



# ACTIVE TRANSPORTATION PLAN

## Technical Memorandum III: Bicycle & Pedestrian Safety Analysis

Updated April 2024



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## Updated April 2024

The 2020 Forward Pinellas Active Transportation Plan (ATP) conducted a bicycle and pedestrian safety analysis. The safety analysis identified collision trends and developed collision profiles related to bicycle and pedestrian crashes. The 2020 ATP also identified unsafe segments and intersections, as well as generated countermeasures to address profiles and trends.

As part of the 2024 ATP update, the bicycle and pedestrian analysis was refreshed with data and findings from the Safe Streets Pinellas Action Plan, adopted in 2021 and updated in 2023, including updated collision trends and profiles, a high-injury network, and a refresh of safety countermeasures.

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# 01 Introduction

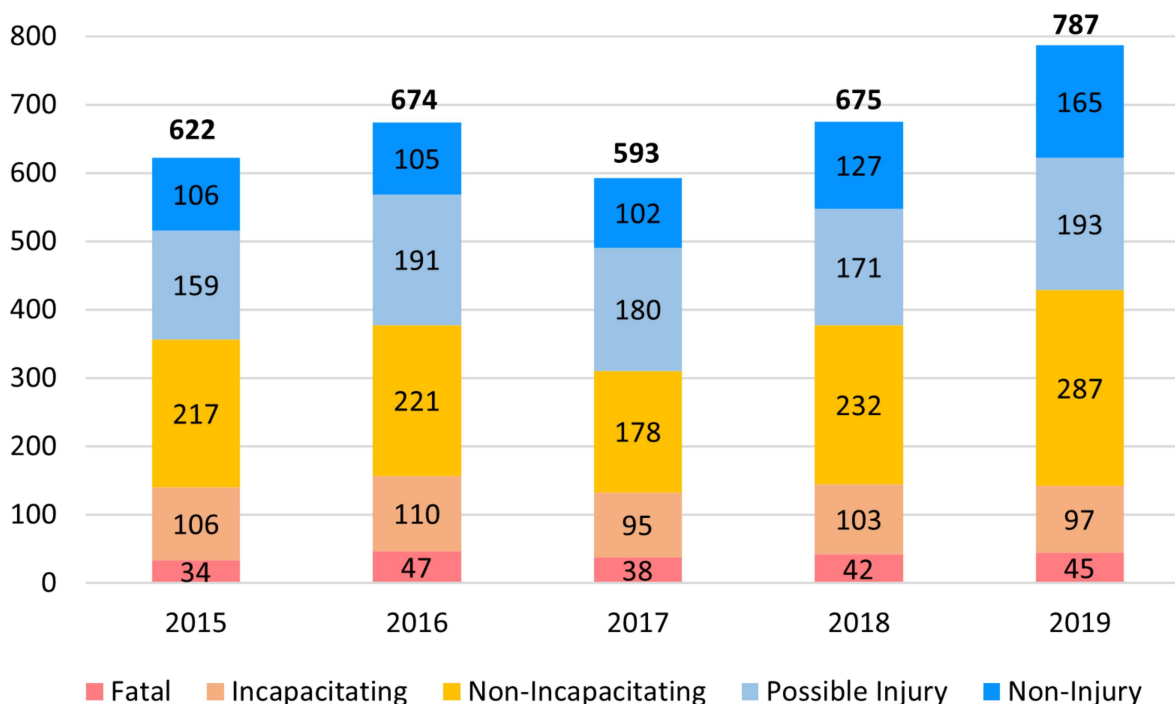
A critical component to the Forward Pinellas Active Transportation Plan is to address existing safety concerns, as shown in the Plan’s Vision Statement, as follows:

*“Pinellas County will have a **safe, connected, and comfortable** active transportation network, which is **community fostered and in harmony with all travel modes, and that advances an efficient, productive, and healthy mobility system for all users.**”*

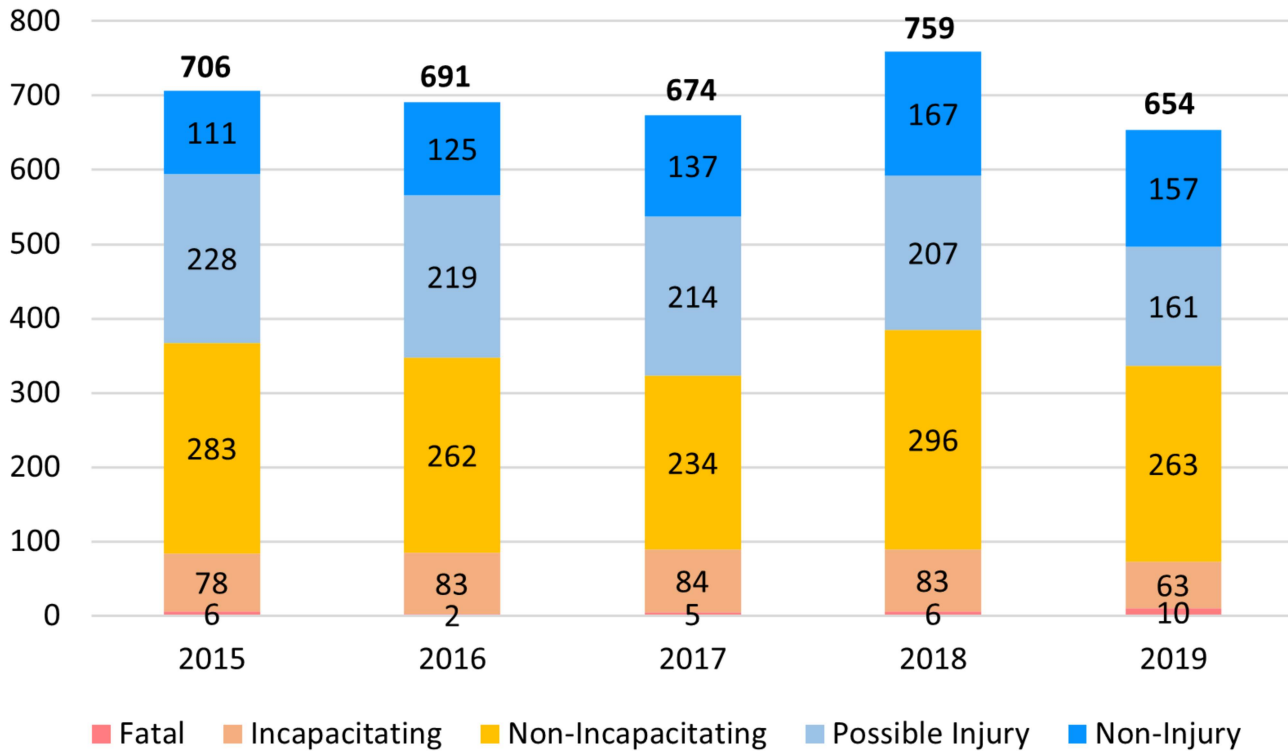
A pedestrian and bicycle safety analysis was completed as part of the 2020 Active Transportation Plan (ATP). The updated 2024 ATP refreshed the bicycle and pedestrian analysis with data and findings from the Safe Streets Pinellas Action Plan, including updated crash trends data, collisions types, incorporation of the high-injury network (HIN) and countermeasures. The Safe Streets Pinellas Action Plan will be updated in the fiscal year 2025-2026. The Safe Streets Pinellas Action Plan data looked at crash trends for years 2015 to 2019. There were a total of 3,351 pedestrian crashes and 3,484 bicycle crashes countywide during this five-year period, including 717 killed or severely injured (KSI) pedestrian crashes and 420 KSI bicycle crashes. The number and severity of pedestrian and bicycle crashes by year is shown in **Figure 1** and **Figure 2**, respectively.

As shown in **Figure 1**, there is a clear overall trend of

**Figure 1. Pedestrian Crashes by Year (2015 - 2019)**



**Figure 2. Bicycle Crashes by Year (2015 - 2019)**



increasing pedestrian crashes over the five-year span, with the most notable increases in non-incapacitating injury crashes. Fatal crashes, while fluctuating, do not show a consistent trend in either direction, and incapacitating crashes have slightly increased.

**Figure 2** shows that outside of an increased number of non-injury pedestrian crashes in 2018, the total number of bicycle crashes followed a relative steady to slightly decreasing trend. The share of not injury

crashes has increased, while possible injury crashes has decreased throughout the period. In 2018 there was a notable increase in non-incapacitating crashes, but the downward trend continued the following year. KSI crashes remain fairly constant throughout the study period. While the full crash analysis will be updated in 2025, review of pedestrian and bicyclist involved crashes between 2020 and 2023 indicates that the trends shown here have continued with no noticeable change.

## 02 Pedestrian and Bicycle Crash Types and Engineering Countermeasures

The 2020 ATP incorporated a nuanced approach to enhancing pedestrian and bicyclist safety through the integration of the Pedestrian & Bicycle Crash Analysis Tool (PBCAT), developed by the Federal Highway Administration (FHWA). This tool enabled the 2020 ATP to systematically analyze pedestrian and bicycle crashes with motor vehicles by categorizing them into specific types, based on detailed factors like location, traffic control, and the dynamics of the crash. This categorization aids in identifying targeted countermeasures for each type of crash, drawing on resources such as [PEDSAFE](#) and [BIKESAFE](#). The 2020 ATP's findings revealed significant patterns in pedestrian and bicycle crashes in Pinellas County, pointing towards failures to yield and specific motorist errors as predominant causes.

Similarly, the collision assessment in the Safe Streets Pinellas Action Plan analyzed data from the Pinellas Crash Data Management System (CDMS), focusing on the five years between 2015 and 2019. During the five-year period approximately 131,200 collisions were reported in Pinellas County, with three percent of those collisions resulting in fatalities or serious injuries. Some key findings include:

- On average, two people are killed or seriously injured on Pinellas County roads each day.
- Overall, collisions overwhelmingly involve people in motor vehicles (90 percent). Collisions that result in a KSI disproportionately include a vulnerable roadway user (people biking,

walking, or riding a motorcycle, with pedestrians accounting for 40 percent of people killed on Pinellas County roadways.

- Alcohol is two or more times as likely to be involved in a KSI collision than a non-KSI collision.
- The highest share of overall collisions occurs between 3 and 6 PM, including KSI collisions. However, collisions that occur between 6 PM and 6 AM are more likely to result in a KSI than between 6 AM and 6 PM.
- KSI collisions are slightly more likely to occur during winter and spring months (December through April) versus other months.
- More than 60 percent of KSI collisions occur on less than 10 percent of roadways, including portions of US 19, Park Boulevard, Gulf to Bay Boulevard, Bay Drive, 4th Street and 38th Avenue.
- While men account for 48 percent of the Pinellas County population, they are behind the wheel in 61 percent of KSI collisions.
- Drivers between the age of 20 and 29 are overrepresented in collisions that result in a fatality as compared to other age groups.
- Rear-end collisions are the most frequent collision type but are less likely to result in a serious or fatal injury, while left-turn, head-on and single-vehicle collisions occur less frequently, but are more likely to result in a fatality or serious injury.

## COVID-19 Crash Patterns

The collision analysis presented in this plan is based on data from 2015 to 2019. Since 2019, the percent of crashes resulting in a fatality or severe injury has increased as a percent of all crashes, with 2021 being the deadliest year on record on Pinellas County roads. This sharp increase in severe and fatal injury crashes mirrors state and national trends. Some increases in KSI crash rates can be attributed to emptier roadways during the height of the COVID-19 pandemic, which resulted in people driving at higher speeds. When crashes did occur, they were more likely to result in a severe injury or fatality. During this time period, enforcement efforts also decreased and despite years of gains, seatbelt use declined, resulting in a crash that might have been an injury crash turning into a severe injury or fatal crash. National studies also indicated a rise in aggressive and distracted driving. KSI crashes in Pinellas County decreased in 2022 as compared to 2021 but are still higher than the average of 2015-2019.

## Collision Types

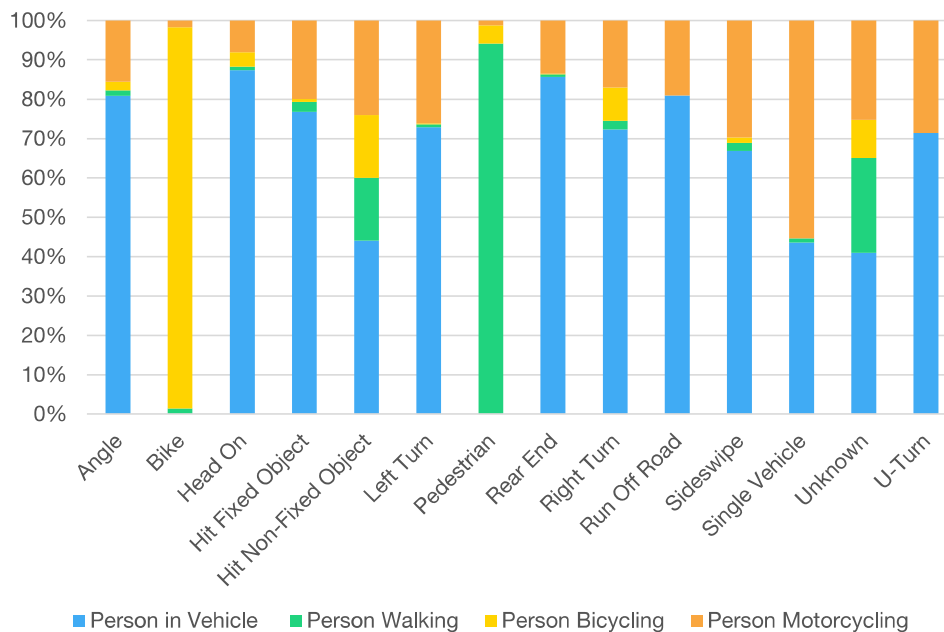
As part of the Safe Streets Pinellas Action Plan crashes were analyzed to understand common collision types

in the county. The collision types reflect bicycle and pedestrian crashes, as well as motor vehicle and motorcycle crashes. Collision types that involved bicycle or pedestrian crashes are noted in each description.

**Angle collisions** occur when two vehicles impact at an angle, for example, the front of one vehicle impacting the side of another. Angle collisions are the second most common collision type in Pinellas County, accounting for 17 percent of all collisions and 19 percent of KSI collisions. It is also the collision type that affects people who ride motorcycles the most: over 130 people who ride a motorcycle were killed or seriously injured between 2015 and 2019 in angle collisions.

**Rear-end collisions** occur when a vehicle crashes into the vehicle in front of it. Contributing causes of rear-end collisions are driver inattention or distraction, tailgating, and reduced traction due to wet weather, worn pavement, or poorly maintained vehicles. Rear-end collisions are the most common collision type in Pinellas County, accounting for 38 percent of collisions; 21 percent of these collisions result in a serious injury or fatality, with 86 percent of those injuries or fatalities involving a vehicle occupant.

**Figure 3. Mode of KSI Victims in Pinellas County 2015-2019 by Collision Type**





**Head-on collisions** occur when the front of one vehicle impacts the front end of another vehicle while the vehicles are traveling in the opposite direction. Head-on collisions account for about 1.5 percent of total collisions and 2.5 percent of KSI collisions. Almost 90 percent of victims of KSI head-on collisions are in vehicles in Pinellas County; eight percent are people riding motorcycles.

**Non-Fixed Object collisions** occur when a vehicle hits an object that is not fixed with the environment, like a vehicle, a person who is walking, or a person riding a bicycle. These account for very few collisions in Pinellas County, as collisions involving a person who is bicycling or walking are typically classified under pedestrian or bicycle collisions.

**Left-turn collisions** occur when the person driving, or a vulnerable roadway user, is making a left-turn at an intersection. In Pinellas County, these account for five percent of the total collisions, but over 11 percent of collisions resulting in a KSI. Over 125 motorcyclists were killed or seriously injured between 2014 and 2019 in left-turn collisions.

**Sideswipe collisions** can occur between vehicles traveling in the same or opposite direction and involve an impact between the sides of the vehicles with no significant involvement of the front or rear of the vehicle. The impact swipes along the surface of the

vehicle parallel to the direction of travel. Sideswipe collisions represent about ten percent of total collisions, and about three percent of KSI collisions. People who motorcycle are involved in about 33 percent of KSI sideswipe collisions.

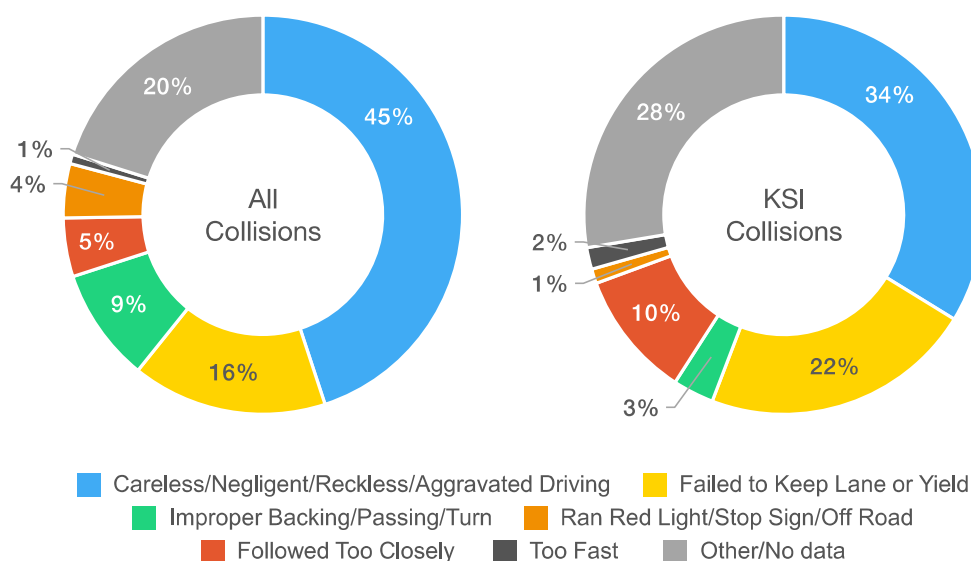
**Fixed Object collisions** occur when a vehicle hits an object that is fixed with the environment, like a light pole or tree. These accounted for 17 percent of total collisions and 11 percent of KSI collisions.

**Right-turn collisions** occur when a person driving, or riding a motorcycle or bicycle, is making a right-turn. In Pinellas County, these account for 1.3 percent of total collisions and one percent of KSI collisions.

**Bike/Ped collisions** account for 25 percent of collisions resulting in a serious injury or fatality. Unfortunately, the root cause of these collision types are not easy to ascertain, as the majority of KSI collisions involving a pedestrian are classified as a pedestrian collision, and the majority of collisions involving a bicyclist are classified as bicycle collision, with limited information about the actions of the person driving.

**Single-vehicle crashes** are collisions that involves only one vehicle. They account for about one percent of total collisions and four percent of KSI collisions. Almost 50 percent of victims of KSI single-vehicle collisions are people who ride motorcycles.

**Figure 4. Cause of Collision in Pinellas County, 2015-2019**



## 03 Pedestrian and Bicycle Crash Location Analysis

The 2020 ATP conducted an analysis to identify intersections and roadway segments with the highest incidence of pedestrian and bicycle crashes. The 2020 ATP focused on pinpointing these high-risk areas and scrutinized road lighting and surface conditions to

determine contributing factors to these crashes. The tabulated results are presented in **Table 1** and **Table 2**. Furthermore, **Figure 7** and **Figure 8** illustrate the pedestrian and bicycle crash-intensive segments and intersections, respectively.

**Table 1. Pinellas County Top Bicycle and Pedestrian Crash Roadway Segments**

ROAD	SEGMENT	PED RANK	PED CRASHES	BIKE RANK	BIKE CRASHES
18 <sup>th</sup> Ave S	22 <sup>nd</sup> St S - 16 <sup>th</sup> St S	1	16	-	-
US 19/34 <sup>th</sup> St N	30 <sup>th</sup> Ave N - 38 <sup>th</sup> Ave N	1	16	-	-
	1 <sup>st</sup> Ave N - 5 <sup>th</sup> Ave N	2	15	-	-
Gulf Blvd	Drawbridge - 133 <sup>rd</sup> Ave N	2	15	-	-
Park Blvd	66 <sup>th</sup> St N - 58 <sup>th</sup> St N	3	14	3	17
	49 <sup>th</sup> St N - 43 <sup>rd</sup> St	5	11	1	20
SR 688/Ulmerton Rd	US 19 - 58 <sup>th</sup> St N	3	14	-	-
	49 <sup>th</sup> St N - Roosevelt Blvd	3	14	-	-
1 <sup>st</sup> Ave N	3 <sup>rd</sup> St N - 2 <sup>nd</sup> St N	4	13	-	-
	22 <sup>nd</sup> St S - 16 <sup>th</sup> St S	5	11	-	-
	28 <sup>th</sup> St N - 22 <sup>nd</sup> St N	5	11	-	-
Gulf-to-Bay Blvd	Keene Rd - S Arcturas Dr	4	13	1	20
14 <sup>th</sup> Ave S	22 <sup>nd</sup> St S - 16 <sup>th</sup> St S	5	11	-	-
22 <sup>nd</sup> Ave S	Dr MLK Jr St S - 4 <sup>th</sup> St S	5	11	-	-
Alt US 19/ Missouri Ave	Rosery Rd - Jasper St	5	11	-	-
Alt US 19/ Seminole Blvd	Ulmerton Rd - 16 <sup>th</sup> Ave SE	5	11	-	-
Gulf Blvd	164 <sup>th</sup> Ave N - Park Blvd	5	11	-	-
	Walsingham Rd - Belleair Cswy	-	-	3	17
US 19	78 <sup>th</sup> Ave N - 80 <sup>th</sup> Ave N	5	11	-	-
	62 <sup>nd</sup> Ave N - 66 <sup>th</sup> Ave N	-	-	5	15
US 19/34 <sup>th</sup>	30 <sup>th</sup> Ave N - 38 <sup>th</sup> Ave N	-	-	2	19
4 <sup>th</sup> St N	38 <sup>th</sup> Ave N - 54 <sup>th</sup> Ave N	-	-	4	16
	9 <sup>th</sup> Ave N - 22 <sup>nd</sup> Ave N	-	-	5	15
5 <sup>th</sup> Ave N	16 <sup>th</sup> St N - I-375 On-ramp	-	-	4	16
66 <sup>th</sup> St N	54 <sup>th</sup> Ave N - 62 <sup>nd</sup> Ave N	-	-	4	16
	30 <sup>th</sup> Ave N - 38 <sup>th</sup> Ave N	-	-	4	16
	62 <sup>nd</sup> Ave N - 70 <sup>th</sup> Ave N	-	-	5	15

**Table 2. Pinellas County Top 10 Bicycle and Pedestrian Crash Intersections**

INTERSECTIONS	PED RANK	PED CRASH	BIKE CRASH	BIKE RANK
SR 686 @ 49th St N	1	13	-	-
SR 686 @ US 19	2	10	-	-
1st Ave N @ US 92	3	9	-	-
1 <sup>st</sup> Ave N @ 4 <sup>th</sup> St N	-	-	2	11
Alderman Rd @ US 92	3	9	-	-
Alt US 19 @ Ulmerton Rd	3	9	-	-
Belcher Ave @ Gulf-to-Bay Blvd	3	9	-	-
SR 686 @ Starkey Rd	3	9	-	-
US 19 @ Alt US 19 S	3	9	-	-
US 19 @ Alt US 19 N	-	-	3	10
US 19 @ 62 <sup>nd</sup> Ave	-	-	1	12
US 19 @ 1 <sup>st</sup> Ave N	-	-	3	10
14th Ave S @ Dr Martin Luther King Jr St S	4	8	-	-
16th St S @ 15th Ave N	4	8	-	-
28th St N @ 54th Ave N	4	8	-	-
52nd St N @ Park Blvd	4	8	-	-
Belcher Rd @ SR 688	4	8	-	-
Belcher Rd @ E Bay Dr	-	-	2	11
Belcher Rd @ Ulmerton Rd	-	-	3	10
Starkey Rd @ Ulmerton Rd	4	8	3	10
66 <sup>th</sup> St N @ 54 <sup>th</sup> Ave N	-	-	2	11
Douglas Ave @ Skinner Blvd	-	-	2	11
Park Blvd @ 49 <sup>th</sup> St N	-	-	2	11
Drew St @ US 19	-	-	3	10
Ulmerton Rd @ 49 <sup>th</sup> St N	-	-	3	10

Top crash segments and intersections developed in the 2020 ATP informed the priority project selection. In developing the Safe Streets Pinellas Action Plan, Forward Pinellas analyzed all crashes that occurred in Pinellas County that were not on a limited access

facility resulting in a fatality or serious injury for the years 2015 through 2019. Vision Zero work in other municipalities has shown that roadway characteristics, such as number of lanes, posted speed limit, and intersection control types, are very important to identify historic collision trends and help municipalities take a proactive approach to identify and improve high-risk locations. Vision Zero work has also highlighted the disproportionate burden traffic crashes have on vulnerable populations, such as seniors and Communities of Concern. Communities of Concern typically have high concentrations of people of color and low-income populations and have historically lacked transportation safety investments. Forward Pinellas incorporated roadway characteristic and demographic datasets into its collision analysis to understand how these patterns play out locally.

A High-Injury Network (HIN) identifies transportation corridors with the highest levels of fatal and serious crashes for people walking, riding bikes, and in vehicles. A HIN was developed as part of Safe Streets Pinellas, as shown in **Figure 9**. In addition to the HIN, new hot-spot locations were identified to allow for improvements to focus on roadway segments and intersections where a high proportion of KSI collisions occur with the most frequency, with a focus on locations where vulnerable roadway users were involved in a KSI collision.

The HIN accounts for about 40 percent of all KSI crashes, which occur on about 2.7 percent of the roadway network in Pinellas County as measured by centerline miles. Most of the roadways on the HIN have a speed limit greater than 40 mph, and the majority are under FDOT jurisdiction (75 percent), as compared to Pinellas County (23 percent) and municipalities (3 percent).

Over one-third of the county’s elementary, middle, and high schools are located along the HIN, which also tends to have speed limits greater than 40 miles per hour. When a vulnerable roadway user is involved in a collision with a person driving greater than 40 miles per hour, the chance of survival is very low. 73 percent of the HIN falls within or runs through a Community of Concern, which compromises only 32 percent of the county’s geographic area.

**Figure 5. Pedestrian Crash Intensive Segments and Intersections (2020)**

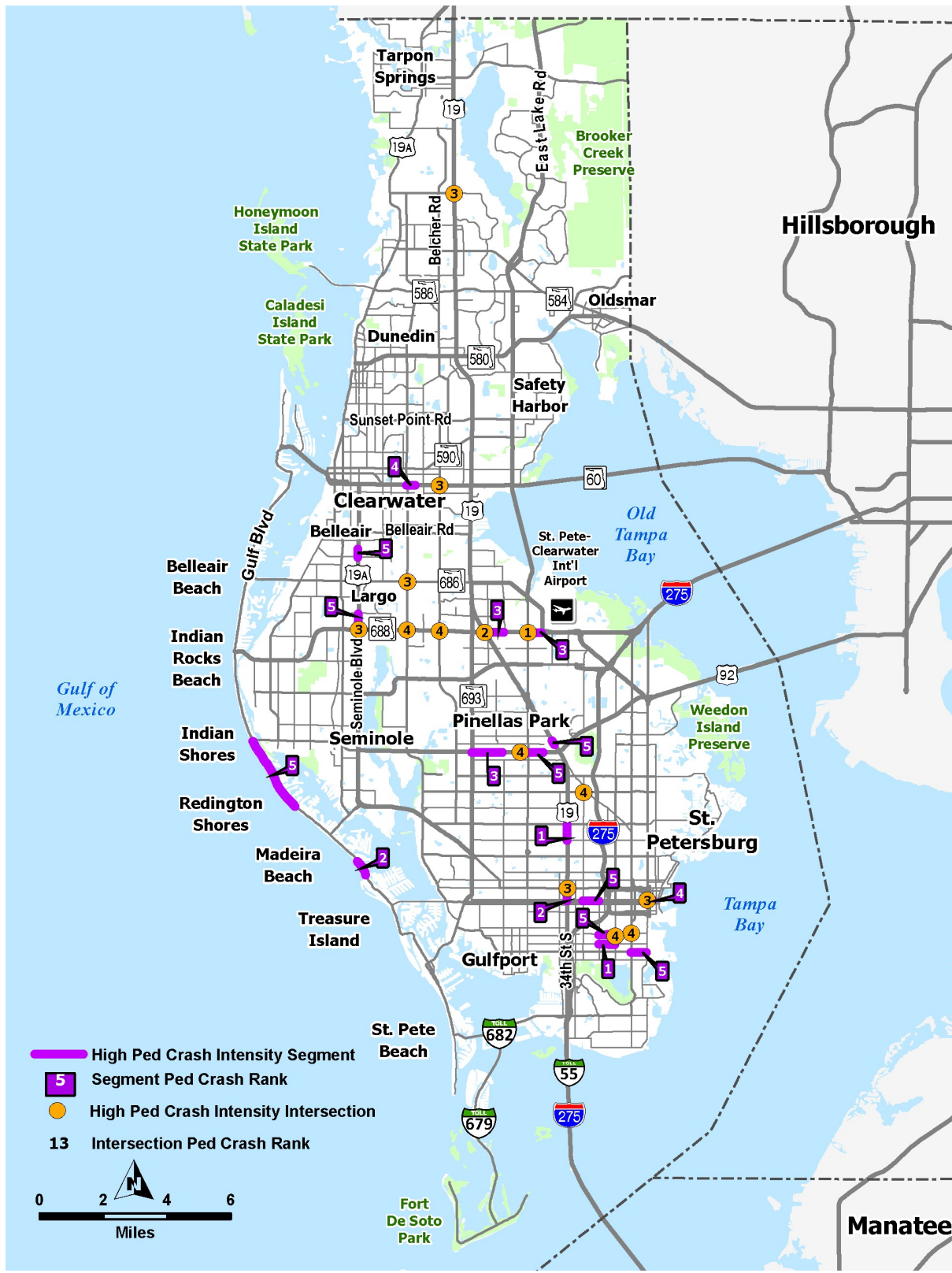
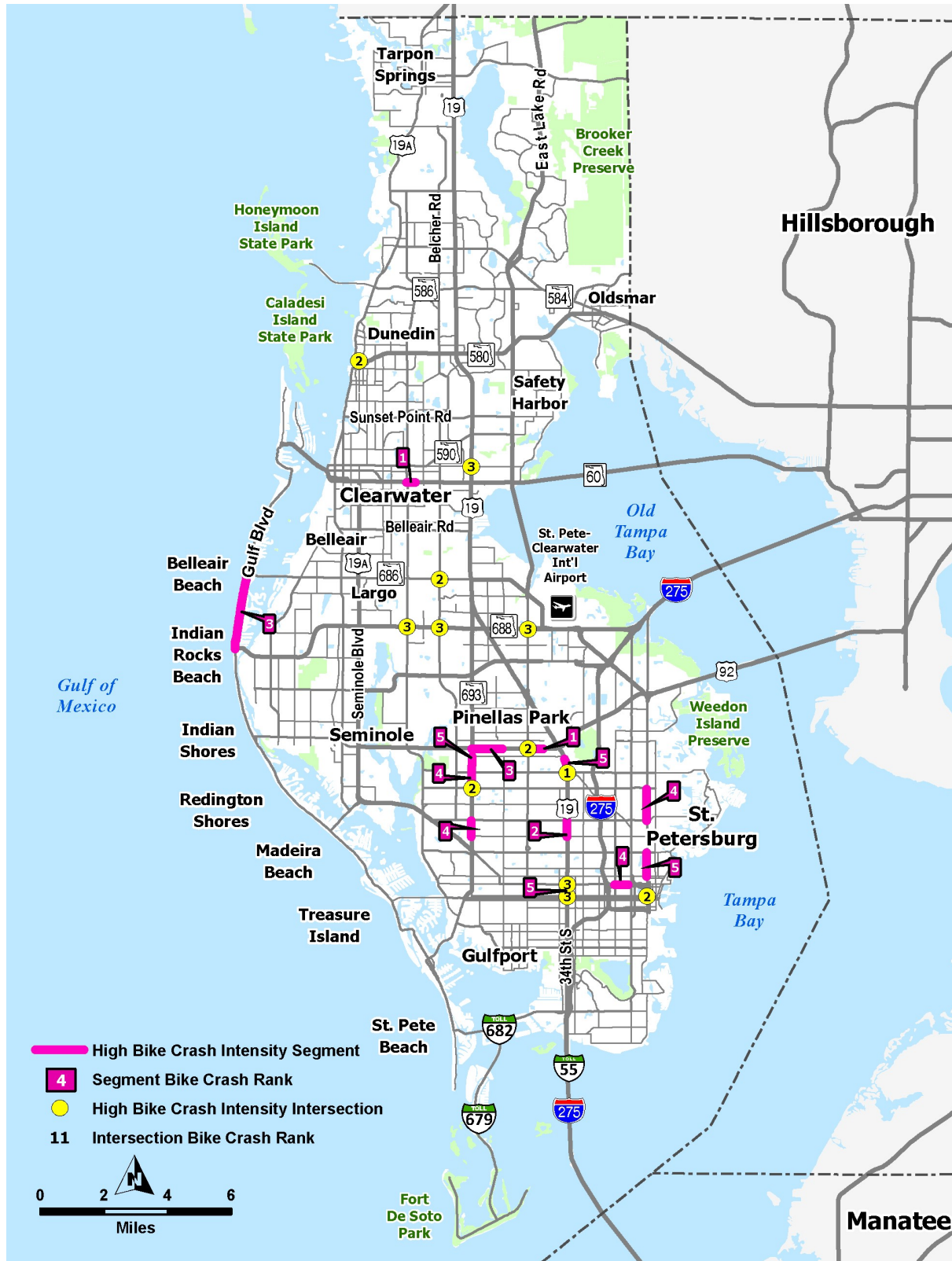
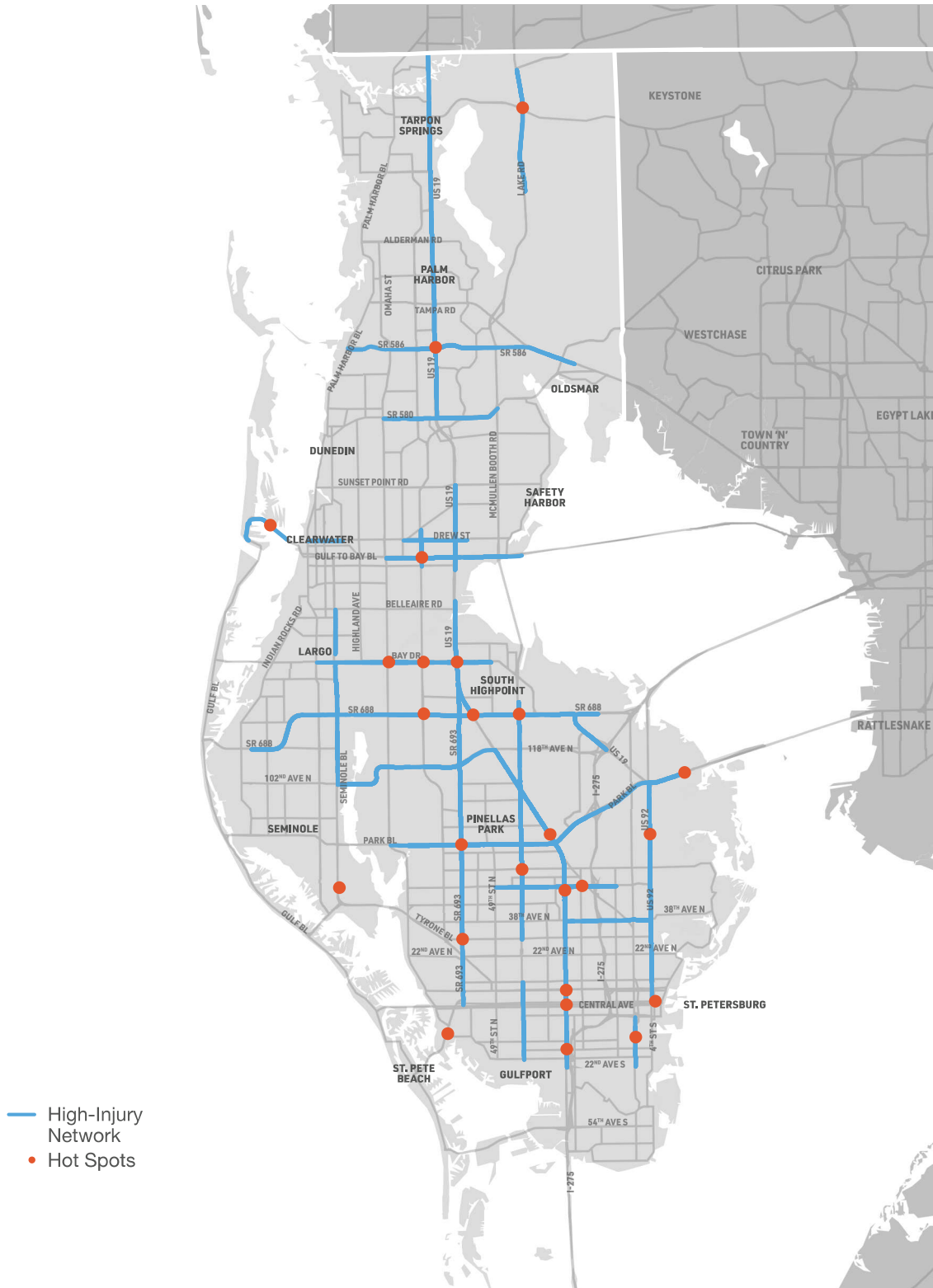


Figure 6. Bike Crash Intensive Segments and Intersections (2020)



**Figure 7. High Injury Network and Hot Spots (2021)**



## 04 Countermeasures

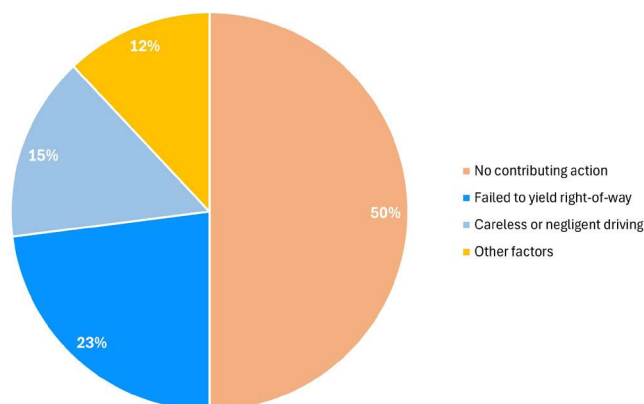
The 2020 ATP and the Safe Streets Pinellas Action Plan both included potential safety countermeasures to address bicycle and pedestrian crash trends and the most common pedestrian and bicycle crash types in Pinellas County. All countermeasures from both the 2020 ATP and the Safe Streets Pinellas Action Plan are included in this chapter.

### Bicyclist Collisions

This crash profile includes all crashes that are classified as bike, or crashes when a person bicycling is harmed during a collision. While crashes involving people bicycling account for only three percent of total crashes, they represent ten percent of all KSI crashes, and five percent of all fatal crashes. The data showed that for the vast majority of bicyclist involved KSI collisions, there was either no contributing action, or the contributing action was unknown. In about 23 percent of KSI collisions, there was a failure to yield

the right-of-way, which could be either a failure on the part of the person bicycling or the person driving. In 15 percent of KSI collisions, the person driving was found to be careless or negligent.

**Figure 8. Bicycle Top Contributing Factors**



### INTERSECTION COUNTERMEASURES

- Automatic Recall Signal Timing
- Bike Box
- Extend Bike Lane to Intersection
- Bike Conflict Zone Markings
- Extend Signal Clearance Time
- Prohibit Left Turn
- Prohibit Right Turn on Red
- Partial Closure/Diverter
- Shorten Signal Cycle Length
- New Traffic Signal
- Slow Green Wave
- Traffic Signal Bike Detection

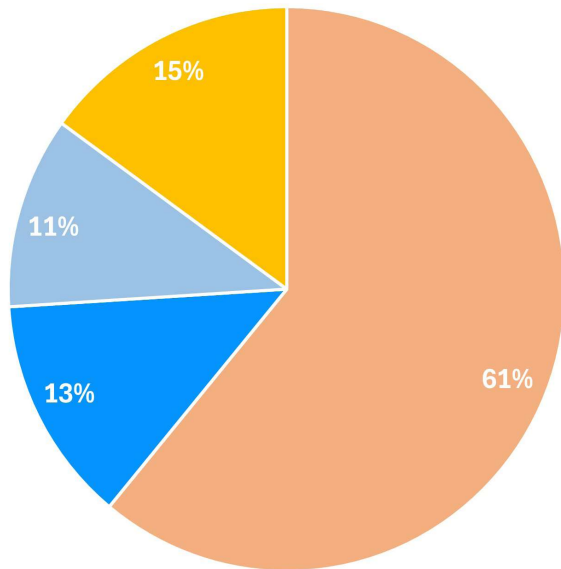
### NON-INTERSECTION / CORRIDOR COUNTERMEASURES

- Bike Conflict Zone Markings
- Narrow Lanes
- Prohibit Left Turn
- Road Diet
- Protected/ Separated Bikeway
- Traffic Calming

## Pedestrian Collisions

This crash profile includes all crashes that are classified as pedestrian or crashes when a person walking is harmed during a collision. While crashes involving people walking account for just two percent of total crashes, they represent 40 percent of all fatal crashes. As speeds increase the likelihood of a serious injury or fatality increases exponentially for pedestrians. The data showed that for the vast majority of pedestrian involved KSI collisions, there was either no contributing action, or the contributing action was unknown. In about 13 percent of KSI collisions, there was a failure to yield the right-of-way, which could be either a failure on the part of the person walking or the person driving. In 11 percent of KSI collisions, the person driving was found to be careless or negligent.

**Figure 9. Pedestrian Top Contributing Factors**



- No contributing action
- Failed to yield right-of-way
- Careless or negligent driving
- Other factors

## INTERSECTION COUNTERMEASURES

- ADA Ramps & Audible Push Button Upgrades
- Advance Stop Bar
- Curb Extensions
- Extend Pedestrian Crossing Time
- Intersection Tightening
- Leading Pedestrian Interval
- Pedestrian Detection
- Pedestrian Hybrid Beacon
- Pedestrian Median Barrier
- Pedestrian Recall Signal Timing
- Prohibit Turn During Pedestrian Phase
- Protected-Only Turn Phase
- Rectangular Rapid Flashing Beacon
- Remove Crossing Prohibition
- Shorten Signal Cycle Length
- Straighten Crosswalks
- Countdown Pedestrian Signal Heads
- High Visibility Crosswalks
- Parking Prohibition/Daylighting
- Pedestrian Lighting
- Pedestrian Refuge Island
- Raised Crosswalk
- Restripe Crosswalk
- Upgrade Curb Ramp

## NON-INTERSECTION / CORRIDOR COUNTERMEASURES

- All-Way Stop Sign
- Co-Locate Bus Stops and Pedestrian Crossings
- Narrow Lanes
- New Traffic Signal
- ADA Ramps
- Signal Spacing
- Traffic Calming
- Repurpose Travel Lanes
- Install Sidewalks



## 05 Conclusions

This pedestrian and bicycle safety analysis and the resulting direction supports the implementation of the Forward Pinellas’ 2024 Active Transportation Plan. Identifying the most common pedestrian and bicycle crash types in the county and the corresponding countermeasures can help to inform general engineering strategies to apply on projects countywide to target improvements in pedestrian and bicycle safety.

The most common crash types could also direct resources related to educational messages. One example would be messaging directed towards

motorists to target bicycle crashes in Pinellas countywide with themes such as “always look to the right” (for drivers turning right from driveways or cross streets) and to pedestrians and bicyclists to be aware of roadside conflict points. These example messaging themes address the causes of common crashes that occur with bicyclists riding on the sidewalk in the opposite direction of traffic.

Forward Pinellas will update the Safe Streets Pinellas Action Plan in fiscal year 2025 - 2026. Updates to the collision profiles and high-injury network could inform future proven safety countermeasures and non-engineering countermeasures.



## 06 References

BIKESAFE: Bicycle Safety Guide and Countermeasure Selection System, [www.pedbikesafe.org/bikesafe/countermeasures.cfm](http://www.pedbikesafe.org/bikesafe/countermeasures.cfm).

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