

CITY OF
JACKSONVILLE, FLORIDA

Pedestrian and Bicycle Master Plan



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INTRODUCTION

VISION STATEMENT

The City of Jacksonville Pedestrian and Bicycle Master Plan provides a roadmap for the transformation of Jacksonville into a city that is recognized as one of the most walkable and bike-friendly in the Southeast.



OVERVIEW

The City of Jacksonville has many of the necessary characteristics of walkable and bicycle-friendly communities. The region is topographically flat and enjoys weather that is conducive to walking and bicycling year-round. There are hundreds of miles of waterfront affording attractive views and popular social and recreational opportunities—where people love to walk and ride. There are some older neighborhoods, such as Springfield, Moncrief Park, Riverside and Avondale, where the street and land use pattern makes active transportation modes relatively popular and convenient choices.

Jacksonville also has a sizeable population that is unable to drive because of age (22.4% of the population is age 14 or less), or for whom the costs of driving are a significant economic burden (17.8% of individuals live below the poverty line). This means that for many people, walking and biking is a necessity rather than a choice, especially in combination with transit services.

At the same time, Jacksonville has many of the characteristics that contribute to a less than safe, comfortable and convenient walking and bicycling experience. The City has developed with very low density suburban land use patterns dominated by a lot of multi-lane, high-speed roadways that offer few safe

crossing points and limited access for people on foot or bike. There are many miles of streets and roadways in the City that have no sidewalks or sidewalks on just one side of the road. Where sidewalks do exist, they are often narrow, discontinuous and in a poor state of repair. There are very few dedicated facilities to accommodate bicyclists, leading many people on bikes to use the sidewalk, which is legal in the State of Florida.

The same waterways that provide terrific amenities also create tremendous barriers for movement. Bridges are few and far between, especially over the larger bodies of water, and were frequently built without appropriate access for bicyclists and pedestrians. The city is also crisscrossed with major highways and busy rail corridors that create barriers to non-motorized travel.

The result of these factors is an alarmingly high number of fatal and serious roadway crashes, particularly involving pedestrians. More than 100 people are killed on Jacksonville roadways each year (Figure 1), and between a quarter and a third of the victims are pedestrians or bicyclists—mostly people on foot. Each life lost or affected by serious injury on the roadways of the City is a terrible tragedy for the victim and their friends and family.

JACKSONVILLE, FLA. TRAFFIC FATALITIES

	ALL	PEDESTRIAN	% PEDESTRIAN	BICYCLIST	% BICYCLIST	% NONMOTORIZED
2011	96	17	18%	5	5%	23%
2012	126	30	24%	8	6%	30%
2013	141	37	26%	7	5%	31%
2014	117	29	25%	1	1%	26%
2015	119	37	31%	2	2%	33%

Source: Signal 4, University of Florida

Figure 1. Traffic fatalities recorded in the City of Jacksonville 2011-2015. This shows a high percentage of non-motorized fatalities. Nationally, 16% of traffic fatalities are pedestrians or bicyclists.¹

These crashes also impose a serious burden on the resources of the City, and have a significant economic cost. The National Highway Traffic Safety Administration estimates that the lifetime economic cost to society for each traffic fatality in the United States is \$1.4 million, and each critically injured survivor costs society an average of \$1 million². (These costs include medical costs, property damage, lost productivity, congestion etc.)

In addition to the direct cost of crashes, Jacksonville has an image problem: a reputation as a dangerous place for walking and bicycling. Cities across the country are competing for an increasingly mobile workforce, and we know from demographic data, real estate studies and directly from elected officials that “quality of life, as defined by millennials”³ is driving the location decisions of individuals, families and

companies large and small. Walkability and bike-friendliness are critical components of quality of life and it is essential for Jacksonville to change the reality and perception of the city as a hostile environment for walking and bicycling.

Jacksonville needs a roadmap to quickly and effectively close the gap between the potential for bicycling and walking in the area and the reality of a dangerous, inconvenient and unattractive environment for bicycling and walking today. The Pedestrian and Bicycle Master Plan is that roadmap.

The City of Jacksonville Pedestrian and Bicycle Master Plan should be the turning point; the moment when the City decided that an annual loss of 30-40 pedestrians and bicyclists on its roadways was simply unacceptable.



1 National Highway Traffic Safety Administration’s National Center for Statistics and Analysis (DOT HS 812 124 and DOT HS 812 151)

2 National Highway Traffic Safety Administration, The Economic and Societal Impact of Motor Vehicle Crashes 2010 (revised). DOT HS 812 013

3 Mayor’s Perceptions on Bicycling: Benefits, Challenges and Opportunities, League of American Bicyclists, 2014

GOALS

In order to be that turning point, the City of Jacksonville Pedestrian and Bicycle Master Plan embraces four goals. This Plan:



1 Creates a roadmap for the City to follow to close the gap between reality and the potential for biking and walking;



2 Identifies short, medium and long term safety actions for the City;



3 Recommends specific implementation strategies for addressing particular challenges and opportunities in Jacksonville; and



4 Establishes a series of benchmarks and performance measures for the City to use in assessing progress over the next five years.



GOAL 1: CREATE A ROADMAP FOR CHANGE

The City of Jacksonville Pedestrian and Bicycle Master Plan builds upon, rather than replaces, planning initiatives that have already taken place at the local and regional level. For example, the city developed a Bicycle Plan in 1999; the North Florida Transportation Planning Organization has a 2006 Trails Plan and a 2013 Bicycle and Pedestrian Plan that have already helped to identify key non-motorized corridors and projects that need attention.

The Plan complements, rather than competes with, ongoing work of agencies such as the Jacksonville Transportation Authority (JTA), Downtown Investment Authority and Public Works Department. For example, the JTA has been studying 14 key transit corridors for improvements that include pedestrian and bicycle safety components as well as extensive public input; this pedestrian and bicycle plan does not duplicate or replicate the ongoing work of the JTA Mobility Works initiative. Equally, there are Capital Improvement Projects and road resurfacing projects already scheduled that, with only minor adjustments, can be a tremendous benefit to addressing pedestrian and bicycle safety needs, for no extra cost.

The Plan recognizes numerous future development and redevelopment opportunities in the city that can be used to deliver a more walkable and bike-friendly community over time. The Plan identifies those opportunities and lays out a process that will increase the likelihood that such development occurs with pedestrian and bicyclist safety to the fore. For example, as the downtown waterfront is redeveloped, it is essential that a trail or pathway be maintained for walking and bicycling and that access from that trail to key streets and bridges is enhanced as part of these larger redevelopment projects. (Chapter: *Roadmap for Change*)

That won't happen overnight or as part of one project... the Plan helps establish a process and a long term

vision for such infrastructure that informs each smaller development project along the way.

The Pedestrian and Bicycle Master Plan articulates a series of guiding principles that establish the importance of dramatically improving the walking and bicycling environment in Jacksonville, to save lives and to ensure a bright and sustainable economic future for the community. These principles are relevant to the City, regional and state government as well as to developers, the business community and community groups throughout the city.

Similarly, the Plan is a clarion call for action in the face of the terrible toll of death, injury and crashes on area roads. The death toll is just the tip of the iceberg: hidden beneath the surface is a level of fear and danger on Jacksonville roads that stifles demand for active transportation, poorly serves a population that has no choice but to walk or ride regardless of the conditions, and which provides little incentive for drivers, cyclists, or pedestrians to follow the rules or respect each other.

Public and stakeholder input into this plan provides a snapshot of conditions for bicycling and walking in 2017, together with a vision for the future. Most importantly, the Plan establishes the process by which the City moves from today's reality toward the future goals and vision of the community. Part of that process will be creating mechanisms and tools by which the City can prioritize projects and programs to ensure progress and success.

Finally, the Plan offers a series of benchmarks and measures that define what success really means, and to which the City can hold itself accountable. (Chapter: *Roadmap for Change*) Both the bicycle- and walk-friendly community programs at the national level identify the presence of performance measures and targets as critical indicators of success.

GOAL 2: IDENTIFY ACTION ITEMS

The Pedestrian and Bicycle Master Plan identifies concrete actions that can be taken in the short, medium and long term for both walking (Chapter: *Pedestrian Safety Action Plan*) 4) and bicycling (Chapter: *Bicycle Network*). Many of those actions derive from the assessment of existing conditions and public involvement activities completed as part of the development of the Plan. Several recommendations emerged that were exemplary of actions necessary on a city-wide scale, rather than just in the immediate plan study area.

The Plan did not set out to create – or recreate – another long list of potential bicycling and walking improvement projects. Rather, the Plan was designed to identify a more data-driven prioritization process for already identified needs and project lists (Chapter: *Roadmap for Change*.). That prioritization process can be used citywide in the future.

The Plan also recognizes that while engineering issues and solutions are critical in improving the environment for walking and bicycling in Jacksonville, there must be a more holistic approach that identifies action items and needs in the areas of education, enforcement, encouragement and evaluation. These areas of activity may not ultimately be the responsibility of the Planning or Public Works Departments to implement,

but are essential complements to the work of those departments.

In summary, the Plan calls for:

- Creation of a Strategic Neighborhood Action Plan for Pedestrians to systematically upgrade the pedestrian environment and improve accessibility and safety.
- Implementation of Targeted Roadway Improvements for Pedestrian Safety to address high crash locations on streets that are typical of those found throughout the City.
- Installation of at least 50 Rectangular Rapid Flashing Beacons in the next three years to improve safety and accessibility for vulnerable road users in targeted locations (based on demand and safety criteria).
- Implementation of a prioritized City Bikeway Network.
- Immediate action on a series of high priority projects that demonstrate the city's commitment to making Jacksonville more walkable and bike-friendly.

GOAL 3: DEVELOP SPECIFIC STRATEGIES IN KEY AREAS

The Pedestrian and Bicycle Master Plan is a City of Jacksonville initiative, and identifies actions the City can take to improve the safety, comfort and convenience of walking and biking. However, the Plan also explicitly recognizes that numerous partner agencies are critical participants in achieving the goals of the document.

The Florida Department of Transportation (FDOT), for example, owns and operates the major roadways

throughout the city. This network is a fraction of the overall roadway network in the City, but half of all pedestrian

and bicyclist fatalities in the city occur on state roads, as do one-third of all pedestrian and bicyclist crashes.

Moving forward, agencies such as FDOT, the Jacksonville Transit Authority, and the development community (including the Downtown Investment Authority) will continue to have a profound impact on transportation and the built environment. It is essential that these agencies and organizations use the most current roadway design standards that prioritize pedestrian and bicyclist safety, and apply them consistently to their projects in the city.

Furthermore, these entities will create opportunities to realize projects in the Pedestrian and Bicycle Master Plan that must be seized. For example, the reconstruction of the I-95 Bridge over the St Johns River in downtown Jacksonville is a once-in-a-lifetime opportunity to improve walkability and bike-friendliness on both sides of the river, as well as on the bridge itself.

In summary, the Plan calls for:

- Adoption of updated roadway design standards, by all relevant agencies, to reflect the most current bikeway and pedestrian design standards applicable to urban roadways.
- Implementation of a comprehensive facility planning and design training program that is delivered to engineers, planners and landscape architects (urban designers) working for all area public agencies (FDOT, COJ, JTA, NFTPO, DIA) as well as the consultant community.
- A twice yearly, high-level, inter-agency implementation meeting to coordinate plans, projects and programs to maximize the effective use of funding to implement the Pedestrian and Bicycle Master Plan. Agencies should include COJ, JTA, FDOT and NFTPO.
- Increased funding levels for implementation of pedestrian and bicycle projects in the City.



GOAL 4: ESTABLISH BENCHMARKS AND PERFORMANCE MEASURES

The ultimate success of the Pedestrian and Bicycle Master Plan is quite simple. Did the Plan establish meaningful, measurable targets that guided decisions that resulted in fewer traffic fatalities and crashes and more walking and bicycling in Jacksonville?

The Plan establishes two overarching goals that are to be met by 2030.

1. Walking and bicycling should account for 10% of all trips (up from less than 2% in 2014)
2. There should be no pedestrians or bicyclists killed or seriously injured in traffic crashes (Vision Zero)

The Plan identifies the following performance metrics that should be monitored and reported annually.

Annual number of pedestrian and bicyclist fatalities, serious injuries and crashes

- Signal4 database¹

Participation in Walking and Bicycling in the City of Jacksonville

- City counts
- American Community Survey Journey to Work

Designation of Jacksonville in national benchmarking studies

- Bicycle-friendly Community program
- Walk-friendly Community program

- Dangerous by Design pedestrian danger index

Pedestrian and Bicycle-related Output

- Agency spending on pedestrian and bicycle infrastructure
- Miles of bikeway completed, connected
- Linear feet of sidewalk installed, repaired
- Number of RRFBs installed
- Number of curb ramps installed, repaired
- Number of intersection improvements for pedestrian and bicyclist safety
- Number of pedestrian and bicycle facility training course participants
- Percent of the Jacksonville population living within an area serviced by the SNAPP program.

Finally, implementation of the Master Plan should be monitored and overseen by an interagency task force or committee, including representatives of stakeholder groups that meets at least quarterly. Initially, the Context Sensitive Streets Committee should perform this role.

¹ Signal Four Analytics, University of Florida. <http://s4.geoplan.ufl.edu/>

EXISTING CONDITIONS

INTRODUCTION

The City of Jacksonville is a sprawling, suburban community of some 850,000 people in Northeast Florida and is very typical of many southeastern and Sun Belt cities in the United States in that it grew and developed in the age of the automobile. In 1940, the population of Duval County was 210,143, of whom 173,065 lived in the then-separate City of Jacksonville. By 1960, the County population had more than doubled to 455,411, but only 28,000 of the 245,000 new residents were in the City of Jacksonville.

The explosive growth of the County continued in the 1960's and the City and County were consolidated in 1968. Since then, the near doubling of the County population from 1960 to the present day total of more than 850,000 has taken place almost exclusively in those parts of the County that are outside the boundaries of the original City of Jacksonville. The timing of this growth means that the layout and physical infrastructure of the city [and larger region] is heavily auto-centric.

In recent remarks to the Center for American Progress, U.S. Secretary of Transportation Anthony Foxx confirmed that this pattern of development was very typical in U.S. metropolitan areas, noting that while the interstate highway system and major roadways were built to connect our cities, “instead of connecting us to each other, highway decision-makers separated us.”

Indeed, the City of Jacksonville has an extensive network of major urban thoroughfares – interstate highways, urban expressways, high-speed arterial roads – that fall into this category. Roads such as the Arlington Expressway, Beach Boulevard, and the Martin Luther King Jr. Parkway connect dispersed, low density and single-use residential, retail, commercial, military, and recreational areas, but they also starkly divide neighborhoods. Within those neighborhoods, the streets often follow a traditional suburban design with disconnected cul de sacs and curvilinear streets channeling traffic onto ever-larger and busier collector and arterial roadways.



Jacksonville is distinguished from many other communities around the country by some unique characteristics that intensify the impact of this traditional suburban and ex-urban growth pattern.

RAIL CORRIDORS

Because of the importance of the Port of Jacksonville and the strategic location of the City on the eastern seaboard of the United States, Jacksonville has an extensive network of rail lines, many of which are still active. However, just like Interstate highways today, these rail corridors also create significant barriers to movement. The impact of this is demonstrated quite dramatically in much of North Jacksonville, which is now dealing with the consequences of both rail lines and highway corridors dividing neighborhoods and areas of the city.

WATERWAYS

Jacksonville is fortunate to have proximity to the ocean as well as to numerous rivers and bodies of water that serve a commercial as well as recreational purpose. However, these same rivers and estuaries also create significant barriers to movement. There are only seven road bridges across the St John's River in the City of Jacksonville, of which only two currently have any kind of pedestrian and/or bicycle accommodation. The numerous tributaries to the St John's River, notably the Ortega, Arlington, and Trout River systems, create similar constraints to connectivity and access, and serve to concentrate traffic on a small number of critical crossing points that are rarely conducive to safe walking and bicycling.

CONSOLIDATION

The consolidation of Duval County and the City of Jacksonville in 1968 created what is now the 12th most populous city in the United States with the greatest land mass of any city in the lower 48 states. However, this means the city also has the 16th lowest population density of the 297 U.S. cities with a population of more than 100,000. While this can partly be explained by the rural nature of parts of the city (e.g., to the South and North-east of Baldwin), these statistics also highlight the low-density, suburban development pattern of much of the community.

The result of this pattern of explosive growth in an era of suburban, auto-centric development is that conditions for bicycling and walking in the city of Jacksonville are poor. Before the mid-1980's, no thought was given to accommodating – let alone encouraging – walking and bicycling in the planning, design, construction and operation of the region's transportation system or development pattern.

In 1984, state legislation required metropolitan areas to include bicycling and walking in the traffic circulation elements of their Comprehensive Plans. The City of Jacksonville responded by appointing a Bicycle Advisory Committee and in 1986 adopted their first Comprehensive Bikeways Plan. These early efforts to include non-motorized or active transportation in roadway design and new development have been met with limited success, and now look quite dated.

Thirteen years later, in 1999, the City and First Coast Metropolitan Planning Organization (MPO), now called the North Florida Transportation Planning Organization (NFTPO), collaborated to produce a Comprehensive Bicycle and Pedestrian Plan for the Duval County and portions of St Johns and Clay Counties and the MPO published a Regional Trails and Greenways Plan in 2006.

The growing awareness of the need to address pedestrian and bicyclist safety and access led NFTPO to adopt the North Florida Regional Bicycle and Pedestrian Plan in 2013, in part to generate projects for the 2040 Long Range Transportation Plan, and to identify several smaller sub-area pedestrian and bicycle plans that are now being completed. Other agencies, including the Jacksonville Transit Authority (JTA), Florida Department of Transportation (FDOT), and City of Jacksonville have ongoing planning activities that focus on walking and bicycling.



“We can’t change everything about the past, but we can certainly work as hard as we can today to repair our infrastructure to make it the connective tissue it ought to be.”

These initiatives have resulted in some modest improvements. The Baldwin Trail is a regionally significant bicycling destination; the Riverwalk path is a popular running, walking and cycling route; new bike lanes on San Jose Boulevard have been welcomed by the bicycling community, and the S Line is an important first step in a greenway corridor running through the heart of the city. Many new and improved roadways in the region do include sidewalks, crosswalks and bike lanes as a matter of routine.

However, everyday walking and cycling as a means of transportation and basic access to work, transit, shops, services, and recreation is still perilous and unappealing for the vast majority of residents. For those residents who don’t have a choice but to walk and/or bike, conditions for these active travel modes (including in combination with transit) are less than ideal – as evidenced in part by the high number of crashes involving pedestrians and bicyclists in the City.

Secretary Foxx went on to say in his remarks to the Center for American progress that “We can’t change everything about the past, but we can certainly work as hard as we can today to repair our infrastructure to make it the connective tissue it ought to be.” This review of the existing conditions for walking and bicycling in Jacksonville is written very much in that spirit: moving forward, based on solid foundations, so that bicycling and walking can thrive in the future.

What We Know About Walking and Bicycling in Jacksonville

The scope of work for the City of Jacksonville Pedestrian and Bicycle Master Plan explicitly recognized many of the unique challenges faced by the region. First, rather than attempt to study the entire City, the study area was focused on four of the Mobility Zones used to develop and implement the Comprehensive Mobility Plan: Mobility Zones 7-10, generally speaking those areas within the confines of the I-295 beltway (Figure 2). However, the recommendations generated by the plan will be applicable to the entire city.

Secondly, the Master Plan tasks were designed to document – and in many cases establish – a baseline of key indicators related to walking and bicycling that were missing from previous planning initiatives. Thus, in addition to gathering public input from two public

meetings, an on-line survey and an interactive Wikimap that allowed people to identify and comment on locations and issues of note, the study team was tasked with reviewing and documenting the following factors:

- Pedestrian and bicycling activity levels
- Crashes involving pedestrians and bicyclists
- Current infrastructure for walking and bicycling, including bicycle parking
- Existing and future plans, policies and programs for walking and bicycling (including those developed by relevant non-city agencies and organizations)

In each of the first three bullets, the TDG team was asked to identify and implement an appropriate method of documenting the necessary information in focused areas within the larger study area. So, for example, no counts had ever been done to determine how many and where people walk and bicycle in Jacksonville. The study team identified an appropriate counting methodology, tested it out in the field in ten locations, and is making recommendations for an ongoing counting program based on the lessons learned in that task.

These tasks are summarized below, and a separate appendix on each of these topics has been prepared as part of the overall Existing Conditions report.



PEDESTRIAN AND BICYCLING ACTIVITY LEVELS

In common with most cities in the United States, there is very little hard data about walking and bicycling activity in the City of Jacksonville. The U.S Census Bureau captures information about the mode of transportation for journeys to work in the annual American Community Survey, and the numbers for walking and bicycling in Jacksonville are low. Less than two percent of people commuting to work in the City report walking or bicycling as their primary mode of transportation, and that number has fallen since 2010.

This data, however, doesn't capture non-commuting trips, which represent more than 80% of all trips today, or even those commuting trips that are made partially by foot or bike but primarily by bus, e.g. people walking to the bus stop or biking to a park and ride facility.

These numbers are important because any attempt to gauge the relative safety of walking and bicycling must consider exposure, or the amount of walking and bicycling in a community. Additionally, a lot of transportation planning and project development depends on the journey to work data rather than any broader measure of trip making.

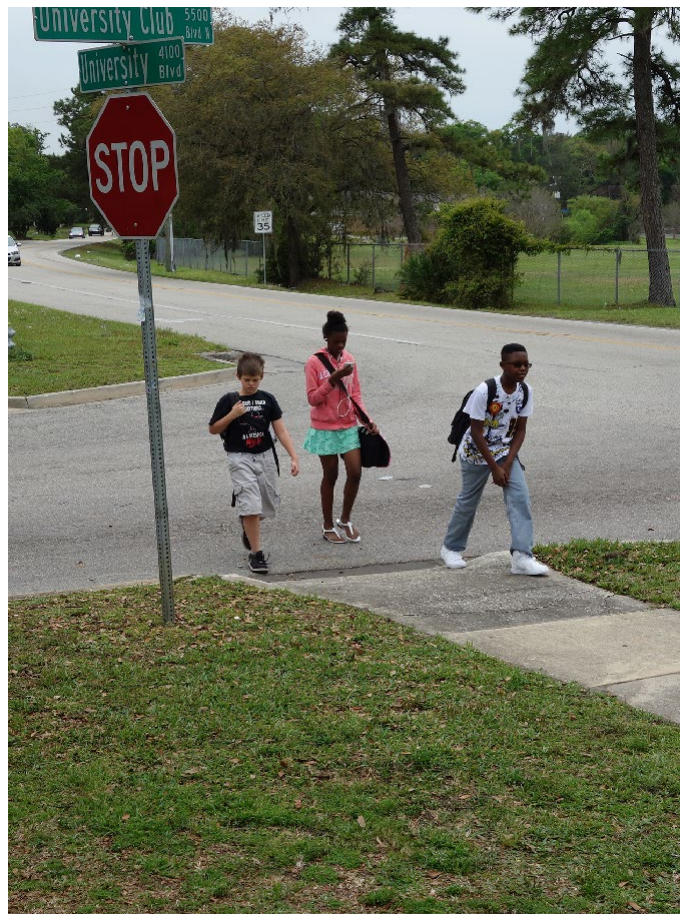
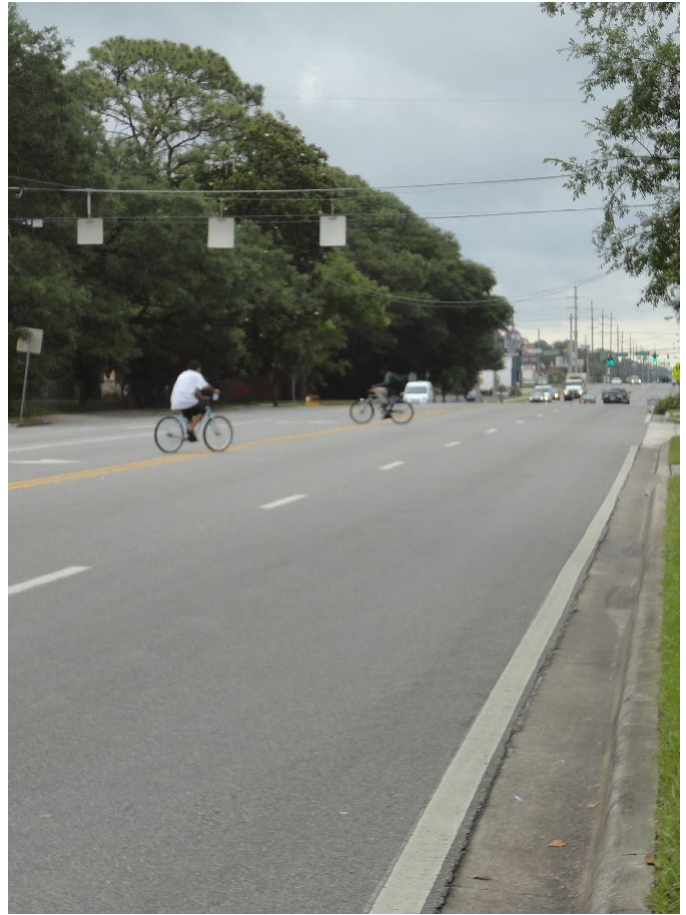
The Jacksonville Transit Authority reports that in 2015 an average of 20,000 passengers per month boarded a bus with a bicycle (on the front rack), which is approximately 2% of all passengers.

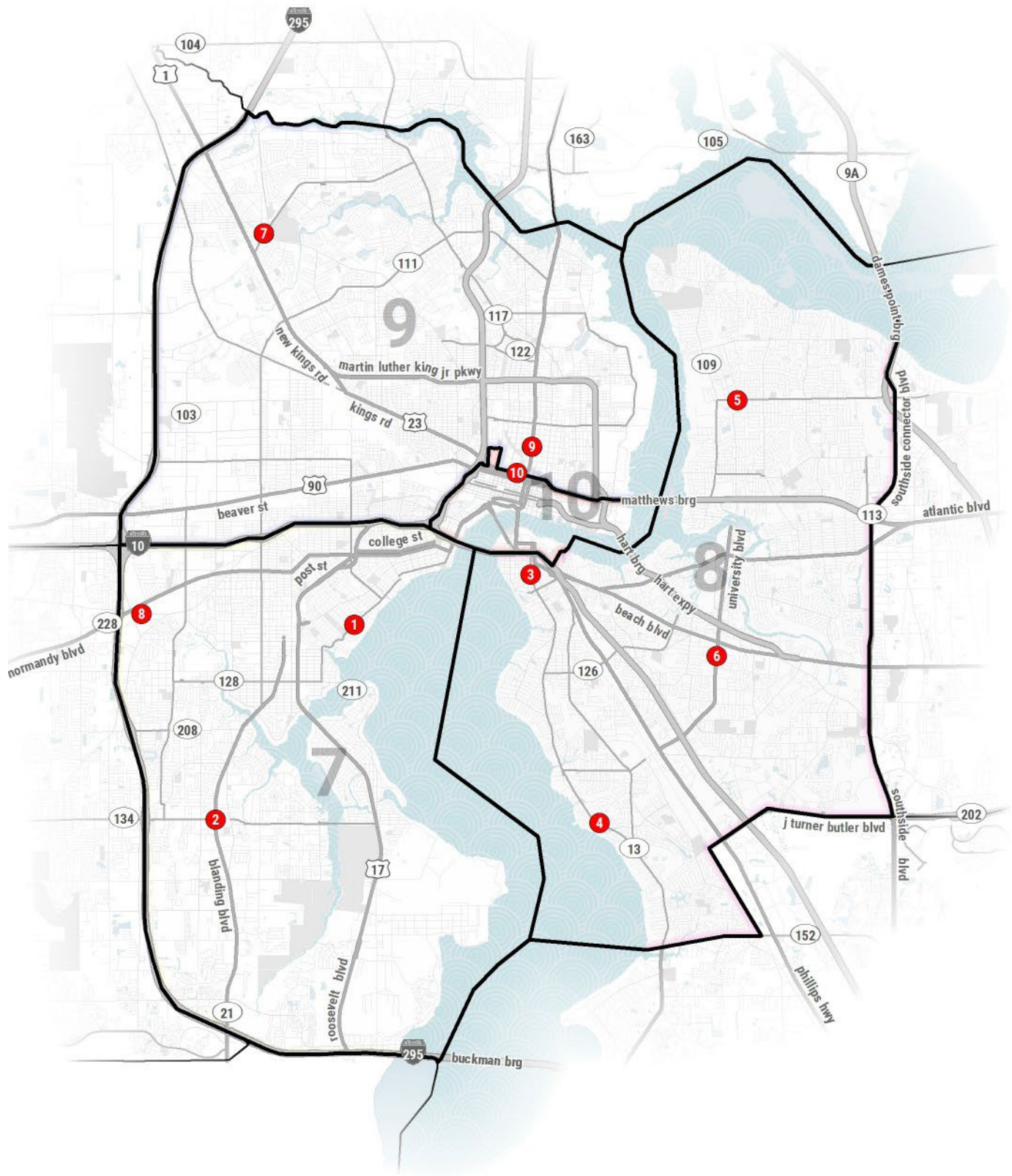
The study team was tasked with counting pedestrians and bicyclists in ten locations with a view to capturing some real numbers about the amount of activity in the community, and to recommend potential ways to establish a regular counting program that would enable the City to monitor progress from one year to the next.

The ten locations were identified from a matrix of factors including known areas of high pedestrian and bicycle activity, high crash locations, and sites where sidewalk improvements were scheduled in the near future (Figure 3). A counting methodology developed by the National Bicycle and Pedestrian Documentation Project was selected to guide the process. This method is a consistent, tried and tested method that also facilitates comparisons with other communities as well as from year to year in Jacksonville.

The counts were carried out, by hand, in January and February. The results were consistent with expectations in that the downtown location had the highest levels of activity, and there was a higher bicycle count on the San Jose Blvd corridor than most other locations because of new bicycling infrastructure. In addition, there were several notable and more surprising outcomes.

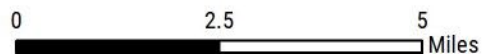
a. While there were no locations with huge numbers of





Bicycle/Pedestrian Count Locations

- Count Locations
- Mobility Zone Boundary



Date: 3/23/2017

Figure 3. Map showing the location of ten bicycle and pedestrian counts within the study area.



pedestrians and/or bicyclists, the counts confirmed that at all locations there were always people on foot and on bike using the streets and sidewalks for transportation and recreation. This confirms anecdotal observations that pedestrians and bicyclists are a continuous presence at intersections and along roadways throughout the study area.

- b. A significant number of bicyclists were observed using the sidewalk rather than the roadway. Of the total 250 bicyclists observed during the counts, almost 150 were riding on the sidewalk. In two of the three locations where bicyclists were riding almost exclusively on the roadway, there were marked bicycle lanes on the roadway – San Jose Boulevard and Hendricks Ave.
- c. The counting process did not make it easy to document where and how pedestrians were crossing the street, and in particular if they were using a crosswalk – if one exists. Most pedestrians were recorded on the sidewalk and in the crosswalk; anecdotal observations suggest that this isn't the case in large swaths of the city. The counting forms make it difficult to record intersection movements when pedestrians are crossing close to the crosswalk but not actually in it, and whether or not the crosswalk is being used as intended.

Key Recommendation

The TDG team recommends the city establish a permanent counting program, initially using the framework and tools

of the National Bicycle and Pedestrian Documentation Project in the locations chosen for this study. Expanding the number of locations in the future should include bridge counts on either the Main Street or Acosta bridges or approaches, as well as locations outside Mobility Zones 7-10.

Looking further ahead, the City should identify opportunities to establish permanent counting sites using permanent counters, smart traffic light technology, and video or infra-red cameras built into traffic signals.

PEDESTRIAN AND BICYCLIST CRASHES

One of the primary motivations for the Pedestrian and Bicycle Master Plan is to reduce the alarmingly high number of pedestrian and bicyclist fatalities and serious injury-producing crashes in Jacksonville. Each year, approximately 120 people are killed on Jacksonville roads and an average of 30% of the victims are either pedestrians or bicyclists—predominantly people walking. By comparison, in cities of a similar population like San Francisco, Boston and Seattle an average of between 20-30 people are killed each year in traffic crashes. In 2015, 230 people died in traffic crashes in New York City—not quite two times the number of people killed in Jacksonville, with almost ten times the population.

The study team analyzed ten years of crash data (2006-2015) for pedestrians and bicyclists, primarily within the area of Mobility Zones 7-10. We looked briefly at one year (2015) of data for all traffic crashes

in the Signal4 database for the same area. We have also looked at all the individual crash reports at one high crash location, 103rd Street (SR 134) and Blanding Boulevard (SR 21), and will be doing that for other high crash locations as part of a subsequent task.

Jacksonville has a serious traffic safety problem. The raw numbers are simply alarming and place the city at or near the top of all the wrong rankings of pedestrian, bicyclist and motorist safety. Among the titles of dubious distinction are that Jacksonville is the:

- 10th Most Unsafe City to Drive (Dangerousroads.org)
- 9th Most Deadly American City for Drivers (thrillist.org, using data from NHTSA)
- 3rd Most Dangerous City to Walk (Dangerous by Design, Transportation for America)
- 1st Most Pedestrian and Most Bicyclist fatalities per 10,000 Pedestrian/Bicycle commuters (Alliance for Biking & Walking, Benchmarking Report)

The most important findings of the pedestrian and bicycle crash analysis for the City of Jacksonville include the following:

- There were 3,093 reported pedestrian and bicycle crashes in Jacksonville between January 1, 2011 and January 1, 2016, with 1,132 bicycle crashes and 1,961 pedestrian crashes. Of those, 22 bicycle crashes and 149 pedestrian crashes resulted in fatalities.
- Pedestrian and bicyclist crashes represent 2.1 percent of the total crashes during this time period, but they account for 27.6 percent of fatalities.
- A higher percentage of pedestrian crashes (7.6 percent) resulted in fatalities than bicycle crashes (1.9 percent)
- State roads are overrepresented in crash numbers.



State roads comprise 6.2 percent of the street network in Jacksonville yet account for 32.1 percent of crashes.

- Crashes on state roads accounted for half of the fatalities between 2011 and 2015.
- Most pedestrian and bicyclist crashes (61.7 percent) occur away from intersections. A higher percentage of pedestrian crashes (70.0 percent) occur at mid-block locations than bicycle crashes (47.3 percent).

The detailed analysis identifies recommendations for improved data collection. The analysis was used to inform the needs assessment, Pedestrian Safety Action Plan, and Bicycle Level of Service Analysis tasks that follow.





	ALL	PEDESTRIAN	% PEDESTRIAN	BICYCLIST	% BICYCLIST	% NONMOTORIZED
2010	388,067	6209	1.6	1552	0.4	2
2011	386,527	5025	1.3	1546	0.4	1.7
2012	382,986	5362	1.4	1532	0.4	1.8
2013	378,200	4917	1.3	1513	0.4	1.7
2014	380,698	4949	1.3	1903	0.5	1.8

Source: ACS 5-yr estimates

Figure 4. Share of trips made by walking and bicycling in Jacksonville

The American Community Survey¹ collects annual data on a wide range of economic and demographic data, including the mode of transportation used by people to get to and from work. The data for Jacksonville, Fla., shows a general decline in the number and percentage of people walking to work since 2010 (Figure 4). There is a small increase in the share of people bicycling to work.

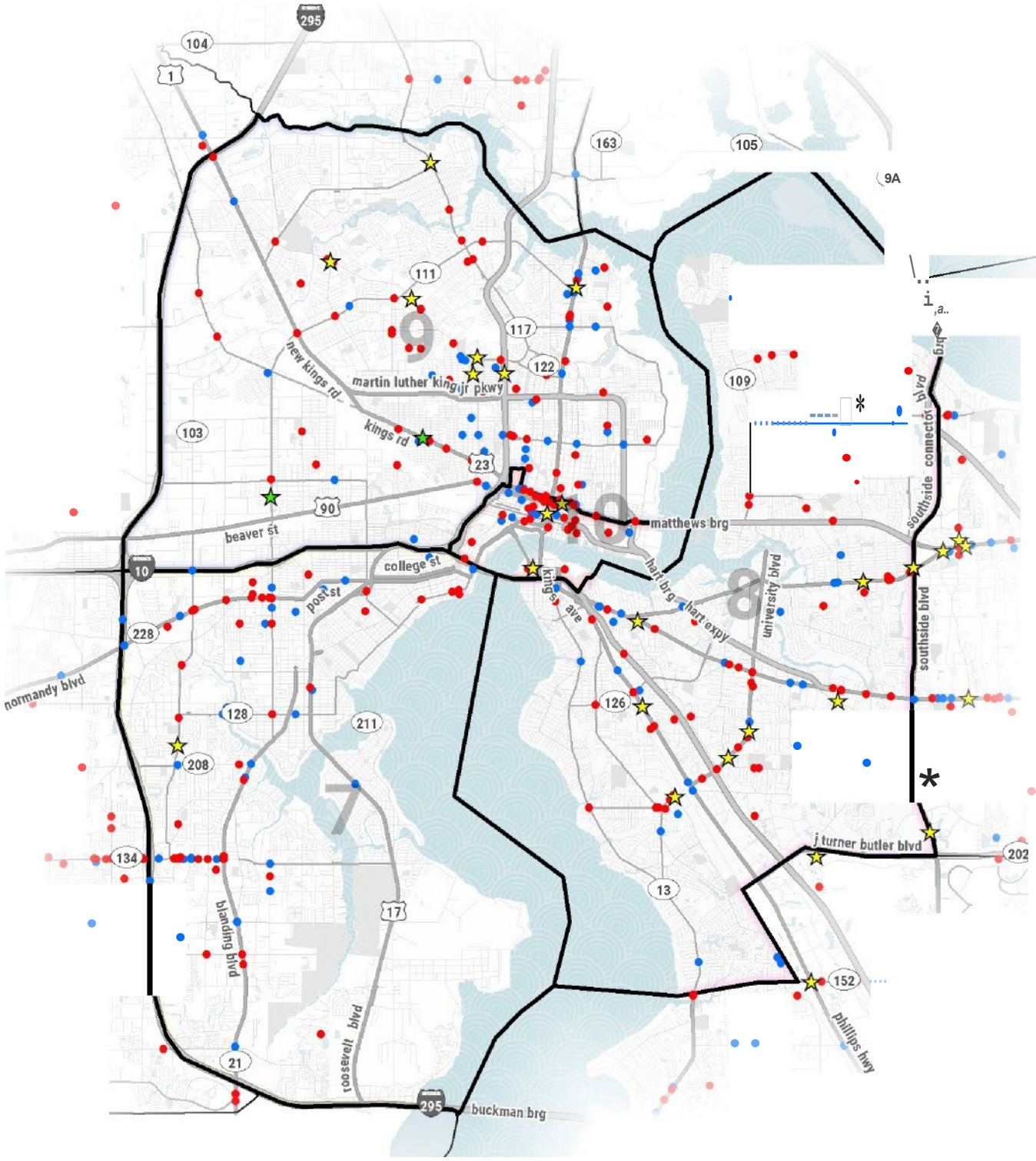
By way of comparison, data is also provided for Charlotte, N.C.—a southeastern city with a similar population. Since 2010, Charlotte has seen a steady increase in both walking and bicycling (Figure 5).

	ALL	PEDESTRIAN	% PEDESTRIAN	BICYCLE	% BICYCLIST	% NONMOTORIZED
2010	354,478	6735	1.9	354	0.1	2
2011	357,349	7147	2	715	0.2	2.2
2012	364,855	7662	2.1	730	0.2	2.3
2013	367,443	8084	2.2	735	0.2	2.4
2014	378,456	8326	2.2	1135	0.3	2.5

Source: ACS 5-yr estimates

Figure 5. Share of trips made by walking and bicycling in Charlotte, NC.

¹ American Community Survey, US Census Bureau



Pedestrian and Bicycle Crashes (Signal 4 Database January - December 2015)

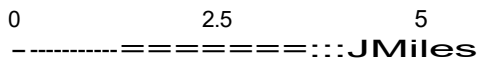
* **Pedestrian Crashes**
 ● **Bicycle Crashes**
 D **Mobility Zone Boundary**

Fatal (29)

Fatal (2)

● Non-Fatal Injuries (275)

● Non-Fatal Injuries (159)



Date: 3/23/2017

Figure 6. Location of pedestrian and bicyclist crashes in the study area, 2015

Key Recommendation

Adopt a goal of zero fatalities and serious crashes by 2030 as a primary goal of the Master Plan. In 2015 alone, 31 pedestrians and bicyclists were killed and 434 seriously injured in the City (Figure 6). Vision Zero policies have been adopted by numerous cities and counties across the country in an effort to eliminate fatal and serious traffic crashes. This approach requires a high level of accountability and transparency in the collection, analysis and presentation of crash data.

PEDESTRIAN AND BICYCLE INFRASTRUCTURE

The study team reviewed available documents showing pedestrian and bicycle infrastructure in the city; visited large areas of the city as part of the field work for the project; and conducted extensive desktop reviews of the sidewalk, crosswalk and bicycle infrastructure on city and state roads throughout the community.

Although there are notable exceptions in certain areas, it is generally true to say that:

Downtown

Downtown Jacksonville has a relatively complete network of sidewalks on both sides of the street, and marked and signalized crossings at most all intersections. The signals are timed and have an automatic pedestrian phase. The on-road bicycle infrastructure is minimal, with only a few streets having even sharrows. Some of the traffic calming features near Jacksonville Landing and the St John's River are detrimental to safe and comfortable cycling, notably the granite pavers used in the intersections along North Laura Street.

Recent changes to downtown streets include the addition of shared bus and bike lanes on Jefferson and Broad Streets. The relatively low volume and speed of both buses and bikes on these streets makes this an appropriate treatment. In the future, the potential switch from one-way to two-way operation on streets such as Monroe, Forsythe, and Pearl has the potential to make these streets more walkable and bike-friendly.

Downtown Jacksonville has a limited amount of bicycle parking available throughout the area. The JTA provides at least one or more bike rack at each bus stop, and is improving the provision of bike parking as it improves its bus stops over time. There is a need for more parking capacity, more evenly distributed at key locations throughout the downtown area and in other neighborhood commercial districts.





Key Recommendation

Improve the availability of bicycle parking in the City, especially in the downtown area. The Plan recommends the City establish a bicycle parking ordinance in place that meets or exceeds the standards recommended by the Association of Pedestrian and Bicycle Professionals.

Local Streets

Most local, residential streets in the City of Jacksonville have no sidewalks on either side. This is true of the older, historic neighborhoods of Riverside and San Marco, just as it is for post-war developments such as Sweetwater (between Wilson Boulevard and 103rd Street just inside the I-295 Beltway), Arlington and Lake Lucina, and 45th Street & Moncrieff Road. There are no bicycle facilities on these streets.

Collector streets in these neighborhoods may have a sidewalk on one side, often well set back from the roadway, and sometimes switching from one side of the road to the other. There are very few marked or controlled crosswalks. There are no bicycle facilities on these streets. A small amount of bicycle parking, of varying quality and effectiveness, can be found in local commercial centers such as Edgewood Avenue and Riverside Avenue.

Arterial Streets

Minor arterial streets often do not have sidewalks on both sides, but may have them on one side. At the intersection of these streets with major roads, there are usually no marked or controlled crosswalks across the major road; there may be marked crosswalks across the minor arterial. Typically, there are no bicycle facilities on these roads, although notable exceptions include Lone Star Road, Spring Park Road, and McDuff Avenue which have striped bicycle lanes.

Major arterial streets, whether they are under City or the Florida Department of Transportation (FODT) jurisdiction, typically do have sidewalks on both sides. Particularly on new and recently improved state roads, these sidewalks are often well setback from the roadway. At the intersection of major roads, fully signalized and controlled crosswalks are the norm on all legs of the intersection. However, there are very few crosswalks marked or controlled, at the intersection of these major roads with any other roadway. This means there are long distances between marked and controlled crossing locations for pedestrians on these busy roadways with fast moving traffic.

Florida DOT and the City are including bicycle lanes on new and improved major roads such as Soutel Drive (west of New Kings Road), San Jose Boulevard, Fort Caroline Road, and sections of 8th Street. This is good, but has resulted in a discontinuous network



of bike infrastructure, often with poor or no transition from sections of roadway with bike lanes to those without. Also, most of the bike lanes are of minimum recommended width (4 feet), even though they are on busy, high-speed multi-lane roadways. (e.g. San Jose Boulevard between Kori Road and the I-295 Beltway.) There are no examples of buffered or protected bike lanes in the City.

Bicyclists are frequently not detected at traffic signals with loop detectors; this is particularly challenging where local and collector streets cross major roads and where bicyclists are turning left from a left turn lane. We recommend that FDOT and the City adjust the sensitivity of their loop detectors at traffic signals to detect bicyclists, and that the sweet spot in the detector loop is marked with a bike symbol to encourage bicyclist to position themselves in the location most likely to trigger the signals.

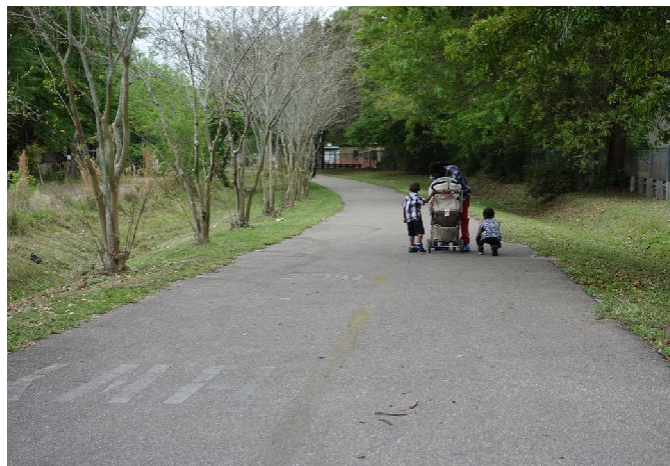
Off-road Facilities

Off road facilities for bicycling and walking are scattered throughout the City of Jacksonville. Although outside the area covered by this planning effort, the Baldwin Trail is clearly a popular and well-known destination for cyclists in the region. The S Line is a closer-in and more generally accessible greenway project at the heart of ambitious plans for redevelopment of an area that has suffered from underinvestment for many years. A shared use path along Kernan Boulevard provides one of the longer stretches of pathway in the area, although it suffers from discontinuity due to the frequent side streets that the path must cross.

Transit Infrastructure

Almost every transit trip starts and finishes with people on foot. We noted earlier that 20,000 bus passengers each month access and egress the bus with their bikes, and there are some park and ride bus services run by the Jacksonville Transit Authority (JTA) where the first and last miles are traveled by car; but walking is the primary mode by which people access transit in Jacksonville. JTA has a comprehensive program of upgrading and improving transit stops, especially on the higher capacity and frequency corridors, so that shelters, concrete sidewalks and pads, bike parking and benches are provided.

However, there are still a lot of bus stops on roads where there are no sidewalks or sidewalks only on one side of the road. Equally important, there are many locations where no marked or controlled crosswalks exist to enable passengers to safely cross the road at the start or finish of their transit trip. Even when there are marked and signalized crosswalks near the bus stops, the study team noted that a significant percentage of riders cross in non-crosswalk locations.



The JTA Mobility Works initiative has identified several exciting opportunities in key transit corridors to dramatically improve the walking and bicycling environment – as well as for transit passengers and drivers – based on extensive public outreach and a series of charrettes. To the maximum extent possible, the Pedestrian and Bicycle Master Plan synchronizes recommendations, focuses area work, and prioritizes projects to take advantage of JTA’s work in these locations.

Key Recommendation

Adopt consistent, current roadway design standards for urban streets that increase the safety, comfort and accessibility of streets and roadways for pedestrians and bicyclists. The Context Sensitive Streets Committee should coordinate this across agencies to ensure consistency of approach and design. This should be accompanied by an aggressive program of training on facility planning and design targeted at all agency planners, engineers and urban designers, as well as consultants that are hired to work on transportation projects within the City.

Detailed Facility Inventory

The study team was tasked with completing an inventory of new pedestrian and bicycle infrastructure in up to six focused areas in an effort to update the 2010 Mobility Plan data and maps. We determined that the current existing data in the 2010 plan was insufficiently detailed to provide a useful GIS layer to update. The sidewalk inventory, for example, noted whether a street segment had zero, 50% or 100% sidewalk coverage, but did not provide information on which side or sides of the street the sidewalk was located, or whether the sidewalk was continuous and connected. Similarly, current bike infrastructure data failed to identify critical distinctions between shoulders, parking lanes and bike lanes, and didn't differentiate between the varying widths of these segments of bikeway.

As a result, the study team completed a fresh inventory of bike and pedestrian infrastructure in four areas of the city, and updated the bike infrastructure data in the San Jose Boulevard corridor. The four areas inventoried included North Arlington, Sweetwater (103rd Street & Blanding Boulevard), Lem Turner Road (SR115) and Edgewood Avenue W., and the area around the S Line and UF Health Center. In those areas, we also captured information about the presence of marked crosswalks.

The absence of reliable baseline data on the extent and nature of pedestrian and bicycling infrastructure throughout the city is a significant challenge moving forward. We recommend that the City undertake a comprehensive inventory of sidewalks, crosswalks, shared use paths, and bikeways to facilitate a more deliberate and data-driven approach to completing a bikeway network and improving conditions for walking. The City should conduct regular inventories on walking and biking infrastructure that are tracked using GIS and provide detailed information on the status, condition and design features of that infrastructure.

Key Recommendation

The city should maintain a current GIS layer with existing bike and pedestrian infrastructure to assist in ongoing planning efforts.

EXISTING PLANS AND GUIDELINES

The City of Jacksonville, North Florida TPO, JTA, Downtown Investment Authority (DIA) and the Florida DOT all have several existing plans and guidelines that are generally supportive of pedestrian and bicycle transportation. The study team met with various agency stakeholders, including the JTA, DIA, and NFTPO, and found a clear and consistent commitment to address pedestrian and bicycle safety and access issues.

The study team has reviewed these planning documents and identified specific areas of opportunity in the recommendations of these documents. There is also room for improvement. The study team noted that while much of the planning framework exists already to make the City of Jacksonville a more walkable and bike-friendly community, there are three major challenges:

a) Ensuring coordinated action . There is little disagreement about the need or desire to improve conditions for walking and bicycling in the City of Jacksonville. The policy framework is largely in place, as is much of the technical guidance necessary to carry out existing plans. The opportunity exists to combine the efforts of numerous agencies and stakeholders into something much greater than the sum of its parts.

b) Not repeating the mistakes of the past. The current NFTPO Long Range Transportation Plan calls for \$8.9 billion of investment in new roads and additional roadway capacity over the next 20 years. The additional traffic, development, and auto-centric growth that this investment will facilitate is destined to overwhelm even the best nonmotorized infrastructure that might be included in these and other projects.

c) Creating comprehensive design standards. The existing policy and regulatory framework does a good job of recognizing the need to address walking and bicycling in the development of the community. However, much of the guidance on what kind of infrastructure to provide to accommodate pedestrians and bicyclists is outdated and in need of revision. The work of the City's Context Sensitive Streets Committee and the JTA Mobility Works initiative will be critical to updating and improving the standard provision for pedestrians and bicyclists.

This Plan builds upon prior planning efforts for these modes to provide a more refined, strategic approach to planning and implementation of infrastructure, policies and programs that will increase safe walking and bicycling in Jacksonville.

Key Recommendation

The City should take the lead on establishing a regular, twice-yearly meeting with its partner agencies (NFTPO, FDOT, JTA, DIA) to coordinate activities such as street resurfacing, major construction projects, planning studies, transit system changes, and development projects. The goal of this meeting should be to ensure every opportunity is taken to implement the Pedestrian and Bicycle Master Plan as effectively and efficiently as possible, using ongoing projects to opportunistically improve conditions for walking and bicycling.

PROJECT APPROACH

LEADING BY EXAMPLE

PROJECT APPROACH AND NEEDS ASSESSMENT

When it comes to walking and bicycling, Jacksonville, Fla., can be described as a big city with a big challenge, and a lot of opportunity to improve. Encouraging walking and bicycling in a city covering the largest geographic area of any in the lower 48 states, where more than 100 people are killed in traffic crashes every year (one third of whom are cyclists or pedestrians), and where the majority of the metropolitan area has been built in the age of auto-dominated suburban development, is a daunting task. Tackling that challenge head-on, however, is vital for the long term economic and physical health of the community.

Where to start? The city does not have the benefit of decades of prior planning and implementation of bikeway networks and pedestrian-friendly development; there was no benchmark data on levels of use, network mileage, connectivity, or even the relative safety of biking and walking on city streets – just the raw crash data and the disturbing near-daily news stories of fatal or serious crashes on area roadways.

The development of the Pedestrian and Bicycle Master Plan was focused on the center of the city – approximately the area within the I-295 Beltway, or Mobility Zones 7-10 – to capture those areas with the highest existing levels of bicycling and walking, the greatest concentration of crashes involving pedestrians and bicyclists, and the biggest likely demand for these activities in the future.

Within this limited geographical scope, the study team was tasked with a series of data collection and inventory tasks that were designed to establish precedent and a methodology that could subsequently be used throughout the whole city. The study included documenting pedestrian and bicyclist counts in the city and inventorying bicycle parking spaces and walking/biking infrastructure in several neighborhoods. In each case, the study team has recommended an approach to continuing these tasks across the whole city in the future.

The discovery phase of the project also revealed:

- A systemic, citywide traffic safety problem with 15,000-18,000 injury-producing motor vehicle collisions every year
- Serious and fatal crashes are heavily concentrated on major arterial roadways – especially FDOT roads (Figure 7).

- Pedestrian and bicyclist crashes are also heavily concentrated on roads with higher speeds and multiple lanes
- There is a significant absence of basic pedestrian infrastructure – sidewalks – on many roads in neighborhoods throughout the city
- There is a significant absence of crosswalks on all but the busiest intersections, leaving long stretches of busy roadways with no controlled or marked crosswalks (with the notable exception of the downtown core where crosswalks and sidewalks are mostly present)
- Infrastructure for bicyclists – trails, striped lanes, signed and marked routes – is highly disconnected and is often the bare minimum required for designation (e.g. bike lanes are minimum widths regardless of traffic volumes, speed and number of lanes)
- There is a widespread disregard for crosswalks by both motorists (failing to stop/yield) and pedestrians (not using push buttons, crossing out of the crosswalk or against the light)
- Extensive sidewalk bicycling (except for riders in the “enthusiast” category), even on streets with marked bike lanes such as North Main Street, suggests a high level of perceived danger associated with on-road bicycling
- An absence of any organized group(s) of pedestrians or voice for issues around walking safety, and
- An active bicycling constituency representing a relatively narrow segment of the observed cycling population.

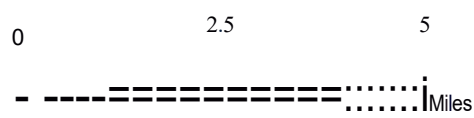
Against this backdrop and potentially overwhelming needs assessment, the study team pursued a strategy for addressing pedestrian and bicyclist issues separately. The goal was to provide both a systematic, long-term, city-wide approach to create a more walkable and bike friendly community while simultaneously creating an actionable list of projects immediately ready for funding through the CIP and Mobility Fee process.



Pedestrian and Bicycle Crashes (Sig al 4 Database 2011 - 2015)

Bicycle and Pedestrian Crashes Per Mile by Quantile D Mobility Zone Boundary

- 2.00135959 - 2.43583804
- 2.43769733 - 4.09681459
- 4.10887555 - 6.50239465
- 6.50971146 - 11.3734478
- 11.3908290 - 583.016994



Date: 3/23/2017

Figure 7. Crash frequency by roadway segment for pedestrians and bicyclists.

WALKING APPROACH

The study team identified five common Jacksonville street types that emerged from the crash study, facility inventory, field work, and other data collection activities. In documenting these street types, the study team highlighted one prime example of each type, together with several similar streets within the study area that fell into the same category and had the most significant crash history and demand for walking.

For each of the five street types, a summary of the key issues and potential design solutions is presented. Before and after images are rendered to show the changes that are necessary to enhance safety and accessibility on that type of street.

BICYCLING APPROACH

Addressing the issues and opportunities around bicycling centered on a traditional approach to establishing a bikeway network in the study area that can be used to identify and prioritize key projects to improve bike safety, accessibility and mobility.

The study team identified a network of some 250 miles of on-street and off-street trail infrastructure that includes existing bikeways (e.g. bike lanes on San Jose Boulevard; the S Line Trail) on city and state rights of way, as well as potential corridors for improvement.

CREATING A ROADMAP FOR CHANGE

The result of this needs assessment and project approach is an extensive set of recommended improvements to hundreds of miles of roadway throughout the study area – and, by extension, throughout the entire city. Clearly, such significant change won't happen overnight, and isn't going to be accomplished by the City alone.

Therefore, the following sections of this Plan create a roadmap for change that:

- Focuses attention on target areas (both high crash locations as well as area- and system-wide improvements that are necessary)
- Prioritizes recommended improvements based on community-developed criteria, and
- Identifies clear roles for the City, JTA, FDOT, DIA and other related agencies to play in making this transformation happen.

By following this roadmap, the City of Jacksonville can lead by example in implementing changes to create a more walkable and bike-friendly community.

PEDESTRIAN SAFETY ACTION PLAN

Elected officials, agency staff, the media, and the general public in Jacksonville are all acutely aware of the poor traffic safety record for which the city is infamous, particularly in relation to pedestrian safety. The city is ranked as the third most dangerous city in America for walking, and has been identified by the Federal Highway Administration (FHWA) as a Pedestrian Safety Focus City.

FHWA recommends, and the City has embraced, development and implementation of a Pedestrian Safety Action Plan to begin to address pedestrian safety issues. The study team followed the steps in the FHWA's "How to Develop a Pedestrian Safety Action Plan" to identify problems, develop countermeasures, and recommend an implementation plan. The implementation plan for Jacksonville is built around three key strategies.

SYSTEMATIC NEIGHBORHOOD ACTION PROGRAM FOR PEDESTRIANS (SNAPP)

The City has an extensive backlog of basic neighborhood pedestrian infrastructure needs that has to be addressed strategically to maximize efficiency and make a noticeable difference. The plan recommends an approach to improving sidewalks and crosswalks throughout the city that tackles all maintenance needs, as well as minor installation projects (e.g. filling a missing section of sidewalk), in a defined neighborhood or area in one concentrated effort – rather than in a reactive, piecemeal approach in individual locations all over the city. This approach is modeled on the City’s successful stormwater management program.

Further, the plan recommends that the prioritization of neighborhoods to receive SNAPP treatment incentivizes community involvement in completing walking audits (another tool provided by the Federal Highway Administration for Focus Cities) to identify needed improvements in the community.

TARGETED ROADWAY IMPROVEMENTS FOR PEDESTRIAN SAFETY (TRIPS)

Too many of the roads and streets in the City of Jacksonville lack adequate infrastructure for safe, convenient, and accessible travel by foot. Most streets lack basic sidewalks, or have sidewalks intermittently on one or other side of the road. Very few intersections have marked or signalized crosswalks, even on roads with significant volumes of traffic.

Only two of the five typical street types identified by the study team have even basic sidewalk and crosswalk facilities in place. On downtown streets, there are sidewalks and crosswalks throughout, but they are often a bare minimum given the actual and potential volume of pedestrians. Along busy commercial and retail roadways, minimum width sidewalks and periodic crosswalks (usually with minimum crossing times and continual turning traffic), are insufficient given the high volume and speed of motor vehicle traffic.

This is impossible to fix overnight. Each of the five typical street types identified in this plan is illustrated with an archetypal example, together with recommended improvements to improve pedestrian and bicyclist safety in that location. In addition, there are several locations identified with similar characteristics to the example where there is a history of pedestrian crashes and/or high pedestrian demand. Making the recommended improvements to these streets will begin to tackle immediate high crash locations in a highly visible manner – and establish concrete examples that are replicable, time and again, in locations all across the city.

The plan further recommends several strategies for

funding improvements to these specific roadways, including stand-alone projects for the Mobility Fee process as well as projects that are included in larger roadway improvements funded by the City or state.

RECOMMENDED LOCATIONS FOR RECTANGULAR RAPID FLASHING BEACONS

During the development of the plan, the study team was asked to address pedestrian safety issues from the perspective of where a particular countermeasure – the rectangular rapid flashing beacon – could be used to improve conditions for walking and pedestrian safety. The team created a methodology and initial list of locations suitable for the installation of RRFBs based on projected crossing demand, roadway characteristics, and crash history.

Implementation by the City of this combination of area-wide improvements, corridor-specific actions, and individual location-based countermeasures can start to change the narrative around pedestrian safety and access in Jacksonville, and point the way forward for all transportation- and development-related agencies and partners in the city.

BIKEWAY NETWORK IMPROVEMENTS

Connecting existing bikeways, and improving the overall safety of the on-road bicycling experience, emerged as clear priorities from the public, project steering committee members and agency staff throughout the planning process.

NETWORK IDENTIFICATION

The study team was tasked with identifying a network of bicycling infrastructure to serve people of all ages and abilities, and to focus on local – i.e. short distance -- bike access issues rather than longer distance cycling routes and trips. The city has a lot of local and neighborhood roads that offer a relatively low stress cycling experience, but connectivity of the street network is very limited. As a result, traffic – including bicycle traffic – is inevitably channeled to a smaller number of busy major roads and bridges that are very high-stress (if not downright hostile) bicycling environments.

Within the study area, the study team identified a potential low-stress network of 250-miles of bikeways, comprising a wide range of bicycle facility types. The network was selected to provide connected, accessible travel throughout the study area.

In some instances, for example where there are limited roadway connections across a river or highway, major arterials with high traffic volumes and speeds were included in the network. In order to make them part of a low-stress bicycling network, these roadways will require protected bike lanes or shared use paths.

In other corridors, low volume local roads were included as reasonable direct alternatives to parallel, busier major roads; on these routes, improvements to busy intersections will be needed to facilitate safe connections between quieter streets.

The plan therefore includes a 250+-mile bikeway network that, when implemented, will create a connected system of on- and off-street bikeways throughout the study area. Some segments of the network must be created as part of Florida DOT projects, others as the JTA completes its' Mobility Works initiative, and still more will be the responsibility of agencies such as the City of Jacksonville Parks department and the Downtown Investment Authority. The balance of the recommended improvements on City streets will likely be funded primarily through the annual CIP and multi-year mobility fee funding process.

NETWORK ASSESSMENT

Of this study network, approximately 150 miles was identified for assessment using the Bicycle Level of Service (BLOS) tool that is a component of Florida DOT's Quality/Level of Service assessment. The BLOS assessment uses roadway and traffic characteristics to determine a level of comfort that bicyclists (with some level of experience) typically feel on the road – with vehicle speed, traffic volume and lane widths as key determinants to that perception of safety or comfort.

Corridors with newly installed bike infrastructure, such as the San Jose Boulevard corridor, were excluded from the BLOS assessment as the goal was to focus on corridors where changes to the roadway would make a significant difference to the comfort and attractiveness of the route for cyclists, i.e. where the BLOS score could be noticeably improved.

For several reasons, the study team would not recommend continued use of the BLOS tool for additional application in the study area or when initiating a planning process for Mobility Zones 1-6.

- The BLOS tool is increasingly dated. For example, it does not adequately assess separated bikeway infrastructure types (e.g. Protected bike lanes, shared use paths) that are more and more common today;
- The BLOS assessment does not take into account intersections and turning movements, which are a significant factor in the feeling of safety and comfort on the roadway for bicyclists; and,
- The BLOS tool was initially calibrated with cyclists of some experience and tolerance for traffic – this does not provide the “all ages, all abilities” focus that communities are using today to determine facility choices and design. Instead, the City should

use the Bicycle Network Analysis tool to assist in the identification and development of the low stress bikeway network.

Based on the BLOS assessment; an analysis of crashes, public input, and network gaps; and current best-practice approaches to low stress bike network development, the study team has recommended specific bikeway facility types for the 250-mile network. The principles behind the facility selection – which boils down to increasing the degree of separation between motor vehicles and bicyclists as speed and traffic volumes increase – should also be applied for network development outside the study area.

PROJECT PRIORITIZATION

In order to create a prioritized list of bikeway projects for the Mobility Fee and CIP funding process, the consultant team worked with the City to break the proposed bikeway network down into individual project segments. These individual projects were then ranked using a tool that reflected priorities established by the Steering Committee, agency staff and the public. This process is documented in the bike network chapter that follows.

DESIGN RECOMMENDATIONS

Throughout the planning process, there has been a clear recognition that while the City must take a leadership role in improving conditions for walking and bicycling, there is also a critical role for other agencies to play. Important segments of the bikeway network will need to be created as part of Florida DOT projects. The ambitious Mobility Works initiative of the Jacksonville Transportation Authority includes critical corridors for walking and bicycling – and the full integration of walking, bicycling and transit is essential to provide real transportation choices in the community. In addition, players such as the Parks Department, the Downtown Investment Authority, and private sector developers all need to be following the city's leadership, and using the same roadmap to create a more walkable and bike-friendly Jacksonville. Therefore the Plan includes general design recommendations for these agencies and organizations to follow when implementing roadway, park and development projects.

PEDESTRIAN SAFETY ACTION PLAN

INTRODUCTION

Every year in the United States, up to 5,000 pedestrians are killed in traffic crashes. Throughout the 1990s and early 2000s, this represented approximately one in ten of all fatal traffic crash victims. In the last decade, however, that percentage of overall fatalities has risen to more than 15%. This has prompted much greater attention from the Federal Highway Administration (FHWA) and National Highway Traffic Safety Administration (NHTSA) as well as state and local government agencies – particularly in Florida, where 12% of all pedestrian deaths nationwide occur each year (compared to Florida’s 6% share of the overall US population).

One of the most popular programs to address pedestrian safety is the Pedestrian Safety Action Plan (PSAP), developed by FHWA as a cornerstone of the agency’s Pedestrian and Bicycle Safety Focus States and Cities initiative (which includes both the State of Florida and the City of Jacksonville). The PSAP is also a featured element of the US Department of Transportation’s Mayors Challenge for Safer People and Safer Streets, of which the City of Jacksonville is a participant.

One of the attractions of the PSAP is that it provides a data-driven approach to developing an action plan that is also tailored to the local context. The recommended approach includes eight steps:

- 1 Define Objectives
- 2 Identify Locations
- 3 Select Pedestrian Safety Countermeasures
- 4 Develop an Implementation Strategy
- 5 Institutionalize Changes to Planning and Design Standards
- 6 Consider Land Use, Zoning and Site Design Issues
- 7 Reinforce Commitment
- 8 Evaluate Results

By following these steps, a three-pronged PSAP emerged as a key element of the City of Jacksonville’s overall Pedestrian and Bicycle Master Plan. One element proposes a strategic approach to tackling the chronic lack of basic pedestrian infrastructure—accessible sidewalks and crosswalks—throughout the community. A second strategy identifies design changes for high-crash and high-demand corridors on city streets, using five common street types found throughout Jacksonville. The third piece of the puzzle starts with a preferred countermeasure, rectangular rapid flashing beacons, and recommends locations where they can be most effectively deployed to reduce pedestrian crashes.

Throughout this process, one fact dominated discussions. The overwhelming majority of fatal and serious injury crashes involving pedestrians occur on state highways, outside the direct control of the City. For example, the awful sequence of four pedestrian fatalities in November 2016 on one stretch of New Kings Road demands attention—yet this is a state road. The state’s response doesn’t include the addition of controlled crosswalks, although the addition of sidewalks to the corridor will certainly improve the comfort of pedestrians and transit users who currently have to walk along a grass verge on this high speed roadway.

As a result of this challenge, the Pedestrian and Bicycle Master Plan focuses on specific recommendations that the City itself can implement, and through which it can show leadership. However, the plan also provides recommendations for Florida DOT and other agencies, as their collaboration is essential to the creation of a more walkable community and safe pedestrian environment.

STRATEGIC NEIGHBORHOOD ACTION PROGRAM FOR PEDESTRIANS (SNAPP)

Creating a continuous network of sidewalks on both sides of the streets in residential neighborhoods is an important element in creating a safe and comfortable environment for pedestrians. Many trips include walking to or from a particular destination; on the other hand, most crashes take place close to home. Therefore, a complete sidewalk network linked to residences is vital to any pedestrian safety and multimodal strategy. Neighborhood schools also benefit through the creation of safe linkages for school-aged children.

In Jacksonville, as in many cities, the repair and infill of the sidewalk network in residential neighborhoods is performed on a case-by-case basis as community members request repairs. While this system has benefits such as directing resources to a specific need and being responsive to community concerns, it has many drawbacks as well, such as:

- Many communities suffer from missing or unmaintained sidewalks, but are not aware that repairs only take place in response to requests to the City.
- When a repair is made at a specific location while nearby repairs are not addressed, community members may become frustrated with the City's service.
- Moving city staff, equipment and supplies across the city daily to address individual maintenance needs is inefficient and typically leads to extensive backlogs and increased maintenance costs.
- A reactive response to maintenance can lead to an increase in sidewalk replacement, whereas regular maintenance can prolong the longevity of a sidewalk.
- A reactive spot-improvement maintenance system does not provide an opportunity to collect data on the existence and maintenance needs of sidewalks neighborhood-wide.
- The lack of a proactive and transparent system of neighborhood sidewalk assessment, repair

Sidewalks “reduce the incidence of pedestrian collisions, injuries, and deaths in residential areas and along two-lane roadways.”

— Institute of Transportation Engineers,
Technical Council Committee 5A 5 (1998)

and installation can lead to negative community-government relations.

It is recommended that the City of Jacksonville establish a proactive neighborhood-based sidewalk assessment, maintenance and infill program. The program should be managed by the Right of Way and Stormwater Maintenance Division within the City of Jacksonville Department of Public Works, which has had success implementing a similar system for the maintenance of drainage facilities.

The following are recommended steps for this approach:

Create Maps of Priority Areas using Council District boundaries. Starting with Council District boundaries, use readily available Geographic Information Systems (GIS) data to establish priority zones. It is recommended that the following data be used: pedestrian and bicycle crashes, schools, transit stations/bus stops, percent of seniors, percent disabled, percent in poverty, percent of households without vehicle access, and residential/commercial density.

Establish Priority Neighborhoods in each Council District. Based on the mapping exercise, establish annual neighborhood areas to be the focus of sidewalk assessments, repairs and infill. Determine the size of the areas based on staff's ability to assess and repair all the sidewalks in the area.



Convene a Neighborhood Assessment Walk. Work with the citizen Planning Advisory Committees (CPACs) to convene a Neighborhood Assessment Walk. For each neighborhood area, work with the CPAC to coordinate a walk with residents and City staff during which the sidewalk network is mapped including sidewalks needing maintenance, sidewalks needing replacement and missing sidewalks the community would like to see installed. As a suggestion, programs or extra-curricular activities can be incorporated in school systems or after school programs to teach the youth in the community about pedestrian crossing safety. For example, K-12 could take annual field trips that include traveling along and crossing their local streets. Such activities would educate the community on pedestrian safety, encourage people to become more active, make communities more family-oriented and take advantage of the new sidewalks.

In some instances, new sidewalks may not be easy to install due to a lack of right-of-way or complicated terrain. If right-of-way is needed, including the neighborhood in the process is more likely to lead to the provision of a sidewalk easement. Sidewalks on difficult terrain, such as steep slopes or those experiencing stormwater issues among others, may require design and engineering plans. These projects should be sent immediately to the Engineering and Construction Management Division within the City of Jacksonville Department of Public Works. The community should be notified that engineering work is needed and provided a timeframe for installation.

Establish sidewalk prioritization. Some neighborhoods may lack sidewalks throughout the area and due to budgetary constraints installing a complete network of sidewalks on both sides of the street may not be possible as part of this process. In these cases, sidewalk installation should be prioritized and installed based on the following factors:

- **Demand** – where there is expected pedestrian demand such as routes to school, retail centers, parks, and transit stops, among others.
- **Missing links/network gaps** – on missing blocks or lots that would form part of a larger network.
- **Through-streets** – on streets that create connections through the neighborhood and link to collector streets.

Complete Sidewalk Repairs, Replacement and Infill Immediately. Sidewalk repair, replacement and infill should commence within thirty days of the Assessment Walk to ensure that community members quickly see the results of their work. This also helps to reduce liability as the city has documented issues which it then has immediately addressed.

DESIGN RECOMMENDATIONS

Three important elements to designing for pedestrian safety and comfort in residential areas are sidewalk widths, sidewalk buffers and curb radii.

Sidewalk widths provide a comfortable space for pedestrian use and including allowing for passing. While recommended sidewalk minimums tend to be five feet in width, six feet in width further encourages walking by providing space for increased social interaction.

Sidewalk buffers provide space between the sidewalk and vehicles – either moving or parked. Buffers enhance sidewalks in numerous ways. Buffers provide a place for street trees or stormwater management, enhancing the health of the environment. Vegetative buffers create a more welcoming environment reminding drivers that they are in a community and leads to safer driving. Buffers separate pedestrians from the roadway, increasing pedestrian's feeling of safety, and leading to increases in walking. Buffers also create a place for street elements, such as street signs and light poles. Without buffers, signs and poles are often placed in the sidewalk, reducing their functionality and creating unsafe conditions. Lastly, buffers provide space for driveway ramps without affecting the slope of the sidewalk. A minimum five foot buffer is recommended to accommodate stormwater, street trees, and roadway signs and poles.

Curb radii are important elements that affect pedestrian safety. The curb radii of a street corner at an intersection, a driveway, or alleyway affects the speed of turning vehicles and the crossing distance of pedestrians. Vehicle speeds are directly correlated to pedestrian fatalities. The longer the crossing distance, the longer the pedestrian is in the roadway, increasing their chances of coming into contact with vehicles. In residential neighborhoods, a 15-foot curb radii is recommended at street intersections with tighter radii at driveways.

SIDEWALK MAPPING

The following maps show where residential sidewalks are needed in neighborhoods with high pedestrian injury rates (Figures 8-11). Similar maps should be created as the first step in the *Repair and Infill of Residential Sidewalks* process.

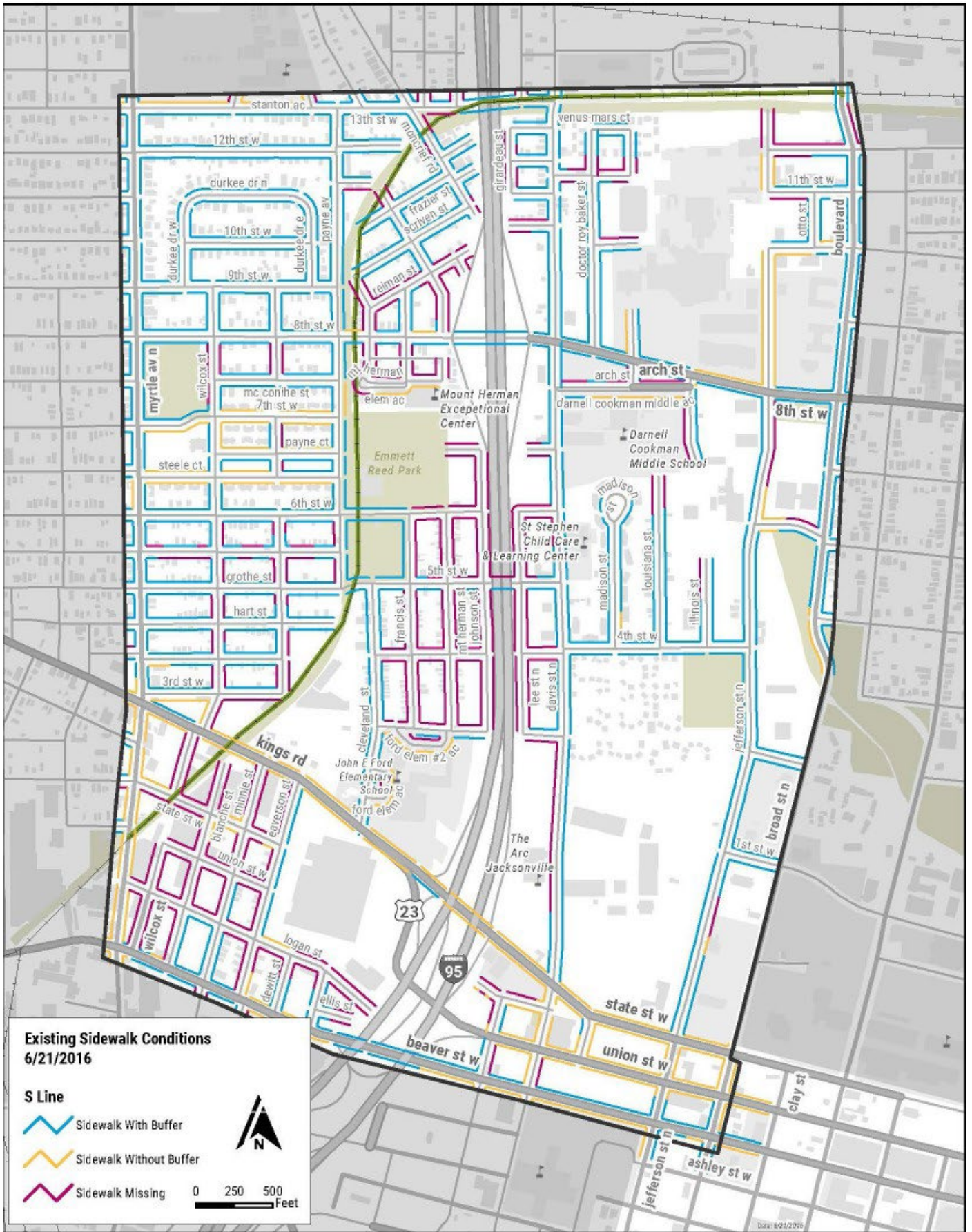


Figure 8. Existing sidewalk conditions proximate to The S-Line.

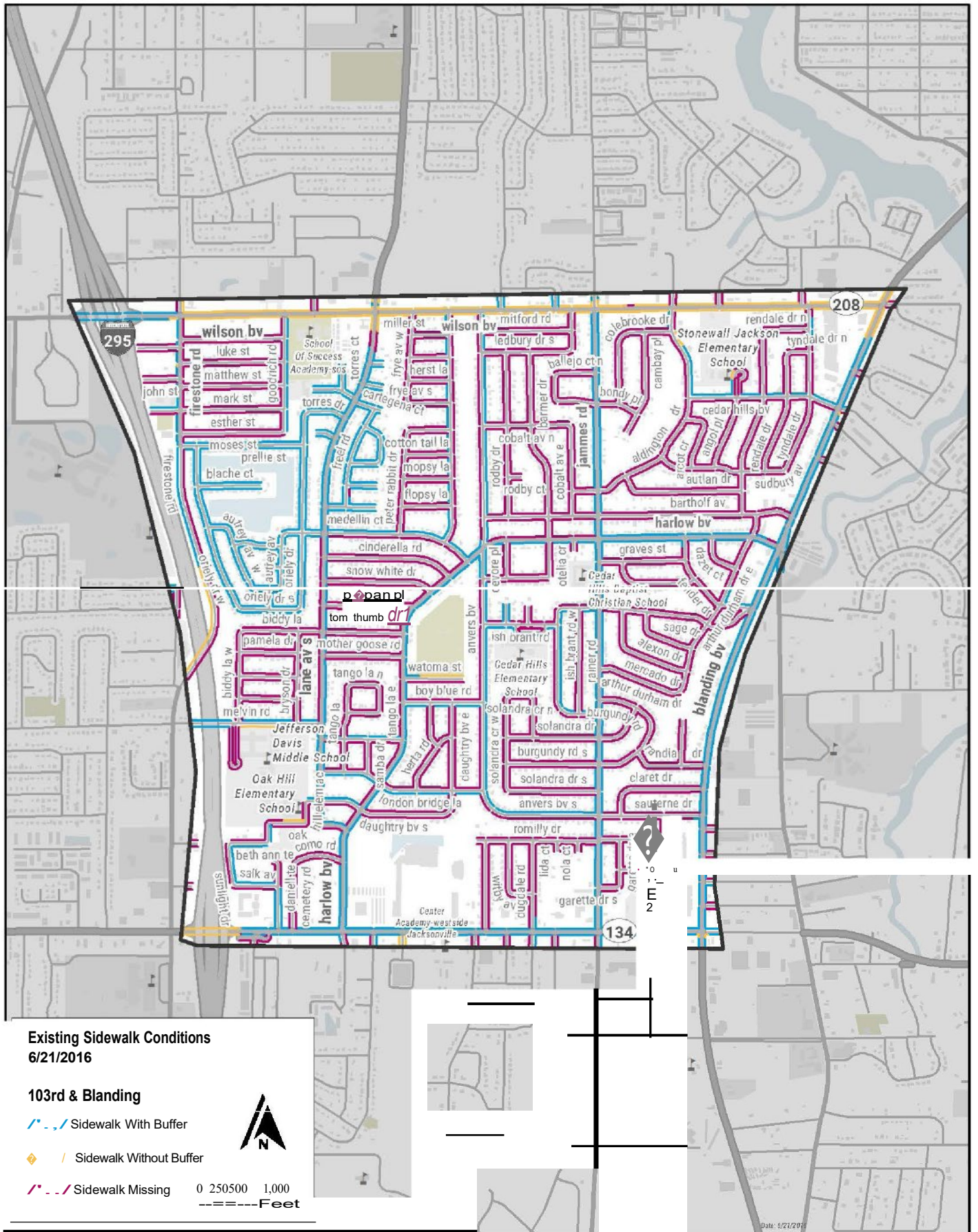


Figure 9. Existing sidewalk conditions at 103rd and Blanding.

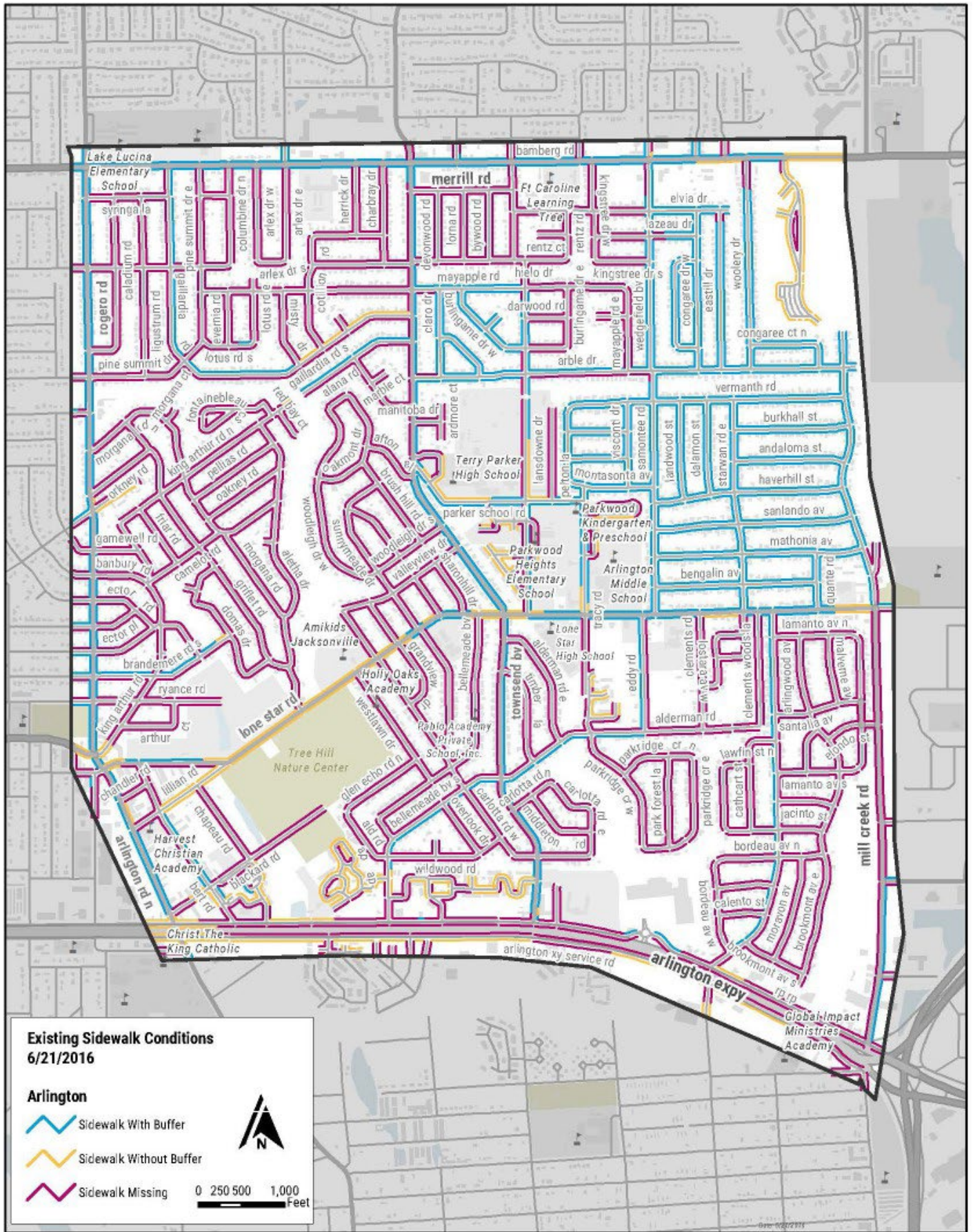


Figure 10. Existing sidewalk conditions in the Arlington neighborhood.

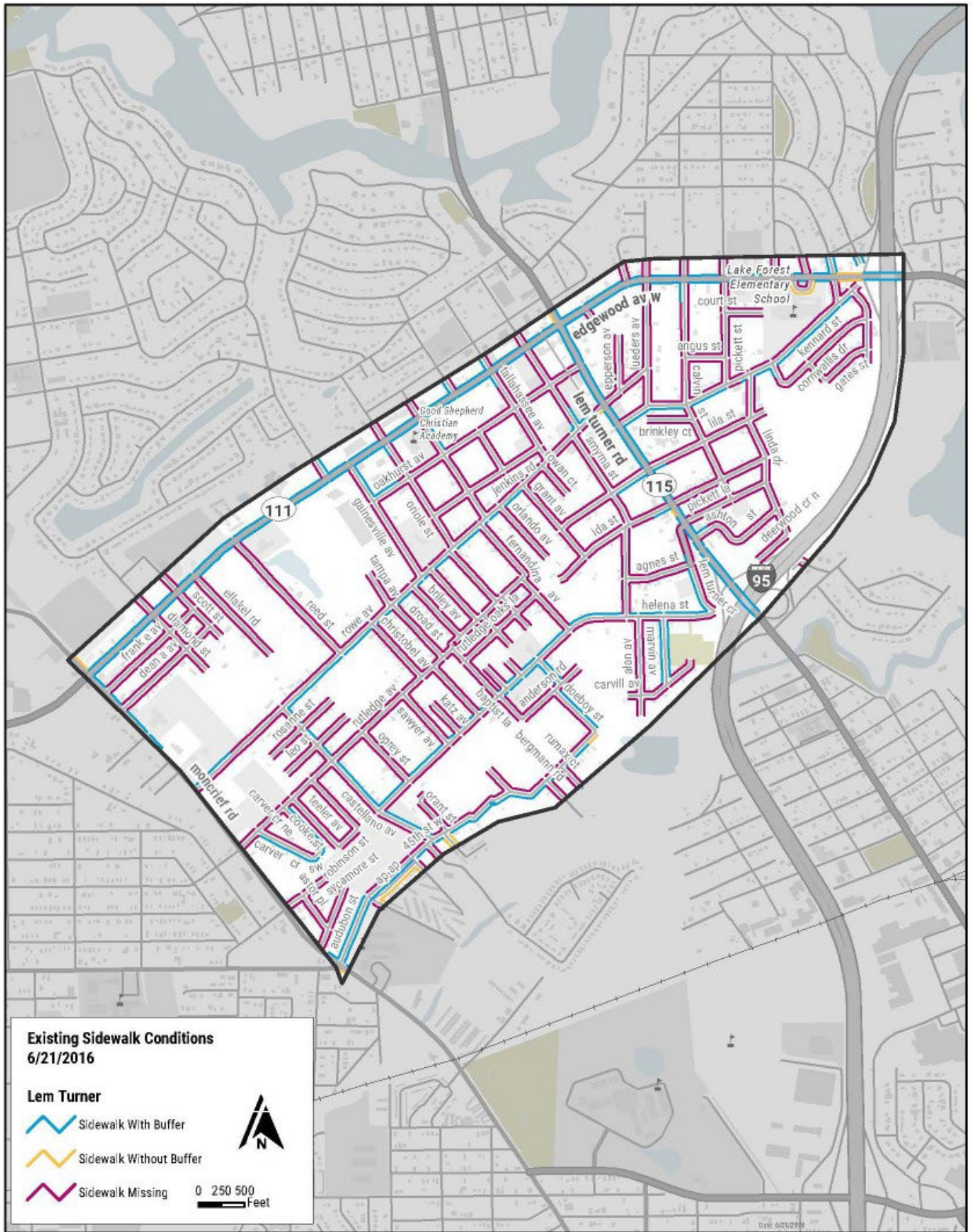


Figure 11. Existing sidewalk conditions, 45th and Moncrief and Lem Turner Road.

TARGETED ROADWAY IMPROVEMENTS FOR PEDESTRIAN SAFETY (TRIPS)



Residential Neighborhoods

Residential neighborhood streets serve the transportation needs of every resident every time they leave their homes. As such, it is especially important that residential streets are safe and comfortable for all users including people who walk and bicycle. Most crashes take place close to home and those crashes often involve Jacksonville's most vulnerable users such as children walking to school. A complete sidewalk network is vital to any pedestrian safety strategy and addressing motor vehicle speeds are the key to enhancing safety.



Roadways in residential neighborhoods of Jacksonville commonly consist of:

- Two lane roadways
- Limited sidewalks
- Wide buffer areas
- Limited curb ramps and ADA-compliant truncated domes
- Wide curb radii
- No marked crosswalks

Safety Enhancements





Recommendations to enhance safety in Jacksonville neighborhoods:



» **INSTALL SIDEWALKS WHERE MISSING AND INCREASE SIDEWALK WIDTHS.** The width of a sidewalk allows for comfortable use by pedestrians and allows for passing. While recommended sidewalk minimums tend to be five feet in width, six feet further encourages walking by providing space for increased social interaction.

Sidewalks “reduce the incidence of pedestrian collisions, injuries, and deaths in residential areas and along two-lane roadways.”

- Institute of Transportation Engineers, Technical Council Committee 5A-5 (1998)

» **CONTINUE TO PROVIDE AMPLE SIDEWALK BUFFERS.**

The sidewalk buffer is the area between the sidewalk and the roadway; in residential neighborhoods in Jacksonville, this area is typically used for stormwater management which improves the environment. Vegetative buffers enhance community safety by reminding drivers that they are in a neighborhood. Buffers create a comfortable distance between the sidewalk and vehicles—either moving or parked—increasing pedestrian’s feeling of safety, and leading to increases in walking. Buffers also create a place for street elements, such as street signs, light poles, and street trees. Without buffers, signs and poles are often placed in the sidewalk, reducing their functionality and creating unsafe conditions. A minimum five foot buffer is recommended to accommodate stormwater, street trees and roadway signs and poles.



Recommendations to enhance safety in Jacksonville neighborhoods:



» **REDUCE CURB RADII AT INTERSECTIONS.** Curb radii at intersections are important elements that affect pedestrian safety. The curb radii of a street corner at an intersection, a driveway, or alleyway affects the speed of turning vehicles and the crossing distance of pedestrians. Vehicle speeds are directly correlated to pedestrian fatalities. The longer the crossing distance, the longer the pedestrian is in the roadway, increasing their chances of coming into contact with vehicles. In residential neighborhoods, a 15-foot curb radii is recommended at street intersections and a tighter radii is recommended at driveways.

» **MARK CROSSWALKS ALONG ROUTES WHICH SHOULD EXPECT HIGH NUMBERS OF PEDESTRIANS.**

In Jacksonville, a pedestrian is legally allowed to cross the street and has the right-of-way at all intersections. Along routes which should expect high numbers of pedestrians, such as routes to school, transit and local retail establishments, marking crosswalks further communicates to drivers that pedestrians may be present and that they have the right-of-way. In locations with higher motor vehicle volumes or speeds, it is recommended that high visibility (ladder, parallel, zebra) crosswalk markings are installed.



Recommendations to enhance safety in Jacksonville neighborhoods:

» INSTALL TRAFFIC CALMING.

In areas that experience excessive vehicular speeds, additional traffic calming measures may be needed.



» **CHICANES.** Chicanes are traffic calming measures that divert the path of travel along a roadway causing vehicles to slow in order to make lateral shifts and/or pass through a narrowed section of roadway. Chicanes can take the form of curb extensions, center islands or staggered on-street parking. On lower speed and lower volume residential streets, chicanes are often mid-block curb extensions used to slow traffic by narrowing the roadway to the width of one lane (choker). Chicanes can be planted to provide additional landscaping.



» MINI-TRAFFIC CIRCLES.

Mini-traffic circles are circular islands that are installed in the center of residential street intersections to reduce traffic speeds and collisions. Traffic circles require vehicles to reduce speed while allowing continuous traffic flow. They can be installed in lieu of signals or stop signs and can be landscaped or paved. Vegetation should be planted/maintained so that it does not block visibility. Mini-traffic circles should be accompanied by tight curb radii on the adjacent corners to reduce right turning vehicle speeds. Larger vehicles such as school buses or transit vehicles that make wider turns can be accommodated by building traffic circles with mountable curbs; however, in general, streets with transit routes should not be considered for traffic circles.

» **HUMPS, BUMPS, AND SPEED TABLES.** These traffic calming devices consist of a raised section of roadway meant to slow motorists. They communicate to motorists that they are nearing a pedestrian crossing or entering a pedestrianized zone such as a neighborhood. Depending on the desired reduction of speed, the length, height and slope/ramps will vary.



A study in the City of Seattle found a 90% reduction in crashes after mini-traffic circles were installed.

Figure 12. These residential streets in Jacksonville have a higher number of pedestrian crashes than other areas and should be retrofitted using the safety enhancements recommended on the previous pages.





Neighborhood Collector Streets

Collector streets provide access to and through neighborhoods and provide cross town connections. As such, they often have high volumes of bicyclists and pedestrians and can create barriers for those who need to cross. When these roadways are designed with a focus on motorized vehicles, crashes are likely to occur. In the Jacksonville area, neighborhood collector streets are the location of a high number of pedestrian and bicycle crashes.



Common current design elements of neighborhood collector streets include:

- Four-lane roadways, two-lane roadways with on-street parking, or three-lane roadways with a center turn-lane
- Limited or no marked crosswalks
- Limited or no pedestrian median-islands
- Wide curb radii
- Fast speeds and speed limits

And, less frequently:

- Missing sidewalks
- Sidewalks located adjacent the roadway (with no buffer)

Safety Enhancements





Recommendations to enhance access along and across collector streets:



» **COMPLETE THE SIDEWALK NETWORK BY FILLING IN GAPS AND INSTALLING SIDEWALKS ACROSS DRIVEWAYS.** The most significant countermeasure for increasing pedestrian safety is to have a network of sidewalks. Sidewalks create a safe place for pedestrians to travel away from motor vehicles. Although, much of the sidewalk network along collectors in Jacksonville is complete, missing segments significantly decrease pedestrian safety. Network gaps include sidewalks missing across driveways, which like roadways are conflict areas. Continuing the sidewalk across a driveway communicates to drivers that pedestrians have the right-of-way and that pedestrians may be present.

» **INCLUDE BUFFERS FROM THE ROADWAY WHEN INSTALLING NEW SIDEWALKS AND RETROFITTING EXISTING SIDEWALKS.** A buffer area between the sidewalk and the roadway is important for a number of reasons. Both pedestrians and vehicles feel unsafe when pedestrians are too close to the roadway. Anecdotal evidence suggests that pedestrians will use only the far side of a sidewalk so as to stay away from vehicles when walking. Every roadway includes elements such as signage or light/telephone poles and may include other amenities such as street trees, bus stops or trash cans. Without a buffer area, these elements end up being placed in the sidewalk, reducing effective sidewalk widths and creating hazards. Lastly, buffers allow the ramps of driveways and ADA ramps at intersections to be placed so as not to interfere with the sidewalk.



Recommendations to enhance access along and across collector streets:



» **PRIORITIZE LANE REDUCTIONS/ROAD DIETS ON FOUR-LANE OR TWO-LANE ROADWAYS WITH PARKING.** Many collector roadways in Jacksonville have four lanes, when only three lanes with a center-turn lane or less are needed. Reducing lanes has been found to increase safety for pedestrians while also reducing motor vehicle crashes. Four to three lane conversions have been found to reduce total crashes by an average of 29%.¹ These conversions reduce pedestrian exposure to motor vehicle traffic, crossing distances, vehicle speeds, and the potential for rear end collisions. They also improve sight distances for left-turning vehicles, provide space for pedestrian median islands and bicycles lanes.

In many areas in Jacksonville, collector streets consist of two travel lanes and two parking lanes; however, the parking lanes are generally not being utilized. This creates the opportunity for vehicles to use the parking lane for overtaking. Bicyclists use the parking lane to travel requiring them to swerve into the travel lane when vehicles are parked. On both four-lane and two-lane roadways with parking, redesigning the roadway to include bike lanes, one travel lane and one center turn lane could enhance safety for all modes.

¹ Crash Modification Factor Clearing House, www.cmfclearinghouse.org

» **INSTALL HIGH VISIBILITY CROSSWALKS WITH FREQUENCY.** Although all intersections constitute legal places to cross (crosswalks) for pedestrians, it is recommended that crosswalks be marked on collector streets to communicate to drivers where pedestrians should be expected and that they have the right-of-way. Creating safe places to cross the street also reduces mid-block crossings. It is recommended that high visibility (sometimes called zebra or ladder) marked crosswalks are installed. Anecdotal evidence suggests that drivers in Jacksonville do not frequently stop for pedestrians at crosswalks, so it is further recommended that driver education is accompanied by enforcement measures as well as other infrastructure countermeasures.



Recommendations to enhance access along and across collector streets:



» **INSTALL CENTER MEDIAN ISLANDS WITH FREQUENCY.** To increase safety, it is recommended that pedestrian median islands are installed. This provides a safer waiting area for pedestrians after crossing one direction of traffic. Pedestrian median islands also reduce vehicle wait times as vehicles can continue moving after a pedestrian has reached the island. As many neighborhood streets are offset from collector streets, pedestrian median islands can easily be installed without affecting turning traffic. It is recommended in high pedestrian areas or at high crash locations that center median islands and marked crosswalks be installed every 200-300 feet.



» **REDUCE CURB RADII.** The degree to which a vehicle must slow at an intersection is dependent on the curb radii. Large turn radii allow for vehicles to turn at much faster speeds. Small turn radii compel vehicles to slow. When vehicles slow, their field of vision increases, better allowing them to see pedestrians, and slow speeds, if a crash does incur, are more likely to result in an injury rather than a fatality. Smaller radii shorten crossing distances for pedestrians; improves sight distances; and allows for greater flexibility of curb ramp placement.

» **IDENTIFY LOCATIONS FOR AND INSTALL RECTANGULAR RAPID FLASHING BEACONS (RRFBs).** Crosswalks or mid-block crossings can be made more highly visible by the installation of Rectangular Rapid Flashing Beacons (RRFB) which include pedestrian-actuated flashing lights and a pedestrian warning sign. RRFBs in other communities have increased driver compliance with pedestrian “stop” and “yield” laws by up to 75%.



Figure 13. These collector streets in Jacksonville have a higher number of pedestrian crashes than other areas and should be retrofitted using the safety enhancements recommended on the previous pages.





Downtown

Downtown Jacksonville is one of the major commercial hubs of the city and the design of its streets can create an atmosphere that attracts new services and employment opportunities as well as places to dine, shop and live. Employers and residents are attracted to downtowns that are attractive to pedestrians and bicyclists, include transit access to other parts of the city, and have great public spaces. Providing access for all modes including those walking, bicycling and using transit can accommodate the greatest number of users for the least cost. As new commercial and residential hubs emerge in Jacksonville, the attributes of the downtown may extend into new regional centers which are also best served by a variety of transportation options.





In downtown Jacksonville, streets share these common elements:

- **Narrow sidewalks**
- **Limited or no space for sidewalk cafes and outdoor dining**
- **No bicycle facilities**
- **Multi-lane one-way streets**
- **Automatic pedestrian signals**

Safety Enhancements



A Two Way Streets and Road Diets

A

C Midblock Crossing

D

B Bicycle Facilities



C Sidewalks

Outdoor Seating E

Recommendations to increase accessibility to and through downtown Jacksonville while enhancing the environment to attract additional services:



» **CONVERT ONE-WAY STREETS TO TWO-WAY.** One-way streets often lead to vehicular speeding due to a perceived lack of conflict. This creates a less comfortable and safe environment for pedestrians and bicyclists. One-way streets also reduce connectivity. Re-establishing a two-way street grid increases network connectivity by dispersing vehicles throughout the system.

» **CONSIDER LANE REDUCTIONS/ROAD DIETS.** Many roadways in downtown Jacksonville may have more lanes than needed. This space can be made available for widened sidewalks, bicycle facilities or outdoor seating. If the facilities are flexible, space can be made available during non-peak periods.

» **WIDEN SIDEWALKS.** Many sidewalks in downtown are narrow which creates bottlenecks for pedestrians and reduces comfort and accessibility. It is recommended that sidewalks be widened to create an eight-foot clear zone.

» **CREATE A BICYCLE NETWORK THROUGHOUT DOWNTOWN.** Most roadways in downtown lack bicycle facilities. Adding separated facilities increases comfort, safety and accessibility for bicyclists.



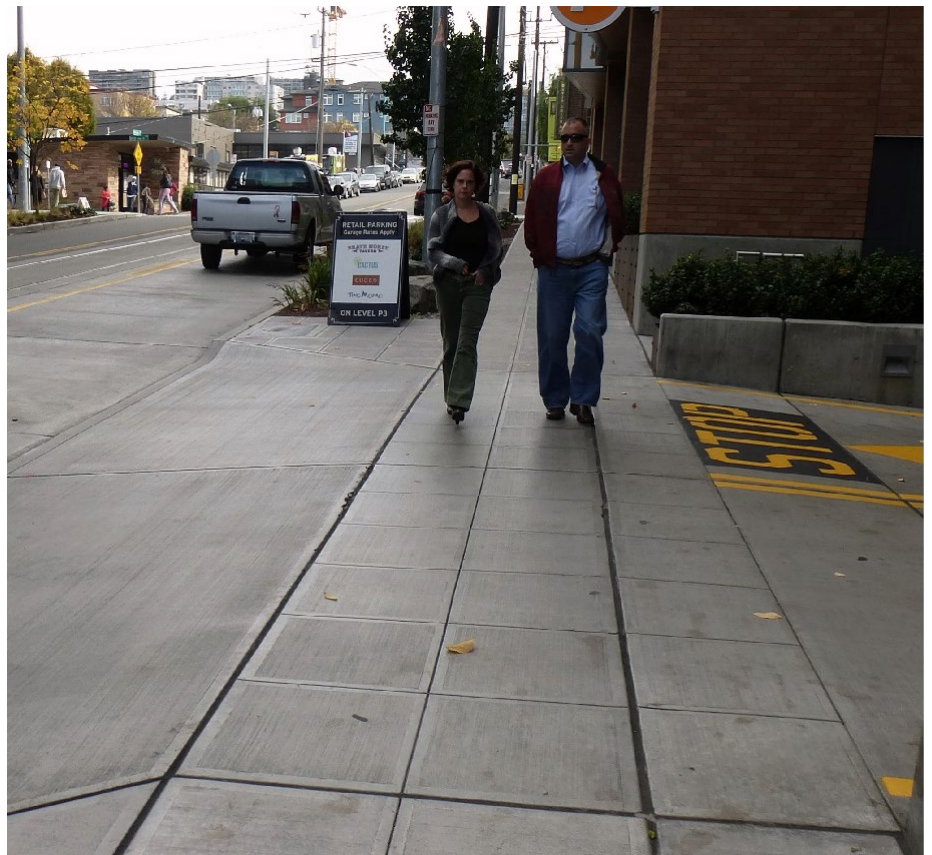
Recommendations to increase accessibility to and through downtown Jacksonville while enhancing the environment to attract additional services:



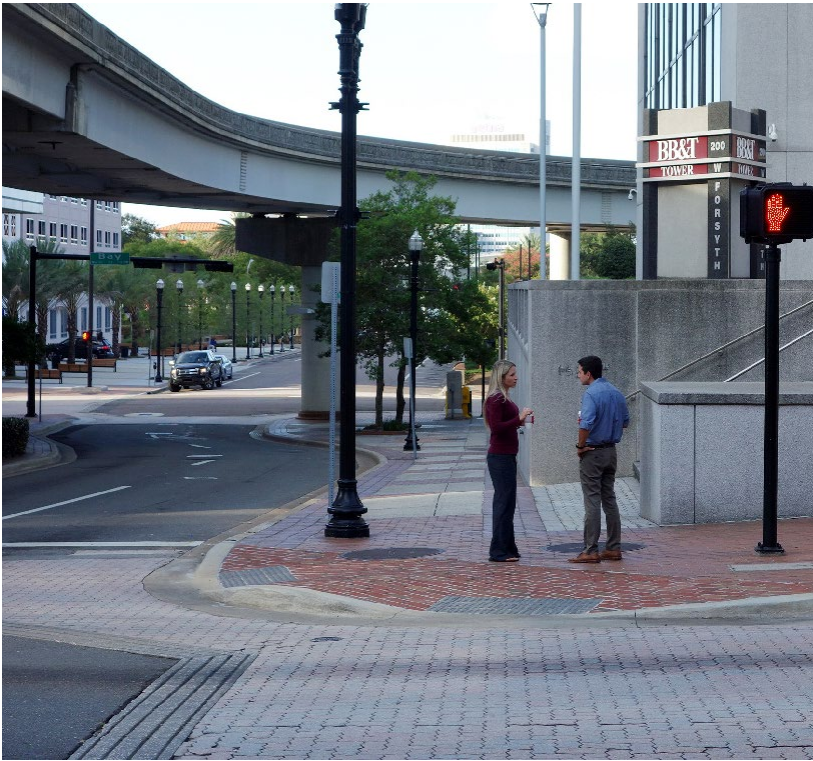
» **ADD OUTDOOR SEATING THROUGH THE CREATION OF PARKLETS OR ON WIDENED SIDEWALKS.** Outdoor seating creates vibrancy and will increase the attractiveness of downtown Jacksonville. Outdoor seating areas can be created by reallocating space used for parking (parklets) or by narrowing vehicular lanes and reallocating the space to outdoor seating, widen sidewalks or bicycle facilities.



» **INSTALL SIDEWALKS ACROSS DRIVEWAYS AND LIMIT DRIVEWAY WIDTH.** Designing sidewalks to continue across a driveway communicates to drivers that pedestrians have the right-of-way, that pedestrians may be present, and maintains ADA compliance. It is recommended that the material (e.g. concrete) and width of the sidewalk be continued across all driveways. Driveways, like roadways, are places of conflict and their width should be minimized as much as possible.



Recommendations to increase accessibility to and through downtown Jacksonville while enhancing the environment to attract additional services:

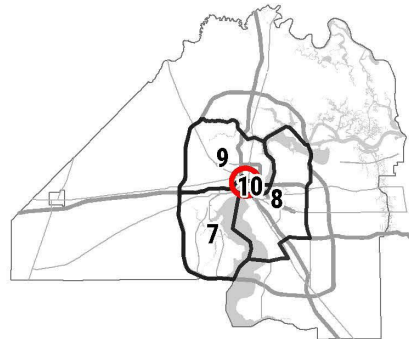
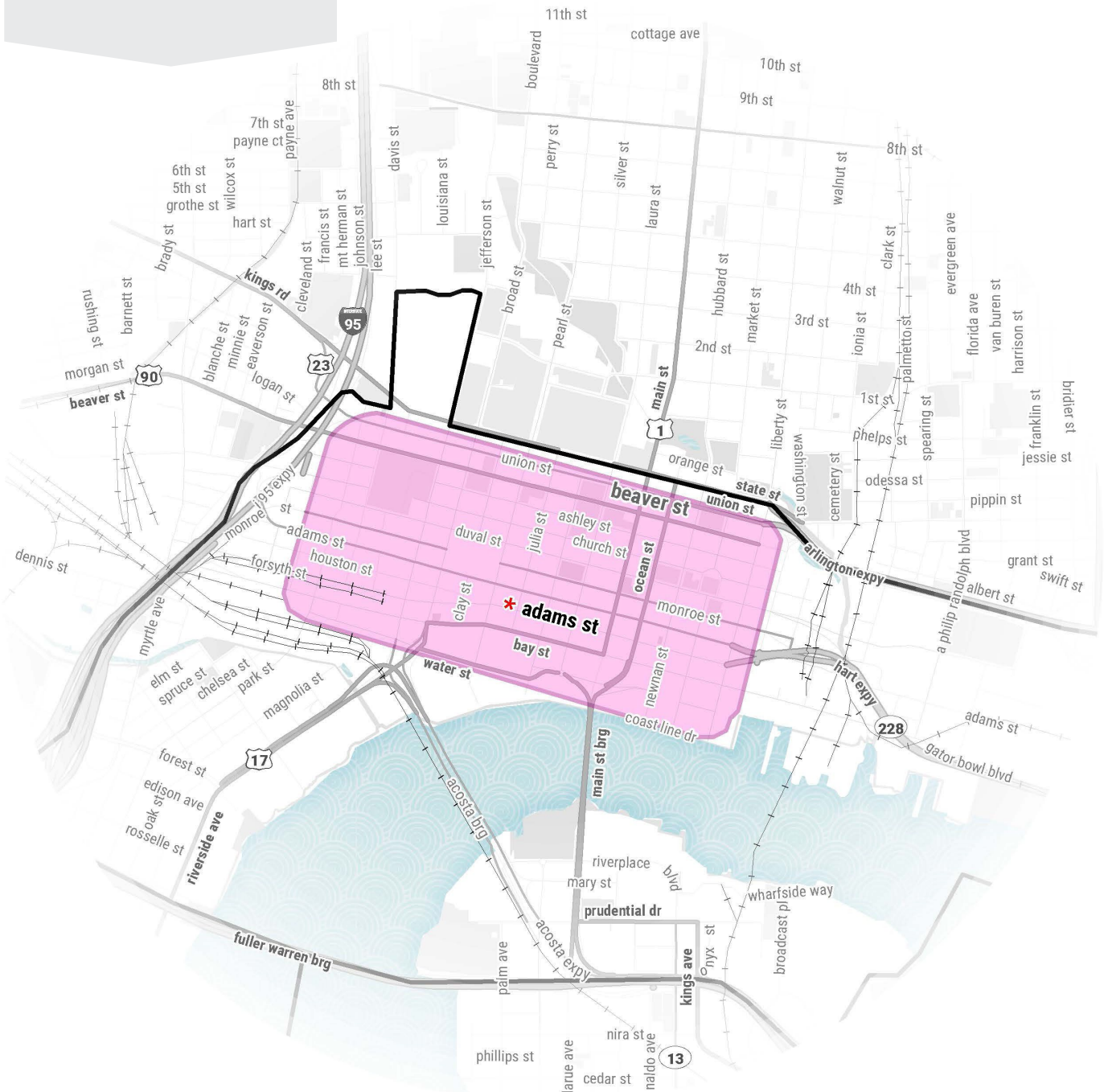


» **KEEP CURB RADII NARROW.** Vehicles must slow to turn at an intersection. The degree to which they must slow is dependent on the size of the curb radii of the intersecting streets. Large turn radii allow for vehicles to turn at much faster speeds. Small turn radii compel vehicles to slow and allows them to see pedestrians more easily. Smaller radii shorten crossing distances for pedestrians which also improves signal timing; provides larger pedestrian waiting areas at corners; improves sight distances; and allows for greater flexibility of curb ramp placement. It is recommended that curb radii in downtown be fifteen feet with curb radii into driveway and parking garages be five to ten feet. Small turn radii are able to accommodate buses; however, Jacksonville Transit Authority (JTA) should be included in discussions on specific routes.

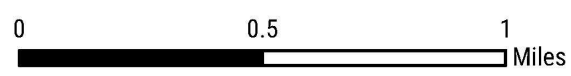
» **ADD MID-BLOCK CROSSINGS.** On long blocks or where there is a lot of pedestrian demand, install mid-block crossings with high visibility pavement markings and center median islands.



Figure 14. These downtown Jacksonville streets should be retrofitted using the safety enhancements recommended on the previous pages.



* Case Study





Neighborhood Commercial Streets

Jacksonville is served by a plethora of neighborhood-serving commercial districts. While attractive to residents from afar, these commercial areas consist of small enterprises with a focus on serving the needs of the immediate neighborhood. Neighborhood commercial streets in Jacksonville could be made safer and more comfortable for patrons, most of who live a short walk or bicycle-ride away.





Currently, commercial streets in Jacksonville include:

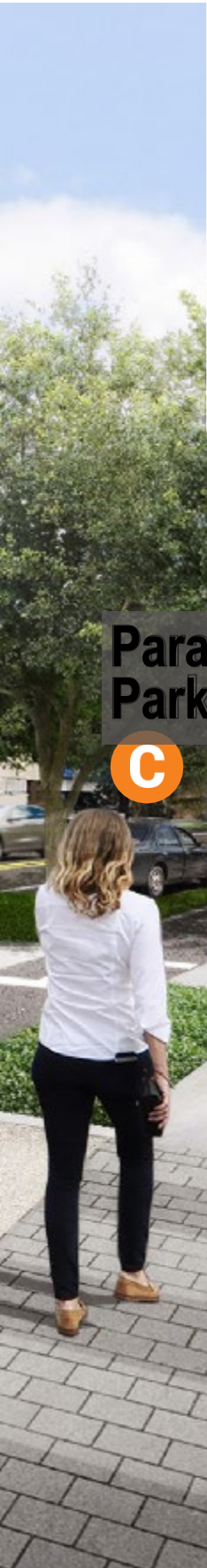
- **Narrow, interrupted, and indirect sidewalks often with obstacles**
- **Some outdoor retail space (for seating, signage, etc.)**
- **Abundant vehicular parking including front-in diagonal parking**
- **Limited bicycle parking and accommodation**

Safety Enhancements



D
Raised
Crosswalk

B
Curb
Extension/
Curb Radii



**Parallel
Parking**

C

A

Clear Sidewalk Zone



Recommendations for enhancing neighborhood commercial streets include:



» REPAIR, REPLACE AND INSTALL SIDEWALKS WITH A CLEAR PEDESTRIAN ZONE, OUTDOOR SEATING AREAS AND BUFFERS FROM THE ROADWAY.

Neighborhood commercial streets attract the most local and regional patrons when pedestrians are accommodated and there is visible activity along the street. A clear zone for pedestrians, with no obstructions, allows patrons to easily move throughout the area. A space allocated for outdoor seating creates vibrancy and attracts patrons. And, a buffer area for street signs and lights, street trees, and bicycle parking enhances patron comfort.



» REDUCE DRIVEWAY WIDTHS AND REMOVE PARKING THAT HAS REPLACED THE ORIGINAL SIDEWALK AREA.

Driveways create areas of conflict for pedestrians. Reducing the width of driveways enhances pedestrian safety and comfort. Along some neighborhood commercial streets in Jacksonville, sidewalks have been rerouted and replaced with diagonal parking. In these areas, it is recommended that parking be moved and the original sidewalk alignment and buffer areas be re-installed.



Recommendations for enhancing neighborhood commercial streets include:

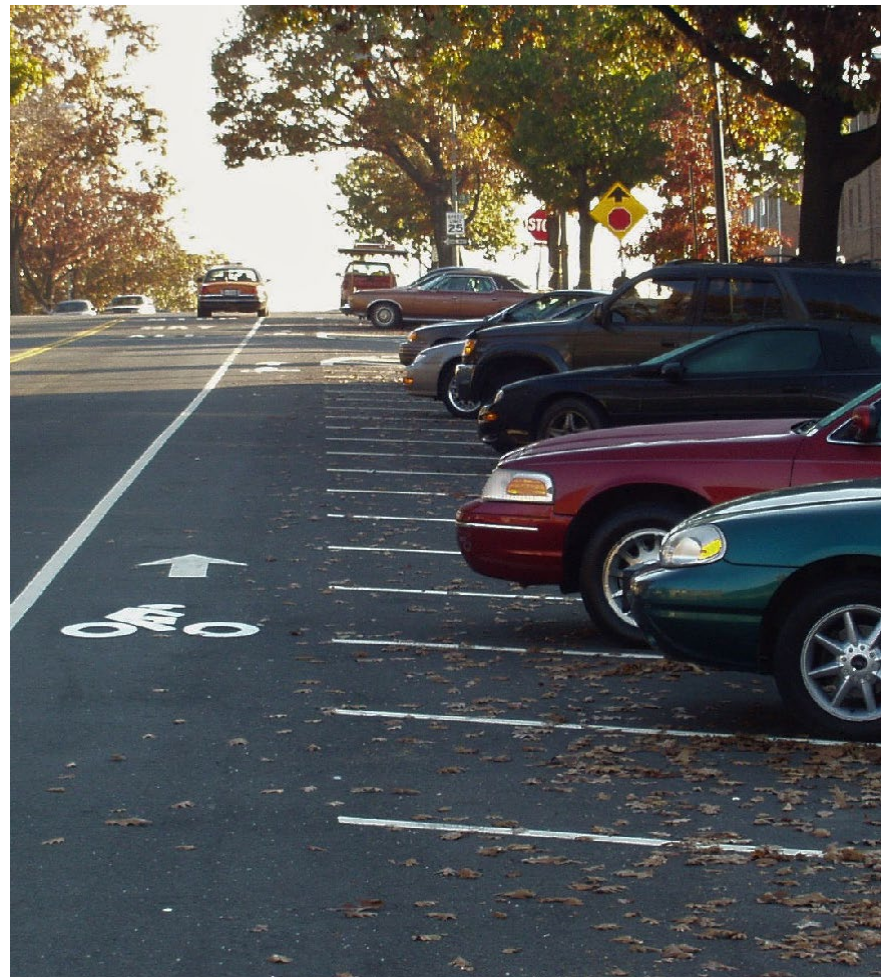


» INSTALL CURB EXTENSIONS.

Curb extensions can be placed at intersections to reduce the crossing distance for pedestrians, improve sight-lines for both pedestrians and vehicles, and reduce curb radii which reduces vehicle speeds. Curb extensions visibly reduce the roadway width which further slows vehicular traffic creating a more pleasant commercial environment.

» REALIGN DIAGONAL PARKING FROM FRONT-IN TO BACK-IN.

Front-in diagonal parking limits visibility when drivers exit the parking space. This creates a hazardous condition for anyone in the roadway (e.g. drivers and bicyclists). Back-in diagonal parking aligns the driver to be able to see roadway users when exiting the parking space. Diagonal parking may not be needed in all neighborhood commercial areas. Parallel parking should be considered as a substitute. This would provide more space for sidewalks, outdoor seating and buffer areas.



Recommendations for enhancing neighborhood commercial streets include:

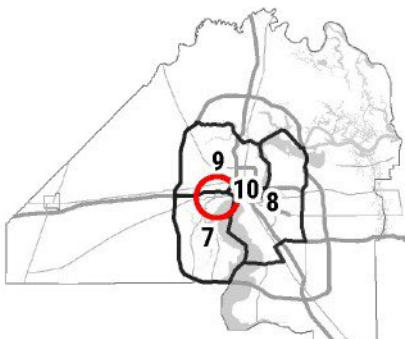
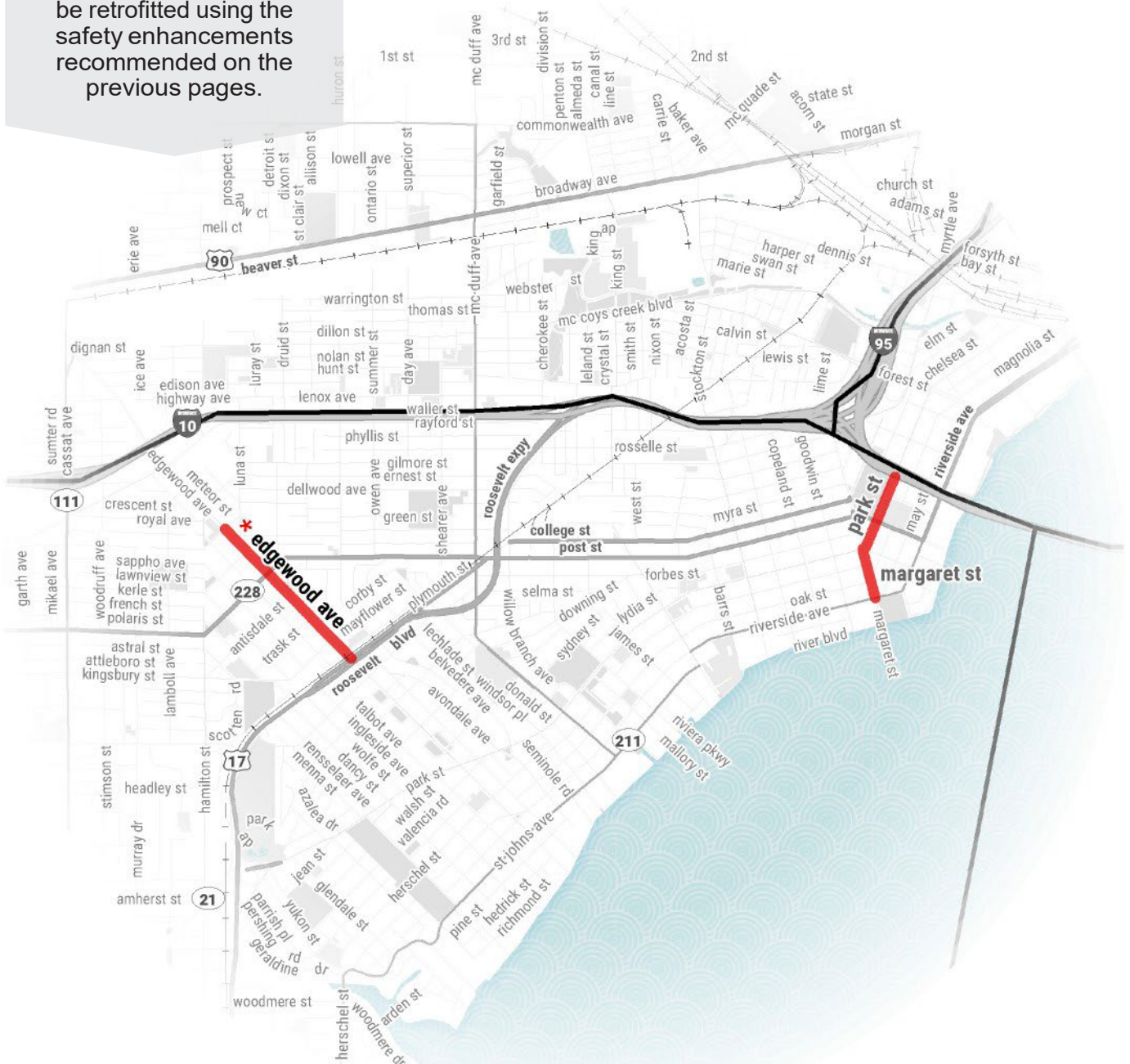


» **REDUCE CURB RADII.** Large turn radii at intersections allow for vehicles to turn at faster speeds than at small radii. When vehicles slow, their field of vision increases, better allowing them to see pedestrians, and slow speeds, if a crash does incur, are more likely to result in an injury rather than a fatality. Smaller radii can also shorten crossing distances for pedestrians which also improves signal timing; provides larger pedestrian waiting areas at corners; improves sight distances; and allows for greater flexibility of curb ramp placement. It is recommended that curb radii on neighborhood commercial streets be fifteen feet.

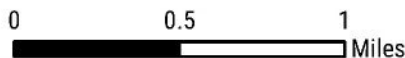
» **INSTALL TRAFFIC CALMING MEASURES SUCH AS RAISED CROSSWALKS AND RAISED INTERSECTIONS.** Raised crosswalks and intersections function as speed tables reducing the speeds of vehicles and creating a safer environment for pedestrians. Locating the speed table at a crosswalk or intersection further enhances safety by reducing vehicle speeds at the location where pedestrians are in the roadway. Raised crosswalks and intersections further enhance safety by raising the height of pedestrians making them more visible to oncoming vehicles.



Figure 15. These neighborhood commercial streets in Jacksonville have a higher number of pedestrian crashes than other areas and should be retrofitted using the safety enhancements recommended on the previous pages.



* Case Study





Major Arterials and Regional-Serving Retail Centers

Major arterial roadways are typically focused on quickly moving cross-town vehicular traffic. They have higher speeds and higher volumes than other roadways and often include multiple lanes. To accommodate through movements, cross-traffic is limited. Because major arterial roadways allow quick access from across the region, retail centers that serve a regional clientele are often positioned along them and located on large parcels. Their placement is typically vehicle-oriented and include large parking lots at the front of buildings, no bicycle facilities and no or limited pedestrian connections. However, many regional retail centers are also destinations for adjacent residents—providing both jobs and places to shop—who arrive by foot or bicycle. The vehicle-oriented design of major arterial roadways and adjacent regional retail centers has resulted in a very high number of crashes along these corridors. These major arterial roadways are often the routes of cross-town bus service. Bus stops along the roadway further attract pedestrians. Most of the roadways are managed by FDOT, requiring special state-level approval for the installation of safety measures.



Major arterial roadways typically include the following design elements:

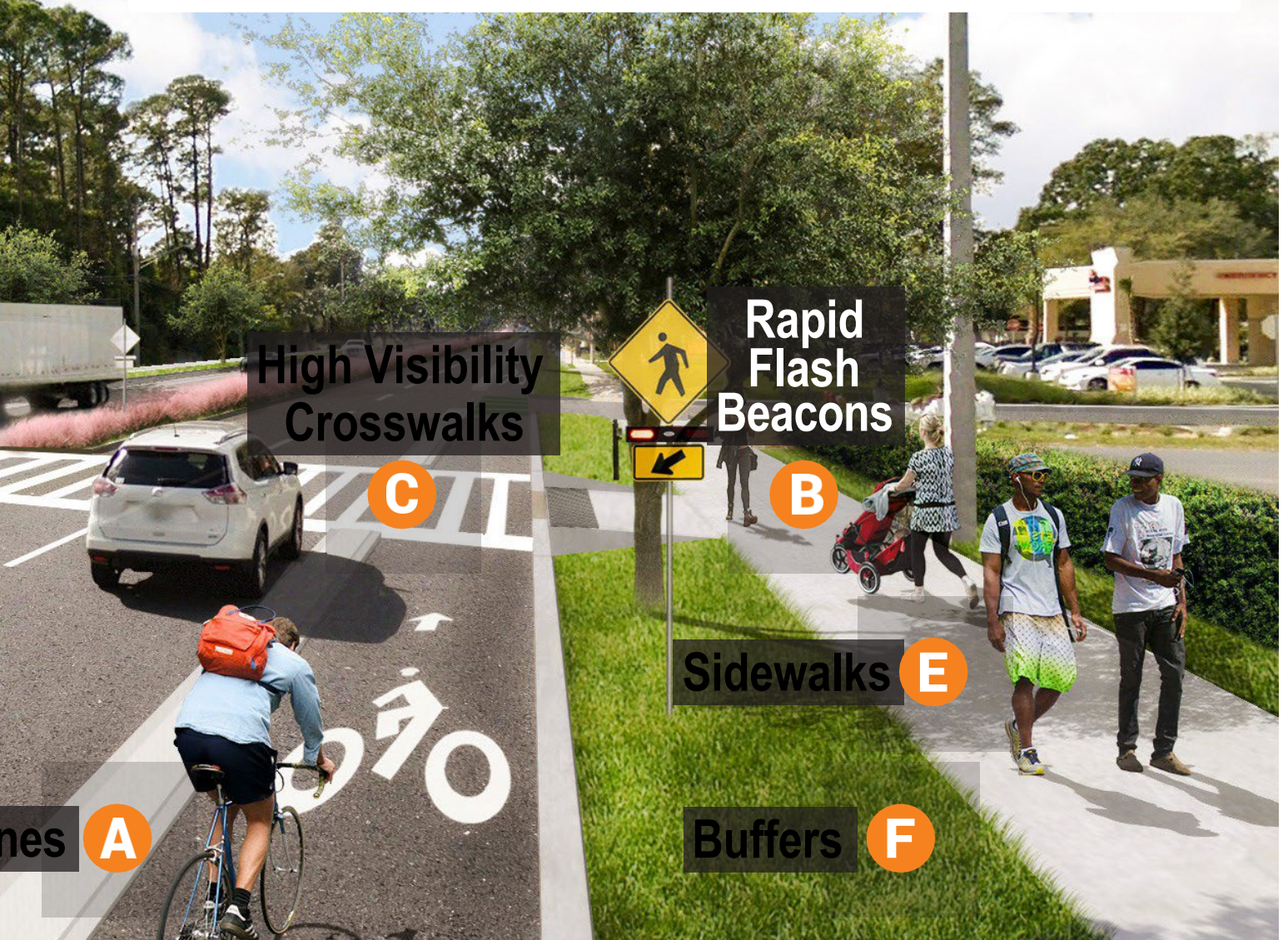
- High speed multi-lane roadways
- Limited locations for crossing
- Large driveway widths and turn radii
- Large blocks
- Limited pedestrian connections
- No (or basic/minimum) bicycle facilities

Safety Enhancements



D Medians

Protected Bike La



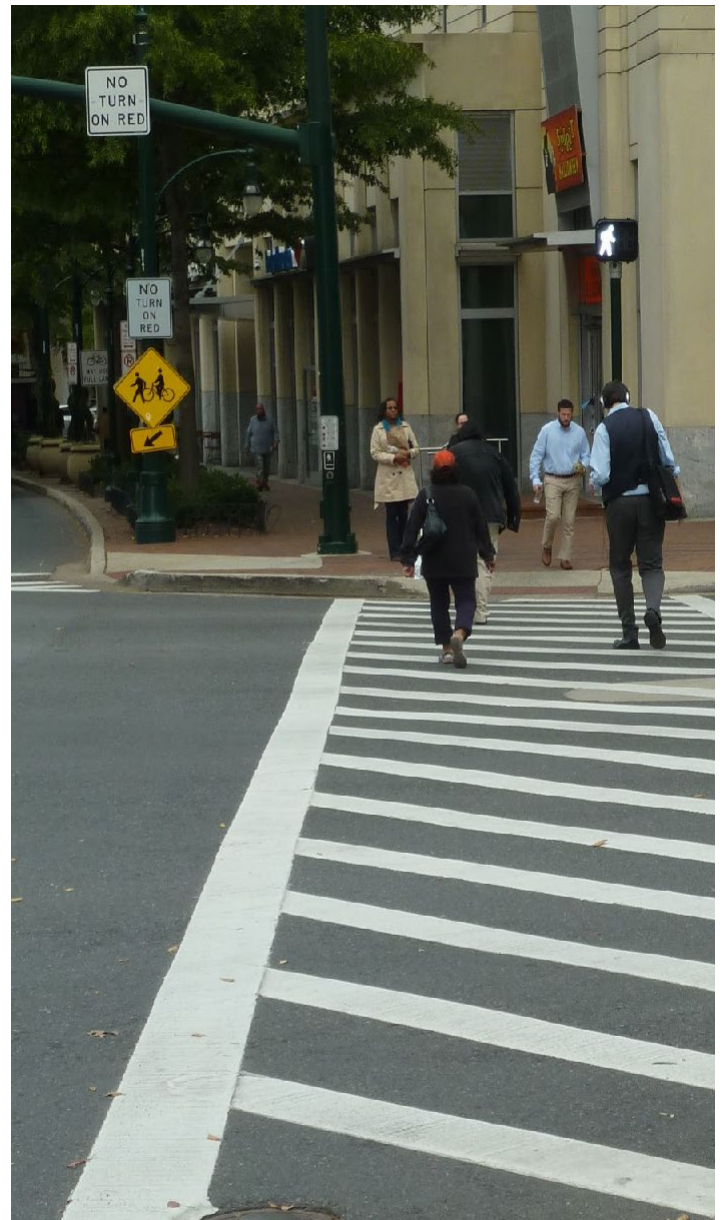
The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:



» **CONSIDER LANE REDUCTIONS/ROAD DIETS WHERE POSSIBLE.** Major arterial roadways may not warrant the number of lanes or the lane width (typically twelve feet) in Jacksonville currently present. Lane reductions reduce the number of lanes pedestrians need to cross and can enhance intersection signal timing. Reducing lane widths can contribute to slower driving speeds and provide space for bicycle facilities.

» **INCLUDE PEDESTRIAN PHASING, LEADING PEDESTRIAN INTERVALS, NO RIGHT TURNS ON RED, AND AUTOMATIC OVER ACTUATED SIGNALS AT SIGNALIZED INTERSECTIONS.**

At signalized intersections, pedestrian safety can be increased. Leading pedestrian intervals (LPI) provide a pedestrian “walk” signal a few seconds prior to the vehicle green phase. This allows pedestrians to enter the roadway, increasing their visibility to right-turning vehicles. “No right turns on red” signage and enforcement limits vehicles from entering the crosswalk when pedestrians are present. Automatic pedestrian signals automatically provide a pedestrian phase with enough time to cross the street during each signal cycle, reducing pedestrian wait times and mid-block crossing. Automatic pedestrian signals should be used in high pedestrian crash locations and where pedestrians are expected to be present.



The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:

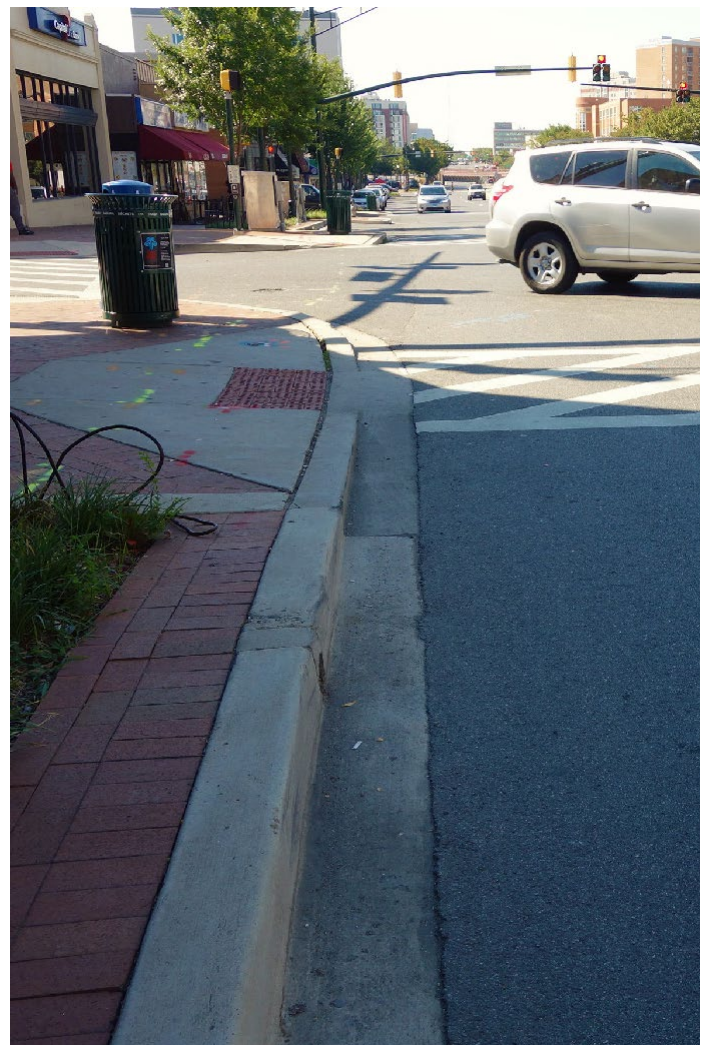


» **USE HIGH VISIBILITY MARKED CROSSWALKS AT ALL CROSSING LOCATIONS.**

High visibility marked crosswalks (sometimes called zebra or ladder) are more visible to drivers. Increasing the visibility of pedestrians along high-volume and high-speed roadways such as major arterials enhances safety.

» **REDUCE CURB RADII AT SIGNALIZED INTERSECTIONS AND UNSIGNALIZED INTERSECTIONS.**

Large curb radii allow vehicles to maintain faster speeds while turning, which can lead to a crash with pedestrians who are crossing the street. Faster speeds reduce a driver's field of vision, making it more difficult to see pedestrians and leading to more serious injuries if a crash occurs. Smaller radii shorten crossing distances for pedestrians which leads to improved signal timing; the ability to provide larger pedestrian waiting areas at corners; and greater flexibility of curb ramp placement.

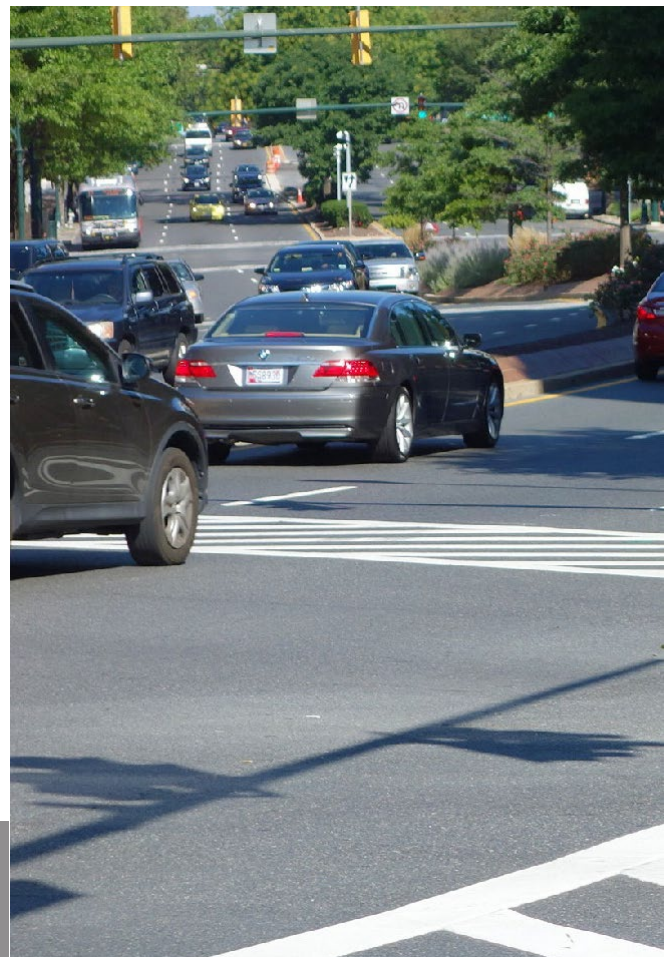


The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:



» **IDENTIFY LOCATIONS AND INSTALL RECTANGULAR RAPID FLASHING BEACONS (RRFB).** Crosswalks at uncontrolled intersections or mid-block crossings can be made more highly visible by the installation of Rectangular Rapid Flashing Beacons (RRFB). Pedestrian-actuated flashing lights are installed in combination with a pedestrian warning sign and crosswalk markings to create a more visible place for pedestrians to cross. On roadways with higher vehicle speeds and/or multiple lanes, the pedestrian crossing may be accompanied by a protective refuge or median island to provide the choice of crossing the road in two stages (in which case, additional RRFBs would be installed in the median as well as at either side of the roadway). RRFBs in other communities have increased driver compliance with pedestrian “stop” and “yield” laws by up to 75%.

» **PROVIDE FREQUENT OPPORTUNITIES TO CROSS THE ROADWAY.** Along major arterials, controlled locations for pedestrians to cross the street are limited—at intervals of up to half a mile. These distances lead to pedestrians crossing at uncontrolled locations, often using the center-turn lane as a pedestrian refuge, which contributes to crashes, injuries and fatalities. At signalized intersections, pedestrian safety should be prioritized through the use of tight curb radii, marked crosswalks, and automatic pedestrian signals at every leg of the intersection. At unsignalized intersections, treatments such as the installation of pedestrian refuge islands and rapid flashing beacons should be considered.

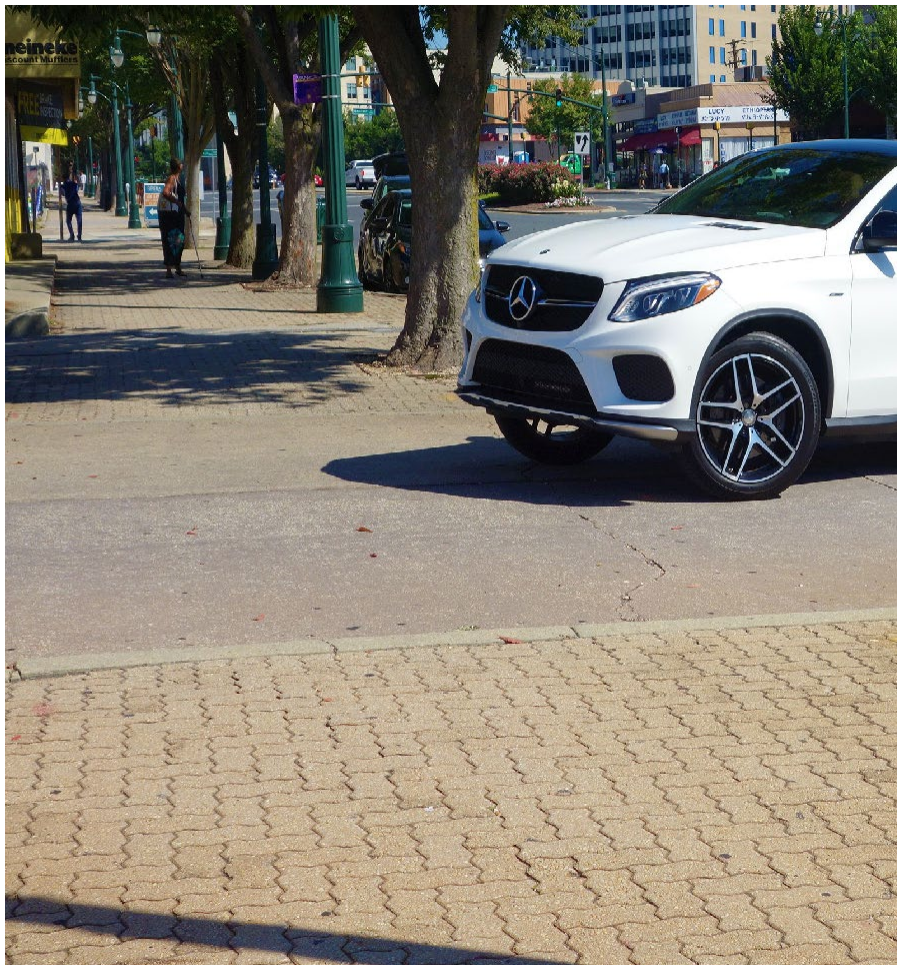


The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:

» **INSTALL MEDIANS WHICH REDUCE CONFLICTS BY CREATING RIGHT-IN/RIGHT OUTS.** Right-in/right-out (RIRO) is an access management technique that refers to a type of driveway where only right turns are permitted, thus reducing conflict points associated with left turning vehicles and improving safety for pedestrians crossing a driveway or roadway. RIRO should be used at locations with high pedestrian volumes, at high crash locations, along arterial streets with speeds of 40 mph or greater, and locations with driveways in close proximity to intersections or other driveways.



» **REDUCE DRIVEWAY WIDTHS AND DRIVEWAY CURB RADII.** Driveways create conflict points and the wider the driveway, the more opportunity for conflict with pedestrians. Driveway curb radii determine the speed at which a vehicle can enter the driveway. At faster speeds, stopping distances and visibility is reduced, and the likelihood of a serious injury is increased.



The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:

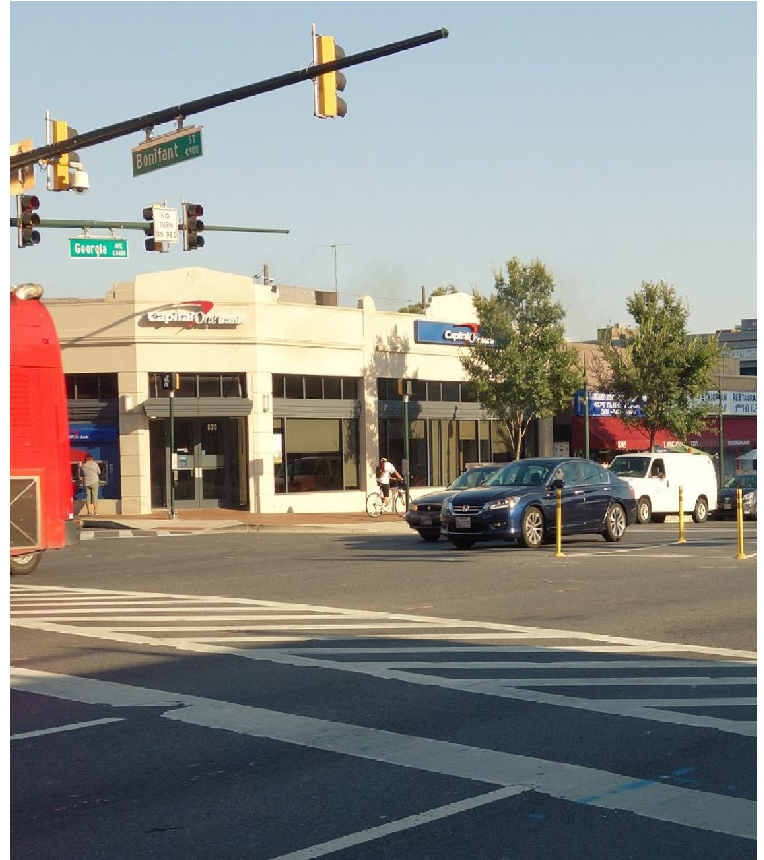
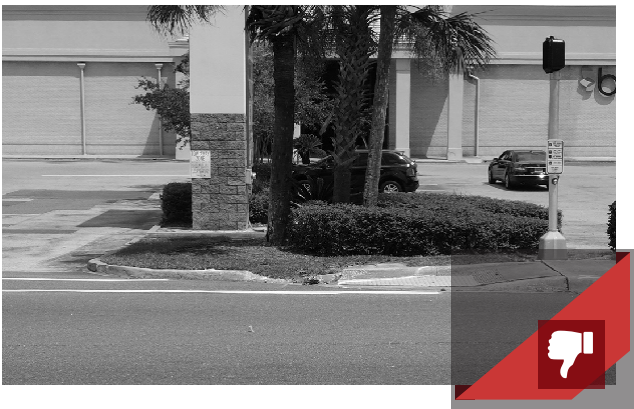


» **CREATE SAFE AND ATTRACTIVE CONNECTIONS TO ADJACENT NEIGHBORHOODS.** The regional-serving retail found along arterial roadways is often located on large-blocks which create barriers to access for adjacent residential neighborhoods. Many of these neighbors may wish to walk or bicycle to the retail center if facilities existed. Large blocks need not create barriers if connections such as pedestrian and bicycle pathways are created through the site and into adjacent communities.



The following recommendations will enhance pedestrian and bicycle safety on major arterial roadways and create enhanced connections for pedestrians:

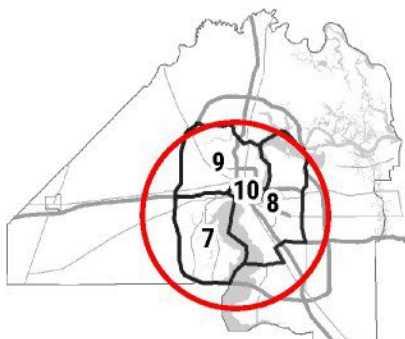
» **REALIGN BUILDINGS TO FRONT THE ROADWAY.** Regional-serving retail along major arterial roadways is often separated from the roadway via large parking lots. Not only is this esthetically unpleasing for people walking, but pedestrian connections from the roadway to the retail entrances do not often exist. As retail centers are renovated or replaced, buildings should be located fronting the roadway with parking at the side or back. This reduces the need for designing and installing two sets of pedestrian infrastructure – one along the roadway and one connecting the roadway to the building entrance.



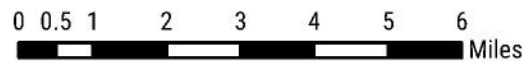
» **ENSURE ALL MAJOR ARTERIALS HAVE SIDEWALKS OF SUFFICIENT WIDTH THAT ARE BUFFERED FROM THE ROADWAY.** The most significant countermeasure for increasing pedestrian safety is to have sidewalks, which provides a safe place for pedestrians to travel away from motor vehicles. Sidewalks should be wide enough to accommodate a multitude of users and allow for passing. The sidewalk should be separated from the street, preferably via a landscaped strip which adds to a feeling of comfort and if trees are installed, provides shade and a physical barrier from vehicles. The most comfortable sidewalks include wider buffers along wider roadways.



Figure 16. These major arterial roadways in Jacksonville have a higher number of pedestrian crashes than other areas and should be retrofitted using the safety enhancements recommended on the previous pages.



* Case Study



INSTALLATION OF RECTANGULAR RAPID FLASHING BEACONS

The Pedestrian Safety Action Plan addresses general issues of pedestrian safety and accessibility in neighborhoods (SNAPP), and targeted pedestrian improvements on typical streets in the City (TRIPS). A third approach to tackling pedestrian safety is to address individual crash or high priority locations with specific countermeasures. For this approach to be manageable, especially for a city the size of Jacksonville, the City needs to have a robust prioritization process to ensure a thoughtful and data-driven selection of locations.

The City has identified Rectangular Rapid Flashing Beacons (RRFBs), which use LED flashing beacons in combination with pedestrian warning signs to provide

a high-visibility strobe-like warning to drivers when activated by pedestrians, as one countermeasure to supplement standard uncontrolled pedestrian crossings and help enhance pedestrian safety. The City identified areas with high concentrations of senior residents and school-aged children as priority populations.

The study team used a three-pronged approach to completing the RRFB assessment, and:

- Conducted a review of national and regional best practices for RRFB installation;
- Completed a demand analysis to understand where pedestrian activity is expected and identify general corridors where pedestrian activity may benefit from the installation of RRFBs; and,
- Analyzed corridor-based data to identify and prioritize a list of recommended locations for RRFB installation.

The results of this assessment are provided in Appendix 6.



DEMAND ANALYSIS

The TDG team performed a demand analysis to understand where the most pedestrian activity is expected and to identify general corridors where pedestrians may benefit from the installation of RRFBs. This was done for the whole City, rather than just Mobility Zones 7-10 which were the focus of the Pedestrian and Bicycle Master Plan. Heat maps were constructed to illustrate which areas should be prioritized for potential installation of RRFBs (Figure 17).

The results of the demand and proposed corridor analysis can be seen on the following map (Figure 18). As data related to roadway characteristics (i.e., street widths, annual average daily traffic, speed limits and pedestrian counts) were not available or were incomplete, a desktop evaluation of existing roadway conditions was completed on the corridors showing the highest demand.

This evaluation focused on capturing basic data including the posted speed limit, availability of transit, adjacent land uses, the presence of sidewalks and buffers, as well as the presence of bicycle facilities. To provide a concise list of corridors for further analysis, corridors with the following conditions were excluded:

- Roadways under the Florida Department of Transportation (FDOT) jurisdiction,
- Roadways with posted speed limits of 40 mph or higher,
- Corridors with more than four lanes, and
- Roadways with more than 20,000 Annual Average Daily Traffic (AADT).

Thirty-six roadway corridors were identified as part of this review for further analysis and prioritization. The complete list of corridors and characteristics captured is provided on the following pages (Figure 19).

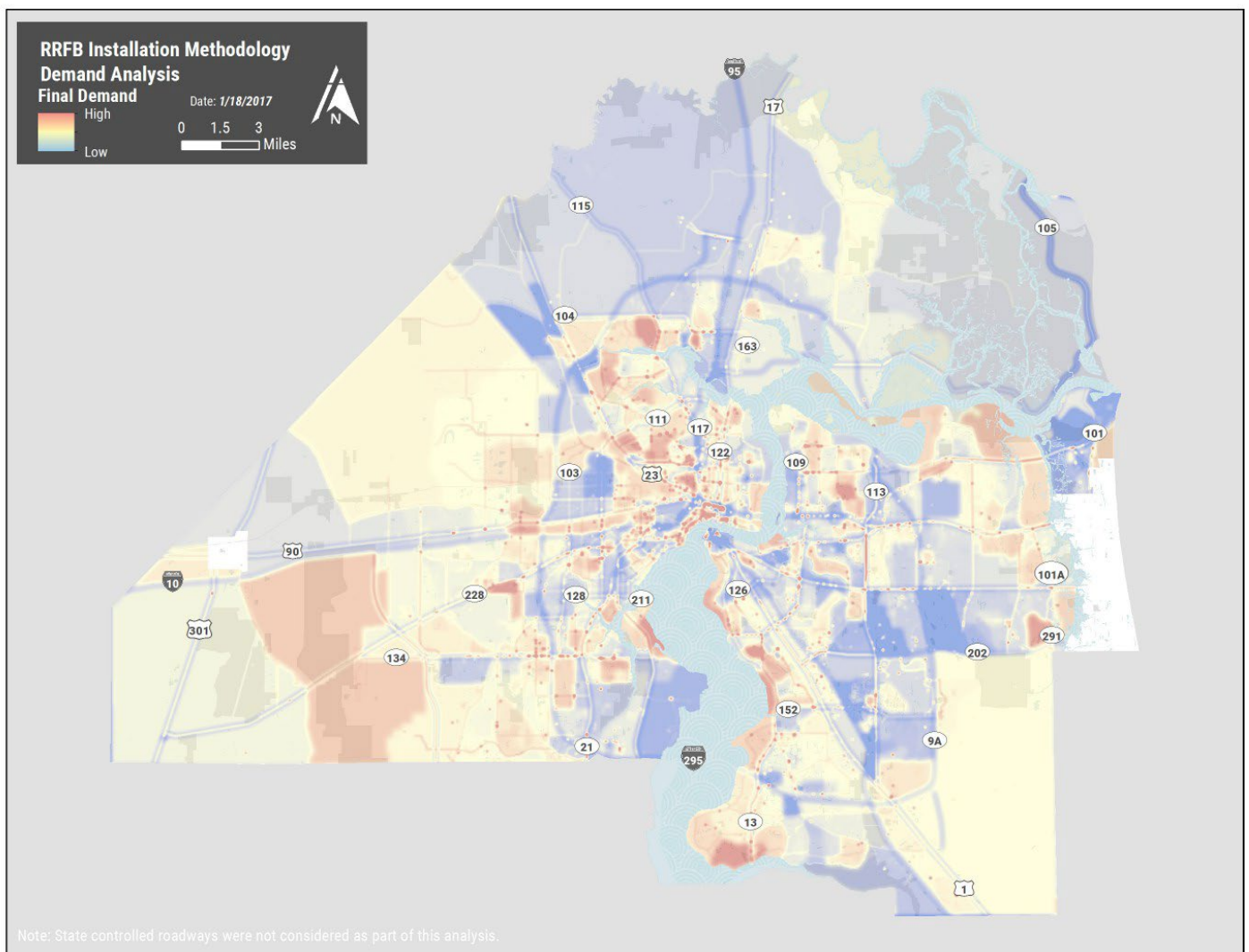


Figure 17. A heat map showing the demand analysis for Rectangular Rapid Flashing Beacons.

SELECTION OF LOCATIONS

Following the identification of corridors based on the Demand Analysis, the study team requested additional data from the City of Jacksonville related to traffic volumes (AADT) and transit ridership (boardings and alightings). Together, this data was used to construct a final composite heat map for each of the corridors to highlight the specific locations where the installation of RRFBs may be appropriate. The final map can be found below (Figure 20).

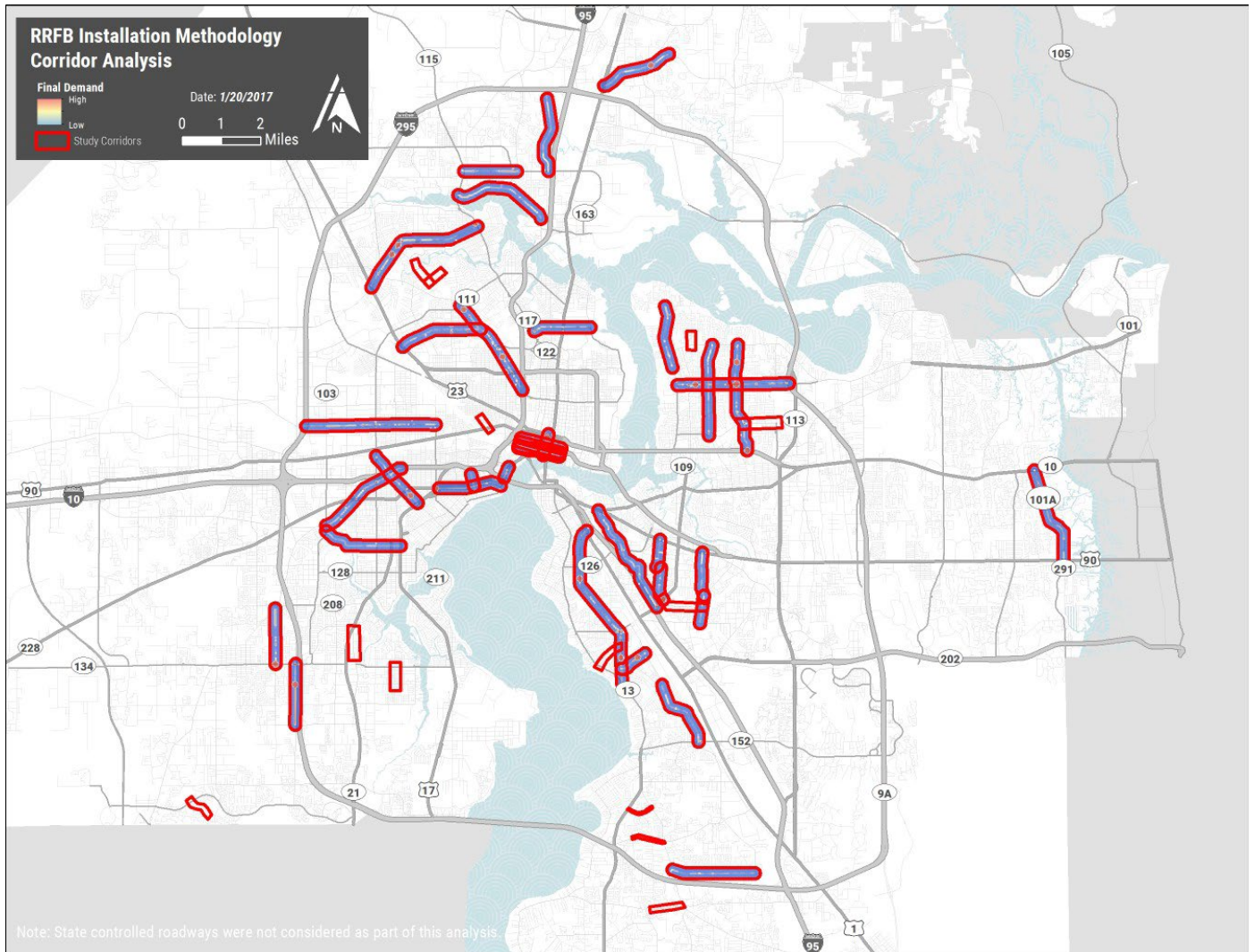


Figure 20. Final corridor analysis for RRFB installation.

The study team used a similar methodology to the one used in the Demand Analysis to construct heat maps for each individual corridor based on the weighted values assigned to the aforementioned data. The study team also used the location of elementary and middle schools, as well as retirement communities to inform the final location of the proposed RRFB improvements. Eighty-eight specific locations were identified along the study area corridors. These locations may benefit from the installation of crossing improvements such as enhanced and improved marked crosswalks, RRFBs, and the relocation of a number of bus stops to increase pedestrian comfort and convenience when connecting to and from transit (Figure 21).

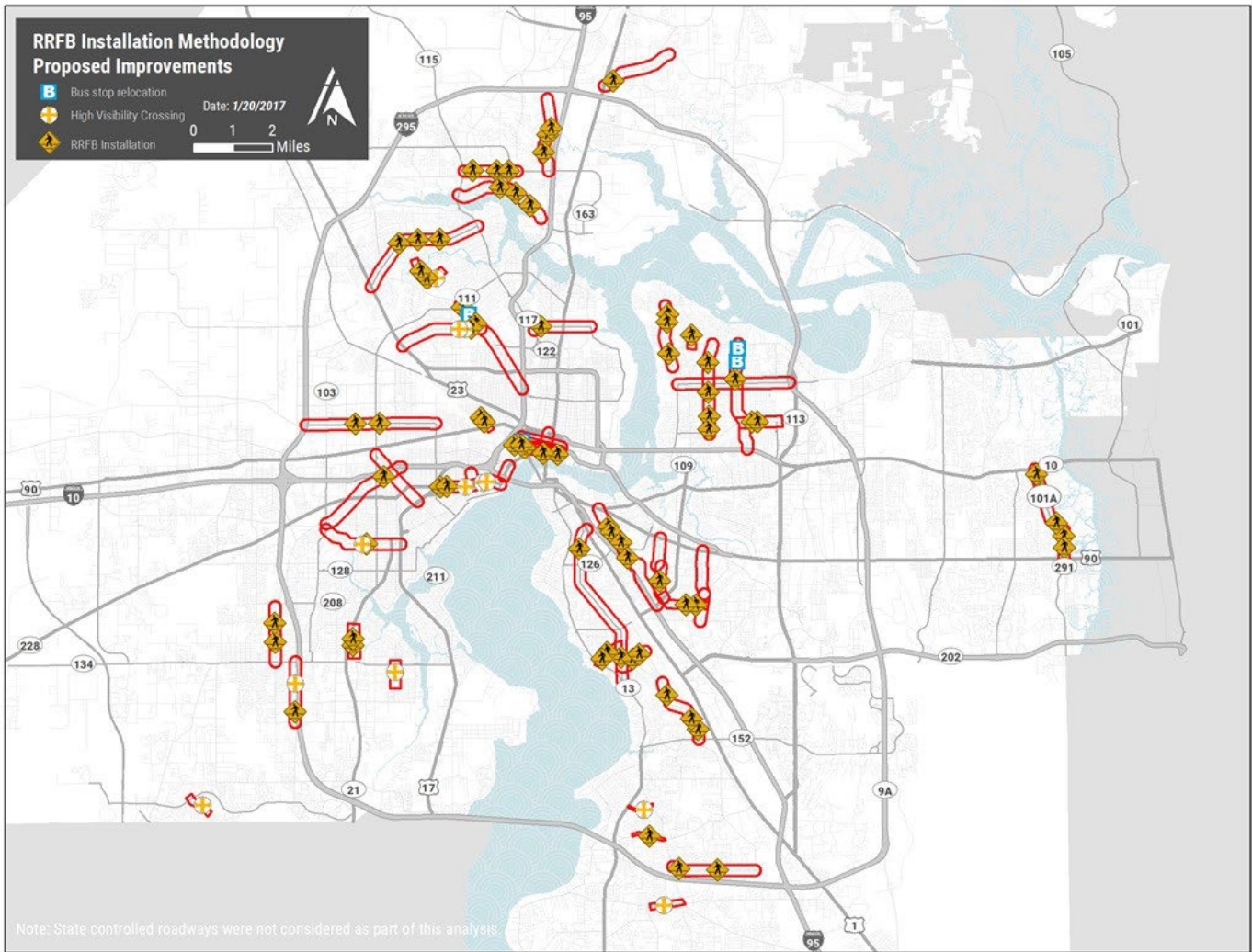


Figure 21. Location of 88 recommended safety improvements in the study corridors.

RRFB PRIORITIZATION CRITERIA AND METHODOLOGY

A prioritization methodology was developed. Prioritization provides the opportunity for all projects to be compared with each other using the same set of criteria. This helps the City identify which projects should be focused on first, based on the most likely beneficial impact on pedestrian safety.

This project used the ActiveTrans Priority Tool (APT), a model methodology developed by the National Cooperative Highway Research Program, to evaluate and prioritize pedestrian improvements on existing roadways. The APT is a spreadsheet tool that provides a flexible, transparent, and step-by-step methodology that incorporates community and City values into the

project prioritization process. This methodology uses a modified version of the APT to quantitatively and objectively compare and prioritize the 88 identified projects.

The modified version of the APT used several factors agreed upon with City engineers to compare and evaluate projects. Four factors were used in the prioritization; each factor was given a weighting based on priorities expressed by the City. The table notes the weighting and provides an explanation of the scaling of variables used in the methodology (Figure 22).

Figure 22. Variables Used in RRFB Location Prioritization

Variable	Explanation	Source	Weight
Proximity to Pedestrian Deaths	Number of pedestrian deaths for the years of 2011-2014 within one-half mile of the proposed crossing improvements.	<i>2011-2014 State of Florida Highway Safety and Motor Vehicles Crash and Citation Reports & Statistics</i>	40
Proximity to Pedestrian Crashes	Number of pedestrian crashes for the period between 2011 and 2014 within one-half mile of the proposed crossing improvements.	<i>2011-2014 State of Florida Highway Safety and Motor Vehicles Crash and Citation Reports & Statistics</i>	30
Proximity to Schools	Number of pedestrian crashes for the period between 2011 and 2014 within one-half mile of the proposed crossing improvements.	Florida Geographic Data Library	15
Proximity to Senior Centers	Number of pedestrian crashes for the period between 2011 and 2014 within one-half mile of the proposed crossing improvements.	City of Jacksonville Website.	15
TOTAL			100%

The rankings provide a scoring based on proximity to schools, senior centers, pedestrian crashes and deaths throughout the city. A full list of rankings can be found in below (Figure 23). Although the top ranked projects will likely improve conditions for walking and crossing the street along selected corridors, it is recommended

that Jacksonville review all projects to take advantage of other opportunities to increase the safety and comfort of people walking. The City should especially consider including walking improvements as part of scheduled repaving, road reconstruction and adjacent development projects.

Figure 23: Prioritized List of RRFB Locations

Road Name	RRFB ID	Improvement Type	Priority Ranking
East Bay Street	55	RRFB Installation	1
Laura Street	59	RRFB Installation	2
Toledo Road	28	RRFB Installation	3
Moncrief Road	49	RRFB Installation	4
East Bay Street	56	RRFB Installation	5
Toledo Road	27	RRFB Installation	6
Adams Street	54	Bus stop relocation	7

St. Augustine Road	25	RRFB Installation	8
Forsyth Street	58	RRFB Installation	9

Road Name	RRFB ID	Improvement Type	Priority Ranking
Catoma Street	67	High Visibility Crossing	10
Soutel Drive	45	RRFB Installation	11
Moncrief Road	50	Bus stop relocation	12
Dupont Avenue	85	RRFB Installation	13
Wesconnett Boulevard	66	RRFB Installation	14
Acorn Street	74	RRFB Installation	15
45th Street W	77	High Visibility Crossing	16
45th Street W	78	High Visibility Crossing	17
Park Street	69	RRFB Installation	18
Post Street	60	RRFB Installation	19
44th Street W	48	RRFB Installation	20
East Bay Street	57	RRFB Installation	21
Post Street	61	RRFB Installation	22
Park Street	70	High Visibility Crossing	23
Rogero Road	39	RRFB Installation	24
Ricker Road	17	RRFB Installation	25
Barnes Road	33	RRFB Installation	26
Rogero Road	38	RRFB Installation	27
Dupont Avenue	86	RRFB Installation	28
Soutel Drive	46	RRFB Installation	29
New Berlin Road	7	RRFB Installation	30
Crown Point Road	87	High Visibility Crossing	31
Firestone Road	19	High Visibility Crossing	32
Wesconnet Boulevard	68	RRFB Installation	33
Lenox Avenue	21	RRFB Installation	34
Commonwealth Avenue	52	RRFB Installation	35
Acorn Street	75	RRFB Installation	36
Townsend Blvd	34	RRFB Installation	37
Lone Star Road	71	RRFB Installation	38
Post Street	62	High Visibility Crossing	39
Ricker Road	18	RRFB Installation	40
Post Street	63	High Visibility Crossing	41
Leonid Road	12	RRFB Installation	42
Leonid Road	11	RRFB Installation	43
Winton Drive	79	High Visibility Crossing	44
45th Street W	76	RRFB Installation	45
Leonid Road	13	RRFB Installation	46
Post Street	64	High Visibility Crossing	47
Loretto Road	84	High Visibility Crossing	48
Spring Park Road	29	RRFB Installation	49
Losco Road	0	RRFB Installation	50
University Boulevard	42	RRFB Installation	51
Moncrief Road	51	RRFB Installation	52

Road Name	RRFB ID	Improvement Type	Priority Ranking
San Pablo Road	6	RRFB Installation	53
Rogero Road	37	RRFB Installation	54
Howell Drive	81	RRFB Installation	55
Lone Star Road	72	RRFB Installation	56
Spring Park Road	30	RRFB Installation	57
St. Augustine Road	26	RRFB Installation	58
University Boulevard	43	RRFB Installation	59
Broward Road	15	RRFB Installation	60
Broward Road	16	RRFB Installation	61
Soutel Drive	47	RRFB Installation	62
University Club Boulevard	73	RRFB Installation	63
Howell Drive	80	RRFB Installation	64
Rogero Road	40	RRFB Installation	65
Losco Road	1	RRFB Installation	66
San Pablo Road	2	RRFB Installation	67
San Pablo Road	3	RRFB Installation	68
Firestone Road	20	RRFB Installation	69
Spring Park Road	32	RRFB Installation	70
Staples Mill Drive	65	High Visibility Crossing	71
Harts Road	10	RRFB Installation	72
San Pablo Road	4	RRFB Installation	73
Broward Road	14	RRFB Installation	74
Townsend Blvd	36	Bus stop relocation	75
Old Kings Road	22	RRFB Installation	76
Commonwealth Avenue	53	RRFB Installation	77
Barnes Road S	82	RRFB Installation	78
Barnes Road S	83	RRFB Installation	79
Hartley Road	88	RRFB Installation	80
Spring Park Road	31	RRFB Installation	81
University Boulevard	41	RRFB Installation	82
San Pablo Road	5	RRFB Installation	83
Old Kings Road	24	RRFB Installation	84
Townsend Blvd	35	Bus stop relocation	85
Harts Road	8	RRFB Installation	86
Harts Road	9	RRFB Installation	87
Old Kings Road	23	RRFB Installation	88

The previous table presents normalized scores for all variables based on their proposed weights. Such scores were calculated by using the following formulas (Figure 24).

Figure 24. Formulas for calculating normalized scores for each of the proposed variables

Variable	Formula
Pedestrian Deaths	Number of pedestrian deaths within ½ mile of the proposed RRFB location divided by the number of total pedestrian deaths in the City, multiplied by the weight assigned (40 percent).
Pedestrian Crashes	Number of pedestrian crashes within ½ mile of the proposed RRFB location divided by the number of total pedestrian crashes in the City, multiplied by the weight assigned (30 percent).
Schools	Number of schools within ½ mile of the proposed RRFB location divided by the number of total schools in the City, multiplied by the weight assigned (15 percent).
Senior Centers	Number of senior centers within ½ mile of the proposed RRFB location divided by the number of total senior centers in the City, multiplied by the weight assigned (15 percent).

FINAL PROJECT SELECTION AND IMPLEMENTATION

While the APT provides an objective ranking methodology based on criteria developed in consultation with City staff, other factors may still influence final project selection, including:

- Grouping of projects along the same corridor (e.g. Soutel Drive or Moncrief Avenue). RRFB’s are still a relatively new traffic control devices and may be unfamiliar to Jacksonville residents. Installing a series of RRFBs along the same road or corridor, even though some locations are ranked higher than others, may assist with complementary public information and education programs and hasten understanding and acceptance of the devices by drivers and pedestrians alike.
- Mobility zones. The list does not consider geographical or political boundaries within the city that may influence the final order in which these devices are installed.
- Pairing with other planned projects. As mentioned above, the opportunity may arise to install an RRFB on this list as a part of a scheduled project.

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BICYCLE NETWORK

BIKEWAY STUDY

More than 800 people lost their lives in the United States in 2015 while riding a bike. As has been the case for several years, almost one in five of those fatalities (150 in 2015) occurred on Florida roads. While this may be in part attributable to a climate and topography that encourages year-round riding, this unacceptable death toll has led Florida to be at the forefront of initiatives to improve bicyclist safety. The state was one of the first to have a statewide bicycle safety plan, and in the late 1980s and early 1990s Florida communities led the way in local bicycle planning and program development.

Unfortunately, crashes involving bicyclists remain stubbornly high throughout the state, and in particular in big cities such as Jacksonville. Education and enforcement programs are an important element of an overall strategy to improve bicycle safety, however having a safe place to ride – and a place that feels safe – is still absolutely fundamental to creating a safe, bicycle-friendly community.

Bicycle planning and engineering has evolved significantly since the Bicycle Level of Service measure was developed and widely implemented in Florida communities, including Jacksonville. Today, the emphasis is on creating a comprehensive and connected network of low stress bicycling routes that comprise trails (such as the Baldwin Trail), separated infrastructure on busy roads, marked bike lanes on less busy roads (e.g. Lone Star Road), and signed routes on low volume, local neighborhood streets.

Taking this approach for the bicycle element of the Pedestrian and Bicycle Master Plan, a 250-mile connected network of roads within the I-295 Beltline was identified as the core of a citywide bike network (Figure 25). This network includes existing infrastructure; recommended changes to existing bike facilities to increase separation from motor vehicle traffic on roads with higher volumes and faster traffic; and proposed new facilities to complete the connected network.

The bicycle element also identifies a range of potential facility types to use in creating the network, and uses the ActiveTrans Prioritization Tool (APT) to generate a prioritized list of projects necessary to complete the network. This list is divided into two parts: one identifies projects on City streets, the other has changes necessary to State roads.

The prioritized list of projects on City streets is designed to assist in the evaluation and selection of projects for funding through the Mobility Fee and CIP process. However, the network map and list of projects

should guide and inform any changes made to these streets whether through regular resurfacing programs, JTA's Mobility Works initiative, or grant funded projects unrelated to the Pedestrian and Bicycle Master Plan specifically.

As with the pedestrian element of the plan, the role of the state is critically important. Not only are crashes involving bicyclists clustered around state roads that tend to have higher speeds and traffic volumes, but the state roads are also the most direct – and sometimes the only – routes serving major retail, commercial, education and residential areas in the city. Therefore, the plan has recommendations for the State DOT to update its design standards and do more than the bare minimum wherever possible. And, the value of the network map is that it provides guidance to encourage the State DOT to include recommended bike network changes in all of its projects on those roads.





Jacksonville, Florida

Department of Transportation



Study Network Pedestrian/Bicycle Master Plan

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Building_Bldg_Facility

Shared Lane Markings



Date: 6/7/2016

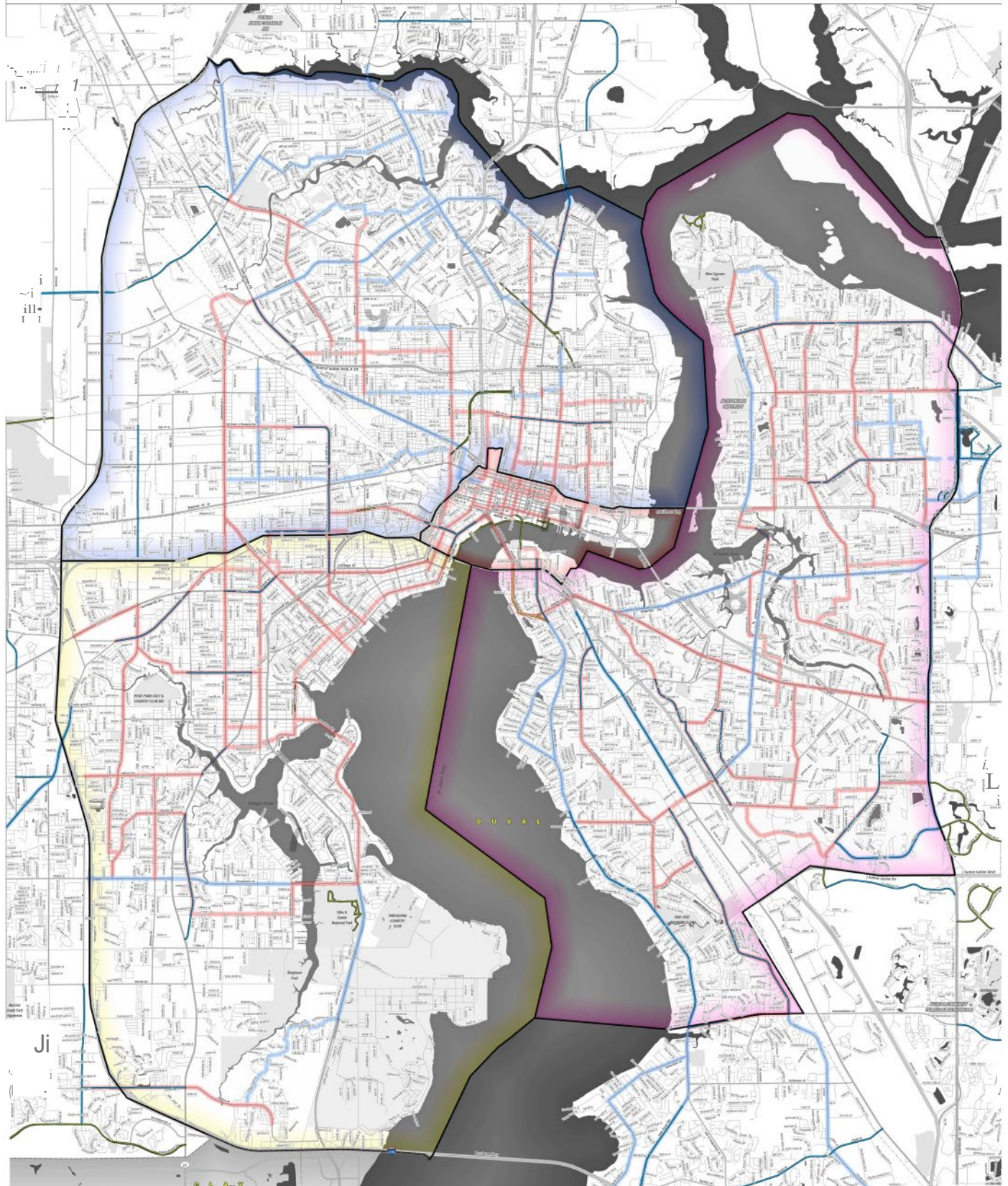


Figure 25. Bicycle network study area and route map.

BICYCLE NETWORK RECOMMENDATIONS

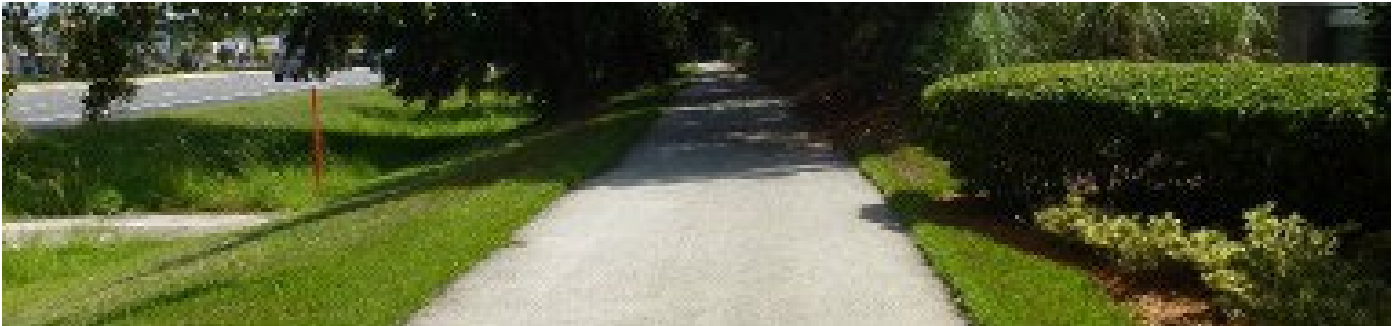
Network recommendations use the suite of facility types discussed below. They are listed from those providing the most protection and space for bicyclists to those providing the least where riders will share space with automobiles. Some facility types already exist on Jacksonville streets, and others will be new to the City. As mentioned in other areas of this plan, national design guidance should be used when implementing facilities, such as the AASHTO Guide to the Development of Bicycle Facilities and the NACTO Urban Bikeway Design Guide.

Shared use paths

Paths shared by both bicyclists and pedestrians come in two distinct types and there are several different ways in which they might be described. Paths that are largely within their own right of way – such as the Baldwin Trail and much of the S-Line – are often referred to as trails or greenways, especially if they have been developed and funded by a park authority or land management agency. Paths that are built within a highway right of way, parallel to the roadway and often on one side of the road for both directions of bicycle traffic, are usually referred to as sidepaths. Good examples in the Jacksonville area include Kernan Boulevard and the Black Creek Trail alongside US 17 south of Doctor's Inlet. Sidepaths are typically built by transportation agencies such Florida DOT and the City of Jacksonville Public Works Department.

The advantage with shared use paths that fall into the trails and greenways category is that as they exist in their own right of way, there are few interruptions from roads and driveways and users are well separated from motor vehicle traffic. By contrast, sidepaths are in the same right of way as the parallel roadway and may be frequently interrupted by driveways, curb cuts, intersections with local as well as major roads, and are subject to a lot of turning traffic. In addition, sidepaths often tend to be close to the motor vehicle traffic and that traffic is likely traveling quite fast. Finally, sidepaths often replace traditional sidewalks and have a heavier mix of pedestrians – who may be waiting at a bus stop, crossing the road, managing strollers and children – with whom cyclists must interact safely.

Sidepaths are an appropriate solution where separation from higher-speed, higher-volume traffic is needed; where pedestrian volumes aren't high enough to create frequent conflicts; and where the issue of frequent interruptions and turning movements can be minimized. Most corridors with shared use path recommendations in Jacksonville are large, commercial streets. These corridors tend to have a high number of driveways, and consolidation of these driveways should be prioritized to improve both bicyclist and pedestrian safety. Consolidating driveways decreases the number of potential conflict points between road users. Shared use path pavement and surface treatments should be carried across those driveways that do remain so drivers are aware that they are crossing a pedestrian and bicycle facility. Signage should also indicate two-way bicyclist and pedestrian travel at these crossings.



BEACH BOULEVARD

A shared use path is recommended on Beach Boulevard. For most of the corridor, this would require widening the existing sidewalk to accommodate both people traveling by foot and on bikes. This may require relocation of some utilities, and driveway consolidation is also recommended to decrease the number of potential conflicts between shared use path users and automobiles. Beach Boulevard currently rates BLOS F meaning it is extremely uncomfortable for all bicyclists. Shared use paths are not evaluated in the BLOS method, but this separation from automobile traffic would greatly increase bicyclist comfort.

Protected Bike Lanes

Protected bike lanes provide space for the exclusive use of bicyclists that is separated from both automobile and pedestrian traffic. This is a new facility type for Jacksonville.

Lanes may be at the street or sidewalk level, or at an intermediate level. Separation types range from less-permanent, lower-cost options such as flexible delineator posts, to mid-range cost options like pre-cast or cast-in-place concrete curb, to full reconstruction of the street providing a separated bike lane at intermediate or sidewalk level.

SBLs may be implemented either as two one-way facilities on each side of the street as typical bike lanes are, or they may be constructed as two-way facilities on one side of a one-way or two-way street. Two-way facilities may require less right-of-way space, but they can also create more complicated movements at intersections that need to be controlled with bicycle-specific signal phasing. In some cases, where streets are very wide, safe crossings are infrequent, and destinations are present on both sides of the street, it may even be desirable to have two-way SBLs on both sides of the street. However, this type of implementation can incur significant space and economic costs, so it is not likely to occur until Jacksonville has implemented a more basic bike network.

Many separated bike lane recommendations in Jacksonville can be implemented within existing curb lines through the removal of travel or parking lanes. In these cases, initial implementation can be done in a cost-effective manner by using striping and lower cost materials such as flexible delineator posts. When major street work is done in the future, these facilities can be upgraded to curb-separated or sidewalk-level lanes.



MERRILL ROAD

Protected bike lanes are recommended on Merrill Road. They can be implemented through a road diet that removes two travel lanes, providing space for the bike lane and buffer area where vertical separation will be placed. Merrill Road currently rates BLOS E, but the new configuration cannot be measured by BLOS which does not account for Protected bike lanes. However, other analysis methods show that this will be a much more comfortable facility.

Buffered Bike Lanes

Buffered bike lanes are dedicated space for bicyclists on the roadway and provide greater horizontal separation from automobile traffic. This facility already exists in Jacksonville on the Acosta Bridge where it was implemented in 2016.

Typically, the buffer is located between the bike lane and the adjacent travel lane, but it may also be located adjacent to a parking lane where there is concern about a the potential for dooring in areas of higher parking turnover. Where space is available, often where an entire travel lane is removed, there may be adequate width for buffering on both sides of the lane. Buffering both sides of the lane may also make it more evident to drivers that this roadway space is now dedicated to bicyclists.

This greater separation can increase bicyclists' comfort on busier streets, but it does not prevent automobiles from entering, stopping or parking in the bike lane and impeding travel. In locations where parking is removed from a street to implement buffered bike lanes, enforcement of the new no parking regulation may be needed. The same is true for locations where a travel lane is removed to prevent driving in the buffered bike lane. Buffered lanes may also be used as an interim treatment before implementation of a separated bike lane to gauge the impact of parking or travel lane removal. After a testing period, vertical separation may be added in the buffer area, or the space dedicated to the buffered bike lane may be reconstructed and built as an intermediate- or sidewalk-level separated bike lane.

Most buffered bike lane projects will be implemented through parking removal on both sides of the street, or through road diets that remove two travel lanes. These actions will provide ample space for buffered bike lanes. They may also be implemented through removal of center turn lanes where the volume of turning traffic is anticipated to be low.



AVENUE B

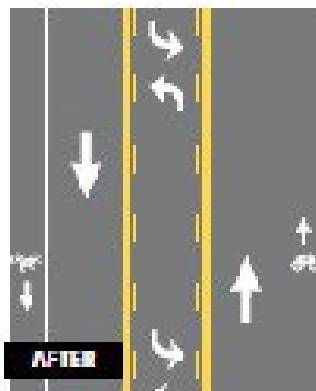
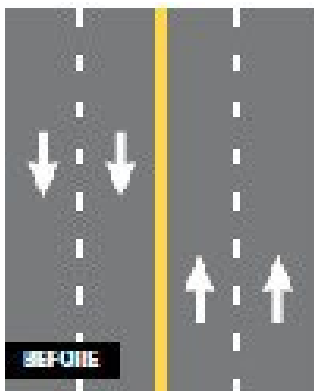
Buffered bike lanes are recommended on Avenue B. They can be implemented through removal of the center turn lane which provides space for a six foot bike lane with a three foot buffer on the travel lane side. The additional space will increase bicyclists' comfort, especially as this is a bus route, and the buffer places bicyclists farther from large buses. The addition of buffered bike lanes improves the BLOS score on Avenue B from a grade D to a grade A.

Bike Lanes

Bike lanes are dedicated space for bicyclists on the roadway that exist on a number of Jacksonville streets today. They provide an increased level of comfort for bicyclists but may not appeal to all riders if located on higher-volume, higher-speed streets. For example, the bike lane on Fort Caroline Road can be uncomfortable due to its minimal width (four feet from gutter pan edge) and higher volumes and speeds of adjacent traffic. Most people would not be comfortable riding here and would likely instead ride on the sidewalk.

Recommendations for bike lanes in this plan focus on streets with moderate to low traffic speeds and volumes, streets like those in the neighborhood collector and neighborhood commercial typologies. Most recommendations will be implemented through road diets which are in line with the recommendation to prioritize lane reductions on these streets to improve pedestrian safety. Reducing the number of lanes provides space on the roadway to stripe bike lanes, and in cases of a four-to-three road diet where a center turn lane is introduced, can provide space for introduction of median refuge islands at pedestrian crossings.

Some projects may also be implemented through lane diets where travel lanes today are wider than necessary or through removal of center turn lanes where turning volumes are not anticipated to be high.



SOUTEL DRIVE

Bike lanes are recommended on Soutel Drive. They can be implemented as part of a road diet project that will benefit pedestrians, bicyclists and motorists along this corridor. A road diet converts a four lane roadway to one with two travel lanes, a center turn lane, and bicycle lanes. The center turn lane can also be built as a pedestrian refuge to help people cross the road safely. The addition of bike lanes on improves the BLOS score on Soutel Drive from a D to a C grade – still somewhat uncomfortable due to the traffic volume and speed.

Bicycle boulevard

Bicycle boulevard routes take advantage of low-speed, low-volume streets that are already comfortable for most bicyclists. As such, limited additional infrastructure is needed on many segments of these streets other than traffic calming described below. Bicycle boulevards are recommended on local streets in Jacksonville, and many of the infrastructure improvements for pedestrians noted for the residential street typology are applicable on bicycle boulevards.

Many local streets are already comfortable for bicycling and are unlikely to have issues with higher speed automobiles. However, some local streets in Jacksonville are wider, around 30 feet in width, have no striped centerline and low on-street parking occupancy. Where these streets have been recommended to be a bicycle boulevard, traffic calming measures should be implemented. These can take the form of either vertical (speed humps, speed cushions, etc.) or horizontal (curb extensions, chicanes, mini circles, etc.) elements. These features are further detailed in the residential street typology. Where traffic calming is not needed, bicycle boulevards should be designated with wayfinding signage, and the City may also consider pavement markings. Because these facilities follow smaller, more circuitous routes, wayfinding signage is of particular importance and should be considered for bicycle boulevards.

A critical part of implementing bicycle boulevards will be to address crossings of major streets. Some of these are already signalized and provide a reasonable means for bicyclists to cross a higher-volume, higher-speed street. Unsignalized crossings will need to be studied at the time of design to determine the appropriate accommodation to make a safe and comfortable crossing for bicyclists. Appropriate treatments will range from marked crosswalks with rectangular rapid flashing beacons (RRFBs), to addition of a median refuge island, to consideration of additional traffic control such as a pedestrian hybrid beacon or full signal.



OAK STREET

A bicycle boulevard is recommended on Oak Street. While the street is already somewhat mostly comfortable for bicyclists, traffic calming should be added. Curb extensions at intersections and mid block locations are good candidates because of on street parking. The crossings to the bridge over Willow Branch should also be highlighted and signed so drivers expect bicyclists to continue with a through movement in these locations. Oak Street already rates BLOS B, and though the addition of traffic calming and signage does not change its BLOS rating, these actions are likely to increase bicyclist comfort and improve conditions for pedestrians as well.

Priority Sharrows

Priority sharrows (PSLs) are used on streets where space is not available to provide a dedicated bicycle facility, such as bike lanes, and where a more prominent notification to drivers is desired. These markings are spaced more frequently than standard sharrows and also have a green backing. They are recommended in commercial areas where more complex traffic patterns will be present as a result of higher parking turnover and anticipated higher bicycle volumes to access adjacent businesses.

While PSLs do not provide dedicated space on the roadway for bicyclists, they do bring a higher level of awareness to drivers than typical sharrows. As a new facility for Jacksonville, they will likely have a large impact by drawing attention, but may also require some education for drivers and bicyclists. Future use of this marking on streets not in this Plan's network should be restricted to those with higher traffic volumes to maintain the difference in usage between PSLs and standard sharrows.



PARK STREET

Priority sharrows are recommended on a short segment of Park Street in the Five Points area. This block has high turnover angled parking with many small retail and restaurant destinations and higher pedestrian volumes. These factors can lead to somewhat chaotic traffic movements where drivers' awareness of potential bike traffic should be heightened. PSLs do not change the BLOS rating of this street.

Sharrows

Sharrows, also known as Shared Lane Arrows, are used on streets where space is not available to provide a dedicated bike facility, such as bike lanes. Sharrows are recommended on lower-volume, lower-speed streets where centerlines are present. Many of these streets are similar to those recommended to become bicycle boulevards, but they likely have higher traffic volumes which warrant centerline striping.

Some streets where sharrows are recommended would also benefit from traffic calming, either vertical or horizontal. The existing sharrows in Jacksonville are on Riverside Avenue near the I-95 underpass and on San Marco Boulevard through a constrained area with medians and a commercial center.



KING STREET

Sharrows are recommended for King Street to connect the College Street bicycle boulevard to bike lanes on McCoy Creek Boulevard. King Street is one of the few connections through the barrier of I 10 in this area, and it is preferable to Stockton Street which is busier and higher speed. While King Street is lower speed and volume, the 28 foot width means there is also room for horizontal traffic calming which may help keep automobile speeds close to the speed limit of 30 mph. Sharrows do not change the BLOS rating of this street.

ADDITIONAL INFRASTRUCTURE PROJECTS

Critical Bridge Connections

There are some potential connection projects within the study area that do not lend themselves to identification as segments within the recommended network.

One critical area would be to create a connection for bicyclists and pedestrians through the interchange at Arlington Expressway and Southside Boulevard. The frontage roads along Southside Boulevard present an easy project for north-south travel in this area, and reconnecting Mill Creek Road via a bicycle and pedestrian bridge or underpass would enable travel to continue farther north. The connection through the Myrtle Avenue underpass would also require major construction work, but it would link two segments of Myrtle that otherwise are an easy win in terms of connectivity from near downtown to northern neighborhoods.

Lighting

Due to the many highways that criss-cross the Jacksonville landscape, there are a number of bike routes which use underpasses. Typically, these are not well lit. While this may be reasonable for automobiles with headlights, typical bike lights do not also light the roadway. The addition of lighting should be considered where bike facilities use underpasses.

BICYCLE NETWORK PRIORITIZATION

The recommendations of the bike network were prioritized in order to help the City decide how to spend available funding sources, where the pursuit of additional funding may be necessary, and projects that could occur with partners such as FDOT, JTA and the Downtown Investment Authority.

Facility recommendations were aggregated or divided into corridors based upon the following criteria:

- **FACILITY TYPE:** A single facility type recommendation that applies to multiple streets along a route, e.g., a bicycle boulevard that include a number of turns;
- **STREET:** A single street with multiple facility types that are implemented through similar means, e.g., a street where bike lanes and sharrows are recommended for different sections, but both projects are implemented through application of paint, not through moving curbs; and/or
- **LOGICAL EXTENTS:** A longer corridor with a single facility type broken at logical end points to create shorter segments, e.g., a five-mile shared use path recommendation broken into corridors based upon places where it connects with other planned/existing facilities or major destinations.

Corridors may not always be implemented as a whole where costs are high or where other roadway projects have different extents. A single corridor may end up being implemented through a series of projects that occur at different times. However, planners should be conscious of perpetuating the existing problems of network connectivity in Jacksonville. The critical problem of the existing bike network is a lack of connectivity, so while connectivity is assessed in the prioritization, common sense consideration of connections should dictate project timing and extents.

Although the data-driven process is intended to determine broad priorities, it should be used as a guide, not as an infallible list of priorities. It's important that the prioritized list not be taken so literally as to preclude projects lower on the list from being constructed first if opportunity arises. For example, if a road rehabilitation project is imminent, a project lower on the list should be considered for implementation even if projects above it are not yet funded.

Prioritization Methodology

The prioritization methodology used for the plan is based on the 10-step method for prioritizing pedestrian and bicycle improvement locations developed for *National Cooperative Highway Research Program (NCHRP) Report 803: Pedestrian and Bicycle Transportation Along Existing Roads—ActiveTrans Priority Tool Guidebook*. The 10-step method is the result of findings from a national survey, literature review, and agency interviews.

The prioritization tool reflects input of a project steering committee regarding community priorities, as well as feedback heard at open houses conducted for this Plan. Each project is scored based on a set of criteria and weighting determined by the steering committee and reflect the vision and goals of the project. The scoring uses a combination of selected factors and variables. Factors are categories used in the prioritization process to express community/agency values and group variables with similar characteristics. Variables are measurable characteristics of roadways, households, neighborhood areas and other features. For this Plan, factors, variables and weighting were recommended by the project team and reviewed by stakeholders (Figure 26).

Prioritization Results

The results of this prioritization exercise are listed in the figures below (Figures 28-29). Those projects near the top of the list will likely have the greatest impact on improving the bicycling environment in Jacksonville. As noted, this list is not the only factor that should inform decisions about project implementation, but the top corridors listed here are those that are more likely to improve safety in high-crash locations, serve areas with higher demand for bicycling, connect to other facilities,

and serve historically underserved populations throughout Jacksonville.

Implementation Opportunities

Some projects that present the opportunity for quicker implementation are not included in the top tier of prioritized corridors. However, there is value in implementing these recommendations early in order to demonstrate the City’s interest in improving the bicycling environment (Figure 27).

Some of the projects listed below will be new facility types for Jacksonville. It is important to start to get these on the ground so users of all modes—people driving, biking and walking—become accustomed to the rules of the road associated with each.

Some of the projects listed below will also be new methods of implementation for Jacksonville. By working through these project designs soon, City staff will be prepared for how they will assess these project types in the future.

Figure 26. Variables and values used for the network prioritization process.

Factor	Variables	Weight (points)
Safety		10
	# bike/ped crashes	
	# fatal or severe bike/ped crashes	
Demand		6
	Average demand over corridor length	
	# bus lines crossed	
	# elementary schools within 1 mile	
	# middle and high schools within 2 miles	
Connectivity		9
	# connections to an existing bike facility	
	# connections to a planned bike facility	
Equity		7
	% population in poverty	
	% non-white population	
	% youth population	
	% population in rental housing	

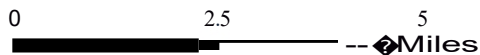
Figure 27. List of top implementation opportunities

Street	From	To	Facility	Implementation Action(s)
Soutel Drive	New Kings Road	Lem Turner Road	Bike lanes	Road diet (4 to 3 lanes)
Avenue B	30 th Street	Moncrief Road	Buffered bike lanes	Center turn lane removal
Oak Street	Margaret Street	Challen Avenue	Bicycle boulevard	Traffic calming; signage
Moncrief Road	Golfair Boulevard	MLK Jr Parkway	Buffered bike lanes	Center turn lane removal



Prioritization

- Prioritized Pro-jects by Score**
- 0-150
 - == 151-175
 - === 176-200
 - ==== 201-225
 - ===== >225
- D** Mobility Zone Boundary



Date: 3/23/2017

Figure 28. Bike network segments ranked by priority.

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
1	Lem Turner Road (Trout River Bridge)	Separated Bike Lane	Dolly Drive	Bayview Avenue		36
2	Lem Turner Road	Shared use path	Bayview Avenue	Clyde Drive		26
3	Bassett Road	Sharrows	Lem Turner Road	Carbondale Drive	130	
4	Clyde Drive	Bicycle boulevard	Soutel Drive	Lem Turner Road	150	
5	Soutel Drive	Bike Lanes	Moncrief Road	Lem Turner Road	124	
6	Sibbald Road	Bike Lanes	Trout River Boulevard	Soutel Drive	146	
7	Howell Drive; Ribault Scenic Drive	Bike Lanes	Clyde Drive	Winton Drive	121	
8	Winton Drive	Bike Lanes	Moncrief Road	Van Gundy Road	74	
9	Carbondale Street, Champlain Road, Van Gundy Road	Bicycle boulevard	Winton Drive	Lem Turner Road	125	
10	Lem Turner Road	Shared use path	Edgewood Avenue	Clyde Drive	48	
11	Edgewood Avenue	Separated Bike Lane	Lem Turner Road	Bunker Hill Blvd		9
12	Edgewood Avenue	Separated Bike Lane	Moncrief Road	Lem Turner Road		21
1	Oakhurst Avenue; Rutledge Avenue; Smyrna Street	Bicycle boulevard; Sharrows	Lem Turner Road	Moncrief Road	105	
14	Moncrief Road	Separated Bike Lane	Soutel Drive	Edgewood Avenue	109	
15	Cleveland Road; Marlo Street	Bike Lanes; Sharrows	25th Street	Moncrief Road	129	
16	Edgewood Avenue	Separated Bike Lane	New Kings Road	Moncrief Road		10
1	Edgewood Avenue, Edgewood Court, McLendon Drive	Paved Shoulder	New Kings Road	Edgewood/McLendon Inter-section	82	
18	Edgewood Avenue	Separated Bike Lane	I-10 underpass	McLendon Street (RR bridge)	31	
19	5th Street; Norman E Tagard Boulevard	Bike Lanes; Sharrows	Edgewood Avenue	Huron Street	57	
20	Melson Avenue	Bike Lanes; Paved Shoulder	Broadway Avenue	20th Street	116	
21	Broadway Avenue	Bicycle boulevard	McDuf Avenue	Edgewood Avenue		
22	Green Street, Luna Street, Melba Street	Bicycle boulevard; Sharrows	Lenox Avenue	Post Street	65	

Figure 29. List of prioritized bikeway network projects, by project number

23	Edgewood Avenue	Bufered Bike Lanes	Mayfower Street	I-10	9	67
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Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
24	Edgewood Avenue	Separated Bike Lane	Mayfower Street	Plymouth Street	95	
25	Edgewood Avenue	Bicycle boulevard; Sharrows	Plymouth Street	Waterfront	136	
26	Challen Avenue; Herschel Street; Oak Street; Margaret Street; Oak Street trail	Bike Lanes; Bicycle boulevard; Priority Sharrows; Trail	Riverside Avenue	San Juan Avenue	139	
27	Hamilton Street	Bicycle boulevard	College Street	Blackburn Street	149	
28	College Street, Falmouth Street	Bicycle boulevard	Cassat Avenue	Luna Street	89	
29	Post Street	Bike Lanes; Sharrows	Roosevelt Boulevard	Cassat Avenue		6
30	Lenox Avenue	Bike Lanes	Normandy Boulevard	Edgewood Avenue	76	
31	Lenox Avenue; Old Middleburg Road	Bufered Bike Lanes	Lane Avenue	Hyde Grove Avenue	114	
32	Normandy Boulevard	Paved Shoulder	Memorial Park Road	Lane Avenue		19
33	Lane Avenue	Separated Bike Lane	Normandy Boulevard	Wilson Boulevard		27
34	103rd Street; Timuquana Road	Separated Bike Lane	I-295	Roosevelt Boulevard		28
35	Wesconnett Boulevard	Separated Bike Lane	110th Street	Harlow Boulevard	111	
36	110th Street; Ortega Farms Boulevard	Bicycle boulevard	Wesconnett Boulevard	Timuquana Road	160	
37	Harlow Boulevard	Bicycle boulevard	103rd Street	Wesconnett Boulevard	111	
38	Lane Avenue; London Bridge Lane	Bike Lanes; Bicycle boulevard; Sharrows	Harlow Boulevard	Wilson Boulevard	96	
39	Jammes Road	Bufered Bike Lanes	Wilson Boulevard	103rd Street	119	
40	Wilson Boulevard	Separated Bike Lane	Lane Avenue	Blanding Boulevard	63	

41	Wilson Boulevard	Shared use path	Firestone Road	Lane Avenue	17
42	Herschel Street; Lakeside Drive; Birkenhead Road; Wabash Avenue	Bicycle boulevard; Sharrows	San Juan Avenue	Hamilton Street	108
44	Blackburn Street	Bicycle boulevard	Hamilton Street	Blanding Boulevard	105
45	Blanding Boulevard (Cedar River Bridge)	Shared use path	Wilson Boulevard	Blackburn Street	1

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
46	Edgewood Avenue	Separated Bike Lane	Cassat Avenue	I-10	42	
47	Park Street (two segments)	Bike Lanes; Bicycle boulevard	Lane Avenue; Blanding Boulevard	Lake Shore Boulevard; Hamilton Street	88	
48	Roosevelt Boulevard/Railroad alignment	Trail	Timuquana Road	Forest Street	145	
49	Riverside Avenue	Bufered Bike Lanes; Bike Lanes	Margaret Street	Leila Street	23	
50	McCoy Creek Boulevard; Forest Street; Fitzgerald Street	Bike Lanes; Sharrows	McDuf Avenue	I-95 Underpass	79	
51	King Street	Sharrows	College Street	McCoy Creek Boulevard	4	
52	College Street, Goodwin Street, Post Street, Roosevelt Boulevard	Bicycle boulevard; Sharrows; Priority Sharrows	Park Street	McDuf Avenue	91	
53	Lee Street; Park Street	Bufered Bike Lanes; Bike Lanes; Priority Sharrows; Sharrows	Adams Street	Post Street	15	
54	Church Street	Contrafow Bike Lane; Sharrows	Eaverson Street	Lee Street	69	
55	Beaver Street; Eaverson Street	Bike Lanes; Sharrows	Church Street	Kings Road	28	
56	Kings Road; New Kings Road	Bike Lanes	MLK Jr Parkway	Eaverson Street		16
57	25th Street	Bicycle boulevard	New Kings Road	Almeda Road	66	
58	Meharry Avenue; Paris Avenue; Brooklyn Road	Bicycle boulevard	Avenue B	Moncrief Road	40	
5	Avenue B; Restlawn Drive; Canal Street; Almeda Street; 30th Street	Bufered Bike Lanes; Bike Lanes; Sharrows; Paved Shoulder	26th Street	Palmdale Street	72	
60	Moncrief Road	Shared use path	Edgewood Avenue	Golfair Boulevard	27	
61	Moncrief Road	Bufered Bike Lanes; Bike Lanes; Sharrows	34th Street	S Line existing trail	7	
62	26th Street; Almeda Street	Sharrows	Canal Street	Moncrief Road	87	

63	33rd Street	Sharrows; Bike Lane	Alameda Street	Myrtle Avenue	100
64	13th Street	Sharrows	Canal Street	Davis Street	43
66	Myrtle Avenue (I-95 underpass)	Shared use path	Dennis Street	Bay Street	14
67	Myrtle Avenue	Buffered Bike Lanes	Forest Street	Dennis Street	25
68	Forest Street	Separated Bike Lane	Forest Street	I-95 SB of-ramp	4

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
69	Jeferson Street	Separated Bike Lane	Leila Street	Forsyth Street	16	
70	Jeferson Street	Sharrows	Forsyth Street	Ashley Street	54	
71	Church Street	Separated Bike Lane; Bike Lanes; Sharrows	Jeferson Street	Washington Street	44	
72	Ashley Street	Separated Bike Lane	Jeferson Street	Washington Street	51	
73	Coast Line Drive; Pearl Street	Protected bike lanes; Bike Lanes; Sharrows	Water Street	1st Street	6	
74	Laura Street	Bufered Bike Lanes; Bike Lanes; Priority Sharrows	Independent Drive	1st Street	2	
75	Bay St	Separated Bike Lane	BAY ST	Liberty Street	21	
76	Bay Street	Bike Lanes	Liberty Street	A Philip Randolph Boulevard	22	
77	Liberty Street	Bufered Bike Lanes; Bike Lanes; Bicycle boulevard	1st Street	Courthouse Drive	7	
78	Liberty Street	Bicycle boulevard	1st Street	21st Street	56	
79	21st Street	Bike Lanes	Liberty Street	Phoenix Avenue	61	
80	Phoenix Avenue	Bike Lanes	Dyal Street	21st Street	36	
81	Dyal Street and Florida Avenue	Bicycle boulevard	First Street	Phoenix Avenue	44	
82	A Philip Randolph Boulevard	Bike Lanes; Sharrows	Bay Street	1st Street	64	
83	1st Street	Bike Lanes; Bicycle boulevard	Pearl Street	US-1	35	
84	S Line Extension	Trail	Phelps Street	Hubbard Street	94	
85	8th Street	Bike Lanes	Franklin Street	Talleyrand Avenue		
86	Bufalo Avenue; Wigmore Street; Talleyrand Avenue	Bufered Bike Lanes; Bike Lanes	44th Street	11th Street	141	

87	Talleyrand Avenue	Bufered Bike Lanes	Duval Street	11th Street	115
88	Bryan Street; Duval Street	Sharrows	Talleyrand Avenue	Northbank Riverwalk Extension	85
89	Hart Bridge	Shared use path	south bank	north bank	41
90	Northbank Riverwalk Extension	Trail		ive	135
91	Acosta Bridge	Shared use path	south bank	north bank	11
92	FEC Rail Corridor	Trail	Acosta Bridge	Avenues Walk Boulevard	154

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
93	St Augustine Road	Bike Lanes	Emerson Street	University Boulevard	133	
94	St Augustine Road	Bike Lanes	University Boulevard	San Jose Boulevard	41	
95	University Boulevard	Separated Bike Lane	San Jose Boulevard	St Augustine Road		
96	University Boulevard	Separated Bike Lane	Powers Avenue	I-95 SB of-ramp	9	
97	Kennerly Road; Spring Glen Road	Bike Lanes; Bicycle boulevard	Spring Park Road	Beach Boulevard	117	
98	San Jose Boulevard	Sharrows	Hendricks Avenue	Hendricks Avenue	163	
100	Hendricks Avenue; San Jose Boulevard	Bufered Bike Lanes	San Marco Boulevard	San Jose Park Drive		4
101	Phillips Highway	Separated Bike Lane	I-95 Interchange	Emerson Street		39
102	Phillips Highway	Shared use path	University Boulevard	Emerson Street		22
103	San Marco Boulevard	Sharrows; Priority Sharrows	Nira Street	Hendricks Avenue	50	
104	Childrens Way; Nira Street; Palm Avenue; Prudential Drive	Sharrows	San Marco Boulevard	Hendricks Avenue	13	
105	San Marco Boulevard	Separated Bike Lane	Mary Street	Prudential Drive	24	
106	Riverplace Boulevard	Bike Lanes	San Marco Boulevard	Prudential Drive	11	
107	Main Street Bridge	Shared use path	south bank	north bank	69	
108	Southbank Riverwalk East Extension	Trail	Southbank Riverwalk East Extension	Southbank Riverwalk East Extension	97	
110	Atlantic Boulevard	Shared use path	I-95 Interchange	Spring Park Road		
111	Beach Boulevard	Shared use path	Spring Park Road	Spring Glen Road		29

113	Beach Boulevard	Shared use path	Spring Glen Road	Dean Road	12
114	Dean Road; Parental Home Road	Bike Lanes; Bicycle boulevard; Sharrows	Bowden Road	Beach Boulevard	159

109	Atlantic Boulevard	Bufered Bike Lane; Bike Lane; Priority Sharrows	San Marco Boulevard	I-95 interchange	38
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Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
115	Bartram Road; Hickman Road; Ryar Road; Smallwood Road	Bicycle boulevard	University Boulevard	Beach Boulevard	138	
116	Bartram Road	Paved Shoulder	Atlantic Boulevard	University Boulevard	147	
117	Atlantic Boulevard	Shared use path	Beach Boulevard	Southside Boulevard		3
118	Berry Avenue; Mill Creek Road	Bicycle boulevard; Sharrows	Arlington Road	Atlantic Boulevard	132	
119	Arlington Road	Bufered Bike Lanes	Atlantic Boulevard	Alderman Road	73	
120	Arlington Road	Shared use path	Arlington Expressway	Alderman Road	33	
121	Arlington Road	Separated Bike Lane	King Arthur Road	Arlington Expressway	1	
122	Arlington Road	Separated Bike Lane	Cesery Boulevard	Rogero Road	39	
123	Rogero Road	Bufered Bike Lanes	Merrill Road	Arlington Road	102	
124	Cesery Boulevard	Bufered Bike Lanes; Bike Lanes; Bicycle boulevard	Merrill Road	Arlington Expressway	98	
125	Arlington Expressway; Service Road	Shared use path	Matthews Bridge	Cesery Boulevard	8	
126	Matthews Bridge	Shared use path				42
127	Arlington Expressway	Shared use path	A Philip Randolph Boulevard	Matthews Bridge	93	
128	University Boulevard	Bike Lanes	Tanglewood Avenue	Clifon Lane	98	
129	University Boulevard	Shared use path; Protected bike lanes	Fort Caroline Road	Arlington Expressway	81	
130	University Club Boulevard; University Boulevard	Bicycle boulevard	Fort Caroline Road	Fort Caroline Road	141	
131	Fort Caroline Road	Separated Bike Lane	University Boulevard	Townsend Boulevard	103	
132	Fort Caroline Road	Separated Bike Lane	Townsend Boulevard	Gilmore Heights Road	151	

133	Southside Connector Service Road	Shared use path	Merrill Road	Regency Square Boulevard	148
134	Merrill Road	Shared use path	Sunrise Ridge Lane	Southside Boulevard underpass	2
135	Merrill Road	Separated Bike Lane	University Boulevard	Dames Point Crossing Boulevard	74

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
136	Cesery Boulevard	Bicycle boulevard	Merrill Road	Fort Caroline Road	68	
137	Rogero Road	Bike Lanes; Bicycle boulevard	Fort Caroline Road	Merrill Road	113	
138	Townsend Boulevard	Bike Lanes	Merrill Road	Fort Caroline Road	59	
139	Townsend Boulevard	Bicycle boulevard	Arlington Expressway	Merrill Road	80	
140	Arble Drive	Bicycle boulevard	Mill Creek Road	Townsend Boulevard	131	
141	Samontee Road; Wedgefeld Boulevard	Bicycle boulevard	Lone Star Road	Merrill Road	120	
142	Mill Creek Road	Bike Lanes; Paved Shoulder; Bicycle boulevard	Regency Square Boulevard	Arble Drive	125	
143	Lone Star Road; Trednick Parkway	Protected bike lanes; Trail; Sharrows	Mill Creek Road	Monument Road	48	
144	Mill Creek Road/Southside Boulevard and connection under Arlington Expressway	Trail/Shared use path	Atlantic Boulevard	Regency Square Boulevard	19	
145	Southside Boulevard	Sharrows	Atlantic Boulevard	Orr Street		37
146	Southside Boulevard (through Beach Blvd interchange)	Shared use path	Southside Blvd service road north	Southside Blvd service road south		24
147	Beach Boulevard	Shared use path	Southside Boulevard	Dean Road		33
149	Altama Road, Glynlea Road, Grove Park Boulevard	Bicycle boulevard	Atlantic Boulevard	Beach Boulevard	157	
150	Arlington Road; Crane Avenue; Holiday Road; Singapore Road	Bicycle boulevard	Altama Road	Atlantic Boulevard	134	
151	University Boulevard	Separated Bike Lane	River Hills Drive	Atlantic Boulevard		13
152	Spring Park Road	Bike Lanes	Emerson Street	Atlantic Boulevard		
153	Barnes Road	Shared use path	University Boulevard	Carrevero Drive	29	
154	Barnes Road	Bike Lanes	Carrevero Drive	Parental Home		
		Bike Lane; Paved Shoulder				

104

156

Southpoint Drive

Bike Lanes

Bowden Road

Belfort Road

143

157

Bridges Street; Tiger Hole Road

Bicycle boulevard

Bowden Road

Belfort Road

158

158

153

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
159	Southside Boulevard; Toutchon Road	Shared use path	Gate Parkway	Deerwood Lake Parkway	127	
160	Southside Boulevard Service Roads	Sharrows	Beach Boulevard exit ramp	southern end of service road		4
161	Gate Parkway	Shared use path	Belfort Road	Southside Boulevard	144	
162	Bradley Road; Live Oak Drive	Paved Shoulder; Bicycle boulevard	Southside Boulevard	Atlantic Boulevard	118	
164	Monument Road	Shared use path	Tredinick Parkway	Atlantic Boulevard		
165	Regency Square Boulevard	Shared use path	Mill Creek Road	Monument Road	36	
166	Lillian Road	Bike Lanes	Arlington Road	Lone Star Road	30	
167	Toledo Road	Bicycle boulevard	St Augustine Road	Powers Avenue	52	
168	McDuf Avenue	Existing Bike Lanes	Phyllis Street	Lenox Avenue	34	
169	McDuf Avenue	Bicycle boulevard; Bike Lanes	St Johns Avenue	Post Street	57	
170	James Street	Bicycle boulevard	College Street	Oak Street	101	
171	Broadway Avenue, McQuade Street, State Street	Bicycle boulevard; Bike Lanes; Sharrows	Myrtle Avenue	McDuf Avenue	86	
172	Canal Street	Bike Lanes	13th Street	26th Street	46	
						8
173	New Kings Road	Shared use path	MLK Jr Parkway	Edgewood Avenue		
174	45th Street	Bufered Bike Lanes; Bike Lanes	New Kings Road	Moncrief Road	121	
176	5th Street; Grothe Street	Sharrows	Davis Street	Myrtle Avenue	20	
177	4th Street, 5th Street, Jeferson Street (also includes existing path across Hogans Creek)	Bicycle boulevard; Bike Lanes; Sharrows	Davis Street	Pearl Street	18	
180	Ashley Street; Davis Street	Bike Lanes	Lee Street	8th Street	12	
181	8th Street	Separated Bike Lane	Boulevard	Davis Street	1	
182	8th Street	Bike Lanes	Myrtle Avenue	Francis Street	3	
183	12th Street, 14th Street, Boulevard, Main Street	Protected bike lanes; Bike Lanes; Bicycle boulevard	Liberty Street	S Line existing trail	55	
184	Pearl Street	Bufered Bike Lanes; Bike Lanes	1st Street	39th Street	69	
185	Pearl Street	Bufered Bike Lanes	Tallah Avenue	39th Street	84	

186

Tallahassee Avenue

Buffered Bike Lanes

Lorain Street

Main Street

25

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
187	Edgewood Avenue; Tallulah Avenue	Bike Lanes; Shared use path	Bunker Hill Boulevard	Lorain Street		29
188	41st Street; 44th Street; Norwood Avenue	Bike Lanes; Sharrows	Pearl Street	Norwood Avenue		1
189	Lem Turner Road	Shared use path	Edgewood Avenue	Norwood Drive		5
190	44th Street	Bicycle boulevard	Bufalo Avenue	Main Street	76	
191	Main Street	Bufered Bike Lanes	Main Street Bridge	S Line existing trail		20
192	Main Street (Trout River Bridge)	Shared use path	Sterling Street	Broward Road		43
193	11th Street; Carmen Street; Evergreen Avenue	Bicycle boulevard	Talleyrand Avenue	Liberty Street	78	
194	Southbank Riverwalk West Extension	Trail	Southbank Riverwalk West Extension	Southbank Riverwalk West Extension	62	
195	Northbank Riverwalk Expansion	Trail	Fuller Warren Bridge	Memorial Park Drive	121	
196	Fuller Warren Bridge	Shared use path	Riverside Avenue	Palm Avenue		18
197	Water Street	Bufered Bike Lanes	Park Street	Jeferson Street	26	
198	Hood Road; Old Kinds Road	Bike Lanes; Paved Shoulder	Losco Road	Baymeadows Road	155	
199	Baymeadows Road	Shared use path	Old Kings Road	San Jose Boulevard		33
200	Beauclerc Road; Scott Mill Road	Paved Shoulder	San Jose Boulevard	I-295	164	
201	Sunbeam Road	Shared use path	San Jose Boulevard	Old Kings Road	137	
202	San Jose Boulevard	Shared use path	Lake Mandarin Court	San Jose Park Drive		3
203	Caravaca Court, Greenway Drive, Ortega Bluf Parkway, Ortega Hills Drive (plus new trail)	BL, NG, TR Bike Lanes; Bicycle boulevard; Trail	Collins Road	Roosevelt Boulevard	156	
204	Collins Road	Bike Lanes	Blanding Boulevard	Roosevelt Boulevard	127	
205	Roosevelt Boulevard	Shared use path	I-295	Timuquana Road	161	

206	Collins Road	Separated Bike Lane	Blanding Boulevard	Rampart Road	109
207	Shirley Avenue	Bicycle boulevard	Cassat Avenue	Hamilton Street	107
208	8th Street (I-95 underpass)	Shared use path	Francis Street	Davis Street	10
209	Cassat Avenue (I-10 underpass)	Shared use path	I-10 EB of-ramp	Rosselle Street	7
210	Cassat Avenue	Separated Bike Lane	Blanding Boulevard	I-10	23
212	University Boulevard	Shared use path	Beach Boulevard	I-95 SB of-ramp	14

Project Number	Project Street(s)	Facility(ies)	From	To	City Ranking	FDOT Ranking
213	University Boulevard	Shared use path	Hart Expressway	River Hills Drive		35
214	University Boulevard	Separated Bike Lane	Atlantic Boulevard	Cesery Boulevard		4
215	University Boulevard	Separated Bike Lane	Beach Boulevard	FL-228		3
311	University Boulevard	Shared use path	St Augustine Road	Powers Avenue	5	

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ROADMAP FOR CHANGE

LEADERSHIP IN ACTION

The preceding chapters have identified a significant number of projects to make the City of Jacksonville more walkable and bike-friendly.

- The SNAPP program lays out a strategy for fixing deficiencies in the safety and accessibility of the pedestrian environment across the city, one neighborhood at a time.
- The TRIPS initiative identifies design strategies, for more than 30 high-crash locations on five common types of Jacksonville street, to reduce crashes and increase walkability and bike-friendliness .
- More than 80 prioritized locations are identified on city streets for the installation of Rectangular Rapid Flashing Beacons (RRFB).
- A recommended 250-mile bikeway network is identified, together with a prioritized list of projects for the City and State DOT to use in completing the network.
- In addition, during the development of the Pedestrian and Bicycle Master Plan, a number of recommendations were made to establish policies and programs to ensure that:
 - Regular bicycle and pedestrian counts are taken to establish and monitor a baseline level of use,
 - Bicycle parking is routinely provided as part of development activity,
 - Details of bicycle and pedestrian infrastructure are captured in an updated GIS layer, and
 - Prioritization of projects is determined with an objective process.

Several of these recommendations are already being implemented. However, this is a large body of work for the City to undertake, and it won't happen overnight. It is also important to note that the City of Jacksonville is not the only player in bringing this plan to life. The Florida Department of Transportation, for example, owns and operates major roadways throughout the city on which half of all pedestrian and bicyclist fatalities occur. These roads are also critical connections across major waterways, railroads and other barriers, and serve important origins and destinations throughout the city.

The Pedestrian and Bicycle Master Plan is a City of Jacksonville initiative and identifies actions the city can take to improve the safety, comfort and convenience of walking and biking. In this Chapter, the plan also identifies a series of specific implementation

strategies through which the City can demonstrate leadership and a commitment to action that is intended to bring partner agencies along as well. This example of Leadership in Action is central to successful implementation of the Master Plan.



CITY LEADERSHIP

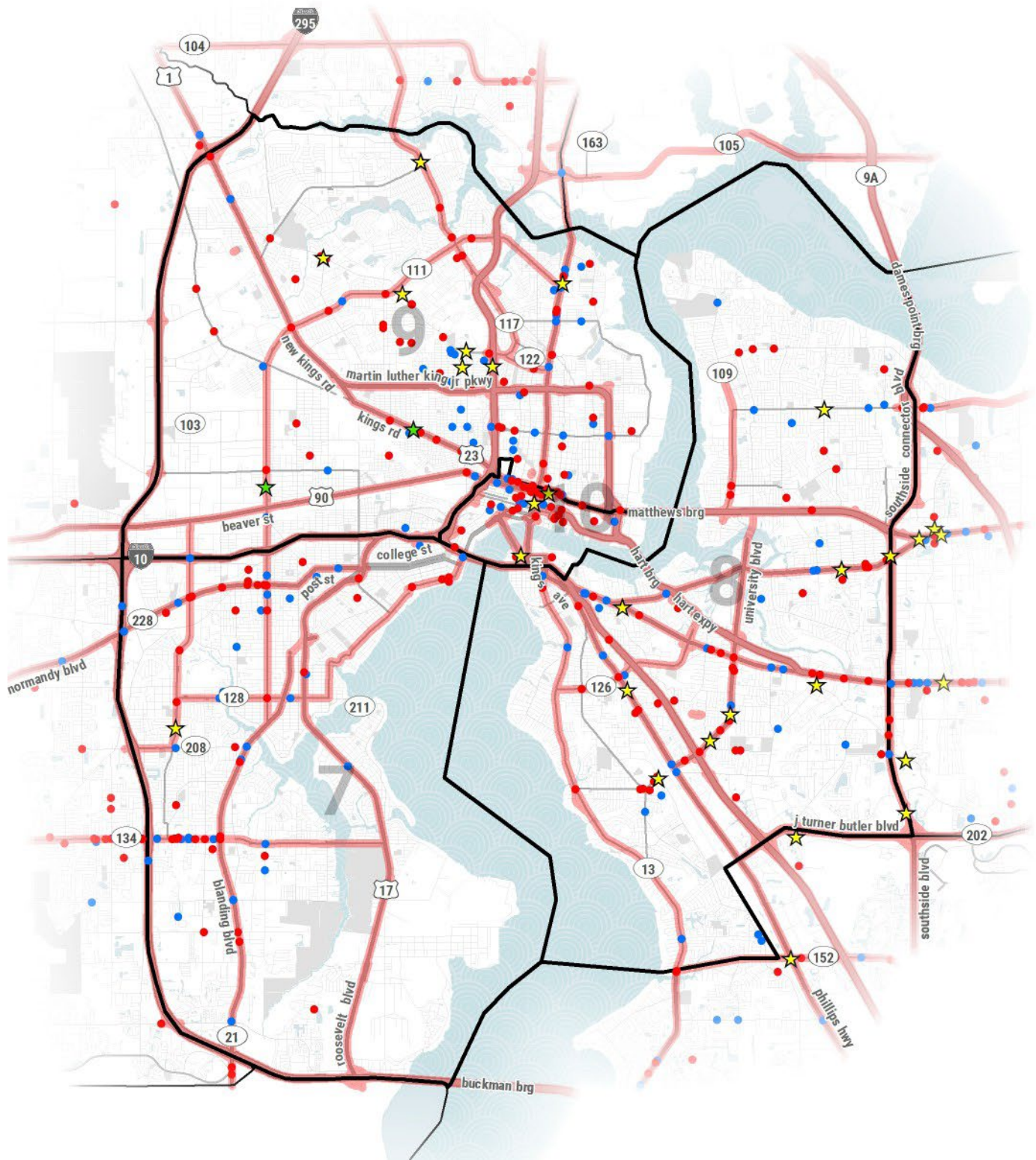
The Pedestrian and Bicycle Master Plan is an important and valuable stand-alone document. However, neither the Plan, nor walking or bicycling itself, exist in a vacuum. The future of this document and the future of active transportation in Jacksonville depend on the actions of many players.

Fortunately, critical agencies and departments in the City are fully aware of the need to address Jacksonville's high traffic fatality rates and to improve conditions for walking and biking as part of a broader "quality of life" strategy that is essential to remain economically competitive. The Master Plan provides an approach and actionable list of projects that will greatly assist the work of the Planning, Public Works, Parks and Recreation, and other departments. Implementation of the JTA's Mobility Works projects dovetail well with the pedestrian improvements and bikeway network recommended in this document.

A bold step is needed to capture this concern and commitment for walking and bicycling safety and mainstream it into the daily operations and actions of the City.

Key Recommendation

This Plan recommends that the City further demonstrate its leadership by adopting a bold Vision Zero policy that places pedestrian and bicycle safety in the context of a much broader commitment to eliminate all traffic fatalities and serious injuries in the City by 2030.



Pedestrian and Bicycle Crashes (Signal 4 Database, January - December 2015)

- | | | |
|----------------------------|----------------------------|--|
| Pedestrian Crashes | Bicycle Crashes | — State Roads |
| ★ Fatal (29) | ★ Fatal (2) | ▭ Mobility Zone Boundary |
| ● Non-Fatal Injuries (275) | ● Non-Fatal Injuries (159) | |

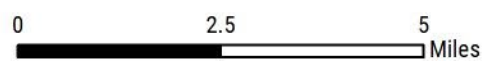


Figure 30. Location of pedestrian and bicyclist crashes in the study area, 2015.

There are several benefits to this approach:

- Walking and bicycling issues are still somewhat marginalized within the City and public perception. Vision Zero is an initiative that explicitly benefits all road users (and thus the entire community) and uses a data-driven approach to focus on particularly vulnerable populations and road users. In this context, improving the safety of pedestrians and bicyclists shifts from being a special interest issue, as it is sometimes perceived, to an issue that is firmly in the public interest.
- The singular focus of a Vision Zero approach ensures a coordinated multi-agency, multi-disciplinary approach that can harness the demonstrated commitment of numerous City departments and partner agencies to collaborate in improving traffic safety.
- The Vision Zero and Safe Systems approach eliminates the tendency we all have to accept traffic crashes as an inevitable part of daily life, and to explain away crashes by blaming the victims – especially in relation to pedestrian and bicyclist crashes. A significant cultural change is needed in Jacksonville (and throughout the Country) to shift perceptions about poor pedestrian and bicyclist behavior and to address inadequate roadway design and enforcement that enables speeding, and aggressive, distracted, and impaired driving to create unsafe and unpleasant conditions.

MORE ABOUT VISION ZERO

Since New York City adopted the first Vision Zero policy in the United States in 2014, several major US Cities have followed suit. While Boston, Seattle, San Francisco, and Washington, D.C., were in the vanguard; smaller cities such as Eugene, OR and states like Washington and North Carolina have since taken up the challenge. In 2015, a Vision Zero Network was established to coordinate work among active Vision Zero communities.

Ten common elements from these Vision Zero policies include:

1. Vision Zero policies are data-driven. The goal is to eliminate fatal crashes through a relentless focus on those roadway designs and human behaviors that contribute to crashes – which can most effectively be identified and isolated with thorough data collection and analysis.
2. Engaging the community is essential to creating both the political backing for difficult policy and program decisions and changing the culture of safety in the community.

3. Accountability for implementation is transparent in targeted action plans which include measurable outcomes as well as outputs. Each task or action item has a clear assignment of responsibility.

4. The best plans successfully balance the need for immediate, responsive actions with a long-term, proactive approach to eliminating fatal and serious crashes.

5. Vision Zero and the Safe Systems approach is explicitly multi-modal, benefitting all users of the transportation system.

6. Vision Zero also benefits enormously from a multi-disciplinary approach to preventing traffic crashes – solutions are rarely limited to enforcement, engineering, education, or legislative actions alone.

7. Equity is a key principle in the development and implementation of Vision Zero policies. Fatal and serious crashes typically disproportionately affect populations already underserved by the transportation system; and enforcement strategies must be addressed with extreme sensitivity in economically distressed communities, communities of color, and neighborhoods with a high percentage of immigrant populations.

8. Leadership from the highest political level is essential to ensure all relevant agencies and stakeholder groups come together with a common purpose to create that multidisciplinary, multimodal approach.

9. Vision Zero documents are action-oriented. Most of the action plans developed in other cities have an initial two-year horizon and are focused on actionable items.

10. Make it Personal. Powerful personal stories and testimonials from the people affected by fatal crashes help change traffic safety culture, and help make it clear that everyone has both a role to play and a personal stake in getting to Zero.

Leadership is demonstrated by a commitment to consistent levels of investment to implement the specific projects and programs identified in the Master Plan. There are several ways in which this investment can be made.

- A specific allocation of Mobility Fee or Capital Improvement Program funding can be identified for Master Plan projects (as is currently the case)
- Master Plan projects can be included as part of other ongoing activities (e.g. the street resurfacing program, JTA Mobility Works, new development projects)
- Bicycle and pedestrian projects are eligible for

numerous transportation funds administered by the Florida Department of Transportation and North Florida Transportation Planning Organization, including: Highway Safety Improvement Program (HSIP), Congestion Mitigation and Air Quality Improvement, Transportation Alternatives, Surface Transportation Block Grant, National Highway System, Highway Safety (Section 402 grants from the National Highway Traffic Safety Administration).

- The City can continue to aggressively pursue grant funding from a variety of additional sources including Federal, state and local funding for health, recreation, environment, community development, and equity. These funds may come from government agencies, corporations, and foundations.

Key Recommendation

The City will sustain an annual funding commitment, to be determined by the City Council and Administration, for implementing pedestrian and bicycle projects in the Master Plan, as well as incorporating incidental projects into the ongoing work of the City and partner agencies.

LEADING BY EXAMPLE

Leadership is also shown through action. There have been false dawns before in the City of Jacksonville's commitment to improving conditions for walking and bicycling. Today, however, many of the pieces are in place to demonstrate that the City is acting on that commitment:

- A new bicycle and pedestrian coordinator is in place
- A Master Plan has been developed
- Individual projects are happening, such as changes to the Acosta Bridge, striping of bicycle lanes on San Jose Boulevard, and the initial installation of RRFBs around the City
- Funding is committed in the CIP and Mobility Plan

The Plan has identified a wide range of action items covering issues as varied as fixing curb ramps to rebuilding major bridges. The various projects and programs were developed around high-crash locations, based on demand and professional judgement, and with an eye to equity issues, safety, access and public input.

Four potential Statement Projects stand out as capturing the essence of the plan. These Statement Projects exemplify opportunities for immediate and long term actions; they combine several strategies and actions; they focus on safety; they affect neighborhoods that have traditionally been

underserved by the transportation system and have been over-represented in the crash statistics.

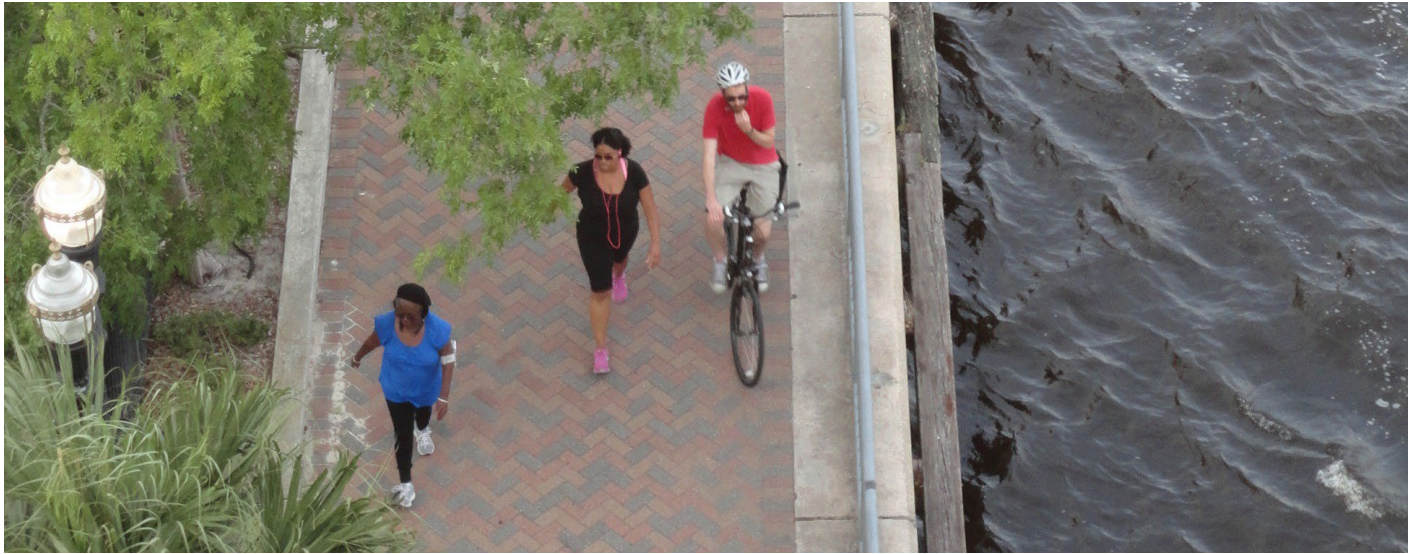
These four projects are:

1. Soutel Drive between Lem Turner Road and New Kings Road. This stretch of Soutel Drive has seen several fatal and severe pedestrian crashes; is identified as a corridor for the installation of three [additional] RRFBs; is a key section of the bike network; has high-frequency transit service; has a mix of schools, shops, business and residential trip generators; and serves a significant number of North Jacksonville residents living in an economically distressed area. Soutel Drive is a candidate for a road diet – taking the street from 4-lanes to three, with the addition of bike lanes and raised medians. Improved crosswalks, sidewalks and ADA ramps would increase the walkability of the corridor – both along and across the road.

2. Implement the first SNAPP project in the Phoenix neighborhood. Walking conditions in the Phoenix neighborhood are poor. There are missing and poorly maintained sections of sidewalk; curb ramps and ADA features are below standard; there is a considerable amount of high-speed, cut-through traffic; there are relatively high levels of walking and bicycling as well as high-crash locations. Equally important, there is community leadership in place that is ready to work with the City to model the implementation of the SNAPP program.

3. Accelerated installation of Rectangular Rapid Flashing Beacons. The plan has identified a prioritized list of more than 80 locations where these devices can be installed. The assessment was based on demand, crash records, and the presence of vulnerable populations (seniors and school-aged children). These are highly visible devices, especially when installed in several locations in the same area or corridor – and compliance with the devices is anticipated to be increased with the additional awareness that can be generated from more widespread installation.

4. Waterfront Trail Development. The programmed rebuilding of the Fuller Warren Bridge carrying I-95 over the St Johns River is a once-in-a-generation opportunity to change the landscape of the neighborhoods at each end of this project. In particular, the bridge project should be the catalyst for the creation of a world-class waterfront trail loop/network on the south side of the river, linking tourist attractions, hotels, medical facilities, and emerging residential communities. While initial planning has begun to pursue this – the potential this has to change the perception of Jacksonville among visitors and residents alike calls for even more concerted action.



Key Recommendation

The City commits to immediately pursue four Statement Projects emerging from the Pedestrian and Bicycle Master Plan as a demonstration of the City's commitment to implement the plan and achieve the goals set out in the document.

The Statement Projects highlighted above will also demonstrate the need for seamless coordination between the many agencies that will ultimately be involved in implementing the Pedestrian and Bicycle Master Plan. Similarly, the funding strategies necessary to implement the Plan require coordination and collaboration between implementing agencies to maximize the efficient and effective use of funds invested in the community.

Key Recommendation

The City will establish a regular (every six months) director-level meeting to coordinate the work programs and planning activities of the Planning, Public Works, and Parks departments, the JTA, DIA and to the extent possible the FDOT.

Every resurfacing, reconstruction, and rehabilitation project in the City undertaken by these agencies represents an opportunity to implement portions of the Plan and improve conditions for bicycling and walking, as does every development permit and major development project.

SETTING STANDARDS FOR THE FUTURE

Roadway design is going through a period of rapid evolution, especially in the ways in which pedestrians, bicyclists, and people with disabilities are accommodated. Beginning in the early 2000's with a shift towards a Complete Streets approach and more universal design principles, the last decade has seen

significant changes in roadway technology, design for people with disabilities, more extensive traffic calming techniques, and more recently a fundamentally different approach to designing roadways for use by bicyclists by separating them from traffic rather than integrating them. Roadway design standards and guidance are struggling to keep up with these changes, especially for urban streets.

The emergence of the National Complete Streets Coalition and the National Association of City Transportation Officials (NACTO) has seen the publication of new manuals and design guidance with a more inclusive and urban focus. More established groups such as the Institute of Transportation Engineers and Congress for a New Urbanism have collaborated to produce an urban streets design guide. The Federal Highway Administration has issued a wide range of publications and design guidance related to improving pedestrian and bicyclist safety – for example, road diets are one of nine proven countermeasures promoted by FHWA's Office of Safety.

The 2018 edition of the AASHTO Guide for the Development of Bicycle Facilities is expected to include detailed information, for the first time, on the design and implementation of cycle tracks and other separated bikeway treatments.

The development of a 250-mile bikeway network, the implementation of a wide range of pedestrian safety improvements, and a move towards a Safe Systems/Vision Zero approach to traffic safety in the City of Jacksonville will benefit enormously from the consistent adoption and application of current roadway designs by all implementing agencies in the area.

Key Recommendation

The City of Jacksonville and partner agencies should update their roadway design standards and guidance to reflect the most current bikeway and pedestrian design treatments applicable to urban roadways.

Both the City and State Department of Transportation are in the midst of updating their design standards to reflect many of these changes. Key principles to include in such a revision are:

- Reduce the opportunity for high-speed collisions by physical separation (e.g. raised medians or barriers or cables to prevent head-on collisions; protected left-turns to prevent side impact collisions; rumble strips)
- Reduce motor vehicle speeds to 35mph or less where that separation can't be achieved, and 25mph or less where pedestrians and bicyclists will be present.
- Changes to the lighting, signing, and marking of intersections and crosswalks to address pedestrian safety issues (e.g. eliminating free- and continuous-right turn lanes; reviewing the use of right turn on red after stopping in core areas; installing signalized crossings for pedestrians)
- Develop effective gateway and transition zones to effectively ensure roadway users adjust appropriately as they travel between rural, suburban and urban roadways and land uses within the City.



Key Recommendation

The City or a partner agency should implement a comprehensive facility planning and design training program as soon as these new guidance documents are complete.

Within six months, training should be delivered to engineers, planners, and landscape architects (urban designers) working for all area public agencies including FDOT, COJ, NFTPO, JTA, and DIA. Consultants working for these agencies should be expected to have attended this training program.





ESTABLISHING BENCHMARKS AND PERFORMANCE MEASURES

The ultimate success of the Pedestrian and Bicycle Master Plan is quite simple. Did the Plan establish meaningful, measurable targets that guided decisions that resulted in fewer traffic fatalities and crashes and more walking and bicycling in Jacksonville?

The Plan establishes two overarching goals that are to be met by 2030.

- 1 Walking and bicycling should account for 10% of all trips (up from less than 2% in 2014)
- 2 There should be no pedestrians or bicyclists killed or seriously injured in traffic crashes (Vision Zero)

Key Recommendation

Implementation of the Pedestrian and Bicycle Master Plan should be monitored and overseen by an interagency task force or committee, including representatives of stakeholder groups, that meets at least quarterly. This committee should present an annual report to City Council on progress towards these goals.

The Plan identifies the following performance metrics that should be monitored and reported annually.

» Annual number of pedestrian and bicyclist fatalities, serious injuries and crashes

- Signal4 database

» Participation in Walking and Bicycling in the City of Jacksonville

- City counts
- American Community Survey Journey to Work

» Designation of Jacksonville in national benchmarking studies

- Bicycle-friendly Community program
- Walk-friendly Community program
- Dangerous by Design pedestrian danger index

» Pedestrian and Bicycle-related Outputs

- Agency spending on pedestrian and bicycle infrastructure
- Miles of bikeway completed, connected
- Linear feet of sidewalk installed, repaired
- Number of RRFBs installed
- Number of curb ramps installed, repaired
- Number of intersection improvements for pedestrian and bicyclist safety
- Number of pedestrian and bicycle facility training course participants
- Percent of the Jacksonville population living within an area serviced by the SNAPP program.

CONCLUSION



The City of Jacksonville has the reputation as one of the most dangerous cities, in one of the most dangerous states in the nation, for walking and bicycling. The death of close to 40 pedestrians and bicyclists each year does little to dispel this image, and almost daily reports of deaths and serious injuries on City streets feeds the perception that walking and bicycling are inherently dangerous activities.

This reputation is harming the City in many ways. The loss of life destroys families and causes grief and despair among family members, friends and colleagues of those who perish. In purely economic terms, the loss of life is devastating at an average cost of \$1.4 million per fatality and \$1 million for a serious injury. There are enormous health, environmental and societal costs associated with physical inactivity that is in part fueled by the unwillingness or inability of residents to walk or bike more frequently out of fear.

The economic competitiveness of the City in attracting new businesses and residents – especially millennials – is severely hampered by the lack of transportation choices and degraded quality of life that comes with a lack of opportunities to walk, bike and take transit.

So it is time to change. Jacksonville can and should be a great place for walking and bicycling. The city has a good year-round climate, perfect topography, numerous vibrant neighborhoods and communities, and City leadership that recognizes the opportunity and need for Jacksonville to become more walkable and bike-friendly.

The City of Jacksonville Pedestrian and Bicycle Master Plan is a powerful roadmap for that change. The plan includes recommendations for hundreds of pedestrian and bicycle projects to be completed over the next decade.

More importantly, perhaps, the Plan also acknowledges that pedestrian and bicycle safety is just one part of a much larger challenge. For every pedestrian or bicyclist killed in the city, two people are killed in cars; more than 15,000 motor vehicle crashes are recorded in the city every year. The City has a traffic safety and transportation problem that transcends any one mode or agency.

This realization has shaped the Pedestrian and Bicycle Master Plan in several critical ways. First, the Plan calls for the adoption of a Vision Zero policy by the City, to address the overwhelming traffic safety issues in the community in a new, data-driven approach that starts with the belief that no loss of life on our roadways is acceptable or inevitable.

Second, the Plan identifies a leadership role for the City in changing the way it does business, and also in leading its partners at the city, regional and state



level to rethink roadway design and community development, by putting people first.

Third, the plan acknowledges that the physical environment is such a crucial determinant of the viability and popularity of walking and bicycling and that without a dramatic change in infrastructure to accommodate active travel, no amount of education, encouragement or enforcement will make a significant change in behavior possible in the area.

The time will come when a robust plan for non-engineering solutions is timely and necessary; and there will continue to be opportunities for very targeted outreach and safety campaigns – for example as new infrastructure is put in place – in the short term. Similarly, there is a critical role for community groups such as the North Florida Bicycle Club to organize rides, events, education programs and safety campaigns, ideally with the support of the City. For now, however, this plan focuses on the unique and critical role the City can play in creating safer, more inviting places for people to walk and bike, especially in combination with transit.

Finally, the plan recommends an approach to implementation that is essentially collaborative – engaging the City with the community and with agency partners at the City, regional and state level in a variety of ways. With the leadership and commitment of the City, an engaged community, and willing partners across the region, Jacksonville can become one of the best cities for walking and bicycling in the Southeast.

