

Collision Assessment

Appendix

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Collision Assessment

Date: April 14, 2020

To: Sarah Caper, Forward Pinellas

From: Kathrin Tellez, Fehr & Peers

Subject: Safe Streets Pinellas Initial Collision Assessment

Introduction

This memorandum presents initial findings from the collision analysis conducted on reported crashes from January of 2015 to December of 2019 in Pinellas County. The collision analysis identifies how contextual factors such as time of day, driving under the influence, and age and gender influence the number of fatal and severe collision in Pinellas County. Collisions from 2015 to 2019 were analyzed with a focus on collisions involving those killed or severely injured (KSI). Severe injury collisions are those which result in extreme and long-term consequences, including permanent disability, lost productivity and wages, and other life altering impacts. Throughout this memo, KSI is used to signify collisions where someone was killed or severely injured while driving, walking, biking, or traveling on a motorcycle.

This collision analysis is the first step in the data-driven Vision Zero process to address fatal and severe injuries for people who are walking, biking, or driving; identify high-risk roadway characteristics and locations; develop countermeasures to address these crashes; and ultimately, devise a Vision Zero Action Plan for Pinellas County to eliminate traffic-related deaths and severe injuries.

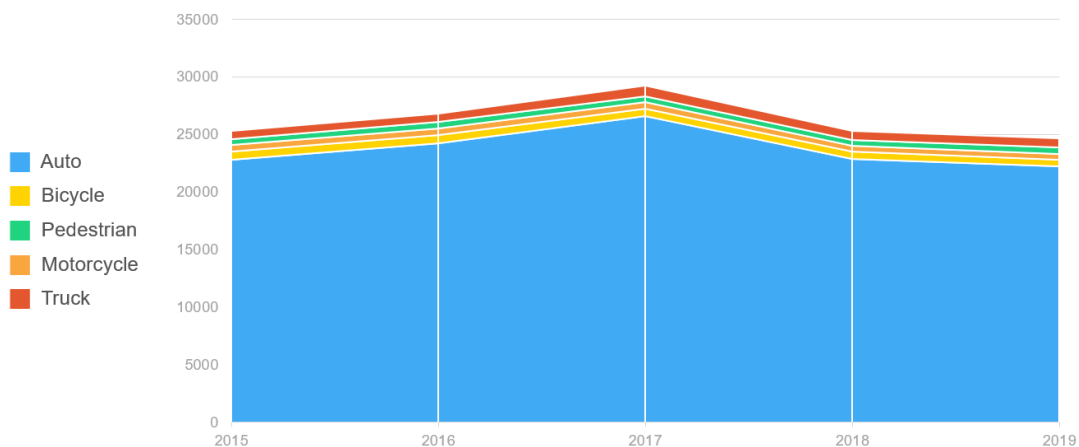
Collision Landscape Summary

The collision assessment analyzed data from the Pinellas Crash Data Management System (CDMS). This assessment focuses on the five years between 2015 and 2019. In that five year period, a total of 131,193 collisions were reported in Pinellas County, with 3 percent of those collisions resulting in fatalities or serious injuries. Data from the last few months of 2019 is still being refined, and some small shifts in collision details may occur in the coming months as the 2019 data

is finalized. Therefore, the numbers presented in this assessment may be refined over time, or conflict with other published data for 2019.

Most collisions involved only automobiles (118,627 collisions), representing 90 percent of all collisions. Trucks and bicyclists were each involved in three percent of crashes (3,850 truck-involved collisions and 3,389 bicyclist-involved collisions), and pedestrians and motorcyclists were each involved in two percent of all crashes (2,641 pedestrian-involved collisions and 2,686 motorcyclist-involved collisions), as displayed on Chart 1.

Chart 1
Collisions in Pinellas County (2015-2019)



Over the last 5-year period, reported collisions peaked in 2017 with the number of total collisions on the decline since 2017; although the total number of collisions is trending down, collisions involving pedestrians are increasing. Key Findings of our collision assessment include:

- Overall collisions overwhelmingly involve automobiles (90 percent), collisions that result in a KSI disproportionately include a vulnerable (bicyclist, pedestrian or motorcyclist) roadway user (40 percent), 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 collisions that result in a KSI. 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.
- The majority of collisions in Pinellas County do not take place at an intersection.
- 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.
- On average, two people are killed or severely injured on Pinellas County roadways each day.

How does Pinellas County Compare?

Florida has the unfortunate distinction of having 8 of the 10 most dangerous metropolitan areas for pedestrians, as documented in the [Dangerous by Design](#) 2019 report, with the Tampa/St. Petersburg-Clearwater area placing 9th on the list. When looking at the total number of collisions that resulted in a fatality or injury, Pinellas County ranks 7th in the state, behind Miami-Dade, Broward, Orange, Hillsborough, Palm Beach and Duval counties based on data representing 2014 through 2018 (Source: <https://www.flhsmv.gov/>). However, when normalized by population, Pinellas County drops to 45th in the state (meaning 44 Florida counties have a collision rate per capita higher than Pinellas County) with the surrounding Counties of Hillsborough, Pasco, and Manatee having lower rates of fatal and injury collisions per capita than Pinellas County.

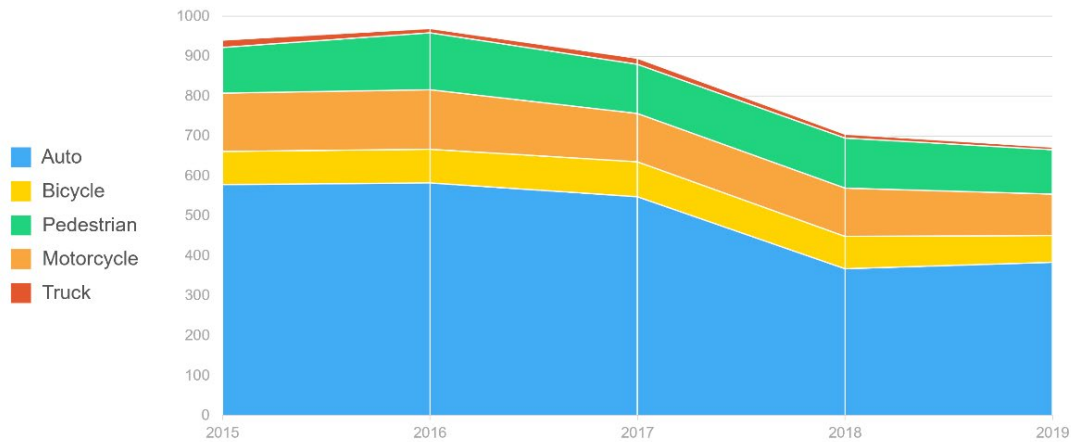
When considering only fatal crashes, Pinellas County has one of the lower rates in the State, slightly less than the surrounding communities. Based on 2018 data, the motor vehicle crash death rate in Pinellas County was 13.1 persons per 100,000 of population, as compared to a state-wide average of 15.5 (<http://www.flhealthcharts.com/>). Vehicle collisions are one of the leading non-health related causes of death within Pinellas County, and severe injury collisions can significantly degrade the quality of life for residents.

Killed or Severely Injured (KSI) Collision by Mode of Travel

Within Pinellas County, a total of 4,181 collisions resulted in a death or serious injury between 2015 and 2019, or 3 percent of overall collisions. Of those collisions, 60 percent involved vehicles as the only mode of travel involved. Motorcycle and pedestrian crashes resulted in the second highest number of collisions at 15 percent each. Bicycle collisions account for 10 percent of KSI crashes. Similar to overall collisions, KSI collisions have decreased over the past five years with KSI collisions decreasing for all modes except pedestrians, as shown in Chart 2.

Since 2015, pedestrians are disproportionately more likely to be involved in a KSI collision. In 2015, pedestrians were involved in approximately 12 percent of KSI collisions, with that percentage increasing to almost 17 percent in 2019. The representation of bicyclists in KSI collisions has remained somewhat constant at about 9 to 10 percent of KSI, similarly motorcyclists remained at about 15 percent representation. Motor vehicle occupants, including automobiles and trucks, declined from approximately 63 percent of KSIs to 58 percent.

Chart 2
Killed or Severely Injured Collisions in Pinellas County (2015-2019)

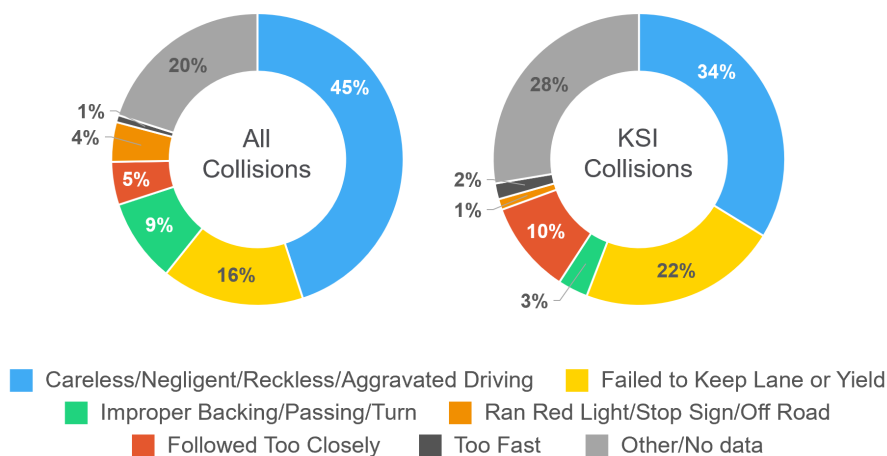


Further refining the data to only collisions that result in a fatality show that pedestrians are disproportionately represented and comprise 40 percent of fatalities. Motorcyclists comprise 22 percent of fatalities, and bicyclists 5 percent of fatalities. The remaining 33 percent of fatalities are in a motor vehicle. Roadway safety improvements targeted at improving pedestrian safety would yield the largest potential to reduce overall fatal collisions. For the purposes of the collision assessment, trucks are defined as vehicles with a weight of more than 10,000 pounds.

High-Level Collision Causes

There are many reasons why collisions occur – such as speeding, aggressive driving, or failure to yield the right-of-way. As shown in Chart 3, careless/negligent driving and reckless/aggravated driving account for 45 percent of total collisions during this period, as compared 34 percent of KSI collisions. Failure to keep in proper lane and yield to the-right-of-way account for the second highest cause of collisions with 16 percent of all crashes in Pinellas County, but 22 percent of KSIs. Speed was a primary factor in 1 percent of all collisions, but 2 percent of KSI collisions.

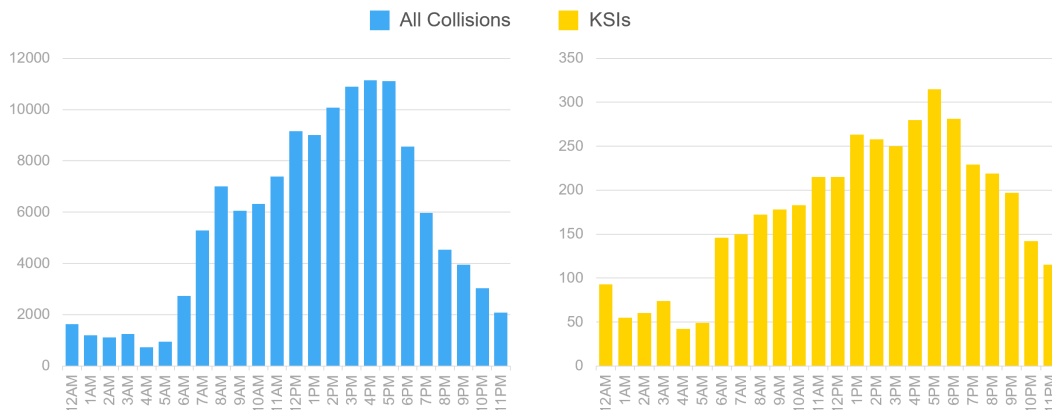
Chart 3
Cause of Collision (2015-2019)



Time of Day

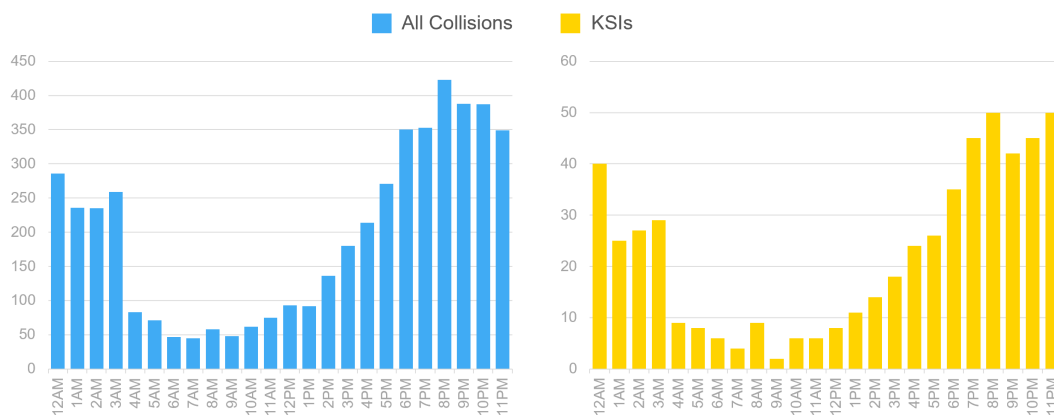
Evaluating the timing of collisions can provide context about the surrounding traffic and lighting conditions, which informs the selection of countermeasures. Almost 60 percent of all collisions occur between noon and 7 PM, with 25 percent of collisions occurring between 3 and 6 PM, coinciding with the typical peak travel times for automobile travel (Chart 4). While most KSI collisions occur between 4 and 7 PM (Chart 4), KSI collisions represent a greater proportion of overall collisions between 9 PM and 6 AM.

Chart 4
Collisions by Time of Day (2015-2019)



Collisions that involve a driver under the influence (which is defined by a blood alcohol level over the legal limit, or under the influence of illegal drugs or other medication) time of day were are shown in Chart 5. When evaluating DUIs collisions by time of day, collisions peak between 6 PM and 3 AM, accounting for 69 percent of all DUI collisions. After 3 AM, collisions decrease and remain relatively even distributed until 6 PM. The peak in DUI collisions between 6 PM and 3 AM is likely due to drivers attending social venues, like bars or festivities in evenings and night. The peak in DUI collisions decreasing after 3AM also corresponds with patronages at bars which are not allowed to serve alcohol past 2 AM.

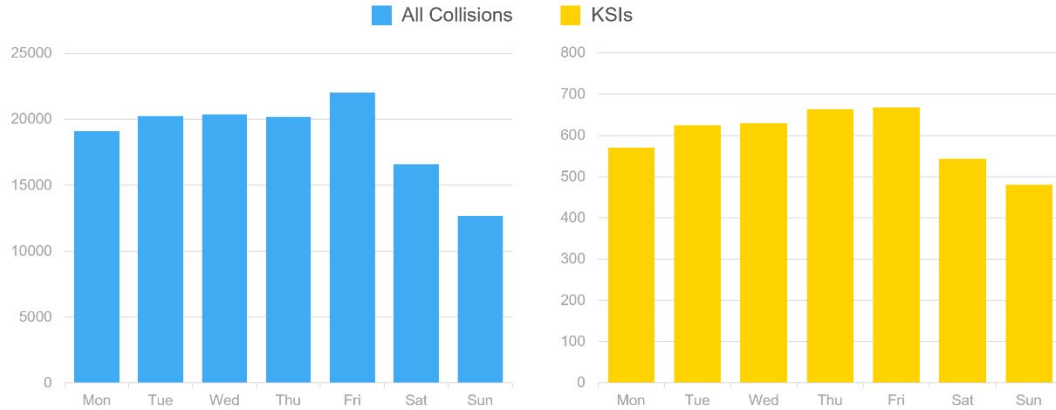
Chart 5
DUI Collisions by Time of Day (2015-2019)



Day of Week

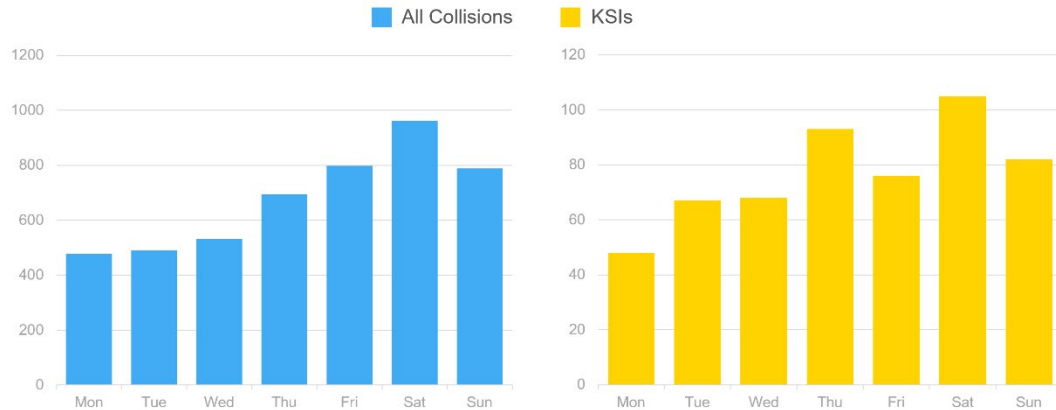
The distribution of all collisions is relatively evenly distributed Monday through Thursday, with a peak on Friday (Chart 6). Sundays have the lowest number of average collisions of any day of the week. Review of traffic count data from the Florida Department of Transportation Traffic Monitoring Site indicates that travel on Saturdays and Sundays is typically less than on weekdays by 10 to 25 percent, depending on location, with roadways closer to beach communities having less variation in weekday versus weekend travel. KSI collisions follow a relatively similar distribution as all collisions with a peak in KSI collisions on Thursday and Fridays (Chart 7). KSI collisions are lowest on Sundays, similar to all collisions, partially attributable to less people driving on Sundays.

Chart 6
Collisions by Day of Week (2015-2019)



When assessing DUI collisions by day of the week, collisions peak on Saturdays with 20 percent of DUI collisions happening that day. DUI collisions begin to rise on Thursdays with a 4 percent increase between Wednesday and Thursday and peak with the highest collisions of the week on Saturdays. Mondays and Tuesdays have the lowest DUI collisions.

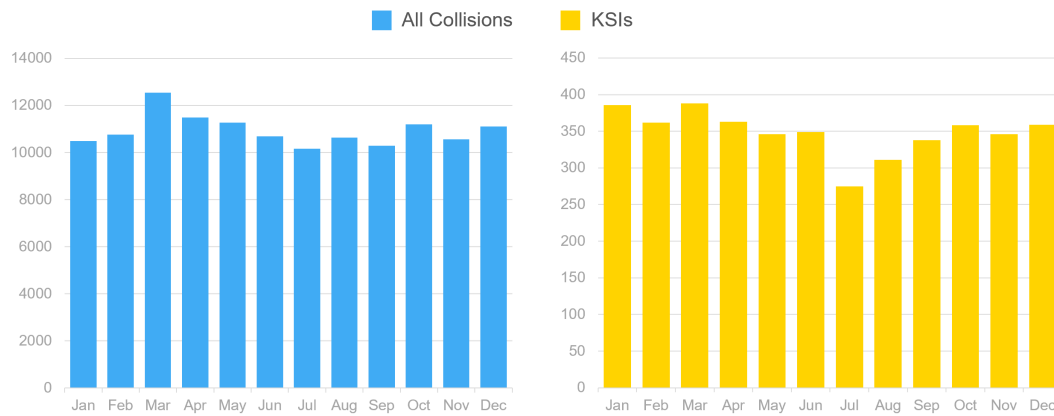
Chart 7
DUI Collisions by Day of Week (2015-2019)



Month of Year

Collisions by month of year are relatively evenly distributed throughout the year as shown on Chart 9, with the most collisions occurring in March. KSI collisions decline as compared to average during the summer months (July, August and September), as shown in Chart 10. KSI collisions peak in winter and early spring, indicative of changes in collisions with seasonal populations and activities, such as Spring Break.

Chart 8
Collisions in Pinellas County by Month of Year (2015-2019)



Hit and Run

Hit and run collisions, or collisions where a party to the collision does not remain at the scene, account for 17 percent of overall reported collisions in Pinellas County, as shown in Chart 11. For all collisions, pedestrians are more likely to be involved in a hit and run than other travel modes. For KSI collisions, 7 percent were hit and run, with pedestrians and bicyclists overrepresented, with 14 percent of KSI hit and run collisions involving a pedestrian and 10 percent involving a bicyclist.

Chart 9
Hit and Run Collisions in Pinellas County (2015-2019)

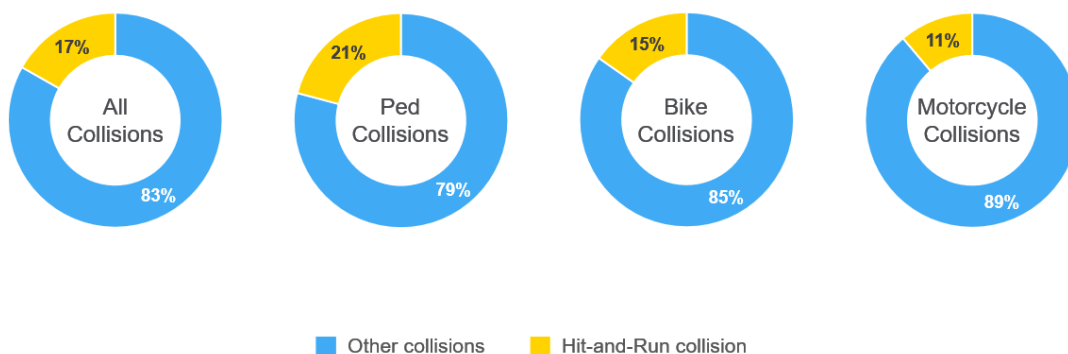
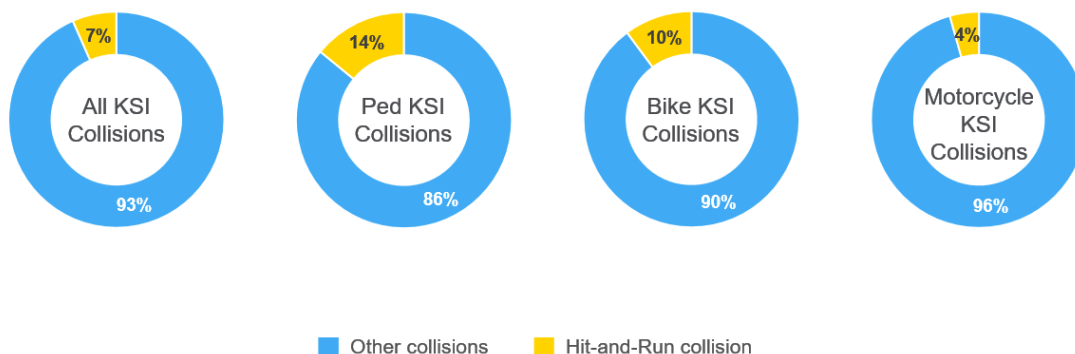


Chart 10
Hit and Run KSI Collisions in Pinellas County (2015-2019)



Under the Influence

Driving under the influence of alcohol and/or drugs increases the likelihood of a collision resulting in serious injury or a fatality. From 2015 to 2019, four percent of collisions involved a driver under the influence, as shown in Chart 11. For collisions that resulted in someone being killed or severely injured, the percentage triples to 13 percent, with pedestrians disproportionately being the victim, as shown in Chart 12. For the purposes of this analysis, intoxication refers to alcohol use over the legal limit, or under the influence of illegal drugs or other medication, and this analysis refers only to the condition of the driver.

Chart 11
Collisions with Drivers Intoxicated (2015-2019)

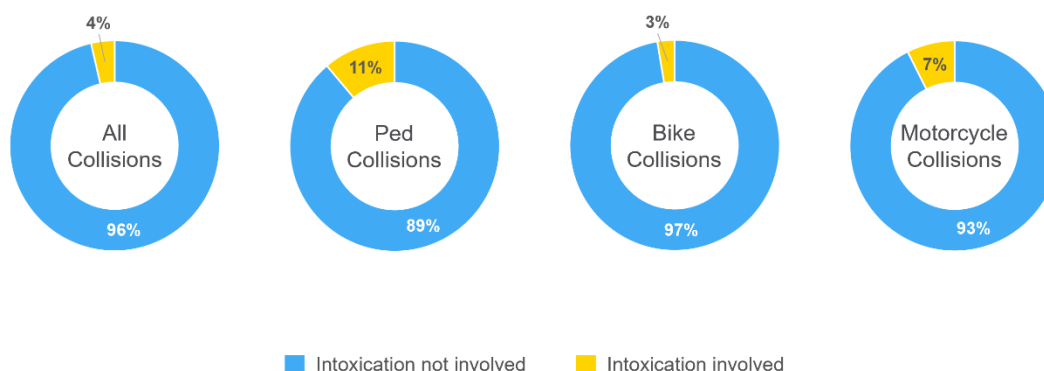
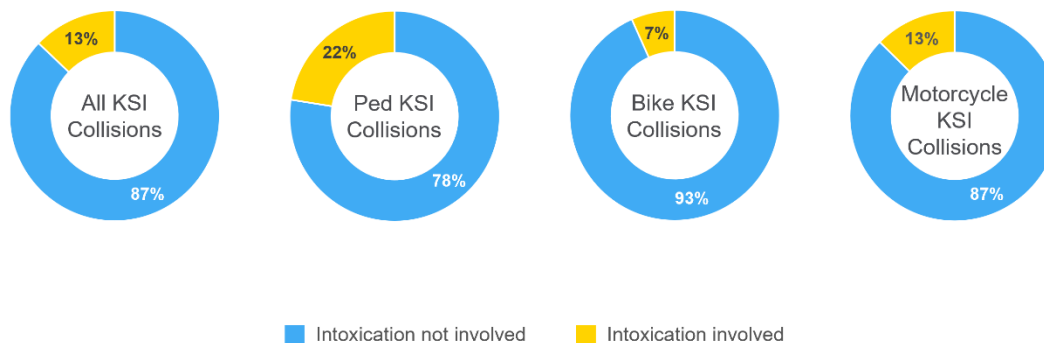


Chart 12
KSI Collisions with Drivers Intoxicated(2015-2019)



Location Type

The majority (65 percent) of collisions in Pinellas County did not occur within the limits of an intersection, as shown on Chart 16. A collision is defined as being at an intersection if the first harmful event occurs within the limits of one. Pedestrian collisions disproportionately (71 percent) do not take place at intersections. For collisions involving someone killed or severely injured, pedestrian collisions (72 percent) disproportionately do not occur at intersections, as shown on Chart 17.

Chart 14
All Collisions by Location (2015-2019)

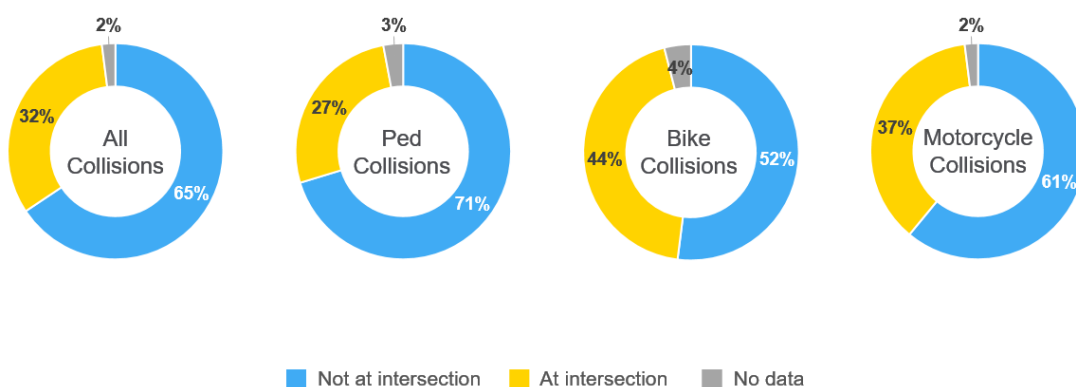
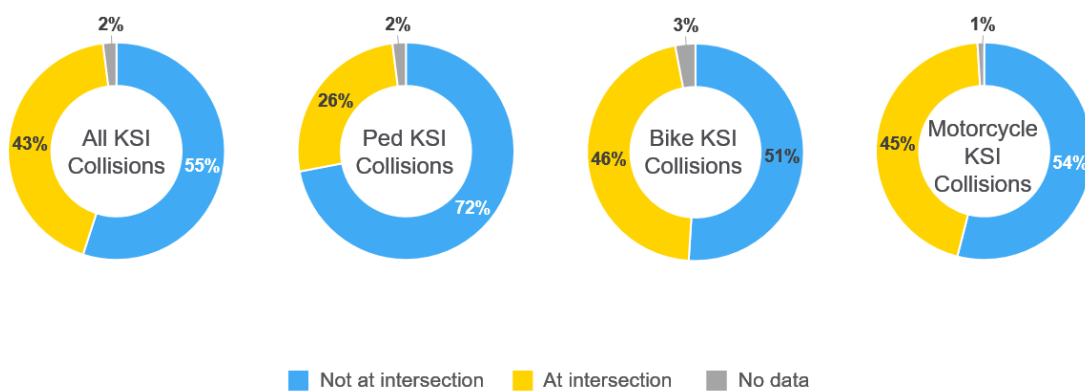


Chart 15
KSI Collisions by Location (2015-2019)



Pedestrian Location

Pedestrians are more likely than any other roadway user group to be killed in a roadway collision in Pinellas County. The reported location of pedestrians at the time of collision is summarized in Table 1 for all collisions and KSI collisions, as this location information could help inform countermeasures. As compared to all pedestrian-involved collisions, pedestrians are more likely to be killed or severely injured while waiting to cross a street, walking along a roadway with traffic, walking on the sidewalk and working in the roadway.

Table 1. Pedestrian Location at Time of Collision (2015-2019)

Location	All Collisions	KSI Collisions
Crossing	49%	37%
Waiting to cross	9%	16%
Walking along roadway with traffic	8%	15%
Walking in sidewalk	6%	8%
Walking along roadway against traffic	4%	4%
In road	1%	1%
K-12 going to or from school	1%	0%
Working in road	1%	3%
Shoulder/median/adjacent to roadway	1%	0%
Other/unknown/no data	19%	16%

Source: CDMS, 2015-2019 and Fehr & Peers.

Collisions by Sex and Age

Men are more likely to be involved in a collision than women, and significantly more likely to be involved in a KSI collision than women, as shown on Chart 17. Drivers between the ages of 20 and 29 are also more likely to be involved in a collision, with drivers over 40 less likely to be involved in a collision, as shown on Chart 18.

Chart 16
Collisions by Sex of Driver (2015-2019)

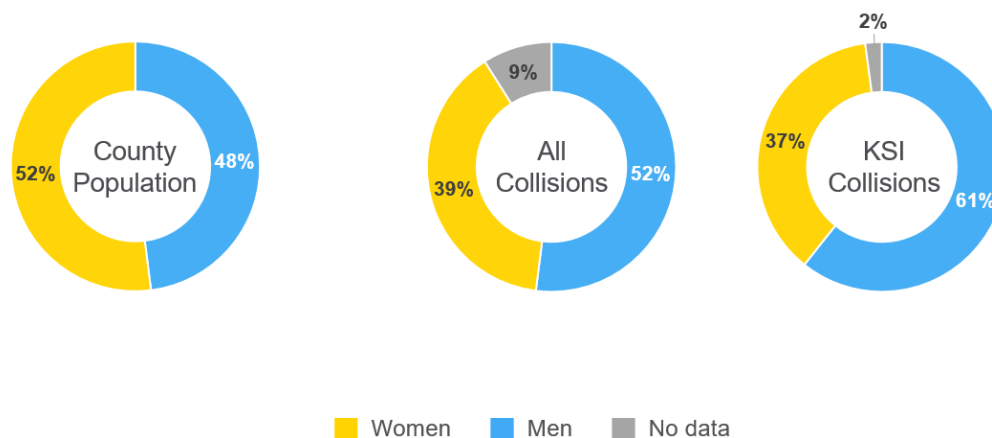
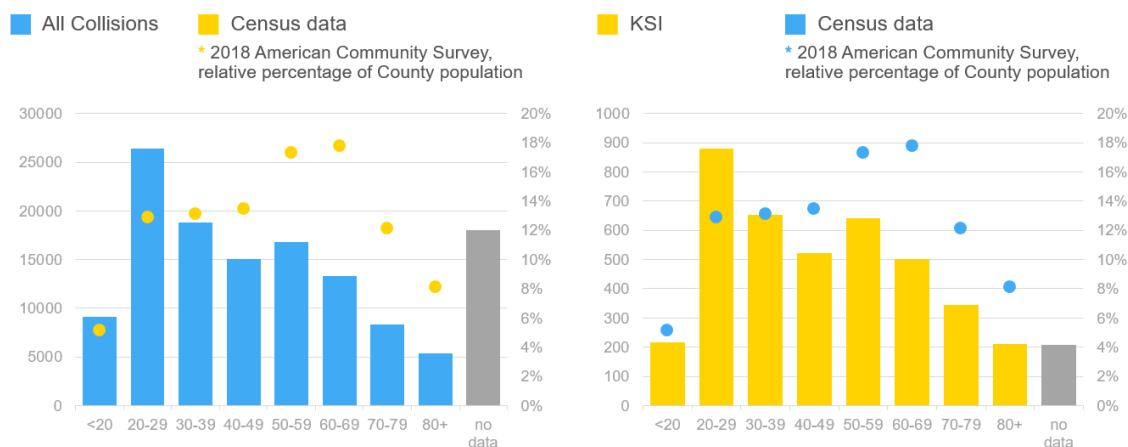


Chart 17
Collisions by Age of Drive (2015-2019)



High Injury Network and Next Steps

An outcome of this project is the development of a high injury network. The high injury network highlights streets with a high concentration of severe injuries and deaths. To develop the network, we recommend a two-step process based on the 2015 to 2019 data, the first step being data-driven and the second manual. In the first step, we will use an automated GIS tool to identify collision clusters and select nearby street segments. Because collisions are typically concentrated, the purely data-driven tool tends to identify short, discontinuous street segments near intersections or hot-spots. These segments provide a helpful indication of where collisions are occurring but stop short of creating a connected network that can guide planning decisions.

The next would be to manually refine the raw segments into a more continuous, final high-injury network consisting of *corridors* and *hot spots*. For corridors, we propose identifying a linear patterns in collisions, with a threshold of a continuous string of intersections that had more than 1 KSI collision per intersection. A threshold of distance between collisions, such as a 1/4-mile or 1/2-mile should be identified.

Hot spots are intersections where a higher density of KSI collisions occurred. Based on the preliminary data analysis, a threshold of three or more KSI collisions per intersection is a likely starting point to identify a hot spot, although different weights could be applied to different collision types (severe injury vs. fatal) or modes.

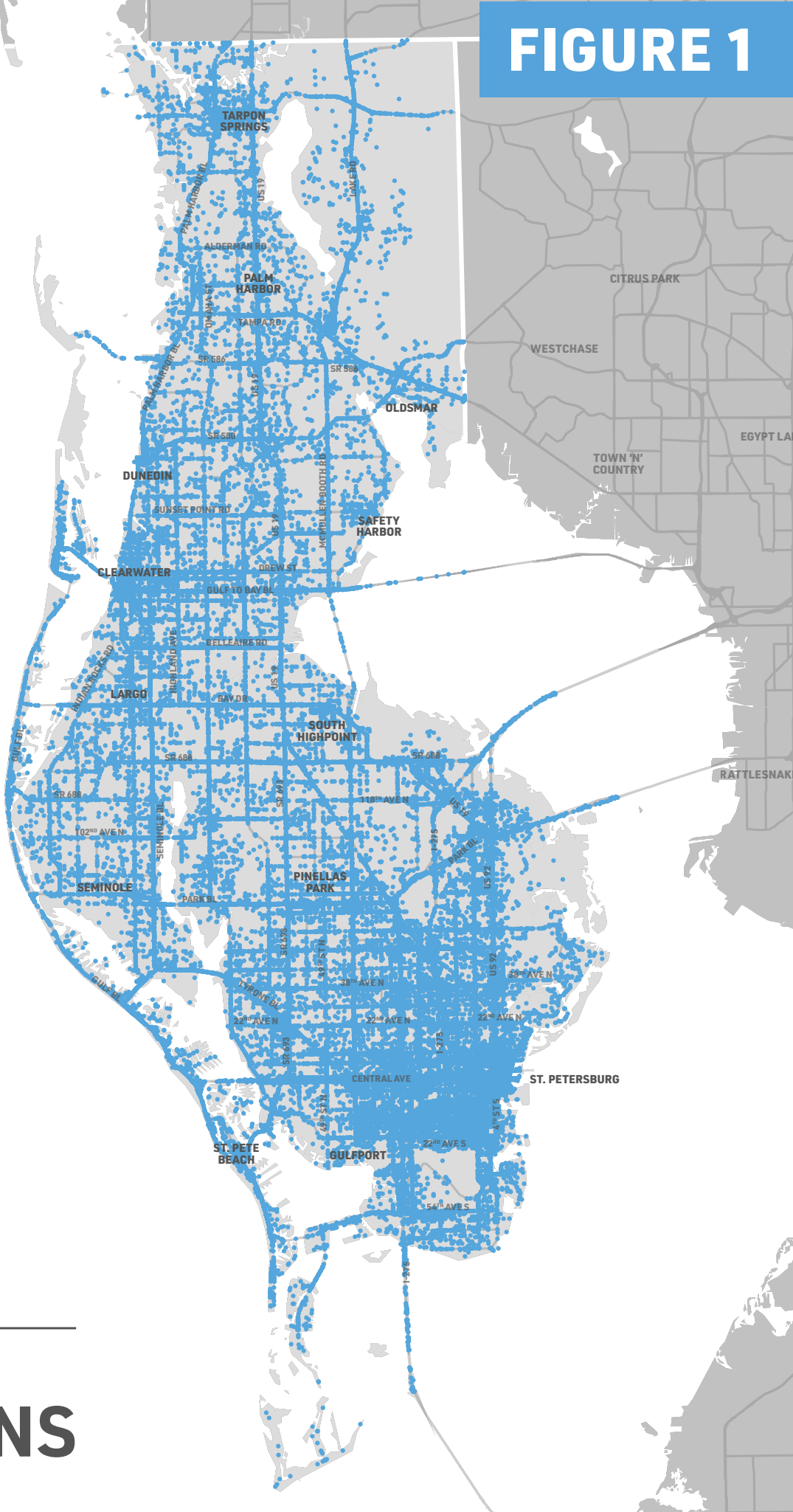
The collision data above will also be assessed by demographics to assess if any one group is being disproportionately affected by collisions in Pinellas County, with preliminary analysis presented on Figure 6. Figure 7 shows the top 25 KSI locations within the County.

Once we develop both the high injury network and have an assessment of demographics in the County, we can begin to prepare safety countermeasures in conversation with Forward Pinellas.

Attachments

Figure 1	Total Collisions from 2015 – 2019
Figure 2	KSI Collisions from 2015 – 2019
Figure 3	Pedestrian KSI from 2015 – 2019
Figure 4	Bicyclist KSI from 2015 – 2019
Figure 5	Motorcyclist KSI from 2015 – 2019
Figure 6	KSI Locations and Demographic Data 2015 – 2019
Figure 7	Top 25 KSI Collision Locations 2015 – 2019

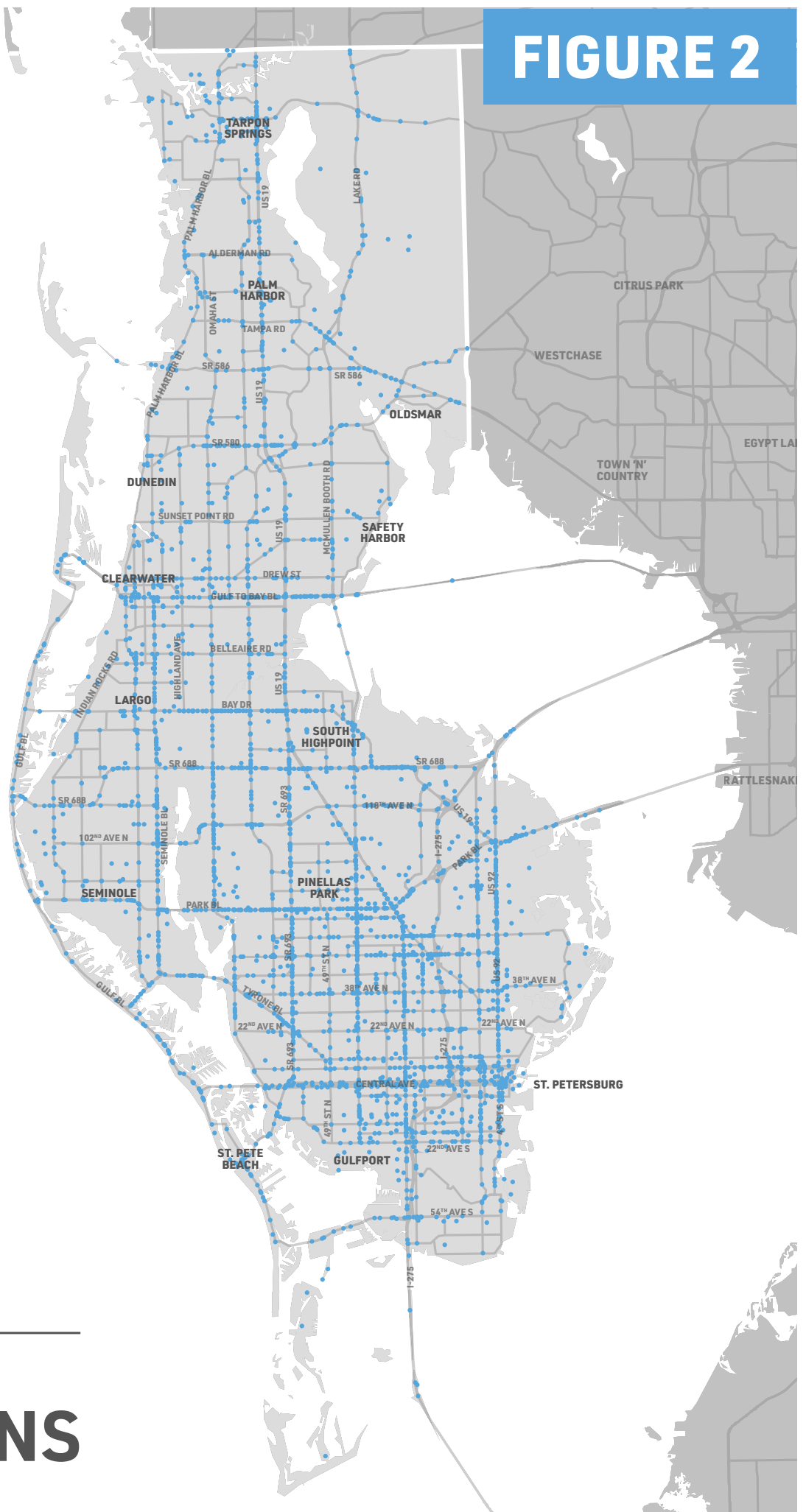
FIGURE 1



ALL COLLISIONS

2015 – 2019

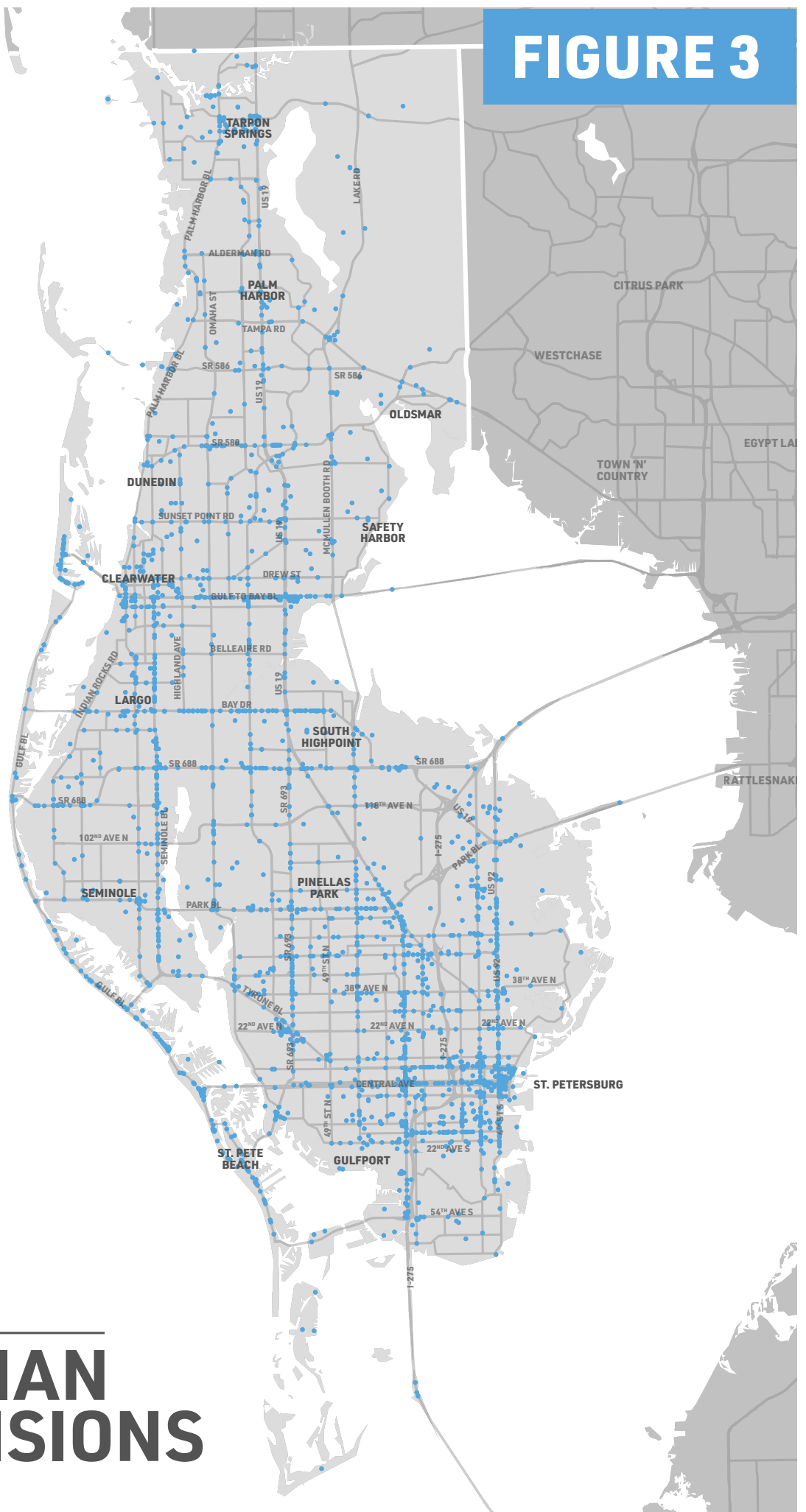
FIGURE 2



KSI COLLISIONS

2015 - 2019

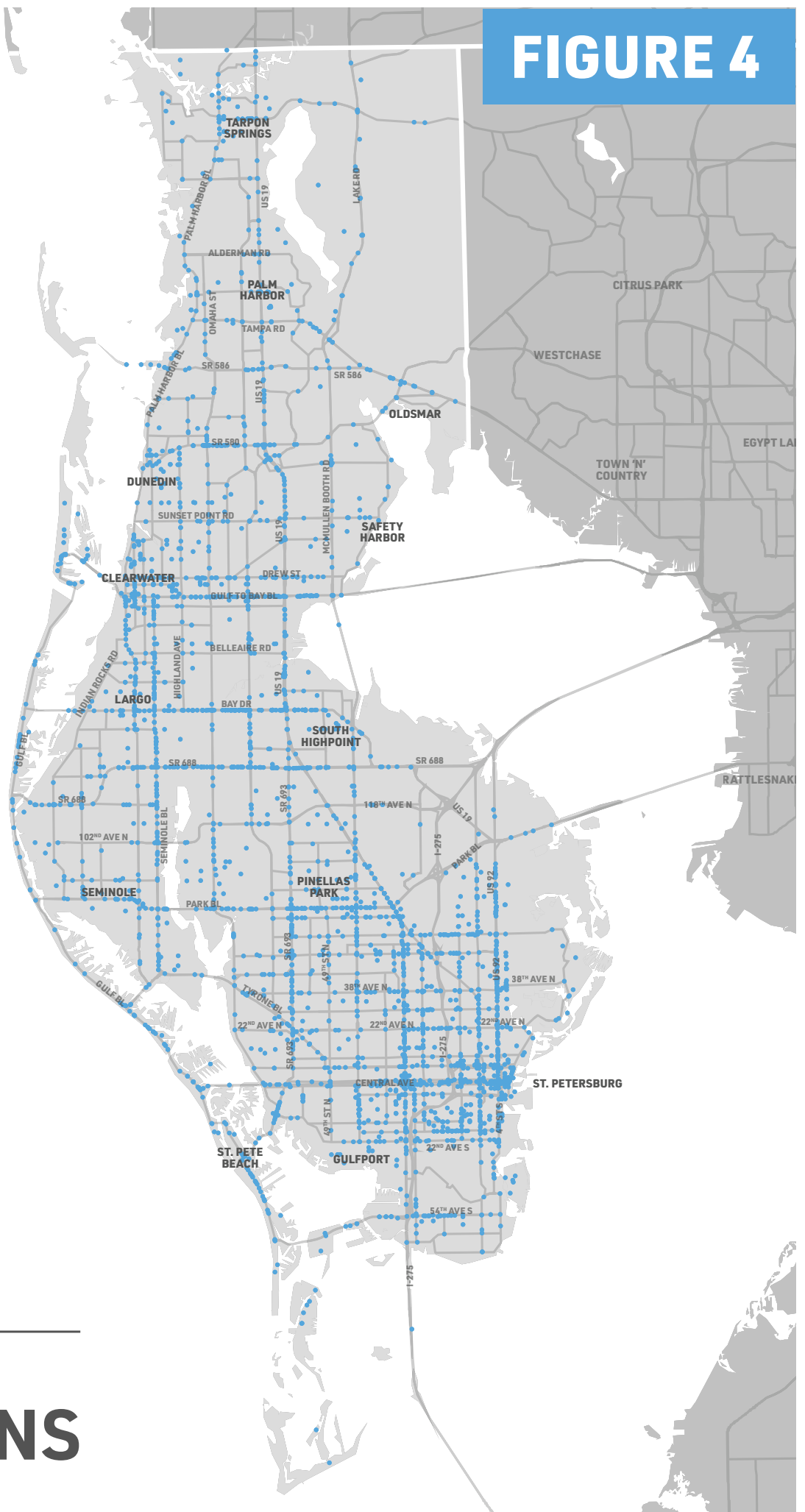
FIGURE 3



PEDESTRIAN KSI COLLISIONS

2015 - 2019

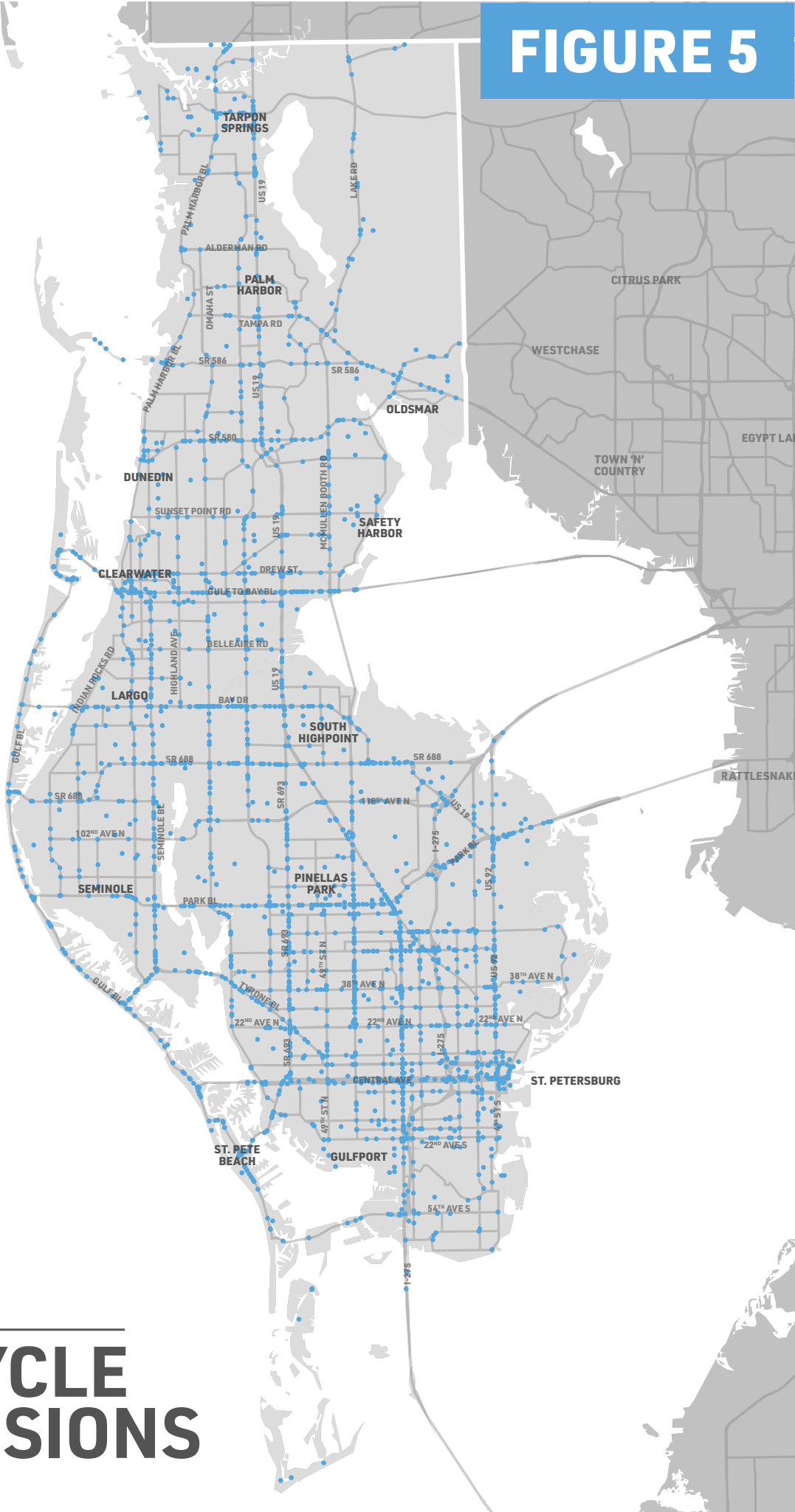
FIGURE 4



BIKE KSI COLLISIONS

2015 - 2019

FIGURE 5

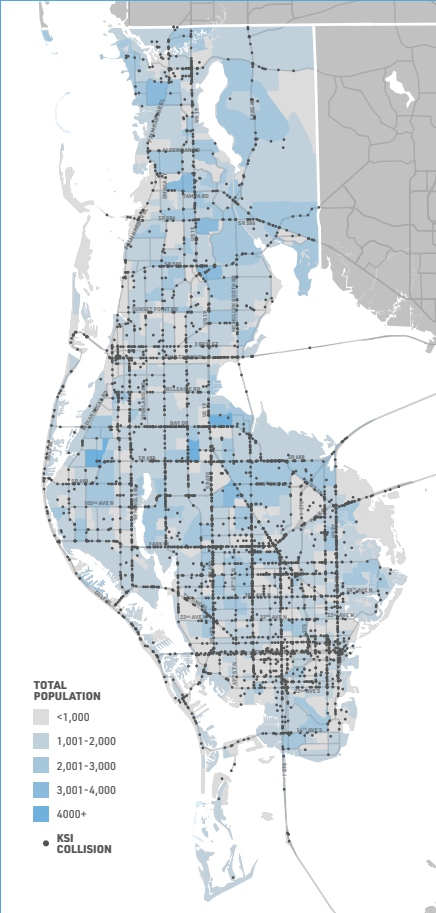


MOTORCYCLE KSI COLLISIONS

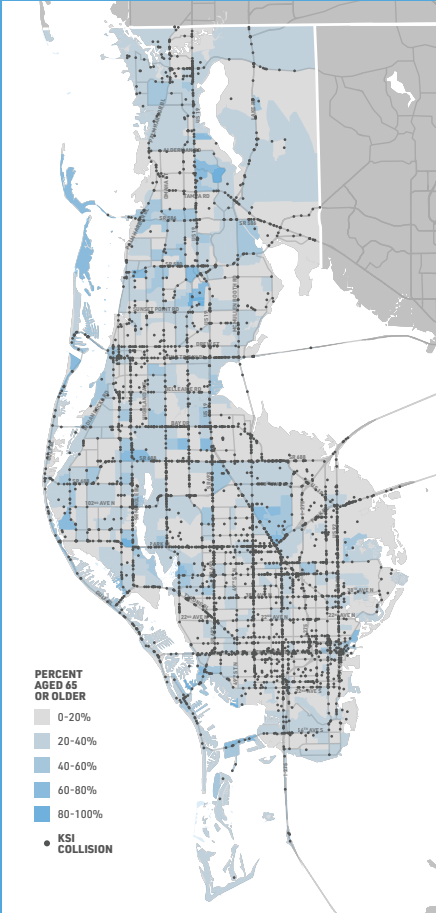
2015 – 2019

FIGURE 6

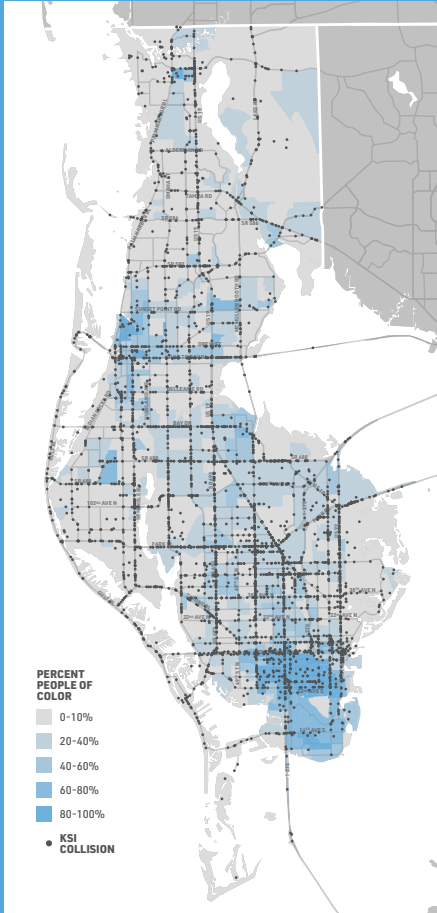
TOTAL POPULATION



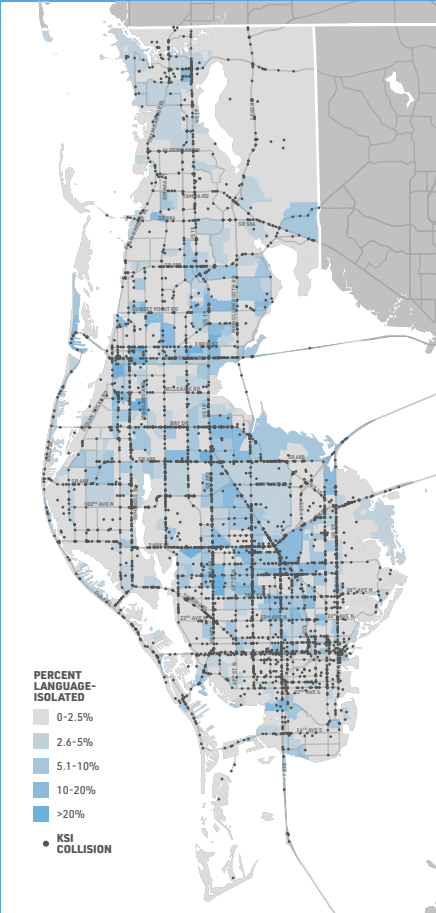
SENIORS



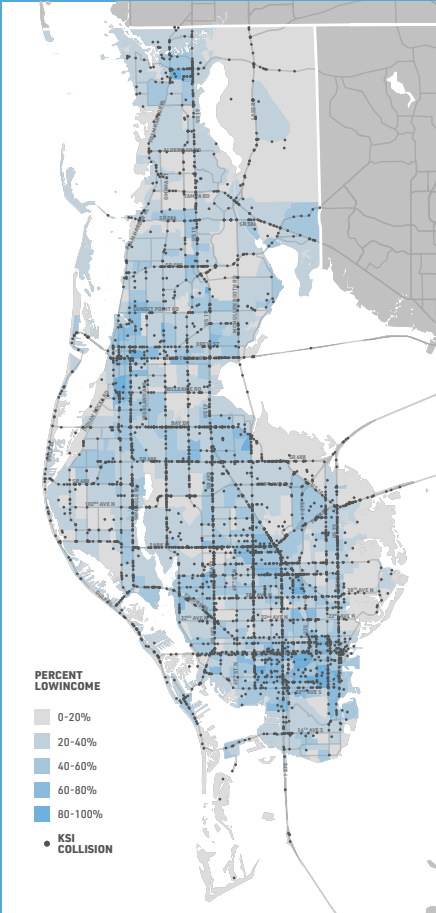
PEOPLE OF COLOR



LANGUAGE ISOLATION



LOW-INCOME COMMUNITIES



WALKING AND BIKING TO WORK

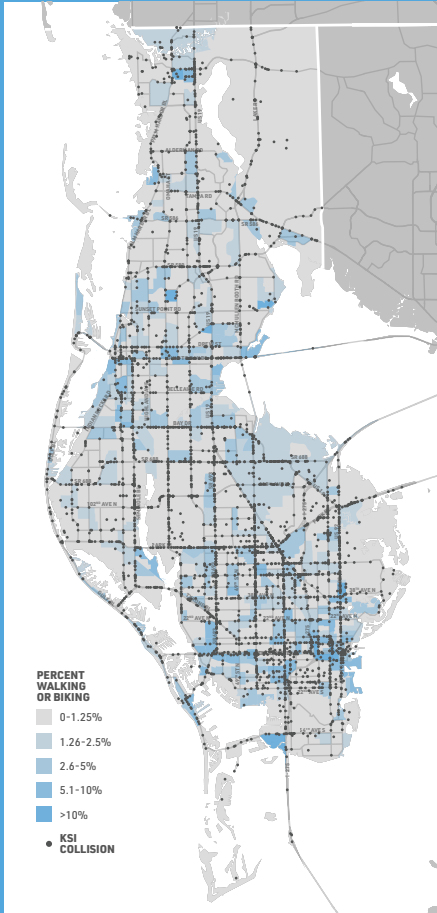
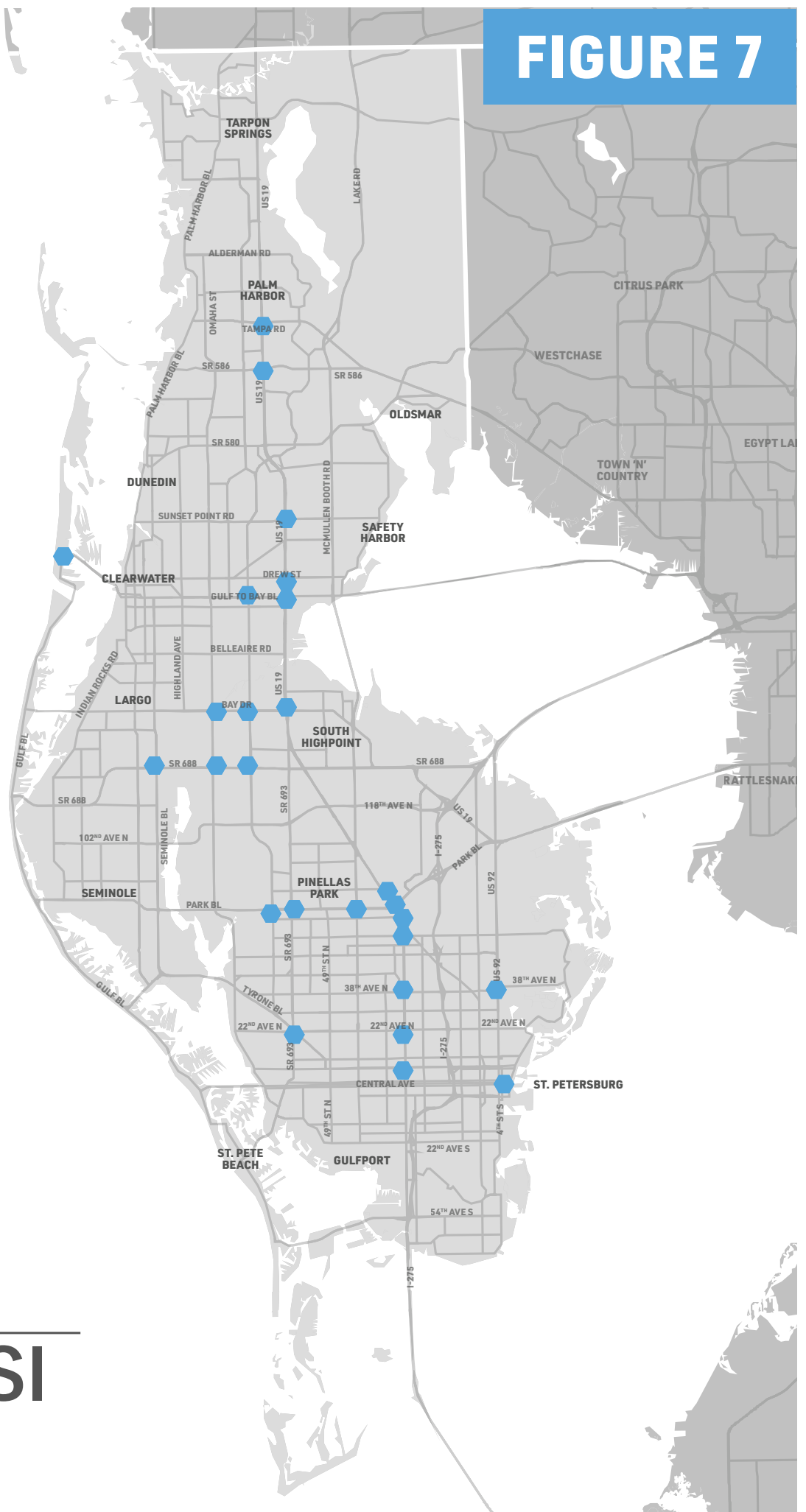


FIGURE 7



TOP 25 KSI

COLLISION LOCATIONS

2015 - 2019

