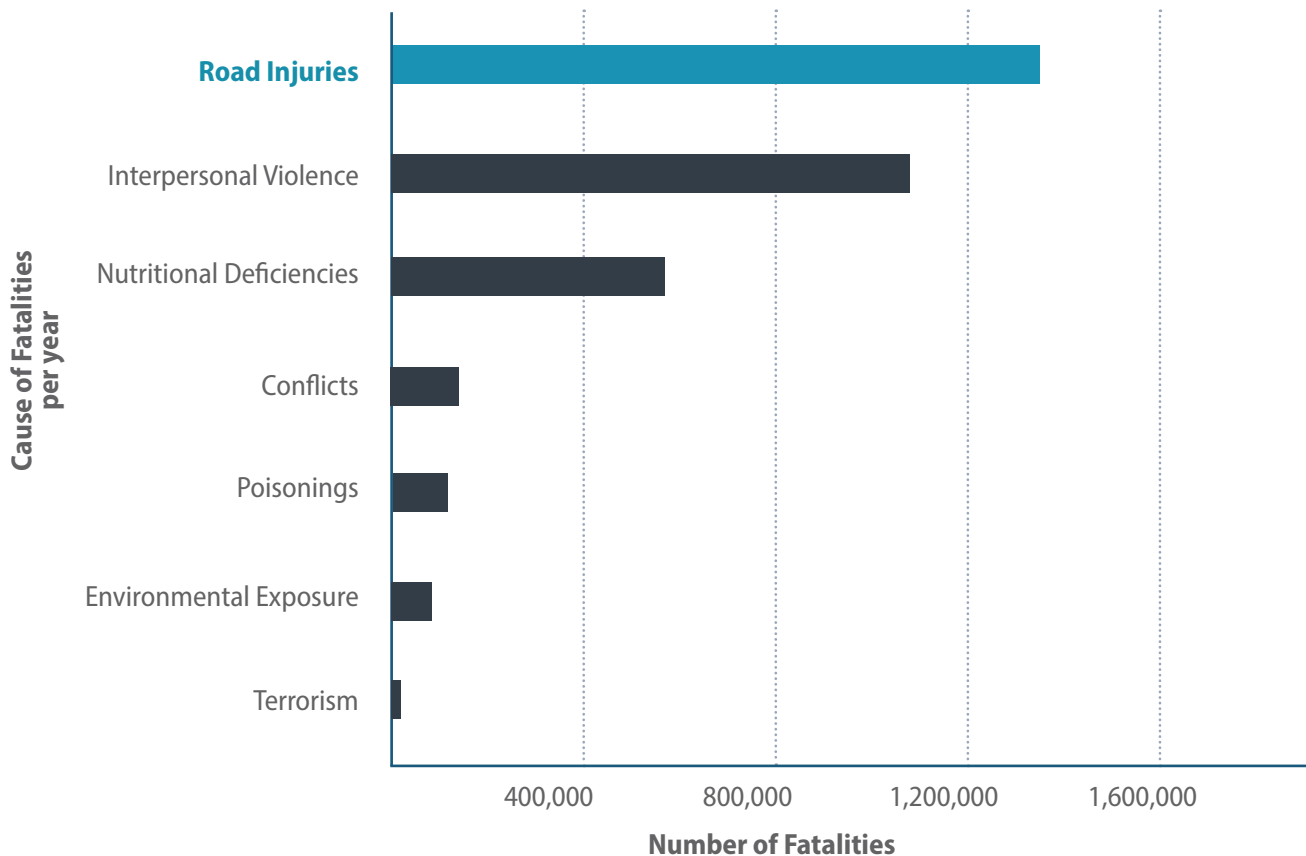


# CURRENT STATE OF ROADWAY SAFETY

## ROAD FATALITIES ARE THE NUMBER ONE NON-DISEASE RELATED CAUSE OF DEATH WORLDWIDE

Road crashes result in a tremendous cost to society around the world, though road fatalities often do not receive as much public attention as other non-disease related causes of death. Globally, road crashes are the leading non-disease related cause of death for people of all ages, per the World Health Organization (WHO)'s Global Status Report on Road Safety (2018).

### WORLDWIDE, ROAD FATALITIES ARE THE NUMBER ONE CAUSE OF DEATH (NON-DISEASE RELATED)



Source: Our World in Data. 1990-2017



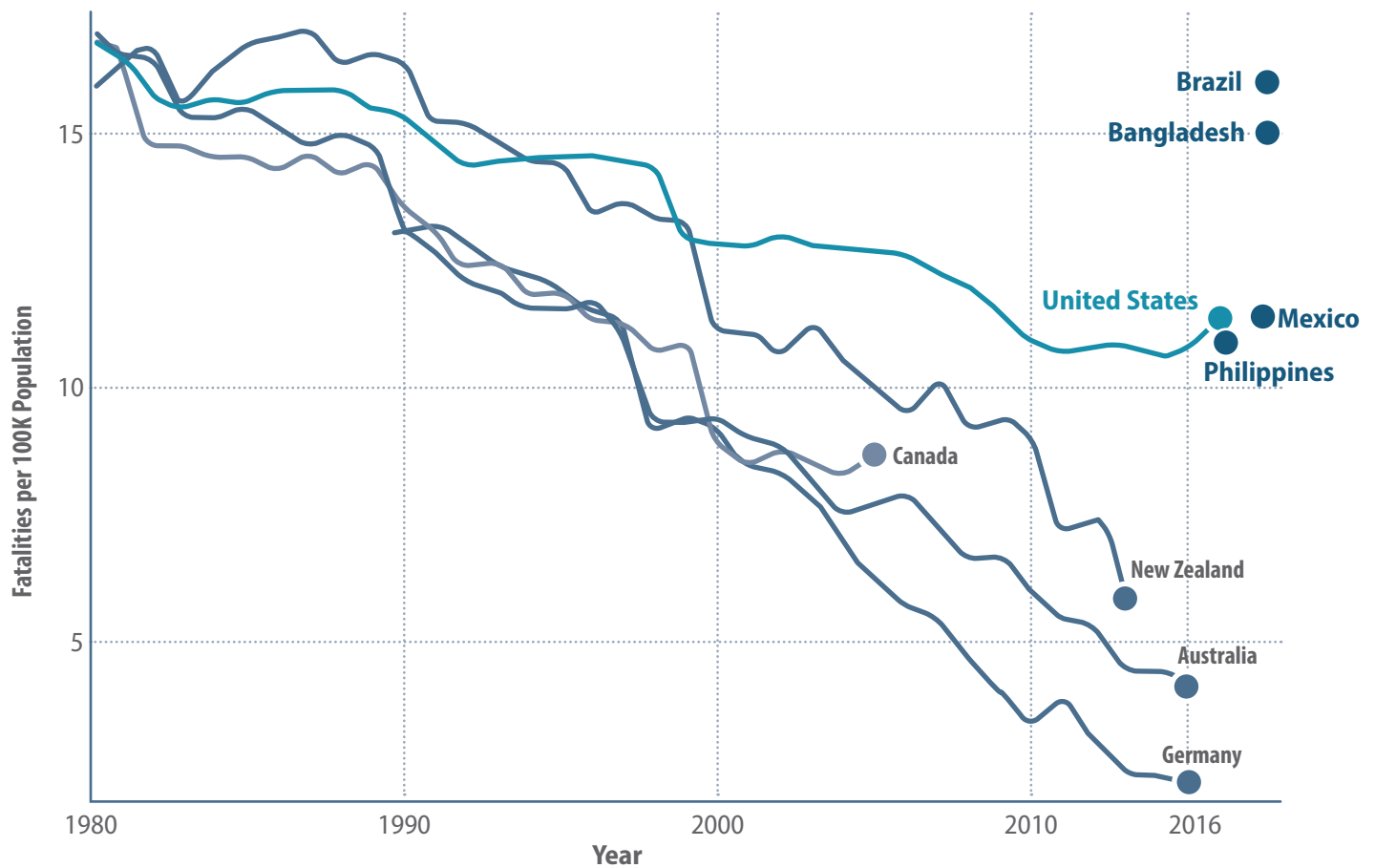
» [Global Status Report on Road Safety 2018. World Health Organization \(WHO\)](#)



## STATE OF ROAD SAFETY IN UNITED STATES

Countries with high average incomes typically have significantly higher infrastructure investment. In the early 1980s, most countries had similar fatal crash rates which started steadily declining in the 1990s. The steady decline in fatal crash rate in countries with high average incomes is attributed to their higher investment in safer infrastructure, mobility programs, shift to non-vehicle transportation modes and services. On the other hand, **the fatal crash rate in the United States did not decline at the same pace as was observed in other countries with comparable income levels.** In fact, the reduction in the fatal crash rate in the United States is comparable to countries with moderate average incomes like the Philippines, and Mexico, signaling the need for a stronger focus on road safety in the transportation agenda within the United States.

**IN THE UNITED STATES, ROAD FATALITIES ROSE WHILE OTHER COUNTRIES WITH HIGH AVERAGE INCOMES SAW A STEADY DECLINE IN THE NUMBER OF ROAD FATALITIES**



- » [Road Safety, National Highway Traffic Safety Administration \(NHTSA\), US DOT](#)
- » [Facts + Statistics: Highway Safety, Insurance Information Institute \(III\)](#)
- » [Data Bank, The World Bank](#)



## ROAD- SAFETY INDICATORS IN THE U.S.

In the U.S., key indicators of road safety can be broadly separated into four categories: crash-vulnerable locations, crash-vulnerable travel modes, crash-vulnerable users, and contributing road factors influencing user behavior.

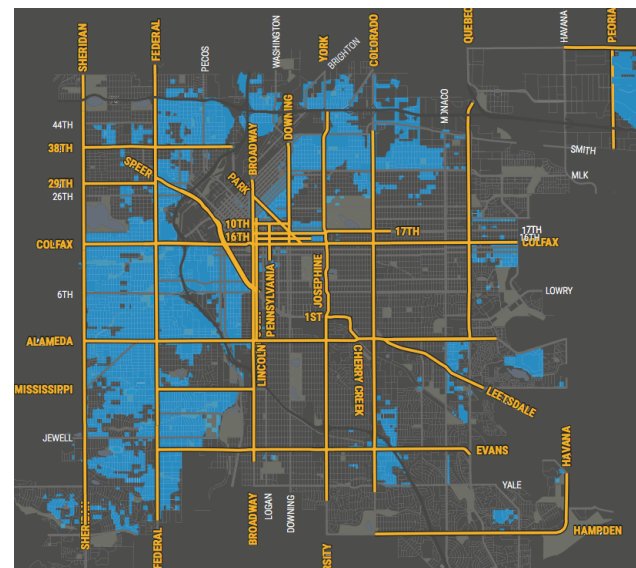
### CRASH-VULNERABLE LOCATIONS IN THE U.S.

Crash-vulnerable locations are locations where a high percentage of fatal and severe crashes occur relative to the population within that area. In many U.S. cities, a person's chances of being in a crash that results in a fatality or severe injuries are dictated by where they live (similar to other health outcomes). These areas were underserved with mismatched investment in public infrastructure like highways that were built running through communities that have the highest concentration of households with zero cars, limited infrastructure like sidewalk and bike infrastructure to support those people walking and biking. Also, socio-economic and demographic analyses indicate strong correlation with areas with the highest concentration of households with low-income people, highest concentration of people of color, predominantly African-Americans or Hispanics. The areas with disproportionately higher crash rate, socio-economic and demographic indicators are identified as Equity Priority Communities. Examples of cities that have designated Equity Priority Communities to integrate equitable strategies to counter the negative outcomes include Denver, Portland, Los Angeles, San Francisco, and Washington D.C.

Understanding the history, correlations to other factors may help develop strategies that counter the negative safety outcomes. The history of exclusionary zoning, infrastructure planning discriminatory lending policies, and private insurance practices referred to as redlining are discussed in *The Color of Law: A Forgotten History of How Our Government Segregated* by Richard Rothstein.

**THE CITY OF DENVER SAW A SIGNIFICANT OVERLAP BETWEEN THE HIGH-INJURY NETWORK (YELLOW) AND COMMUNITIES OF CONCERN (BLUE).**

**38% OF ALL ROAD FATALITIES AND 44% OF FATALITIES INVOLVING PEOPLE WALKING WERE WITHIN THE COMMUNITIES OF CONCERN.**



Source: City and County of Denver



- » [Plan Bay Area 2040 Equity Analysis, Bay Area Metro](#)
- » [Charlotte Future 2040 Comprehensive Plan. Built City Equity Atlas](#)
- » [Centering Equity: Safe Mobility is a Right. Vision Zero Network](#)



## CRASH-VULNERABLE TRAVEL MODES IN THE U.S.

Crash-vulnerable users are identified as those not within motor vehicles. The following sections quantify the crash-vulnerable users by travel modes using two key indicators.

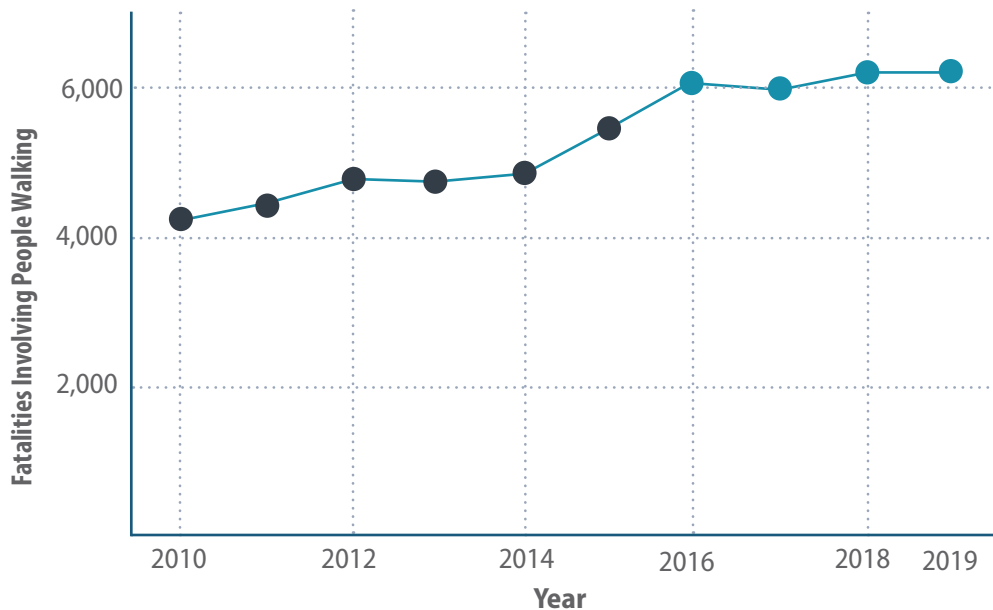
### Travel-mode Indicators

#### i. People Walking, Biking or using Micro-Mobility

More than 14 people walking were struck and killed everyday in the U. S. between 2010 and 2019 by people driving. Non-vehicular road users are disproportionately adversely impacted compared to those driving across all contributing roadway factors and along all parts of the roadway based on several national studies. The studies have shown that crash risks for those walking, biking or using micro-mobility increase with lack of sidewalks, safe crossing opportunities, and inadequate roadway lighting. Crashes for non-vehicle users are also highest along roadways with high traffic volumes and high operating speeds.

The current roadway system design and transportation programs have focused on improving vehicle capacity and speed. While modern vehicles are better designed to protect occupants at higher speeds during crashes, these safety features have only recently been extended to people outside of the vehicle - people walking, biking, micro-mobility and using transit.

**45% INCREASE IN FATALITIES INVOLVING PEOPLE WALKING THOUGH POPULATION INCREASED BY 6% BETWEEN 2010 AND 2019 IN THE U.S.**



Source: *Dangerous by Design*, 2021



- » [Pedestrian Injury and Social Equity in Oregon, Oregon Department of Transportation](#)
- » [Transport and Inequity: Why Disparities in Access Matter in Cities. World Resources Institute](#)
- » [Racism has Shaped Public Transit, and its Riddled with Inequities. Rice Kinder Institute for Urban Research](#)
- » [Examining the Increase in Pedestrian Fatalities in the United States, 2009-2018. AAA Foundation for Traffic Safety](#)

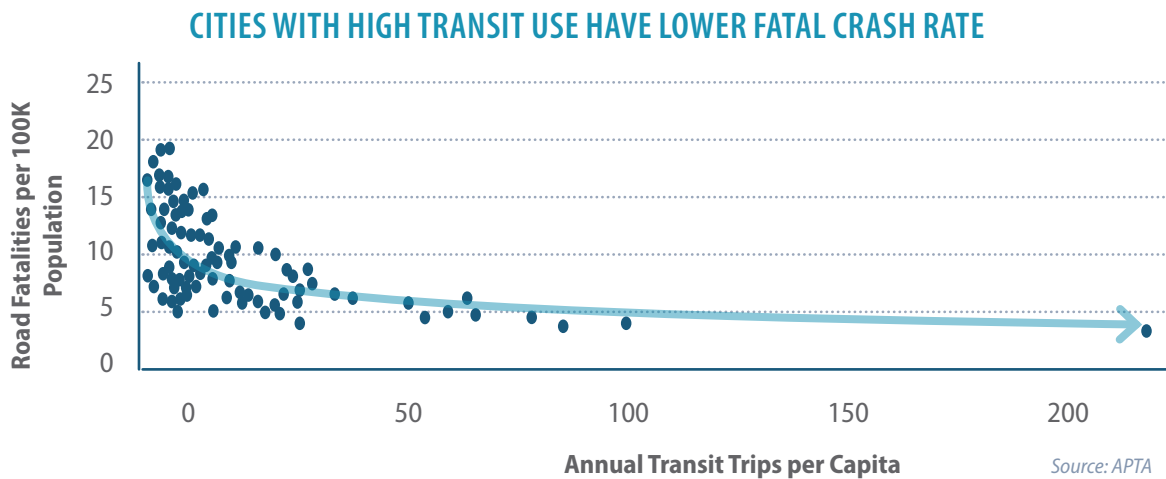


## ii. People Accessing Transit

According to the report *Who Rides Public Transportation* published by the American Public Transportation Association (APTA), two-thirds of transit riders walk to the transit station. Research led by Texas A&M Transportation Institute titled *Innovative Tools to Evaluate Intersection and Pedestrian Safety Issues* concluded that the [crash risk for people walking to transit increased by 48%](#) over locations without a bus stop present. The study indicates a high crash risk in connection with transit that may be experienced by vulnerable users and the need to provide safe for those walking to and from transit stations.

### The Importance of Travel- Mode Shift Towards Transit

In the U.S., urban areas with higher rates of transit usage have lower road fatality rates and documented in a study conducted in metro areas with populations over 500,000 by the American Public Transit Association (APTA). The conclusion of the study signals that mode-shift to a transit community from a predominantly vehicle-oriented community is directly attributed to areawide crash reduction for all roadway users. The [shift towards a transit-oriented community must be combined with targeted infrastructure investment around transit stations](#) to ensure safe access to and from the transit stations (particularly for crash vulnerable travel-modes).



### Impacts on People Walking, Biking and Transit-Dependent Users during COVID-19 Restrictions

In 2020, COVID-19 related restrictions discouraged people from congregating in places of work, worship, or recreation, reducing their travel. However, the mobility needs for essential workers - hospital staff, grocery staff, delivery staff, and others who are typically transit-dependent due to lower wage jobs - skyrocketed. Nationally, two inequitable transportation outcomes were observed: 1) an unprecedented number of people were walking and biking. As many streets are not designed for people outside vehicles, the number of crashes involving people walking and biking increased drastically, along with higher vehicle speeds on roads with lower than usual traffic volumes; 2) Demand for transit declined nationwide, and in turn service was reduced or eliminated. However, mobility needs of essential workers and others who are transit dependent increased.



» [Initial Impact of COVID-19's Stay-At-Home Order on Motor Vehicle traffic and Crash Patterns in Connecticut, BMJ Journals](#)



## CRASH-VULNERABLE USERS

Safety outcomes are different based on user’s demographics (a person’s race, ethnicity, age, and gender) and socio-economic status (people living in low-income households, with disabilities, and with limited English proficiency).

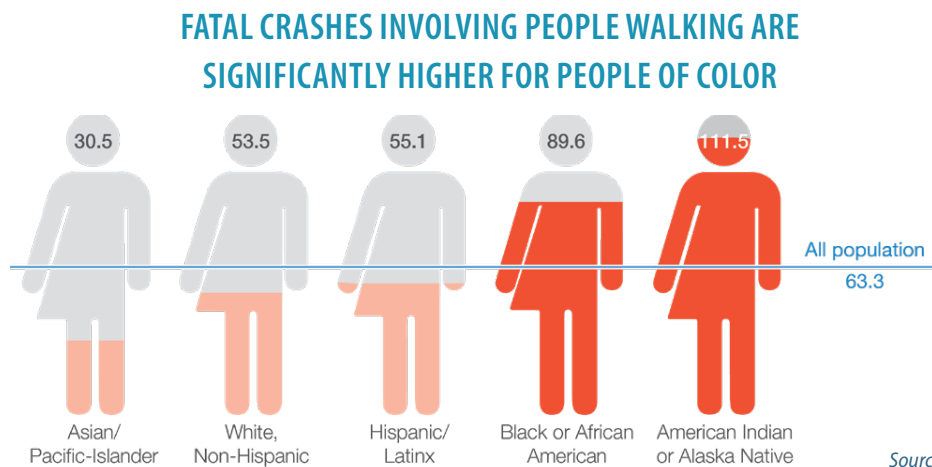
### Demographic Indicators

#### i. Race and Ethnicity

A person’s race and ethnicity are correlated to their risk of experiencing a fatality or severe injury crash. Studies discussed in the previous section show that people of color are disproportionately impacted - particularly Hispanics, African-Americans, and Native Americans because of where they live, work, and play.

Based on annual data from National Highway Traffic Safety Administration (NHTSA), Native Americans have the worst safety outcome, followed by African- Americans and then Hispanics.

- » According to two research studies, one by the University of Nevada, and one by Portland State University and the University of Arizona, implicit bias in driver yielding behavior may influence fatal crash risk. The researchers concluded that drivers were less likely to yield to a black pedestrian compared to a white pedestrian, signaling that implicit bias of roadway users may have perpetuated disparities.
- » Behavior tendencies influenced by culture, economic disposition, and other factors impacting crash risk include: non-use of safety equipment, driving under the influence, running red lights, and speeding according to research by Virginia Commonwealth University.



Source: 2021 Dangerous by Design



- » [Racial bias in driver yielding behavior at crosswalks, Portland State University & University of Arizona](#)
- » [Examining racial bias as a potential factor in pedestrian crashes, University of Nevada](#)
- » [Racial/ethnic Differences in Fatality rates from motor vehicle crashes: An analysis from a behavioral and cultural perspective, Virginia Commonwealth University](#)
- » [An Analysis of traffic fatalities by race and ethnicity, Governors Highway Safety Association](#)





## ii. Gender

Analysis of crashes by gender indicates that in the U.S., the gender of the driver is an indicator of fatal crashes involving people driving. Female drivers have a higher probability for severe crashes, but male drivers have a higher probability for fatal crashes. A 2011 study by the U.S. National Library of Medicine and National Institutes of Health indicates that women have an approximately 50% higher vulnerability compared to men of experiencing a severe crash.

### THOUGH, FEMALE DRIVERS HAVE 50% HIGHER SEVERE CRASH VULNERABILITY, MALE DRIVERS HAVE THREE TIMES HIGHER FATAL CRASH RATE THAN FEMALE DRIVERS

Fatal Crash Rate per 100,000 Licensed Drivers

Year	Male	Female
2015	33.15	11.17
2016	34.44	11.87
2017	33.99	11.96
2018	33.12	11.58
2019	32.52	11.09

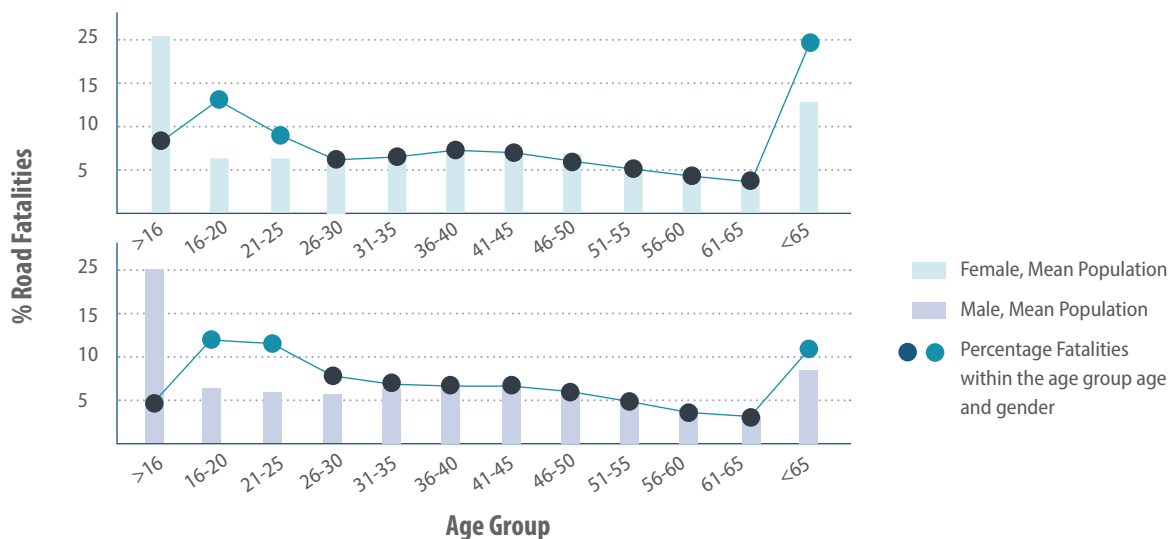
Source: USDOT, NHTSA

APPROX. 3 TIMES HIGHER!

## iii. Age

In the U.S., adults over 65 years old, and children and young adults between 16 and 25 years old account for the highest percentage of fatal road crashes. The 2021 *Dangerous by Design* report by Smart Growth America states that people over 75 years old constitute the highest proportion of fatal crashes involving people walking.

### AGE GROUPS OF OVER 65 YEARS OLD AND BETWEEN 16-25 YEARS OLD, MALE AND FEMALE ARE DISPROPORTIONATELY IMPACTED BY FATAL ROAD CRASHES



Source: Comparison of Crash Fatalities by Sex and Age Group, NHTSA



» [Motor Vehicle traffic crashes as a leading cause of death in the U.S., 2002- A demographic perspective](#)



## Socio-Economic Indicators

### i. People Living in Low-Income Households

The cost of owning and operating a personal vehicle is \$9,300 annually, as estimated by the Bureau of Transportation Statistics in 2019. To reduce this financial burden, people with low incomes tend to walk, bike, and use transit. This is illustrated below based on the results of the 2017 National Household Travel Survey conducted by the FHWA. A comparison of income level and crash rates shows a disproportionate share of severe and fatal crashes in low-income communities. People living in low-income households are often the most vulnerable roadway users based on their mode of travel.

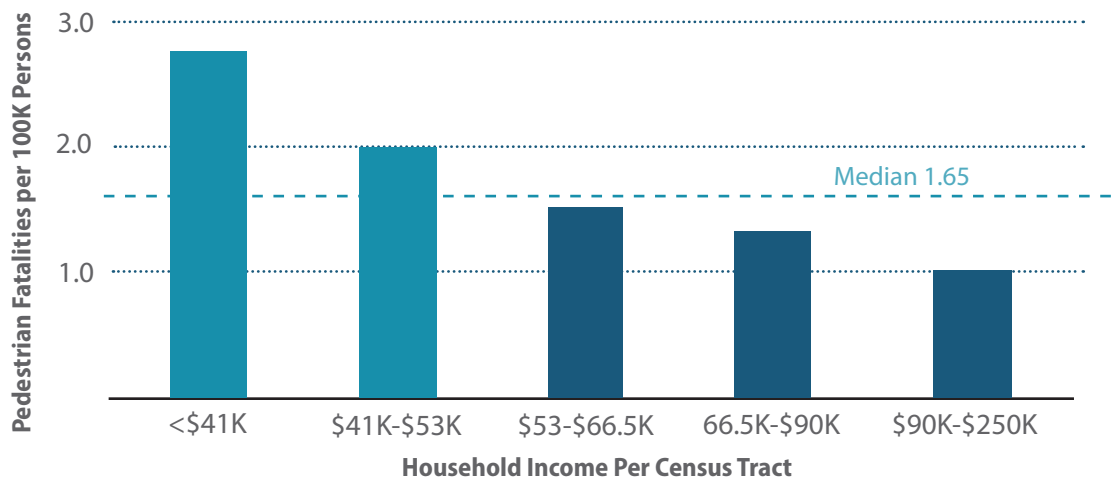
### FINANCIAL BURDEN OF TRAVEL ON LOW-INCOME HOUSEHOLDS DICTATES NON-VEHICLE TRAVEL MODE

	Walk to Reduce Financial Burden	Use Transit to Reduce Financial Burden
<b>Household Income</b>		
less than \$25,000	29%	21%
\$25,000 to \$49,999	17%	10%
\$50,000 to \$99,999	14%	9%
\$100,000+	11%	11%

*APPROX. 2.6 TIMES HIGHER!* (Comparison between 29% and 11%)  
*APPROX. 2 TIMES HIGHER!* (Comparison between 21% and 11%)

Source: National Household Travel Survey, FHWA

### PEOPLE IN HOUSEHOLDS EARNING LESS THAN \$41K ANNUALLY HAVE THE HIGHEST FATAL CRASH RISK, ATTRIBUTED TO NON-VEHICLE TRAVEL MODE



Source: Dangerous by Design 2021



## ii. People with Disabilities

People in wheelchairs and those with disabilities who cannot operate a personal vehicle tend to rely on transit or paratransit for mobility. Research by BMJ, one of the world's leading medical journal in a paper titled *Disparities in Road Crash Mortality Among Pedestrians using Wheelchairs in the USA: Results of a Capture-Recapture Analysis* concluded that [people using wheelchairs had a 36% higher fatality rate than the general population](#), 47.5% of crashes involving people in wheelchairs were within marked crosswalks. The research also identified men between 50-64 years old have a 75% increased crash risk when using a wheelchair compared to an able-bodied person walking.

## iii. Linguistic Isolated People (*non-English speaking or limited English proficiency*)

While data and research on the crash risk associated with English proficiency is limited, the correlation between the two is recognized as a potential indicator of crash risk. For example, the study *Pedestrian Injury and Social Equity in Oregon* by the Oregon Department of Transportation indicates a [high correlation between linguistically isolated people and their increased crash risk](#). Additionally, agencies such as the Metropolitan Transportation Authority (MTA) include limited English proficiency as a parameter when defining Equity Priority Communities within the Bay Area.

# CRASH-CONTRIBUTING ROADWAY FACTORS

The elements of road design, operations, maintenance and supporting policies, directly impact safety outcomes of the road users.

## SPEED LIMIT, LIGHTING, FUNCTIONAL CLASSIFICATION OF ROADS, OTHERS

Research led by Transport Research Procedia, titled *Analysis of Roadway and Environmental Factors Affecting Traffic Crash Severities* concluded that functional classification of roads, crash location, road alignment, light condition, road surface condition, and speed limit has significant impacts on traffic crash severity. The research highlights that higher crash severity is associated with the following roadway factors and conditions: rural roadways, major arterials, mid-block locations, roads with curves, nighttime when it is dark without street lights, dry roadway conditions, and high speed limits.

Research published on the Journal of Transport and Land Use, titled *United States Fatal Pedestrian Crash Hot Spot Location and Characteristics* also establishes the connection between crash risk and roadway factors. The research notes that the [highest number of fatal crashes involving people walking occur on multi-lane roadways, requiring pedestrians to cross five or more lanes](#). The majority (three-quarters) of the fatal crash hot spots had speed limits of 30MPH or higher, traffic volumes exceeding 25,000 vehicles per day, adjacent commercial retail and service land uses, and a majority (three-quarters) were bordered by low-income neighborhoods.



- » [Wheelchair Users are More Likely to be Killed in Traffic than Other Pedestrians, Bloomberg CityLab](#)
- » [Pedestrian Injury and Social Equity in Oregon, Oregon Department of Transportation](#)
- » [Equity Priority Communities, Metropolitan Transportation Authority \(MTC\)](#)



## The Importance of Speed Management

Managing speed is a key component of the Safe System Model. Lower speeds dramatically reduce the likelihood that a crash would result in a fatality or severe injuries. **In combination with lower posted and design speed limits, safer road design passively influences people driving to operate at speeds appropriate for the context of the roadway.** For example, narrower travel lanes, the presence of tree canopy and clearly marked crosswalks with advance stop bars, provide information to drivers to expect people to cross the street, exercise caution, or slow down.

The number of fatal crashes attributed to high speeds is even higher (about 1.7 times higher) than driving under the influence, the number two contributing driver behavior in fatal crashes. There is also a direct relation between the severity of crashes and the speed of the moving vehicles. For people outside a vehicle, their likelihood of experiencing a fatality or severe injury depends on the speed of the vehicle during crash. An able-bodied, middle-aged person’s chance of dying is 10% when hit at about 20MPH but 75% when hit at 50MPH, signaling an immediate need for context-sensitive speed reduction policies and roadway design to eliminate fatal and severe injuries.

## Driver Behavior is Influenced by Road Design and Policies

It is important to distinguish between behavior and underlying design and policies that influence driver behavior.

A list of driver behaviors were developed by NHTSA, based on behavior observed by officers at crash sites. Driver behaviors include, speeding, driving under the influence, distracted driving, and other behaviors. In 2019, speeding was the foremost driver behavior resulting in fatalities or severe injury crashes.

Driver behavior is also influenced by road design and policies such as establishment of design speeds and speed limit. The Insurance Institute for Highway Safety (IIHS) found that rising state speed limits in the United States over the 25 years between 1993 and 2017 have resulted in the loss nearly 37,000 lives.

### SPEEDING WAS THE TOP REASON FOR FATAL CRASHES NATIONWIDE IN 2019

Reported Driver Behavior	Number of Fatal Crashes in	Percentage of Total
	2019	Crashes
Driving too fast, driving in excess of posted speed limit	8,746	17.2%
Driving Under the Influence (DUI) of alcohol, drugs, or medication	5,164	10.1%
Failure to yield right of way	3,728	7.3%
Failure to keep in proper lane	3,381	6.6%
Operating vehicle in a careless manner	3,302	6.5%
Distracted (phone, talking, eating, object, etc.)	3,008	5.9%
Failure to obey traffic signs, signals, or officer	2,054	4.0%
Operating vehicle in erratic, reckless or negligent manner	1,880	3.7%
Overcorrecting/oversteering	1,569	3.1%

← APPROX. 1.7 TIMES HIGHER!



- » [Motor Vehicle traffic crashes as a leading cause of death in the U.S.,2002- A demographic perspective](#)
- » [United States Fatal Pedestrian Crash Hot Spot Location and Characteristics, Journal of Transport and Land Use](#)



## The Importance of Integrating Land Use (Built Environment) and Transportation

Land use and built environment policy decisions are often made based on analysis of vehicular traffic impacts without a strong consideration of the context or built environment. Such approach yields to identification of solutions that address the needs of drivers, while not taking into consideration the needs of the non-vehicle road users. Similarly, roadway design and policies are often geared to and focused on improving traffic capacity. A systematic approach to include design elements and policies to incorporate non-vehicle mobility infrastructure into the design is often lacking. When addressed, it is often included with minimal consideration to context, destinations, or attractors that people walking, biking, or using micro-mobility want to access. A holistic approach to the development of design and policies that address the needs of the vehicles as well as non-vehicle users with consideration to land-use and zoning are essential in producing positive safety and health outcomes on our roadways.

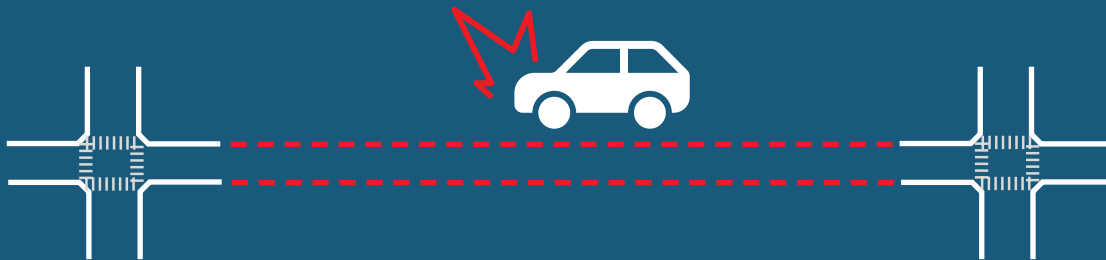
Various studies have illustrated the impact on safety when transportation decision-making is integrated with the built environment. A study led by the *National Library of Medicine*, titled *Are School Zones Effective? An Examination of Motor Vehicle Versus Child Pedestrian Crashes Near Schools* is one example. The study concluded that crash data between 2000 and 2005 in Toronto, Canada, indicated that the concentration of fatal crashes for children and young adults less than 18 years old was highest in school zones. Fatal crashes decreased as the distance from schools increased. Most fatal crashes within school zones involved 5-9 year olds as they traveled to and from school and occurred at mid-block locations. Another, research by Texas A&M Transportation Institute concluded that the crash risk at mid-block involving people walking increases near bus stops.

To reduce the burden of crashes on the vulnerable road users, research based on crash data clearly [signals the need for integrating the planning and design of the built environment with transportation planning and design.](#)



# INCOMPATIBLE ROAD INFRASTRUCTURE AND LAND USE INCREASES CRASH RISK FOR NON-VEHICLE USERS

CRASH RISK INCREASES AT MID-BLOCK FOR CHILDREN AND ADULTS.  
MID-BLOCK CROSSINGS INCREASE NEAR BUS STOPS AND SCHOOLS.



Data Source: National Library of Medicine

CRASH RISK FOR PEOPLE WALKING INCREASES NEAR BUS STOPS AND SCHOOLS.



Data Source: Texas A&M Transportation Institute

HIGHEST CONCENTRATION OF FATAL CRASHES ARE IN SCHOOL ZONES  
INCREASING CRASH RISK FOR <18 YEAR OLDS.



Data Source: National Library of Medicine



## PEOPLE DISPROPORTIONATELY IMPACTED BY FATAL CRASHES ARE



PEOPLE WALKING, BIKING, USING MICRO-MOBILITY



PEOPLE ACCESSING TRANSIT

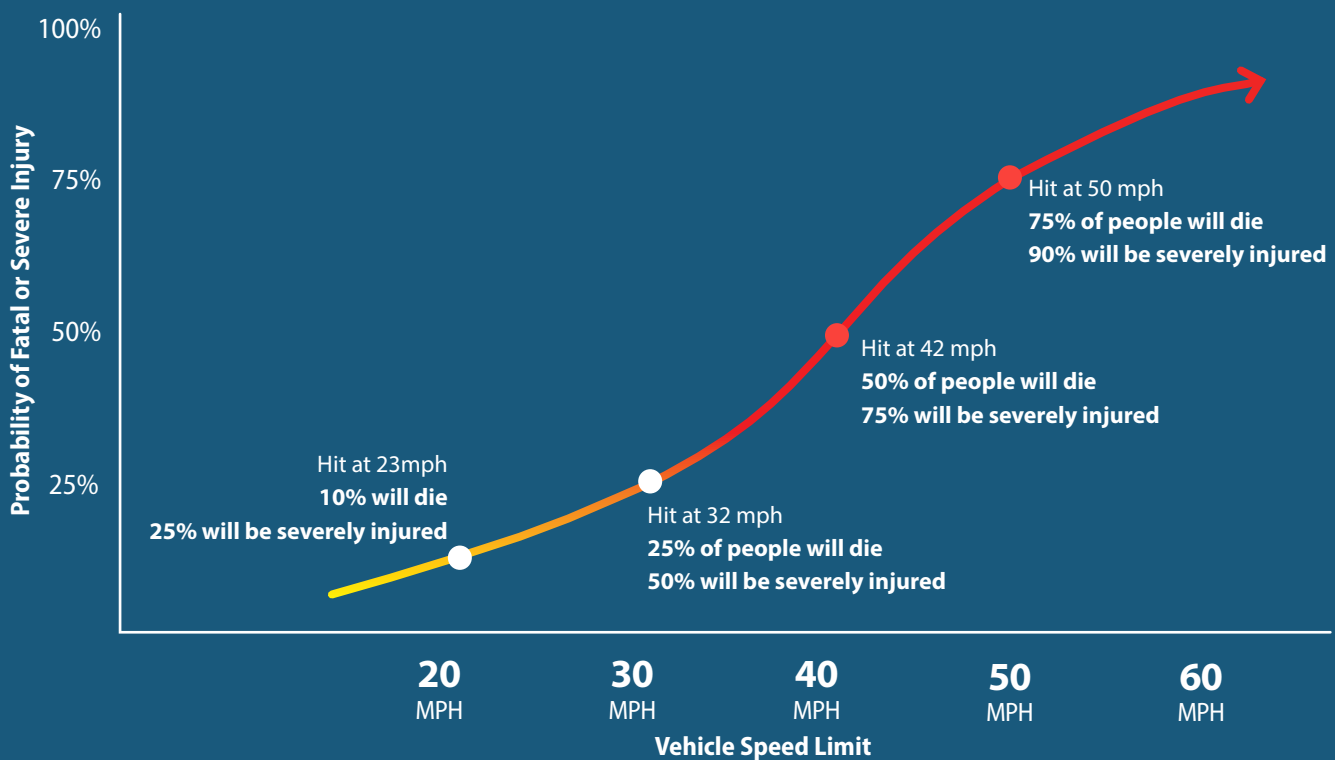


LOW-INCOME HOUSEHOLDS, PEOPLE WITH DISABILITIES, NON-ENGLISH SPEAKING PEOPLE, PEOPLE OF COLOR, WOMEN, OLDER ADULTS AND YOUTH

**INDICATING A NEED TO INVEST IN  
INFRASTRUCTURE AND POLICIES  
TO PROTECT CRASH-VULNERABLE USERS,  
AND WITHIN CRASH-VULNERABLE AREAS**



# THE LIKELIHOOD OF A PERSON WALKING DYING OR BEING SEVERELY INJURED, INCREASES EXPONENTIALLY WITH VEHICLE SPEED



Source: Graph adapted from City Limits. Setting Safe Speed Limits on Urban Streets, Data from: <https://aaaafoundation.org/impact-speed-pedestrians-risk-severe-injury-death/>





## CRASHES RESULTING IN FATALITIES OR SEVERE INJURIES ARE PREVENTABLE.

Road fatalities are people - our neighbors, our friends, our family members. Traffic crashes are often called “random occurrences” by the media, mirroring how we perceive these fatalities. But fatalities and severe injuries are not random. The so called “ransom accidents” that occur are part of a pattern of crashes that resulted in fatal and severe injuries. With a paradigm shift on establishing design and policies that address all users, crashes that result in fatalities and severe injuries are preventable.

### ZERO FATAL AND SEVERE INJURIES IS THE ONLY ACCEPTABLE OUTCOME

Franklin White  
@FranklinW5VN

NEW: FHP has released the name of the 2-year-old hit and killed in South Miami-Dade Friday afternoon. They say Anthony De Leon was struck near a Valentines stand on U.S. 1 by 42-year-old Hanskabel Amargos. Charges pending. FHP previously said the toddler was 3, but he's 2 @wsvn



4 4:18 PM - Feb 15, 2020

See Franklin White's other Tweets

FHP: 3-year-old boy killed in South Miami-Dade crash



FAMILY MOURNS AFTER CHILD'S DEATH  
HOMESTEAD

6:02 72°



WATCH NBC 6 LIVE FROM ANYWHERE ON THE NBC 6 APP

Source: WSVN <https://wsvn.com/news/local/miami-dade/fhp-3-year-old-boy-killed-in-south-miami-dade-crash/>

“A few weeks ago we had a big dump truck slam into a building just 2 blocks down.”

“It’s so random. It’s not like she did something to provoke it. She was just standing at the entrance to the building. It was not like she was on the dangerous part of the sidewalk next to the street.”

Source: CBS 4 Miami <https://miami.cbslocal.com/2019/12/04/pedestrian-killed-bird-road/>



» [The most dangerous threat on Miami streets. Transit Alliance Miami.](#)



# Vision Zero

*is a framework for eliminating fatalities and severe injuries on all streets.*



# VISION ZERO

Vision Zero is a paradigm shift that aims to eliminate deaths and severe injuries on all roadways through a system-wide approach. Vision Zero, also referred to as the safe systems approach, establishes a mindset with no tolerance for crashes that result in a fatality or severe injury. Many cities in the U.S. and Europe have seen a drastic reduction in the number of fatal and severe crashes using the Vision Zero approach. The Vision Zero approach is different from the prevailing transportation planning approach in the four distinct ways described below.

## Vision Zero Approach : Eliminate All Fatalities and Severe Injury Crashes

Vision Zero focuses on actions that eliminate fatalities and severe injury crashes while the traditional planning and engineering focus on reducing all traffic crashes. While not at odds with each other, this approach leads to different outcomes. Most crashes are property damage only (PDO) crashes, resulting in only damage to a motor vehicle or roadside object with no injuries or deaths. As such, the traditional planning and engineering approach identifies solutions yielding to an extraordinary amount of effort put into reducing all crashes with very little impact on fatalities and severe injury crashes. Vision Zero acknowledges this and **complements the traditional approach by focusing on and addressing crashes that lead to severe injury or death.**

Vision Zero recognizes that fatalities and severe injury crashes are a small percentage of total crashes that have a disproportionate impact on communities and society. A fatal injury is irreversible. Severe injuries can be permanent and demand life long care for the injured from immediate family and the community. Without a doubt, both fatalities and severe injuries are life altering events and a burden to the impacted person, their family and the community with effects that last far beyond the immediate crash. The 2016 Comprehensive Crash Cost, based on *Crash Cost for Highway Safety Analysis, FHWA* estimates:

**One Severe Injury Crash is 50 times more costly than a Property Damage Only Crash**  
**One Fatal Crash is 950 times more costly than a Property Damage Only Crash**

Eliminating crashes resulting in fatalities and severe injury means prioritizing locations that have a pattern of these crashes for safety improvements and supporting policies. **The entire community benefits when focus is put on eliminating crashes resulting in fatalities and severe injuries to people.**



## Vision Zero Approach : Acknowledge and Plan for Driver Error

The Vision Zero approach is to plan for a road system that accounts for human error and attempts to minimize the effects when the inevitable error occurs. No one is perfect. Vision Zero approach attempts to bridge the gap and balance the fact that while humans are inherently fallible and people will inevitably make mistakes, no one deserves to be killed or severely injured for a minor lapse of judgment or a mistake. Instead of focusing on human error, **the focus must be on preventing the severity of a crash even when the person driving makes an error.**

The Vision Zero approach is to acknowledge that drivers will make mistakes and invest in policies and roadway design that minimize the impact of those mistakes when driver error cannot be eliminated. Inside vehicles, advancements have been made to reduce impact with safety features like seat belts and airbags. These same advancements need to be employed by system designers to accommodate the needs of users outside of vehicles like people walking, biking or using micro-mobility. **Engineering countermeasures identifies roadway infrastructure design that can reduce the crash impact when a crash cannot be avoided.** These include designing based on the context, considering people walking, biking and using micro-mobility in locations around transit. Detailed engineering countermeasures based on common crash types are shown in Chapter 3.



## Vision Zero Approach : Share Responsibility Between Policymakers, Designers and Users

Building a safe transportation system includes many components from vehicles, modes of travel, user demographic, socio-economic conditions and land-use. To achieve a system with zero injuries and fatalities, **all users and designers of the transportation system must acknowledge and accept shared responsibility.**

People driving must also share the responsibility, but they must not be considered the singular reason for these crashes. The common goal of eliminating crashes resulting in fatalities and severe injuries must be shared by all stakeholders including transportation system designers, policymakers, politicians/government officials, infrastructure owners and operators, planners, engineers and road designers, vehicle manufacturers, trauma and hospital care providers, and law enforcement. The concept of 'shared responsibility' is not to assign blame, rather to **recognize the positive impact that people and agencies, together can have on improving roadway safety.**



## Vision Zero Approach: Employ a Data-Driven or Evidence-Based Safe Systems Approach

The safe systems approach considers systemic changes that can both prevent and minimize the severity of crashes. Both policy and engineering countermeasures can have a positive impact on reducing the number or severity of crashes. Policy countermeasures, include reducing vehicle miles traveled through land use planning and increasing transit funding. Likewise, proven engineering countermeasures identifies roadway infrastructure design that can reduce the crash impact when a crash cannot be avoided.

### VISION ZERO APPROACH



**All parts of the system must be strengthened**

So, if one part of the system fails, other parts will protect any person involved in the crash.

**Accommodate for driver error**

Reducing speed limits are essential for creating safer roads.

**Focus both on avoiding and surviving crashes**

Reduce the crash impact to below thresholds likely to result in death or severe injuries, for people inside and outside a vehicle.

**PREVAILING APPROACH**

A shift from assuming that roads complying with existing standards and guidelines will be safe, regardless of context

**VISION ZERO**

Utilize a data-driven and substantive safety approach to identify countermeasures that will both prevent and lessen severity of crashes in a context-sensitive manner



## IS VISION ZERO POSSIBLE?

The most prominent Vision Zero success was recently reported in Oslo, Norway. With a population of 670,000 people, the city reported one roadway death in 2019 and no death involving a person walking or biking. The singular death was a result of a medical emergency happening while the driver was operating their car. Other countries around the world, and U.S. cities have seen substantially accelerated reductions in traffic deaths and severe injuries since implementing Vision Zero, though they have not achieved absolute zero yet.

**Yes, Vision Zero is possible!** Vision Zero is a long-term goal that creates a continuous momentum to strive for zero fatalities and severe injuries.

### Vision Zero! Norwegian Capital Completely Quashes Road Deaths

Oslo recorded zero cycling and pedestrian fatalities in 2019 and U.S. cities can learn from its example.

By Aaron Short | Jan 3, 2020 | 57 COMMENTS

THIS POST IS SUPPORTED BY 

## Oslo Just Proved Vision Zero Is Possible

THE NORWEGIAN CAPITAL HAD ZERO PEDESTRIAN AND CYCLIST FATALITIES IN 2019.



BY JESSICA COULON Jan 7, 2020

### How Helsinki and Oslo cut pedestrian deaths to zero

After years of committed action, neither city recorded a single pedestrian fatality in 2019



▲ A pedestrian crossing in Oslo. In 2017, there was a 70% increase in tolls across the city, while car parking charges were raised by up to 50%. Photograph: Thomas Russ Arnestad/Alamy

News Article Source:

<https://www.bicycling.com/news/a30433288/oslo-vision-zero-goal-2019/>

<https://www.theguardian.com/world/2020/mar/16/how-helsinki-and-oslo-cut-pedestrian-deaths-to-zero>

<https://usa.streetsblog.org/2020/01/03/vision-zero-norwegian-capital-completely-quashes-road-deaths/>

<https://www.theguardian.com/world/2020/mar/16/how-helsinki-and-oslo-cut-pedestrian-deaths-to-zero>



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VISION  
ZERO

VISION ZERO 2021 FRAMEWORK PLAN  
MIAMI-DADE COUNTY

The background of the page features a large, light blue silhouette of a group of people walking across a crosswalk. On the left, a person is pushing a stroller. In the center, a woman is walking with a child. On the right, another person is walking. The crosswalk lines are also visible in the silhouette.

# Who are Disproportionately Impacted and Where are they Located in Miami-Dade County?

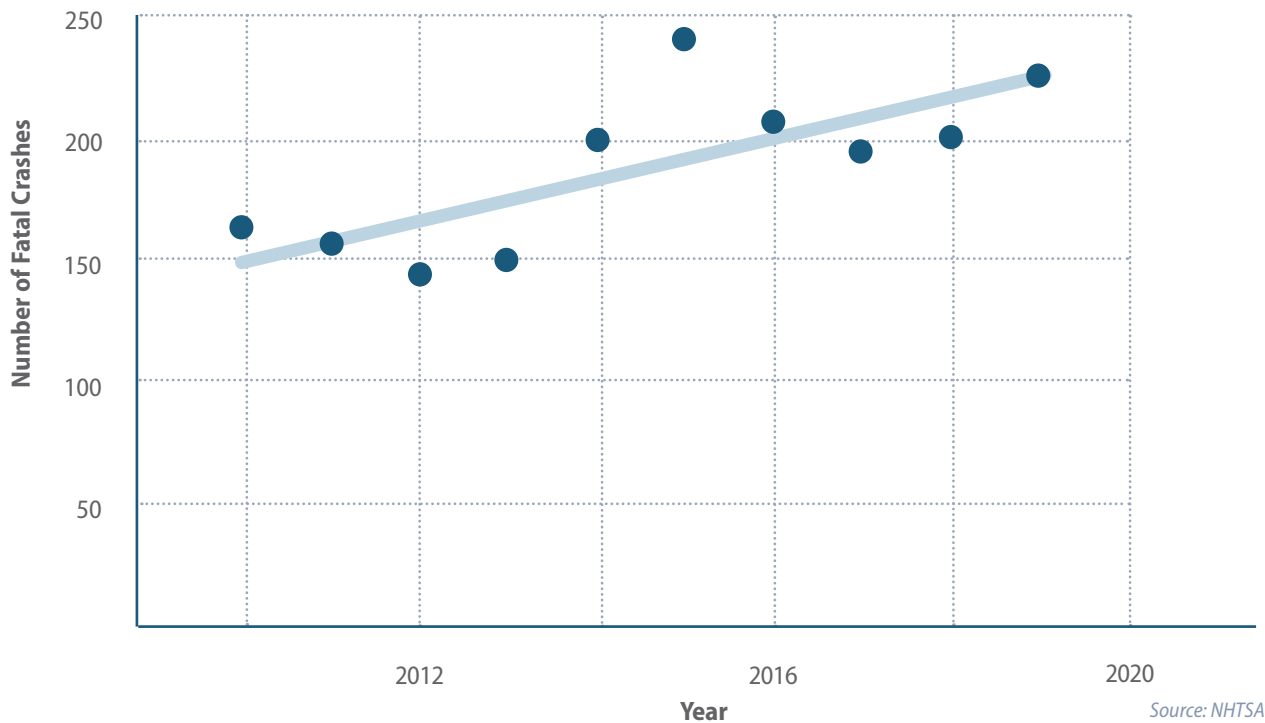


# CURRENT STATE OF ROAD SAFETY IN MIAMI-DADE COUNTY

In Miami-Dade County, over the past 10 years, the number of fatal crashes increased by 38%, as reported by NHTSA and the U.S. Census Bureau. This increase represents close to five times the population increase of 8% and three times the vehicle miles traveled increase of 13%.

Analysis of five-year crash data was used to identify the locations and affected populations of fatal and severe crashes. The data collection, classification, analysis methodology, correlations, and inferences from the data analysis are described in the following sections.

IN MIAMI-DADE COUNTY, FATAL CRASHES INCREASED OVER THE PAST DECADE



## CRASH DATA ANALYSIS METHODOLOGY, PROCESS ILLUSTRATION

### DATA COLLECTION, CLASSIFICATION

The geographic information system (GIS) data processing tool ArcGIS was used for analysis of the following data sets: 1) Crash Data 2015-19 within Miami-Dade County, Signal Four Analytics, Florida Department of Transportation (FDOT); 2) Street Maintenance GIS Layer, Street Intersection GIS Layer, maintained by Miami-Dade County GIS Team; 3) Averaged 2015-2019 AADT Data geographic layer, maintained by FDOT Transportation Data and Analytics Office; 4) ACS-2017 Miami-Dade County Transportation Development Plan (TDP).

The data from crash reports were categorized for analysis and included: crashes that resulted in incapacitating/severe injuries or death within 30 days within the public right-of-way. Crashes along freeways and freeway ramps were not included for further analysis.

The crash data was further categorized and analyzed as DUI and non-DUI crashes. The cause that leads to a DUI crash and the corresponding countermeasures are distinctively different from non-DUI related crashes. Therefore, these crashes were separated and analyzed separately. Non-DUI crashes were separated by user type as crashes involving people driving and crashes involving people walking and biking.

Crash data was separated based on whether the person involved was driving or walking/biking because of: 1) the exponentially high number of vehicular crashes compared to non-vehicular crashes (people walking and biking); and 2) the known data gap in police reports for the crashes involving people biking and walking. People involved in a non-vehicular crash tend to visit the emergency room instead of filing a police report.

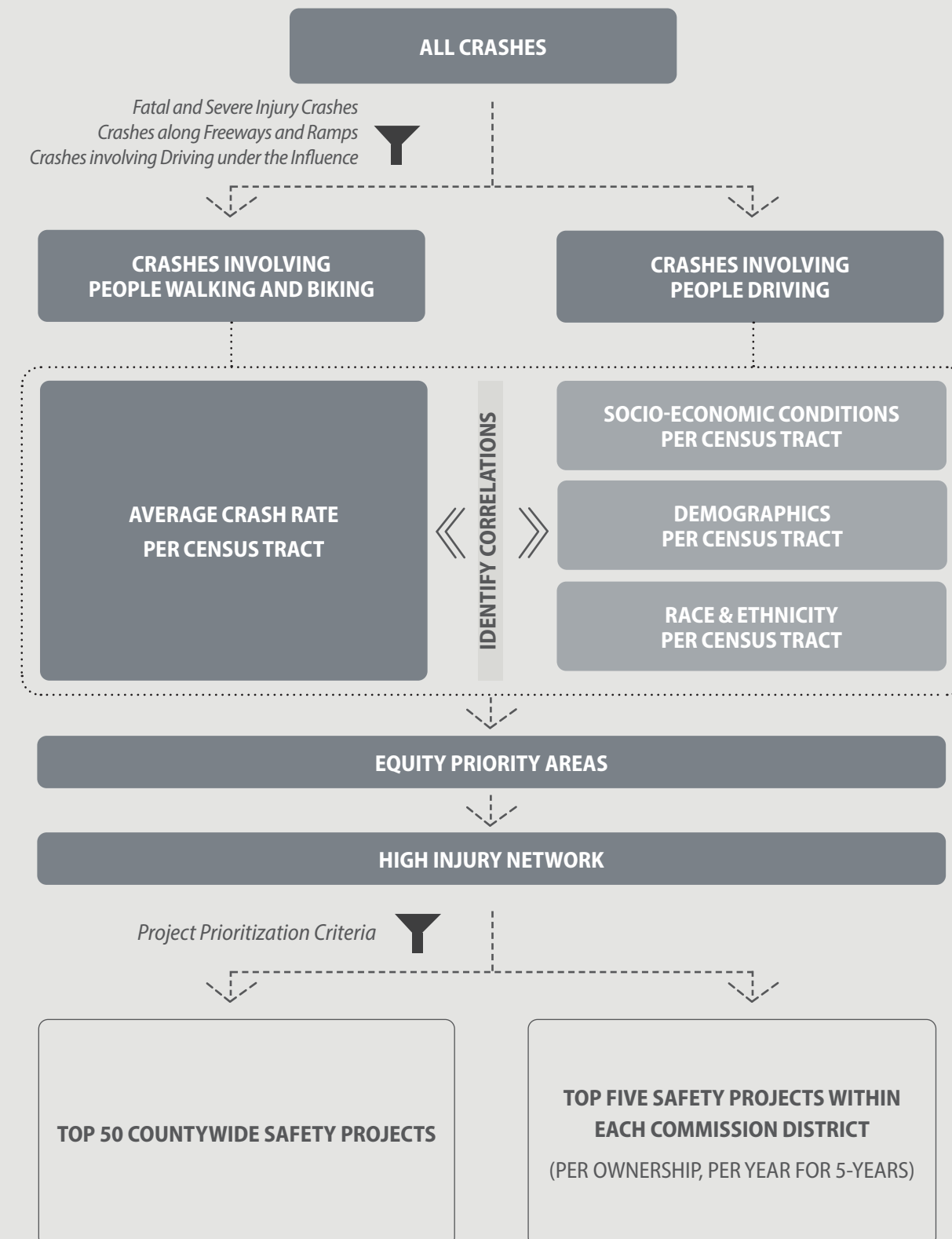
Crashes involving people walking and biking, including vehicle-pedestrian and vehicle-bicycle crashes, were analyzed together. More than 55% of bicycle and pedestrian crashes are likely not captured in the police incident reports according to [pedbikeinfo.org](http://pedbikeinfo.org). This analysis acknowledges that the data set for crashes involving people walking and biking is incomplete and does not include crash data from emergency rooms, where police reports are not filed.

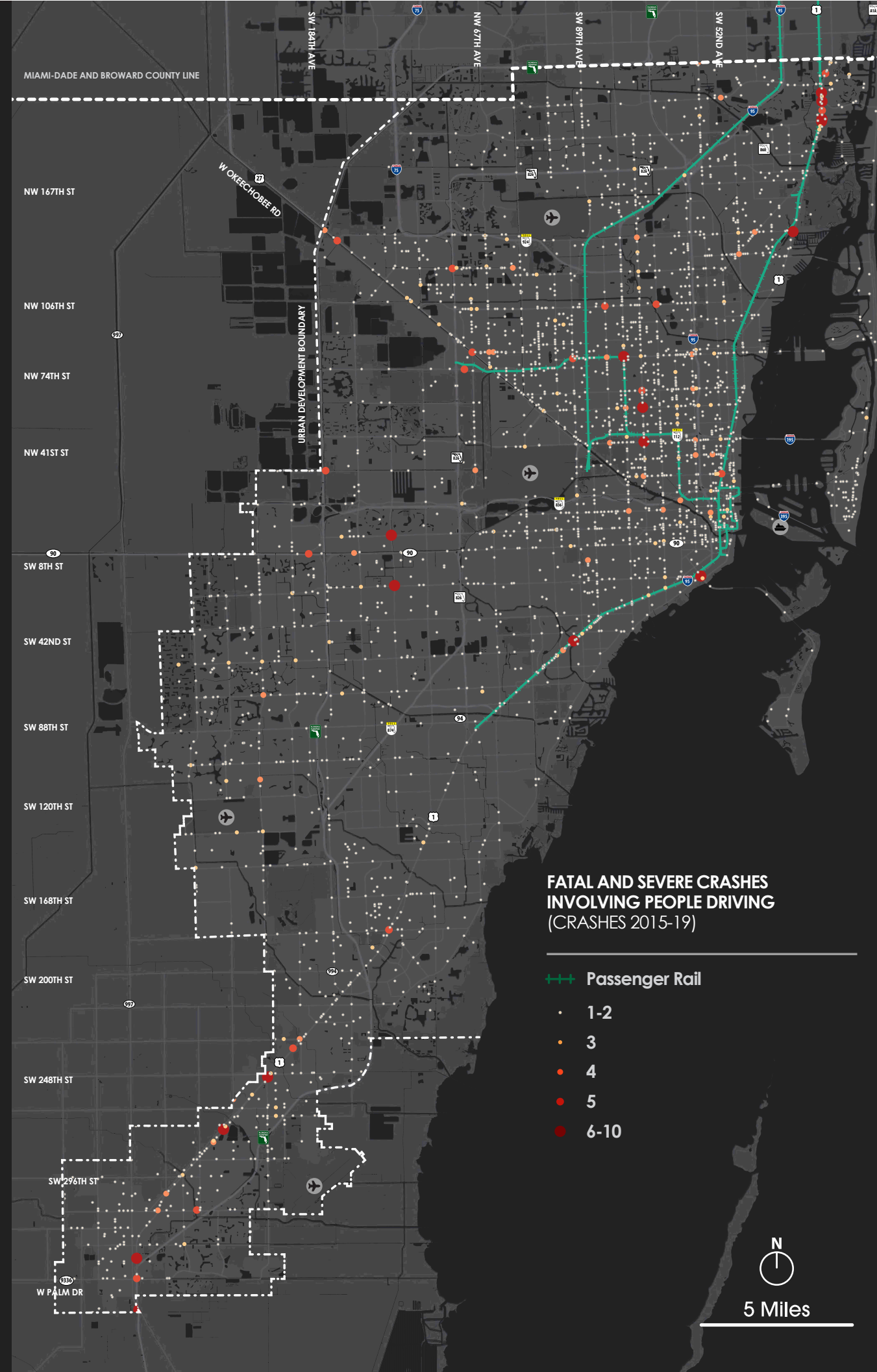
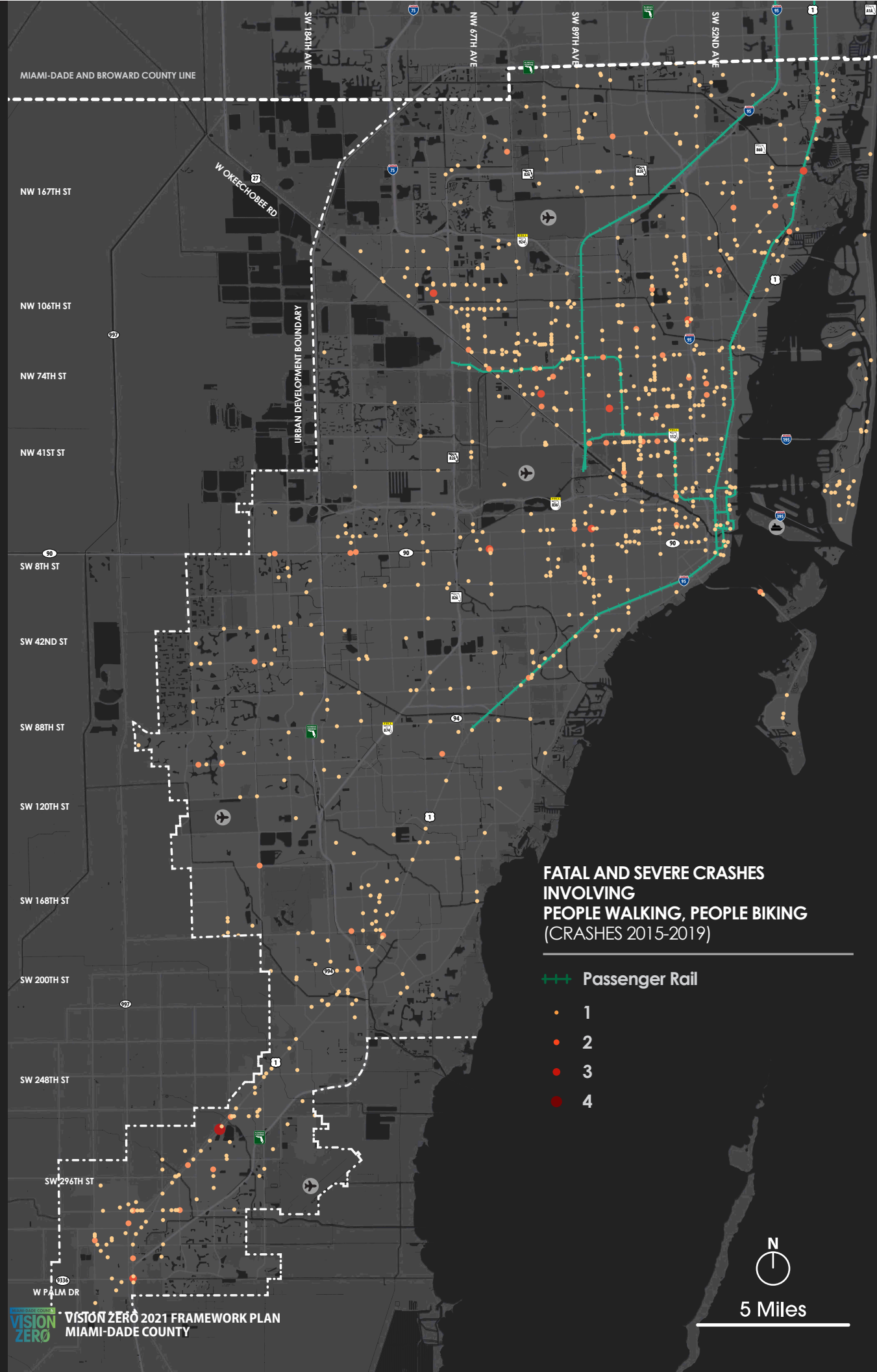
Within Miami-Dade County, the highest number of crashes involving people walking or biking at a location was four, and the highest number of crashes involving people driving at a location was ten. The crash symbols used distribution (Jenks natural breaks) to assign 1-5 points based on the highest number of crashes per user mode. Jenks natural breaks is based on the natural grouping inherent in the data and additional information is available at Geospatial Analysis—A Comprehensive Guide, 6th edition.

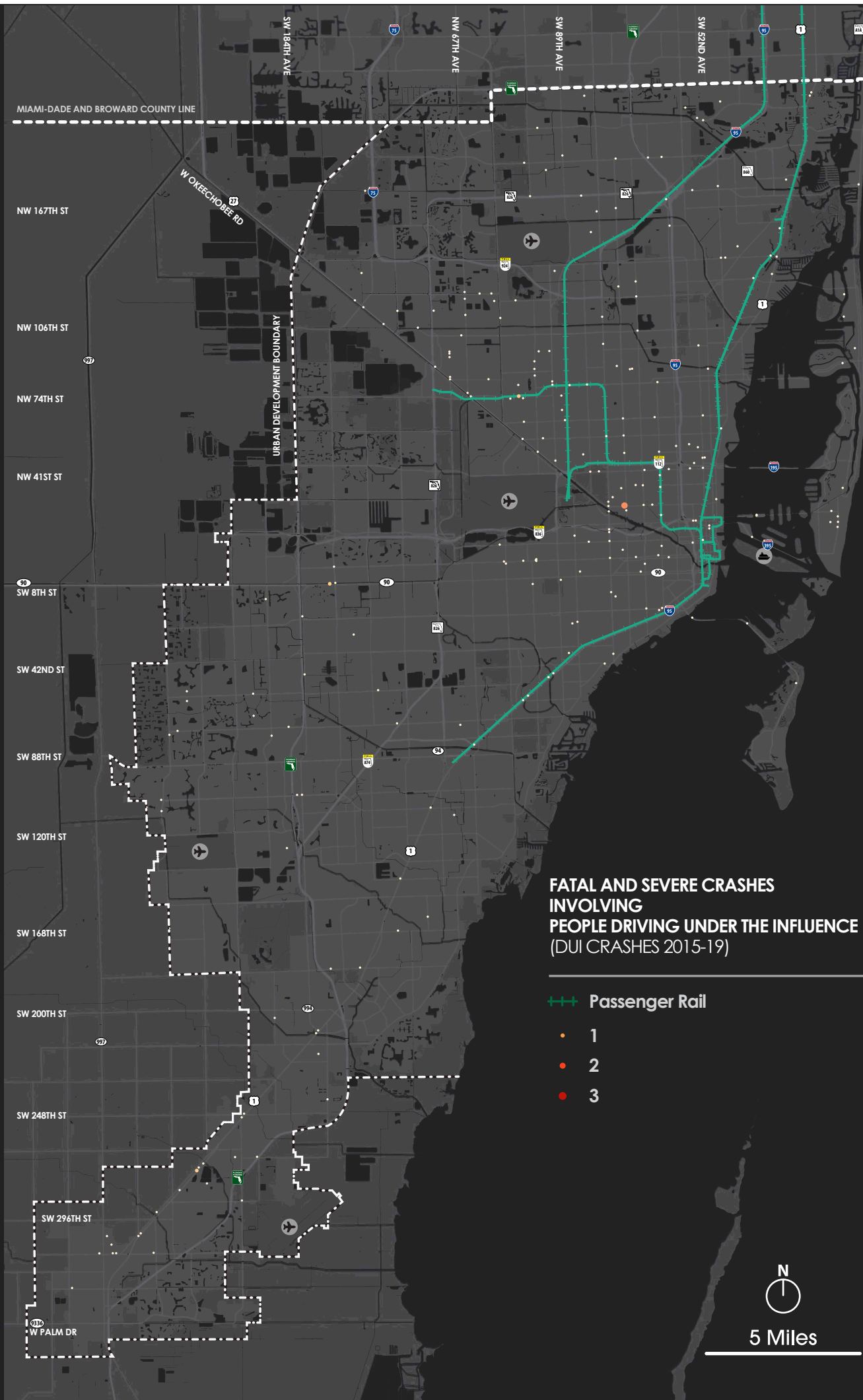
**Crashes involving People Driving:** Crashes analyzed under this category involved occupants of a motor vehicle that include- cars, trucks, buses, vans, and transit vehicles. These include crash incidents involving vehicles (crashes between vehicles only and crashes identified as others). The police reports do not include a separate category for crashes involving transit vehicles.

**Crashes involving People Walking and Biking:** Crashes analyzed under this category were people walking and biking, and people driving (vehicle-bike, vehicle-pedestrian). The data did not indicate any fatality or severe injury crashes between bike-pedestrian, bike-bike, or pedestrian-pedestrian. It is unknown if there were crashes related to e-scooters and e-mopeds. Police incident reports do not separate e-scooters and e-mopeds into separate categories, so they may have been misreported as an incident involving a person walking or biking.

**Crashes involving People Driving Under the Influence:** Crashes involving people driving under the influence of drugs or alcohol were separated and analyzed separately and are not included in the above two categories.







**IN MIAMI-DADE COUNTY, SEVERE AND FATAL CRASHES INVOLVING PEOPLE WALKING, BIKING AND DRIVING ARE CLUSTERED IN SOME AREAS.**

**16% OF SEVERE AND FATAL CRASHES INVOLVE PEOPLE DRIVING UNDER THE INFLUENCE (DUI) AND THESE CRASHES ARE DISTRIBUTED COUNTYWIDE.**



# ROAD-SAFETY INDICATORS IN MIAMI-DADE COUNTY

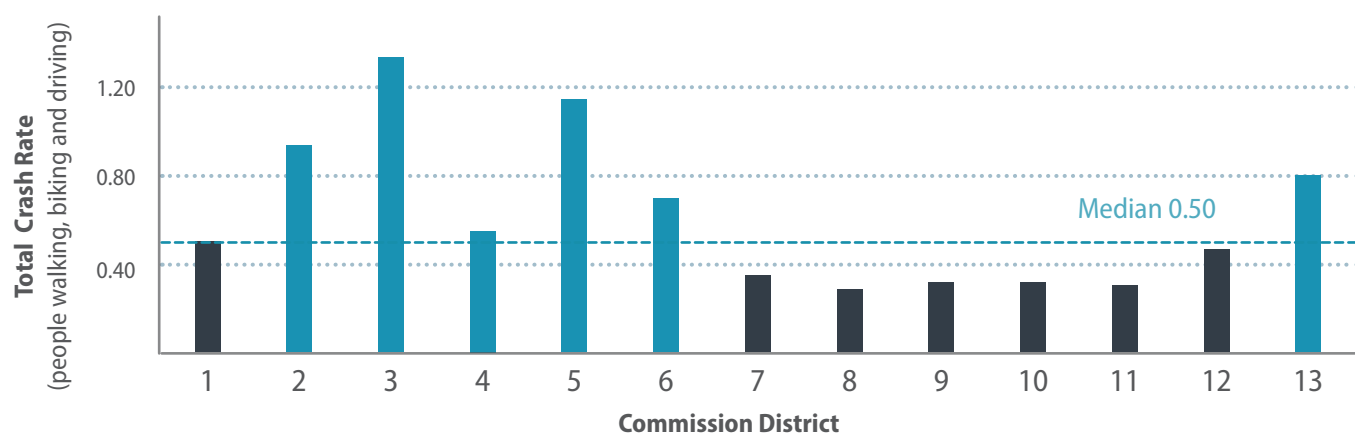
## CRASH-VULNERABLE AREAS, USERS

Data analysis was conducted to identify the crash-vulnerable areas, crash-vulnerable travel modes, crash vulnerable users, and crash contributing roadway design and policies. Crashes resulting in fatalities and severe injuries were separated as crashes involving people driving, crashes involving walking and biking, and crashes involving people driving under the influence.

The crashes were plotted on Countywide maps based on the locations where they occurred. Data analysis of crashes involving people driving and crashes involving people biking and walking indicated clusters in some parts of the County. The clusters of crashes indicate that some areas were disproportionately impacted compared to others. To identify if some geographic areas or locations are disproportionately impacted, a crash rate analysis by Commission district and by census tract was conducted. Crashes involving people driving under the influence are distributed across the County with no discernible clusters and no further analysis was conducted on these crashes.

The average crash rates within a Commission District involving people walking, people biking and people driving were analyzed and compared against each other. The analysis indicated that some Commission Districts are disproportionately impacted by crashes despite the mode of travel (people walking, biking, or driving). A total average crash rate (all travel-modes) was calculated to identify the disproportionately impacted districts.

**DATA INDICATED THAT COMMISSION DISTRICTS 3, 5, 2, 13, 6, 4 (order of severity) WERE DISPROPORTIONATELY IMPACTED BY SEVERE AND FATAL CRASHES.**



## CRASH DATA ANALYSIS

A census tract is a geographic region defined for the purpose of taking a census. The average crash rate per Commission District and per census tract were calculated by combining the number of intersection and segment crashes.

Total Crashes = Severe and Fatal Crashes involving People Driving, People Biking and People Walking

$$\text{Average Crash Rate per Commission District} = \frac{\text{Total Crashes per Commission District}}{\text{Total Roadway Miles per Commission District}}$$

$$\text{Average Crash Rate per Census Tract} = \frac{\text{Total Crashes per Census Tract}}{\text{Total Roadway Miles per Census Tract}}$$

## SOCIO-ECONOMIC AND DEMOGRAPHIC DATA ANALYSIS

The socio-economic and demographic data distribution (Jenks natural breaks) per census tract was compared with the average crash rate per census tract. The data used for the analysis were:

### Socio-Economic Analysis

- » Low-Income Households (households earning less than \$25,000 a year)
- » Zero-Vehicle Households

### Demographic Analysis

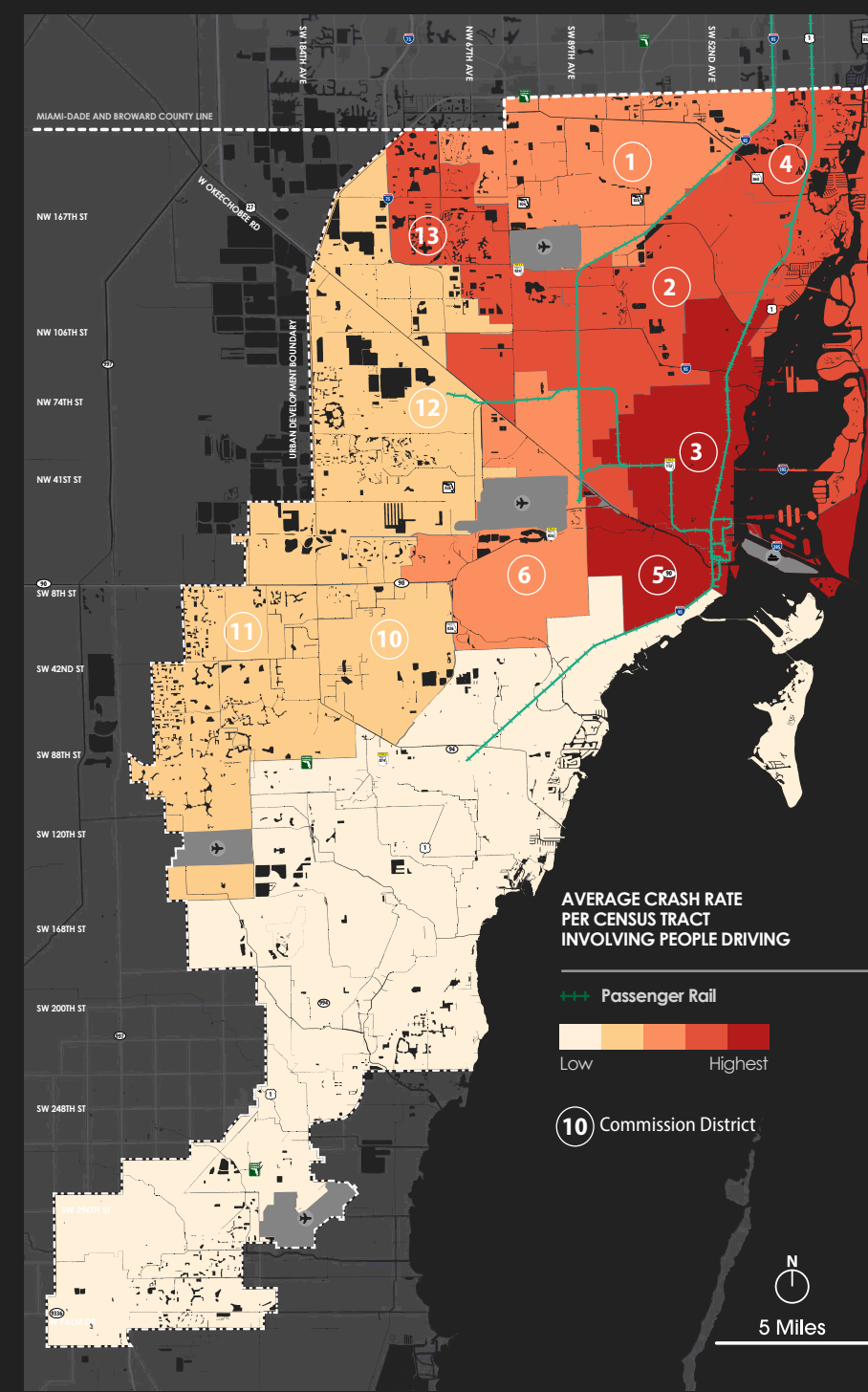
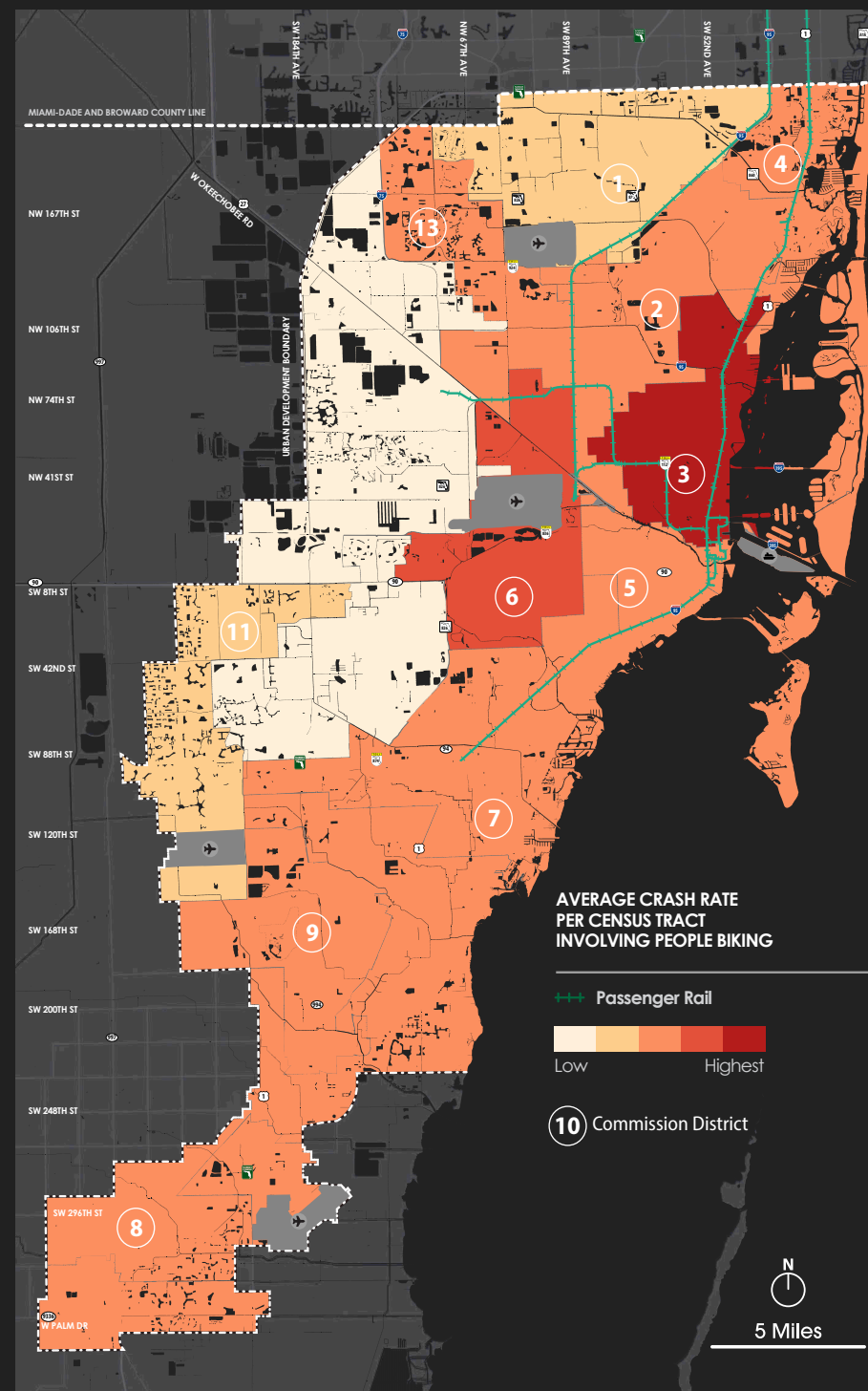
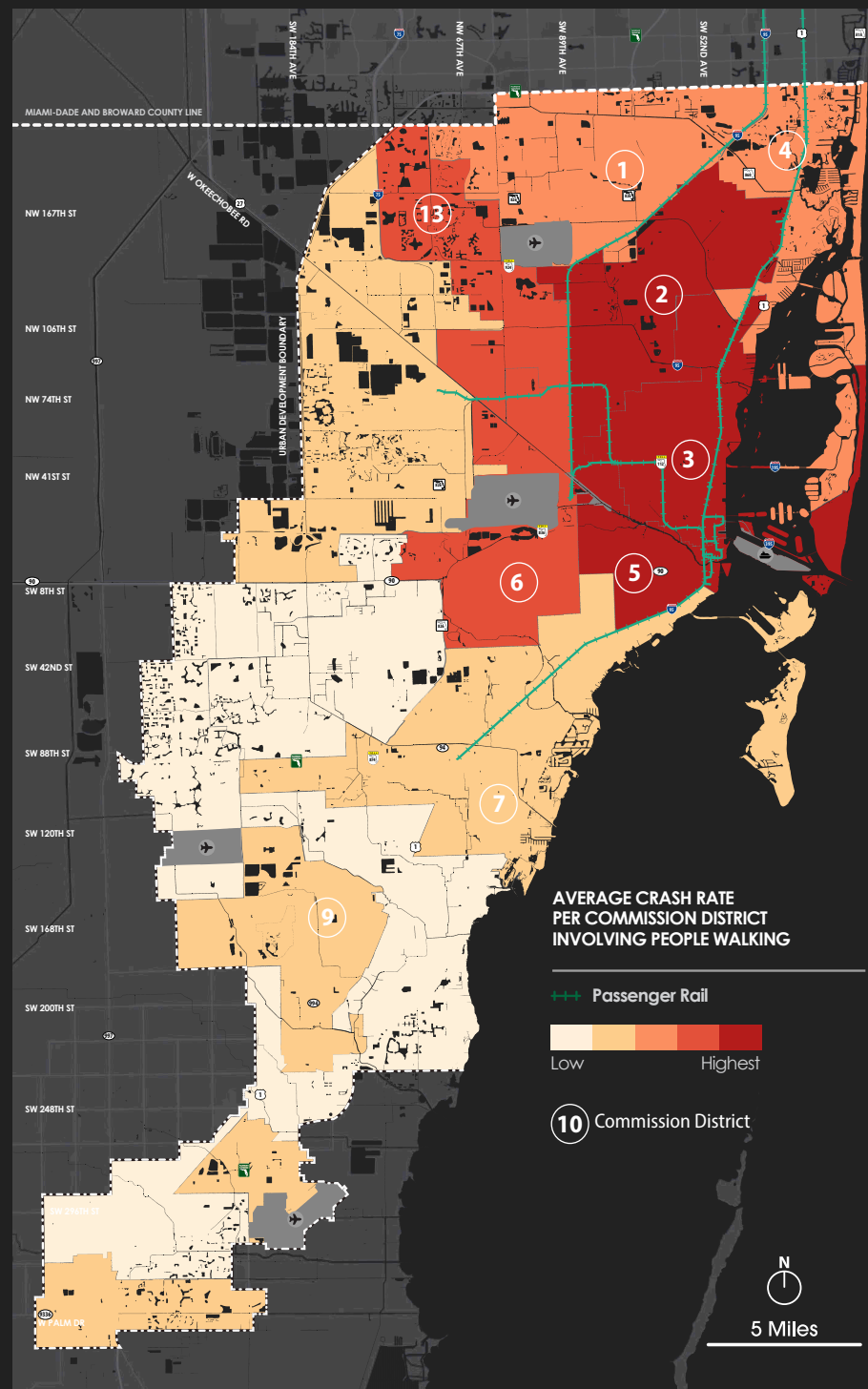
- » Population under 15-years old
- » Population over 65-years old
- » Population density
- » Distribution of population based on race and ethnicity

For an in-depth analysis and to identify potential correlations, crash data was analyzed at a granular level of census tract. The average crash rate per census tract was calculated by separating the mode of travel and the crash rate involving people driving. Then, a combined crash rate of crashes involving people walking and biking were analyzed, given the smaller number of crashes among these modes of travel. The analysis indicated that similar locations or census tracts were impacted despite the different mode of travel. The next step was identifying the underlying correlations that contribute to a high crash rate within the disproportionately impacted areas. Additional data analysis was conducted to identify the underlying correlations between areas disproportionately impacted by fatalities and severe injury crashes and existing conditions.

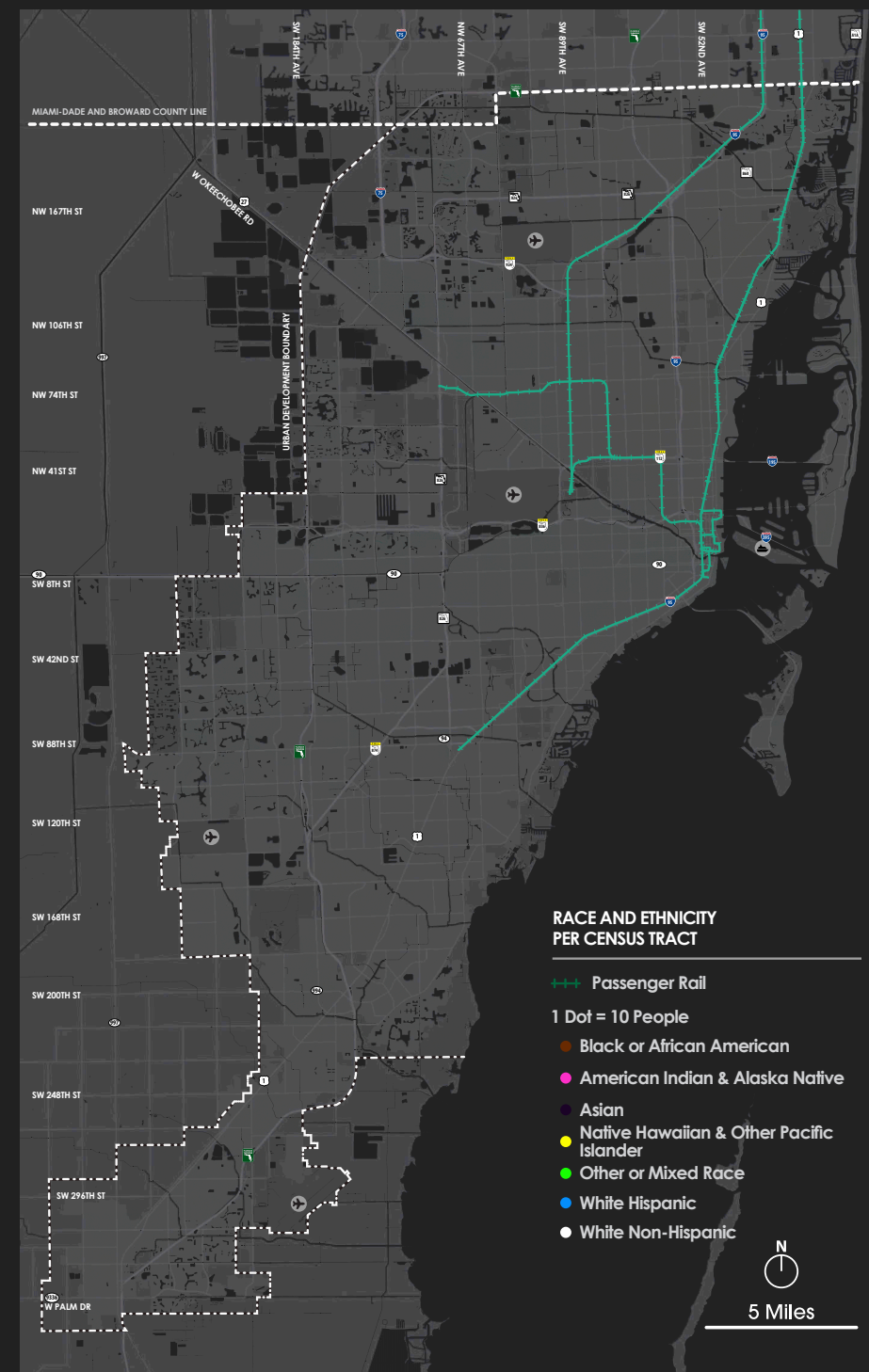
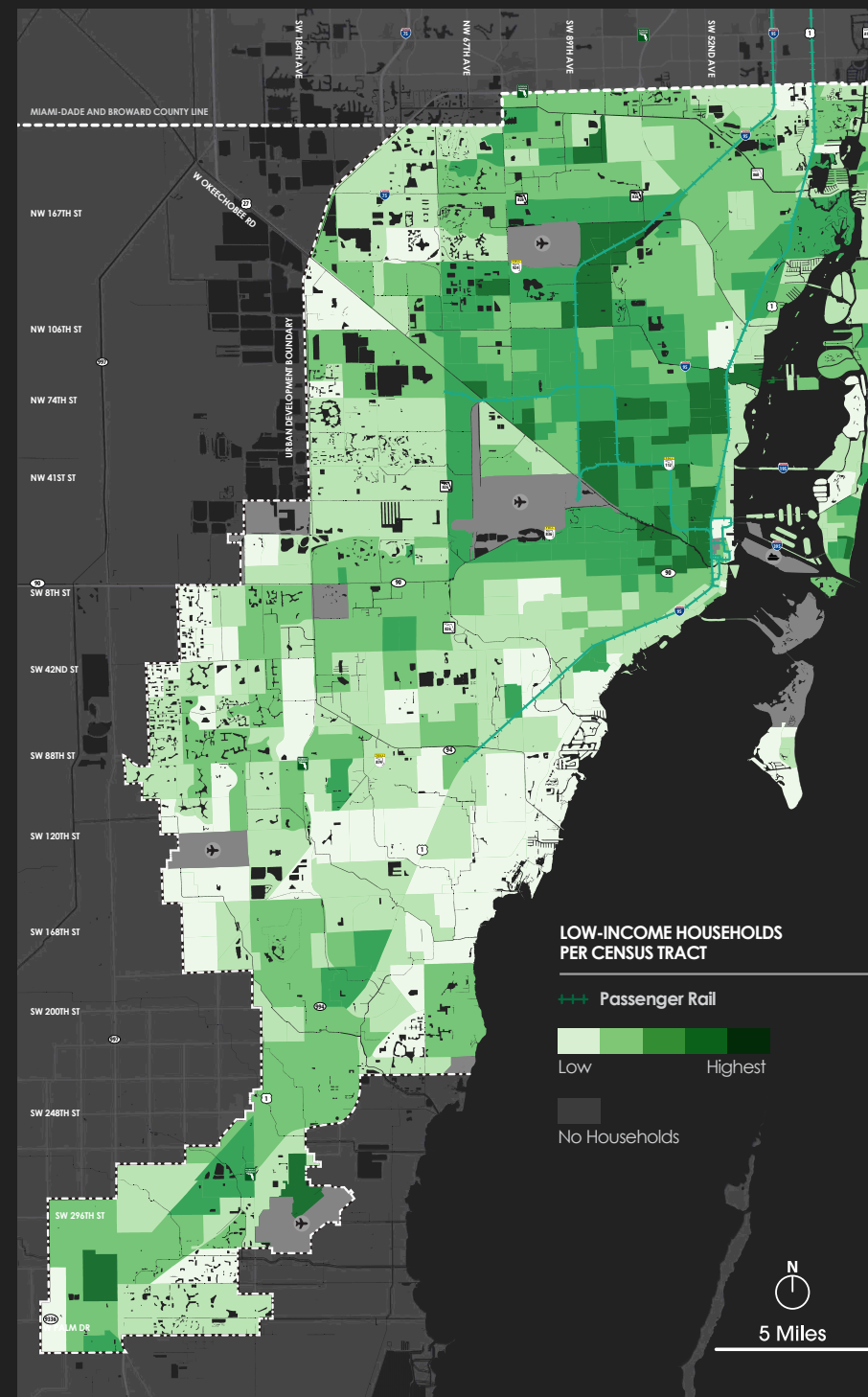
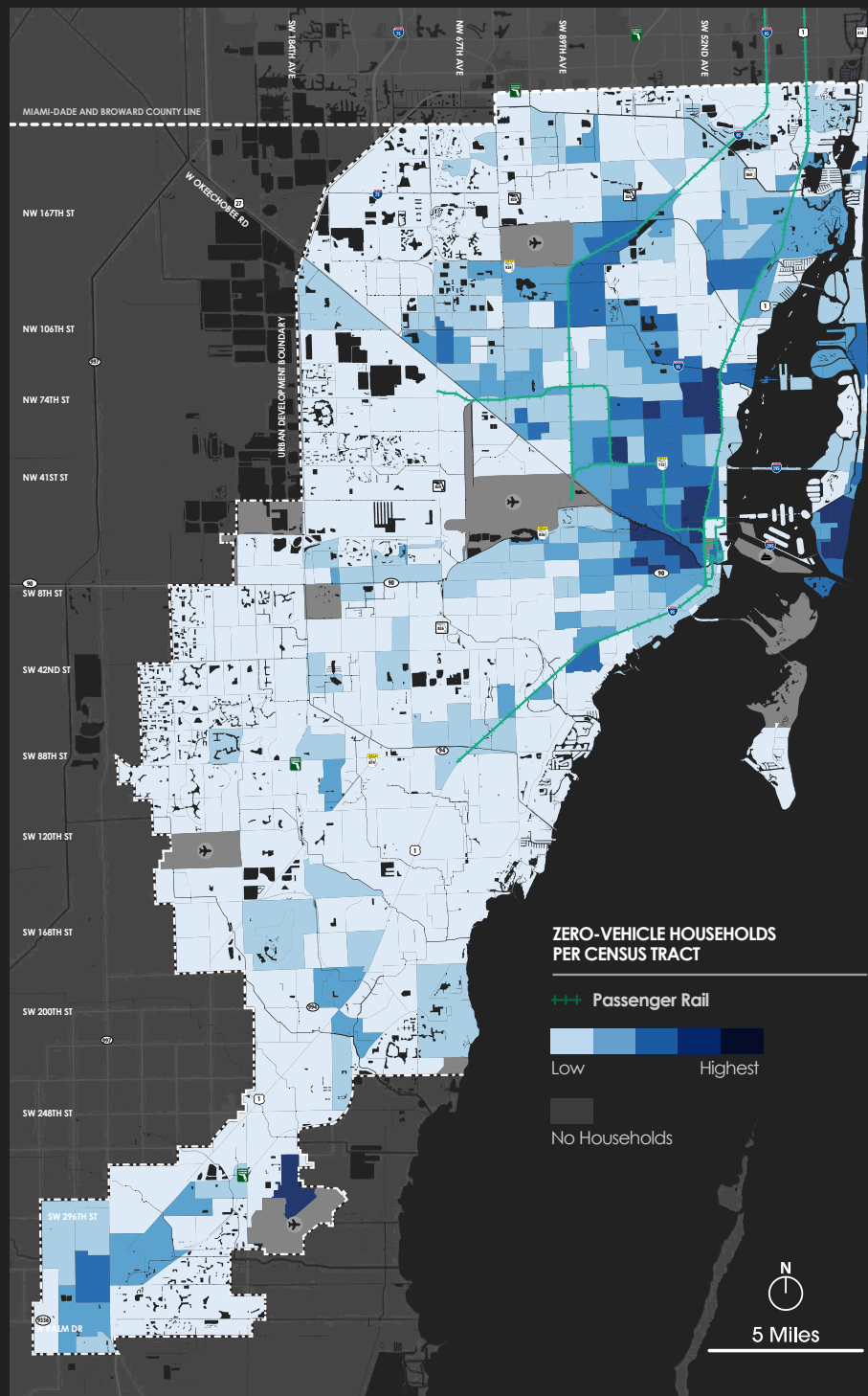
Using academic research, an informed hypotheses of socio-economic and demographic indicators were developed. These hypotheses were verified by comparing the average crash per census tract to the distribution of the identified indicators. The data within identified indicators were distributed Countywide based on the census data and illustrated on the following pages.





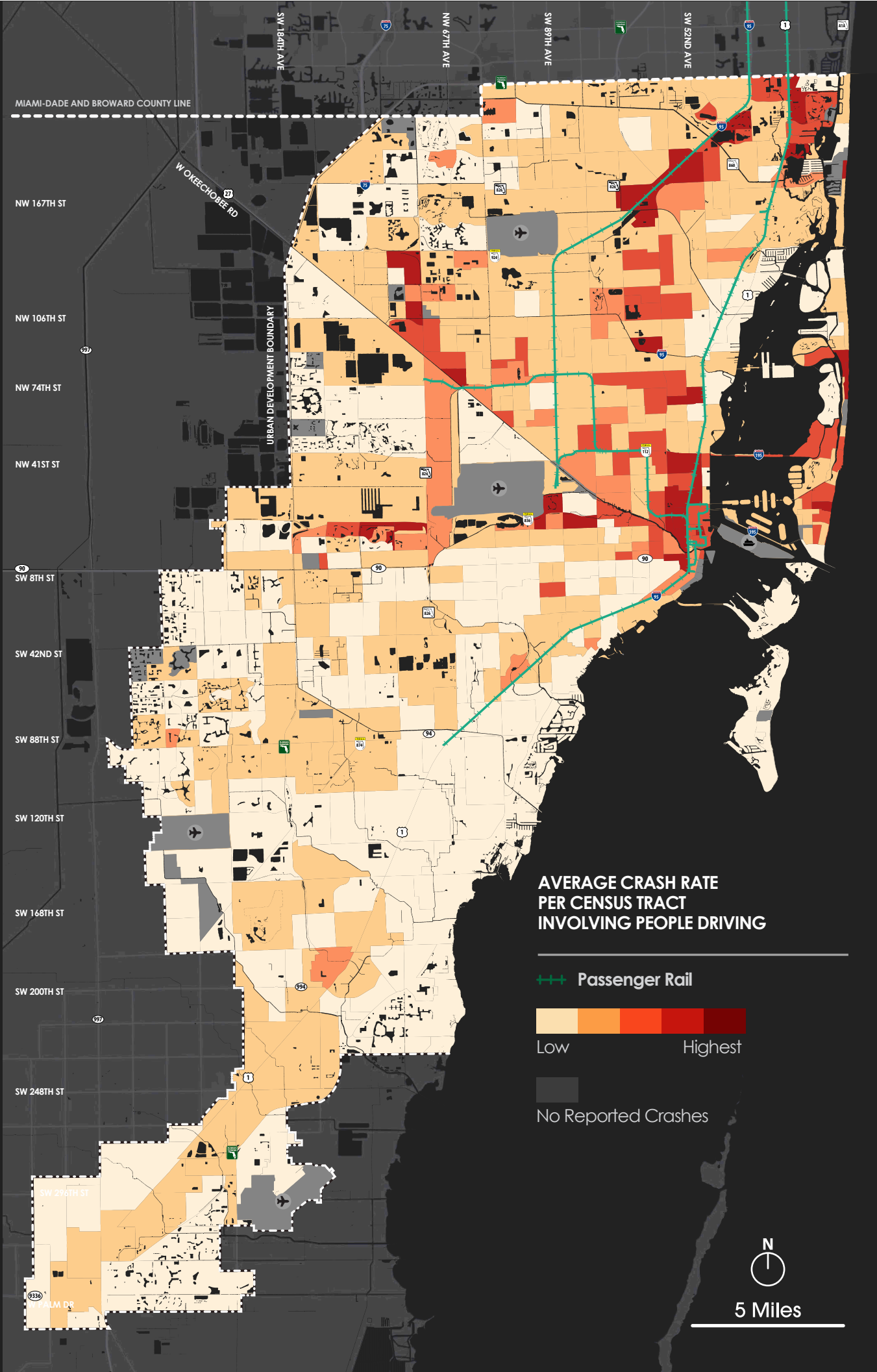
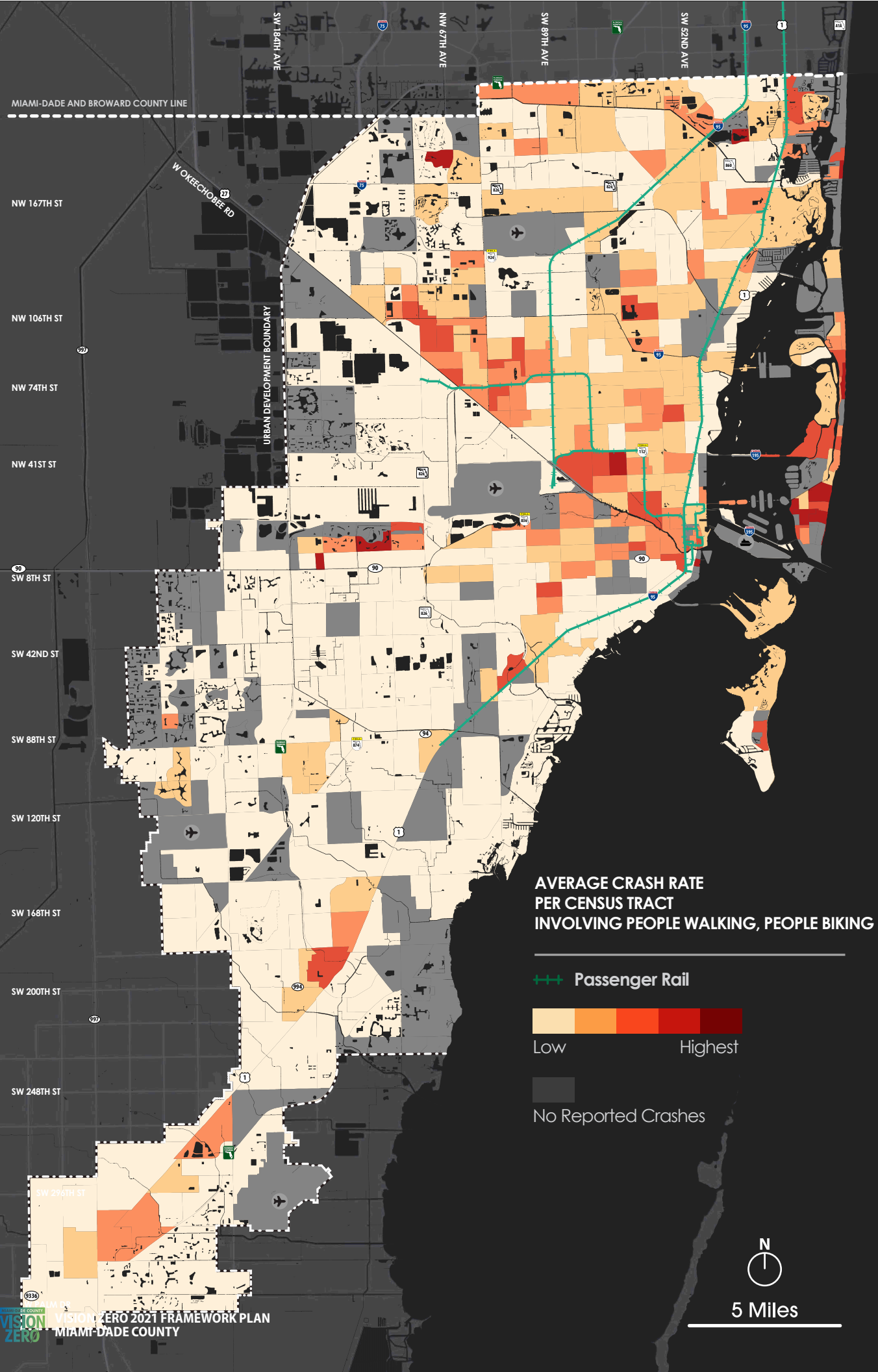


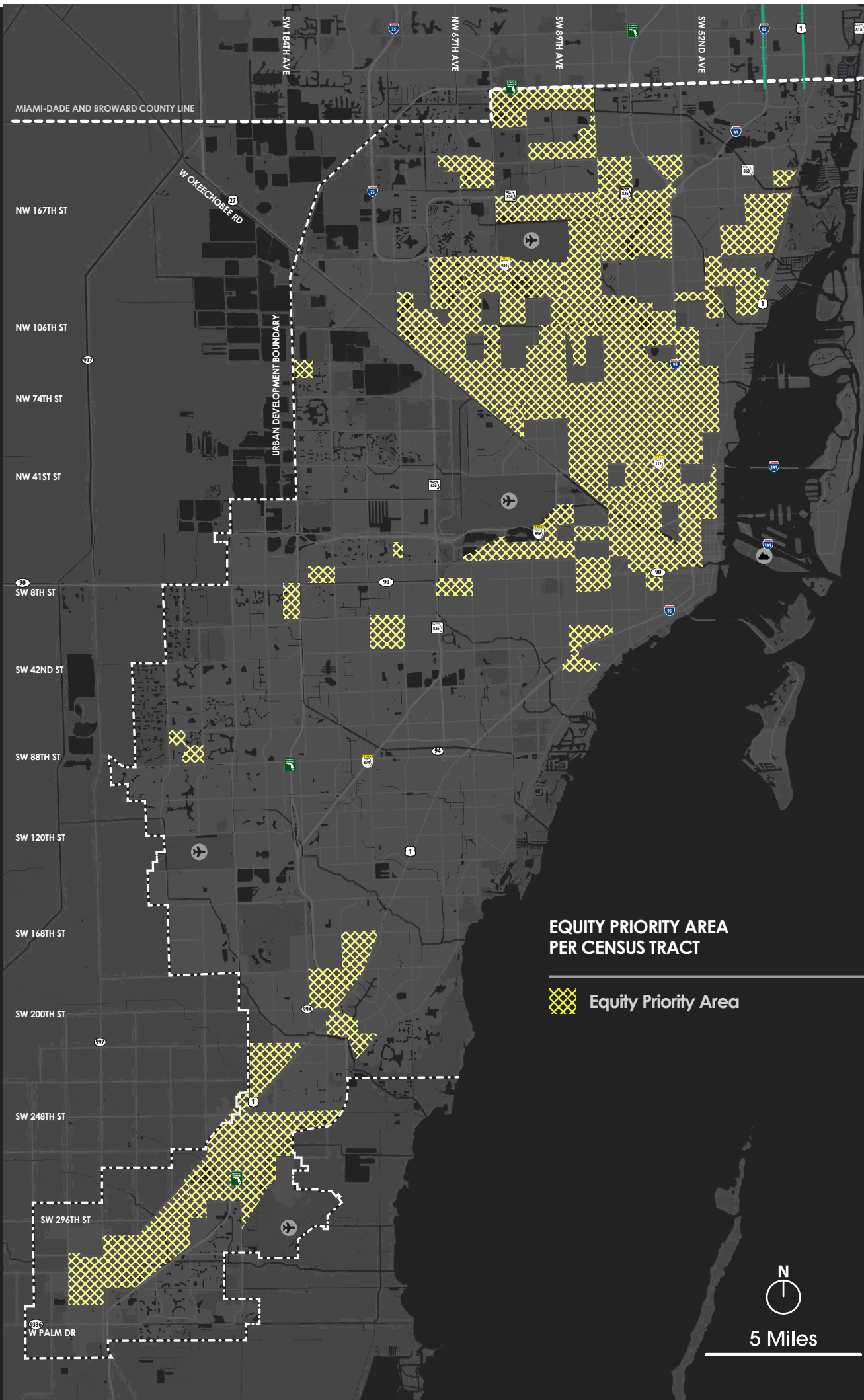
**PEOPLE LIVING IN COMMISSION DISTRICTS 3, 5, 2, 13, 6 (IN THE ORDER OF IMPACT), DISPROPORTIONATELY BEAR THE SOCIAL, ECONOMIC AND PERSONAL BURDEN OF FATAL AND SEVERE CRASHES**



**SOCIO-ECONOMIC AND DEMOGRAPHIC ANALYSES INDICATE STRONG CORRELATIONS BETWEEN AREAS WITH THE HIGHEST CRASH RATE AND CONCENTRATIONS OF HOUSEHOLDS WITH ZERO VEHICLES, LOW-INCOME HOUSEHOLDS, AND HOUSEHOLDS THAT ARE PREDOMINANTLY AFRICAN -AMERICAN AND HISPANIC IN MIAMI-DADE COUNTY.**







**CRASH-VULNERABLE AREAS IN  
MIAMI-DADE COUNTY ARE:**

**AREAS WITH THE  
HIGHEST NUMBER OF LOW-INCOME  
HOUSEHOLDS**

and

**PREDOMINANTLY AFRICAN-AMERICAN  
OR HISPANIC COMMUNITIES**

and

**LOCATIONS DISPROPORTIONATELY  
IMPACTED BY FATAL AND SEVERE CRASHES  
REFERRED TO AS**

**EQUITY PRIORITY AREAS**



## Equity Priority Areas In Miami-Dade County

The socio-economic and demographic analysis per census tract, along with the average crash rate per census tract indicate strong correlations. Data indicates that the highest average crash rates are correlated to areas with low-income households, zero-vehicle households, or predominately African-American and Hispanic households. On the other hand, a low correlation was found within populations with the highest concentration of youths under the age of 15, adults over 65 years old, and areas with the highest population density like the Downtown core.

Inferences from Miami-Dade County crash data analysis show that typical assumptions, such as the idea that the highest number of people walking could indicate a high potential for crashes, may be incorrect. Therefore, it is critical that Miami-Dade County uses a data-based approach against common assumptions during the decision-making process.

The findings of the census tract analysis illustrated the disproportionately impacted locations per census tract. Areas within the top quartile of the highest density of households living in poverty and highest density of minority people were identified as **Equity Priority Areas**. The identified areas are indicated on a map in the following pages. The identified areas are predominantly low-income, zero-car households, African-American and Hispanic population. The areas fall within Census Tracts designated in the 1930s as 'Grade D- undesirable, hazardous' and colored in red by the Home Owners Loan Corporation (HOLC), a government sponsored corporation. This process labeled "redlining" resulted in limited capital investment slow economic decline. The 1930s HOLC map is provided in the following pages alongside the map with crashes illustrating the observed correlations. An essential component of the Vision Zero approach is to insure equitable distribution of countermeasures to achieve the goal of zero fatalities and severe injuries. It is therefore imperative that areas with the highest crash occurrences be prioritized and appropriate countermeasures implemented immediately to limit the loss of life in these communities.

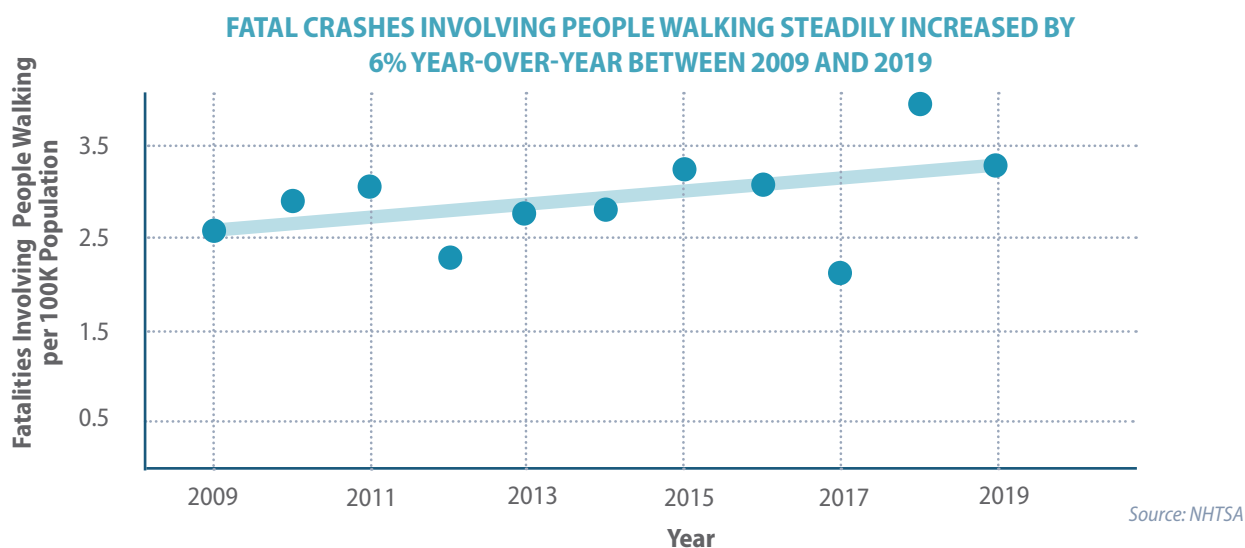
Further analysis of the crash-vulnerable users was limited, as Signal Four crash included minimal demographic information as, gender, age, or race of those involved in a crash. Since local data is not available, national research and trends indicated in the previous chapter are recommended to inform decision-making.



## CRASH-VULNERABLE TRAVEL MODES

### i. People Walking

In Miami-Dade County, fatal crashes involving people walking steadily increased by an average of 6% year-over-year between 2009 and 2019. However, only 2% of all trips involved people walking according to 2019 American Community Survey, U.S. Census Bureau, indicating that the crashes involving people walking disproportionately increased when compared to the total number of trips involving people walking. Therefore, immediate actions are required to reverse this trend.



### ii. People Accessing Transit

Academic research indicates that people who use transit tend to walk or bike to the bus stop or train station. Across the U.S. people accessing transit and people dependent on transit are one of the most crash-vulnerable users. An analysis of crashes around transit hubs were conducted to study the impact of severe crashes on people accessing transit in Miami-Dade County.

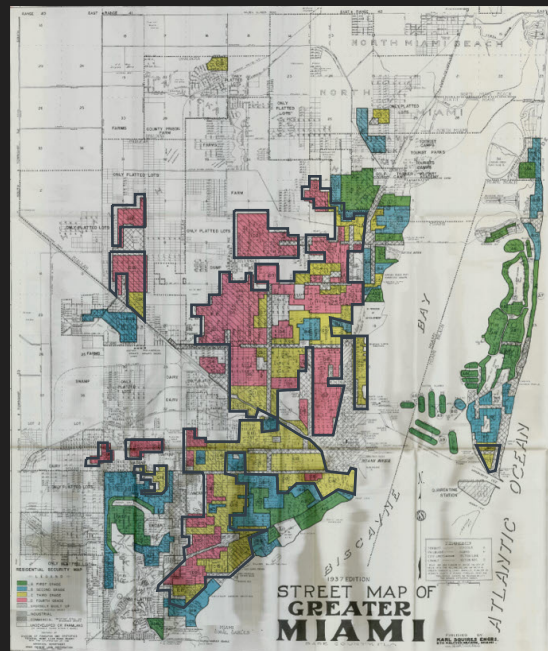
Data Analysis Methodology

#### Crashes around Metrorail and Park-and-Ride stations.

The safety outcomes of people accessing transit were analyzed using fatal and severe crashes data involving people walking and people biking around transit stops (Metrorail and park-and-ride stations). The travel shed used for this study was 1/2 mile around Metrorail stations and 1 mile around park-and-ride stations.

The highest number of crashes involving people walking and biking are at the Earlington Heights Metrorail station and NW 7th Avenue Transit Park-and-Ride Station. Both of these locations are within the previously identified Miami-Dade County Equity Priority Areas. Lack of safe crossing facilities was observed at the Earlington Heights Metrorail station. Safety challenges observed around NW 7th Avenue Transit Park-and-Ride Station, included people crossing the five-lane roadway without safe mid-block crossing opportunities. Propensity of crashes around transit stations with graphs indicating the frequency of fatal and severe crashes is illustrated in the following pages.



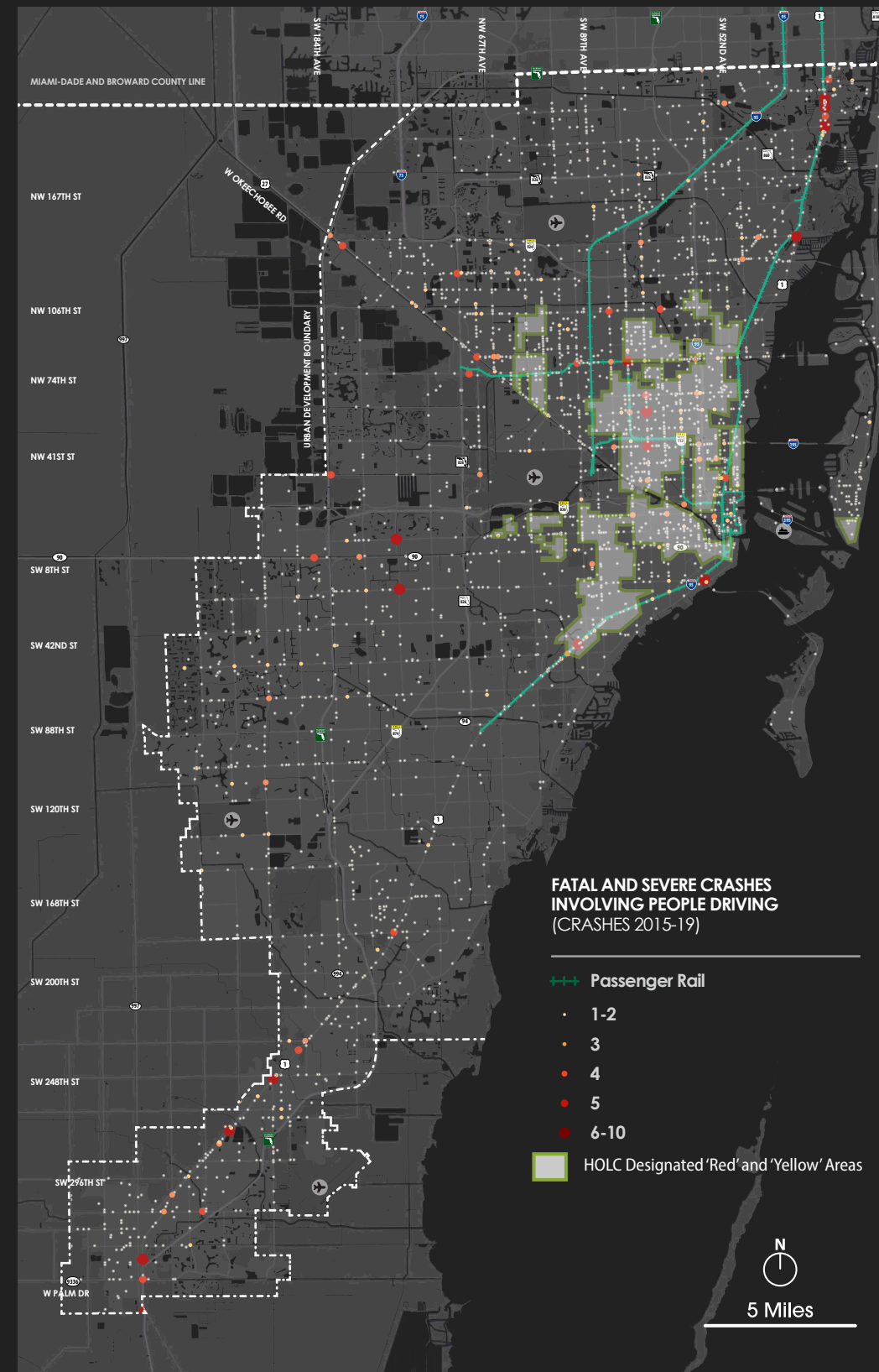
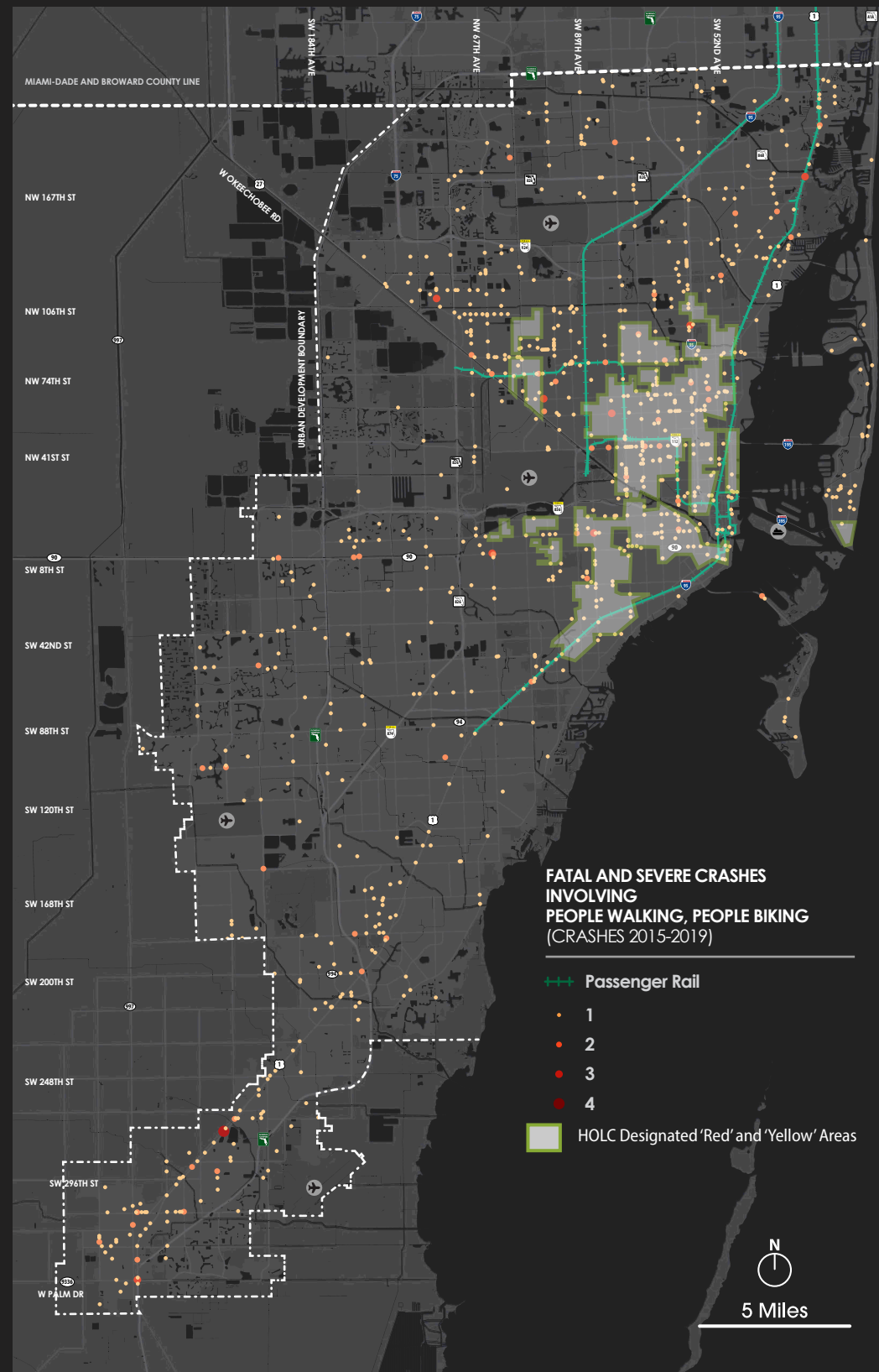


**Areas by Grade**

Area	Grade
18%	A "Best"
22%	B "Still Desirable"
27%	C "Definitely Declining"
32%	D "Hazardous"

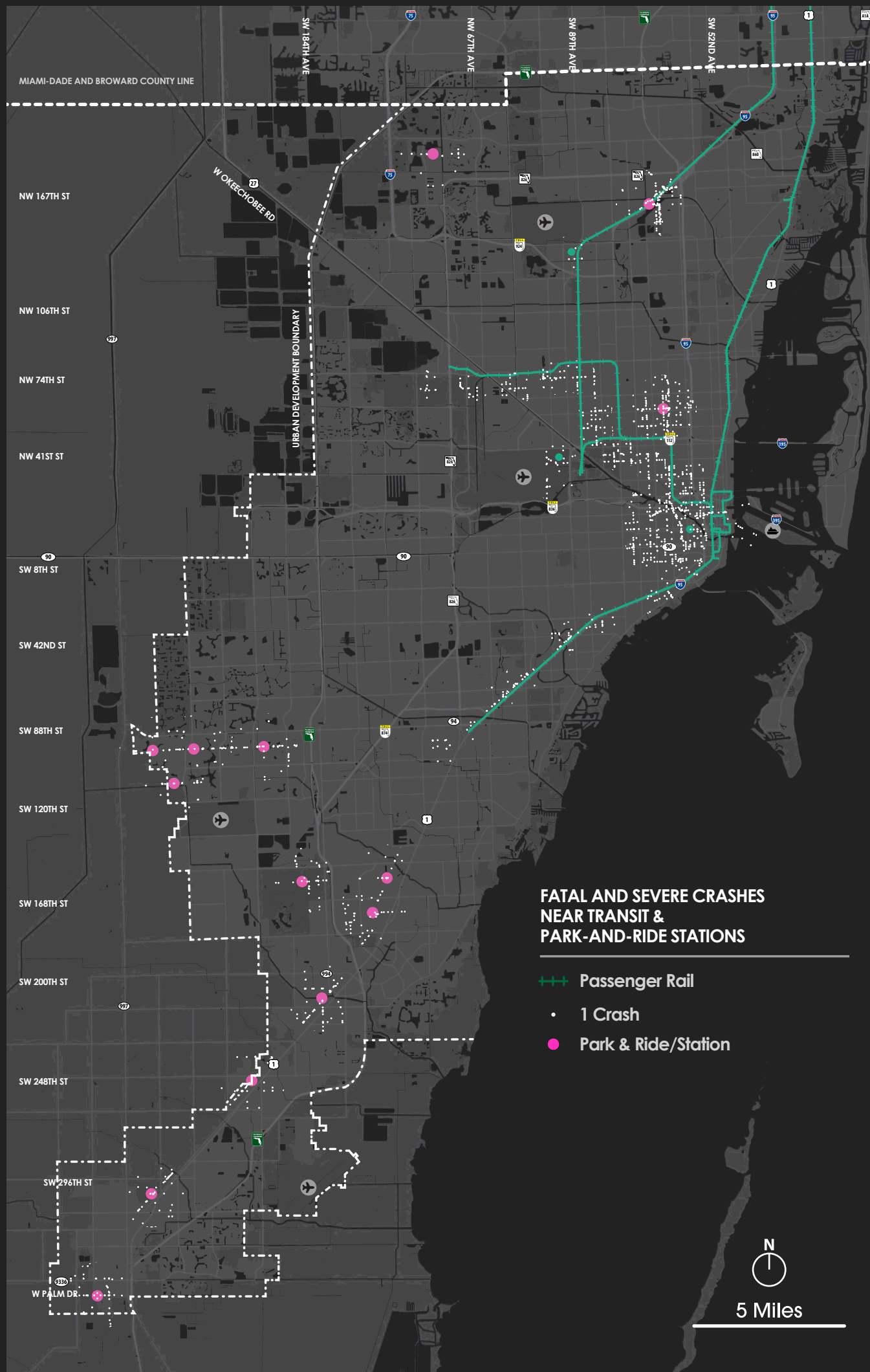
**IN THE U.S., PAST INEQUITABLE PRACTICES SHOW STRONG CORRELATIONS TO CURRENT INEQUITABLE SOCIAL, ECONOMIC AND SAFETY OUTCOMES.**

Source: Home Owners' Loan Corporation (HOLC) maps in Greater Miami and other parts of the United States. <https://dsl.richmond.edu/panorama/redlining/#loc=10/25.654/-81.001&city=miami-fl&area=D4>



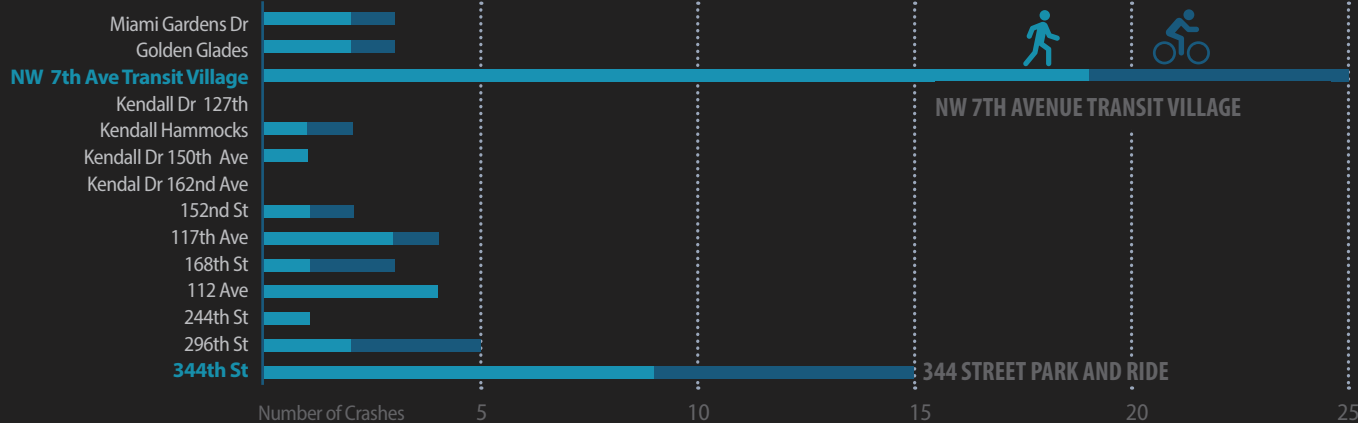
**IN MIAMI-DADE COUNTY, AREAS WITH PAST INEQUITABLE PLANNING, POLICIES, INDICATE STRONG CORRELATION TO CURRENT ROAD SAFETY OUTCOMES.**



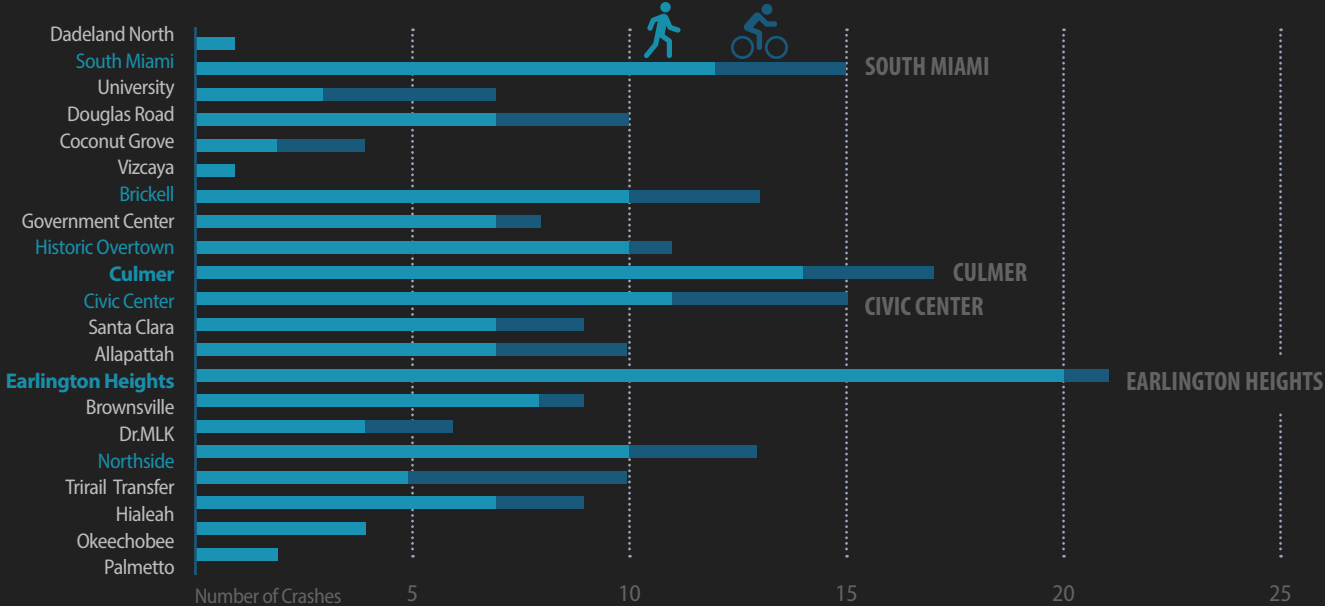


## CRASH-VULNERABLE TRAVEL MODES IN MIAMI-DADE COUNTY

**NW 7TH AVENUE TRANSIT VILLAGE PARK-AND-RIDE STATION (WITHIN 1-MILE) HAS THE HIGHEST NUMBER OF CRASHES INVOLVING PEOPLE WALKING, BIKING**



**EARLINGTON HEIGHTS METRORAIL STATION (1/2 MILE) HAS THE HIGHEST NUMBER OF CRASHES INVOLVING PEOPLE WALKING, BIKING**





## Roads with High Injury Rates

The high injury roadway network was identified and classified based on frequency of crashes resulting in fatalities and severe injuries. A hierarchy of high, higher, and highest injury roadways.

Data Analysis Methodology

### High Injury Network

The high-injury roadway network identifies intersections and segments where crashes resulting in fatal or severe injuries occurred between 2015 and 2019. Crashes involving people driving under the influence are not included in this analysis. The crash score was calculated separately for people driving and for people walking and biking. The score for each was then combined for a total intersection crash score and segment crash score. Crash scores were distributed using Jenks natural breaks into three classifications: high, higher, and highest injury location.

### Intersection and Segment Crashes

Crashes were separated into crashes within intersections and segments.

- » **Intersections:** The number of crashes within 200 feet of an intersection were analyzed as intersection crashes.
- » **Segments:** Crashes outside of the intersection but within the right-of-way were analyzed as segment crashes. Segment lengths vary based on the location and the spread of crashes in the area. Crashes within segments were analyzed as minor and major roads to account for differences in traffic volumes between facility types. The crash rate for major roadways was calculated per 100 million vehicles miles of travel:

$$\text{Crash Rate for Major Roads} = \frac{100,000,000 * C}{365 * N * V * L}$$

Crashes per 100 million vehicle-miles of travel (VMT)

**C** Total number of fatal and severe crashes 2015-19  
**N** Number of years of data - 5 years  
**V** Number of vehicles per day (AADT)  
**L** Length of the roadway miles

The crash rate for minor roads was calculated by crashes per roadway mile:

$$\text{Crash Rate for Minor Roads} = \frac{C}{N * L}$$

Crashes per mile

**C** Total number of fatal and severe crashes 2015-19  
**N** Number of years of data - 5 years  
**L** Length of the roadway miles

Source: Road Safety Information Analysis. A Manual for Local Rural Road Owners



Data Analysis Methodology

## Crash Score Calculation

Using the intersection and segment crashes methodology, bicycle and pedestrian crash scores were assigned between 1 and 5 points using Jenks natural breaks for:

- » **Intersections:** The crash distribution was between one and three crashes, where three crashes were the highest number of crashes involving bicycles and pedestrians at an intersection within the County.
- » **Segments:** Using For major roadways, the crash rate distribution was between 0.01 and 101.06. For minor roadways, the crash rate distribution was between 0.01 and 2.84, the highest rate within the County.

Vehicle crash score was assigned between 1 and 5 points using Jenks natural breaks for:

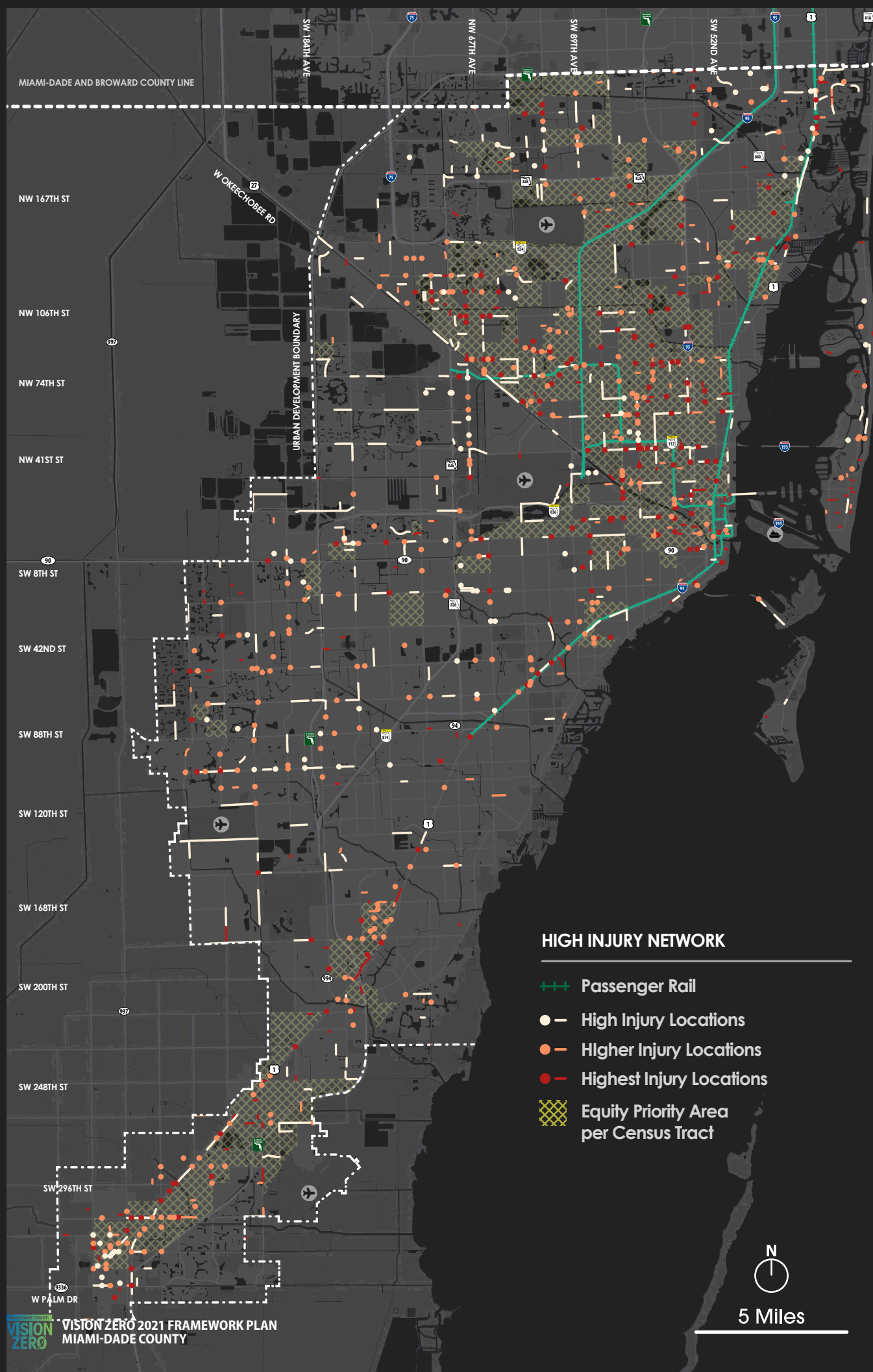
- » **Intersections:** The crash distribution was between one and six crashes, where six crashes were the highest number of crashes involving vehicles at an intersection within the County;
- » **Segments:** For major roadways, the crash rate distribution was between 0.01 and 122.71. For minor roadways, the crash rate distribution is between 0.01 and 4.69, the highest rate within the County.

The Countywide high injury network is illustrated in the following page. The majority of the sections identified are within the County’s equity priority areas. Also, the highest proportion of high injury locations are on the roads classified as major arterial.

### THE HIGHEST PROPORTION OF THE HIGH INJURY LOCATIONS ARE IN ROADS WITH FUNCTIONAL CLASSIFICATION MAJOR ARTERIAL

		High Injury Network (Linear Miles)	Total Linear Miles
Road Functional Classification	Major Arterial	130	959
	Minor/Local Road	105	5,810
	Collector	33	552
	Highway	60	365





# CRASH CONTRIBUTING ROADWAY FACTORS IN MIAMI-DADE COUNTY

## Lighting Conditions

Data indicates that there are a high number of crashes during well-lit conditions and consistent with the observations from around the country. More people use the streets during the daytime when the streets are well-lit compared to the nighttime or badly-lit conditions.

In Miami-Dade County, the proportion of crashes for people walking and biking during insufficient lighting conditions is 1.5 times higher than people driving. The data signals a need for investment in better lighting in areas where people are walking and biking.

To analyze Daylight Saving Time (DST) impacts to road safety in Miami-Dade County, the number of fatalities and severe crashes between October and March was compared to the number of fatal and severe crashes between April and September. The number of crashes did not increase significantly between the two periods in Miami-Dade County, inconsistent with experience from other U.S. Cities.

### THE HIGHEST PROPORTION OF THE FATAL AND SEVERE CRASHES OCCUR AT WELL-LIT CONDITIONS BUT, AT INSUFFICIENT CONDITIONS PEOPLE WALKING AND BIKING ARE DISPROPORTIONATELY IMPACTED

		Well Lit*	Insufficient Lighting**
Travel Mode	People Walking	76%	23%
	People Biking	72%	28%
	People Driving	82%	17%

1.65  
 TIMES  
 HIGHER

The following conditions listed on the police crash reports were categorized.

\* Well-lit = Clear sky daytime + Dark but lighted

\*\* Insufficient Lighting = Dark non-lighted + Dark unknown lighting + Dusk and Dawn + Daylight-Cloudy, Smoke, Fog, Rain



## Posted Speed Limit

A crashes to road length ratio was used to study the relationship between crash-risk and posted speed limit. The ratio is based on the of fatalities and severe crashes per mile within posted speed limits 30MPH to 45MPH.

In Miami-Dade County, crashes to road length ratio within posted speed limit of 45 MPH is exponentially (7.5 times) higher than crashes to road length ratio within posted speed limit of 30 MPH.

$$\text{Ratio. Crashes To Road Length within Posted Speed} = \frac{\% \text{ of total crashes within roads with same posted speed limit}}{\% \text{ of road length with same posted speed limit}}$$

### THE HIGHEST PROPORTION OF THE FATAL AND SEVERE CRASHES OCCUR ON ROADS WITH HIGHER POSTED SPEED LIMIT

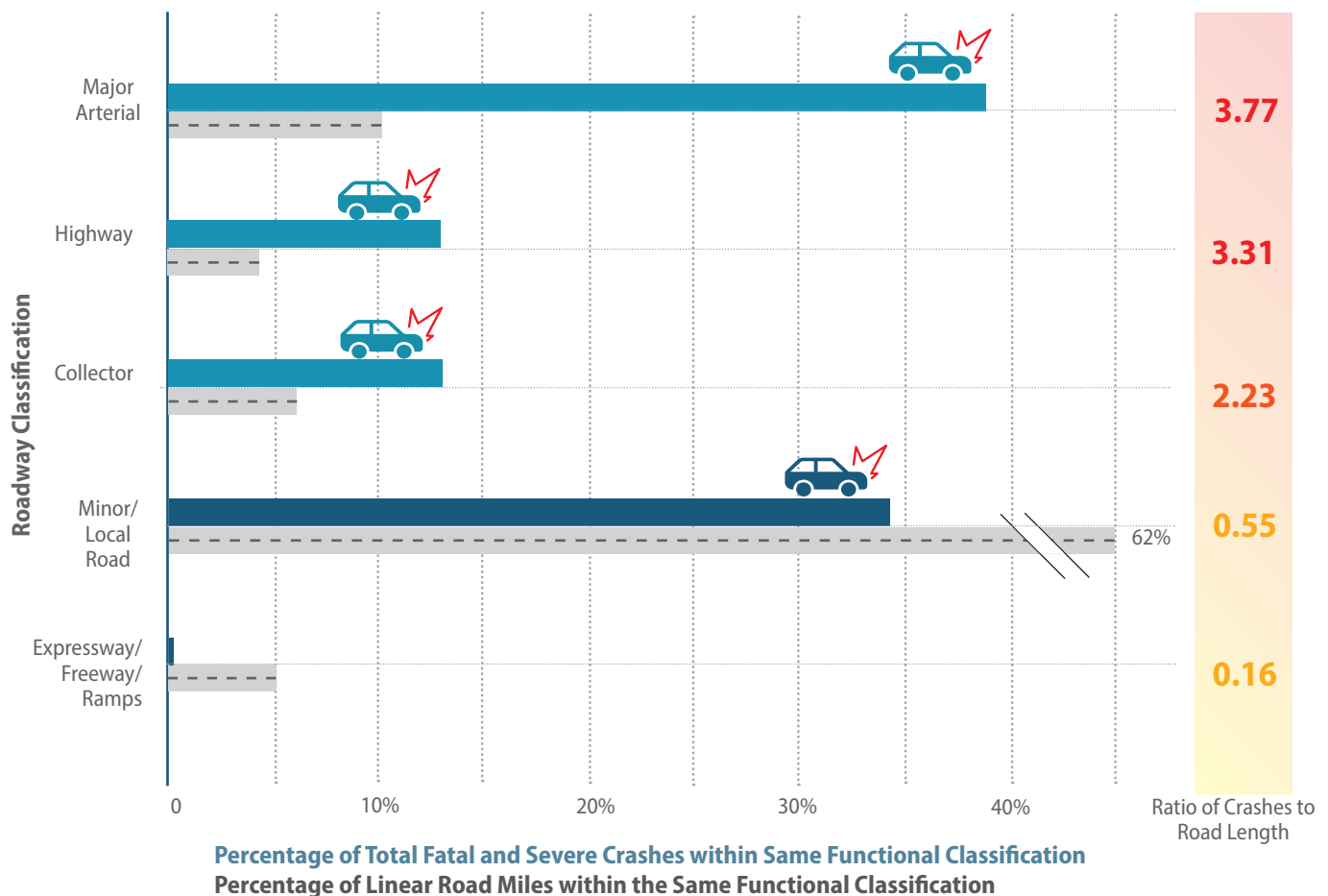


## Roadway Functional Classification

A crash to road length ratio by functional classification was used to identify if road types affect crash risk. The ratio is based on the number of fatal and severe injury crashes within each roadway classification. The functional classification assigned by FDOT to Miami-Dade County roadways was used to calculate the percentage of total crashes within a functional classification. The analysis showed that 39% of all fatal and severe injury crashes occur on arterials which account for 10% of the total lane miles in the County. Freeway, expressway and ramps account for 5% of all roadways and experience less than 1% of all fatal and severe injury crashes (privately owned roads were excluded from this analysis). In Miami-Dade County, crashes to road length ratio within the functional classification, major arterial is exponentially (23.5 times) higher than crashes to road length ratio within functional classification, freeway and expressway.

$$\text{Ratio of Crashes to Road Length within Functional Classification} = \frac{\% \text{ of total crashes within roads with same functional classification}}{\% \text{ of road length with same functional classification}}$$

### THE HIGHEST PROPORTION OF THE FATAL AND SEVERE CRASHES OCCUR ON ROADWAYS CLASSIFIED MAJOR ARTERIAL, HIGHWAY, COLLECTOR



### ***What are roads classified arterial? Why do they have the highest crash-risk in Miami-Dade County?***

According to the FHWA, roads classified as collectors serve as connection between local roads and arterial roads. Arterials are roadways that serve major centers of metropolitan areas and provide a high degree of mobility. Unlike their access-controlled counterparts, arterials provide direct access to abutting land uses. Types of access include driveways to specific parcels and at-grade intersections with other roadways.

Arterials serve a large volume of vehicles (AADT), have three lanes or more, have a typical lane width of 11 feet or greater, have posted speed limits of 30 MPH or higher, and have the goal of efficient traffic flow. Also, arterials intersect with local streets, often have sidewalks, and sometimes have designated crossings allowing people walking or biking to cross the arterial. The number of conflict points between people driving and those walking and biking increase significantly at every intersection and at mid-block locations without crossing facilities. Although, arterials abut residential and commercial uses, they are typically not designed to accommodate non-vehicle travel modes, thereby drastically increasing the risk of conflicts resulting in fatal and severe injuries.

These observations signal the need for additional safety considerations in the design of arterial roadways to accommodate the needs of the crash-vulnerable travel modes like people walking or people biking.

## **PEOPLE WALKING AND BIKING ARE DISPROPORTIONATELY IMPACTED ON ROADS CLASSIFIED AS AN ARTERIAL**

	Roadway Functional Classification	Collector	Major Arterial	Minor/Local roads	Highway
Travel Mode	People Walking	13%	<b>42%</b>	33%	12%
	People Biking	11%	<b>35%</b>	<b>41%</b>	12%
	People Driving	13%	<b>38%</b>	<b>34%</b>	13%



## Parts of the Road

To understand which parts of the roadway present higher crash risk, the number of fatal and severe crashes were calculated along intersection and segments. The data indicated that intersections have higher number of fatalities and severe injuries, and disproportionately impacted compared to roadway segments. Crashes at intersections were separated into signalized and unsignalized locations.

In Miami-Dade County, the highest crash-risk along a corridor is at unsignalized intersections (controlled or uncontrolled).

### MAJORITY OF CRASHES OCCUR AT UNSIGNALIZED INTERSECTIONS, IMPACTING ALL TRAVEL MODES

		All Intersections	Segment
Travel Mode	People Walking	72%	28%
	People Biking	83%	17%
	People Driving	79%	21%

2.6 TIMES HIGHER!

		Signalized	Unsignalized (Controlled, Uncontrolled)
Travel Mode	People Walking	43%	57%
	People Biking	38%	62%
	People Driving	45%	55%

1.3 TIMES HIGHER!





**IN MIAMI-DADE COUNTY,  
86% OF FATAL AND SEVERE CRASHES OCCURED  
ON ROADS CLASSIFIED AS ARTERIAL OR  
COLLECTOR ROADWAY**



Image Courtesy: Cityfi

## **IN MIAMI-DADE COUNTY, CRASH-VULNERABLE:**

- » **LOCATIONS** are Commission Districts 3, 5, 2, 13, 6, 4 (in order of severity)
- » **USERS** are people in
  - Households with Zero Cars,
  - Low Income Households, and
  - Predominately African American or Hispanic households
- » **TRAVEL MODES** include
  - People Walking,
  - People Biking, using other Micro-mobility
- » **ROAD LOCATIONS** are ones that
  - have Insufficient Lighting,
  - have Speed Limits over 30 MPH,
  - are Classified as an Arterial or Collector
  - are at Unsignalized Intersections





# How to Reverse the Current Safety Trajectory in Miami-Dade County?



## A PARADIGM SHIFT TOWARDS CREATING A SAFER SYSTEM FOR ALL ROAD USERS IS NECESSARY TO ACHIEVE MIAMI-DADE COUNTY'S GOAL TO ELIMINATE FATALITIES AND SEVERE INJURIES ON THE ROADS BY 2030

The previous chapter illustrated the current safety inequities in Miami-Dade County that include: location-based inequity, travel-mode inequity, user-based inequity, and crash contributing road factors such as design and policies. These inequities are certainly not in line with ensuring equitable outcomes, one of the guiding principles of Miami-Dade County Vision Zero's goals and strategy. Therefore, a paradigm shift is required to address these inequities and should be integrated into leadership priorities, funding allocation, and everyday decisions made by system designers like engineers and planners.

The paradigm shift towards Vision Zero from prevailing approaches requires a commitment to:

- » **Eliminate All Fatalities and Severe Injury Crashes.** A Shift from Attempting to Eliminate All Crashes.
- » **Acknowledge and Plan for Driver Error.** A Shift from Attempting to Perfect human Behavior.
- » **Share Responsibility Between Policymakers, Designers and Users.** A Shift from Assigning Responsibility Only on Road Users.
- » **Employ a Data-Driven Safe Systems Approach.** A Shift from Assuming that Roads Complying with Existing Standards and Guidelines will be Safe.

The call to action response requires deliberate, collaborative effort within the entire organization. The McKinsey 7-S framework proven effective with organizational shift was used to develop Miami-Dade County's Vision Zero Framework Plan. The 7-S framework identifies seven internal elements of an organization that must align for changes to be successful. When working in harmony within the organization, the seven elements have shown to be effective in managing change and improving performance. The seven elements are separated as hard elements - structure, strategy and systems; and soft elements - skills, style, staff, and guiding values. This framework plan will focus on the hard elements aligned with the identified Vision Zero guiding values. The soft elements are outside the scope of this report and recommended that County staff analyze them to ensure successful Vision Zero outcomes. Miami-Dade County as an organization and agency partners Vision Zero Champions, collaboratively identified its guiding values and they are:

1. **Collaboration**
2. **Prioritization of Equitable Outcomes**
3. **Brave Direction using Sensitivity**
4. **Data-Driven Decisions**
5. **Clear, Transparent Communications**

The framework plan recommendations were identified using: a collaborative style, a data-driven approach, and guided by the County's Vision Zero values. The paradigm shift required to achieve Miami-Dade County's goal are:

- » **Structural** that identifies the team structure to create the cultural paradigm shift.
- » **Strategic** that identifies the policies the County should adopt to jump-start the paradigm shift.
- » **Systemic** that identifies the action that must be integrated into the system, monitored and evaluated to track progress, to ensure that the paradigm shift is sustained over time.



# THE VISION ZERO APPROACH



**All parts of the system must be strengthened**

So, if one part of the system fails, other parts will protect any person involved in the crash.

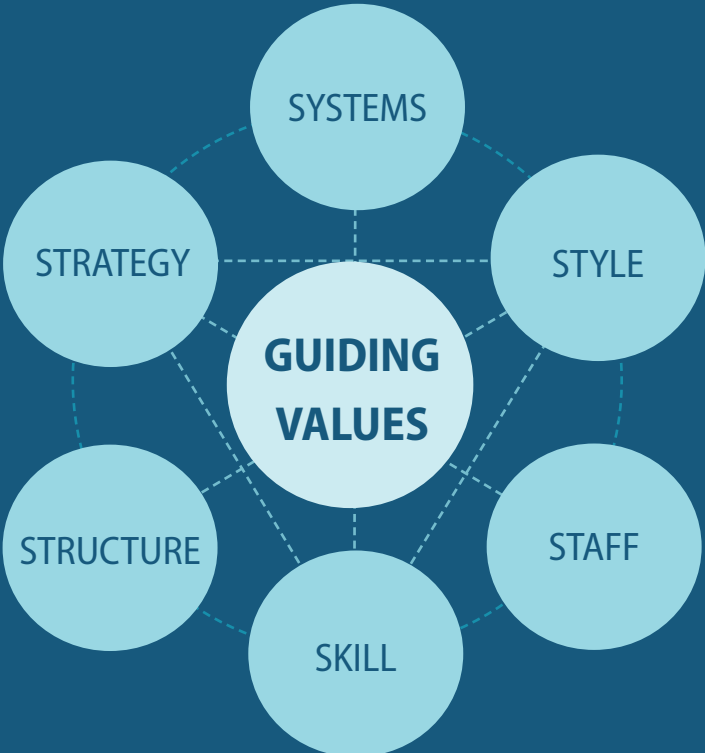
**Accommodate for driver error**

Reducing speed limits is essential for creating safer roads.

**Focus both on avoiding and surviving crashes**

Reduce the crash impact to below thresholds likely to result in death or severe injuries, for people inside and outside a vehicle.

## EVERY PART OF THE COUNTY ORGANIZATION MUST WORK IN HARMONY TO CREATE A PARADIGM SHIFT TOWARDS THE VISION ZERO APPROACH



Source: McKinsey & Company



# MIAMI-DADE COUNTY VISION ZERO FRAMEWORK PLAN

The framework plan developed for Miami-Dade County is anchored and aligned with the Vision Zero guiding values. Guiding values were identified during the multi-jurisdictional stakeholder, champions and implementors workshops.

## STRUCTURAL LEADERSHIP TO CREATE MOMENTUM WITHIN THE COUNTY

Structural leadership from the County's policy makers to the implementing staff is necessary to both energize in the immediate term and sustain the paradigm shift in the long term. Recommendations will include a proposed decisionmaking process and address how the leadership priorities are coordinated through clear lines of communication with the departments, professional disciplines and jurisdiction (municipalities and FDOT). Recommendations on changes to organization/team structural changes within the County that may be required are outside the scope of this report.



### Cultivate System Leadership using a Collaborative Style

**TACTIC: Cultivate internal leadership to create momentum.** Designate a Vision Zero Internal Task Force with representatives from Miami-Dade County departments to create momentum and advance the County's priorities- policies, processes. A Vision Zero Lead designated by the Mayor's office may lead this task force.

A County multi-department task force will help build momentum within the various departments. The collaborative task force can also help identify the process and procedures that slow down or counteract change, and potential changes required to reduce or remove the bottlenecks towards achieving the paradigm shift. At a minimum, the task force should include leaders from the Department of Transportation and Public Works, County Health Department, Regulatory and Economic Resources (RER) Department, Miami-Dade Police Department and Fire Rescue.

**TACTIC: Cultivate external leadership to create momentum.** Establish a Vision Zero Equity Task Force/Steering Committee with representatives from communities of concern, public health organizations, local universities, and the school board.

The goal of the task force would be to guide decision making for equitable outcomes from the Miami-Dade County's Vision Zero program. For example, the task force will review opportunities to leverage existing resources and context-sensitive features to improve safety of vulnerable users and verify that the project utilized adequate and meaningful community engagement, during the project planning phase.

**TACTIC: Sustain momentum through multi-jurisdictional leadership.** Continue the established Vision Zero Champions and Implementors working group. The Vision Zero Champions and Implementors working group should meet every quarter to expedite the implementation of safety projects under their respective purview and receive updates on the Vision Zero progress.



# STRATEGIC SHIFT TO FOCUS ON PREVENTING ONLY FATAL AND SEVERE INJURY CRASHES

Strategic shift in Countywide transportation policies are necessary to support the County’s goal to eliminate fatalities and severe injuries by 2030. Recommendations will address the shift from the prevailing approach such as travel-mode prioritization, continuous education of system designers, policy makers, and road users.

## Focus resources and initiatives on preventing on Crashes resulting in Fatal and Severe Injuries

**TACTIC: Focus on preventing crashes resulting in fatal and severe injuries and reducing crash risk.**

The paradigm shift must be to focus on eliminating fatal and severe injury crashes that have the most adverse negative impact. Investment in counteracting these negative impacts would provide the highest societal benefit.

**TACTIC: Incorporate the County’s goal into every transportation project.** Transportation projects should include the Vision Zero framework from funding prioritization to the implementation process, which includes planning, engineering, operations, and maintenance phases. The projects should also incorporate safety analysis when retrofitting or modifying existing transportation infrastructure.

- » Establish a review process for planned roadway improvements by private developers, proposed roadway improvements to mitigate traffic impacts and use of traffic impact fees along roadways identified within the high injury network.
- » Coordinate with the County Planning Division, and Regulatory and Economic Resources Department (RER) during the review of private development site plans at the Development Review Committee (DRC) to ensure Vision Zero goals are incorporated.
- » Develop and integrate policy requiring a safety analysis when proposing roadway modifications.
- » Collaborate between Miami-Dade County departments by integrating land use, health and transportation with the focus of increasing safety along the high injury network.
- » Identify opportunities to collaborate between the County’s various departments, from the Health Department to the Department of Transportation and Public Work. This collaboration would cover areas such as community engagement and safety education in addition to providing and assisting with crash data from emergency centers and others.



**GUIDING VALUES ALIGNMENT:**  
Collaboration, Brave-Direction using Sensitivity, Data-Driven Decisions





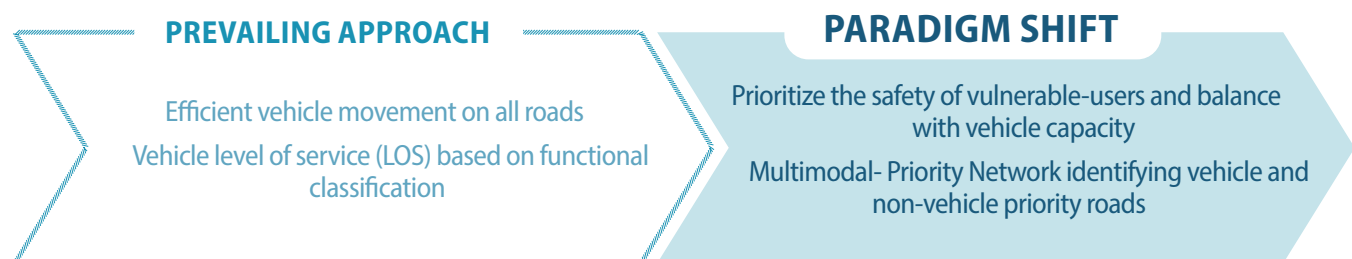
## Prioritize the Safe Mobility of Vulnerable-Modes and Vulnerable-Users

**TACTIC :** Set Countywide goals and adopt a County resolution to prioritize the safe mobility of vulnerable-modes and vulnerable-users. First, prioritize people walking; second, people accessing transit; third, people biking; and finally people driving.

Travel mode prioritization will ensure that infrastructure and services will accommodate the safety of all users. In the case of freeways with limited non-motorized vehicle access, reasonable alternate routes must be provided and intersections with local roads must accommodate people walking or biking. Prioritizing the road to ensure safety for the most vulnerable modes will ensure a safer transportation system for all road users - even those not considered vulnerable.

A person's survival is dependent on the speed of the traveling vehicle during a crash. People outside a personal vehicle, including those walking, biking, and traveling to and from transit stations have been identified as the most vulnerable. Academic research indicates that the chances of surviving a crash decreases significantly for children and older adults. Therefore, it is critical that the transportation systems provide the infrastructure and services necessary for the safe mobility of vulnerable users and vulnerable travel modes.

**TACTIC :** Miami-Dade County system designers should plan and design roadways for the most vulnerable users. Designers should also incorporate universal design elements, particularly along roadways identified as non-vehicular priorities. An urban street network should also be developed with systemwide modal prioritization of urban streets for vehicular and non-vehicular priorities. This will provide system designers the mode to prioritize rather than defaulting to enhancing the quality of vehicle capacity and speed, referred to as Level of Service (LOS).



### GUIDING VALUES ALIGNMENT:

**Prioritization of Equitable Outcomes; Brave Direction Using Sensitivity; Data-Driven Decisions**



- » [Universal Design Elements, Transit Street Design Guide, NACTO](#)
- » [Cities Safer by Design, Guidance and Examples to Promote Traffic Safety through Urban Design and Street Design, WRI](#)



## PRIORITIZE SAFE MOBILITY OF VULNERABLE TRAVEL MODES



**#1 People Walking, Accessing Transit**



**#2 People Biking**



**#3 People Riding in Transit, Transit Vehicles**



**#4 People Driving, other Vehicles**

AND

## PRIORITIZE SAFE MOBILITY OF VULNERABLE USERS



**RESULTING IN BETTER SAFETY FOR ALL**





## Leadership in Speed Management Strategies to Support Safe Mobility of Vulnerable-Modes and Vulnerable-Users

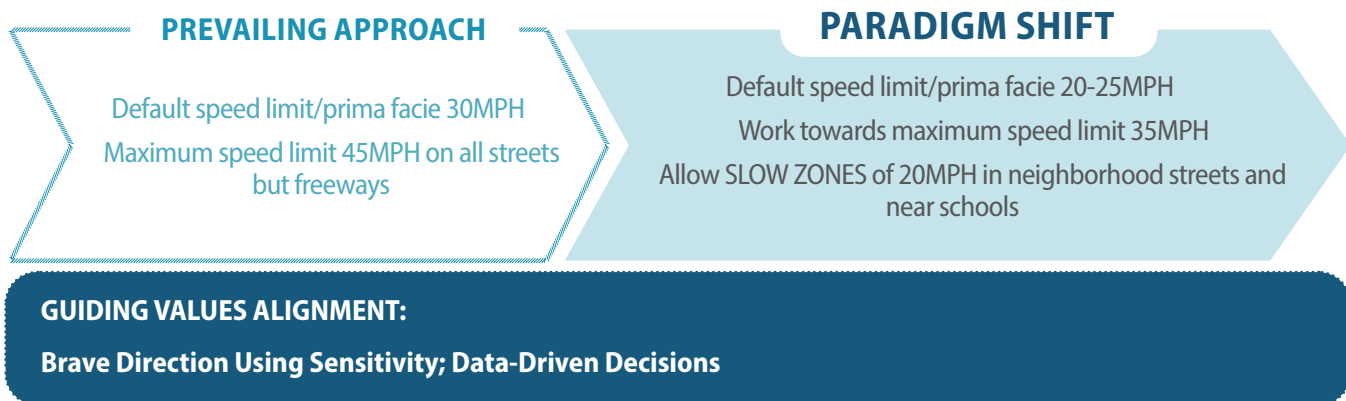
Speed management is critical in achieving Miami-Dade County’s goal of Vision Zero. The average speed of a road has a significant impact on both the number of crashes and the severity of crashes. There is a direct correlation between higher posted speed, vehicle speeds, the likelihood of vehicles exceeding the speed limit, and traffic fatalities. Over the past decade in the United States, the largest increase in pedestrian fatalities were on roadways with speed limits over 35MPH. Countermeasures to address speed-related crashes based on experience from other U.S. Cities include:

- » Reduce default speed limits/prima facie
- » Set posted speed limit using an alternate method to 85th percentile
- » Automated speed enforcement

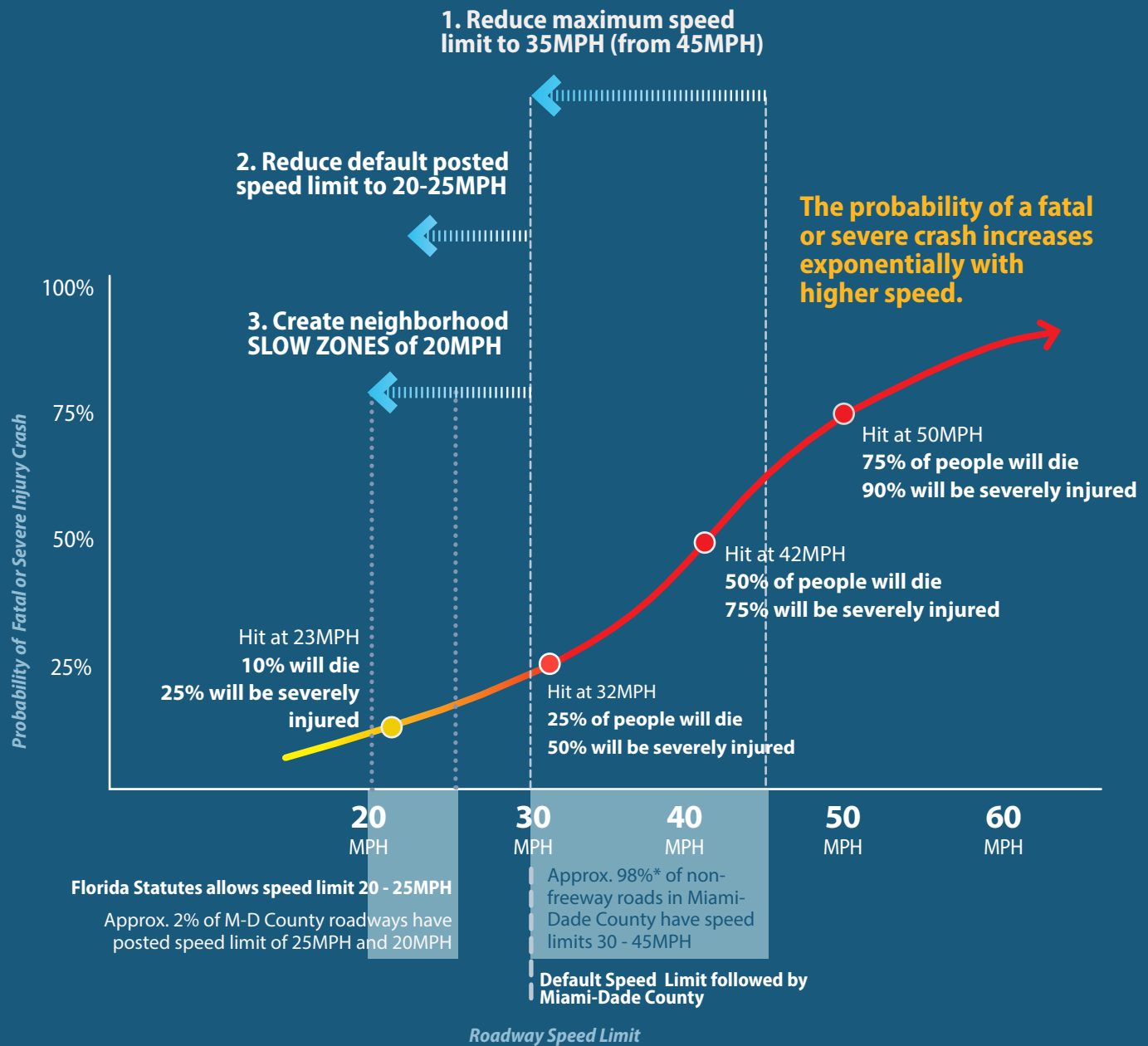
**TACTIC:** Reduce the default speed limit/prima facie from 30MPH to 25MPH consistent with the allowable limits in the Florida Statutes. Work towards setting a maximum speed limit to 35MPH from 45MPH on all appropriate streets classified as arterials and collectors or highways.

The current default speed limit/prima facie on roadways without a posted speed limit is 30MPH in Miami-Dade County. However, vehicles traveling at approximately 30MPH are unsafe for the vulnerable users with 25% fatal and 50% severe injury outcomes for able-bodied young adults. Research documented in *Research Synthesis for the California Zero Traffic Fatalities Task Force*, University of California Institute of Transportation, indicates that a 5MPH reduction in posted speed limit on limited access roads resulted in reduction in injuries as high as 39% and an average for 8-15%. The reduction in fatalities ranged between 10 and 30%.

These findings indicate that reducing speed limits is a great countermeasure that must be considered. The countermeasure includes reducing the default speed limit on unposted roadways and set maximum speed limits to protect the safety of vulnerable travel modes and users.



# REDUCE DESIGN SPEED AND POSTED SPEED, ALONG WITH CHANGING ENGINEERING DESIGNS TO REDUCE OPERATING SPEED TO REDUCE CRASH SEVERITY



Graph adapted from City Limits. Setting Safe Speed Limits on Urban Streets  
Data Sources: <https://aaafoundation.org/impact-speed-pedestrians-risk-severe-injury-death/>  
The 2020 Florida Statutes, Title XXIII, Chapter 316, 316.183 Unlawful speed



**TACTIC: Allow for 20MPH or SLOW ZONES on neighborhood streets and near schools.**

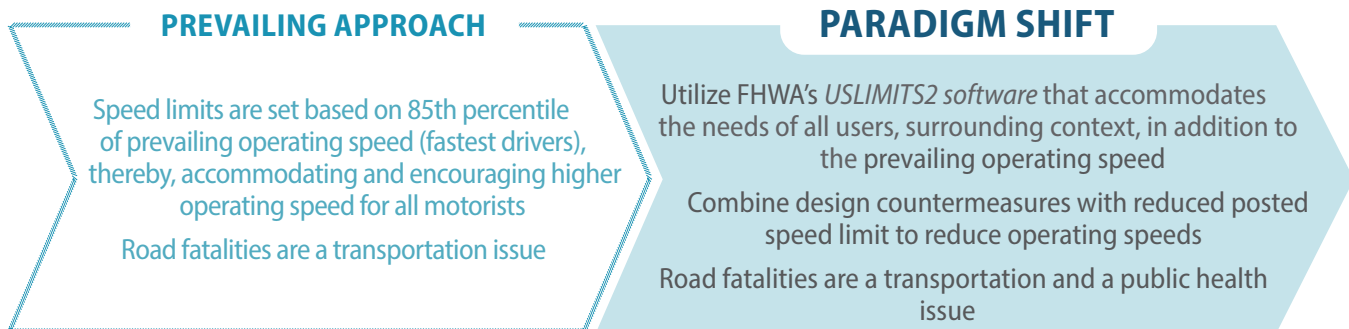
Local neighborhood streets and areas around schools have a default speed of 35MPH. Within school zones, the speed limit is reduced to 15MPH during the school year during drop-off and pick-up hours. However, academic research indicates that the concentration of fatal crashes for children and young adults less than 18 years old was highest in school zones. At the same time, the 2020 Florida Statutes, Title XXIII, Chapter 316, 316.183 Unlawful Speed allow speeds limits of 20- 25MPH in school zones. 'SLOW ZONES' with a maximum speed limit of 20MPH could be implemented on neighborhood streets and near schools to improve safety in these areas.

**TACTIC: Use effective countermeasures that incorporate flexible and context-sensitive design to manage speed.**

A driver's operating speed is influenced by the roadway design. It is therefore important to integrate flexible design that acts as a traffic calming measure that would in turn influence driver's operating speed. Flexible design, the substantial safety approach, and engineering design countermeasures are discussed in the following sections. Furthermore, Section 202-Speed Management in the 2019 FDOT Design Manual provides guidance on using engineering design to manage operating speed based on the surrounding context. Integrating context-sensitive design is the main factor in reducing crash severity with existing conditions/operations. People drive at a speed perceived to be comfortable to that driver and this is the basis of the 85th percentile design guideline. However, when roads are designed without considering the context, people drive at higher speeds. Therefore, the 85th percentile speeds should not be the basis for setting speed limits in all instances and should rather be adapted to the surrounding context.

**TACTIC: Update County policy to utilize the USLIMITS2 software to set speed limits instead of using the 85th percentile speeds.** The shift would increase safety outcomes on roadways classified as arterials or collectors that were identified having the highest rate of fatalities or were identified as part of the high injury network in Miami-Dade County.

Speed limits have predominantly been set according to the principles outlined in the Manual on Uniform Traffic Control Devices (MUTCD) that specify speed limits should be set to approximately the same speed as the 85th percentile speed of free-flowing traffic. The applicability of the 85th percentile rule need to be put in context and consider the following:



**GUIDING VALUES ALIGNMENT:**  
**Prioritization of Equitable Outcomes; Brave Direction Using Sensitivity; Data-Driven Decisions**



- » Drivers tend to underestimate their speed and this effect is exacerbated at lower speeds;
- » Drivers may speed on local streets due to the lack of strong visual cues to assess safety and speed, as guardrails and shoulders do on highways; and
- » Drivers may also succumb to spatial speed creep which occurs when high highway speed limits encourage drivers to drive fast even on connecting local roads.

The Federal Highway Administration (FHWA) developed the *USLIMITS2* software to set speed limits based on safety targets, street context, and prevailing operating speeds.

**TACTIC: Establish policies and funding to support automated speed enforcement for traffic violations such as running red lights or speeding to reduce dangerous driving behaviors.** Work with the Florida Legislature to continue to allow automated speed enforcement within Miami-Dade County. Collaborate with the Police Department and Fire Rescue to identify equitable traffic enforcement strategies to use during a traffic stop.

**TACTIC: Use public health tools to advance County's Vision Zero efforts.**

The Vision Zero framework suggests road fatalities and severe injuries are a public health crisis, like a curable illness. During a public health crisis, resources and interventions are deployed to address and curtail the spread of illness and bring the death toll to zero. Some cities like San Francisco, New York City, and Chicago are using public health tools and working with health professionals towards achieving Vision Zero.





## Utilize Substantive Safety Approach on Transportation Projects to Provide Safe Mobility of Vulnerable Travel-Modes and Users

**TACTIC: Utilize a substantive safety approach which balances safety and mobility for all users by retrofitting safety countermeasures on roadways within the high injury network.**

Currently, most of transportation projects are designed with a nominal safety approach. Most design plans simply reference safety design criteria to accepted documents including: *Policy on Geometric Design of Highways and Streets* or the *Green Book*, American Association of State Highway and Transportation Officials (AASHTO); *Roadside Design Guide*, AASHTO; *Manual on Uniform Traffic Control Devices (MUTCD)*, Federal Highway Administration (FHWA); *Guide for Planning, Design, and Operation of Pedestrian Facilities*, FHWA, and *Guide for the Development of Bicycle Facilities*, FHWA. Adherence to nominal safety is useful for protection against claims of professional and legal liability.

It is recommended that the substantive Locations with acute safety challenges require a substantive safety approach as outlined in the Highway Safety Manual (HSM), AASHTO. The HSM informs the design using existing crash data and statistical models to identify and implement countermeasures that would likely reduce crashes on an existing road and provides guidance to accommodate vulnerable non-motorized roadway users. A substantive approach links investment decisions to substantive safety outcomes (crash reduction) rather than just adhering to standards (nominal safety) offers system designers the opportunity to make better and more cost-effective decisions.

**TACTIC: Collaborate with Fire-Rescue on balancing the infrastructure needs of emergency access and the safety and mobility needs of the vulnerable roadway users.**

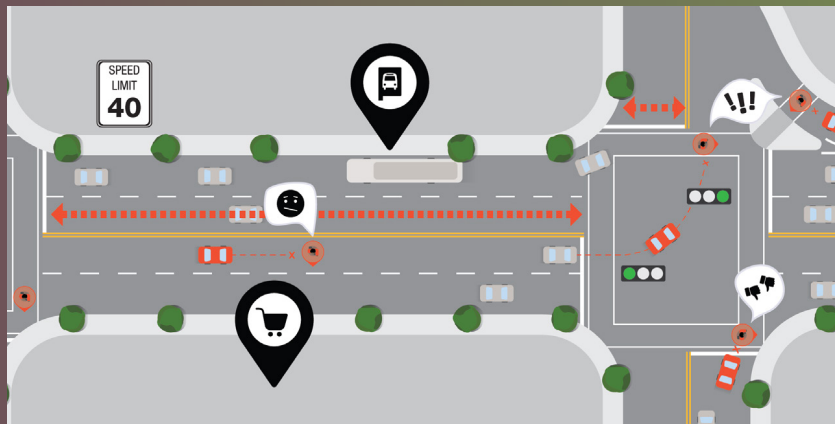
It is important to collaborate with Fire-Rescue whose goal is to reach the community in the shortest time, safely, while maneuvering fire trucks. Fire trucks have large turning movements that require a larger curb radius, which in turn substantially increase the turning speeds of smaller vehicles. System designers can identify design solutions such as truck aprons to balance the safety of vulnerable users while accommodating the movement of the fire trucks. Likewise, a design that incorporates a continuous median may pose a barrier to quick access. Through collaboration, system designers may identify gaps in the median or mountable curbs to accommodate the emergency access while balancing the needs of the vulnerable users.



**GUIDING VALUES ALIGNMENT:**  
**Brave Direction Using Sensitivity; Data-Driven Decisions**

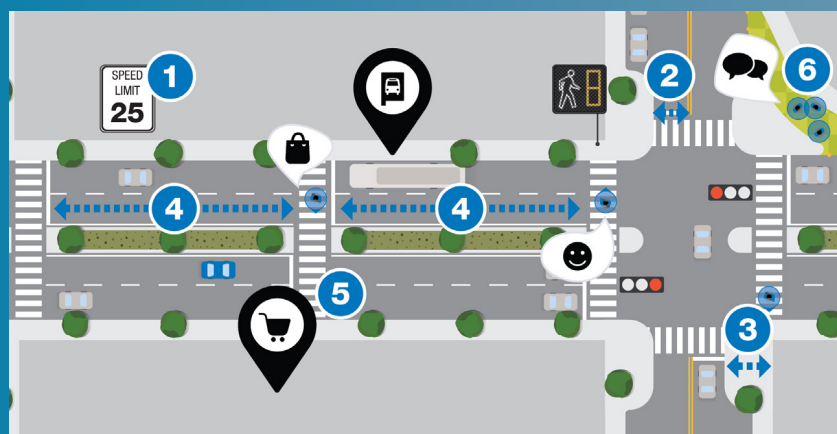


## A SUBSTANTIVE SAFETY APPROACH DURING PLANNING AND ENGINEERING DESIGN SUPPORTS SAFE MOBILITY FOR ALL USERS



*Dangerous by Design*

Regardless of how low speed limits are set, higher vehicular speeds are encouraged on streets with wide lanes that allow room for mistakes, lack high-visibility crosswalks, have wide intersections that encourage drivers to make turns without slowing down, and have long distances between intersections, encourage higher speeds—. Yet people will cross even in dangerous conditions when the nearest safe crosswalk requires a long detour, especially when there are destinations or transit stops along the road.



*Safer by Design*

1. Safe design gives drivers other visual cues to slow down. 2. Narrower travel lanes naturally slow traffic. 3. High-visibility, signalized crosswalks make drivers more aware of pedestrians and extended curbs shorten the distance required to cross the street. 4. Decreasing the distance between intersections also helps reduce speeds. 5. Adding signalized crosswalks in the middle of long blocks slows traffic and provides valuable new connections where people already want to walk. 6. Eliminating right turn “slip” lanes in favor of right-angle turns produces slower, safer turns and shorter crossing distances for pedestrians.

Sources: “Dangerous by Design 2021,” 2021. Smart Growth America. Smart Growth America. March 26, 2021. <https://smartgrowthamerica.org/dangerous-by-design/>.







## Integrate Land Use and Transportation Design through Context-Sensitive Solutions applying Design Flexibility

**TACTIC: Integrate context-sensitive solutions and flexible design particularly on major or minor arterials within the high-injury network.** Context sensitive solutions build on a substantive safety approach by combining it with the goals of the surrounding communities for vulnerable users and vulnerable travel modes.

Improvements to the street-side (adjacent to the right-of-way) or multimodal considerations provide the integration of land use, transportation, and infrastructure needs. The integration of these elements is commonly referred to as context sensitive solutions using flexible design. Context-sensitive solutions balance safety and mobility for all users, with the added co-benefit of enhancing the surrounding community. Flexibility in design is achieved through an open, collaborative, and creative thinking process with multi-disciplinary professionals and exercised during the engineering design. Florida Department of Transportation (FDOT) Context Classification Guide provides guidance on integrating land use and context with transportation design. National guidance is provided in *Flexibility in Highway Design*, FHWA, *Achieving Multimodal Networks*, FHWA, *A Guide for Achieving Flexibility in Highway Design*, AASHTO.

Crash data in Miami-Dade County and national academic research indicates that the greatest safety challenges are on roads classified as arterials. Although arterials only comprise 15% of all roads in Miami-Dade County they account for 51% of all fatalities and severe injuries. Therefore, it is imperative that immediate and deliberate steps are taken to reverse the safety outcomes along Miami-Dade County arterials integrating a substantive safety approach using flexible design solutions based on the surrounding context. The paradigm shift away from the prevailing approach by using the substantial safety approach are described on the following page.



### GUIDING VALUES ALIGNMENT:

**Brave Direction Using Sensitivity; Data-Driven Decisions**



- » [Understanding and Improving Arterial Roads to Support Public Health and Transportation Goals, American Public Health Association](#)
- » [United States Fatal Pedestrian Crash Hot Spot Locations and Characteristics, Journal of Transport and Land Use](#)
- » [Predictive network Screening Tools Webinar Series \(2021\) for Urban and Suburban Arterials, FHWA](#)



## PARADIGM SHIFT IN DESIGNING AND MANAGING ROADS CLASSIFIED AS ARTERIAL OR COLLECTOR

	PREVAILING APPROACH	PARADIGM SHIFT
<b>Traffic Operations</b>	Best traffic Level of Service (LOS) regardless of detrimental effects	Balance need for good Level of Service with need for improved safety and access for all users
<b>Posted Speed Limit</b>	35+ MPH based on 85th Percentile Speed	<35MPH based on speed targets developed using USLIMITS2
<b>Pedestrian Crossing Locations</b>	Marked crossing opportunities at signalized intersections, sometimes spaced ¼+ mile apart	Based on activity generators like bus stops, schools, and commercial and recreational destinations with crossings preferably every ¼ mile or less on average
<b>Sidewalk</b>	5' wide with minimum 3' width around utilities, built attached to back of curb	8'+ wide with minimum 5' around utilities, built with a minimum 3' wide buffer (landscape/streetscape) between curb and sidewalk
<b>Surrounding Land Use Residential, Commercial</b>	Road acts as a barrier separating neighborhoods.	Safe, connected for all road users, supports foot traffic and sidewalk activity
<b>Landscape</b>	Minimal landscape with low shrubs, palm trees	Shade trees and landscape that supports walkability for the people using the sidewalk and livability for the surrounding community
<b>Non-Vehicular Mobility</b>	Minimal infrastructure	Provide generous sidewalks on both sides of street, provide bike facilities where identified on master plans, consider amenities such as benches, trash cans, and bike racks
<b>Lighting</b>	Lighting provided for street area only, spaced at a typical distance	Provide lighting for cars and for pedestrians, strategically locate streetlights to brightly illuminate intersections and bike/pedestrian crossings
<b>Driveways</b>	Properties granted access for multiple driveways per site, driveway widths vary up to 30+ feet wide	Utilize access management guidelines for new driveways, consolidate and narrow existing driveways to <25' wide
<b>Access Management</b>	Allow full-access driveways and intersections at all locations	Restrict access to right-in/right-out except in special circumstances
<b>Right Turn Lanes</b>	Right turn lanes provided with yield-controlled slip lanes to increase capacity	Right turn lanes only installed in limited circumstances and removed where high pedestrian and bike traffic exists. Signalize right-turn lanes and remove yield-controlled high speed slip lanes.
<b>Intersection Control</b>	Use two-way stop control for minor streets and traffic signals for major streets	Utilize innovative intersections to improve safety, eliminate left-turns, and support U-turns. Utilize supporting access management (Roundabouts, RCUT, MUT)
<b>Bus Stops</b>	Few or no amenities provided	Provide minimum ADA accessibility at all bus stops, provide additional amenities such as benches, trash cans, and shelters



# SYSTEMIC CHANGES TO INTEGRATE PARADIGM SHIFT INTO EXISTING PROCESSES WITHIN THE COUNTY

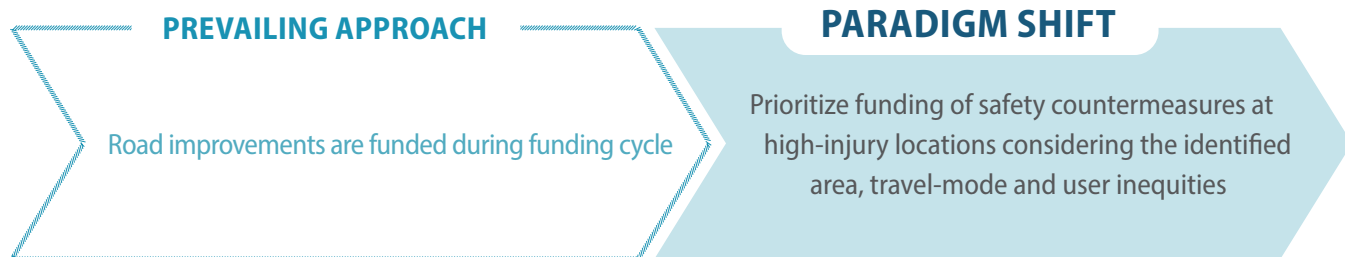


## Prioritize Safety Improvements at High-Injury Locations

**TACTIC :** Prioritize engineering infrastructure improvements at locations identified as high-injury, while considering the underlying socio-economic correlation to ensure equitable safety outcomes.

Priority locations for safety improvements were identified using data-based approach using safety and correlated socio-economic data. Prioritization criteria included the location's crash severity and frequency, socio-economic attributes of the adjacent community, and planned future transit routes and roadway projects. The top fifty Countywide projects and the top safety project within each Commission district were identified using the prioritization criteria.

Over 2,500 locations (intersections and road segments) were identified in the high injury network. Addressing the safety at all these locations at the same time may be cost- and resource-prohibitive. Therefore, criteria to prioritize locations were developed similar to emergency services' TRIAGE system. The TRIAGE system prioritizes treatment based on the severity of a person's condition and that person's likelihood of recovery without treatment. Using the TRIAGE approach, the project prioritization methodology considers the severity and frequency of crashes at a location and combines it with the likelihood of the outcomes changing without intervention (or action) from leadership and transportation professionals. Safety projects were created by combining segment and intersection crash locations to form contiguous projects. The identified safety projects were categorized by priority for immediate action.



**GUIDING VALUES ALIGNMENT:**  
Brave Direction Using Sensitivity; Data-Driven Decisions



## Safety Projects

Contiguous projects were created by combining high-injury segment and intersection crash locations close to each other (less than 300 feet) and not separated by a major roadway. A total of 1,957 intersections and 622 segments were combined into 1,140 safety projects.

## Projects Prioritization

The prioritization categories were developed based on the guiding principles identified with the stakeholders. These include:

### 1. Crash Score

The crash score was calculated by combining the bicycle, pedestrian, and vehicle crash scores, with a maximum score of 11 points.

### 2. Equitable Outcomes Score

The equity score prioritizes safety projects within geographic locations (identified in the socio-economic analysis) that correlate with the highest crash rate. The criteria under this category are:

- » Low-Income Households (households earning less than \$25,000 a year)
- » Zero-Vehicle Households
- » Minority (non-white) Population

The equity score was assigned between 0 and 5 points based on the five Jenks Natural Breaks for each category.

### 3. Safe Access to Transit Score

Areas within a ½ mile around the Metrorail, Tri Rail, and Brightline stations and within a ¼ mile around bus stops and Metromover stations were prioritized. A score between 0 and 2 was assigned if a project was within the travel shed for a maximum score of 6 points.

- » Projects within the travel shed of rail stations (Metrorail, Tri Rail and Brightline) were assigned 2 points each.
- » Projects within the ¼ mile travel shed of a bus stop were assigned 2 points, and those within ½ mile were assigned 1 point.
- » Projects within ¼ mile travel shed of a Metromover were assigned 2 points, and those within ½ mile were assigned 1 point.

### 4. Safe Access to Future Transit Score

Scores were assigned based on the project’s vicinity to future projects for a

maximum score of 6 points.

- » Projects within ¼ mile of the Miami-Dade Transportation Planning Organization in the Long-Range Transportation Plan (LRTP) 2045 project extents were assigned 1 point. Projects within the project boundary were assigned 2 points.
- » Projects within ¼ mile of a Miami-Dade Strategic Miami Area Rapid Transit Plan (SMART) Corridors were assigned 2 points.
- » Projects within 100 feet of the Better Bus Project route was assigned 2 points, and projects within ¼ mile were assigned 1 point.

## Projects Weighting

Projects were prioritized using the total weighted score of the top 50 Countywide priority Vision Zero safety projects. To provide Miami-Dade County program flexibility, five projects within each Commission District were identified to be implemented over the next 5 years. These, projects are separated based on right-of-way jurisdiction or ownership. The top five priority projects within County: located on the County-owned roads, on municipal-owned roads, or that are multi-jurisdictional, were noted as year-one, the next five priority projects were noted as year-two, up to year-five.

PROJECTS PRIORITIZATION											
Bicycle Crashes	Pedestrian Crashes	Vehicle Crashes	Minority Population Density	Low Income Households Density	Zero-Vehicle Households Density	Rail Station Vicinity	Bus stop Vicinity	Metromover Vicinity	SMART Corridor Vicinity	Better Bus Project Vicinity	2045 LRTP Projects Vicinity
0-2 points	0-3 points	1-6 points	0-5 points	0-5 points	0-5 points	0 or 2 points	0-2 points	0-2 points	0 or 2 points	0-2 points	0-2 points
TOTAL SCORE											
CRASH SCORE - 11 POINTS			EQUITY SCORE - 15 POINTS			TRANSIT SCORE - 6 POINTS			FUTURE TRANSIT SCORE - 6 POINTS		
WEIGHTING											
CRASH - 55%			EQUITY - 25%			CURRENT TRANSIT ACCESS - 15%			FUTURE TRANSIT ACCESS - 15%		



# PRIORITIZED ROADWAY SAFETY PROJECTS IN MIAMI-DADE COUNTY

## TOTAL CRASH SCORE

A location's crash severity is a key indicator for countermeasures and improvements.

+

## EQUITABLE OUTCOMES SCORE

The likelihood of a location's safety outcomes changing without targeted intervention to address geographic inequity is low. The equity score prioritizes safety projects within geographic locations (identified in the socio-economic analysis) that correlate with the highest crash rate.

+

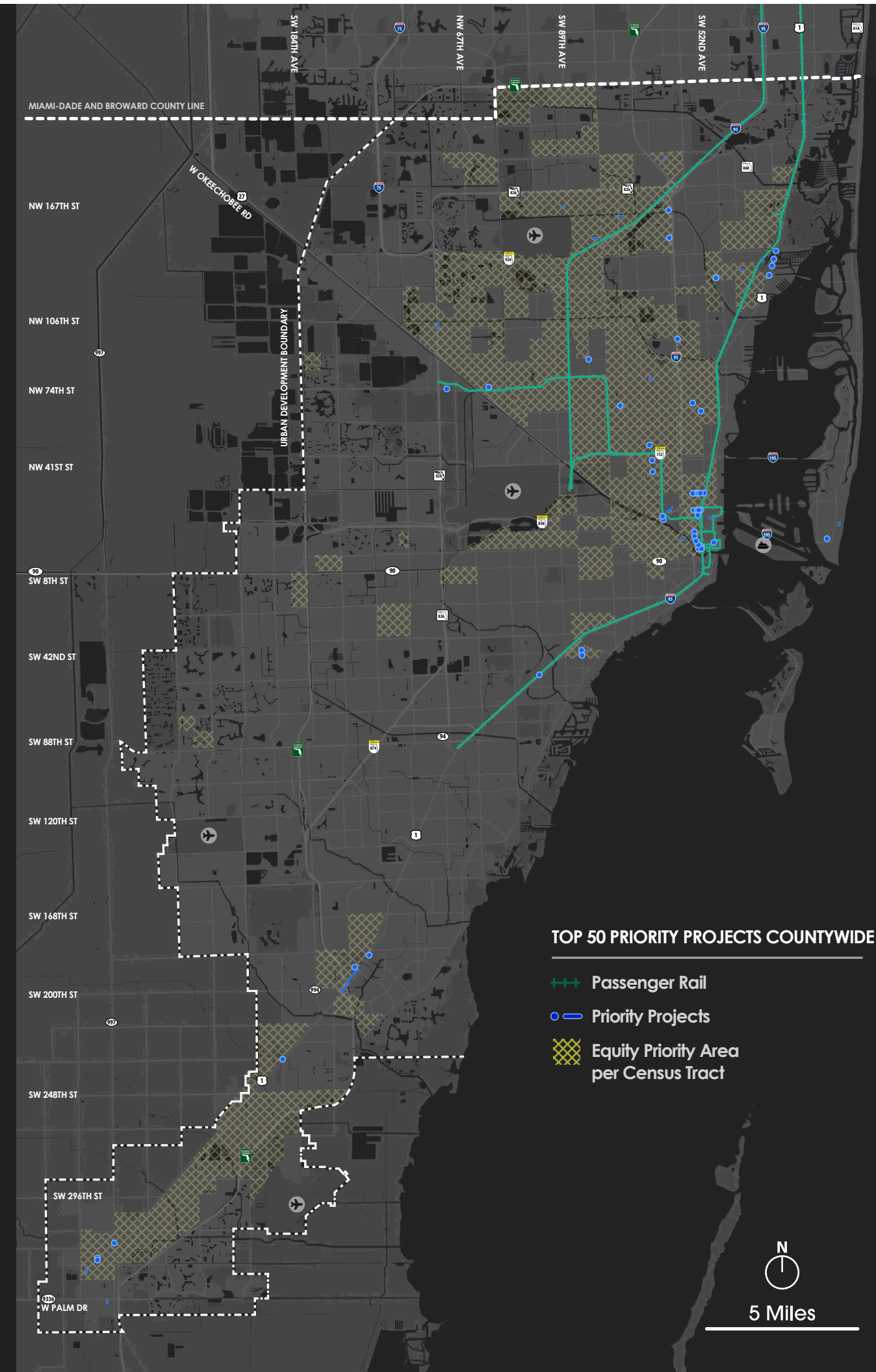
## SAFE TRANSIT ACCESS SCORE

Targeted intervention to ensure safe access to and from transit is essential to increase a location's safety outcome. The transit access score prioritizes safety projects for non-vehicular mobility within the travel shed of existing transit stations.

+

## LEVERAGE FUTURE TRANSPORTATION PROJECTS SCORE

Targeted intervention when planning for future projects can increase a location's safety outcome. This score prioritizes safety projects connected to future transit routes, premium transit projects, and funded roadway improvements.



### TOP 50 PRIORITY PROJECTS COUNTYWIDE

- Passenger Rail
- Priority Projects
- Equity Priority Area per Census Tract

## COUNTYWIDE TOP FIFTY - PRIORITY PROJECTS

Priority	Commission District	Roadway Ownership	From: Nearest Intersection	To: Farthest Intersection
1	1	Municipality	NW 154th St & NW 22nd Ave	NW 20th Ave & NW 154th St
2	3,5	Multi-jurisdiction	NW 11th St & NW 12th Ave	NW 11th St & NW 11th Ct
3	3	Multi-jurisdiction	NW 11th St & NW 2nd Ave	NW 1st Pl & NW 12th St
4	3	Multi-jurisdiction	NW 2nd Ave & NW 21st St	NW 2nd Ave & NW 20th Ter
5	3	Municipality	NW 14th St & NW 10th Ave	NW 15th St & NW 9th Ave
6	2	Municipality	NE 126th St & NE 10th Ave	NE 11th Ave & NE 126th St
7	3,5	Multi-jurisdiction	NW 12th Ave & NW 12th St	Dolphin Expy & NW 12th Ave
8	13	Municipality	W 20th Ave & W 51st Pl	W 20th Ave & W 49th St
9	1	Municipality	Sharazad Blvd & Ahmad St	Sharazad Blvd & Kalandar St
10	3	County	NW 14th Ave & NW 77th Ter	NW 77th Ter & NW 13th Ct
11	2	Multi-jurisdiction	NE 16th Ave & NE 131st St	NE 16th Ave & NE 130th St
12	3,5	Multi-jurisdiction	NW 3rd Ave & NW 5th St	NW 3rd Ave & NW 1st St
13	3	Municipality	NW 2nd Ave & NW 64th St	
14	7	Multi-jurisdiction	Grand Ave & SW 37th Ave	Grand Ave & Plaza St
15	5	Multi-jurisdiction	NW 2nd Ave & NW 1st St	SW 2nd Ave & SW 3rd St
16	8,9	County	Busway & Caribbean Blvd	Busway & Marlin Rd
17	3	Municipality	NE 1st Ave & NE 11th St	NE 11th St & NE 2nd Ave
18	7	Multi-jurisdiction	Stanford Dr & S Dixie Hwy	
19	9	Municipality	NW 14th St & NW 8th Pl	NW 8th Pl & NW 12th St
20	5	Municipality	SW 1st Ct & SW 2nd St	SW 1st Ct & SW 3rd St
21	9	County	Marlin Rd & SW 106th Ave	
22	8,9	Multi-jurisdiction	SW 232nd St & Dixie Hwy	
23	5	Municipality	Ocean Dr & 11th St	Ocean Dr & 12th St
24	9	Municipality	SW 3rd Ave & SW 1st St	SW 3rd Ave & SW 2nd St
25	2	Multi-jurisdiction	NW 7th Ave & NW 155th Ln	

Priority	Commission District	Roadway Ownership	From: Nearest Intersection	To: Farthest Intersection
26	8,9	Multi-jurisdiction	Quail Roost Dr & Busway	SW 186th St & Dixie Hwy
27	7	Multi-jurisdiction	Charles Ave & SW 37th Ave	
28	2	Multi-jurisdiction	NE 123rd St & W Dixie Hwy	NE 123rd St & NE 5th Ave
29	1	Municipality	NW 159th St & NW 38th Ct	NW 37th Pl & NW 159th St
30	3	Municipality	NW 14th St & Highland Rd	NW 14th St & NW 10th Ave
31	12	Multi-jurisdiction	NW 74th Ave & Hialeah Expy	
32	5	Municipality	NW 2nd St & NW 7th Ave	NW 2nd St & NW South River Dr
33	3	Multi-jurisdiction	N Miami Ave & NW 60th St	
34	2	Multi-jurisdiction	NW 7th Ave & NW 143rd St	
35	9	Municipality	SW 6th Ave & SW 5th St	SW 6th Ave & SW 6th St
36	3	Multi-jurisdiction	NW 95th St & NW 6th Ave	
37	3	Municipality	NW 14th Ave & NW 30th St	
38	8,9	Municipality	SW 177th Ave & NW 2nd St	
39	9	County	SW 194th Ave & SW 194th Ct	SW 194th Ave & SW 195th Ave
40	5	Multi-jurisdiction	NE 2nd Ave & E Flagler St	
41	3	County	NW 23rd Ave & NW 64th St	
42	3	Multi-jurisdiction	NW 3rd Ave & NW 20th St	N Miami Ave & NE 20th St
43	3	Multi-jurisdiction	NW 14th Ave & NW 36th St	
44	5	Municipality	Meridian Ave & 6th St	6th St & Euclid Ave
45	3	Multi-jurisdiction	NW 3rd Ave & NW 14th St	NW 1st Ave & NW 14th St
46	13	Multi-jurisdiction	W 8th Ave & Hialeah Expy	
47	2,4	Multi-jurisdiction	NE 123rd St & Biscayne Blvd	Biscayne Blvd & NE 135th St
48	1	Municipality	NW 179th Ter & NW 7th Pl	NW 179th Ter & NW 7th Ct
49	2	County	NW 32nd Ave & NW 87th St	
50	3	Municipality	NW 14th Ct & NW 45th St	

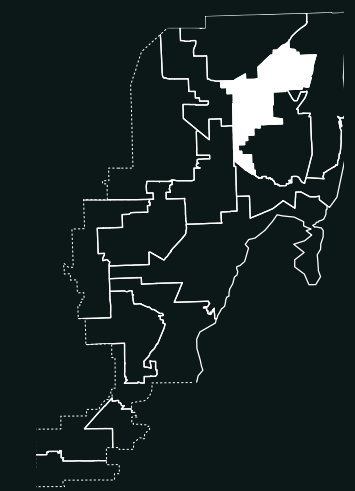
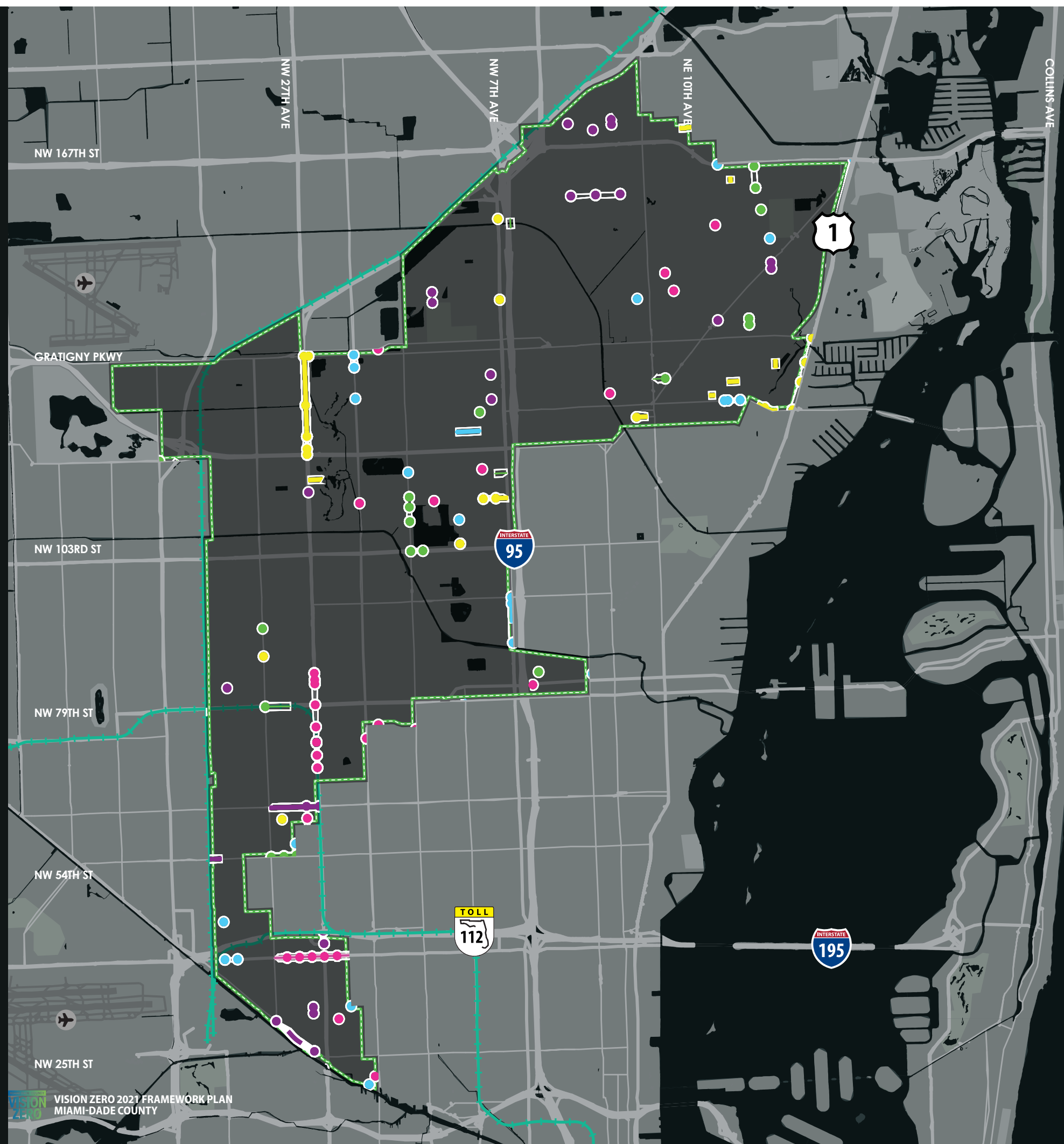


# DISTRICT 2 PRIORITY PROJECTS.

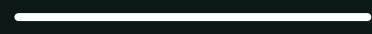
++ Passenger Rail

Top Five Projects per  
Roadway Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



2 Miles



## COMMISSION DISTRICT 2 - PRIORITY PROJECTS

COUNTY ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 32nd Ave & NW 87th St	
	NW 104th St & NW 12th Ave	
	NW 31st Ave & NW 60th St	
	NW 115th Sr & NW 27th Ave	NW 115th St & W Golf Dr
	NW 10th Ave & NW 111th St	NW 7th Ave & NW 111th St
YEAR 2	NW 6th Ave & N Biscayne River Dr	NW 6th Ave & S Biscayne River Dr
	NW 32nd Ave & NW 92nd St	
	NW 17th Ave & NW 112th St	NW 17th Ave & NW 108th St
	NW 5th Ave & NW 83rd St	
	NW 115th St & NW 8th Ave	NW 7th Ave & NW 115th St
YEAR 3	NW 30th Ave & NW 56th St	
	NW 12th Ave & NW 79th St	NW 75th St & NW 12th Ave
	NW 22nd Ave & NW 128th St	
	NW 17th Ave & NW 116th St	
	NW 12th Ave & NW 108th St	
YEAR 4	NW 10th Ave & NW 116th St	
	NW 22nd Ave & NW 73rd St	
	NW 14th Ave & NW 111th St	
	NW 22nd Ave & NW 111th St	
	NW 29th Ave & NW 28th St	NW 29th Ave & NW 27th St
YEAR 5	N Miami Ave & NW 159th St	NE 4th Ave & NE 159th St
	NW 36th Ave & NW 82nd St	
	NW North River Dr & NW 32nd Ave	NW 29th Ave & NW North River Dr
	NW 13th Ct & NW 14th Dr	NW 13th Ct & NW 143rd St
	NW 21st Ave & NW 75th St	

MUNICIPAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NE 126th St & NE 10th Ave	NE 11th Ave & NE 126th St
	NE 128th St & NE 12th Ave	NE 128th St & NE 13th Ave
	NE 13th Ave & NE 161st St	NE 160th St & NE 13th Ave
	NE 15th Ct & NE 155th Ter	
	NE 129th St & NE 6th Ave	NE 7th Ave & NE 129th St
YEAR 2	NW 10th Ave & NW 125th St	
	NE 14th Ave & NE 138th St	NE 14th Ave & NE 137th St
	NW 122nd St & NW 12th Ave	NW 122nd St & NW 10th Ave
	NE 5th Ave & NE 142nd St	
	NW 22nd Pl & NW North River Dr	
YEAR 3	NW 24th Ave & NW 28th St	
	NE 11th Ct & NE 153rd Ter	
	NE 7th Ct & NE 146th St	
	NW 22nd Ct & NW 18th St	
	NE 8th Ave & NE 143rd St	
YEAR 4	NW 25th Ave & NW 26th St	
	NW 8th Ave & NW 127th St	
	NW 8th Ave & NW 131st St	
	NE 2nd Ave & NE 169th Ter	
	NE 3rd Ct & NE 171st St	NE 3rd Ct & NE 170th St
YEAR 5	N Miami Ave & NE 171st St	

MULTI-JURISDICTIONAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NE 16th Ave & NE 131st St	NE 16th Ave & NE 130th St
	NW 7th Ave & NW 155th Ln	
	NE 123rd St & W Dixie Hwy	NE 123rd St & NE 5th Ave
	NW 7th Ave & NW 143rd St	
	NE 123rd St & Biscayne Blvd	Biscayne Blvd & NE 135th St
YEAR 2	NW 42nd Ave & E 65th St	
	NW 32nd Ave & NW 79th St	NW 30th Ave & NW 79th St
	NW 32nd Ave & NW 54th St	NW 24th Ave & NW 54th St
	NW 17th Ave & NW 103rd St	NW 103rd St & NW 15th Ave
	Miami Dr & NE 15th Ave	NE 15th Ave & NE 159th St
YEAR 3	NW 37th Ave & NW 36th St	NW 36th Ave & NW 36th St
	NW 95th St & NW 7th Ave	NW 7th Ave & Little River Dr
	NW 37th Ave & NW 43rd St	
	NE 125th St & NE 11th Pl	NE 13th Ave & NE 125th St
	NE 16th Ave & NE 151st St	
YEAR 4	NW 36th St & NW 32nd Ave	NW 17th Ave & NW 36th St
	NW 5th Ct & NW 81st St	
	NW 27th Ave & NW 84th St	NW 27th Ave & NW 69th St
	Griffing Blvd & NE 127th St	
	NE 16th Ave & NE 147th St	NE 16th Ave & NE 146th St
YEAR 5	NE 138th St & W Dixie Hwy	
	NW 27th Ave & NW 113th St	
	NW 135th St & NW 27th Ave	NW 135th St & NW 26th Ct
	NE 123rd St & NE 14th St	NE 16th Ave & NE 123rd St
	NW 22nd Ave & NW 135th St	NW 22nd Ave & NW 133rd St



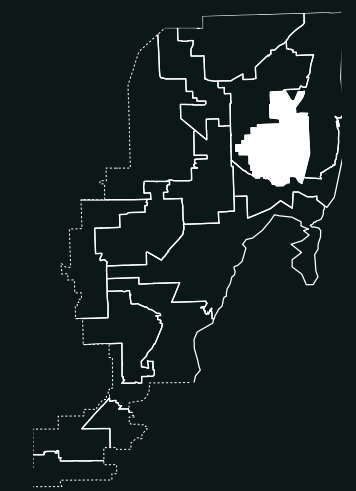
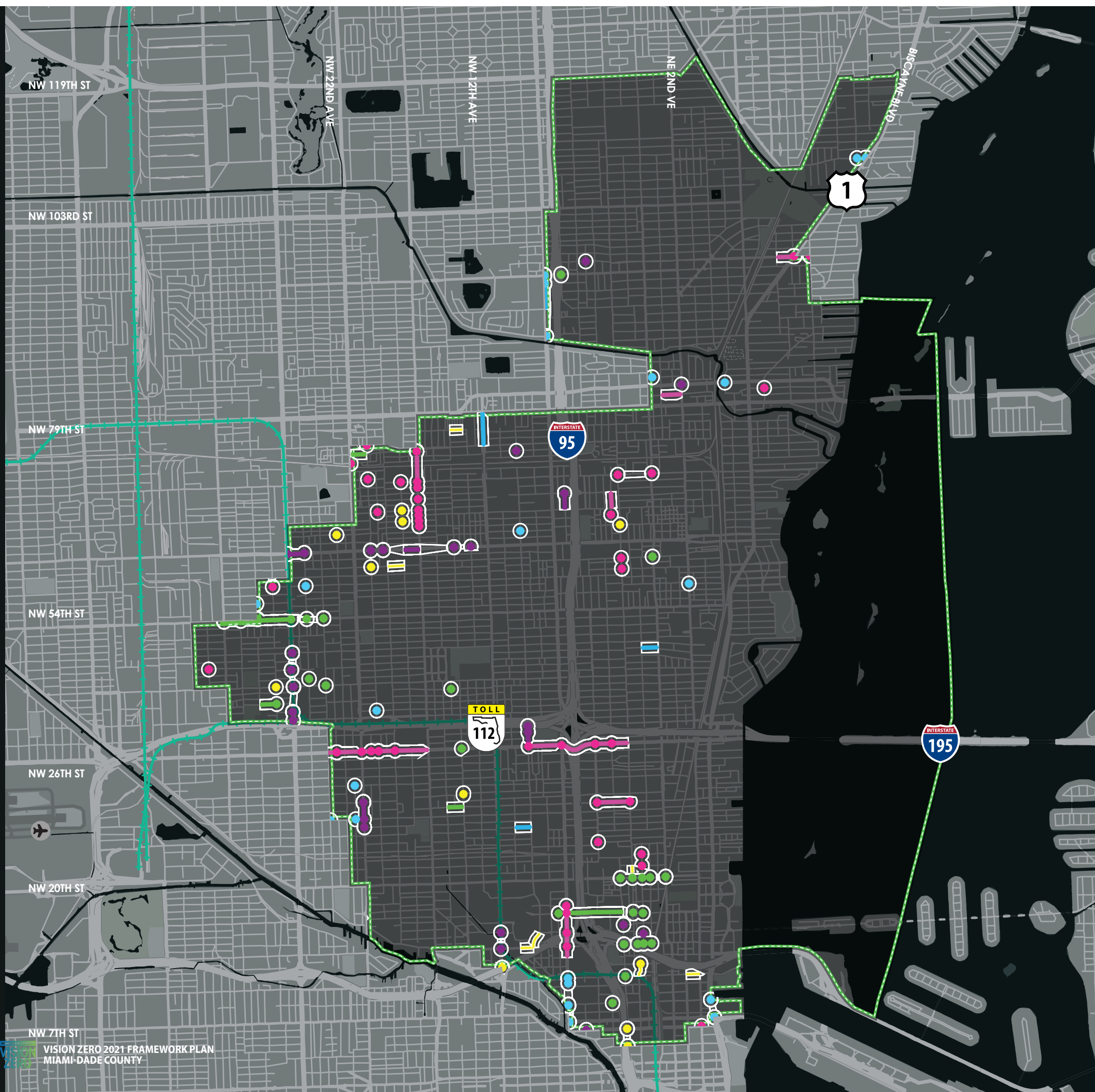


# DISTRICT 3 PRIORITY PROJECTS.

--- Passenger Rail

Top Five Projects per  
Roadway Ownership

- Priority One
- Priority Two
- Priority Three
- Priority Four
- Priority Five



1 Mile



## COMMISSION DISTRICT 3 - PRIORITY PROJECTS

COUNTY ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 14th Ave & NW 77th Ter	NW 77th Ter & NW 13th Ct
	NW 23rd Ave & NW 64th St	
	NW 18th Ave & NW 68th St	NW 18th Ave & NW 66th St
	NW 29th Ave & NW 46th St	
	NW 21st Ave & NW 60th St	NW 60th St & NW 18th Ave
YEAR 2	NW 74th St & NW 22nd Ave	NW 74th St & NW 21st Ave
	NW 24th Ave & NW 46th St	
	NW 43rd Ter & NW 30th Ave	NW 29th Ave & NW 43rd Ter
	NW 25th Ave & NW 47th St	
	NW 25th Ave & NW 58th St	
YEAR 3	NW 12th Ave & NW 79th St	NW 75th St & NW 12th Ave
	NW 29th Ave & NW 60th St	NW 29th Ave & NW 58th St
	NW 21st Ave & NW 42nd St	
	NW 18th Ave & NW 71st St	
	NW 21st Ave & NW 71st St	
YEAR 4	NW 68th St & NW 20th Ave	
	NW 33rd Ave & NW 48th Ter	
	NW 4th Ave & NW 96th St	
	NW 10th Ave & NW 74th St	
YEAR 5		

MUNICIPAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 14th St & NW 10th Ave	NW 15th St & NW 9th Ave
	NW 2nd Ave & NW 64th St	
	NE 1st Ave & NE 11th St	NE 11th St & NE 2nd Ave
	NW 14th St & Highland Rd	NW 14th St & NW 10th Ave
	NW 14th Ave & NW 30th St	
YEAR 2	NW 14th Ct & NW 45th St	
	NW 3rd Ave & NW 11th St	
	NW 15th Ave & NW 29th St	NW 14th Ave & NW 29th St
	NW 4th Ave & NW 8th St	
	NW 17th St & NW 7th Ct	NW 1st Ct & NW 17th St
YEAR 3	NW 49th St & NW 1st Ave	NW 49th St & N Miami Ave
	NW 22nd Ct & NW 28th St	
	NW 32nd St & NW 22nd Ct	
	NW 10th Ave & NW 64th St	
	NW 11th Ave & NW 26th St	NW 26th St & NW 10th Ave
YEAR 4	NE 1st Ave & NE 80th Ter	NE 2nd Ave & NE 80th Ter
	NE 7th Ave & NE 81st St	
	NW 2nd Ave & NW 60th St	NW 2nd Ave & NW 59th St
	NW 5th Ave & NW 23rd St	
	NW 1st Ct & NW 22nd St	NW 1st Ct & NW 21st St
YEAR 5	NW 39th St & NW 10th Ave	NW 10th Ave & NW 36th St
	NW 6th Ave & NW 69th St	NW 6th Ave & NW 67th St
	NW 6th Ave & NW 5th St	
	NW 1st Ct & NW 15th St	
	NW 3rd Ave & NW 16th St	

MULTI-JURISDICTIONAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 11th St & NW 2nd Ave	NW 1st Pl & NW 12th St
	NW 2nd Ave & NW 21st St	NW 2nd Ave & NW 20th Ter
	NW 12th Ave & NW 12th St	Dolphin Expy & NW 12th Ave
	NW 3rd Ave & NW 5th St	NW 3rd Ave & NW 1st St
	N Miami Ave & NW 60th St	
YEAR 2	NW 95th St & NW 6th Ave	
	NW 3rd Ave & NW 20th St	N Miami Ave & NE 20th St
	NW 14th Ave & NW 36th St	
	NW 3rd Ave & NW 14th St	NW 1st Ave & NW 14th St
	Biscayne Blvd & NE 8th St	Biscayne Blvd & Port Blvd
YEAR 3	NE 4th Pl & NE 82nd St	
	NW 7th Ave & NW 11th St	NW 7th Ave & NW 6th St
	NW 32nd Ave & NW 54th St	NW 24th Ave & NW 54th St
	NE 2nd Ave & NE 57th St	
	NW 29th St & NW 5th Ave	NW 2nd Ave & NW 29th St
YEAR 4	NW 10th Ave & NW 36th St	NW 2nd Ave & NW 36th St
	NW 7th Ave & NW 18th St	NW 7th Ave & NW 13th St
	NW 2nd Ct & NW 69th St	NW 2nd Pl & NW 66th St
	NW 2nd Ave & NW 71st St	NE 71st St & N Miami Ave
	NW 12th Ave & NW 13th Ct	NW 12th Ave & NW 14th St
YEAR 5	NE 2nd Ave & NE 82nd St	
	NW 22nd Ave & NW 30th St	NW 22nd Ave & NW 27th St
	NW 21st Ave & NW 62nd St	NW 13th Ave & NW 62nd St
	NW 95th St & NW 7th Ave	NW 7th Ave & Little River Dr
	NW 36th St & NW 32nd Ave	NW 17th Ave & NW 36th St

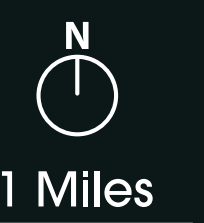
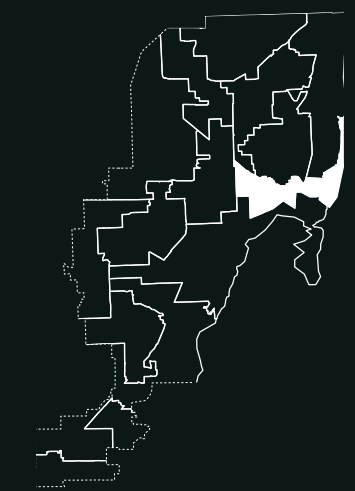
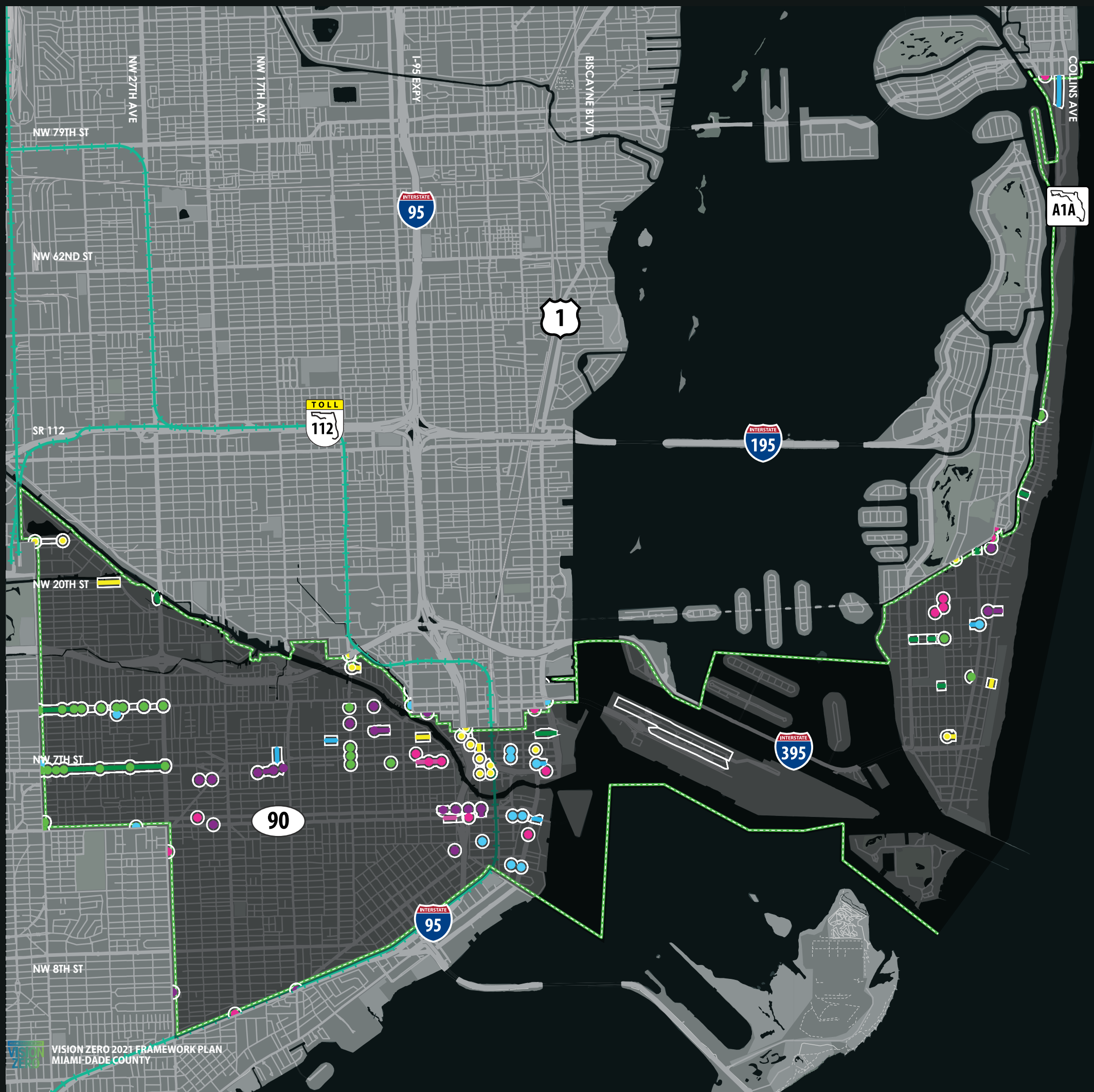


# DISTRICT 5 PRIORITY PROJECTS.

++ Passenger Rail

Top Five Projects per  
Roadway Ownership

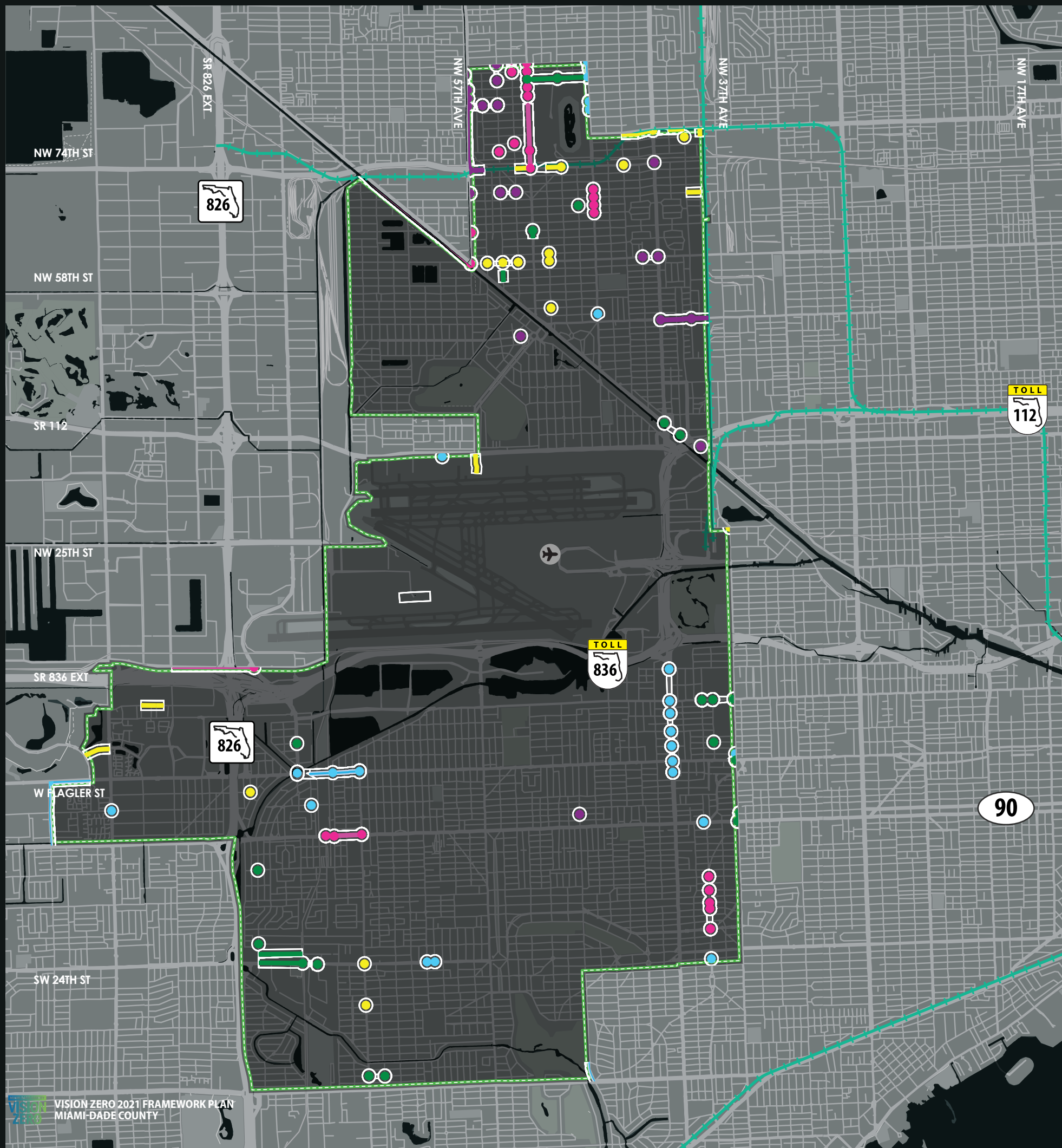
- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



## COMMISSION DISTRICT 5 - PRIORITY PROJECTS

COUNTY ROADS			MUNICIPAL ROADS			MULTI-JURISDICTIONAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection	Priority	From: Nearest Intersection	To: Farthest Intersection	Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 20th St & NW 32nd Ave	Delaware Pkwy & NW 20th St		SW 1st Ct & SW 2nd St	SW 1st Ct & SW 3rd St		NW 11th St & NW 12th Ave	NW 11th St & NW 11th Ct
	NW 37th Ave & NW 25th St	NW 25th St & NW 35th Ave		Ocean Dr & 11th St	Ocean Dr & 12th St		NW 12th Ave & NW 12th St	Dolphin Expy & NW 12th Ave
YEAR 1				NW 2nd St & NW 7th Ave	NW 2nd St & NW South River Dr	YEAR 1	NW 2nd Ave & NW 1st St	SW 2nd Ave & SW 3rd St
				Meridian Ave & 6th St	6th St & Euclid Ave		NE 2nd Ave & E Flagler St	
				NW 3rd Ct & NW 2nd St			NW 12th Ave & NW 1st St	SW 12th Ave & SW 1st St
YEAR 2				NE 2nd Ave & NE 2nd St	Biscayne Blvd & NE 2nd St		NW 6th St & NW 12th Ave	
				11th St & Jefferson Ave	11th St & Meridian Ave	YEAR 2	SW 9th Ave & SW 1st St	
				28th St & Indian Creek Dr	28th St & Collins Ave		S Miami Ave & SW 1st St	E Flagler St & N Miami Ave
YEAR 2				Drexel Ave & 12th St			S Miami Ave & SW 14th St	Brickell Ave & SE 14th St
				Alton Rd & 15th St	Meridian Ave & 15th St		S Miami Ave & 8th St SE	8th St SE & Brickell Key Dr
				NW 30th Pl & NW 6th St			SE 2nd Ave & SE 2nd St	SE 3rd Ave & SE 2nd St
YEAR 3				NW 17th Pl & NW 1st St	W Flagler St & NW 17th Pl		SW 2nd Ave & SW 11th St	
				16th St & Drexel Ave	Washington Ave & 16th St	YEAR 3	NW 7th Ave & W Flagler St	
				NW 2nd St & NW 14th Ave	NW 13th Ave & NW 2nd St		SW 5th Ave & 8th St SE	8th St SE & SW 3rd Ave
YEAR 3				SE 10th St & Brickell Ave			SW 24th Ave & SW 7th St	
				Dade Blvd & Washington Ave	Washington Ave & 21st St		SW 1st St & SW 7th Ave	SW 1st St & SW 5th Ave
				Jefferson Ave & Lincoln Rd		YEAR 4	NW 12th Ave & NW 4th St	
YEAR 4				Meridian Ave & 17th St	Meridian Ave & Lincoln Ln N		SW 19th Ave & SW 1st St	SW 17th Ct & SW 1st St
				SE 3rd Ave & SE 3rd St			SW 23rd Ave & SW 8th St	
				SW 17th Rd & SW 4th Ave			SW 5th Ave & SW 7th St	SW 2nd Ave & SW 7th St
YEAR 4				NW 10th Ave & NW 3rd St	NW 9th Ave & NW 3rd St		SW 27th Ave & SW 25th St	
				James Ave & Lincoln Rd	Lincoln Rd (dead end E of Collins Ave)	YEAR 5	SW 30th Ave & SW 8th St	
				SW 2nd St & SW 24th Ave	SW 23rd Ave & SW 2nd St		SW 27th Ave & SW 11th St	
YEAR 5				NW 10th Ave & NW 6th St			SW 8th St & SW 37th Ave	SW 7th St & SW 37th Ave
				NW South River Dr & NW 27th Ave	400' West of NW South River Dr & NW 27th Ave		SW 22nd Ave & S Dixie Hwy	



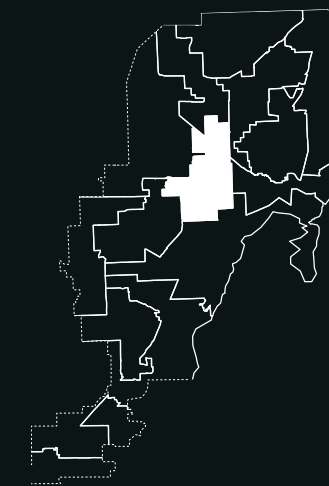


## DISTRICT 6 PRIORITY PROJECTS.

--- Passenger Rail

Top Five Projects per  
Roadway Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



2 Miles

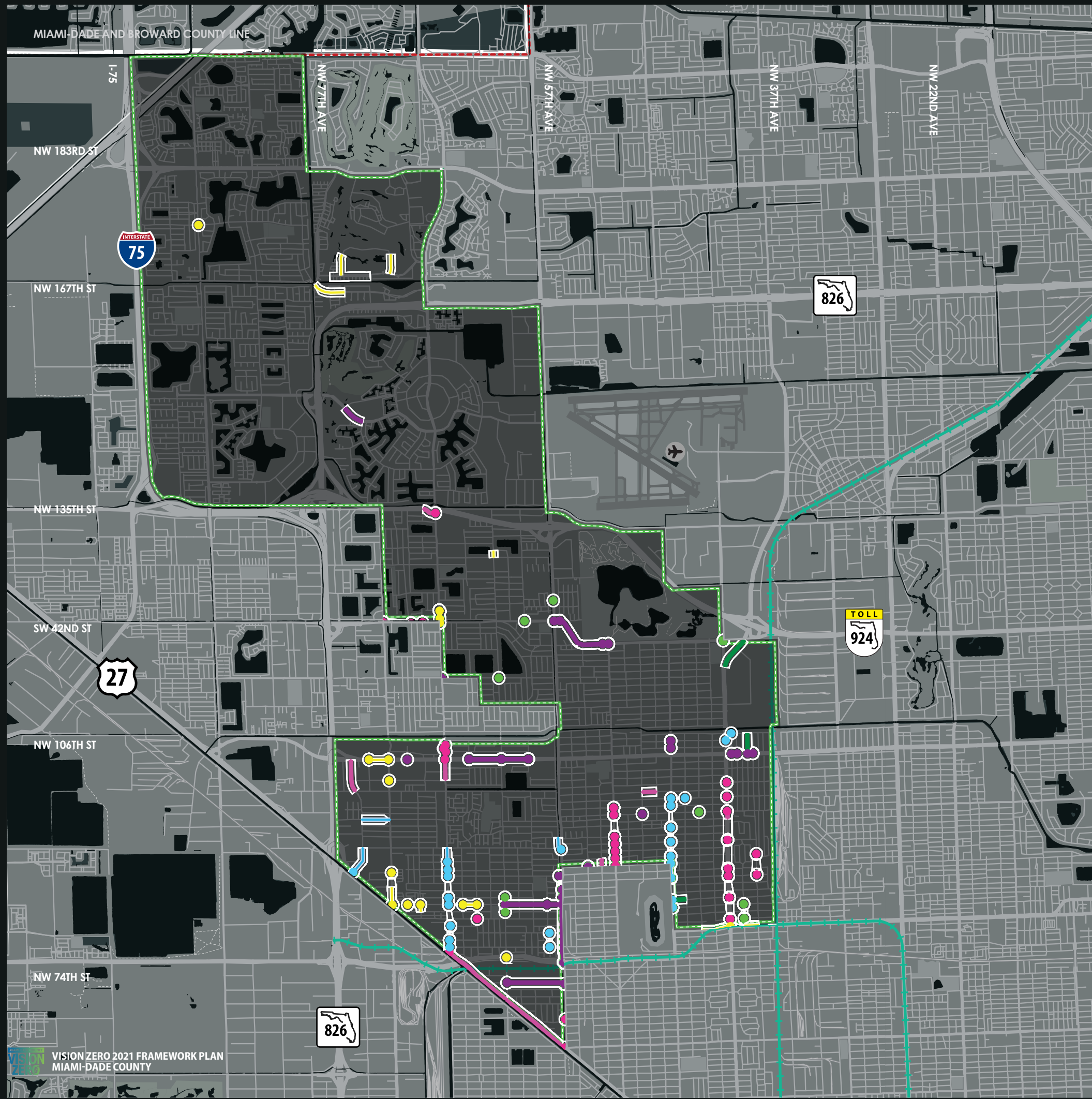
## COMMISSION DISTRICT 6 - PRIORITY PROJECTS

COUNTY ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	Fontainebleau Blvd & NW Park Blvd	NW 87th Ave & NW Park Blvd
	NW 8th St & NW 84th Ave	NW 8th St & NW 82nd Ave
	SW 76th Ave & SW 2nd St	
	SW 67th Ave & SW 29th St	
	NW 57th Ave & NW 36th St	3401 NW 57th Ave, 33122
YEAR 2	SW 23rd St & SW 75th Ave	SW 23rd St & SW 72nd Ave
	SW 75th Ave & SW 12th St	
	SW 24th St & SW 75th Ave*(non-linear segment)	SW 24th St & SW 70th Ct*
	SW 75th Ave & SW 22nd St	
	SW 67th Ave & SW 39th St	SW 65th Ave & SW 39th St
YEAR 3	SW 62nd Ave & SW 24th St	SW 61st Ave & SW 24th St
	Perimeter Dr & NW 59th Ave	
YEAR 4		
YEAR 5		

MUNICIPAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	E 11th Ave & NW 79th St	E 11th Ave & E 24th St
	E 1st Ave & E 3rd St	
	E 10th Ave & E 17th St	E 17th St & E 11th Ave
	E 10th Ave & E 24th St	
	E 6th Ave & E 21st St	
YEAR 2	E 3rd Ave & E 16th St	
	W 2nd Ave & W 8th St	W 2nd Ave & W 7th St
	Palm Ave & W 13th St	Palm Ave & E 12th St
	Palm Ave & W 32nd St	E 4th Ave & E 32nd St
	NW 38th Ct & NW 2nd St	
YEAR 3	E 4th Ave & E 2nd St	
	Granada Blvd & Algaringo Ave	SW 40th St & Granada Blvd
	E 4th Ave & E 43rd St	E 4th Ave & E 28th St
	SW 71st Ave & SW 4th St	
	Ponce de Leon Blvd & Andalusia Ave	
YEAR 4	W 2nd Ave & W 23rd St	
	E 4th Ave & E 18th St	E 4th Ave & E 15th St
	Ponce de Leon Blvd & Menores Ave	Ponce de Leon Blvd & Alhambra Cir
	W 1st Ave & W 24th St	
	W 2nd Ave & W 34th St	W 2nd Ave & W 32nd St
YEAR 5	W 2nd Ave & W 18th St	W 1st Ave & W 18th St
	SW 49th Ave & SW 6th St	
	W 8th Ave & W 29th St	W 2nd Ave & W 29th St
	Cross St & Westward Dr	

MULTI-JURISDICTIONAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	E 1st Ave & E 10th St	E 1st Ave & E 9th St
	E 6th Ave & NW 79th St	NW 79th St & E 10th Ave
	SW 67th Ave & SW 24th St	
	W 3rd Ave & W 9th St	W 1st Ave & W 9th St
	W 1st Ave & W 21st St	Curtiss Dr & E 21st St
YEAR 2	NW 72nd Ave & NW 3rd St	
	SE 8th Ave & US Hwy 27	US Hwy 27 & SE 9th Ave
	W Flagler St & NW 37th Ave	W Flagler St & SW 27th Ave
	NW 72nd Ave & W Flagler St	NW 67th Ave & W Flagler St
	SW 39th Ave & SW 8th St	
YEAR 3	SW 87th Ave & SW 4th St	
	NW 42nd Ave & NW 11th St	SW 42nd Ave & SW 2nd St
	Palm Ave & W 42nd St	Palm Ave & W 21st St
	SW 8th St & SW 70th Ave	SW 67th Ave & SW 8th St
	N Red Rd & W 13th St	
YEAR 4	W 12th Ave & S Okeechobee Rd	S Okeechobee Rd & N Red Rd
	E 8th Ave & E 45th St	NW 79th St & E 8th Ave
	NW North River Dr & NW 36th St	
	E 8th Ave & E 21st St	
	E 8th Ave & Hialeah Dr	NW 37th Ave & NW 54th St
YEAR 5	E 9th St & E 7th Ave	E 8th Ave & E 9th St
	W 4th Ave & W 21st St, W 4th Ave & W 33rd St * (non-linear segment)	W 3rd Ave & W 21st St* (non-linear segment)
	W 8th Ave & W 18th St	W 18th St & N Red Rd
	SW 92nd Ave & SW 8th St * (non-linear segment)	W Flagler St & Fontainebleau Blvd* (non-linear segment)



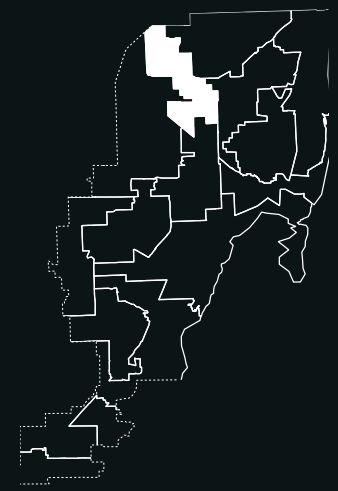


# DISTRICT 13 PRIORITY PROJECTS.

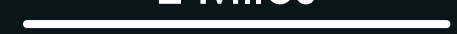
+++ Passenger Rail

Top Five Projects per  
Roadway Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



2 Miles



## COMMISSION DISTRICT 13 - PRIORITY PROJECTS

COUNTY ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	NW 188th Ter & NW 67th Ave	NW 67th Ave & NW 183rd St
	NW 173rd Dr & NW 69th Ct	NW 69th Ct & NW 174th Ter
	NW 172nd Ln & NW 74th Ave* (non-linear segment)	NW 172nd Ln & NW 71st Pl* (non-linear segment)
	NW 169th St & NW 77th Ct	NW 74th Ave & NW 169th St
	NW 87th Ave & NW 178th St	
YEAR 2		
YEAR 3		
YEAR 4		
YEAR 5		

MUNICIPAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	W 20th Ave & W 51st Pl	W 20th Ave & W 49th St
	E 11th Ave & NW 79th St	E 11th Ave & E 24th St
	W 11th Ave & W 29th St	W 10th Ave & W 29th St
	W 16th Ave & W 46th St	
	W 14th Ave & W 29th St	W 14th Ave & W 28th St
YEAR 2	W 78th St & W 8th Ave	W 8th Ave & W 77th St
	E 29th St & E 4th Ave	E 5th Ave & E 29th St
	E 52nd St & E 9th Ln	E 9th Ln & E 49th St
	E 9th Ave & E 28th St	E 9th Ave & E 26th St
	W 8th Ave & W 30th St	W 8th Ave & W 28th St
YEAR 3	E 6th Ave & E 41st St	
	E 52nd St & E 8th Ct	
	E 5th Ave & E 43rd St	
	W 5th Ave & W 25th St	W 5th Ave & W 23rd St
	W 18th Ave & NW 41st St	W 16th Ave & W 41st St
YEAR 4	E 4th Ave & E 43rd St	E 4th Ave & E 28th St
	W 18th Ct & W 49th St	W 18th Ct & W 44th Pl
	E 44th St & E 2nd Ave	E 3rd Ave & E 44th St
	W 10th Ave & W 27th St	
	W 1st Ave & W 35th St	W 1st Ave & W 33rd St
YEAR 5	E 10th Ave & E 35th St	E 10th Ave & E 32nd St
	E 2nd Ave & E 41st St	
	Miami Lakes Dr W & Fairway Dr	Miami Lakeway S & Miami Lakes Dr W
	E 4th Ave & E 51st St	E 4th Ave & E 50th St
	W 8th Ave & W 29th St	W 2nd Ave & W 29th St

MULTI-JURISDICTIONAL ROADS		
Priority	From: Nearest Intersection	To: Farthest Intersection
YEAR 1	W 8th Ave & Hialeah Expy	
	W 16th Ave & W 33rd Pl	W 29th St & S Okeechobee Rd
	W 17th Ct & W 49th St	W 16th Ave & W 49th St
	E 6th Ave & NW 79th St	NW 79th St & E 10th Ave
	N Red Rd & W 71st St	
YEAR 2	W 6th Ave & W 68th St	
	W 12th Ave & W 69th St	W 12th Ave & W 68th St
	Le Jeune Douglas Expy & E 8th Ave	Le Jeune Douglas Expy & E 65th St
	W 8th Ave & W 60th St	
	W 4th Ave & W 38th Pl, W 4th Ave & W 37th St * (non-linear segment)	N Red Rd & W 36th Ter* (non-linear segment)
YEAR 3	W 12th Ave & W 37th St	W 26th St & W 12th Ave
	E 8th Ave & E 51st St	
	W 12th Ave & S Okeechobee Rd	S Okeechobee Rd & N Red Rd
	E 8th Ave & E 45th St	NW 79th St & E 8th Ave
	W 84th St & W 13th Ave	NW 67th Ave & W 84th St
YEAR 4	W 4th Ave & W 21st St, W 4th Ave & W 33rd St * (non-linear segment)	W 3rd Ave & W 21st St* (non-linear segment)
	S Okeechobee Rd & W 18th Ave	W 37th St & W 18th Ave
	E 8th Ct & E 49th St	E 10th Ave & E 49th St
	W 68th St & N Red Rd	Palm Ave & E 65th St
	W 14th Ln & W 49th St	
YEAR 5	W 8th Ave & W 18th St	W 18th St & N Red Rd
	W 10th Ave & W 49th St	W 49th St & W 6th Ave
	W 50th Pl & W 12th Ave	W 49th St & W 12th Ave







## Continuously Educate System Designers and Contributing Staff to Reduce Crash-Risk for Vulnerable Users

**TACTIC: Provide refresher training for system designers on safe systems model and the need for design flexibility.**

A paradigm shift through consensus among system designers can be built when designers understand the goals of Vision Zero and the rationale behind exercising flexibility from conventional standards. Continuous reinforcement through training and workshops should include multi-jurisdictional entities.

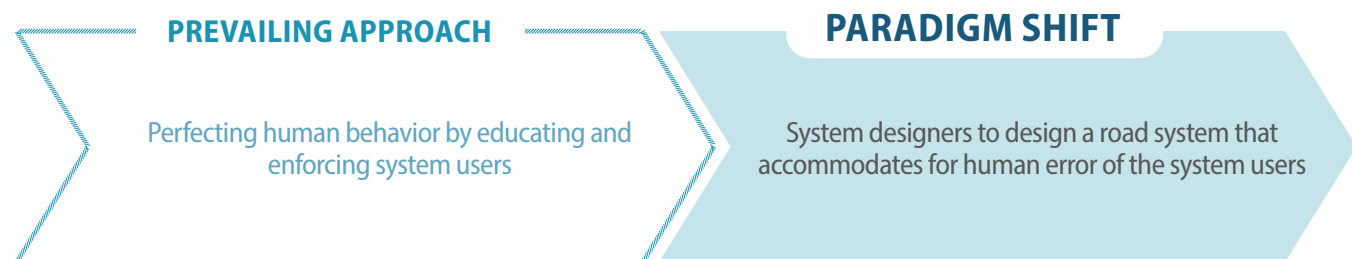
Continuous reinforcement through trainings and embedding the Vision Zero framework into the planning, project development and implementation process can ease the transition of the paradigm shift. Training can be personalized for the County or through curated webinars from national entities such as the FHWA, National Association of City Transportation Officials (NACTO), and others. An essential part of the paradigm shift is removing the lingering perception among some designers that requesting a design exception is an immediate barrier to project development. Even after conducting training, there may be a disconnect between staff acceptance and understanding the Vision Zero framework and carrying out the day-to-day implementation. Vision Zero is a paradigm shift that requires a continuous improvement process over an extended period of time.

**TACTIC: New employee on-boarding on the Vision Zero approach.**

Newly hired employees may not be aware of the County's goal towards Vision Zero or its framework. Additionally, when existing staff retire or leave, the institutional knowledge associated with the paradigm shift may be lost. Therefore, it is important to introduce and provide training on Vision Zero during the new employee on-boarding process.

**TACTIC: System designers to participate with other Vision Zero communities and agencies to share knowledge and lessons-learned.** Also, work towards Vision Zero Network recognition for Miami-Dade County and continue the momentum.

As the County begins the paradigm shift, Vision Zero practitioners' networks can provide knowledge and support from lessons-learned. Studying success stories from other cities can provide the encouragement and support to pilot new strategies and initiatives. Also, celebrating and recognizing small victories can be critical to sustaining the momentum and creating a sense of pride among the system designers and contributing staff.



### GUIDING VALUES ALIGNMENT:

**Collaboration, Brave-Direction using Sensitivity**



- » [Strategies to Coordinate Zero Deaths Efforts for State and Local Agencies, FHWA](#)
- » [Speed Management, FDOT Design Manual](#)





## Create a Sense of Urgency among System Users to Influence Behavior Change

**TACTIC:** Develop a public campaign to create a sense of urgency on achieving Vision Zero. Messaging Vision Zero for the public is a foundational element to raising awareness.

To support the development of Vision Zero, a public campaign and messaging strategy was developed with the County marketing staff. The goal of the public campaign is to change how people behave – not what they think or how aware they are about an issue – to reduce their speed while driving. The strategy for this campaign is to incorporate designs and messaging that encourage people to think differently and evoke an emotional response. This campaign should reflect an understanding of the barriers to behavior change (e.g. drivers may be running late or driving distracted) as a center point to the necessary changes to make a difference.

**Brand Statement.** Vision Zero is Miami-Dade County’s commitment to reduce all road fatalities and severe injuries to zero, while increasing safe, equitable, and healthy mobility for all.

The campaign background is focused on the premise that fatal and severe injuries are preventable. The public campaign is intended to raise awareness of the issue of traffic safety and its impact on our community, particularly the most vulnerable-users and people using vulnerable-modes. Speed is the primary contributor to road fatalities and should be the focus of this campaign. Yielding to pedestrians in the public right-of-way is another key priority.

- Create a sense of urgency to address traffic safety in Miami-Dade County. This is a matter of life and death.
- Engage individuals with a sense of personal responsibility to be a part of the solution.
- Promote the message that streets are for people and should be safe for all road users, no matter how they travel.

**Primary Messaging.** Develop a single campaign slogan to be incorporated into all media. There are two key messages for this campaign: slow down because speed kills and stop for pedestrians. Strong visuals and even personal narratives could be included in this, depending on the media channel. Key challenges to address are-

- Changing behaviors is difficult and people do not want to be “told” what to do.
- Multiple languages and cultural differences may require different messaging strategies.
- Use the term “crashes” instead of “accidents” to indicate that it is preventable.

The tone of the message must convey a strong sense of urgency through an emotional appeal, capture attention through provocative visuals and messages, and humanize the issue-this is about people losing their lives. Potential messages for outreach are:

- Slow down, Miami. (add % that year)% of people killed in crashes are pedestrians.
- Don’t rush it, Miami. Speed kills.
- One second can change lives forever. Slow down, Miami.
- Crashes are not accidents. Slow down, Miami.
- STOP. Just stop, Miami. Yield to pedestrians.
- People first. Your turn is next. Stop for pedestrians, Miami.

### Target Audiences.

- **Internal:** This entails looking to appeal to county staff across all departments, particularly those staff who drive as part of their job responsibilities.
- **External:** Drivers are the primary external audience. While there are other road users, they are more vulnerable and tend to be most adversely affected by crashes.



**Communication Channels.**

- **Phase one (Low-Cost Media).** Online only (email, websites, YouTube)
- **Phase two (Future Budgets)**
  - Outdoor media such as billboards, transit stops, bus wraps, and other advertising in the public right-of-way. Additional options might include banners for buildings, yard signs, or other signage on private property visible to the public.
  - Recognizing that these campaigns are more expensive, it is recommended that Miami-Dade County partner with other organizations who could support outreach on Vision Zero such as: insurance companies; automobile retailers/dealers; other mobility providers; large employers; etc.



**Provide Clear Transparent Communication to Empower Action**

**TACTIC : Develop a dedicated website with a public dashboard and open platform for data accessibility.** A public dashboard with maps and data will improve transparency and equip members of the public with key information related to safety and performance indicators.

A public-facing crash database with tools to increase data accessibility and enable data visualization should be developed. The public dashboard would show both data related to fatalities and severe injury traffic crashes along with the high injury network with planned and completed safety projects. The dashboard would also track the identified Vision Zero program key performance indicators. Performance indicators that are not tracked are not often improved. The dashboard will equip staff, elected officials, and the public with the knowledge of the successes and needed improvements to achieve Vision Zero.

Open data platforms enable the public to provide input into areas of safety concern, supplementing data already being collected by Miami-Dade County and improving overall data quality and accuracy. Platforms with internal and open components provide robust tools for analysis, while enabling the public to contribute to the agencies’ data sets and allowing the public to conduct their own analyses. Summarizing the results of a data crash analysis must be done in a way that is meaningful so that it can contribute to developing interim goals and targets that will drive the performance and implementation of the Vision Zero plan.

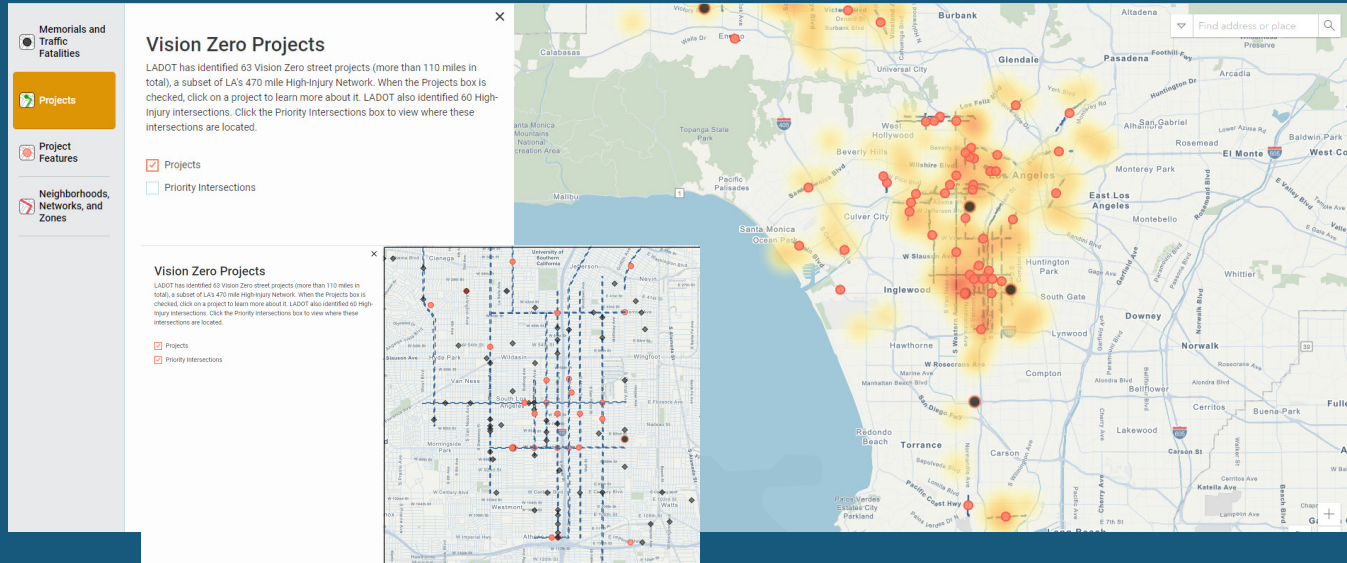


**GUIDING VALUES ALIGNMENT:**  
**Clear and Transparent Communication, Data-Driven Decisions**

- » [Communication Strategies for Vision Zero, Vision Zero Network](#)
- » [Florida’s Pedestrian and Bicycle Focused Initiative, Florida Department of Transportation \(FDOT\)](#)

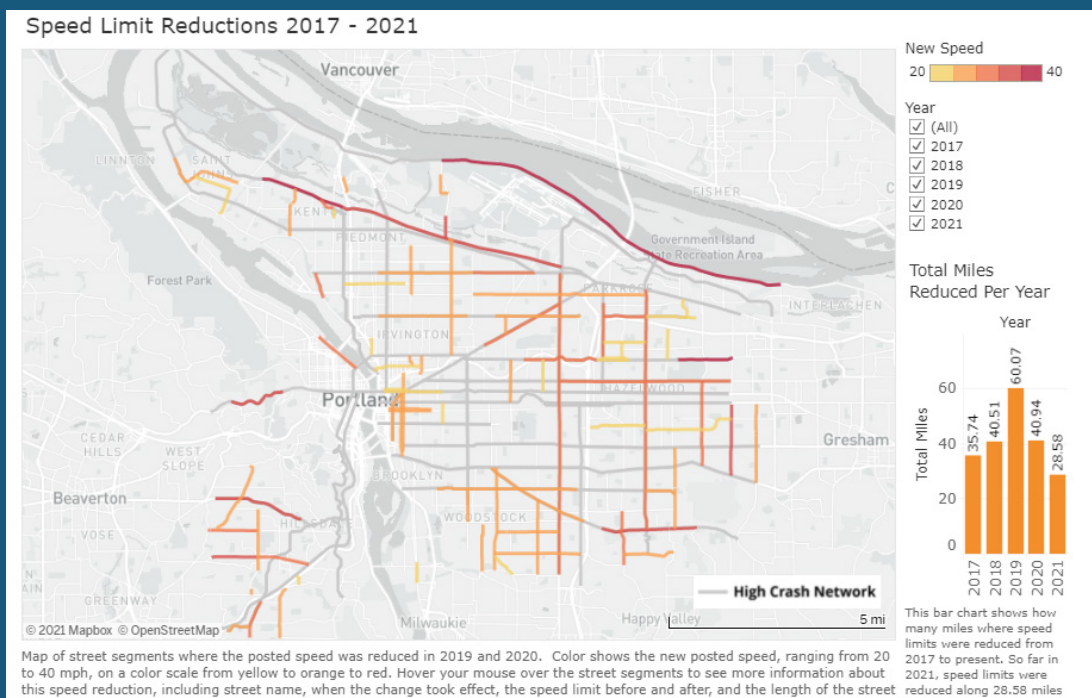


# VISION ZERO WEBSITE WITH TRANSPARENT COMMUNICATION ON PLANNED INITIATIVES AND PROJECTS



Sources: Vision Zero Map, LA DOT . <https://ladotlivablestreets.org/programs/vision-zero/maps>

# PUBLIC VISION ZERO DASHBOARD WITH VISUALIZATION OF CRASH DATA FOR SYSTEM USERS



Sources: Vision Zero Dashboard, Portland Bureau of Transportation. [https://public.tableau.com/app/profile/portland.bureau.of.transportation/viz/VisionZeroDashboard\\_16179023789280/VisionZeroDashboard\\_1](https://public.tableau.com/app/profile/portland.bureau.of.transportation/viz/VisionZeroDashboard_16179023789280/VisionZeroDashboard_1)





## Expand Understanding using a Complete Crash Dataset

Crash data for the analysis documented in this report is based only on police reports. These reports do not accurately report crashes for people walking or biking and do not yet have a classification to input crashes related to micro-mobility and other emerging mobility solutions. Police tend to visit mainly crash sites where a car is involved, regardless of the outcome in terms of fatalities or injuries. Crashes with only vulnerable road users can be very severe or fatal and are more likely to be reported through hospitals. Communities of color and low-income communities usually have low police reporting rates, leading to under-reporting of crashes and lack of focus on improving safety for these historically disinvested communities.

According to the report *Getting to Zero-Alcohol-Impaired Driving Fatalities: A Comprehensive Approach to a Persistent Problem*, by the National Academy of Science, comparing police and hospital reports shows that less than 2% of single-bicycle crashes reported by the hospitals also are reported by the police. The reported crashes are matched automatically through an algorithm based on person identification number, report time, and crash location. Using both data sources will help decision-makers make better decisions on where actions are needed with a more comprehensive view. In Sweden, where all hospital and police records related to injuries in the public right-of-way are combined into the same data system called STRADA, 90% of bicycle and pedestrian injuries and deaths were found to be underreported in the police report.

**TACTIC: Future Miami-Dade County transportation-related injury crash analyses must include data from hospital trauma records and transit safety records in addition to the police incident records.**

Miami-Dade County can utilize the State of Florida's epidemiological data collected as part of the Health Insurance Portability and Accountability Act (HIPAA) using the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). This data is anonymized and categorized into very specific categories, which allows comparisons between police crash data and epidemiological/hospital crash data.

The STRADA system in Sweden is notable for its ability to interface with a variety of stakeholders. The system contains three main applications: crash registration for police, a similar crash registration function for hospitals, and one for planners, engineers, and others using the data for statistical and planning purposes. The applications have been developed over time and several new editions have been launched.

In the U.S., the City of San Francisco (SF) includes data from the Office of the San Francisco Chief Medical Examiner and San Francisco Police Department (SFPD) Reports. The transportation-related crash data includes SFPD Collision Data, SF General Hospital Trauma Registry/Emergency Department data, Medical Examiner's Office, San Francisco Municipal Transportation Agency (SFMTA) Transit SAFE data, and SF Emergency Medical Services.

### STRADA DATABASE DEPICTING FATAL AND SEVERE INJURIES IN GOTHENBURG, SWEDEN

Red represents hospital records and blue represents police records.





## Establish a Vision-Zero Program with Recurring Funding

**TACTIC:** Establish and fund a 5-Year Vision Zero program to implement identified Countywide priority projects, with recurring yearly funding. Coordinate and garner support from the County Commissioners to prioritize funding for safety projects and policies.

**TACTIC:** Collaborate with other County departments to identify opportunities to implement quick-build safety solutions within the identified high injury network.

- » Consider opportunities to incorporate quick-build safety projects at the same time as pavement marking and signage improvements or other improvements, such as proposed utility infrastructure projects that require milling and resurfacing after construction.
- » Collaborate with transportation and transit agencies, including FDOT and municipalities within Miami-Dade County, to review traffic signal timings of intersections identified as high-injury locations.
- » Identify and prioritize opportunities for low-cost safety improvements included in the Vision Zero engineering toolbox.

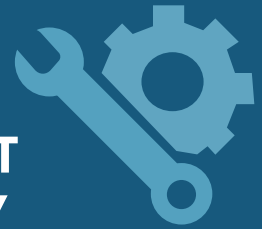


## Integrate Design Flexibility during Roadway Engineering Project Phase

A systemic shift in the everyday activities, processes, procedures, and decision-making guidance used by system designers and supporting staff is required. Systemic changes are required, in combination with, the structural and strategic changes led by the leadership recommended in the previous sections.

### NATIONAL, STATE GUIDANCE TO INTEGRATE FLEXIBLE DESIGN IN PROJECT DELIVERY FOR SYSTEMIC SHIFT





## ADDITIONAL TOOLS DEVELOPED TO SUPPORT SYSTEMIC SHIFT DURING PROJECT DELIVERY

The tools identified in Miami-Dade County's blueprint are intended to support the implementation strategies identified through data analysis and stakeholder engagement. These tools are:

**ENGINEERING COUNTERMEASURES** to address common collision types using Crash Modification Factors (CMFs). Crash countermeasures involving people walking, people biking and using other micro-mobility were developed as guidance for system designers to integrate during the planning and design phase.

**INFRASTRUCTURE CONSIDERATIONS FOR SAFE ACCESS TO TRANSIT** to address infrastructure needs for supporting safe multi-modal access. This tool was developed to help system designers plan for safe connections to and from bus stops.

**AN ENGAGEMENT FRAMEWORK** was developed with Miami-Dade County Communications to assist with the initial phase of Vision Zero outreach campaign.

**PROJECT EVALUATION METRICS** were developed to help gauge the outcomes of the safety projects, so design or policies can be re-calibrated to achieve the project goal of zero fatalities.

**'HOW-TO' IMPLEMENTATION USER GUIDE** was developed to assist system designers with assembling the tools using an high-crash area as an example.





## Deliberately Integrate Crash Countermeasures through Road Design, Maintenance, and Operations

Crash countermeasures - or simply countermeasures - are defined in this report as a change in a roadway’s geometry, operations, signage and pavement markings, or access management to achieve safe mobility outcomes.

**TACTIC : Deliberately integrate crash countermeasures within the various phases of project delivery.** Utilize the flexible guidance and other design tools developed within this report through the various phases from project development, planning, and engineering to implementation and maintenance.

Countermeasures begin with policies set by County leadership and continue with system designers during the planning, design, operations and maintenance of the road infrastructure. Engineering countermeasures provide guidance for system designers to design with safety as a priority and eliminate fatalities and severe injury crashes. These countermeasures can be integrated during the design phase or retrofitted along existing roadways. Countermeasures were developed using Crash Modification Factors (CMFs) proven to prevent crashes and identified by common collision types of travel modes -people walking and people biking.

Crash Modification Factors (CMF) are a research-based baseline to quantify the expected effectiveness of a countermeasure. A CMF less than 1.0 indicates the potential to reduce crashes. The FHWA CMF Clearinghouse is a web-based database of CMFs with supporting documentation. System designers should consider that crashes involving people biking are relatively rare events compared to crashes involving people driving, and few data sources are available for cyclist exposure data, making the development of CMFs for bicycle safety treatments difficult. Resources and additional information on countermeasures and CMFs are listed below.



- » [Crash Modification Factors Clearinghouse](#)
- » [Safe Transportation for Every Pedestrian \(STEP\) Resources, FHWA](#)
- » [Pedestrian and Bicycle Information Center Webinars](#)



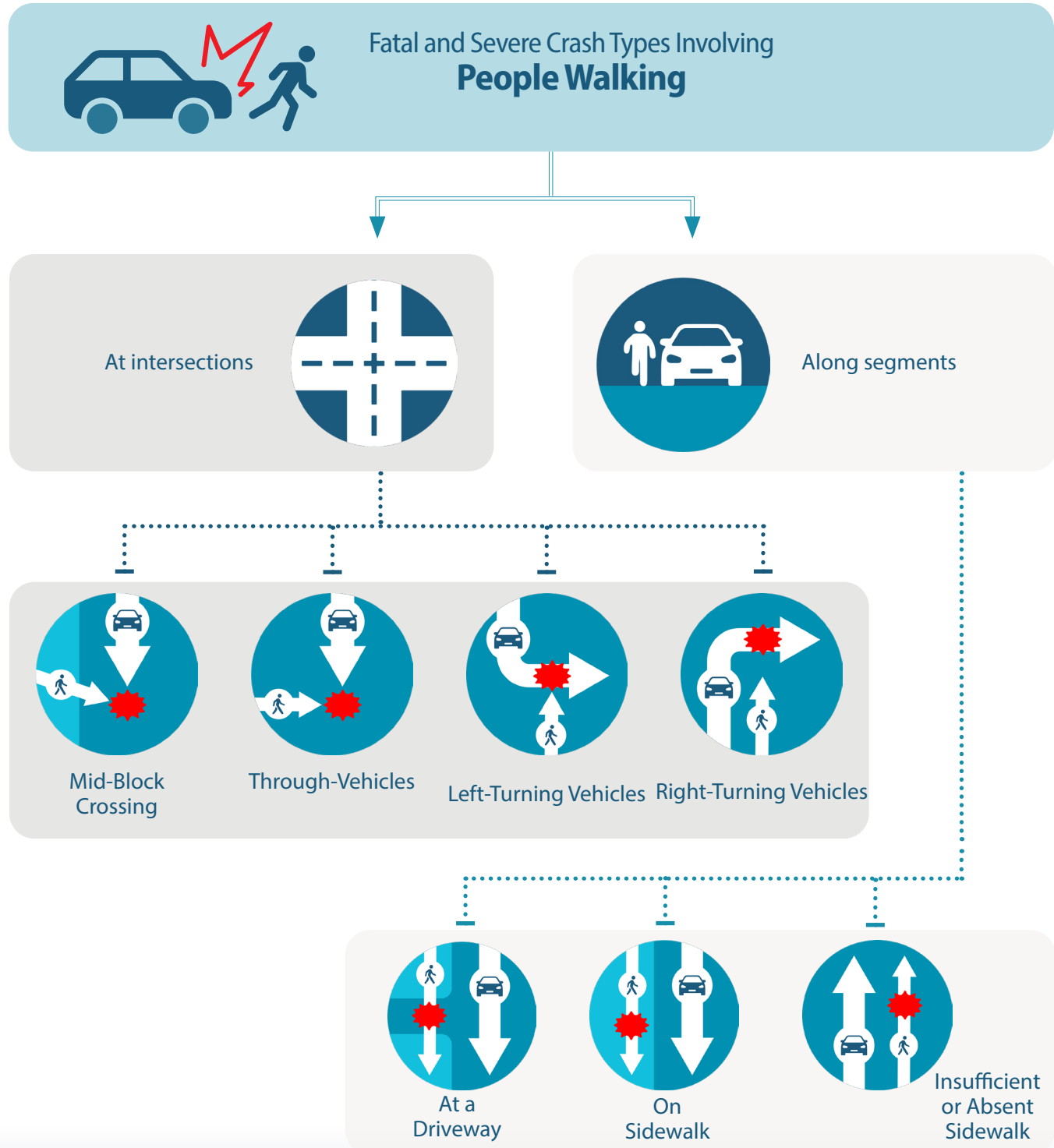
- » [Pedestrian Safety Countermeasures, FHWA](#)
- » [Leading Pedestrian Intervals \(LPIs\), FHWA](#)
- » [Rapid Flashing Beacons \(RRFB\), FHWA](#)
- » [Road Diets, FHWA](#)
- » [Pedestrian Refuge Islands, FHWA](#)
- » [Raised Crosswalk, FHWA](#)
- » [Crosswalk Visibility Enhancements, FHWA](#)





## Priority #1 - People Walking

Safer design accommodates the infrastructure needs of all the roadway users. The engineering countermeasures provide guidance when designing with safety as a priority and can either be retrofitted or incorporated during the design phase. Engineering design countermeasures were identified using common collision types involving people walking using Crash Modification Factors (CMFs) that have been proven to prevent crashes, and they are indicated on the following pages.





## Priority #1- People Accessing Transit

A transit travel shed is typically the distance a person is willing to travel to reach a transit stop, as illustrated in the next page. Typically, the travel shed to a local bus stop is a ¼ mile, a rail station is a ½ mile to 1 mile and 1 mile for a park-and-ride station. Safe infrastructure addressing the needs of the people walking, biking, using micro-mobility within the travel shed, should be prioritized.

Guidance to plan and design safer infrastructure and operations, which provides system designers criteria that supports safe access for people traveling to and from bus stops, is provided in the following pages.

### Adjusting Bus Routes

The common crash types are adjacent to the bus stop, often at the nearest intersection based on the bus stop placement location, as illustrated in the following page. The most common crash type for:

- » farside bus stop location are the right-turning vehicles towards the bus stop (at the immediate intersection).
- » nearside bus stop location are left-turning and right-turning vehicle moving away from the bus stop (at adjacent intersections).
- » mid-block bus stop are mid-block crossings across the bus stop.

Therefore, during bus route planning, the bus stop placement must be considered to minimize transit vehicle conflict with those access the bus stops. When planning bus routes and stop locations, include the following:

- » **Far-side bus stop: ensure that the bus does not make a right-turn ahead of the bus stop.**
- » **Near-side bus stop: ensure that the bus does not make a right-turn or left-turn after the bus stop, and the bus continues straight across the intersection**

The below recommendations supplement the guidance for transit travel sheds.

### Modifications

- » Ensure that sidewalks have ample space for people walking to bus stops and the adjacent area. If there are no dedicated bike facilities near the bus stop, consider that the sidewalk may be used by people biking. Also, ensure an adequate number of marked crossings that are compliant with the American with Disabilities Act (ADA).
- » Consider that a small turning radius reduces the turning speed of the vehicle while ensuring access to trucks and emergency vehicles.
- » Consider bus-boarding islands with marked pedestrian crossings where bike facilities exist along bus routes.
- » Identify bike facilities on arterials and collector roadways for cyclists and electric scooters.

### Bus Stop Amenities

- » Ensure better coordination between bus routes to facilitate safe transfers.
- » Consider that basic bus stop amenities must include a shelter from the weather, seating, and wayfinding.
- » Consider enhancing transfer stations with additional amenities like real-time bus arrivals, wi-fi hubs, and fare stations.
- » Consider providing bike share, scooter share at or near bus stop or transit station.
- » Provide non-motorized micro-mobility parking or docking facilities at the bus stop/transit station.

### Wayfinding

- » Install wayfinding signage guiding people toward the bus stop.
- » Consider that wayfinding signage include bus schedules and nearby destinations.

### Park-and-ride

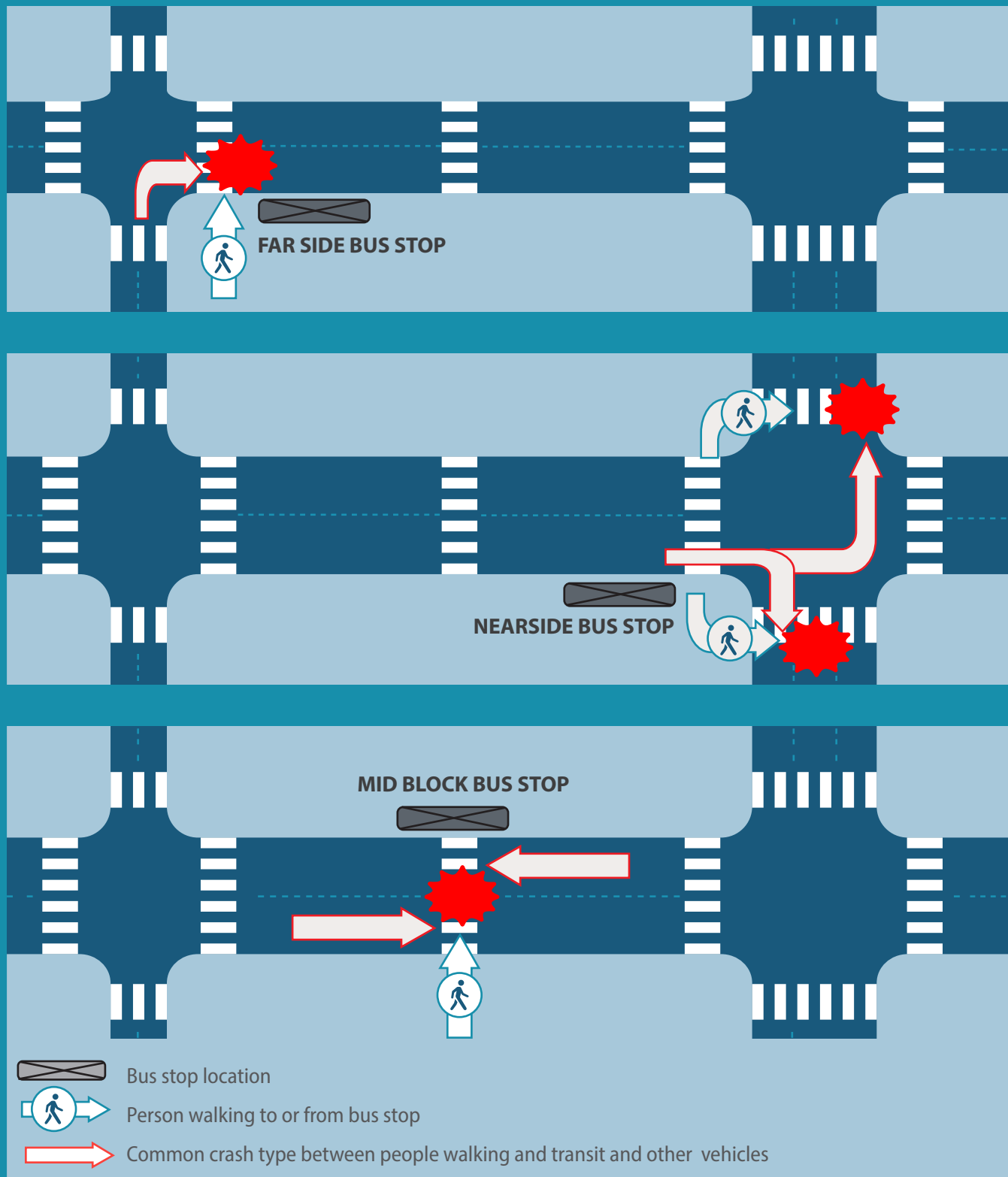
- » Ensure safe access from parking areas to the station.
- » Provide a dedicated drop-off, pick-up area and designated waiting area.



# TRAVEL SHED IS THE AREA A PERSON IS WILLING TO TRAVEL TO AND FROM A TRANSIT STATION/BUS STOP

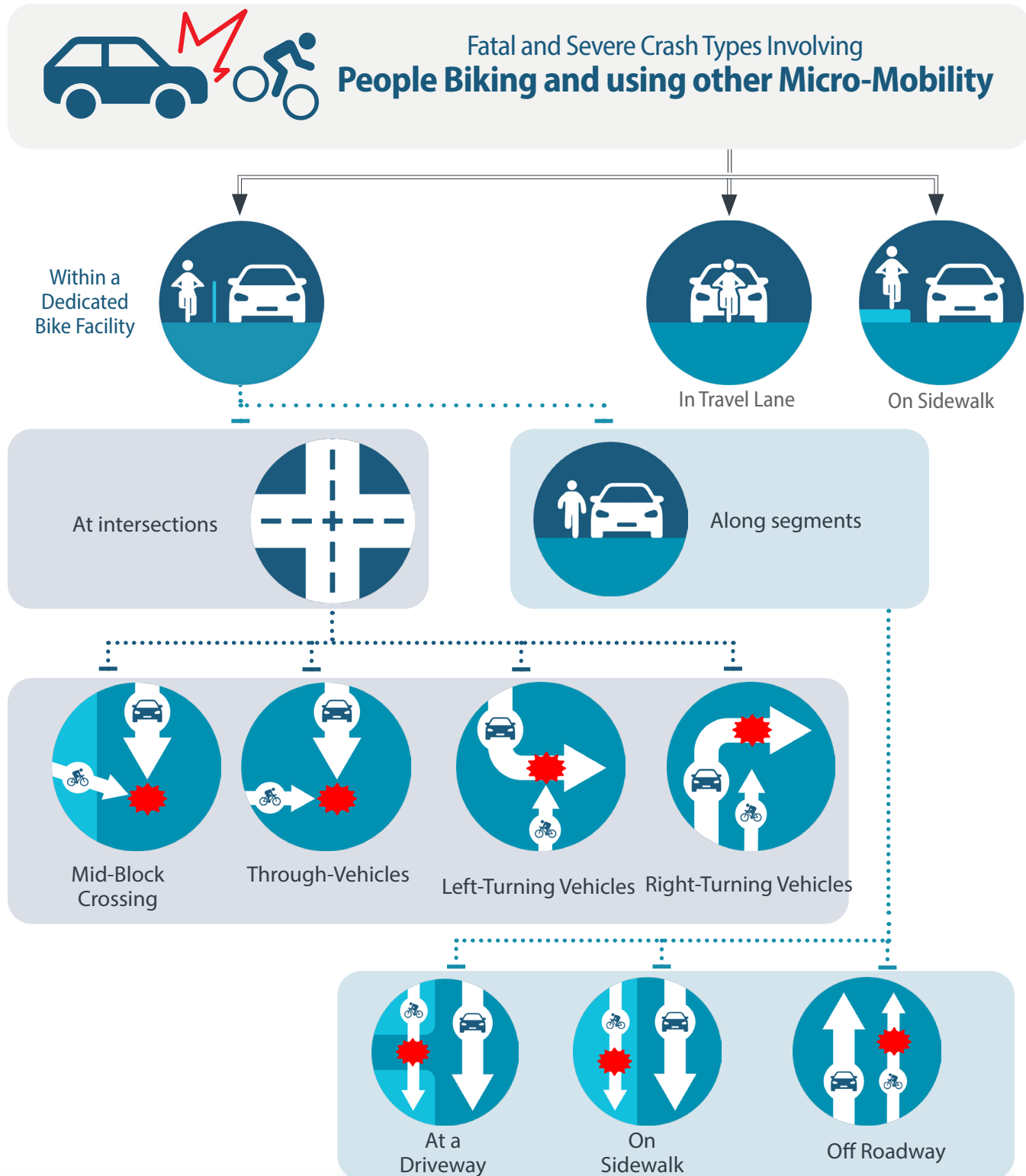


# BUS ROUTING AND ROAD INFRASTRUCTURE MUST CONSIDER COMMON CRASH TYPES BASED ON THE BUS STOP LOCATION



## Priority #2 - People Biking or Using Other Micro-Mobility

Engineering design countermeasures were identified for common collision types involving people biking or using other micro-mobility using Crash Modification Factors (CMFs) that have proven to prevent crashes.



# SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS FOR PEOPLE WALKING REFER 'HOW TO USE' GUIDANCE

**Cost (Unit cost installation. For linear improvements cost estimates is for 1/4 mile):**

θ = No capital cost | \$ = Up to \$25,000 | \$\$ = \$25,000 - \$100,000 | \$\$\$ = \$100,000 - \$500,000 | >\$\$\$ = \$500,000 and higher

**Implementation Time:**

Immediate = 3 months or less | Quick = 3 months to 1 year | Mid-term = 1 - 5 years

COUNTERMEASURES	COST	IMPLEMENTATION TIME	CRASH REDUCTION POTENTIAL	MID-BLOCK CROSSING	THROUGH-VEHICLES AT INTERSECTION	LEFT-TURNING VEHICLES	RIGHT-TURNING VEHICLES	AT A DRIVEWAY	ON SIDEWALK	INSUFFICIENT SIDEWALK
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## A. SIGNALIZATION COUNTERMEASURES

1	Adjust Signal Timings for Additional Pedestrian Crossing Time	θ	Immediate	50%		✓				
2	Relocate / Consolidate Bus Stop	\$	Quick		✓	✓	✓	✓	✓	✓
3	Install Leading Pedestrian Interval (LPI)	θ	Immediate	19%		✓	✓			
4	Add Exclusive Pedestrian Signal Phase / Pedestrian Scramble	θ	Immediate	51%		✓	✓			
5	Convert Permissive or Permissive / Protected to Only Left-Turn Phasing	θ	Immediate	42%		✓				
6	Add Automatic Pedestrian Signal Phase (remove activation button)	\$	Quick		✓	✓	✓			
7	Add Right-Turn Signal / Eliminate Right-Turn on Red	θ-\$	Quick	41%			✓			
8	Install Pedestrian Countdown Signals with Visual/Audio cues	\$\$-\$\$\$	Quick	70%	✓ mid-block crossing	✓	✓			
9	Remove Unwarranted Vehicle Signals (and replace with appropriate controls)	\$\$	Quick	34%		✓	✓			
10	Install Rectangular Rapid Flashing Beacon (RRFB)	\$\$-\$\$\$	Quick	47%	✓					
11	Install Pedestrian Hybrid Beacon (PHB)/ High-Intensity Activated Crosswalk beacon (HAWK)	\$\$-\$\$\$	Quick	55%	✓					

## B. SIGNAGE, PAVEMENT MARKING, OPERATIONAL COUNTERMEASURES

1	Remove Unwarranted STOP Signs (as part of a area-wide connectivity and safety plan or traffic study)	θ	Immediate			✓	✓	✓		
2	Add Advance 'STOP/YIELD HERE FOR PEDESTRIANS' Signage and Pavement Markings (mid-block crossing)	\$	Immediate	25%	✓	✓	✓			
3	Install In-street Sign 'YIELD to Pedestrians' (one sign/gateway)	θ	Immediate	25%	✓	✓				
4	Reduce Posted Speed Limit	\$\$	Quick	6%	✓	✓	✓	✓	✓	✓
5	Improve Sight Distance at Driveways and at Intersections (remove obstructions)	\$	Quick to Mid-term	37%	✓	✓	✓	✓	✓	✓
6	Install High-Visibility Crosswalk	\$	Quick	40%	✓	✓	✓			
7	Install Hard Yellow Centerline	\$\$-\$	Quick			✓	✓			
8	Repurpose / Eliminate travel lane	\$\$	Quick to Mid-term	37%	✓	✓			✓	✓
9	Improve crosswalk / Intersection lighting	\$\$	Quick	44%	✓	✓	✓	✓	✓	✓
10	Create Continuous Illumination (roadway and sidewalk)	\$\$\$	Mid-term	44%	✓	✓	✓	✓	✓	✓



# SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS FOR PEOPLE WALKING REFER 'HOW TO USE' GUIDANCE

**Cost (Unit cost installation. For linear improvements cost estimates is for 1/4 mile):**  
 0 = No capital cost | \$ = Up to \$25,000 | \$\$ = \$25,000 - \$100,000 | \$\$\$ = \$100,000 - \$500,000 | >\$\$\$ = \$500,000 and higher

**Implementation Time:**  
 Immediate = 3 months or less | Quick = 3 months to 1 year | Mid-term = 1 - 5 years

MID-BLOCK CROSSING	THROUGH-VEHICLES AT INTERSECTION	LEFT-TURNING VEHICLES	RIGHT-TURNING VEHICLES	AT A DRIVEWAY	ON SIDEWALK	INSUFFICIENT SIDEWALK
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COUNTERMEASURES	COST	IMPLEMENTATION TIME	CRASH REDUCTION POTENTIAL
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### C. GEOMETRIC COUNTERMEASURES

1	Convert Unsignalized Intersection to 4-way Stop <i>(where warranted)</i>	\$	Quick	61%		✓	✓	✓			
2	Install Raised Crosswalk	\$\$	Quick	45%	✓	✓	✓	✓	✓		
3	Install Refuge Island, Raised Median	\$\$	Quick	31%	✓	✓	✓	✓			
4	Change Curb Radii	\$\$\$	Quick	32%	✓		✓				
5	Install Speed Management / Traffic Calming Strategies - Mini-circles - Chicanes - Speed tables/humps/cushions - Traffic Diversion	\$\$-\$\$\$	Mid-term	32%		✓	✓	✓		✓	✓
6	Install Curb Extensions, Transit Boarding Bulb-Outs	\$\$-	Quick to Mid-term	32%	✓	✓	✓	✓		✓	
7	Install / Widen Sidewalk, ADA Ramp	\$\$-	Quick to Mid-term		✓				✓	✓	✓
8	Install Shared-Use Path	\$\$\$	Mid-term		✓				✓	✓	✓
9	Install Raised Intersection	\$\$\$	Mid-term		✓	✓	✓	✓			
10	Convert Unsignalized Intersection to a Roundabout	>\$\$\$	Mid-term	71%		✓	✓	✓			
11	Convert Signalized Intersection to a Roundabout	>\$\$\$	Mid-term	66%	✓	✓	✓	✓			

### D. ACCESS MANAGEMENT/BARRIER COUNTERMEASURES

1	Restrict On-Street Parking near Crossings, Bus Stops	\$	Immediate	47%	✓	✓	✓	✓	✓		
2	Restrict Driveways near Pedestrian Crossings	0	Mid-Term		✓	✓	✓	✓	✓		
3	Install Buffer Area, Reflective Pavement Markers (RPMs) using quick-build	\$	Quick						✓	✓	✓
4	Consolidate or Relocate Driveways	\$\$	Mid-Term	31%	✓	✓	✓	✓	✓		
5	Limit Access to Driveway, Restrict Turning Movements, Cross Traffic into Driveways and Minor roads	\$\$	Mid-Term	19%	✓	✓	✓	✓	✓		
6	Install Pedestrian Channelization	\$\$	Quick		✓	✓	✓	✓	✓	✓	✓
7	Install Physically Separated Buffer (between drive lanes and walking area)	\$\$\$	Mid-Term						✓	✓	✓
8	Install Elevated / Underground Crossing Opportunities	>\$\$\$	Mid-Term		✓	✓	✓	✓			



# SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS FOR PEOPLE BIKING AND USING MICRO-MOBILITY REFER 'HOW TO USE' GUIDANCE

**Cost (Unit cost installation. For linear improvements cost estimates is for 1/4 mile):**  
 0 = No capital cost | \$ = Up to \$25,000 | \$\$ = \$25,000 - \$100,000 | \$\$\$ = \$100,000 - \$500,000 | >\$\$\$ = \$500,000 and higher

**Implementation Time:**  
 Immediate = 3 months or less | Quick = 3 months to 1 year | Mid-term = 1 - 5 years

	MID-BLOCK	THROUGH-CAR AT INTERSECTION	LEFT-TURNING CAR AT INTERSECTION	RIGHT-TURNING CAR AT INTERSECTION	VERTICAL BARRIER SEPARATED	NON-BARRIER SEPARATED	OFF-ROADWAY	ON SIDEWALK	TRAVEL LANE

COUNTERMEASURES	COST	IMPLEMENTATION TIME	CRASH REDUCTION POTENTIAL
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## A. SIGNALIZATION COUNTERMEASURES

1	Adjust Signal Timing for Additional Bike Crossing Time	0	Immediate	45%	✓	✓	✓	✓				✓ (crossing)
2	Install Bicycle Detection	\$\$	Quick			✓	✓	✓				✓ (crossing)
3	Install bike signal	\$\$	Quick			✓	✓	✓				

## B. SIGNAGE, PAVEMENT MARKING, OPERATIONAL COUNTERMEASURES

1	Add Bike Box / Two-Stage Turning Queue Box	\$	Immediate			✓	✓	✓				
2	Add Bike Crossing / Transition Pavement Marking	\$	Immediate		✓	✓	✓	✓				
3	Install Transition / Green Pavement Markings (driveway, right turn)	\$\$	Immediate	39%	✓	✓	✓	✓				
4	Reduce Posted Speed Limit	\$\$	Quick	6%	✓	✓	✓	✓	✓	✓	✓	✓
5	Install Bike Crossing / combined Pedestrian and Bike Crossing	\$	Quick	19%	✓	✓	✓	✓			✓ (crossing)	✓ (crossing)
6	Add Curb Management (dedicated deliveries pick-up and drop-off areas, rides hare area, others)	\$	Quick						✓	✓		✓ (along road)
7	Change Angled Parking to Parallel / Back-In Angled Parking	\$	Quick						✓	✓		✓ (along road)
8	Reduce Travel Lane Width	\$\$	Quick		✓	✓	✓	✓	✓	✓	✓	✓ (along road)
9	Repurpose / Eliminate Travel Lane	\$\$ to \$\$\$	Quick to Mid-Term	37%	✓	✓	✓	✓	✓	✓	✓	✓
10	Install Bike Facility	\$\$\$ to \$\$\$	Mid-Term	60%		✓	✓	✓			✓ (along road)	✓ (along road)
11	Install Buffered Bike Facility (paint)	\$	Quick						✓	✓		
12	Improve sight distance at driveways and at intersections (remove obstructions)	\$	Quick	37%	✓	✓	✓	✓	✓	✓	✓	✓





# SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS FOR PEOPLE BIKING AND USING MICRO-MOBILITY REFER 'HOW TO USE' GUIDANCE

**Cost (Unit cost installation. For linear improvements cost estimates is for 1/4 mile):**  
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**Implementation Time:**  
 Immediate = 3 months or less | Quick = 3 months to 1 year | Mid-term = 1 - 5 years

COUNTERMEASURES	COST	IMPLEMENTATION TIME	CRASH REDUCTION POTENTIAL	MID-BLOCK	THROUGH-CAR AT INTERSECTION	LEFT-TURNING CAR AT INTERSECTION	RIGHT-TURNING CAR AT INTERSECTION	VERTICAL BARRIER SEPARATED	NON-BARRIER SEPARATED	OFF-ROADWAY	ON SIDEWALK	TRAVEL LANE
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### C. GEOMETRIC COUNTERMEASURES

1	Install Median-Break for Neighborhood Bike Access	\$	Quick		✓						✓ (crossing)	✓ (crossing)
2	Protected Intersection (through permanent curb or temporary delineation)	\$ to \$\$	Quick			✓	✓	✓				
3	Install Curb Extensions, Transit Boarding Bulb-Outs	\$\$-\$	Quick to Mid-Term	32%				✓	✓	✓	✓ (along road)	
4	Install Speed Management / Traffic Calming Strategies - Mini-circles - Chicanes - Speed tables/humps/cushions - Traffic Diversion	\$\$\$	Mid-Term	32%	✓	✓	✓	✓	✓	✓	✓	✓
5	Install Shared-Use Path	>\$\$\$	Mid-Term					✓	✓	✓	✓	✓

### D. ACCESS MANAGEMENT/BARRIER COUNTERMEASURES

1	Restrict On-Street Parking near Crossings, Bus Stops	θ	Immediate	47%	✓	✓	✓	✓			✓ (crossing)	
2	Restrict Driveways near Bike Crossings	θ	Mid-Term		✓		✓	✓			✓ (crossing)	
3	Install Buffer Area, Reflective Pavement Markers (RPMs) using quick-build	\$	Quick						✓	✓		
4	Consolidate / Relocate Driveways (driveways are not intersections)	\$\$	Mid-Term	31%				✓	✓	✓	✓	✓
5	Install Raised Bike Facility	\$\$\$	Mid-Term	73%		✓	✓	✓	✓	✓		
6	Install Physically Separated Buffer (between drive lanes and bike lane)	\$\$\$	Mid-Term						✓	✓		

### E. OTHER SUPPORTIVE IMPROVEMENTS

	Launch education combined with Enforcement	\$ to \$\$\$	Immediate		✓	✓	✓	✓	✓	✓	✓	✓
	Maintenance	\$	Quick		✓	✓	✓	✓	✓	✓	✓	✓
	Streetscaping Elements	\$\$	Mid-Term		✓	✓	✓	✓	✓	✓	✓	✓

SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS - **CRASH MODIFICATIONS FACTORS (CMF)** REFER 'HOW TO USE' GUIDANCE

	COUNTERMEASURES	CMF - ALL CRASHES	CMF - PEOPLE WALKING CRASHES	CMF - PEOPLE BIKING CRASHES	CMF ID	NOTES
<b>A. SIGNALIZATION COUNTERMEASURES</b>						
1	Increase cycle length for pedestrian crossing	0.55	0.50		4115, 4116	
2	Modify signal phasing (implement a leading pedestrian interval)	0.87	0.81		9906	
3	Add exclusive pedestrian phase (pedestrian scramble)	1.10	0.49		4117, 4118	
4	Permit Right turn on red	1.07	1.69	1.69	4579, 4580	CMF for 'Prohibit Right Turn on Red'
5	Convert permissive to protected only left-turn phasing	0.45	1.10	0.69	4144, 9897, 10233	
6	Convert permissive to permissive/protected left-turn phasing	0.58	1.10		4140, 9897	
7	Add pedestrian countdown timers (ADA)	0.91	0.30		8790, 5272	
8	Remove unwarranted signal	0.76	0.82		332, 331	Only valid for one-lane, one-way streets
9	Add Rapid Rectangular Flashing Beacon (at mid-block crossing)	0.93	0.53		9125, 9024	
10	Add pedestrian hybrid beacon	0.71	0.45		2911, 9020	
11	Add new traffic signals when warranted	0.61	1.12		4121, 7848	
<b>B. SIGNAGE, PAVEMENT MARKING, OPERATIONAL COUNTERMEASURES</b>						
1	Add stop bars	0.33			1692	Only applies to angle crashes
2	Add in-street yield sign gateway treatment	0.89	0.75		9018, 9017	CMF for Install Advanced Yield or Stop Markings and Signs
3	Add "Stop Here for Pedestrians" signage/markings (mid-block)	0.89	0.75		9018, 9017	CMF for Install Advanced Yield or Stop Markings and Signs
4	Reduce speed limit	0.94			8204	CMF for reducing speed limit by 5 mph. For other reductions, use formula $CMF = EXP(0.013*(X-Y))$ where X = proposed speed limit, Y = existing speed limit
5	Improve lighting	0.92	0.56		5421, 2379	
6	Improve sight distance	0.63			1638	
7	Improve pavement friction (skid treatment with overlay)	0.76			194	
8	Add high-visibility crosswalk (for bike/ped)	0.81	0.60		4124, 4123	
9	Add green colored pavement marking for bicycle conflict areas			0.61	3258	
<b>C. GEOMETRIC COUNTERMEASURES</b>						
1	Tighten curb radii (traffic calming)	0.68			128	CMF for Traffic Calming. CMF for specific treatment is not available
2	Add intersection curb extensions (traffic calming)	0.68			128	CMF for Traffic Calming. CMF for specific treatment is not available
3	Add bus bulb out/floating bus island (traffic calming)	0.68			128	CMF for Traffic Calming. CMF for specific treatment is not available



## SAFER ROADWAY ENGINEERING DESIGN, OPERATIONS - CRASH MODIFICATIONS FACTORS (CMF) REFER 'HOW TO USE' GUIDANCE

	COUNTERMEASURES	CMF - ALL CRASHES	CMF - PEOPLE WALKING CRASHES	CMF - PEOPLE BIKING CRASHES	CMF ID	NOTES
<b>C. GEOMETRIC COUNTERMEASURES</b>						
4	Install sidewalk (to avoid walking along roadway)			0.41	9240	Only valid for 2-lane roads
5	Covert unsignalized intersection (2-way stop) to 4-way stop	0.39			3130	
6	Convert unsignalized intersection (2-way stop) to roundabout	0.29			7868	
7	Convert signalized intersection to roundabout	0.34			4185	
8	Install raised crosswalk	0.64	0.55	0.49	135, 136, 4039	
9	Install raised median	0.81	0.69		7789, 8799	
10	Install refuge islands (with raised median)	0.70	0.69		5044, 8799	
11	Install speed management strategies (traffic calming)	0.68			128	
12	Reduce number of lanes (convert 4-lane undivided road to 2-lane plus turning lane)	0.63			7829	
13	Reduce travel lane width					CMFs correlated to the reduction of roadway width depend on the existing conditions/ environment as well as the usage for the reallocated street width.
14	Install off-street bike facility (shared use path)			0.75	9250	Only valid for 6-lane roads
15	Install protected bike infrastructure			0.27	4098	
16	Install bike lanes	0.73		0.40	7841, 7839	
17	Provide paved shoulder (of at least 4 feet)	0.86		0.76	6762, 8716	CMF for all crashes only valid for urban multi-lane highways 35 - 65 mph. CMF for bike crashes is for adding 4' shoulder where no shoulder existed prior. For other should changes, use formula $CMF = EXP(-0.0681*(X-Y))$ where X = proposed shoulder width, Y = existing shoulder width
18	Install bicycle boulevard			0.37	3092	
<b>D. ACCESS MANAGEMENT</b>						
1	Restrict parking near intersections (to off-street)	0.53			307	
2	Reduce driveway width by 5 feet	0.87				CMF for reducing driveway width by 5'. For other driveway width changes, use formula $CMF = EXP(0.02656*(X-Y))$ where X = proposed driveway width, Y = existing driveway width
3	Reduce number of driveways	0.69			179	Only valid for reducing driveways 24 - 48 per mile to 10 - 24 per mile
4	Restrict driveway access (Install Raised Median)	0.81	0.69		7789, 8799	
5	Prohibit left-turns. Install Right-In/Right-Out at stop-controlled intersection.	0.55			9821	

Source: Crash Modification Factors Clearinghouse. <http://www.cmfclearinghouse.org/index.cfm>

## CONSIDERATIONS FOR SAFE ACCESS TO BUS STOP (MIXED TRAFFIC BUS ROUTE)

### SAFETY COUNTERMEASURES TO REDUCE POTENTIAL VEHICULAR CONFLICTS LIKE TRANSIT AND OTHER VEHICLES

EXISTING CONDITION/S AT OR NEAR THE BUS STOP	EXISTING BUS ROUTE	RECOMMENDED BUS STOP PLACEMENT/ BUS REROUTE	RECOMMENDED SUPPORTING INFRASTRUCTURE NEAR THE BUS STOP
<ul style="list-style-type: none"> <li>Complex intersections with multi-phase signals and/or dual turn lanes</li> <li>The intersection before the stop has transit signal priority treatments</li> <li>Near side bus stop located in the right-turn lane with permitted right-on-red turns</li> <li>Higher proportion of vehicles turning right at the near-side of the intersection</li> </ul>	<ul style="list-style-type: none"> <li>Bus route does not have right turns or left turns immediately before arriving at the bus stop</li> <li>Route or transit stop is part of rapid transit system (BRT/LRT)</li> </ul>	Place bus stop at farside	<ul style="list-style-type: none"> <li>Install large sidewalk waiting area to accommodate people using the sidewalk and transit passengers waiting to board at the intersection. Farside bus stop placement is considered the safest for people crossing since pedestrians cross behind the stopped bus.</li> </ul>
<ul style="list-style-type: none"> <li>High number of right-turning vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Bus route takes a right turn at the intersection after bus stop and the curb radius accommodates buses</li> <li>The route does not include a left-turn after this bus stop. Otherwise, the bus would have to shift lanes to make the left-turn in a very short distance</li> </ul>	Place bus stop at near side	<ul style="list-style-type: none"> <li>Bus driver must watch for pedestrians crossing in front of bus and the view of pedestrians by drivers in adjacent lanes may be blocked by bus.</li> </ul>
<ul style="list-style-type: none"> <li>Passenger destinations are located mid-block</li> <li>Turning radius at intersection is small before and after the bus stop</li> </ul>	<ul style="list-style-type: none"> <li>Bus route makes right or left turn after bus stop</li> </ul>	<ul style="list-style-type: none"> <li>Place bus stop at mid-block placement when the conditions are not conducive for farside and nearside placement</li> </ul>	<ul style="list-style-type: none"> <li>Install mid-block crossing (if destination is across the street, lack of safe crossing at intersection or ADA). Mid-block bus stop provides the potential for larger waiting areas on sidewalk in high-pedestrian area. When dedicated safe infrastructure is not available, people walking and biking will often use travel lanes, roadway shoulders, and driveways.</li> </ul>
<ul style="list-style-type: none"> <li>Bus route is along roadway with on-street parking. Parked vehicles may block boarding and alighting or make it difficult for buses to access stops.</li> <li>Corridor was identified for traffic calming</li> </ul>		<ul style="list-style-type: none"> <li>Create an in-lane stop at farside, nearside or mid-block bus stops</li> </ul>	<ul style="list-style-type: none"> <li>Install bus boarding bulb-out/curb extensions at bus stops provides space for pedestrians to wait and other amenities, such as micro-mobility parking stations. Also, it provides an opportunity to create/insert on-street parking, and/or a landscape area along the length of the sidewalk.</li> <li>Consider that buses may experience delays when reentering traffic. If the curb extension is at a signalized intersection, consider queue-jump.</li> </ul>

### SAFETY COUNTERMEASURES TO REDUCE POTENTIAL NON-VEHICULAR CONFLICTS LIKE PEOPLE WALKING, BIKING, OR USING OTHER MICRO-MOBILITY

<ul style="list-style-type: none"> <li>High number of people (walking or biking) crossing at intersection</li> <li>High-volume boarding and alighting</li> <li>Pedestrian waiting area on the sidewalk is inadequate</li> </ul>		<ul style="list-style-type: none"> <li>Prohibit left-turns on streets with BRT and LRT from the transit lane, permitting them only from an adjacent lane with a dedicated turn phase</li> <li>If bus route turns at the intersection, reroute bus to another intersection with lower pedestrian volumes</li> </ul>	<ul style="list-style-type: none"> <li>Install bus boarding bulb-out/curb extensions at bus stops provides space for pedestrians to wait and other amenities, such as micro-mobility parking stations. Also, it provides an opportunity to create/insert on-street parking, and/or a landscape area along the length of the sidewalk.</li> <li>Prohibit right-turns for all traffic at the adjacent intersection Install a dedicated pedestrian phase, Leading Pedestrian Intervals (LPI) at the adjacent intersection or scramble crossings</li> <li>Implement short signal cycles to reduce overall pedestrian wait times and cross street delay, improving rider access to transit</li> </ul>
<ul style="list-style-type: none"> <li>People crossing at unmarked locations. Reasons can be infrequent crossing opportunities, or a high-pedestrian attractor away from a signalized intersection</li> <li>Pedestrians crossing the street at mid-block bus stop</li> </ul>			<ul style="list-style-type: none"> <li>Install mid-block Crossing (Z-type, pedestrian refuge island)with crossing signage, HAWK or RRFB</li> </ul>
<ul style="list-style-type: none"> <li>Bus stop along protected/unprotected bike lane (bi-direction or uni-direction cycle track)</li> </ul>		<ul style="list-style-type: none"> <li>Install a bus stop boarding island to position bike facility behind bus stop, install pedestrian crossing with pavement markings</li> <li>If one-way street, locate bus stop on right-side for passenger access and locate bike facility on left side</li> </ul>	<ul style="list-style-type: none"> <li>Bicyclists yielding to pedestrians crossing the bike facility is critical to the safety of all users.</li> <li>Alert bicyclists to the bus stop by raising the boarding/alighting area and using pavement markings and signage. When elevating the boarding area, ensure that the bike lane is at grade before the intersection. Elevated bike facilities at bus stops create level pedestrian access from sidewalk to bus boarding island.</li> </ul>
<ul style="list-style-type: none"> <li>Bus stop along parking-separated bike lane (or right-of-way repurposed along the corridor)</li> </ul>		<ul style="list-style-type: none"> <li>Install side boarding island</li> <li>Consider integrating mid-block crossing with bus boarding island design if high pedestrian crossings at this location</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle signals can enhance the clarity of intersection movements. Consider using bike signals with far-side boarding islands to provide a dedicated bike and pedestrian through phase, especially if high turn volumes or a right-turn pocket is present. Bike signals are also applicable at near-side boarding islands where turns are prohibited and bicycles move concurrently with other through traffic.</li> <li>Require people on bikes to yield to people accessing the island directly from the sidewalk, at high ridership bus stops. Markings, color, and signage must reinforce appropriate yield behavior.</li> </ul>

Refer to image 1,2, next page

Refer to image 1,2, next page

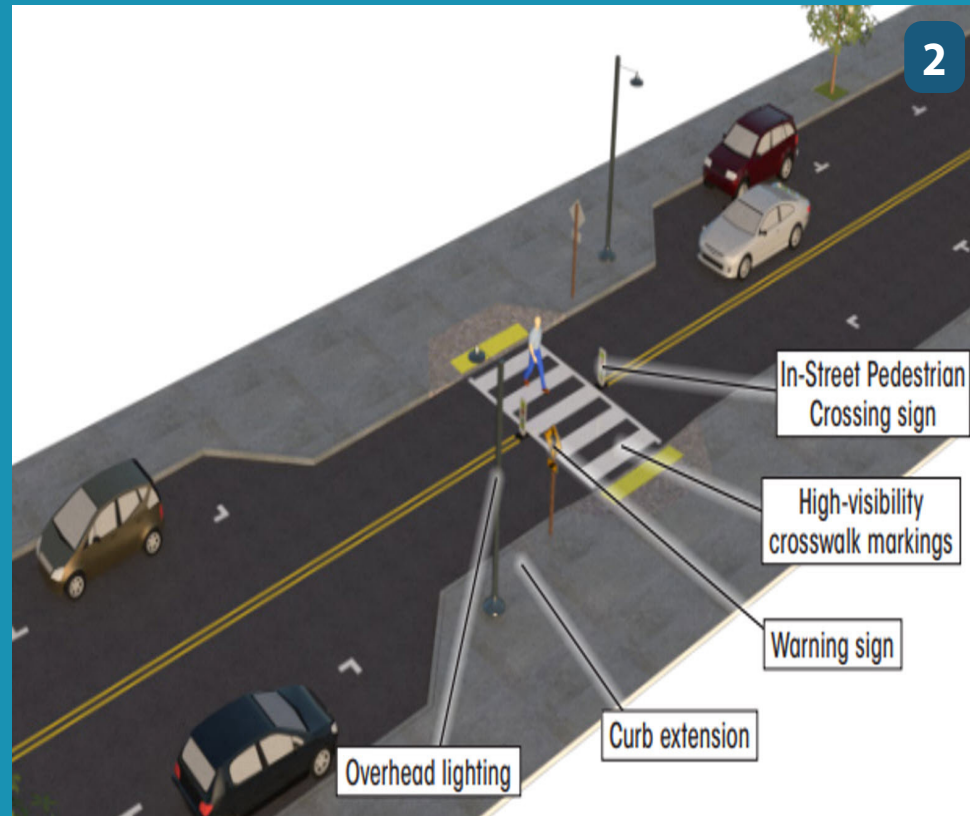
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Refer to image 4, next page



## CONSIDERATIONS FOR SAFE ACCESS TO BUS STOP (MIXED TRAFFIC BUS ROUTE)





## Conduct Meaningful Community Engagement

Community engagement is crucial to the success of safety projects, especially in low-income and communities with a high percentage of minority population. Community engagement increases the efficiency and the public acceptance of the safety.

Safety data and infrastructure data only tells part of the picture in any given community. Crash reports for fatal and severe injury crashes can identify what type of and where crashes are taking place and who may be involved. The crash reports also sometimes indicate contributing circumstances. However, they do not identify why crashes happen, why road users are engaging in the activities they are engaging in, where people are going, and what the challenges are in their community. These critical elements can be better understood by engaging the public.

Members of the local community will likely understand the challenges better than anyone else could in a complex environment and provide insights of challenges that are difficult or impossible to determine through data analysis alone.

The members of the community can also identify what they would prefer or not prefer when design concepts are developed. Because of complex socio-economic factors, user attitudes, and preferences, application of certain treatments may have very different outcomes in different neighborhoods even though they may have similar safety implications. If community engagement is performed successfully, then champions for Vision Zero can be fostered in the community. These individuals, whether they are residents, business owners, advocates, or organizational staff, can ease implementation for the project at hand and promote Vision Zero in a broader sense across the county. This partnership improves trust between the users and the government, and benefits everyone.

**Tactic: Engagement should be conducted throughout the project lifecycle.** Public engagement starts once specific projects have been identified. Discussion on specific project elements should be initiated if these elements were not set during the area or master planning process. After the concept design has been finalized and the project moves to final design, community engagement should continue in an informative capacity—keeping the stakeholders updated on project process and any design changes that have been made.

**Tactic: All roadway users should be involved in the community engagement activities.** Roadway users include anyone who utilizes the street whether they are residents, business owners, employees, property owners, or visitors to the area. Focus on engaging different types of users such as transit users, cyclists and pedestrians, drivers, and freight delivery drivers, and should consider the adjacent socio-economic conditions. Different user groups will all have different needs, and challenges, sometimes the desires of different groups may conflict. Building consensus through public discourse can be a helpful way for different groups to empathize with each other and identify the different challenges or needs that may exist, and help identify priorities.

**Tactic: Plan for engagement to be conducted in a multi-stage, iterative process.** Depending on the complexity of the project, some of the phases may need to be repeated to develop the final recommendations.

» **Community Engagement Plan.** Community engagement plans should integrate tailored outreach strategies to reach underserved community members, along with evaluation metrics of outreach effectiveness. A plan should be developed at the start of the project to determine who the stakeholders are that should be engaged and how they can most effectively be engaged. Demographics should be used to understand the community around the project as well as cultural and language sensitivities. An emphasis should be placed on the safety elements of the project and a clear description of the scope and estimated timeline should be made to set expectations among members of the public. The messaging recommendations from this plan can be utilized as a guide. Safety treatments can be better tailored



to the street context by better understanding the needs and challenges of the specific users. Therefore, community engagement plans should integrate tailored outreach strategies to reach underserved community members, along with evaluation metrics of outreach effectiveness.

- » **Discovery / Data Analysis.** Upon identification of the outreach methods and engagement structure, the overall vision and goals for the project need to be set. The needs and challenges of street users, the types of users and street activities need to be identified in the plan. This phase also involves analysis of available data including engineering and planning data such as crash data, infrastructure data, and demographic data, but should also include anecdotal data from the public gathered through the community engagement exercises. This anecdotal data can be used to supplement or inform interpretations of the traditional data sources. A focus should be made in this phase to identify the most important elements—most severe issues resulting in fatal and severe injury crashes, users most often involved in fatal and severe injury crashes, and potential causation of those crashes. These important elements are often referred to as “emphasis areas.”
- » **Design Development.** After the planning and engineering team thoroughly understands the vision, goals, needs, and challenges of the project, concepts can be developed. Safety improvements should be developed based on engineering and planning best practices including utilizing the countermeasure toolboxes provided in this plan. The design should not be done “by committee” but should be generated by specialists relying on the input from the committees and the public. The concept should attempt to reduce fatal and severe injury crashes of all kinds but should focus on the emphasis areas identified in the Discovery/Data Analysis phase.
  - **Public Feedback** – Once a concept has been developed, this concept should be vetted by the public. The concept can be depicted to the public in written narrative form, concept plans, cross-sections, and renderings. Oftentimes, renderings are the visual tools that are most understood by the broadest audience. The public should be consulted on whether the improvements are desirable to the user groups, whether they will support the proposed elements moving into project implementation, and if there are certain elements that need modification. This phase and the concept development phase may be repeated as necessary on more complex projects.





## Evaluate Performance to Track Progress

**TACTIC : Create performance criteria to track Vision Zero program progress.** Setting performance targets and tracking progress made towards those targets will help set goals and objectives, evaluate effectiveness of programs and strategies, provide feedback on further iterations of safety plans, and communicate with leadership and the public.

The best way to foster accountability is to implement processes that transparently show the public how a plan is being implemented. To improve accountability of the County's Vision Zero program a set of performance criteria should be developed upon adoption of this Vision Zero Implementation Plan. A yearly program evaluation is recommended to track process and make necessary program changes to meet the County's Vision Zero goal.

It should be noted that it may take several years before a trend in safety data can be obtained. Because fatality and severe injury crashes typically represent a small statistical sample size on an individual corridor, absolute crash reduction due to a safety treatment can be hard to determine when looking at a statistical distribution over a short time period. Typically, a minimum of three years of crash data should be obtained before indicating certainty in trends. However, other performance indicators can be obtained in much less time.

**TACTIC: Conduct project before and after studies.** It is also important to analyze the effectiveness of completed safety improvement projects to quantify the benefits of the project and identify future projects that may provide similar benefits, in addition to evaluating the effectiveness of the Vision Zero program.

Before and after performance must be measured when a safety project is implemented. These projects can identify treatments that have been highly successful that may be replicated in other locations. A list of project performance indicators on a project-level basis are included in the following chart.







# TRACK PERFORMANCE BEFORE AND AFTER PROJECT DELIVERY TO SUPPORT SYSTEMIC SHIFT

SAFE MOBILITY	<b>Crashes</b>	Number of crashes (all users)
		Number of deaths
		Number of severe injuries
	<b>Context Sensitive Engineering Design</b>	Number of new marked crossings (at intersections or mid-block), new RRFB
		Linear feet of protected bike infrastructure installed
		Number of driveways/curb cuts along the sidewalk
	<b>Lighting Conditions</b>	Number of pedestrian lights at signalized intersections and at mid-block locations
		Number of crashes after sunlight hours
	<b>Speed Management</b>	Reduction of posted speed limit
		Number of traffic calming features
		Percentage of people driver over the posted speed limit
		Median driving speed compared with posted speed
	<b>User Perception</b> (feedback collected through survey)	Walking on the intersection/street
		Driving down the intersection/street
		Biking on the intersection/street
		Using transit on the intersection/street
Using other mobility options like an electric scooter, ride share on the intersection/street		
EQUITABLE OUTCOMES	<b>Transit</b>	Number of boarding and alighting at transit stops
		Number of new transit stops
	<b>Active Transportation</b>	Number of people biking
		Number of people walking
		Number of people using other micro-mobility
		Number of people driving
	<b>Vulnerable Travel-Mode</b>	Number of users per travel mode (people walking, biking or using other micro-mobility)
		Proportion of fatalities and severe injuries crashes compared to number of users per travel mode
	<b>Vulnerable Area</b>	Proportion of fatalities and severe Injuries crashes within areas identified 'Equity-Priority' compared to areas outside



## HOW-TO USER-GUIDE

The engineering countermeasures provided in this chapter are tools to shift the project delivery towards substantial safety approach using flexible and context sensitive design. These tools used AASHTO's Highway Safety Manual (HSM) methodology, the Safety Performance Functions (SPFs) among other resources. The user-guide also builds on the FHWA's Proven Safety Countermeasures. These resources should be considered for reference when doing safety work in addition to this how-to user-guide.

### Project Delivery Step-by-Step Guidance

The user-guide walks through the recommended steps to conduct road safety at high-injury locations and on all transportation projects.

#### Step 1: Collect Quantitative and Qualitative Data Around Proposed Project Location

**Quantitative Data:** Collect information and data relevant to the location including fatalities and severe injury crashes in the study area, traffic volumes, bicycle and pedestrian usage, transit lines and stop locations, physical infrastructure information, and adjacent land uses. Use the Vision Zero approach and analyze only fatality and severe injury crash data and note that Property Damage Only crash data should not be considered. Crash data for seven to ten years is preferable, but at a minimum the most recent three to five years should be used. Crash data is used to identify safety issues given the relatively small sample size of crashes at individual intersections and segments. Data should also include anecdotal data from stakeholders and the public to be considered in the context of the quantitative data.

**Qualitative Data through Community Engagement:** All safety projects should include public engagement with outreach corresponding to the size of the project. On a small single intersection or single segment project, this may only include engaging a few key stakeholders. On a long corridor study or district-wide study, this would likely entail a full public engagement process. This public engagement process is highlighted in this Framework Plan.

#### Step 2: Identify Safety Issues through Data Analysis, Site-Audit, Community Feedback

**Data Analysis (Qualitative and Quantitative):** Undertake three separate analyses as follows:

- One analysis for all vehicle-vehicle/vehicle-fixed object fatality and severe injury crashes,
- One for all bicycle fatality and severe injury crashes, and
- One for pedestrian fatalities and severe injury crashes.

Analyses should focus on most common fatal/injury crash types, analysis of typical locations of certain crashes, rate of crashes compared to vehicle AADT and/or bicycle/pedestrian usage, and crashes observed near transit stops among other potential activity generators. Safety issues can also be identified through the public engagement process; however, this anecdotal data should be considered in the context of the quantitative data.

**On-Site Safety Audit:** An in-person safety audit is an important step and guidance on the recommended actions during a safety audit are noted in Road Safety Audit Guidelines, FHWA. The safety audit helps the system designer observe behavior at the location and provides a supplementary information to the findings of the data-analysis and community feedback.



» [Road Safety Audit Guidelines, FHWA](#)



### Step 3: Determine Project Extents

Utilize this Implementation Plan and other project prioritization efforts to identify a corridor or neighborhood with an elevated rate of fatality and severe injury crashes. Factors to include in the project prioritization include neighborhood fatality and severe injury crash rates per 100k population, fatality and severe injury crash rates and frequencies on specific corridors, and the demographics of the corridor or neighborhood.

### Step 4: Determine Countermeasures

Utilize the engineering countermeasures tools to identify appropriate treatments to mitigate the safety issues identified in the previous step. The tool should be used to identify a range of treatments—looking at potential low-cost, medium-cost, and high-cost options so that quick implementation steps can be identified, and long-term projects can be added to future planning endeavors. The needs, desires, and attitudes of the project area stakeholders and public should be considered in selecting appropriate countermeasures. Secondary outcomes desired for the area and the land use context should also be considered.

### Step 5: Calculate Countermeasure Benefits

Because the countermeasures have associated Crash Modification Factors (CMFs) from the CMF Clearinghouse included on the engineering countermeasures guide, crash benefits can be calculated directly. (Note that crash modification factors represent the absolute change in crashes—if the crash modification factor is less than 1.0, that indicates a reduction in crashes.) Video instructions on calculating countermeasure benefits are in the below links.



- » [Selecting and Applying Multiple Countermeasures \(calculating CMFs\) Part 1, FHWA](#)
- » [Selecting and Applying Multiple Countermeasures \(calculating CMFs\) Part 2, FHWA](#)

Furthermore, FDOT uses Crash Reduction Factors (CRFs) to calculate benefit-cost, and those are not discussed in this report.

Multiply the number of fatal crashes, severe injury crashes, and injury crashes by the lowest CMF implemented at each intersection or segment along the corridor to obtain the expected crashes post-implementation. The absolute reduction in crashes can be monetized according to the 2020 FDOT crash cost estimates. The monetized benefit is typically then multiplied by 20 (without utilizing discount rates or traffic growth rates) to obtain a total 20-year life cycle benefit estimate. A more accurate economic estimate utilizing discount rates and traffic growth rates can be performed if necessary.

Crash Severity	FDOT Comprehensive Crash Cost
Fatality (K)	\$10,560,000
Severe Injury (A)	\$599,040

Source: Highway Safety Improvement Program, FDOT. August 2020



- » [Crash Reduction Analysis System Hub-CRASH, FDOT](#)
- » [Highway Safety Implementation Program, Implementation Manual, FDOT](#)



## Optional Step: Calculate Benefit to Cost Ratio

To calculate the benefit-to-cost ratio (BCR), a conceptual cost estimate must be calculated for the improvements. Once this estimate is available, the calculated benefits of the project from the previous step are divided by the costs to obtain the ratio. If the BCR is  $>1.0$ , then it is expected that the project will return more value to society than the cost and is typically considered a good investment. The higher the BCR, the more value the proposed improvements are expected to bring to society. For more detailed information on safety analysis methodology, FDOT maintains a clearinghouse of analysis resources, listed below.



» [Safety Analysis Methods & Resources, FDOT](#)

» [Transportation Systems Management and Operations Benefit-Cost Analysis Compendium, FHWA](#)

**How to Calculate Cost-Benefit Ratio?** Project prioritization can take many forms but prioritization by safety benefits provide the most tangible and substantial social benefits. Every project must be prioritized based on the safety benefits compared to the costs to achieve Vision Zero.

By utilizing the methodology contained in the AASHTO Highway Safety Manual, a specific crash reduction or crash prevention factor can be calculated for infrastructure modification projects or new infrastructure construction projects. This crash reduction can be converted to a monetized benefit and compared to the project cost to determine a benefit-to-cost ratio (BCR). Projects that do not have a BCR  $> 1.0$  will not maximize the safety benefits with public investment.

Every project approved for implementation in the County should have a safety benefit-to-cost ratio calculated. If the project has a calculated BCR  $< 1.0$ , then a staff report should be prepared to provide in-depth justification for implementing the project. By prioritizing projects in this way, Vision Zero has the best chance of being integrated into every project moving forward. This method also creates opportunities for grant funding opportunities. Federal programs such as Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant rely on benefit-to-cost analyses to allocate funding. Therefore, prioritizing projects based on safety benefits will position the County for more robust grant funding applications.

## NEXT STEPS

This chapter indicated the actions under three hard elements of the 7-S framework: structural, strategic, and systemic changes. The County should identify the action under the three soft elements: skill, staff and style to ensure successful outcomes and sustain the paradigm shift. The County should also conduct public outreach to get feedback on the proposed recommendations and begin the next phase of the implementation plan.



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- Arturo Ruiz, Hialeah
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- Alan Dodd, Miami
- Jeremy Calleros, Miami
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- Thomas Nash, Miami Springs
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- Wisler Pierre-Louis, North Miami
- Judeen Johnson, North Miami Beach
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Jay Aber

Kerri Collins

Andrew Ceifetz

Lisa Shoftall

Rachel Gaylord-Miles

### Cityfi

Ahmed Darrat

Gabe Klein

Ashley Hand





# APPENDIX A

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## PRIORITY PROJECTS BY COMMISSION DISTRICTS 1,4,7,8,9,10,11,12 (NOT INCLUDED IN THE REPORT)

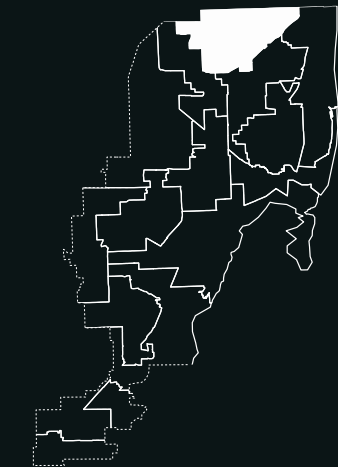
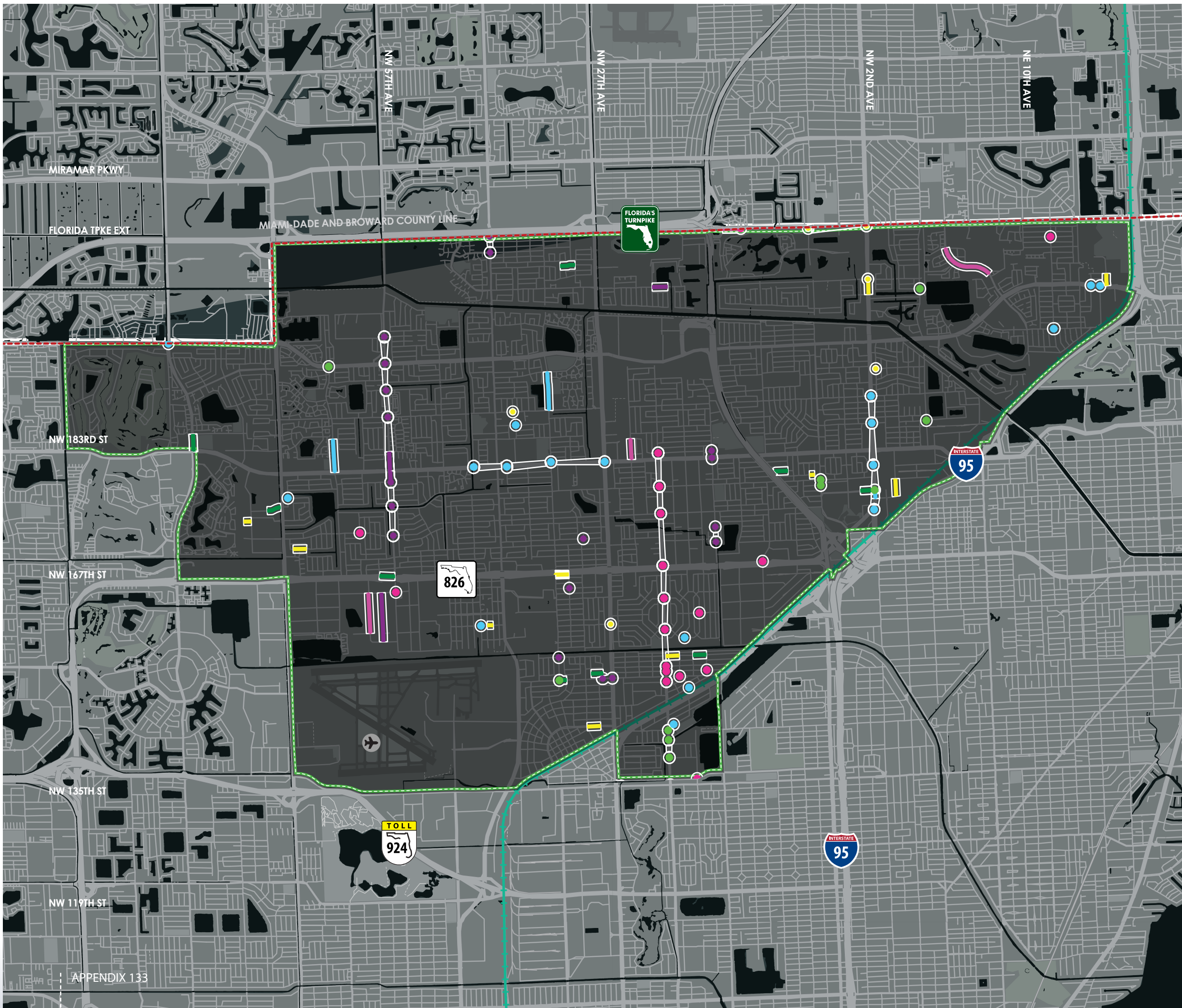


# DISTRICT 1 PRIORITY PROJECTS

++ Passenger Rail

Top Five Projects per Road  
Ownership

- Priority One
- Priority Two
- Priority Three
- Priority Four
- Priority Five



2 Miles

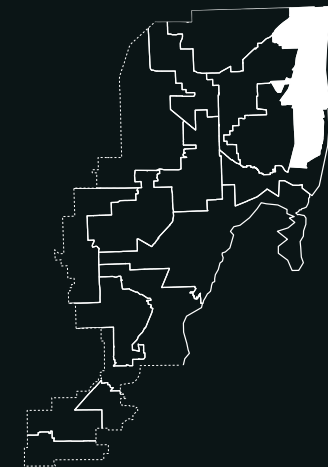


# DISTRICT 4 PRIORITY PROJECTS

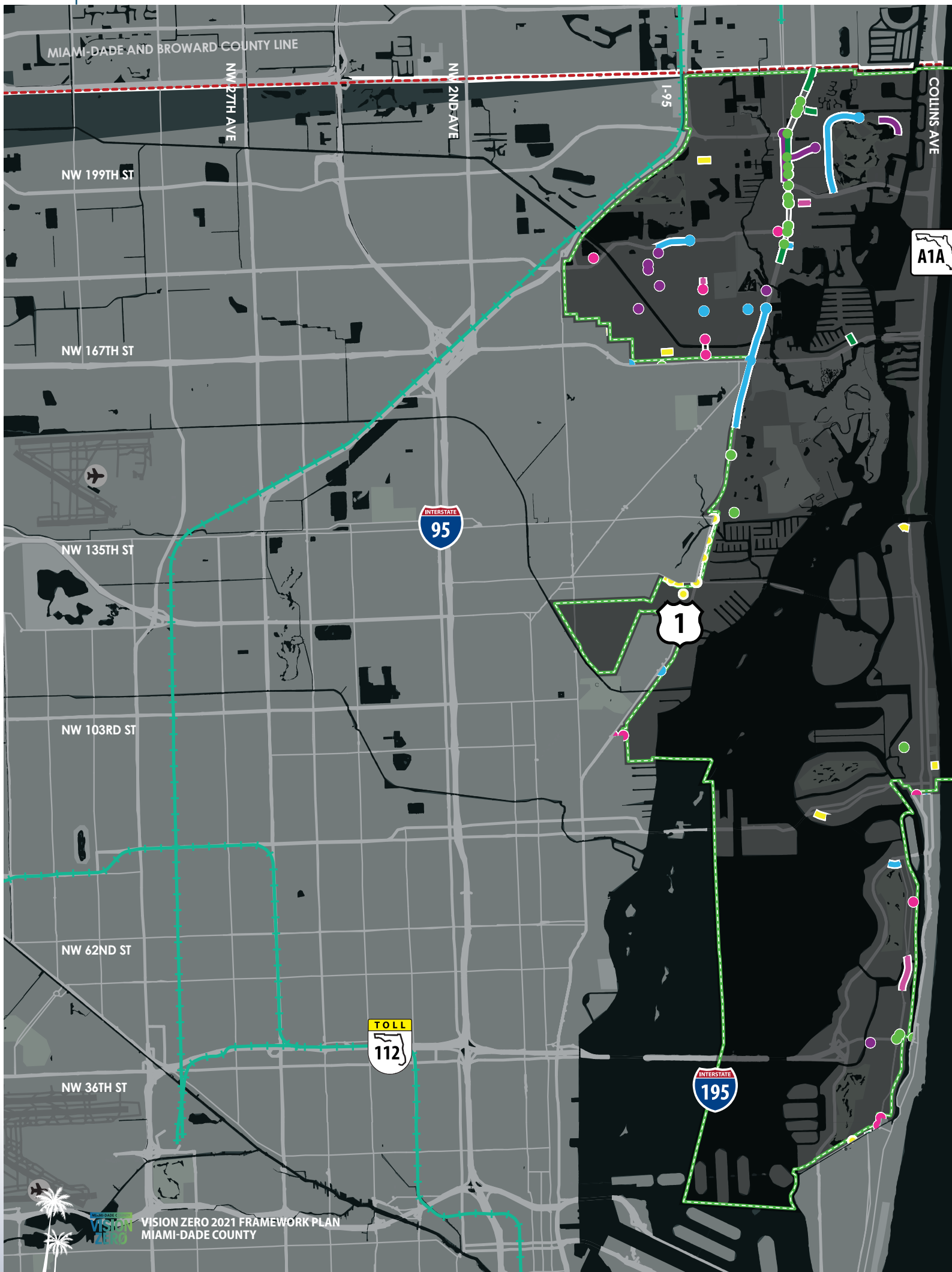
+++ Passenger Rail

Top Five Projects per Road  
Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



3 Miles

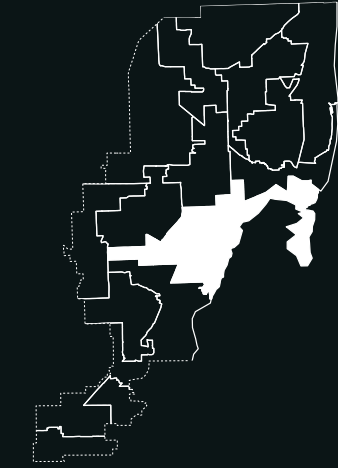
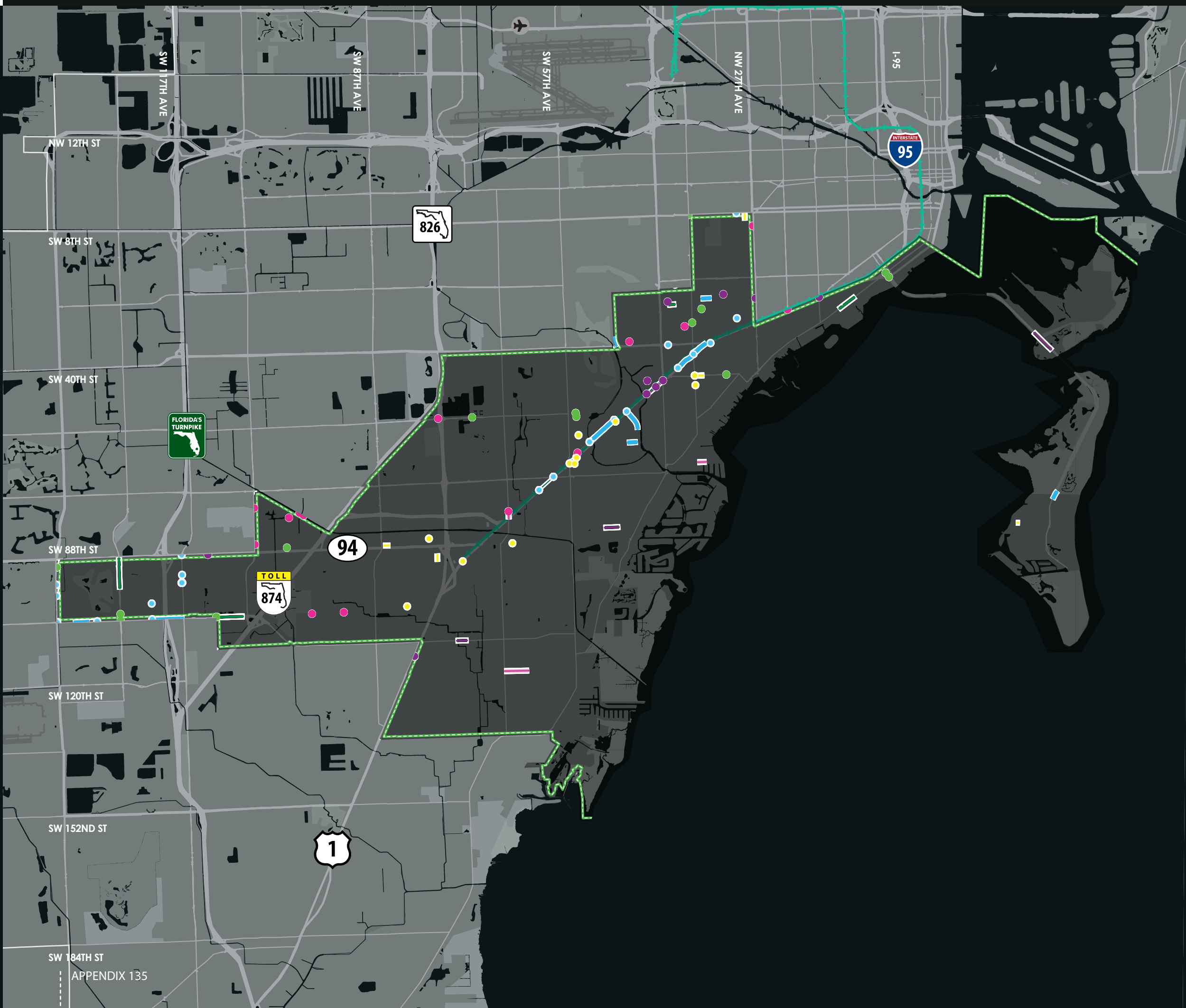


# DISTRICT 7 PRIORITY PROJECTS

+++ Passenger Rail

Top Five Projects per Road  
Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



3 Miles



# DISTRICT 8 PRIORITY PROJECTS

+++ Passenger Rail

Top Five Projects per Road  
Ownership

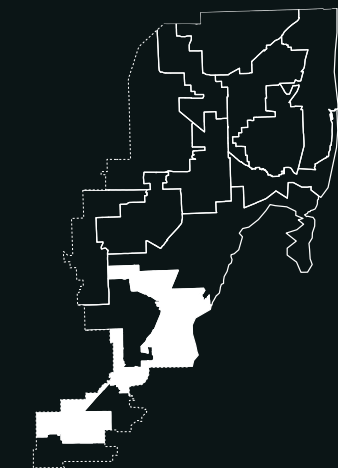
● — Priority One

● — Priority Two

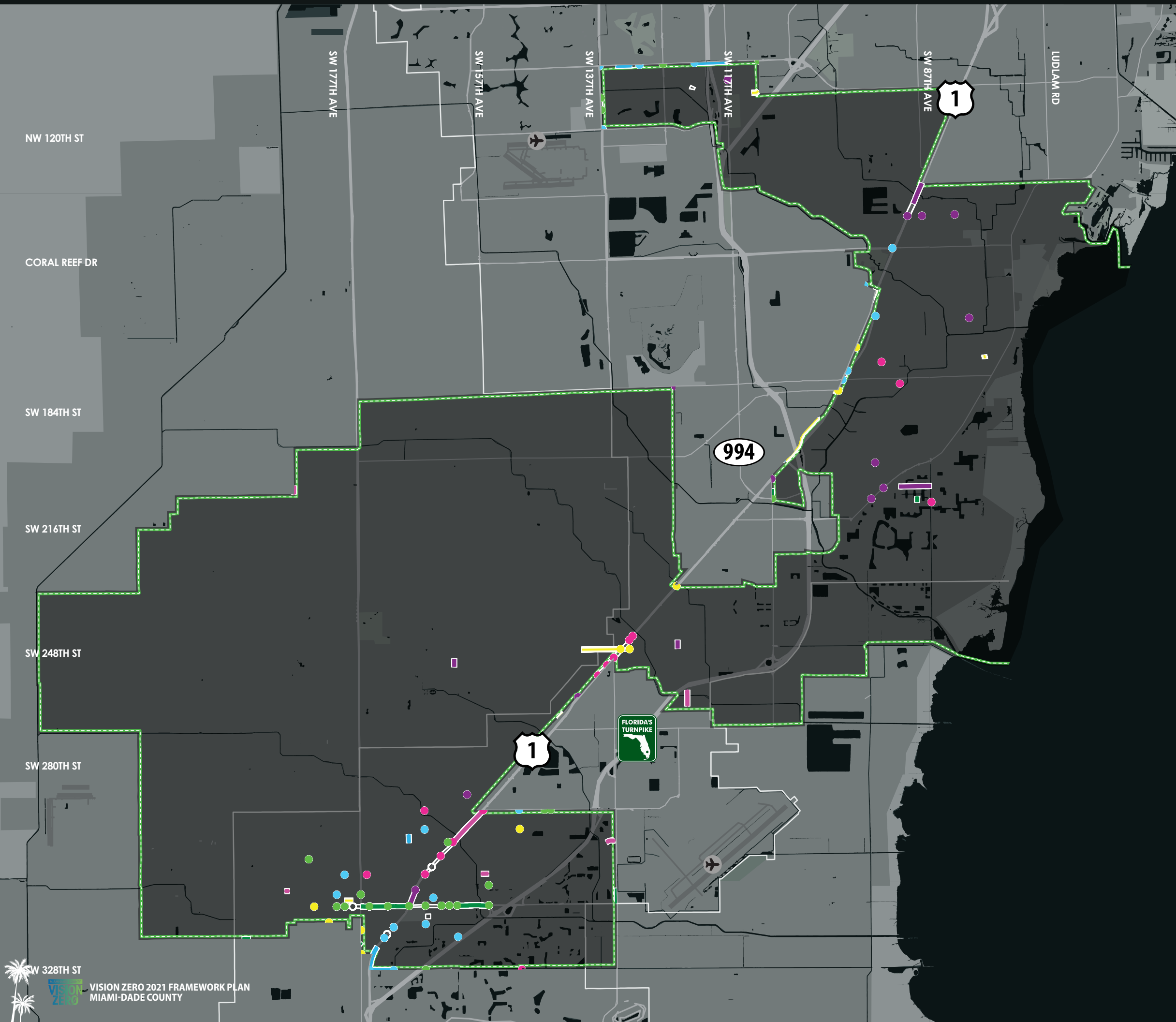
● — Priority Three

● — Priority Four

● — Priority Five



3 Miles



# DISTRICT 9 PRIORITY PROJECTS

+++ Passenger Rail

Top Five Projects per Road  
Ownership

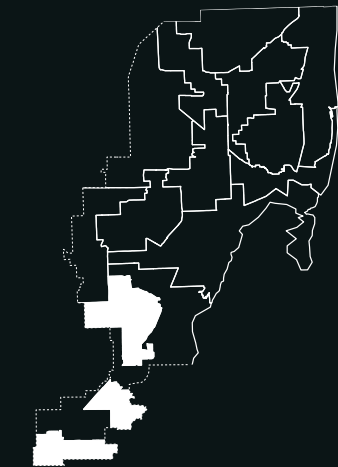
● — Priority One

● — Priority Two

● — Priority Three

● — Priority Four

● — Priority Five



4 Miles



NW 112TH ST  
SW 152ND ST  
SW 200TH ST  
SW 248TH ST  
SW 288TH ST  
SW 344TH ST

SW 177H AVE  
SW 137H AVE  
SW 117H AVE  
SW 87H AVE  
LUDLAM RD

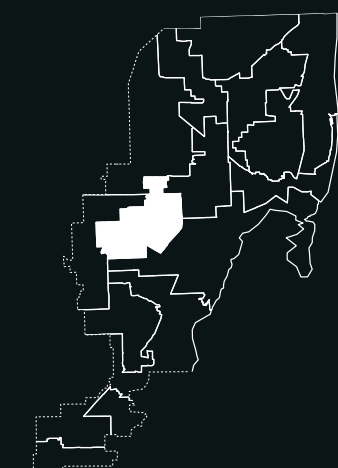


# DISTRICT 10 PRIORITY PROJECTS

+++ Passenger Rail

Top Five Projects per Road  
Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



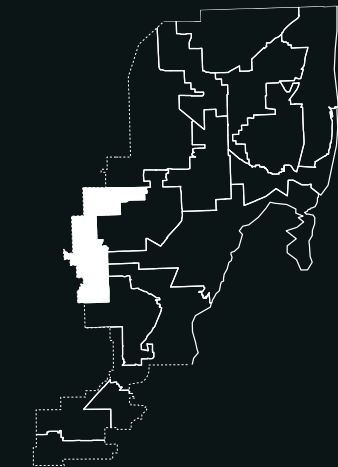
1 Miles

# DISTRICT 11 PRIORITY PROJECTS

+++ Passenger Rail

Top Five Projects per Road  
Ownership

- — Priority One
- — Priority Two
- — Priority Three
- — Priority Four
- — Priority Five



2 Miles



SW 42ND ST

SW 56TH ST

SW 72ND ST

SW 88TH ST

SW 104TH ST

SW 120TH ST

SW 136TH ST

KROME AVE

SW 157H AVE

SW 137H AVE

SW 177H AVE

94

TOLL  
874



MIAMI-DADE AND BROWARD COUNTY LINE

KROME AVE

W OKEECHOBEE RD

NW 107TH AVE

NW 67TH AVE

NW 170TH ST

NW 138TH ST

NW 106TH ST

NW 74TH ST

DORAL BLVD

NW 12TH ST

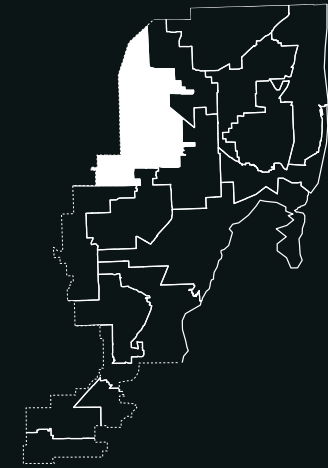


# DISTRICT 12 PRIORITY PROJECTS

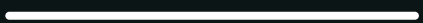
+++ Passenger Rail

Top Five Projects per Road  
Ownership

- Priority One
- Priority Two
- Priority Three
- Priority Four
- Priority Five



3 Miles



# APPENDIX B

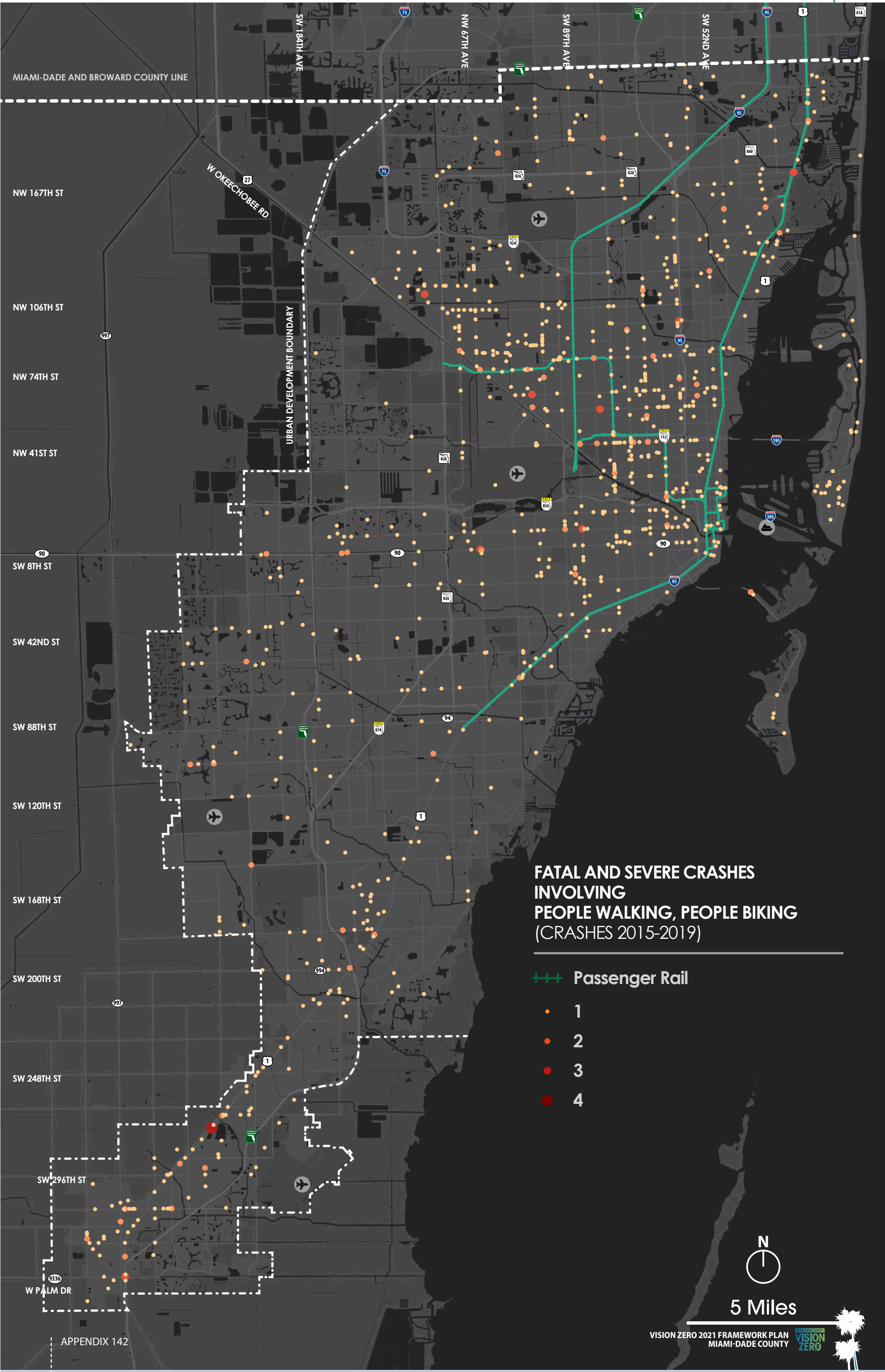
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## LARGE FORMAT MAPS



MIAMI-DADE COUNTY  
**VISION  
ZERO**

**VISION ZERO 2021 FRAMEWORK PLAN**  
MIAMI-DADE COUNTY



MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

W PALM DR

W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

SW 184TH AVE

NW 67TH AVE

SW 89TH AVE

SW 52ND AVE

**FATAL AND SEVERE CRASHES INVOLVING PEOPLE WALKING, PEOPLE BIKING (CRASHES 2015-2019)**

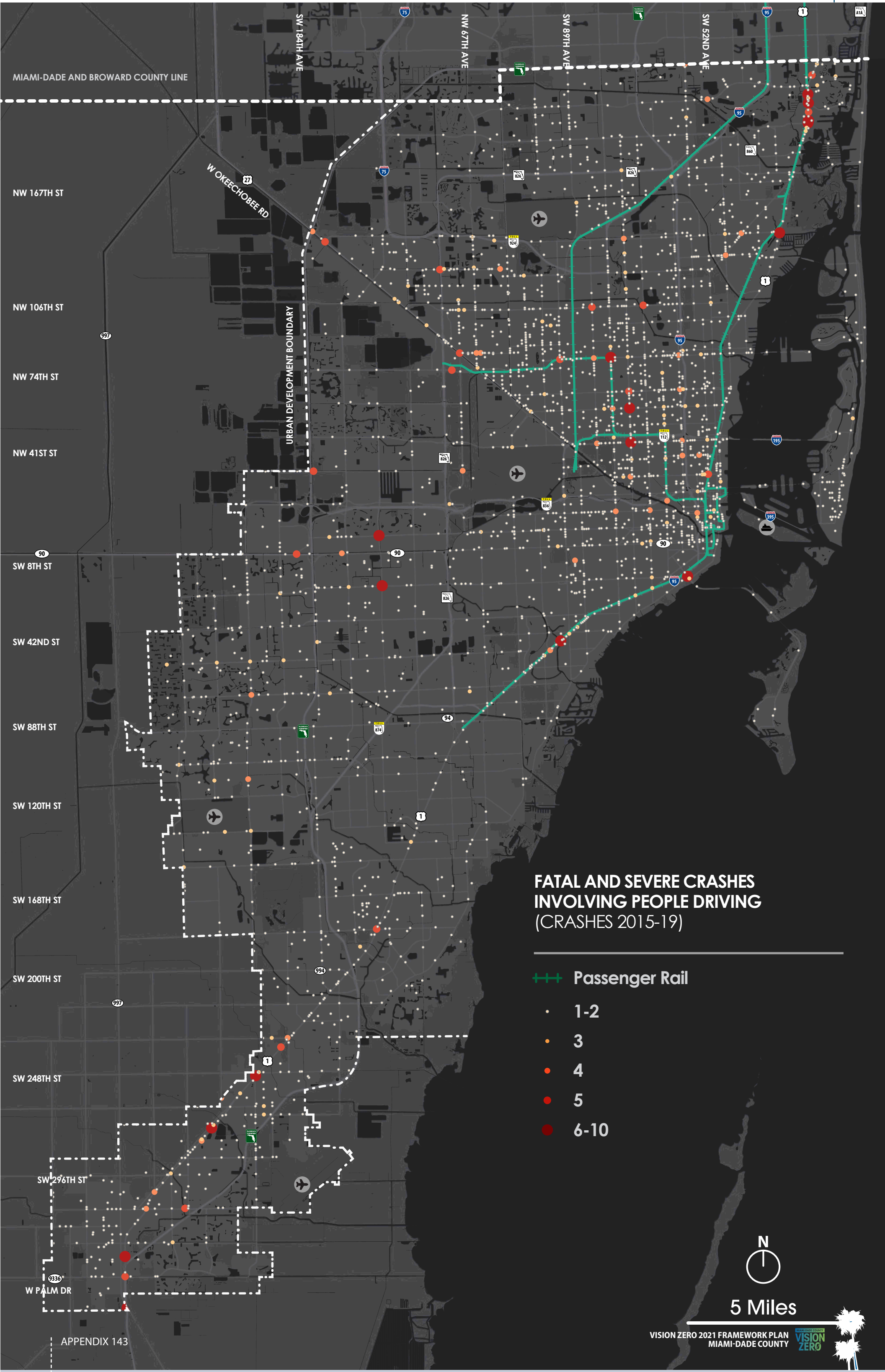
+++ Passenger Rail

- 1
- 2
- 3
- 4



5 Miles





MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

W PALM DR

SW 184TH AVE

NW 67TH AVE

SW 89TH AVE

SW 52ND AVE

W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

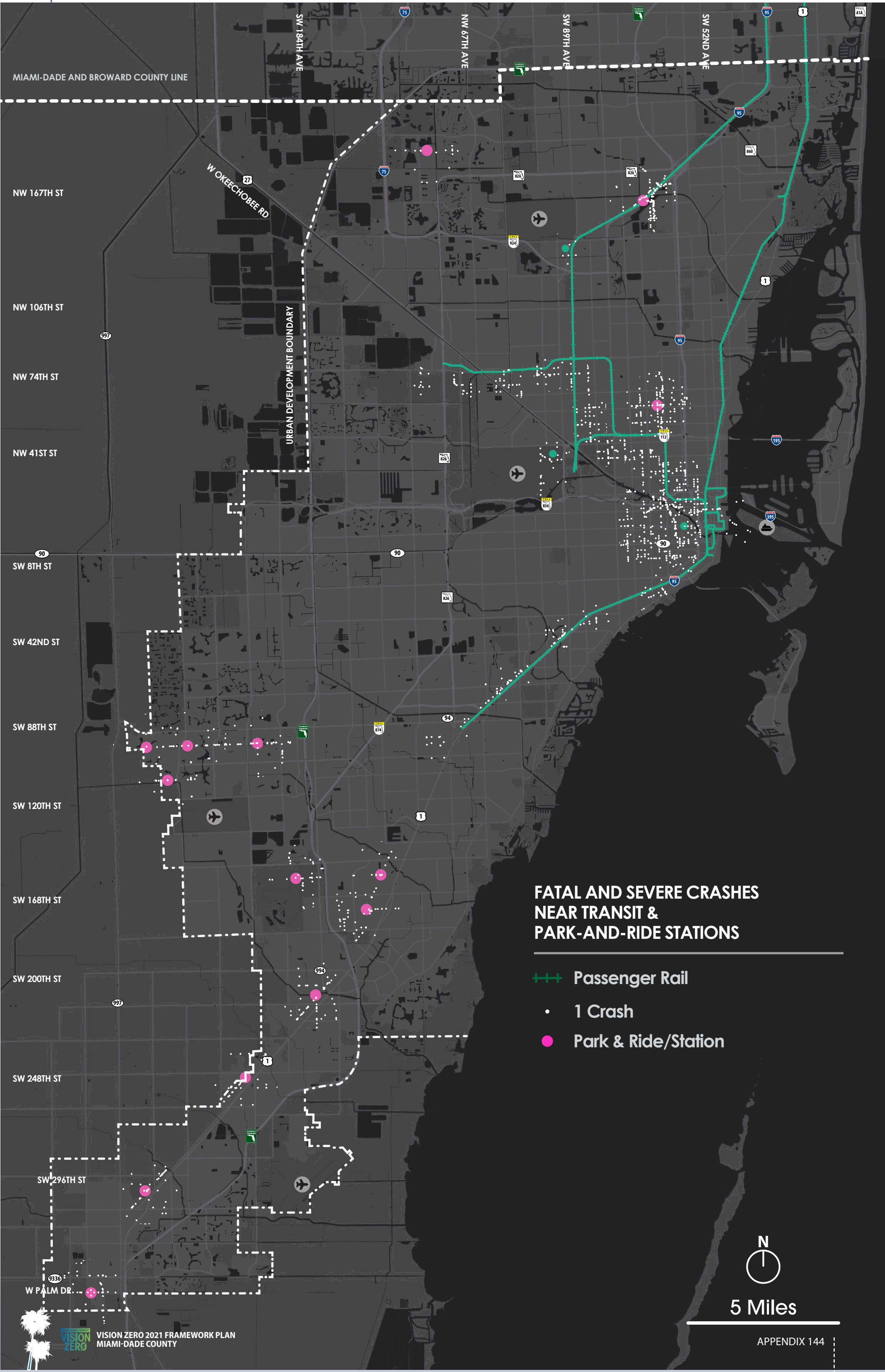
### FATAL AND SEVERE CRASHES INVOLVING PEOPLE DRIVING (CRASHES 2015-19)

- +++ Passenger Rail
- 1-2
- 3
- 4
- 5
- 6-10






5 Miles



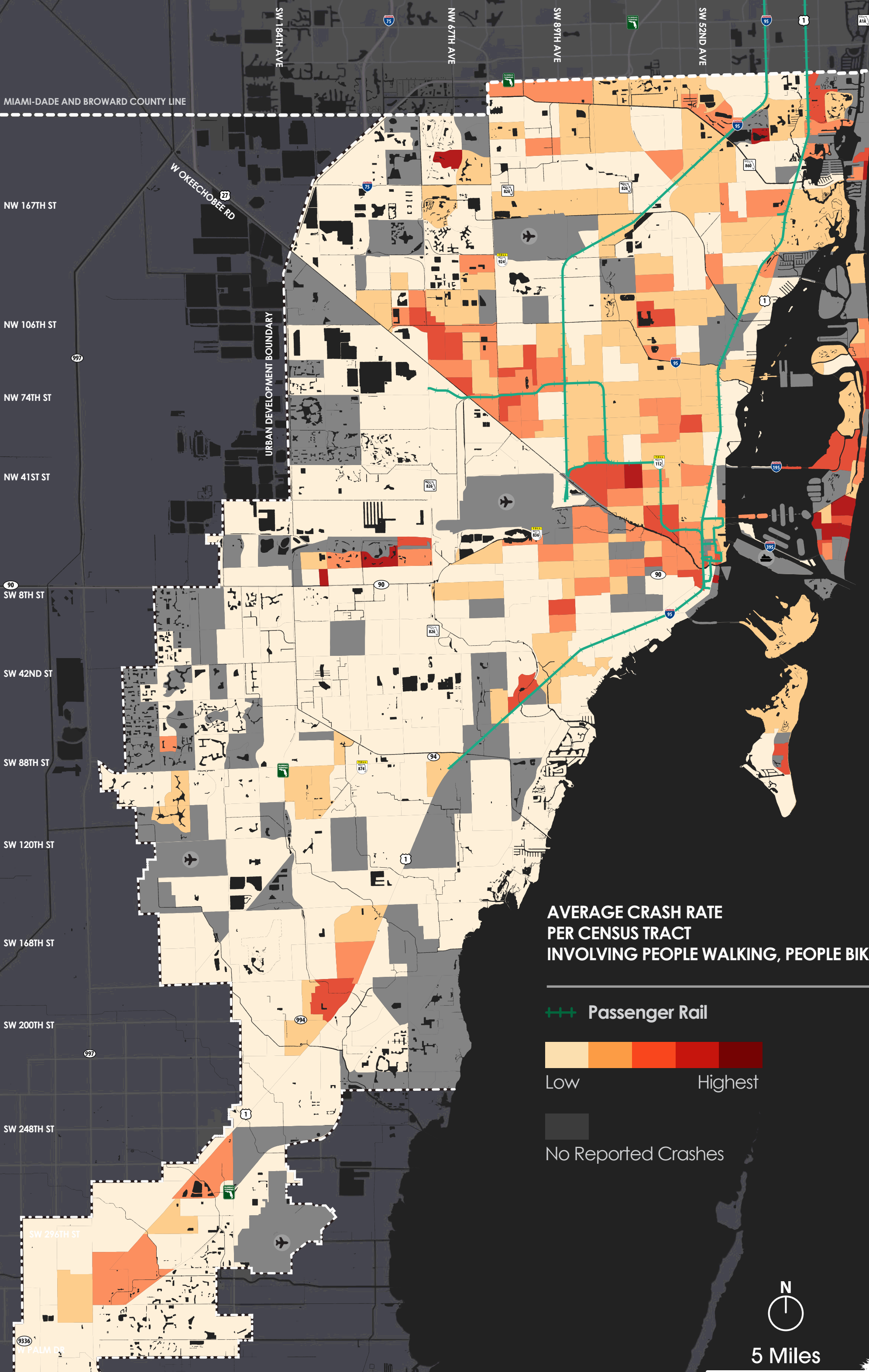


**FATAL AND SEVERE CRASHES  
NEAR TRANSIT &  
PARK-AND-RIDE STATIONS**

-  Passenger Rail
-  1 Crash
-  Park & Ride/Station



5 Miles



MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

SW 184TH AVE

NW 67TH AVE

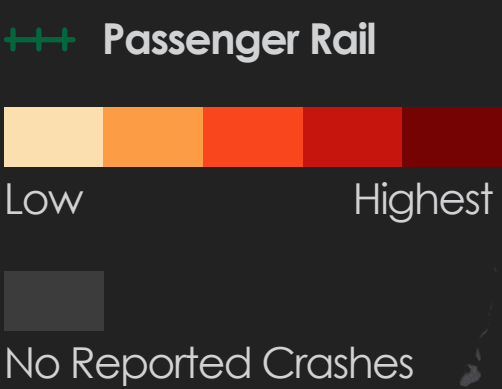
SW 89TH AVE

SW 52ND AVE

URBAN DEVELOPMENT BOUNDARY

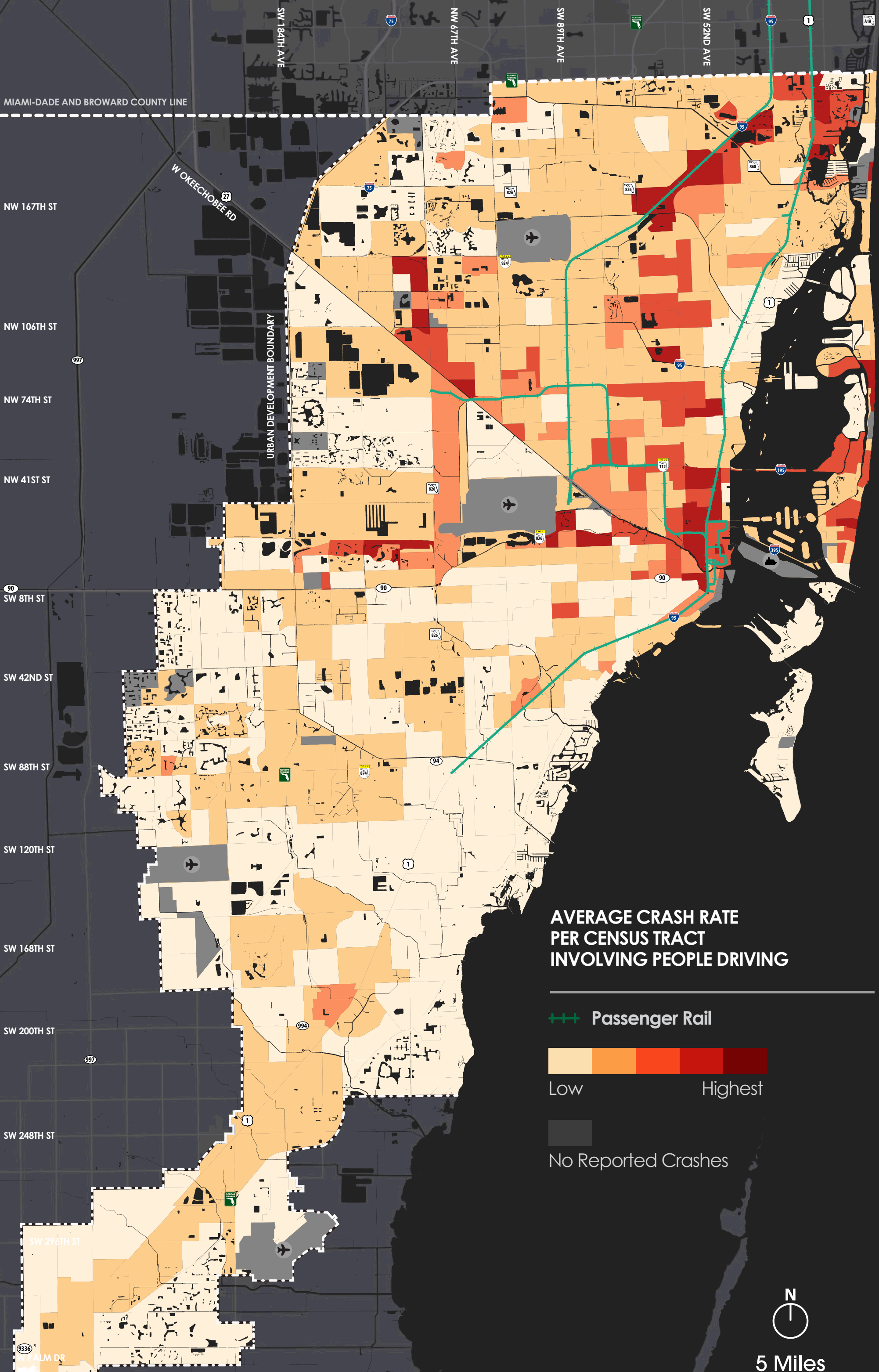
W OKEECHOBEE RD

**AVERAGE CRASH RATE PER CENSUS TRACT INVOLVING PEOPLE WALKING, PEOPLE BIKING**



5 Miles





MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

SW 184TH AVE

NW 67TH AVE

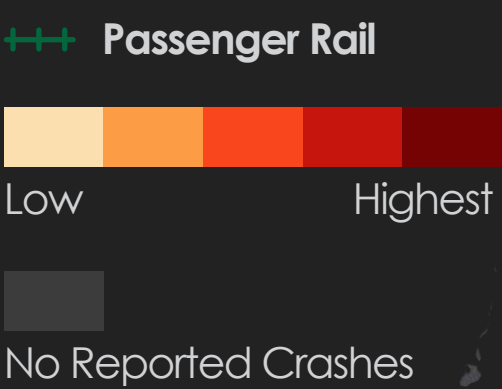
SW 89TH AVE

SW 52ND AVE

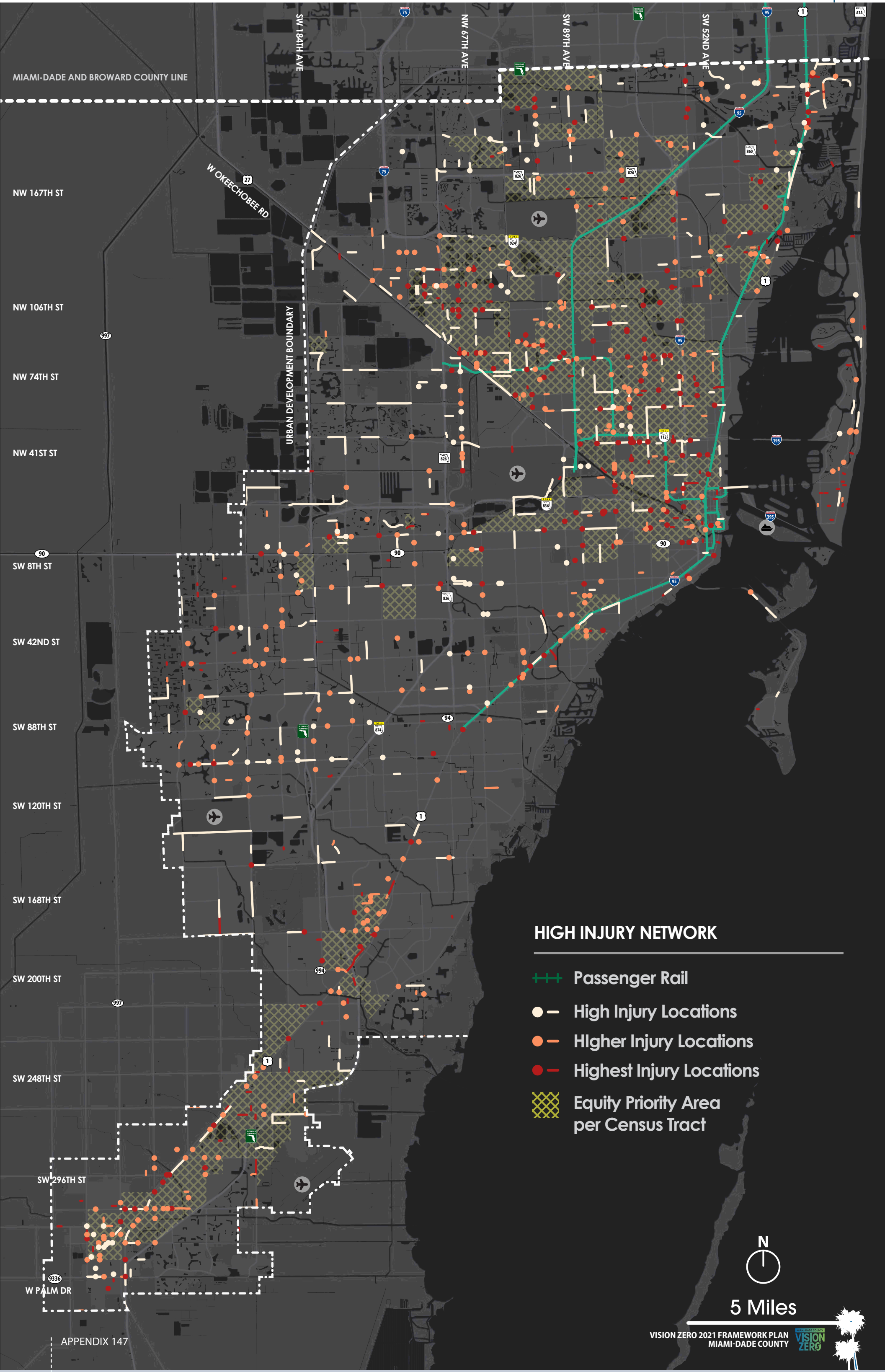
W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

**AVERAGE CRASH RATE PER CENSUS TRACT INVOLVING PEOPLE DRIVING**



5 Miles



MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

W PALM DR

W OKEECHOBEE RD

SW 184TH AVE






NW 67TH AVE

SW 89TH AVE

SW 52ND AVE

URBAN DEVELOPMENT BOUNDARY

### HIGH INJURY NETWORK

-  Passenger Rail
-  High Injury Locations
-  Higher Injury Locations
-  Highest Injury Locations
-  Equity Priority Area per Census Tract



5 Miles





MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

W PALM DR

SW 184TH AVE

NW 67TH AVE




SW 89TH AVE

SW 52ND AVE

W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

### TOP 50 PRIORITY PROJECTS COUNTYWIDE

-  Passenger Rail
-  Priority Projects
-  Equity Priority Area per Census Tract



5 Miles

MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

SW 184TH AVE

NW 67TH AVE

SW 89TH AVE

SW 52ND AVE

W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

### POVERTY AND MINORITIES SCALE PER CENSUS TRACT

+++ Passenger Rail

% Minority Population

% Population Below Poverty Level

High

High

Low



5 Miles



MIAMI-DADE AND BROWARD COUNTY LINE

NW 167TH ST

NW 106TH ST

NW 74TH ST

NW 41ST ST

SW 8TH ST

SW 42ND ST

SW 88TH ST

SW 120TH ST

SW 168TH ST

SW 200TH ST

SW 248TH ST

SW 296TH ST

W PALM DR

SW 184TH AVE

NW 67TH AVE

SW 89TH AVE

SW 52ND AVE

W OKEECHOBEE RD

URBAN DEVELOPMENT BOUNDARY

### EQUITY PRIORITY AREA PER CENSUS TRACT

 Equity Priority Area



5 Miles

# APPENDIX C

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## SOCIO-ECONOMIC DATA MAPS WITH LOW CORRELATION TO AREAS WITH HIGH CRASH RATE (NOT INCLUDED IN THE REPORT)



