metroplan orlando
A REGIONAL TRANSPORTATION PARTNERSHIP

Pedestrian Safety Action Plan

Adopted July 11, 2012



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EXECUTIVE SUMMARY

MetroPlan Orlando has developed a Pedestrian Safety Action Plan to address the clear need to improve both the physical environment for pedestrians and the behaviors necessary to reduce crashes. This plan identifies the most pressing pedestrian crash problems and solutions, sets a course to implement those solutions, and outlines how to monitor progress on the implementation and effectiveness of those efforts.

While pedestrian crashes are widely spread around the metro area, there are a number of corridors which represent a significant share of the total. These corridors tend to be four- and six-lane arterials that serve lower-income housing and jobs, are lined with many commercial destinations and multi-family housing developments, are served by transit buses, have posted speeds at 40 mph or greater, have long distances between marked and signalized crosswalks, and usually have no medians or lighting.

Central Florida also suffers from poor behaviors on the part of both drivers and pedestrians. Driver yielding behavior at marked crosswalks is so low that pedestrians often avoid using the crosswalks, preferring instead to cross mid-block where turning conflicts are reduced. Some pedestrians violate crosswalk signals rather than wait. Pedestrians rarely make their crossing intentions known at unsignalized crosswalks, so drivers see no reason to yield. For investments in improved pedestrian crossing infrastructure to be of real value, drivers must be counted on to yield. Law enforcement plays a critical role in changing this behavior. MetroPlan Orlando has teamed up with Bike-Walk Central Florida and other partners to advance the plan's education and enforcement component, named Best Foot Forward.

This plan identifies and compiles many ongoing efforts to improve pedestrian safety -- such as filling sidewalk gaps, adding medians, and adding street lighting -- and expands upon them. It also identifies other needs, such as providing more frequent, safe crossings between signalized intersections.

The key actions in this plan are:

- Ongoing support for educational and enforcement efforts to improve driver and pedestrian behavior; updates on these strategies can be found at the Best Foot Forward website (iyield4peds.org).
- Creation of a list of priority pedestrian safety corridors that will be studied in detail using the Federal Highway Administration's Pedestrian Road Safety Audit process.
- Findings from these audits will result in specific physical improvements and educational and enforcement strategies; the physical improvement needs will be placed on a separate Pedestrian Safety Priority Project List.
- Identification of lighting needs to improve pedestrian safety.

Pedestrian Road Safety Audit Corridors

- Semoran Blvd. (SR 436) from Colonial Dr. (SR 50) to Old Cheney Hwy.
- Colonial Dr. (SR 50) from Orange Ave. (SR 527) to Magnolia Ave.
- Orange Ave. (SR 527) from Gore St. to Kaley St.
- US 17/92 from Park Dr. to 1st Street
- Hoffner Ave. (SR 15) from Mauna Loa Ln. to Semoran Blvd. (SR 436)
- Kirkman Rd. (SR 435) from Florida's Turnpike Overpass to Vineland Rd.
- Edgewater Dr. (SR 424) from Lee Rd. (SR 423) to Forest City Rd. (SR 434)
- Main St. (US 17/92/441) from Old Dixie Hwy. to Vine St. (US 192)
- Oak Ridge Rd. from Millenia Blvd. to Wingate Dr.
- Oak Ridge Rd. from S. Orange Blossom Trail (US 17/92/441) to Orange Ave. (SR 527)
- Kirkman Rd. (SR 435) from Conroy Rd. to Summer Oak St.
- Semoran Blvd. (SR 436) from Montgomery Rd. to Maitland Ave.
- Semoran Blvd. (SR 436) 1/2 mile north and south of Howell Branch Rd.
- Colonial Dr. (SR 50) from Culver Rd. to Murdock Blvd.
- University Blvd. from University Park Dr. to Forsyth Rd.
- S. Orange Blossom Trail (US 17/92/441) from Grand St. to Kaley St.
- Simpson Rd. from Fortune Rd. to Vine St. (US 192)

Pedestrian Safety Lighting Priorities

- Semoran Blvd. (SR 436) from Hunt Club Blvd. to Bear Lake Rd.
- Edgewater Dr. (SR 424) from Lee Rd. (SR 423) to Forest City Rd. (SR 434)
- Colonial Dr. (SR 50) from Apopka-Vineland Rd. to Mission Rd.
- S. Orange Blossom Trail (US 17/92/441) from Landstreet Rd. to Whisper Lakes Blvd.
- Aloma Ave. (SR 426) from Lakemont Ave. to SR 417
- Colonial Dr. (SR 50) from Forsyth Rd. to Semon Dr.
- Lee Rd. (SR 423) from Adanson St. to Wymore Rd.
- Sand Lake Rd. (SR 482) from International Dr. to Presidents Dr.
- Orange Ave. (SR 527) from Hoffner Ave. to Sand Lake Rd. (SR 482)

Pedestrian safety will also be a focus in MetroPlan Orlando's 2040 Long Range Transportation Plan, and a number of projects will address the needs for improved pedestrian safety and mobility in conjunction with improved transit service and pedestrian-oriented land use.

In total, this action plan fits into the broader MetroPlan Orlando vision of "a regional transportation system that safely and efficiently moves people and goods through a variety of options that support the region's vitality." It does so by identifying short-term, mid-term and long-term strategies to provide safe and supportive physical and social environments for people meeting their daily needs on foot.

INTRODUCTION

Like many metropolitan areas in the Sunbelt, the Orlando urban area was developed primarily around the desires of automobile users. With daily destinations far apart and well beyond comfortable walking distances, high-speed arterials serve longer-distance auto trips. This has resulted in relatively few people traveling by foot, and the few who do must often navigate streets and roads which present serious safety challenges. Compounding this problem is a culture that does not adhere to the behaviors – by both drivers and pedestrians – necessary to make a safe and civil walking environment.

The advocacy group Transportation for America has identified the Orlando urban area as the worst in the nation for pedestrian safety. In its report Dangerous by Design, the group used a "Pedestrian Danger Index" to attempt to measure the relative pedestrian safety of urban areas. This index divided pedestrian fatalities per capita by the U.S. Census walk-to-work rate. While some might debate whether the Orlando metro area deserves to be ranked worst in the nation, it is clear that our area, like many SunBelt regions, must take action.

To address these problems, MetroPlan Orlando has developed this Pedestrian Safety Action Plan. This plan identifies the most pressing pedestrian crash problems and solutions, sets a course to implement those solutions, and outlines how to monitor progress on the implementation and report on the effectiveness of the efforts.

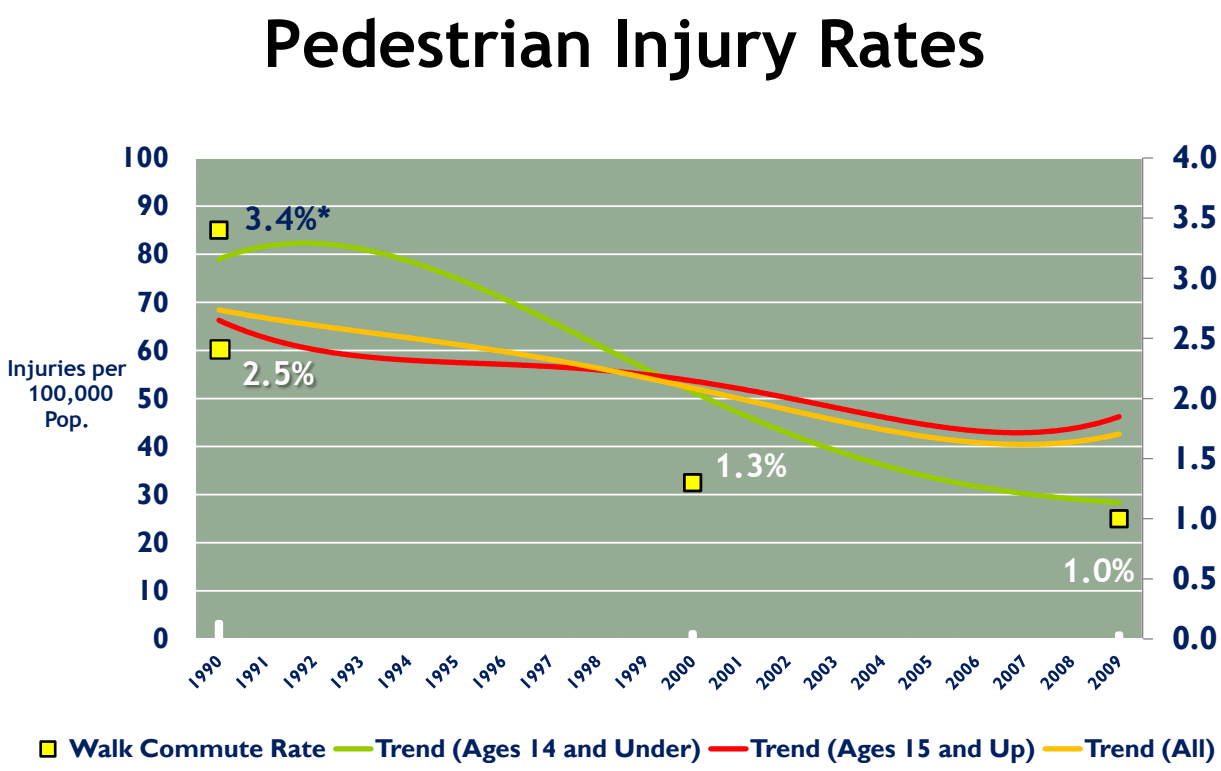
Building partnerships is another key component of this plan. In addition to our traditional partners of local governments, the Florida Department of Transportation, and LYNX (the Central Florida Regional Transportation Authority), MetroPlan Orlando is also working with law enforcement representatives of the three county Community Traffic Safety Teams (CTSTs) and Bike/Walk Central Florida. A Pedestrian Safety Joint Subcommittee was created to guide the development of this plan. This subcommittee was composed of members from the MetroPlan Orlando Bicycle & Pedestrian Advisory Committee, Citizens' Advisory Committee, and Management & Operations Subcommittee, as well as representatives from each of the CTSTs, LYNX, and the Transportation Disadvantaged Local Coordinating Board.

TRENDS

Pedestrian injuries have trended downward since 1990. Children under age 15, in particular, are far less likely to be involved in a pedestrian crash today than 20 years ago. In 1990, there were roughly 80 pedestrian injury crashes per 100,000 population for those younger than 15 in the Orlando metro area, and about 65 per 100,000 for those age 15 and older. Today, those numbers have dropped to about 30 for children and 45 for adults (Figure 1). Unfortunately it is likely a reduced exposure rate which has accounted for much of this drop.

Far fewer children walk to school today or roam about on their own outdoors, and fewer adults walk for transportation. U.S. Census data shows walking as 3.5% of journey-to-work trips in 1990, and only 1% today. (*The 1990 walk commute rate was heavily influenced by the presence of the Orlando Naval Training Center (NTC), which accounted for more than 8,000 walk-to-work trips in the Census data. When this is removed from the data, the 1990 walk rate drops to 2.5%. The NTC closed between 1990 and 2000.)

FIGURE 1

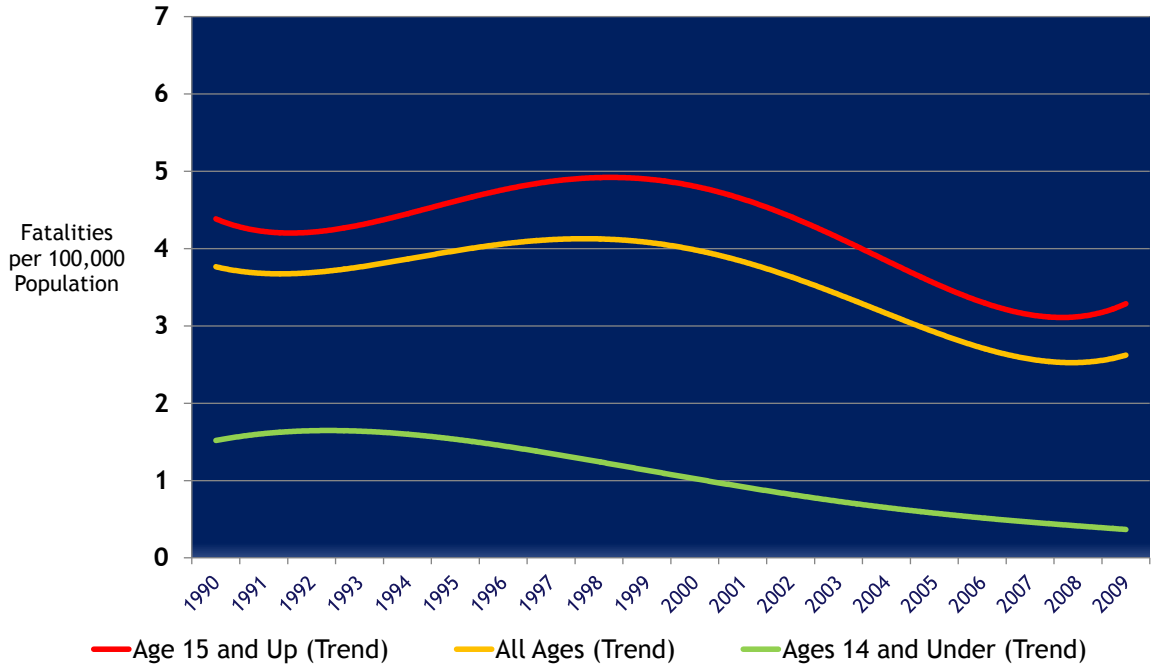


Orange, Seminole and Osceola Counties

Figure 2 illustrates that the pedestrian fatality rate has also dropped, though less steeply. The percentage of pedestrian crashes resulting in fatalities climbed during the 1990s, but it has mostly dropped since 2000 (Figure 3).

FIGURE 2

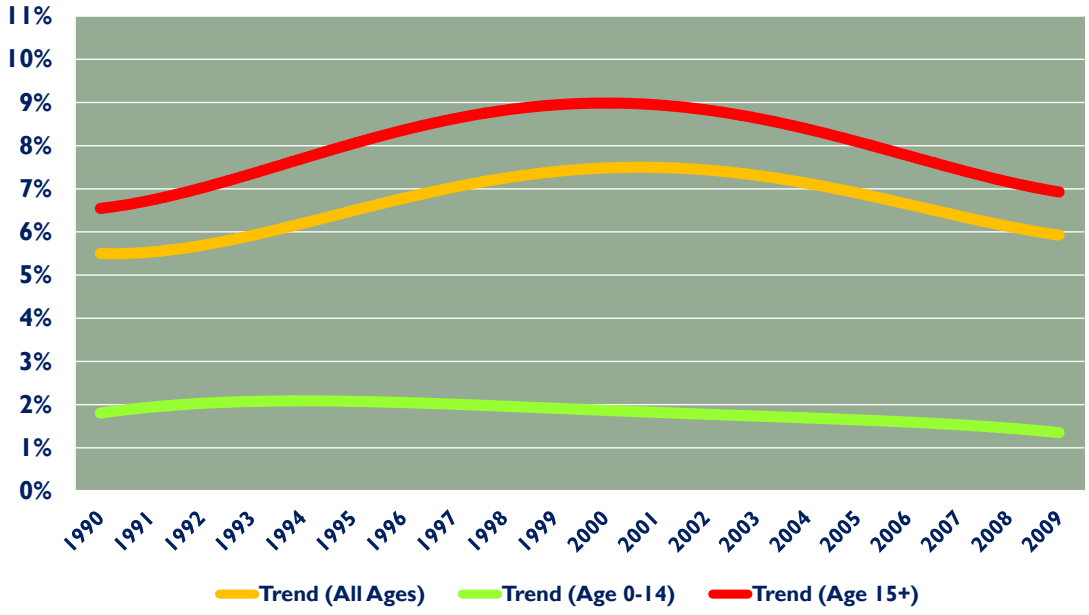
Pedestrian Fatality Rates



Orange, Seminole and Osceola Counties

FIGURE 3

Percentage of Pedestrian Crashes Resulting in Fatalities



Orange, Seminole and Osceola Counties

PROBLEMS, FACTORS AND SOLUTIONS

Useful data and information are needed in order to identify problems, determine appropriate solutions, and plan, design and fund those solutions. In cooperation with the Florida Department of Transportation, the Department of Highway Safety and Motor Vehicles, the University of Florida and local governments, MetroPlan Orlando operates a Crash Database System. This system maps the locations of all reported traffic crashes and ties the geographic location to the official crash report and its associated data. Through this system, MetroPlan has been able to identify concentrations of pedestrian crashes, whether along corridors, at intersections, or in particular neighborhoods or business districts. Other important factors can also be mapped via this system, such as the lighting condition and contributing causes.

Additional data was collected prior to the implementation of the Crash Database System during a special study in 2006. This study mapped and analyzed 1,265 pedestrian crashes from long-form police reports.

The following figures show pedestrian crash locations within Orange, Osceola, and Seminole Counties (Figures 4-9). Crash plots on these maps represent incidents from 2003 and 2004 from the 2006 special study noted above, and from 2008, 2009 and 2010 from the MetroPlan Orlando Crash Database System.

FIGURE 4

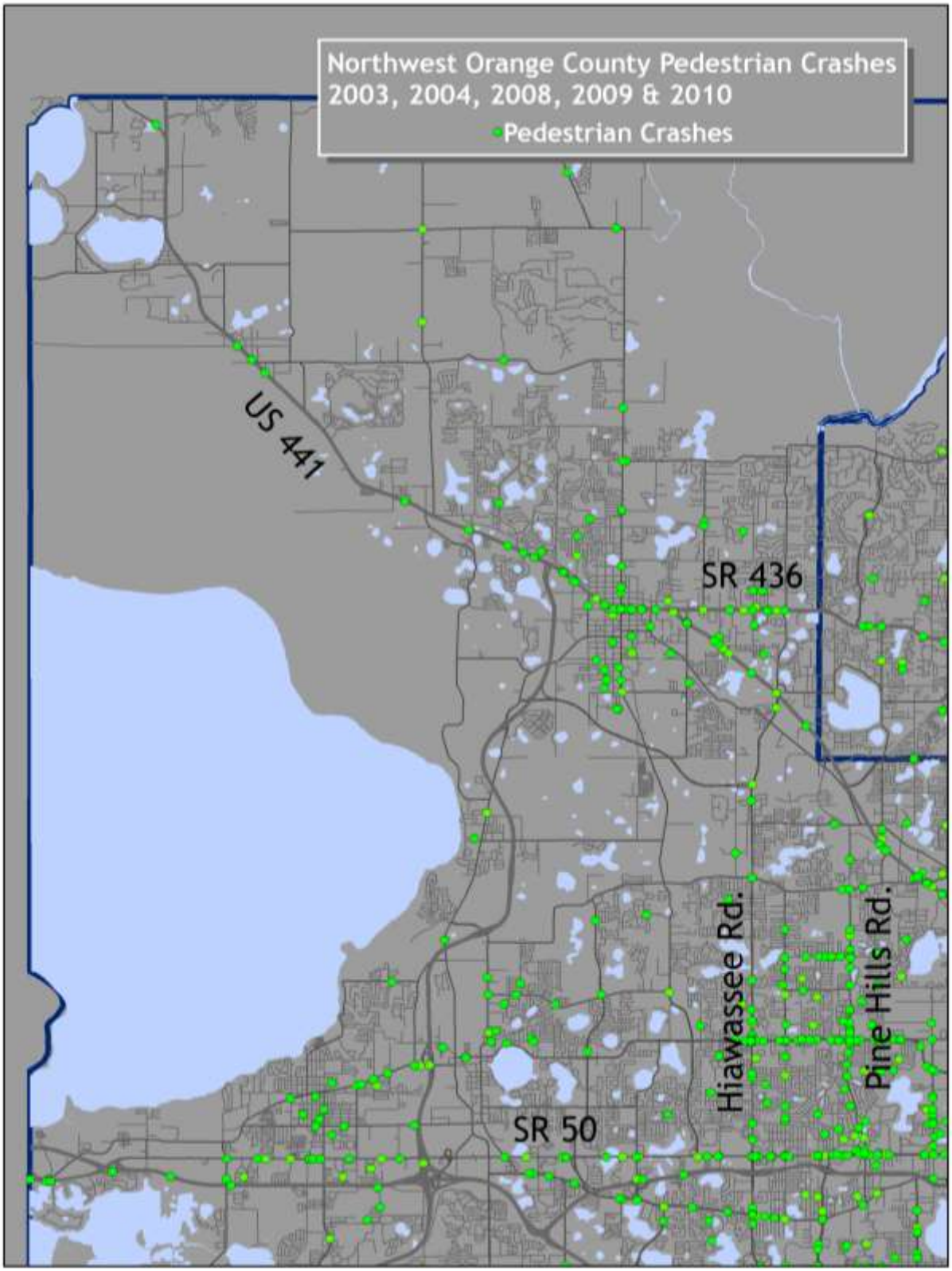

Northwest Orange County Pedestrian Crashes
2003, 2004, 2008, 2009 & 2010
Pedestrian Crashes
US 441
SR 436
SR 50
Hiawassee Rd.
Pine Hills Rd.

FIGURE 5

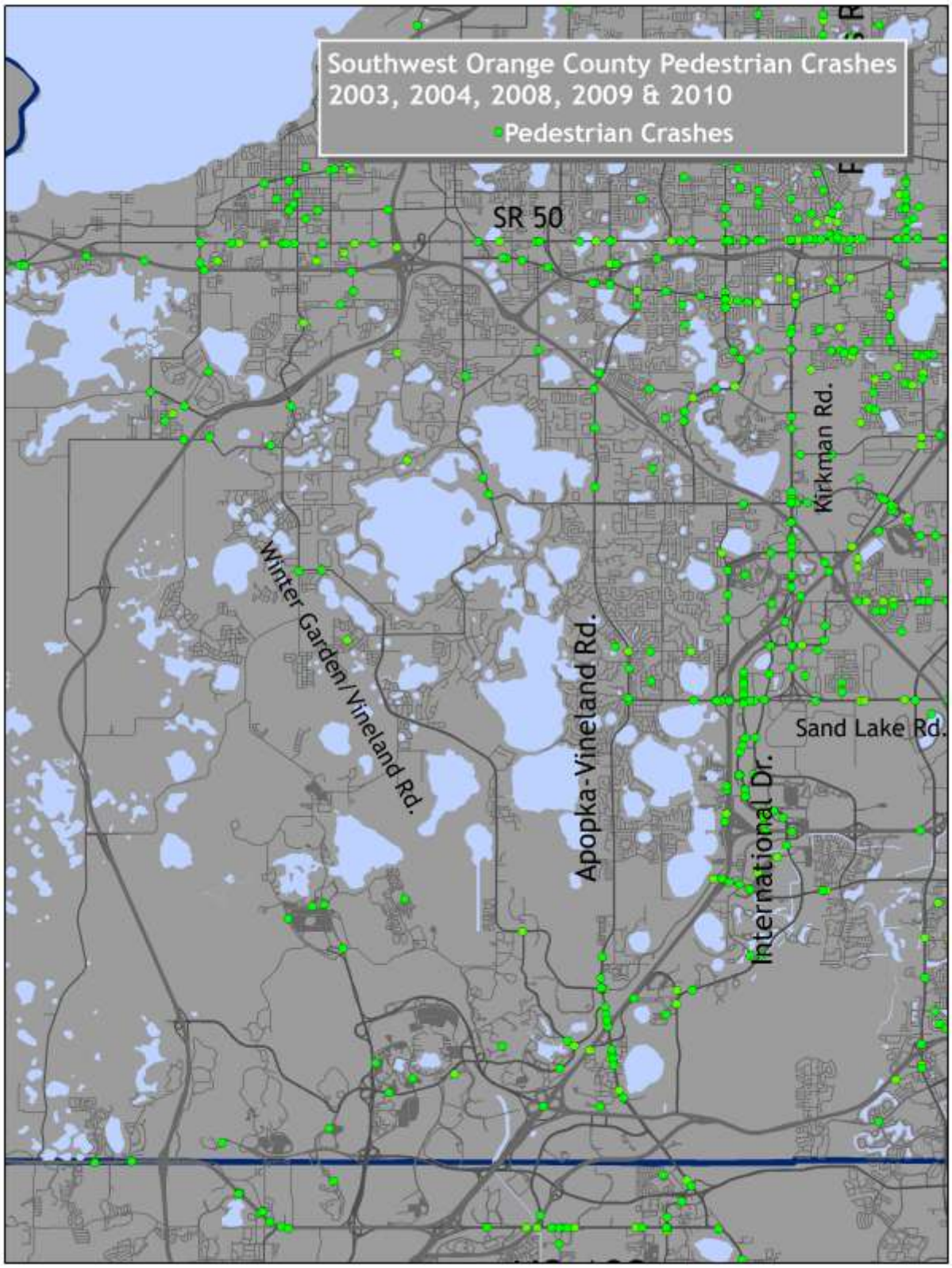

Southwest Orange County Pedestrian Crashes
2003, 2004, 2008, 2009 & 2010
Pedestrian Crashes
SR 50
Kirkman Rd.
Winter Garden/Vineland Rd.
Apopka-Vineland Rd.
Sand Lake Rd.
International Dr.

FIGURE 6

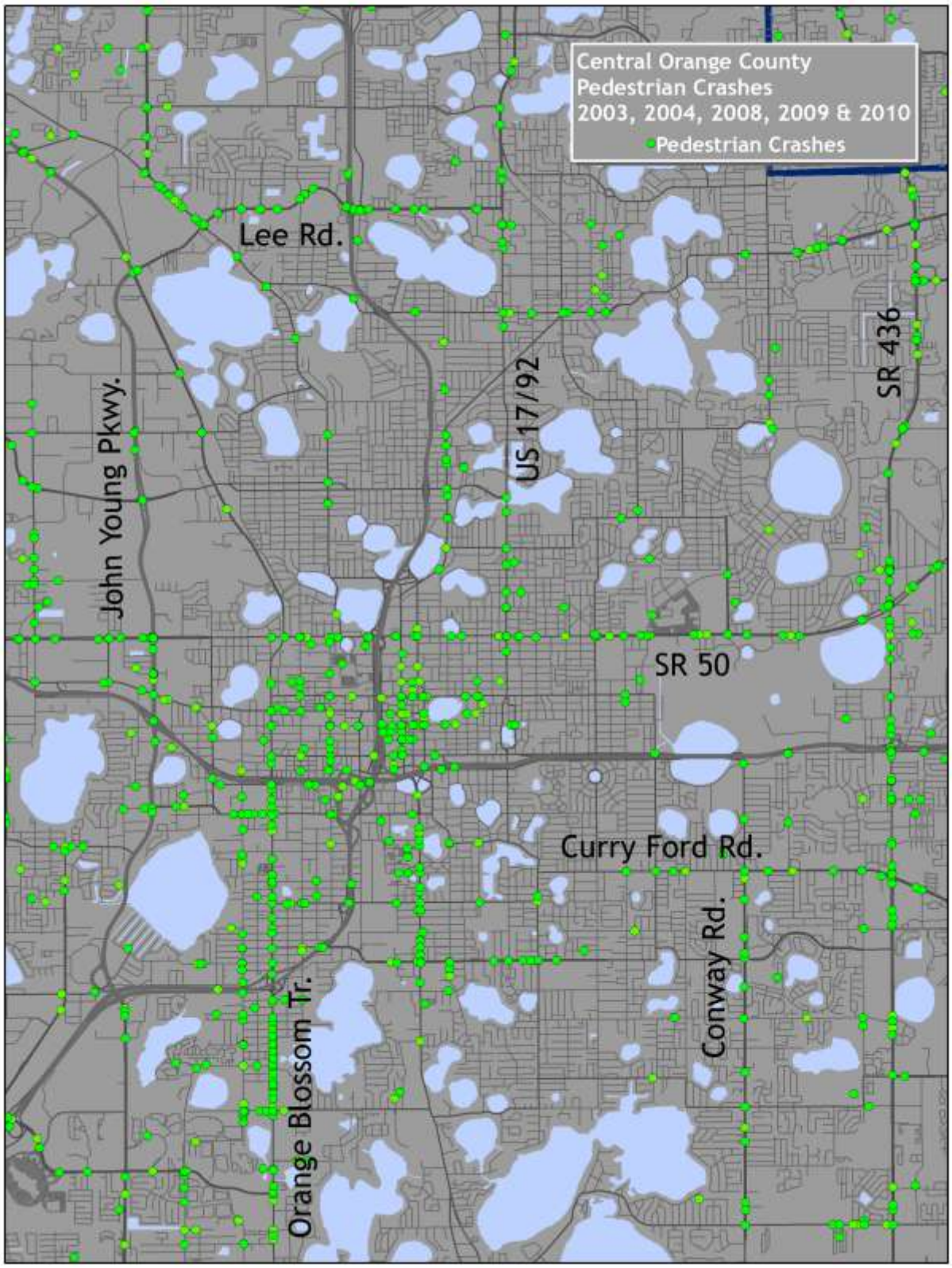

Central Orange County
Pedestrian Crashes
2003, 2004, 2008, 2009 & 2010
Pedestrian Crashes
Lee Rd.
John Young Pkwy.
US 17/92
SR 436
SR 50
Curry Ford Rd.
Conway Rd.
Orange Blossom Tr.

FIGURE 7

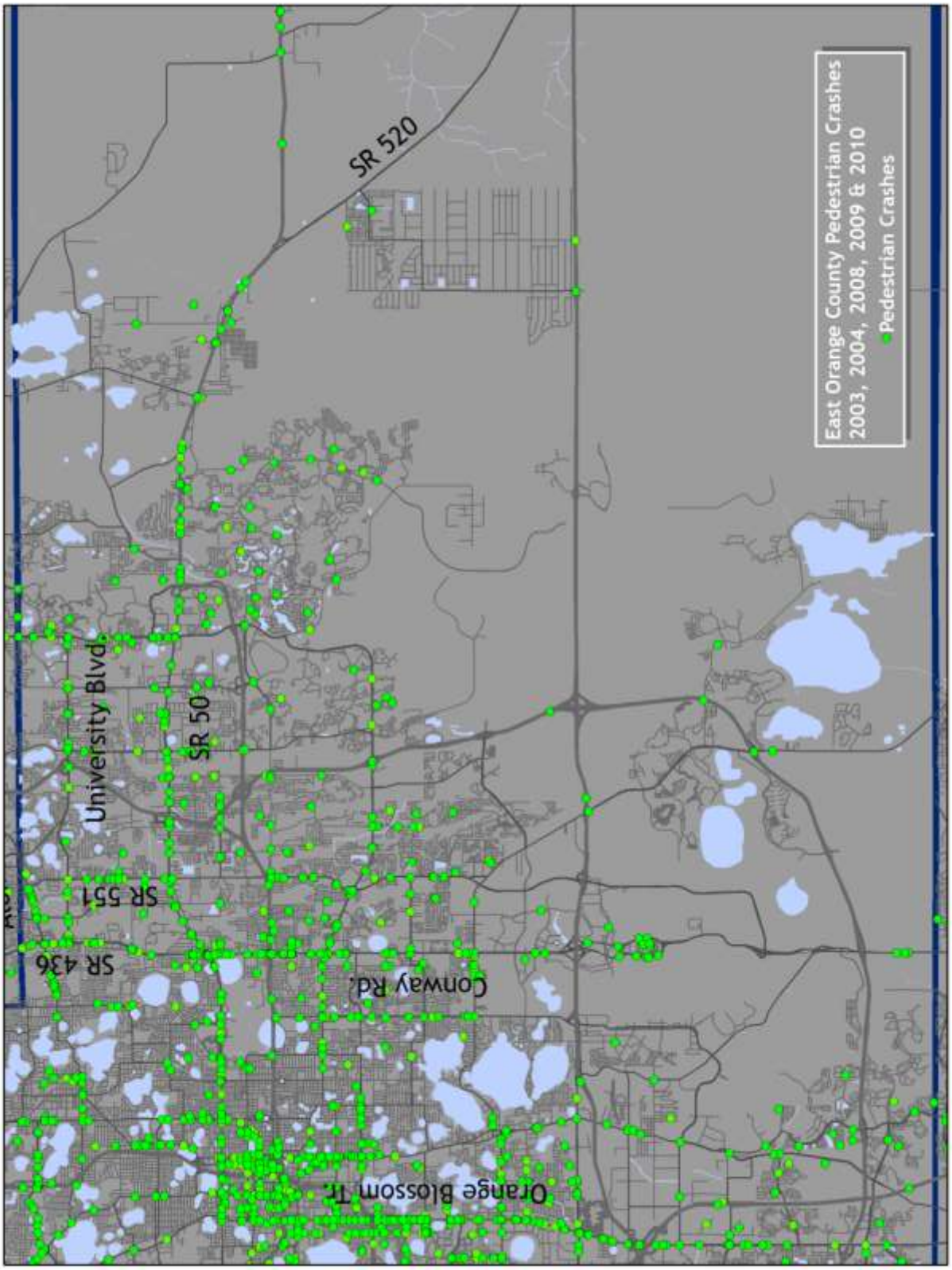

East Orange County Pedestrian Crashes
2003, 2004, 2008, 2009 & 2010
Pedestrian Crashes
SR 520
University Blvd.
SR 50
SR 551
SR 436
Conway Rd.
Orange Blossom Tr.

FIGURE 8

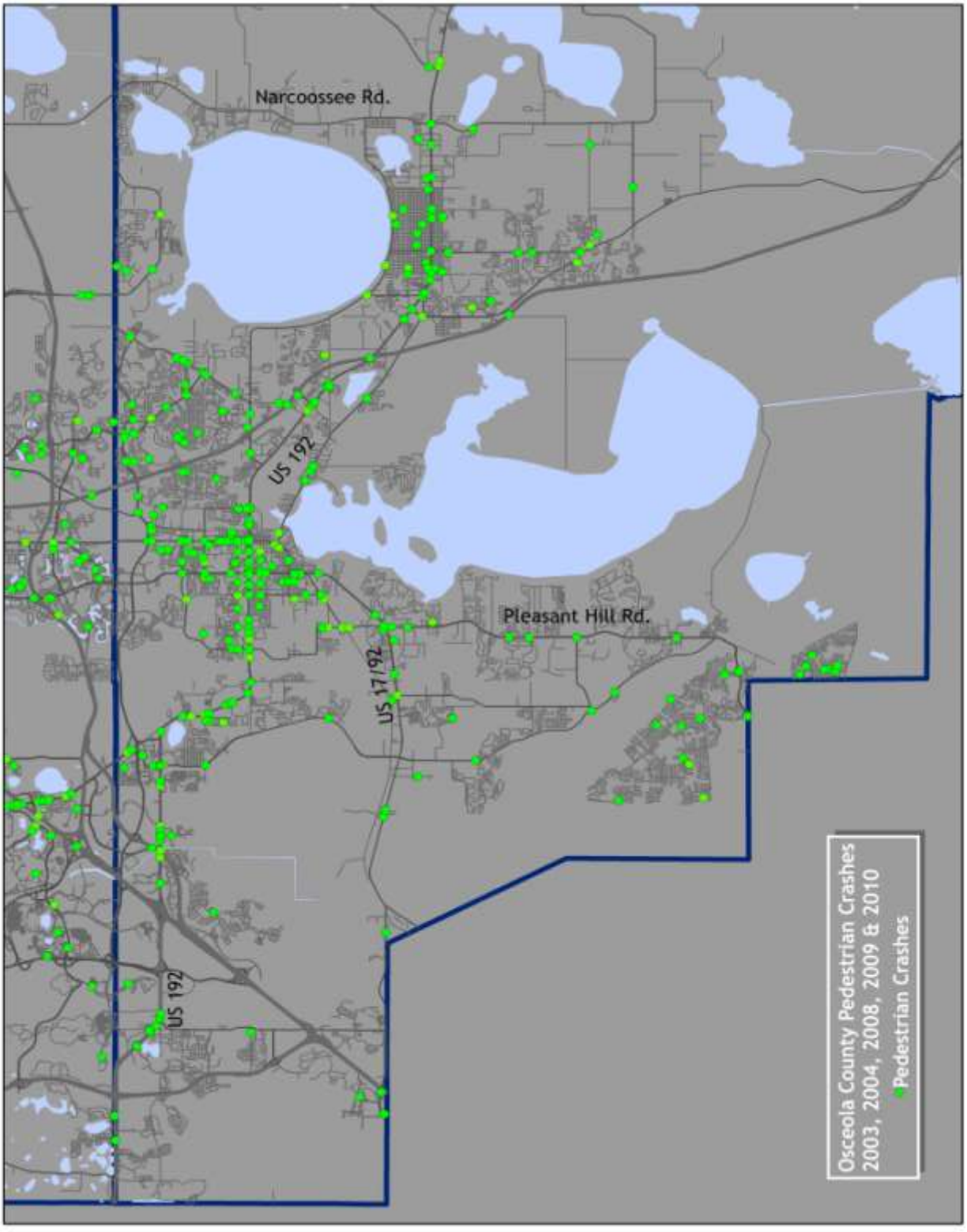
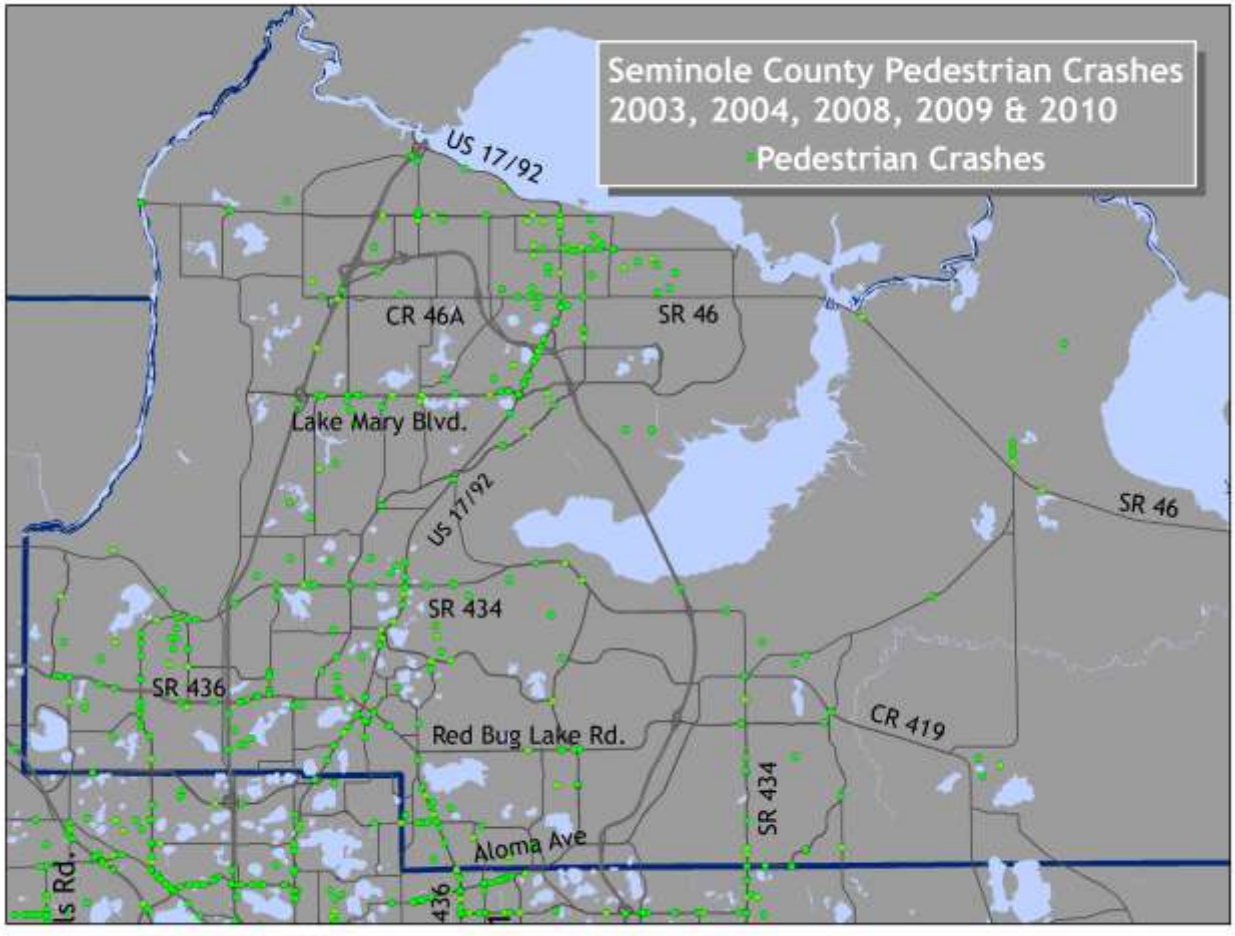

Narcoossee Rd.
US 192
Pleasant Hill Rd.
US 17/92
US 192
Osceola County Pedestrian Crashes
2003, 2004, 2008, 2009 & 2010
Pedestrian Crashes

FIGURE 9



Location-Based Factors

Metro Orlando's pedestrian crashes, and particularly fatalities, tend to be concentrated along major arterial highways. A study of 2003 and 2004 crashes along the arterial and collector road network found that, on a per centerline-mile basis, six-lane roads have 2.0 times as many pedestrian crashes and 2.6 times as many fatalities as four-lane roads. (Table 1)

Table 1: Crashes by Number of Lanes

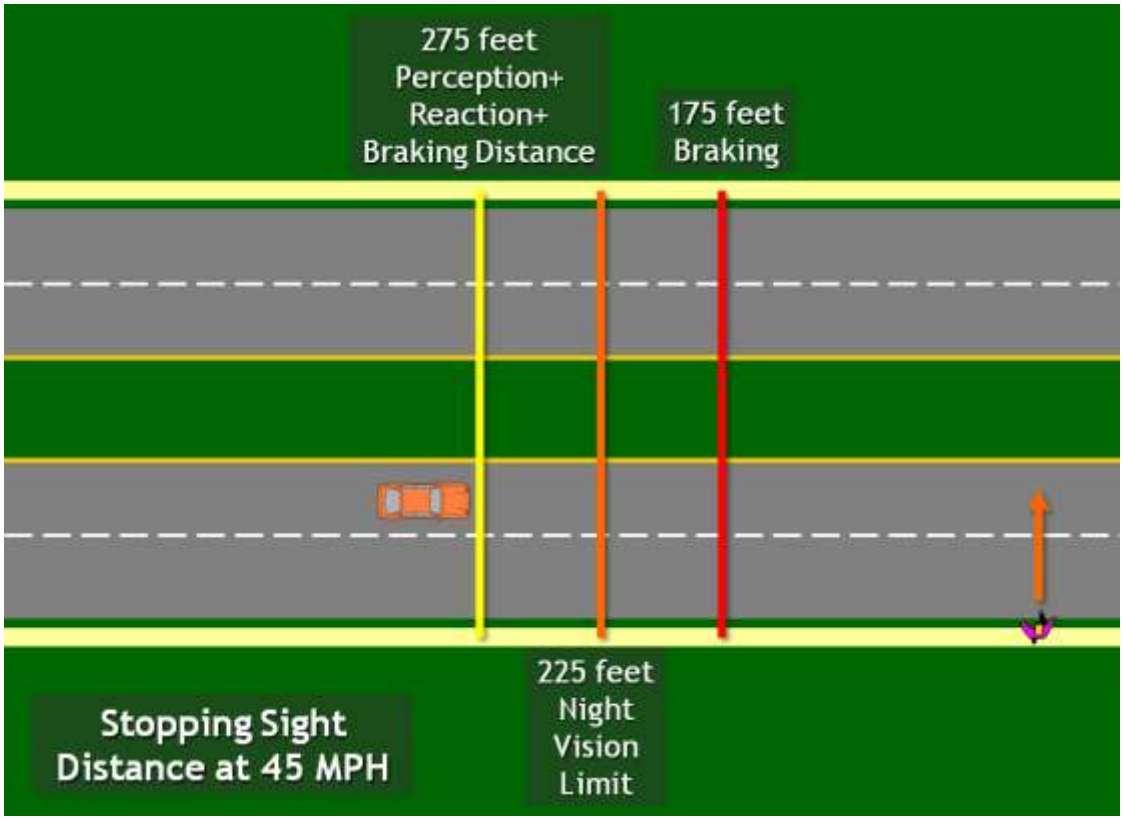
Number of Lanes	Crashes Per Centerline Mile per Year	Fatal Crashes Per Centerline Mile per Year
2 or 3	0.10	0.004
4 or 5	0.22	0.03
6 or more	0.43	0.07

FIGURE 10

The six-lane sections of 10 area arterials account for only 104 centerline miles of roadway, but 490 pedestrian crashes in 2003, 2004, 2008, 2009 and 2010, the years for which detailed pedestrian crash data is available. Those 104 miles of six-lane highway represent roughly 6% of the arterial and collector road system, and about 1% of the entire area roadway system, but account for 17% of the pedestrian crashes and 23% of the fatalities.

Six-lane roadways compound challenges and risks for pedestrians. They increase motorist speeds and increase the possibilities of lane-changing and of vehicles and pedestrians being hidden from one another. When these challenges are combined with the lack of a median refuge and/or effective street lighting, crash risks increase even more. Without a median refuge, pedestrians must keep track of traffic approaching from both directions at once (Figure 10). Without lighting, the pedestrian has difficulty judging the speeds of approaching vehicles. Additionally, drivers cannot see pedestrians at the stopping sight distance – the distance at which a driver must see an object in order to stop in time (Figure 11).

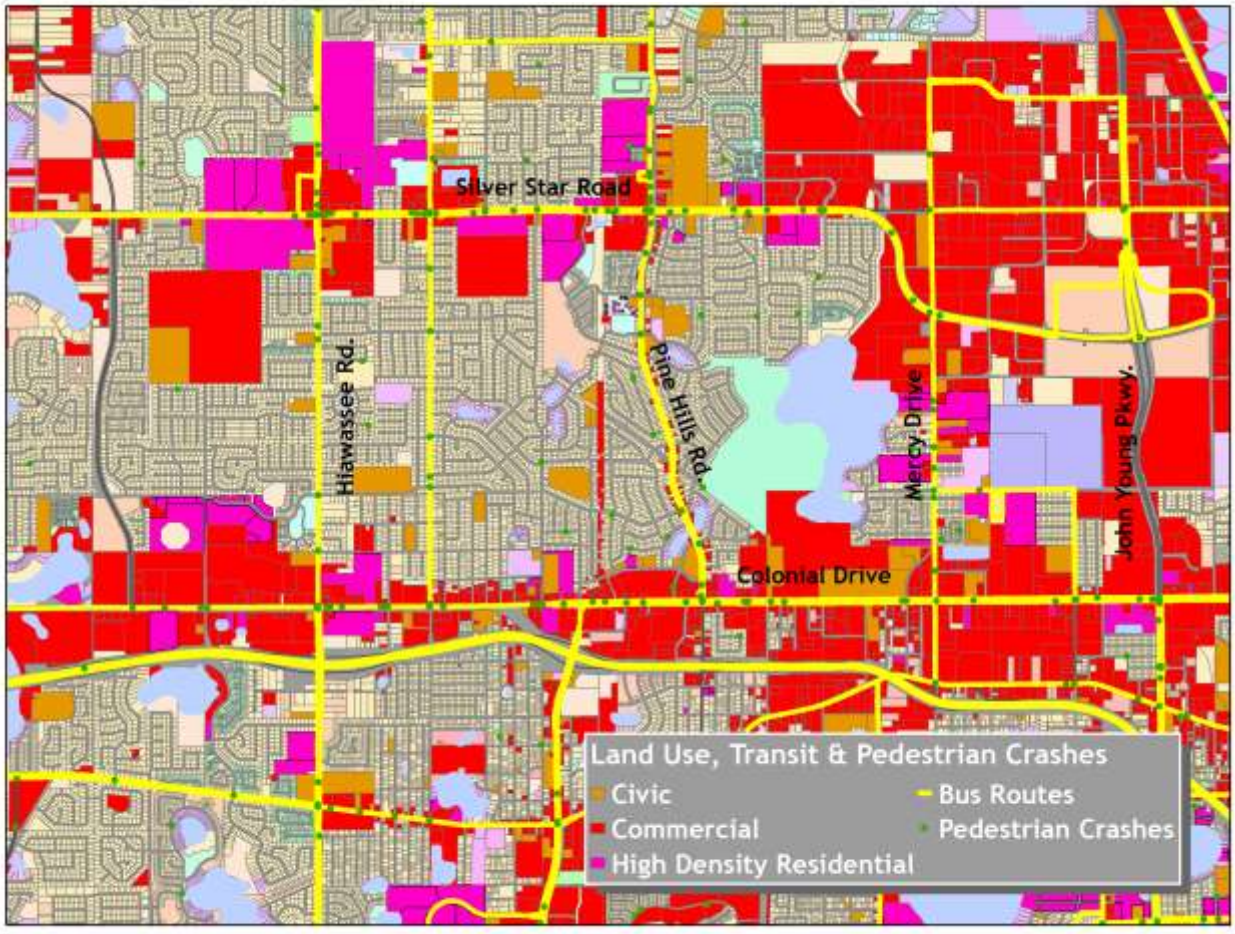
FIGURE 11



The factors most likely to contribute to pedestrian exposure, crash risk, and fatality risk tend to combine along our arterial roads. On the exposure side, such highways host a great deal of commerce and lower-wage jobs, transit bus routes to serve the workers and customers for that commerce, and lower-income-oriented apartments. These all generate pedestrian trips and the need to cross the roadway. On the risk side are the need to cross the roadway to access a bus, home or destination; the high speed of vehicular traffic; and, on some roads, the lack of a median refuge and/or lighting. (Figure 12)

Another key issue is the distance between signalized intersections. On state highway arterials, the minimum allowable distance between signals is a quarter mile; in many areas signalized intersections are a half mile or more apart. In a year 2000 study of pedestrian crashes on five major Orlando area arterials, the average distance from the crash location to the nearest signalized intersection was 500 feet (nearly a tenth of a mile), and 760 feet to the nearest marked crosswalk and pedestrian signal (not all signalized intersections had pedestrian signals).

FIGURE 12



Vehicle Speeds and Injury Levels

The speed of vehicles has a definite effect on pedestrian safety, but reducing motorist speed is challenging and complicated. Vehicles operating at higher speeds pose three key risks to pedestrians. First, increased stopping sight distance; the vehicle will cover more ground during the perception and reaction period (usually assumed to be 2.5 seconds) and require more braking distance (Figure 13). Second, especially at night and without street lighting, a pedestrian's ability to assess the speed of approaching vehicles degrades as the speed increases, since the pedestrian must make that assessment when the vehicle is much farther away. At the same time, the approaching driver is less likely to be able to see the pedestrian in time to take evasive action. Third, the speed at impact has a profound effect on pedestrian survival; with a 20 mph impact the chance of a pedestrian fatality is 15%; at 40 mph that increases to 85% (Figure 14).

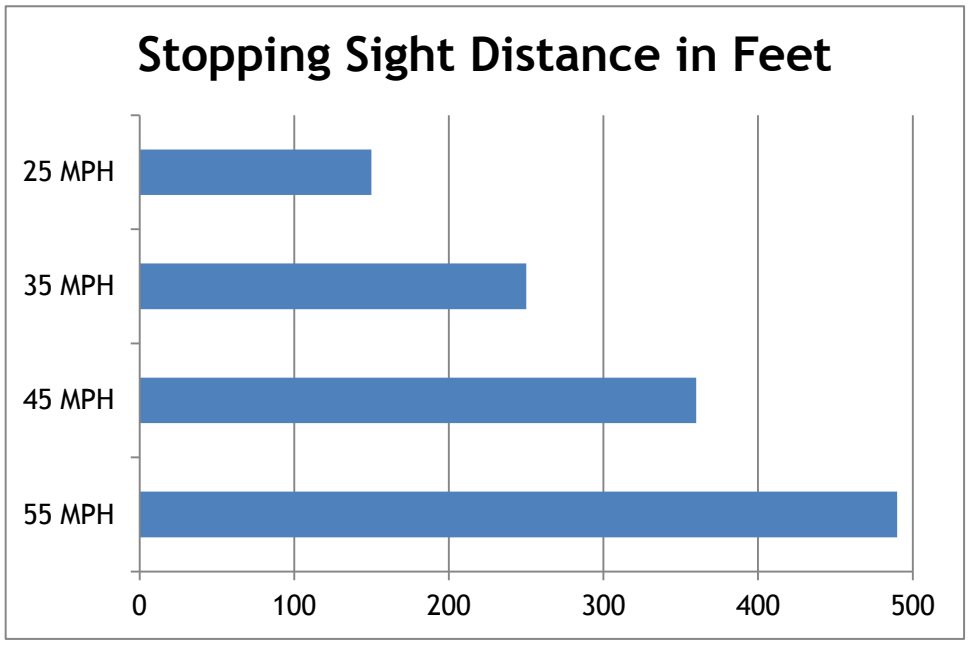


FIGURE 13

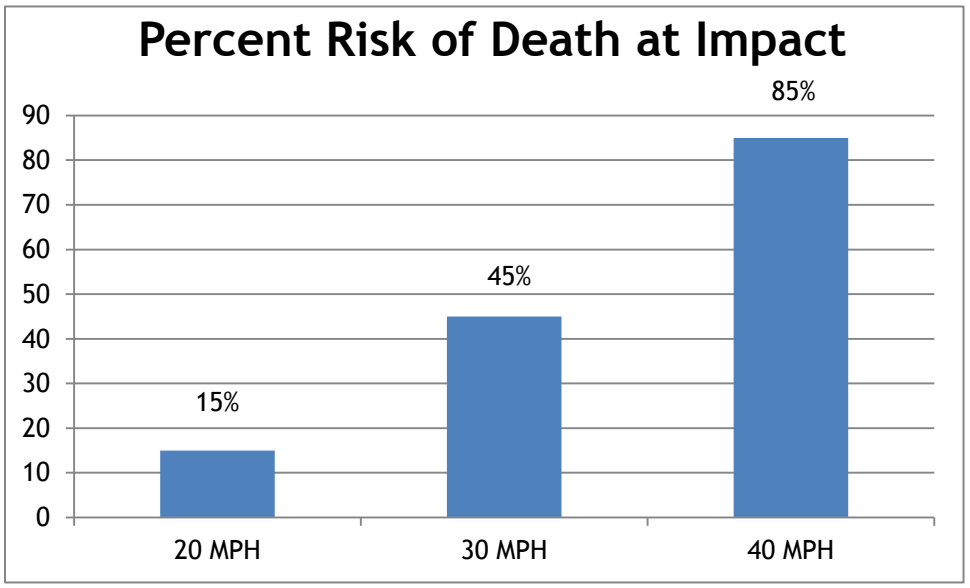


FIGURE 14

Local crash data does not show a strong correlation between posted speed and injury level (Table 2). This is because we do not have exposure data to tell us how many pedestrians are at risk at the different posted speed levels or lighting conditions. And, of course, the posted speed does not tell us the actual traveling speed of the vehicle.

Table 2: Crashes by Posted Speed

ALL HOURS	Posted Speed		
Pedestrian Injury Level	**Less Than 30 MPH**	**30 to 40 MPH**	**45 MPH+**
Fatal	9.7%	9.4%	14.6%
Incapacitating	20.4%	22.5%	24.9%
Non-Incapacitating	49.5%	37.0%	37.9%
Possible	17.2%	27.5%	20.9%
None	3.2%	3.6%	1.6%
Total	100.0%	100.0%	100.0%
Fatal + Incapacitating	**30.1%**	**31.9%**	**39.5%**
DAYTIME	**Posted Speed**		
Pedestrian Injury Level	**Less Than 30 MPH**	**30 to 40 MPH**	**45 MPH+**
Fatal	1.9%	4.7%	5.5%
Incapacitating	15.4%	16.5%	23.1%
Non-Incapacitating	57.7%	43.5%	46.2%
Possible	23.1%	32.9%	23.1%
None	1.9%	2.4%	2.2%
Total	100.0%	100.0%	100.0%
Fatal + Incapacitating	**17.6%**	**21.7%**	**29.2%**
NIGHT-TIME	**Posted Speed**		
Pedestrian Injury Level	**Less Than 30 MPH**	**30 to 40 MPH**	**45 MPH+**
Fatal	21.6%	18.4%	20.9%
Incapacitating	21.6%	32.7%	26.1%
Non-Incapacitating	43.2%	24.5%	32.7%
Possible	8.1%	18.4%	19.0%
None	5.4%	6.1%	1.3%
Total	100.0%	100.0%	100.0%
Fatal + Incapacitating	**43.2%**	**51.0%**	**47.1%**

Posted speeds cannot simply be reduced by replacing signs. Federal and state policies require that state and local governments use the 85th percentile rule for setting speed limits. In other words, the posted speed is set at the 5 mph increment closest to the speed that 85% of drivers are traveling at or slower.

In order to effectively reduce vehicular speeds, the design speed of the road must be reduced. The key aspects of design speed are often beyond the control of the traffic engineers and road designers. Straight, flat roads have inherently higher design speeds, and when buildings are set far back from the roadway the sight lines allow for higher operating speeds. Effective speed reduction will require long-term coordination between land use planners and road designers to bring buildings closer to the street and add features such as street trees, on-street parking, and bulb-outs. Opportunities for such changes are on the horizon. MetroPlan Orlando has identified a number of corridors to be studied for redesign and reconstruction as pedestrian- and transit-oriented facilities. (See *Multi-Modal Corridors* on pages 38-39 for more information.)

Unmarked Crosswalks and Distances Between Signals

Crosswalks exist on all sides of every intersection, whether they are marked or not, and whether or not the intersection is controlled by a traffic signal.

Florida statute 316.003 (6) defines a crosswalk as: *"that part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway, measured from the curbs or, in the absence of curbs, from the edges of the traversable roadway*. [and] *Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface."* Since the definition of a crosswalk depends on the definition of a sidewalk, we must also look at the sidewalk definition (Figure 15). A sidewalk need not

FIGURE 15

Courtesy of Keri Caffrey

be paved to qualify as a legal sidewalk. Florida Statute 316.003 (47) defines a sidewalk as: *"that portion of a street between the curbline, or the lateral line, of a roadway and the adjacent property lines, intended for use by pedestrians."* Florida's statute covering hazardous walking conditions for elementary school students (FS 1006.23) allows unpaved areas next to the roadway greater than 4 feet in width (and meeting other criteria) to be considered not hazardous, so unpaved areas next to the roadway should be considered as "intended" for pedestrian use.

Unfortunately, neither drivers nor pedestrians recognize the existence of unmarked crosswalks; one could think of them as "abandoned," since they are not designated by traffic engineers or recognized by most law enforcement officers, drivers or pedestrians. Even marked crosswalks across higher-speed roadways are of little value if motorists do not observe them and yield right-of-way as the law requires. Only at signalized intersections do Central Florida pedestrians have a fair chance of being yielded to and somewhat protected from conflicts when crossing higher-speed roadways.

In the interest of safety and keeping vehicular traffic moving, traffic signals are limited along arterials and collectors. On state roads, the FDOT limits the minimum distance between signals to a quarter-mile. Along many state arterials, distances between signals often exceed a half-mile. This means pedestrians must either detour relatively long distances to access a signalized intersection, or take their chances crossing at unmarked crosswalks or mid-block locations. Just as it is legal for a vehicle driver to cross a roadway from a private driveway, it is legal for pedestrians to cross mid-block at some locations, provided they yield to vehicular traffic on the roadway. Crossing mid-block is only prohibited between adjacent signalized intersections. Along metro area arterial roads, the median distance from a crash location to the nearest signalized intersection is one-tenth of a mile. Such a detour could add five to seven minutes to a pedestrian's trip compared to a 30- to 45-second direct crossing.

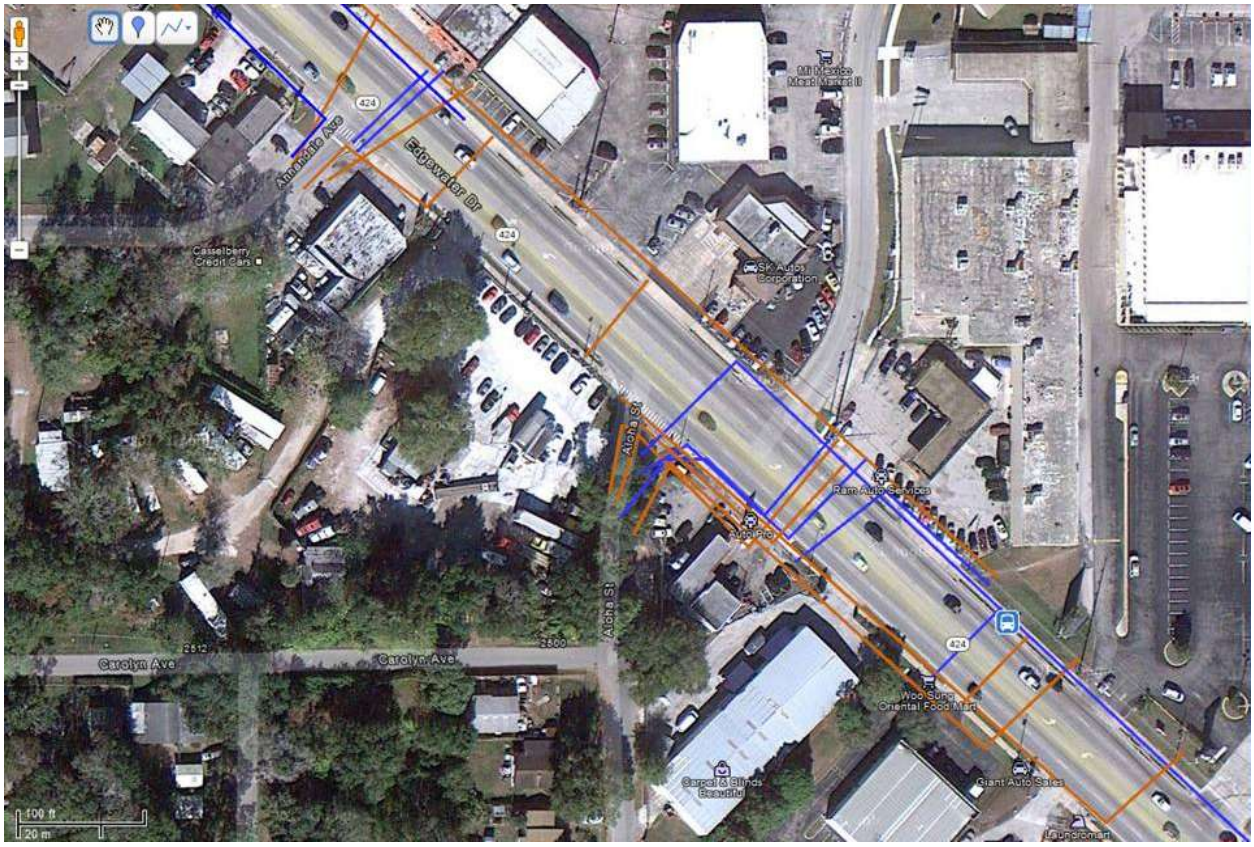
Figure 16 illustrates the number of abandoned crosswalks along a major arterial. The yellow dashes show the marked crosswalks at signalized intersections and red dots indicate pedestrian crash locations. The green dashes indicate unmarked crosswalks at unsignalized intersections.

FIGURE 16


S. Orange Blossom Trail
Pedestrian Crash Locations
12 Pairs of "Abandoned" Crosswalks
0.6 miles
0.6 miles
3 Pairs of Marked Crosswalks at Signals
Google

Providing more closely-spaced and effective pedestrian crossings should be considered for corridors with significant crash locations. Placement of such crossings requires not only consideration of crash locations, but also observations of pedestrian crossing locations, origins and destinations. On roads without medians, and without sufficient width to retrofit for such medians, providing such crossings also involves identifying suitable locations for short refuge islands to make crossings safer and more effective. Even short refuge islands can present challenges in placement; access to driveways and cross-streets must be considered. Figure 17 shows three hours of pedestrian observations along Edgewater Drive (SR 424) between Lee Road (SR 423) and Forest City Road (SR 434). Blue lines indicate paths of pedestrians crossing from south to north; orange lines from north to south. Similar observations will be conducted as part of the Pedestrian Roadway Safety Audit process (see page 34).

FIGURE 17



Behavioral Factors

Who Yields?

Florida statutes describe which road users are required to yield right-of-way to others. At unsignalized intersections, vehicle drivers are required to yield to pedestrians within crosswalks. This is so, regardless of whether the crosswalk is marked or whether the driver is facing a stop or yield sign. The exception is that a pedestrian may not *"suddenly leave a curb or other place of safety and walk or run into the path of a vehicle which is so close that it is*

impossible for the driver to yield." When a vehicle is approaching at 45 mph, this means the pedestrian cannot step into the roadway if the vehicle is less than 300 to 400 feet away.

At signalized intersections, drivers must yield to pedestrians who are legally in the crosswalk, which means the pedestrian entered the crosswalk during the "WALK" phase. If the pedestrian signal changes to flashing "DON'T WALK" while the pedestrian is in the crosswalk, turning drivers must still yield to the pedestrian. If a signalized intersection does not have pedestrian signals, pedestrians may enter the crosswalk during the green signal phase and drivers must yield in the same manner.

Away from intersections, unless a marked mid-block crosswalk is present, a pedestrian may cross, but must yield right-of-way to vehicles traveling on the roadway. An exception to this is that pedestrians may not cross between adjacent signalized intersections (unless crossing at a marked, mid-block crosswalk). Another exception is that drivers must yield to blind pedestrians indicating a desire to cross (by extending their white cane) at any location.

At unsignalized intersections, motorists were at fault 57% of the time and pedestrians at fault 21% of the time. The most common crash types involved Motorist Failure to Yield (29%) and Pedestrian Dart-out or Dash (12%). (Table 3)

Table 3: Crashes at Unsignalized Intersections
(Data from 2003-2004 study)

Motorist At Fault	52.3%
Pedestrian At Fault	15.9%
Both At Fault	4.6%
Neither At Fault	1.0%
Undetermined	26.2%
Total	100.0%

Major Crash Types	
Motorist Failed to Yield	29.2%
Pedestrian Dart-out or Dash	12.3%
Motorist Left Turn (Failed to Yield)	6.2%
Motorist Right Turn	6.2%
Pedestrian Walking In Roadway	6.2%
Pedestrian Failure to Yield	4.1%
Pedestrian Walking Along Roadway	3.6%
All Other	32.3%

At signalized intersections, motorists were at fault 52% of the time and pedestrians at fault 28% of the time. The most common crash types involved Motorist Failure to Yield (19%), and Pedestrian Failure to Yield (14%). (Table 4)

Table 4: Crashes at Signalized Intersections
(Data from 2003-2004 study)

Motorist At Fault	48.5%
Pedestrian At Fault	23.8%
Both At Fault	3.8%
Neither At Fault	1.5%
Undetermined	22.4%
Total	100.0%

Major Crash Types	
Motorist Failed to Yield	18.5%
Pedestrian Failed to Yield	13.8%
Motorist Left Turn	10.8%
Motorist Right Turn (Failed to Yield)	7.7%
Pedestrian Dart-out or Dash	6.9%
Motorist Right Turn on Red (Failed to Yield)	4.6%
All Other	37.7%

Table 5: Crashes at Mid-Block Locations
(Data from 2003-2004 study)

Motorist At Fault	21.3%
Pedestrian At Fault	55.4%
Both At Fault	4.5%
Neither At Fault	0.9%
Undetermined	17.9%
Total	100.0%

Major Crash Types	
Pedestrian Failed to Yield	32.5%
Pedestrian Dart-out or Dash	14.6%
Pedestrian Walking Along Roadway	10.4%
Working in Roadway or Disabled Vehicle Related	5.4%
Motorist Entering or Exiting Driveway	5.0%
School or Transit Bus Related	3.4%
Backing Vehicle	2.6%
Multiple Threat or Trapped	1.9%
Driver Loss of Control	1.7%
Motorist Failed to Yield	1.5%
Motorist Right or Left Turn	1.3%
Pedestrian Crossing Limited Access Roadway	1.3%
All Other	18.5%

At mid-block locations, motorists were at fault 26% of the time and pedestrians at fault 60% of the time. The most common crash types involved Pedestrian Failure to Yield (33%), Pedestrian Dart-out or Dash (15%), and Pedestrian Walking Along the Roadway (10%). (Table 5) Pedestrians who are struck while crossing mid-block are most often legally at fault (because the law requires them to yield, and being struck is prima facie proof the pedestrian did not yield). However, one must recognize that there is no practical benefit for a pedestrian to cross at an unmarked crosswalk (or even a marked one) at an uncontrolled intersection, since virtually no drivers currently yield at such crosswalks, particularly on higher-speed roads.

Motorist Yielding Behaviors

In a pedestrian safety project for Bike-Walk Central Florida, the Center for Education and Research in Safety (CERS) measured driver yield rates at uncontrolled marked crosswalks (where the driver is not facing a stop sign, yield sign or traffic signal). The average yield rate was 14%, with a range from 69% to 1.7%. Locations with better yield rates tended to be places with relatively high pedestrian activity. (Table 6)

Table 6: Driver Yield Rates

Crosswalk Location	Percent Drivers Observed Yielding
Canton Ave. at Publix	69.3%
Sandspur Rd. at Bucher Rd.	37.0%
700 N. Denning Dr.	35.9%
Lakemont Ave. at Yorkshire Dr.	34.4%
Summerlin Ave. at Mount Vernon St.	20.9%
Denning Dr. at New England Ave.	18.8%
Rollins St. at Camden Rd.	17.7%
Livingston St. at Ruth Lane	8.1%
Edgewater Dr. at Shady Lane	7.8%
Morse Blvd. at Virginia Ave.	6.5%
Kennedy Blvd. at Johnson St.	5.5%
Maitland Ave. at Packwood Ave.	4.3%
Church St. at Glenn Lane	3.8%
Washington St. at Brown Ave.	3.6%
485 Keller Road	1.7%

Alcohol

The impact of alcohol and other drugs on pedestrian safety is not entirely clear. While pedestrian fatalities are strongly correlated to pedestrian intoxication, the effects in non-fatal crashes are less clear. Law enforcement officials suggest that many non-fatal pedestrian crash victims were intoxicated to some degree, but since they are not required to submit to any sort of test, because walking while intoxicated is not a traffic violation, we have no clear idea of what percent might be intoxicated. Not surprisingly, intoxication does tend to correlate to hours of darkness.

Data from a MetroPlan study of pedestrian crashes in 2003 and 2004 suggests that the differences between intoxicated and non-intoxicated pedestrians may be modest or insignificant compared to other important factors. One would expect that intoxicated pedestrians would be more likely to be struck in the first lane of multi-lane roadways than non-intoxicated pedestrians, yet the data shows relatively little difference.

Looking at the lane in which the pedestrian was struck in mid-block crashes, we find a much higher proportion of crashes happening in the second, third and higher lanes than in the first, regardless of intoxication or lighting condition.

Data on driver intoxication also poses some uncertainties. While 2.7% of drivers involved in a pedestrian crash were intoxicated, another 1.3% of reports noted a pending blood test, and another 18% of crashes involved a hit and run driver. Intoxicated drivers would, of course, be more likely to leave the scene of a crash due to the likelihood of arrest.

COUNTERMEASURES

Key Safety Features Along High-Crash Corridors

The three most important features for pedestrian safety along arterial roads are sidewalks, medians and lighting. All three of these features increase in necessity as the speed and number of lanes increase.

Sidewalks

While there are many streets without complete sidewalks -- and the completion of the sidewalk system is an important goal – data shows that complete sidewalks are present along both sides of all corridors with significant concentrations of pedestrian crashes. A lack of sidewalks can result in pedestrians walking along the edge of the roadway or fully within the roadway lanes. Gaps in the sidewalk system can also influence where pedestrians cross, if they desire to use a sidewalk on the other side of the roadway.

Figure 18 shows arterial and collector roads with complete sidewalks on both sides, on at least one side, and programmed improvements which will complete gaps in the sidewalk

system. (The information on existing sidewalks is as of 2008 and is from data collected for the 2030 Long Range Transportation Plan. Some sections have since received new sidewalks.)

FIGURE 18

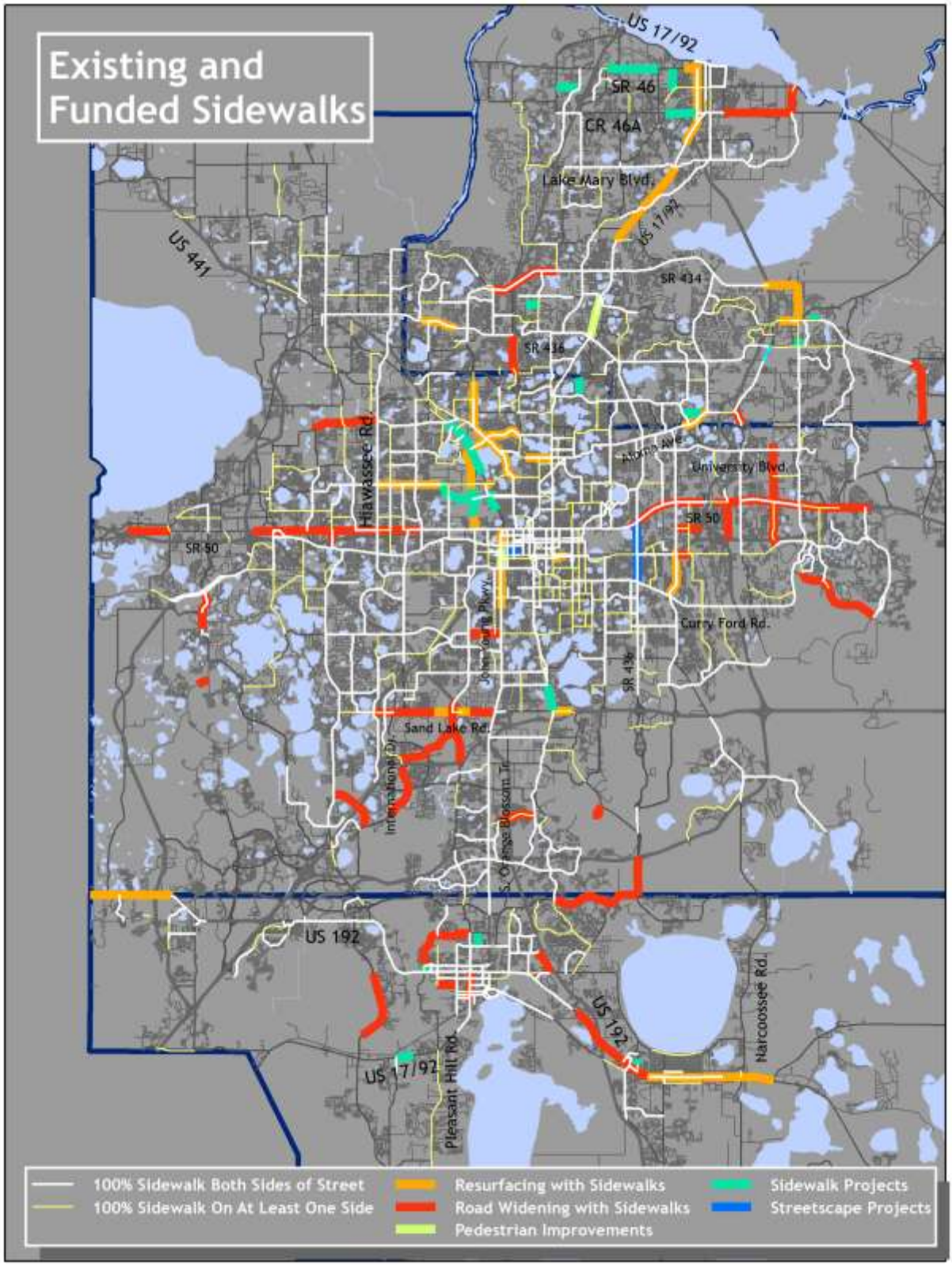


FIGURE 19

Medians

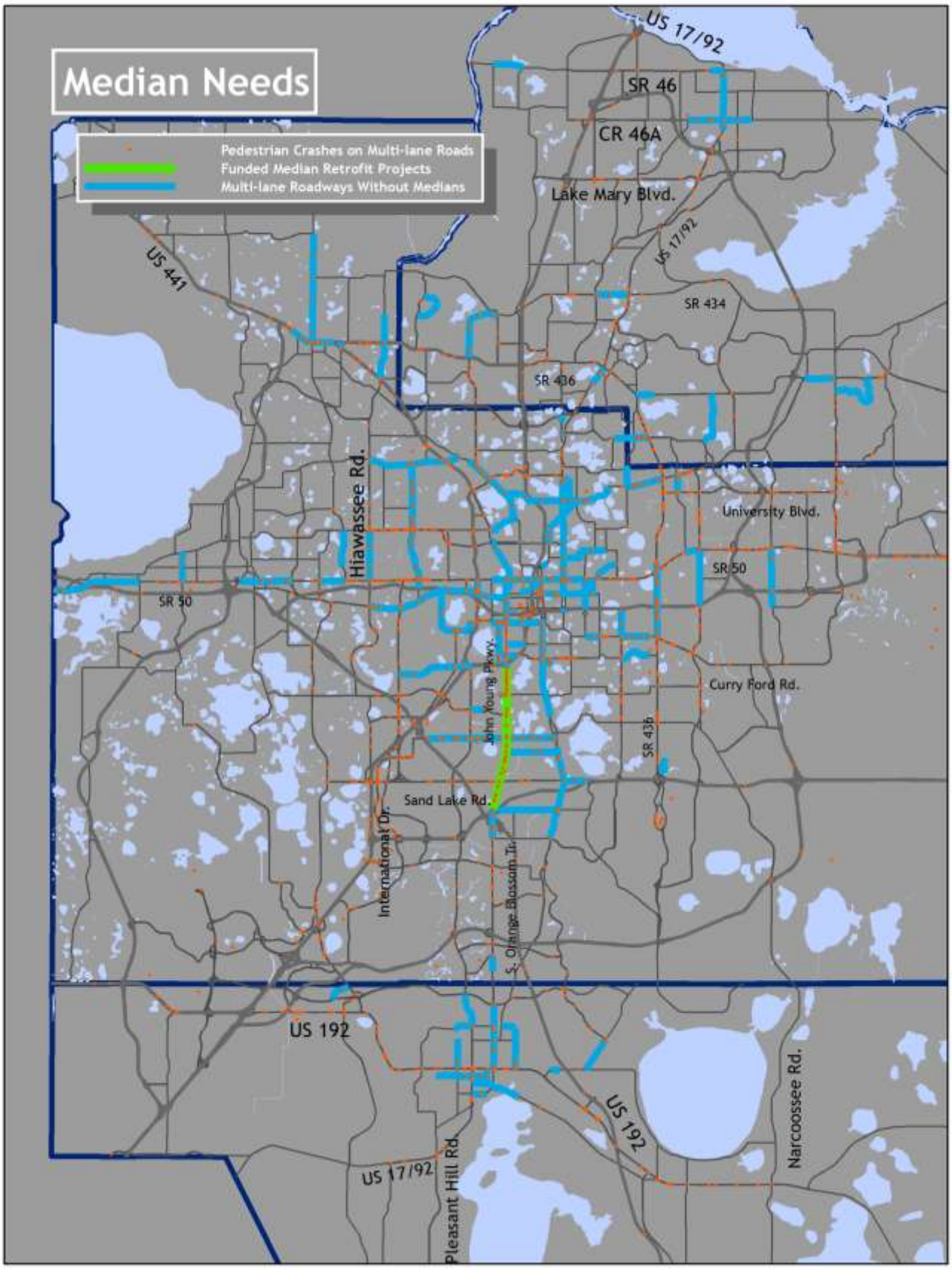
Detailed crash analysis from 2003-2004 data shows 25% of metro Orlando's pedestrian crashes and 27% of fatalities occurred on multi-lane roadways without medians. A raised or grass median provides a refuge for the pedestrian in the center of the roadway. This refuge allows the pedestrian to focus on traffic coming from one direction at a time. By shifting attention from the left to the right and back again, pedestrians can misjudge the speed of approaching vehicles, or miss seeing vehicles hidden behind other vehicles. A pedestrian in a hurry to catch a bus or get under cover before an approaching thunderstorm may be even more likely to misjudge crossing conditions.

A 2007 study conducted for MetroPlan Orlando found 6.5 times as many crashes per crossing pedestrian on a six-lane arterial with lighting and no median as on a six-lane arterial with both lighting and a median. Medians also improve safety for motorists and bicyclists by reducing the number of turning and crossing conflicts.

Retrofitting roadways with medians can be challenging. Roadway width is often insufficient, and access to adjacent properties can be reduced. Shorter pedestrian refuge islands can be installed in areas where full medians are not feasible (Figure 19).

Figure 20 shows multi-lane roadways without raised or grass medians and pedestrian crashes on multi-lane roads. Currently, one median retrofit project is programmed; South Orange Blossom Trail (US 17/92/441) from 34th Street (near I-4) to Landstreet Road. This corridor has the highest concentration of pedestrian crashes in the metro area.

FIGURE 20


Median Needs
Pedestrian Crashes on Multi-lane Roads
Funded Median Retrofit Projects
Multi-lane Roadways Without Medians
US 17/92
SR 46
CR 46A
Lake Mary Blvd.
US 441
SR 434
SR 436
Hiawassee Rd.
University Blvd.
SR 50
John Young Pkwy.
Curry Ford Rd.
Sand Lake Rd.
International Dr.
S. Orange Blossom Tr.
US 192
Pleasant Hill Rd.
Narcoossee Rd.

Lighting

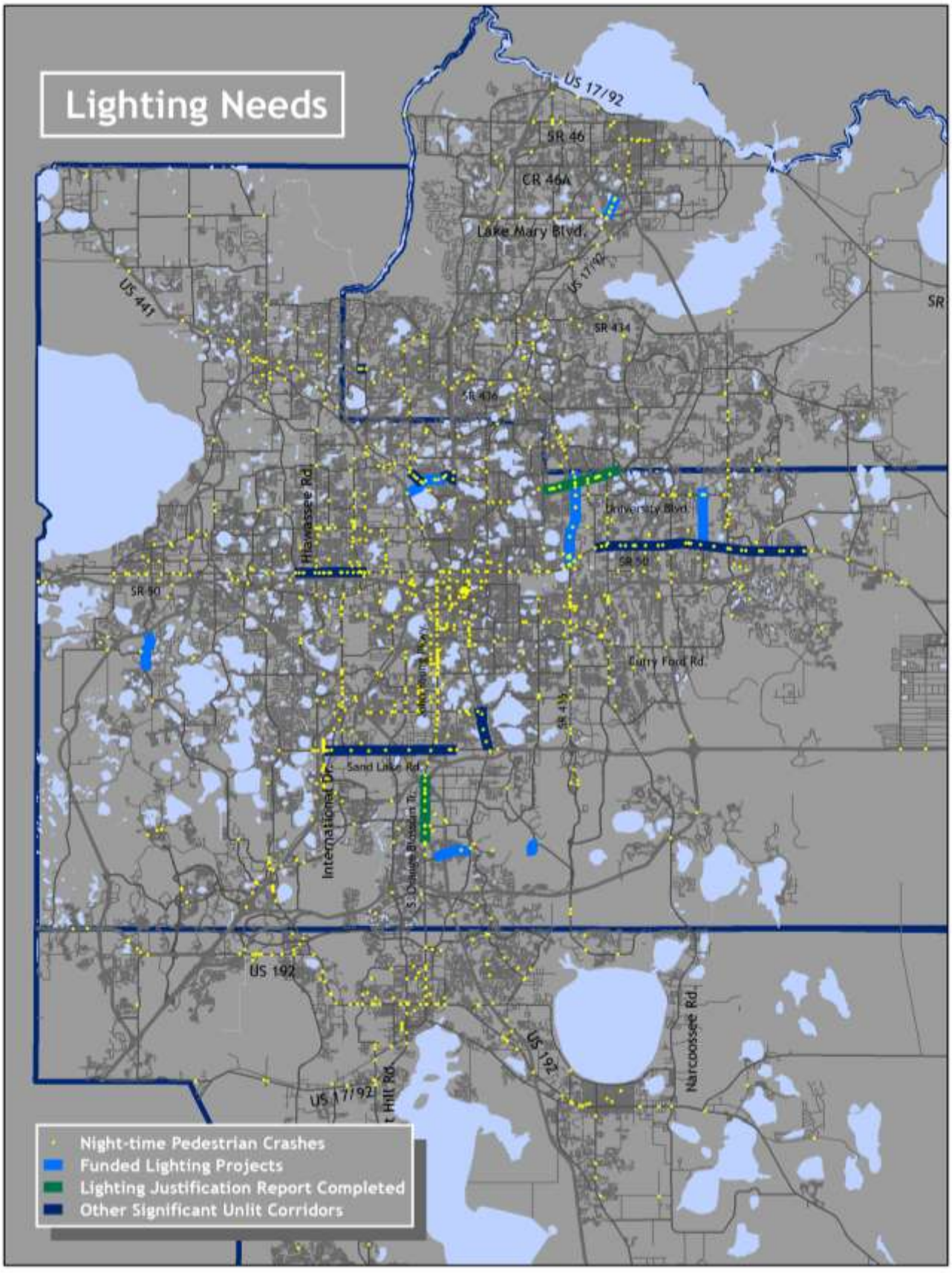
Darkness is a matter of life and death when it comes to pedestrians. While 39% of all pedestrian crashes occur in the dark hours between dusk and dawn, darkness accounts for 82% of pedestrian deaths. A lack of effective street lighting is also a contributing factor, with 11% of pedestrian injuries and 41% of nighttime fatalities occurring on streets without lighting. Additionally, 7% of nighttime crashes and 33% of nighttime fatalities occurred on streets with four or more lanes and no lighting.

A 2007 study conducted for MetroPlan Orlando found 1.7 times as many crashes per crossing pedestrian on a six-lane arterial with a median and no lighting as on a six-lane arterial with both a median and lighting.

MetroPlan Orlando has identified a number of key corridors on which lighting could reduce pedestrian injuries and fatalities. Figure 21 shows roads with planned lighting improvements, roads which have received Lighting Justification Reports by the Florida Department of Transportation, and other corridors in need of further study. A significant issue with the provision of lighting on state roads is that local governments must commit to pay for power and maintenance of the lighting before the FDOT will fund the capital expenditure of installing poles and lamps.

New lighting technology may reduce the costs of electricity consumption and maintenance and make the lighting of new corridors more affordable. For example, the City of Pittsburgh, Pennsylvania plans to replace its entire inventory of 40,000 street lights with LED (light emitting diode) lighting over the coming decade, which is expected to save the city $1.7 million per year in energy and maintenance costs (a 70% savings).

FIGURE 21


Lighting Needs
US 17/92
SR 46
CR 46A
Lake Mary Blvd.
US 441
SR 434
SR 436
Hiawassee Rd.
University Blvd.
SR 50
Curry Ford Rd.
Sand Lake Rd.
International Dr.
US 192
Narcoossee Rd.
Night-time Pedestrian Crashes
Funded Lighting Projects
Lighting Justification Report Completed
Other Significant Unlit Corridors

High-Emphasis Crossings

Simply marking a crosswalk on the roadway pavement is usually insufficient, and even unsafe, on higher-speed roads. Approaching drivers normally cannot see the markings from the stopping sight distance at higher speeds. At such speeds supplemental devices such as signs and flashing lights are often necessary to give drivers adequate time and distance to react, slow and yield to a crossing pedestrian. High-emphasis markings and signage can also improve driver compliance at lower speed crossings.

At higher-speed crossings, highly visible signals and beacons are necessary to get drivers to yield. Examples are regular traffic signals (Figure 22; mid-block crossing on I-Drive), High-Intensity Activated crossWalK beacons (HAWK beacons) (Figure 23), and Rectangular Rapid-Flashing Beacons (RRFBs) (Figure 24). Installation of a regular traffic signal must meet the "warrants" of the Manual on Uniform Traffic Control Devices (MUTCD). Warrants for a regular traffic signal are difficult to meet for pedestrian crossings alone; a significant number of pedestrians must be crossing at the proposed location. Very few locations in the Orlando metro area meet these warrants.

FIGURE 22

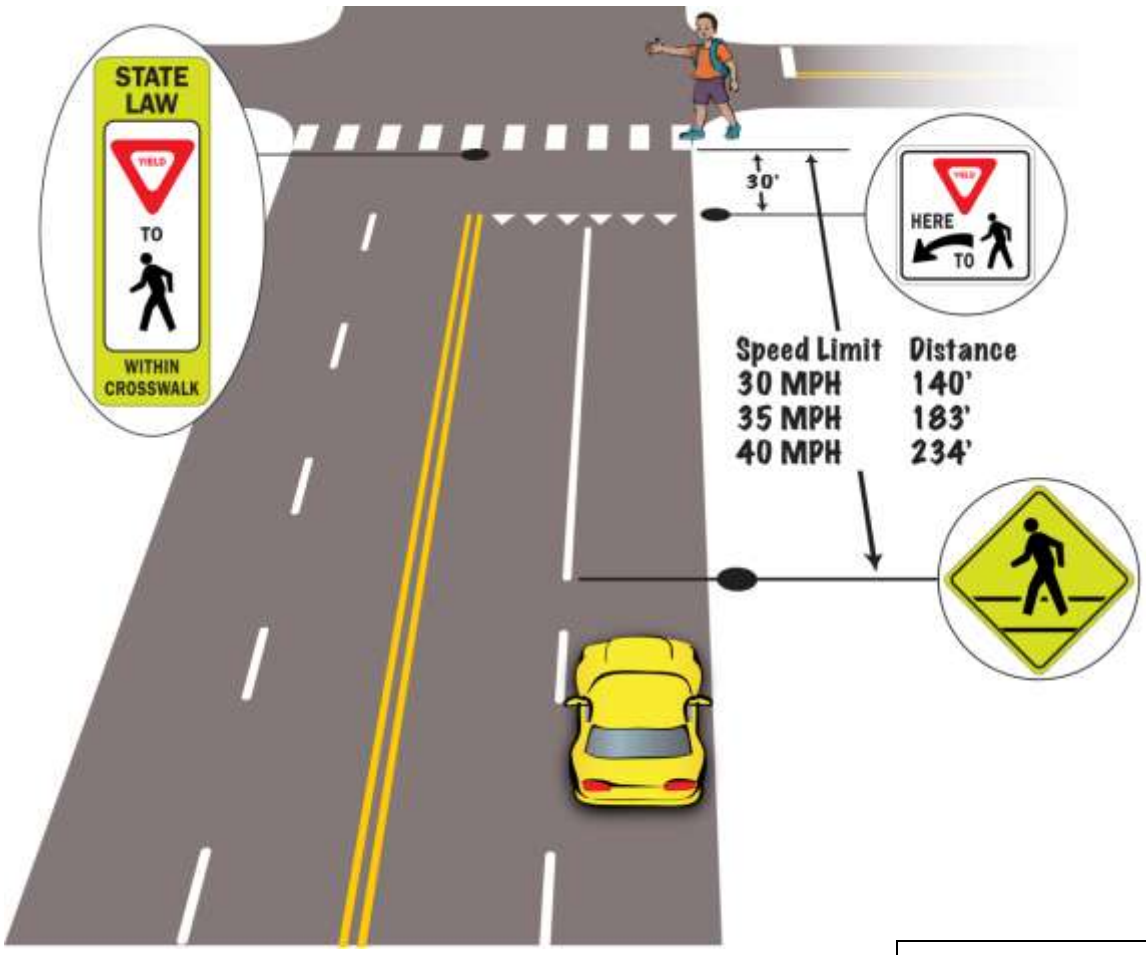
FIGURE 23

FIGURE 24

FIGURE 25

HAWK beacons and RRFBs are being tested by FDOT and other agencies to determine the best conditions under which they should be used. One or both of these may be viable for high-speed roadway crossings where additional support is needed for crossing pedestrians. Identification of such locations will be an on-going process as this plan is implemented. At lower speed locations, a number of signage and pavement marking options are possible and their designs and usage are fully described in the MUTCD. (Figures 25 and 26 show examples of a centerline sign, crosswalk sign, yield line, yield/stop here sign)

FIGURE 26



Courtesy of Keri Caffrey

Overpasses and Underpasses

While bridges over, and tunnels under, roadways certainly improve safety for those who use them, there are few locations within the metro area with significant concentrations of crossing pedestrians. Overpasses and underpasses can work for school crossings, trail crossings and other locations where no detour is necessary to use the facility. Federal law requires that these facilities be built with long ramps to accommodate persons with disabilities, so costs are very high; normally in the range of $3 million to $4 million. For the same amount of money, many more at-grade crossings can be built to serve many more pedestrians.

FIGURE 27

Bulb-Outs

Bulb-outs are used only on roadways with on-street parking (Figure 27). They project the pedestrian space towards the center of the roadway so pedestrians about to enter the roadway are less likely to be hidden behind parked cars. By being up on a curb, the pedestrians' eye level is about 6 inches higher, improving the ability to see and be seen. Bulb-outs also reduce the crossing distance from curb to curb and reduce the speeds of turning motorists. With a shorter crossing distance, traffic engineers can provide a shorter "WALK" and flashing "DON'T WALK" phase, which can improve intersection performance and reduce driver frustration.

Provide Marked Crosswalks at All Legs of the Intersection

At signalized intersections on arterials, marked crosswalks and pedestrian signals should be provided on all sides. If one leg of the intersection does not provide a protected pedestrian crossing phase, pedestrians may need to cross as many as three times instead of once, waiting for a signal at each leg and dealing with potential turning conflicts as well. Some pedestrians may even avoid such intersections, because there are more conflicts with turning vehicles and significant time is added to trips.

Education and Enforcement

There appears to be a significant disconnect between how Florida drivers feel about yielding to pedestrians and how they actually behave. In a 2006 survey conducted for FDOT, 90% of drivers said they were "very likely" or "highly likely" to yield to a pedestrian in a marked crosswalk at an intersection with no stop sign or signal; 81% agreed or strongly agreed that "everyone should have the right to safely cross the street as a pedestrian whether or not

there is a painted crosswalk;" and 77% agreed or strongly agreed that "every pedestrian should have the right to safely cross a street mid-block if there is a painted crosswalk." So drivers clearly believed they have a duty to yield.

But drivers also expressed frustration with having to yield to pedestrians: 46% agreed or strongly agreed that "most pedestrians don't need to be on major roads. They should stay on neighborhood streets," and 43% agreed or strongly agreed that "most pedestrians are walking for recreation." When asked about yielding to pedestrians when turning onto a busier road, drivers felt it was highly or somewhat frustrating to yield on "county or state highways" (50%) and "busy avenues and arterials" (51%).

These attitudes are at odds both with observed behavior (as shown in the CERS crosswalk yielding study), and with the need for residents and visitors to travel the area without a personal motor vehicle. "Busy avenues and arterials" are where most of our transit routes, high-density housing, and commercial destinations are located. Changing motorist attitudes and expectations is necessary if pedestrians are to gain the safety benefits of crosswalks. A crosswalk is only of value if motorists respect the pedestrians using it. Such respect requires not only a community expectation that drivers should and will yield when the law requires, but also that pedestrians will uphold their side of the bargain and behave predictably. When motorists don't live up to their legal responsibilities at crosswalks, pedestrians see no value in using them. Here is a story illustrating this problem:

On a nice December afternoon in downtown Orlando, a young man walked north on Magnolia Avenue toward Colonial Drive. He pushed the button for the crosswalk and waited. When the "WALK" signal appeared he began to cross the street, but a stream of left-turning cars cut across his path, prohibiting him from proceeding. The problem was that the left-turning drivers had a green signal at the same time the young man had his "WALK" phase. Still, those drivers were required by law to yield to the pedestrian. After half a dozen cars passed, he was finally able to complete his crossing, and he continued on to the nearby convenience store. A few minutes later, he exited the convenience store and proceeded to cross the street about 150 feet from the crosswalk. He had learned there was obviously no point in detouring to and waiting for the pedestrian signal (Figure 28).

FIGURE 28

This series of events was observed during MetroPlan Orlando staff's observations at a number of high-crash corridors. When we observe pedestrians crossing in places we believe are inappropriate, it's helpful to stop and think that they might have a reason.

To this end, Bike-Walk Central Florida and MetroPlan Orlando are working with local law enforcement agencies, LYNX and the Orange County School Board to conduct pedestrian-oriented enforcement and education efforts. This project, which will target both drivers and pedestrians to encourage and enforce safer behaviors, was initiated as a pilot project for cities in central Orange County, but will be expanded around the metropolitan area as funding and time allow. For more information on this program, visit www.iYield4peds.org.

Long-term change requires reaching children. A very successful school-based pedestrian safety program from Miami-Dade County named WalkSafe is now expanding statewide, and the first priority outside South Florida is Orange County. Bike-Walk Central Florida has been working with WalkSafe and Orange County Public Schools to get the program started in the Orlando metro area. Expanding to Seminole and Osceola Counties is the natural next step.

STRATEGIES

Pedestrian Road Safety Audits

The Federal Highway Administration (FHWA) has developed, and encourages the use of, the Pedestrian Road Safety Audit process. From the FHWA website:

Road Safety Audit (RSA) is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. The FHWA works with State and local jurisdictions and Tribal Governments to integrate RSAs into the project development process for new roads and intersections, and also encourages RSAs on existing roads and intersections. The aim of an RSA is to answer the following questions: What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances? What opportunities exist to eliminate or mitigate identified safety concerns?

Road safety audits can be used in any phase of project development from planning and preliminary engineering, design and construction. The pedestrian RSA materials provide more detail on pedestrian safety issues than the traditional RSA. One of the key features of the pedestrian RSA materials is a set of prompt lists. These prompt lists help ensure that audit teams consider key issues for pedestrian safety when out in the field. A master prompt list provides higher level, more general issues to

consider. The detailed prompt lists cover the same issues as the master prompt list, but are more specific things to look for during the field review. Taken together, these prompt lists should empower users with different levels of expertise on pedestrian safety issues to conduct successful RSAs.

Through mapping and analysis of pedestrian crashes, MetroPlan Orlando and the local governments have identified 17 corridors with significant numbers of pedestrian crashes and/or concerns over future crash potential (Table 7). The corridors are ranked based on the number of pedestrian crashes and fatalities, with fatal crashes given extra weighting. Pedestrian Roadway Safety Audits are expected to cost approximately $20,000 per corridor; studies for the 17 corridors listed would then cost approximately $340,000. MetroPlan Orlando, FDOT and the local governments will identify funding to conduct Pedestrian RSAs for these corridors.

Pedestrian Safety Improvements Priority List

Recommendations for engineering solutions from the RSAs will be used to develop a Pedestrian Safety Prioritized Project List. FDOT, MetroPlan Orlando committees, LYNX, and local governments will then collaborate to ensure these priorities are funded and constructed. As new crash data becomes available through the MetroPlan Orlando Crash Database System, new corridors can be identified for Pedestrian RSAs and the countermeasures can be analyzed for effectiveness.

Funding of these prioritized safety needs will be directed collaboratively by the following agencies:

- FDOT – the department administers studies and programming for federal highway safety funds

- City and County Governments – local governments may provide pedestrian safety improvements solely with their own funds, or in cooperation with other agencies

- MetroPlan Orlando – various committees and subcommittees advise the MetroPlan Orlando board on which projects to fund, including:
    - Transportation Technical Committee – develops prioritized project list with input from the Plans and Programs Subcommittee and the Management and Operations Subcommittee; projects are funded with Surface Transportation Program (STP) funds
    - Bicycle & Pedestrian Advisory Committee – develops a list of pedestrian and bicycle projects; projects are funded with federal Enhancement funds and a 15% set-aside of STP funds

- LYNX – the transit agency can use federal transit accessibility funds to improve safe access to bus stops

Table 7: Pedestrian Road Safety Audit Priorities

Street	Jurisdictions	Limit A	Limit B	Road Characteristics	Number of Crashes	Crash Characteristics
SR 436 (Semoran Blvd.)	FDOT, Orange Co.	300 ft. N of Old Cheney	SR 50	6-lane undivided; 45 mph; no lighting (lighting programmed)	15	10 at night; 4 at intersection; 6 within 200 ft. of intersection
SR 50 (Colonial Dr.)	FDOT, Orlando	Orange Ave.	Magnolia Ave.	4-lane undivided; 40 mph	8	4 at intersections; turning movements from Magnolia onto Colonial
SR 527 (Orange Ave.)	FDOT, Orlando	Gore St.	Kaley St.	4-lane undivided; 35 mph	15	9 at intersections
US 17/92	FDOT, Sanford, Seminole Co.	Park Dr.	1st St.	4-lane undivided; lighting; 45 mph	13	7 at intersections
SR 15 (Hoffner Ave.)	FDOT, Orange Co.	Mauna Loa Ln.	SR 436	2-lane;	5	3 at intersections
SR 435 (Kirkman Rd.)	FDOT, Orlando	Turnpike Overpass	Vineland Rd.	6-lane divided; 45 mph	6	4 at intersections; high transit use
SR 424 (Edgewater Dr.)	FDOT, Orange Co.	SR 434	SR 423	4-lane undivided; 45 mph; no lighting	19	10 at intersections
US 17/92/441 (Main Street)	FDOT, Kissimmee	Old Dixie Hwy.	US 192	4-lane undivided; 45 mph; no lighting	11	5 at intersections
Oak Ridge Rd.	Orange County	Millenia Blvd.	Wingate Dr.	4-lane divided; high-emphasis crosswalks	9	6 at intersections
Oak Ridge Rd.	Orange County	US 441	SR 527	4-lane undivided	12	5 at intersections
US 17/92/441 (S.O.B.T.)	FDOT, Orlando	Grand St.	Kaley St.	4-lane divided	9	7 at intersections
SR 435 (Kirkman Rd.)	FDOT, Orange Co.	Conroy Rd.	Summer Oak St.	6-lane divided; 45 mph	6	3 at intersections
SR 436 (Semoran Blvd.)	FDOT, Altamonte Springs, Seminole	Montgomery Rd.	Maitland Ave.	8-lane divided; lighting; 45 mph	8	5 at intersections
SR 436 (Semoran Blvd.)	FDOT, Seminole Co. Casselberry	Around Howell Branch Rd. intersection		6-lane divided; lighting; 45 mph	6	Fatality 11/4/2011 on Howell Branch
SR 50 (Colonial Dr.)	FDOT, Orange Co.	Culver Rd.	Murdock Blvd.	6-lane divided; 45 mph	5	4 at intersections
University Blvd.	Orange County	University Park Dr.	Forsyth Rd.	6-lane divided; 45 mph	4	2 at intersections; planned Full Sail expansion
Simpson Rd.	Osceola Co.	Fortune Rd.	US 192	2-lane undivided	1	1 mid-block crash; increasing pedestrian activity

Lighting Priority List

Because an agreement between the local government and FDOT is necessary for lighting to be installed on state roads, roadway lighting has been separated out with its own priority list (Table 8). Under current state policy, local governments must commit to providing electrical power and maintenance if lighting is installed. As with the safety improvements identified above through the Roadway Safety Audit process, MetroPlan Orlando, FDOT and the local governments will coordinate to identify funding for these lighting improvements. A list of already-funded lighting projects is also included (Table 9).

Table 8: Prioritized Lighting Needs

Street (Jurisdictions)	Limit A	Limit B	Cost Estimate for Installation	Night-time Crashes per Year	Fatal Night-time Crashes per Year	Crash Score
SR 436 (FDOT, Seminole Co.)	Hunt Club Blvd.	Bear Lake Rd.	$113,150	0.8	0.6	2.0
Edgewater Dr. (FDOT, Orange Co.)	SR 434	Lee Rd.	$196,114	1.2	0.2	1.6
SR 50 (FDOT, Orange Co.)	Apopka-Vineland Rd.	Mission Rd.	$858,711	4.2	0.8	5.8
S. Orange Blossom Tr. (FDOT, Orange Co.)	Landstreet Rd.	Whisper Lakes Blvd.	$800,235	2.8	0.6	4.0
Aloma Ave. (FDOT, Winter Park)	Lakemont Ave.	SR 417	$932,709	2.2	0.6	3.4
SR 50 (FDOT, Orange Co.)	Forsyth Rd.	Semon Dr.	$2,528,946	6.6	1	8.6
Lee Rd. (FDOT, Orange Co.)	Adanson Ave.	Wymore Rd.	$180,376	0.6	0	0.6
Sand Lake Rd. (FDOT, Orange Co.)	International Dr.	Presidents Dr.	$1,583,331	3	0.6	4.2
Orange Ave. (FDOT, Orange Co.)	Hoffner Ave.	Sand Lake Rd.	$639,132	0.6	0.4	1.4

Table 9: Programmed (Funded) Lighting Projects

Street (Jurisdictions)	Limit A	Limit B
SR 436 (FDOT, Orange Co.)	SR 50	Orange/Seminole Line
US 17/92 (FDOT, Seminole Co.)	Lake Mary Blvd.	Airport Blvd.
Lee Rd. (FDOT, Orange Co.)	US 441	Adanson St.
Rouse Rd. (Orange Co.)	Corporate Blvd.	SR 50
Wetherbee Rd. (Orange Co.)	Balcombe Rd.	Orange Ave.
Wetherbee Rd. (Orange Co.)	1.8 miles east of Landstar Blvd.	Boggy Creek Rd.
Winter Garden-Vineland Rd. (Orange Co.)	SR 429	Magnolia Park Ct.

Pedestrian Safety and Mobility Assessment Tool (PSMAT)

MetroPlan Orlando has developed an assessment tool to assist FDOT and local governments in measuring present and potential pedestrian safety and mobility conditions, and identifying characteristics that might be changed to improve pedestrian safety and mobility.
This tool may be used during Efficient Transportation Decision-Making studies (ETDM), Project Development & Environmental studies (PD&E), and comparable local government project studies. It can also be used for Resurfacing, Rehabilitation & Restoration (3R) projects. Local governments may find it useful in assessing the walkability of new developments. The PSMAT is intended to be used only for non-limited-access projects within the urban service area.

The tool measures characteristics of each intersection, and of mid-block conditions between intersections. Scores for conditions are weighted in order to produce scoring scales of zero to 100 for each element. There are six resulting scores from this data:

1. **Individual Intersection Score** – the total of all scored intersection characteristics
2. **Block Walkability Score** – the total of all mid-block walkability characteristics
3. **Mid-Block Crossing Score** – the total of mid-block characteristics that pertain to the relative ease or difficulty of crossing the roadway at a non-intersection location
4. **Block Intersection Score** – the averaged score of intersections along the block
5. **Total Crossing Score** – the combined average of the Mid-Block Crossing Score and the Block Intersection Score
6. **Pedestrian Trip Potential** – a score estimating the relative potential for pedestrian trips in the block, based on land use and transit boardings

For more information on the PSMAT, contact MetroPlan Orlando at 407-481-5672.

Multi-Modal Corridors

MetroPlan Orlando also has the broader goal of moving more people by transit and other modes. Effective transit depends on a good walking environment. Making this shift entails a very different approach to designing and building streets. The most effective method to improve pedestrian safety is to completely redesign the road environment and adjacent land uses to support and encourage safe walking. Lowering vehicular speeds is the most effective way to reduce pedestrian fatalities. Reducing vehicular speeds involves building setbacks, providing street trees and on-street parking.

MetroPlan Orlando has developed a list of priority projects to convert existing streets into multi-modal corridors. This list (Table 10) is of Project Development and Environmental (PD&E), Preliminary Engineering (PE) and Alternatives Analysis (AA) studies. Projects on this list include studies for conventional widening projects, intersection improvements, multi-modal and context-sensitive improvements, Bus Rapid Transit (BRT) projects, and streetcar projects. Multi-modal enhancements could include bus bays, transit shelters, wider

sidewalks, landscaping, and potential intersection improvements. Funding for these projects will occur through the regular transportation planning process.

Table 10: Multimodal and Context Sensitive Improvements

Priority Ranking	Project Name or Designation	From	To	Jurisdictions	Work Description and Comments
1	**SR 535**	Orange/Osceola Co. Line	I-4	FDOT, Orange Co.	Widen to 6 and 8 lanes
2	**SR 438/Silver Star Rd.**	SR 429	Bluford Ave.	FDOT, Ocoee	Widen to 4 lanes
3	**SR 527/Orange Ave.**	Pineloch Ave.	Anderson St.	FDOT, Orlando	Multimodal/Context Sensitive Improvements; transit emphasis improvements
4	**SR 436**	US 17/92	Wilshire Dr.	FDOT, Seminole Co., Casselberry	Multimodal/Context Sensitive Improvements; widen to 8 lanes; includes bus bays, wider sidewalks, trail/pedestrian bridge crossing
5	**SR 436**	Newburyport Ave.	Ronald Reagan Blvd.	FDOT, Altamonte Springs	Intersection Improvements
6	**SR 434**	SR 417	Mitchell Hammock Rd.	FDOT, Seminole Co.	Widen to 4 lanes
7	**US 17/92**	at Pleasant Hill Rd.		FDOT, Osceola Co.	Intersection Improvements; feasibility study is underway; intersection capacity improvements may include flyover, crossover diverted left turn lanes
8	**SR 527/Orange Ave.**	SR 482/Sand Lake Rd.	SR 15/ Hoffner Ave.	FDOT, Orange Co.	Multimodal/Context Sensitive Improvements; feasibility study underway
9	**SR 434/Alafaya Tr.**	SR 50	McCulloch Rd.	FDOT, Orange Co.	Multimodal/Context Sensitive Improvements; feasibility study underway
10	**US 17/92**	SR 417	SR 46/1st St.	FDOT, Seminole Co., Sanford	Multimodal/Context Sensitive Improvements
11	**US 192 BRT**	Main St.	Walt Disney World	FDOT, Osceola Co., Kissimmee	Bus Rapid Transit (BRT); Alternatives Analysis underway
12	**SR 436**	Orlando International Airport	Orange/ Seminole Co. Line	FDOT, Orange Co., Orlando	Multimodal/Context Sensitive Improvements; improvements to include BRT
13	**SR 527/Orange Ave.**	SR 50	Princeton St.	FDOT, Orlando	Multimodal/Context Sensitive Improvements; Main Street District; transit emphasis improvements
14	**US 17/92**	SR 50	Princeton St.	FDOT, Orlando	Multimodal/Context Sensitive Improvements; Main Street District; transit emphasis improvements
15	**SR 15/Conway Rd.**	at Gatlin Ave.		FDOT, Orange Co.	Intersection Improvements
16	**SR 436**	I-4	US 17/92	FDOT, Seminole Co., Altamonte Springs	Multimodal/Context Sensitive Improvements
17	**SR 434**	CR 427	US 17/92	FDOT, Seminole Co., Longwood	Multimodal/Context Sensitive Improvements
18	**SR 424/ Edgewater Dr.**	at SR 426/ Fairbanks Ave.		FDOT, Orange Co.	Intersection Improvements
19	**SR 500/US 441**	at Piedmont Wekiva Rd.		FDOT, Orange Co.	Intersection Improvements
20	**SR 551/ Goldenrod Rd.**	SR 408	SR 50	FDOT, Orange Co.	Multimodal/Context Sensitive Improvements

Priority Ranking	Project Name or Designation	From	To	Jurisdictions	Work Description and Comments
21	**SR 50**	Orange Ave.	Bumby Ave.	FDOT, Orlando	Multimodal/Context Sensitive Improvements; Main Street District; transit emphasis improvements
22	**SR 424/ Edgewater Dr.**	at SR 423/Lee Rd.		FDOT, Orange Co.	Intersection Improvements
23	**US 17/92**	Shepard Rd.	Dog Track Rd.	FDOT, Seminole Co., Longwood	Multimodal/Context Sensitive Improvements
24	**Kissimmee Circulator Service**			Lynx, Kissimmee	Streetcar; new streetcar connecting to planned SunRail stop in Kissimmee
25	**SR 436**	Orlando International Airport	Orange/ Seminole Co. Line	FDOT, Orange Co., Orlando	Multimodal/Context Sensitive Improvements; improvements to include BRT
26	**SR 436**	Wilshire Dr.	Orange/ Seminole Co. Line	FDOT, Seminole Co., Casselberry	Multimodal/Context Sensitive Improvements; includes consideration for alternative transit modes and dedicated or shared transit lanes
27	**SR 426/Aloma Ave.**	SR 436	Orange/ Seminole Co. Line	FDOT, Orange Co.	Multimodal/Context Sensitive Improvements
28	**SR 482/Sand Lake Rd.**	SR 500/US 441	SR 527/Orange Ave.	FDOT, Orange Co.	Multimodal/Context Sensitive Improvements
29	**SR 50**	Bumby Ave.	Old Cheney Hwy.	FDOT, Orlando	Multimodal/Context Sensitive Improvements; transit emphasis improvements
30	**SR 500/US 441**	I-4	SR 50	FDOT, Orlando	Multimodal/Context Sensitive Improvements; transit emphasis improvements
31	**SR 423/Lee Rd.**	at I-4		FDOT, Orange Co.	Intersection Improvements
32	**SR 435/ Kirkman Rd.**	SR 482/Sand Lake Rd.	SR 50	FDOT, Orange Co., Orlando	Multimodal/Context Sensitive Improvements; transit emphasis improvements, exclusive BRT lanes
33	**SR 434**	Maitland Blvd.	SR 436	FDOT, Seminole Co., Altamonte Springs	Multimodal/Context Sensitive Improvements

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