Vision Zero

Corridor Studies

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Vision Zero Corridor Studies

CR 579/Mango Road

Table of **Contents**

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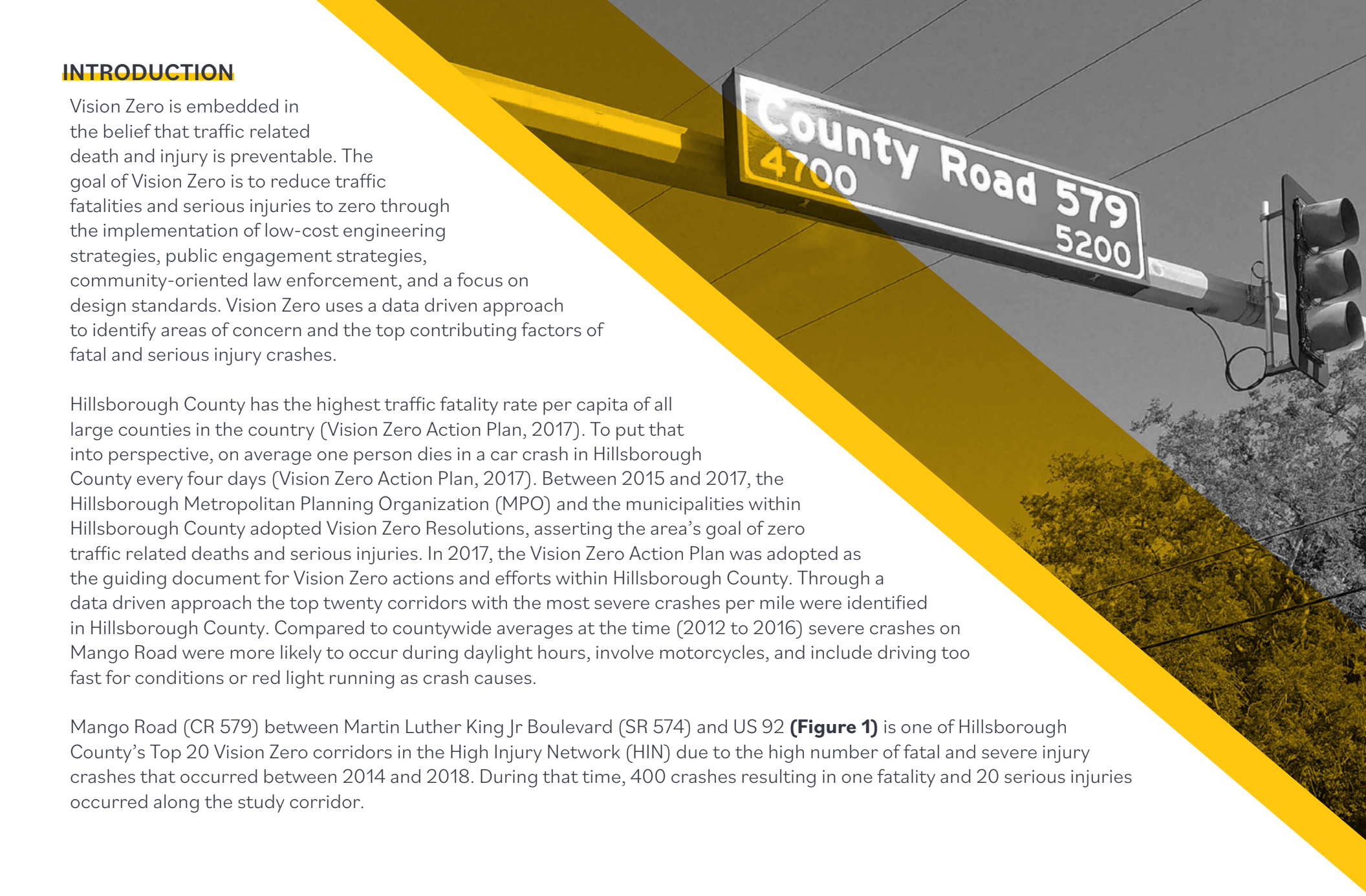
INTRODUCTION

Vision Zero is embedded in the belief that traffic related death and injury is preventable. The goal of Vision Zero is to reduce traffic fatalities and serious injuries to zero through the implementation of low-cost engineering strategies, public engagement strategies, community-oriented law enforcement, and a focus on design standards. Vision Zero uses a data driven approach to identify areas of concern and the top contributing factors of fatal and serious injury crashes.



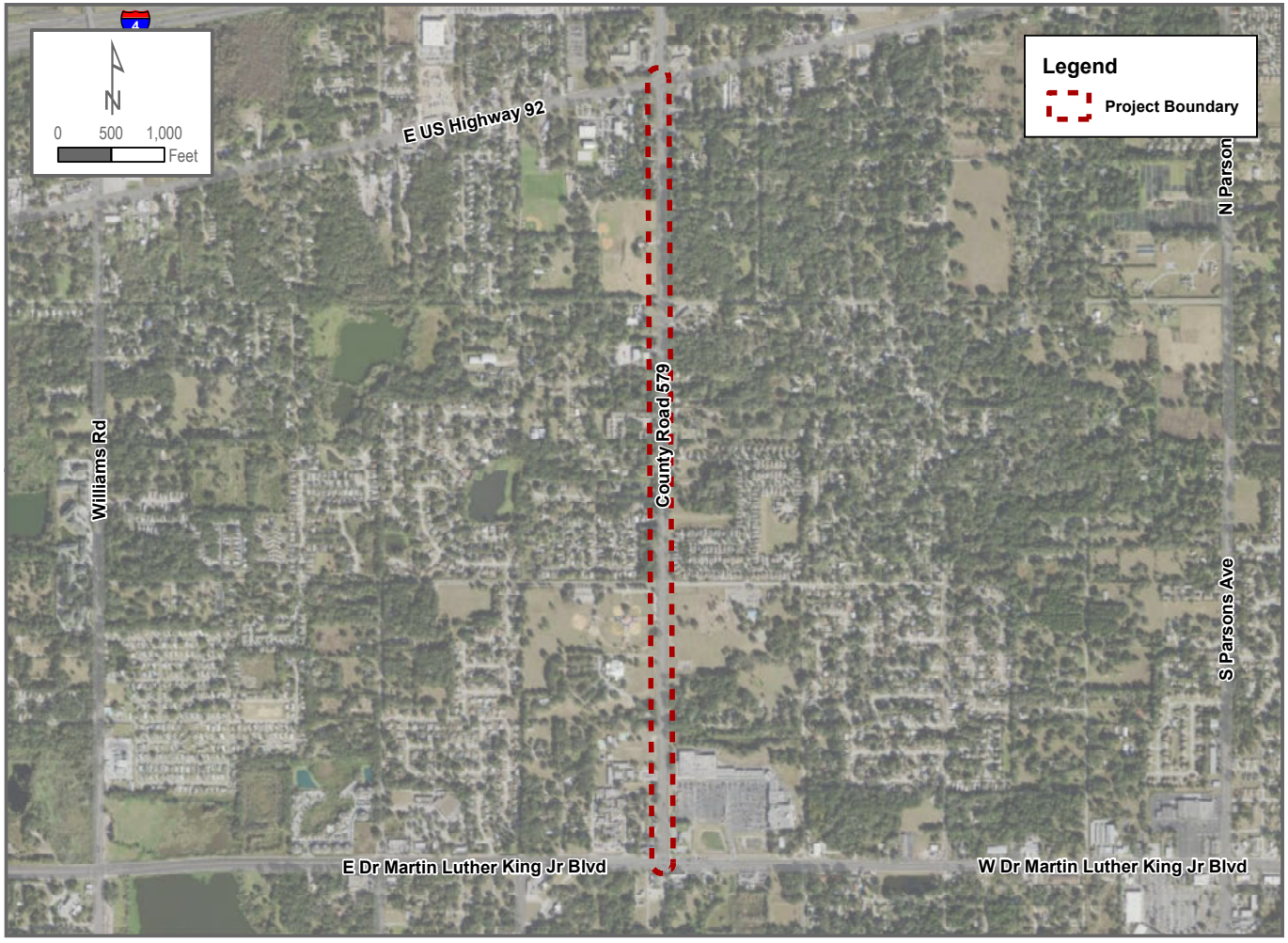
Hillsborough County has the highest traffic fatality rate per capita of all large counties in the country (Vision Zero Action Plan, 2017). To put that into perspective, on average one person dies in a car crash in Hillsborough County every four days (Vision Zero Action Plan, 2017). Between 2015 and 2017, the Hillsborough Metropolitan Planning Organization (MPO) and the municipalities within Hillsborough County adopted Vision Zero Resolutions, asserting the area's goal of zero traffic related deaths and serious injuries. In 2017, the Vision Zero Action Plan was adopted as the guiding document for Vision Zero actions and efforts within Hillsborough County. Through a data driven approach the top twenty corridors with the most severe crashes per mile were identified in Hillsborough County. Compared to countywide averages at the time (2012 to 2016) severe crashes on Mango Road were more likely to occur during daylight hours, involve motorcycles, and include driving too fast for conditions or red light running as crash causes.

Mango Road (CR 579) between Martin Luther King Jr Boulevard (SR 574) and US 92 **(Figure 1)** is one of Hillsborough County's Top 20 Vision Zero corridors in the High Injury Network (HIN) due to the high number of fatal and severe injury crashes that occurred between 2014 and 2018. During that time, 400 crashes resulting in one fatality and 20 serious injuries occurred along the study corridor.

PROJECT PURPOSE

The purpose of this Vision Zero corridor project is to enhance safety and mobility on Mango Road through the implementation of short-term improvements that uphold Vision Zero beliefs and objectives. The safety and mobility improvements proposed in this report serve to enhance mobility and safety for everyone that travels, lives, works, and recreates along Mango Road. The recommended improvements for Mango Road were developed through a process inclusive of a field review of existing corridor conditions, review of planned projects, an analysis of crash data, and community engagement in the form of virtual and physical outreach efforts.

Figure 1 - Project Location Map



EXISTING CONDITIONS

Mango Road is in east Hillsborough County and serves as a regional connection to and from Interstate 4 and US 92. The character of the corridor consists of small concentrations of residential development and supporting uses surrounded by rural and recreation areas.

Roadway Conditions

Mango Road from SR 574 to US 92 is a 1.4-mile-long corridor. The roadway is comprised of two lanes with a posted speed of 45 miles per hour and is classified as an arterial roadway. The roadway includes a 6-foot paved shoulder along both sides. At the ends of the corridor, both US 92 and Martin Luther King Jr Boulevard are classified as principal arterials. There are numerous local and collector roads that connect to the Mango Road corridor. The average daily traffic for Mango Road is approximately 10,500 and has increased slightly in the past five years (from 9,700 vehicles in 2015 to 10,500 in 2019). The daily traffic volumes of the corridors SR 574 and US 92 are 14,900 and 16,100 vehicles, respectively.

Roadway Cross Section

This section of Mango Road is comprised of two 12-foot travel lanes with a 6-foot paved shoulder on each side. There is a variable grass buffer along both sides of the sidewalk which also includes ditches for drainage. **Figure 3** depicts an area of the corridor without a buffer. Lighting is not currently provided along the entire corridor.

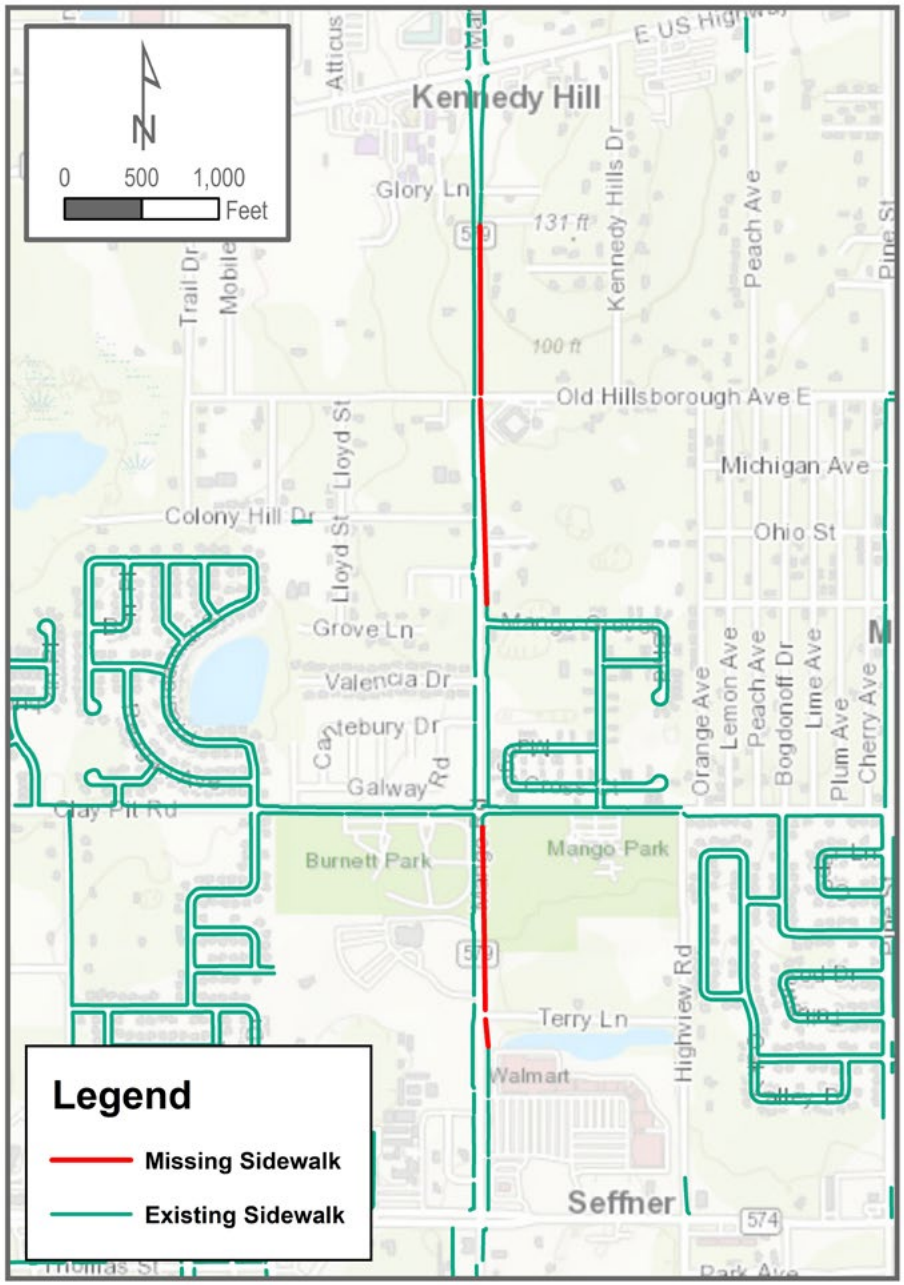
Multimodal Conditions

Along Mango Road there is continuous 5-foot sidewalk on the west side of the roadway **(Figure 2)**. Fragmented sidewalk ranging from five to six wide is present on the east side **(Figure 3)**. Gaps in the sidewalk on the east side are located between north of the Walmart driveway to Clay Pit Road (approximately 1,400 feet) and between north of Mango Groves Boulevard to Sunlight Lane (approximately 2,550 feet) **(Figure 4)**. Paved shoulder is present along the roadway but dedicated bicycle facilities are not provided along the corridor.

Figure 2 - Sidewalk (West Side)

Figure 3 - Sidewalk (East Side)

Figure 4 - Sidewalk Gaps



The Hillsborough Area Regional Transit Authority (HART) operates local service in proximity to Mango Road. Local Route 38 operates along SR 574 and serves a stop at the shopping plaza located at the northeast corner of the intersection of SR 574 and Mango Road **(Figure 5)**. There are bus stops located at the southwest and southeast corner of the Mango Road and Clay Pit Road intersection that were served by Megabus **(Figure 6)**. Megabus provides city-to-city bus service across North America. The bus stop includes a shelter and bench on the west side. On the east side there is a sign for the Megabus stop.

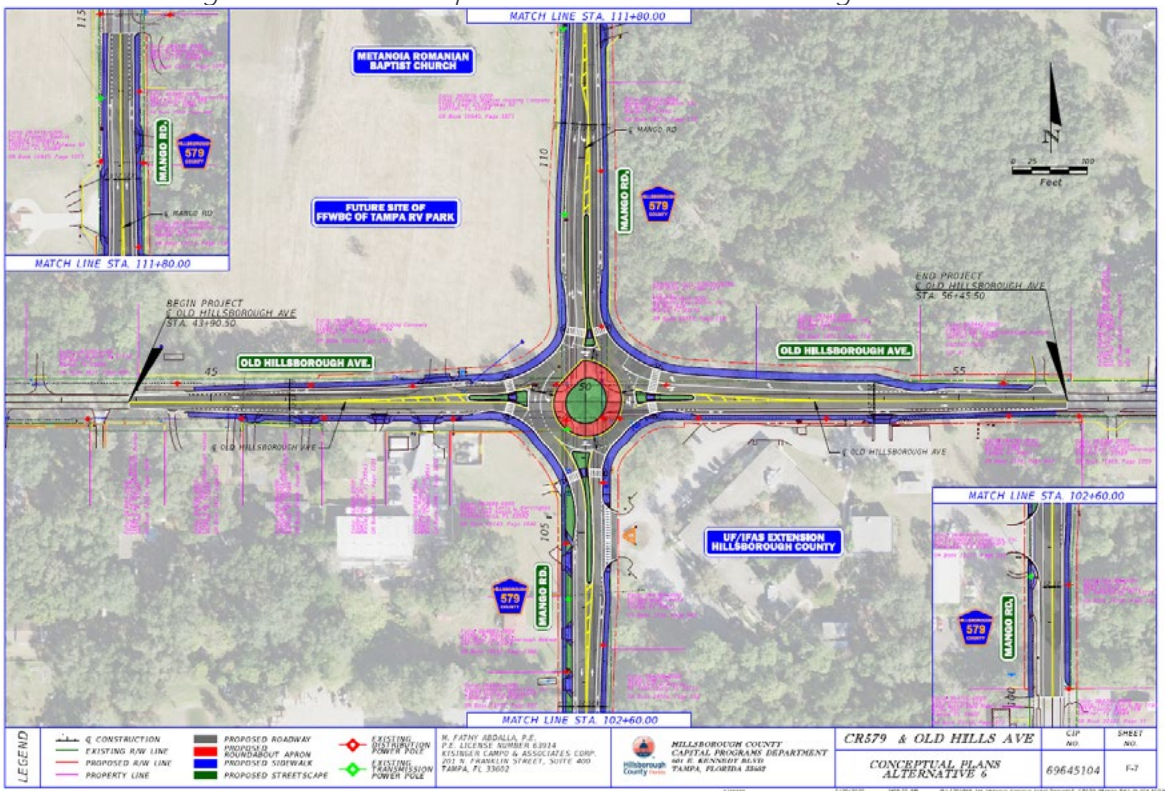
Figure 5 - Local Route 38 Bus Stop

Figure 6 - Megabus Stop

Planned Improvements

Planned roadway and multimodal improvements for Mango Road were reviewed in addition to the existing conditions. At the Mango Road and Old Hillsborough Avenue intersection, Capital Improvement Project #69645104 indicates intersection improvements to address the need for additional capacity and pedestrian connectivity through the intersection. A Light Preliminary Engineering Report (LPER) for the intersection improvements was completed in June 2020. The report includes an evaluation of six design alternatives for the intersection that include adding lanes to the intersection, signalizing the intersection, and implementing a roundabout at the intersection. The results of the report conclude that a partial two-lane roundabout with a westbound right turn lane is the preferred alternative for the intersection due to it benefits related to traffic delay, safety improvement, and cost effectiveness **(Figure 7)**. The concept plans for the preferred alternative indicate pedestrian improvements consisting of adding sidewalk at all intersection approaches and improved intersection lighting. Bicycle improvements are also included in the concepts plan. The plan depicts bicycle lanes at all intersection approaches. It was noted in the LPER that a shared use path may be considered during the design phase. The CIP at Old Hillsborough Avenue is currently in the planning phase and is scheduled for project close out in early 2024.

Figure 7 - Planned Improvements at Old Hillsborough Avenue

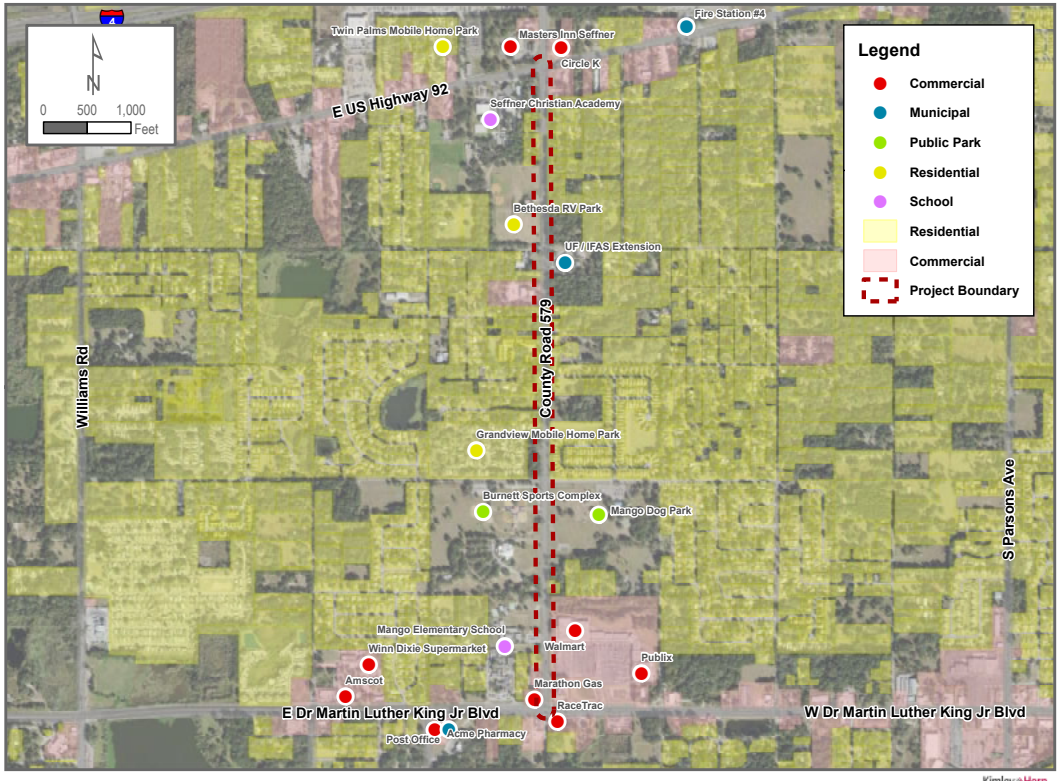


Land Use

Existing land use along the corridor consists of small concentrations of developed residential areas with supporting uses surrounded by rural and natural areas **(Figure 8)**. Key points of interest include commercial, recreational, and residential uses such as the Walmart and Publix located at the northeast corner of Mango Road and SR 574, Mango Elementary School, the Mango Dog Park, Burnett Sports Complex, and Seffner Christian Academy. The existing land uses along the corridor generate pedestrian, bicycle, and vehicle activity as people travel to and from destinations along Mango Road or use Mango Road as a thoroughfare to destinations outside of the corridor. Mango Road also serves as a connection to regional destinations via Interstate 4 access.

Based on the current Future Land Use (FLU) codes that are present adjacent to the corridor, the land use character will not change significantly in the future. The adopted FLU codes allow for a maximum of 12 dwelling units per acre (DU/A) for residential uses and a maximum Floor Area Ratio of 0.75 for non-residential and mixed-uses. The development trend within the last three years along Mango Road has been a mixture of uses but mainly inclusive of residential and residential supporting uses, such as churches and schools.

Figure 8 - Points of Interest Map



Demographics

The demographics of the Mango Road study area were analyzed using ESRI's Community Analyst software utilizing American Community Survey (ACS) data from 2014-2018. The estimated population of the area within a one-mile buffer of the Mango Road study corridor is 13,132 comprised of 4,624 households. The ACS Housing and Populations summaries are provided in **Appendix A**.

Transit Dependent Populations

Transit dependent populations were analyzed within the study area to determine the percentage of the population within the buffered study area that are more likely to walk, bike, and use public transportation. Transit dependent demographic statistics for the study area that were reviewed and compared to Hillsborough County statistics. The comparison of demographic data is provided in **Table 1**.

Table 1 - Transit Dependent Populations

Demographic Statistic	Study Area (Mango Road One-Mile Radius)	Hillsborough County
Total Population	13,132	1,378,045
Total Households	4,624	516,011
Total Housing Units	5,297	571,337
Housing Units with one or no vehicle	2,121 (40%)	237,034 (42%)
Renter (Housing Units)	1,858 (35%)	216,306 (38%)
Individuals younger than 18 or older than 65	4,416 (35%)	524,606 (38%)
Low income households[1]	911 (20%)	73,426 (14%)
Individuals who commute using transit[2]	25 (0.4%)	10,039 (1.5%)

[1]Households below the poverty level

[2]Percent of workers 16+ years

Source: U.S. Census Bureau, 2014-2018 American Community Survey

Crash Data and Crash Reports Review

As part of the existing conditions analysis, crash data for the corridor was analyzed to identify potential safety improvements and locations. Crash data for the most recent five years (2014 to 2018) was collected and analyzed.

Between 2014 and 2018, 400 crashes **(Figure 9)** resulting in one fatality and 20 serious injuries **(Figure 10)**, were reported on Mango Road. During this time, five bike and four pedestrian crashes were reported on Mango Road. The greatest contributing factors for all crashes was "Operated MV (motor vehicle) in Careless or Negligent Manner" (31%) and "Failed to Yield Right-Of-Way" (28%). The greatest crash type was rear end crashes, making up 47% of all crashes **(Table 2)** and 38% of all fatal and serious injury crashes **(Table 3)**. Most rear end crashes occurred at the signalized intersections (SR 574, Clay Pit Road, and US 92) and the unsignalized intersection of Old Hillsborough Avenue **(Figure 11)**. There is an upcoming County planned project at Old Hillsborough Avenue to convert the intersection to a roundabout. Signal clearance times at the signalized intersections along the corridor should be reviewed to determine if adequate yellow and red times are currently provided. Additionally, the signal heads should be updated to provide yellow backplates at the signalized intersections to increase visibility.

Figure 9 - Crashes per Year (2014-2018)

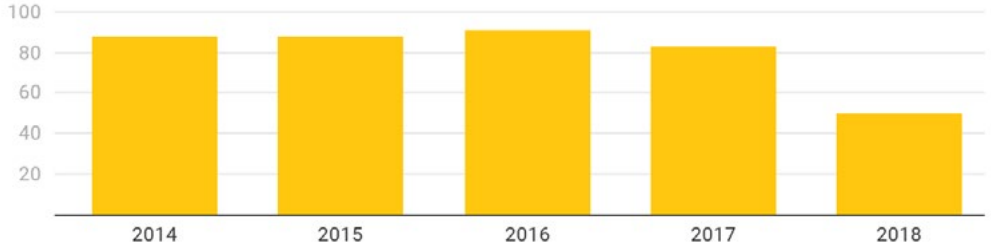


Figure 10 - Fatal and Serious Injury Crashes per Year (2014-2018)

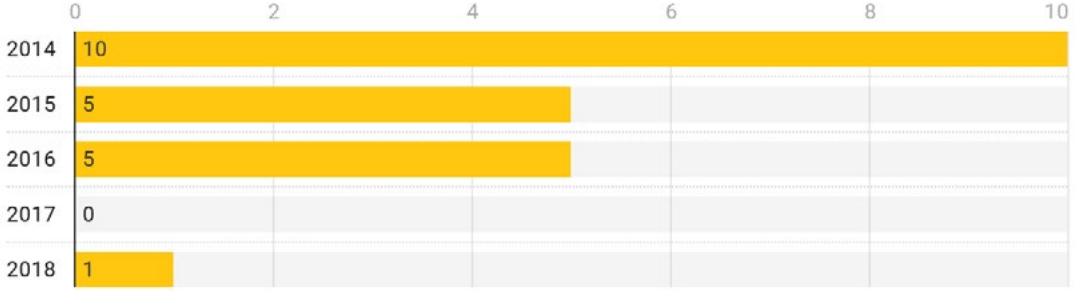


Figure 11 - Rear End Crashes by Location

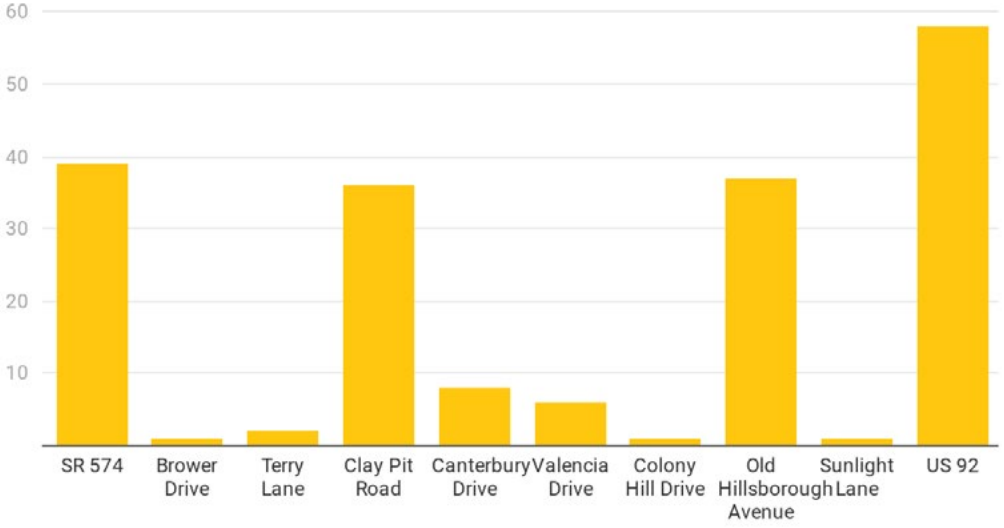


Table 2 - All Crashes by Type

Crashes by Type	Number of Crashes	Percent of Total
Angle	87	22%
Bike	5	1%
Head On	11	3%
Hit Fixed Object	6	2%
Hit Non-Fixed Object	2	1%
Left Turn	49	12%
Pedestrian	4	1%
Rear End	189	47%
Right Turn	7	2%
Sideswipe	30	8%
Single Vehicle	6	2%
Unknown	1	0%
U-Turn	3	1%
Total	400	100%

Table 3 - Serious and Fatal Crashes by Type

Fatal and Serious Injury Crashes by Type	Number of Crashes	Percent of Total
Angle	5	24%
Bike	1	5%
Head On	0	0%
Left Turn	3	14%
Pedestrian	1	5%
Rear End	8	38%
Right Turn	1	5%
Sideswipe	0	0%
Single Vehicle	2	10%
U-Turn	0	0%
Total	21	100%

Of all crashes, 31% occurred at an intersection. Of serious injury crashes, 52% occurred at an intersection. As shown in the crash heat map **(Figure 12)**, most crashes at intersections occurred at the major intersections along the corridor including SR 574, US 92, Clay Pit Road, and Old Hillsborough Avenue.

Most crashes between 2014 and 2018 (72%) occurred during daylight conditions. Most serious injury crashes (60%) also occurred during daylight hours. It should be noted that the single fatal crash occurred in dark conditions. Furthermore, 53% of all crashes occurred during off-peak times and 33% occurred during the PM peak hours (3pm to 6pm). Similarly, most serious injury crashes (61%) occurred during non-peak hours and 26% occurred during the evening peak hours **(Figure 13)**. Bike and pedestrian crashes accounted for 2.3% of all crashes but 9.6% of the fatal and serious injury crashes. Additionally, 22% of bike and pedestrian crashes resulted in a fatality or serious injury (Figure 12). Vulnerable users are four times as likely to be involved in a serious or fatal crash along Mango Road.

Figure 12 - Crash Heat Map

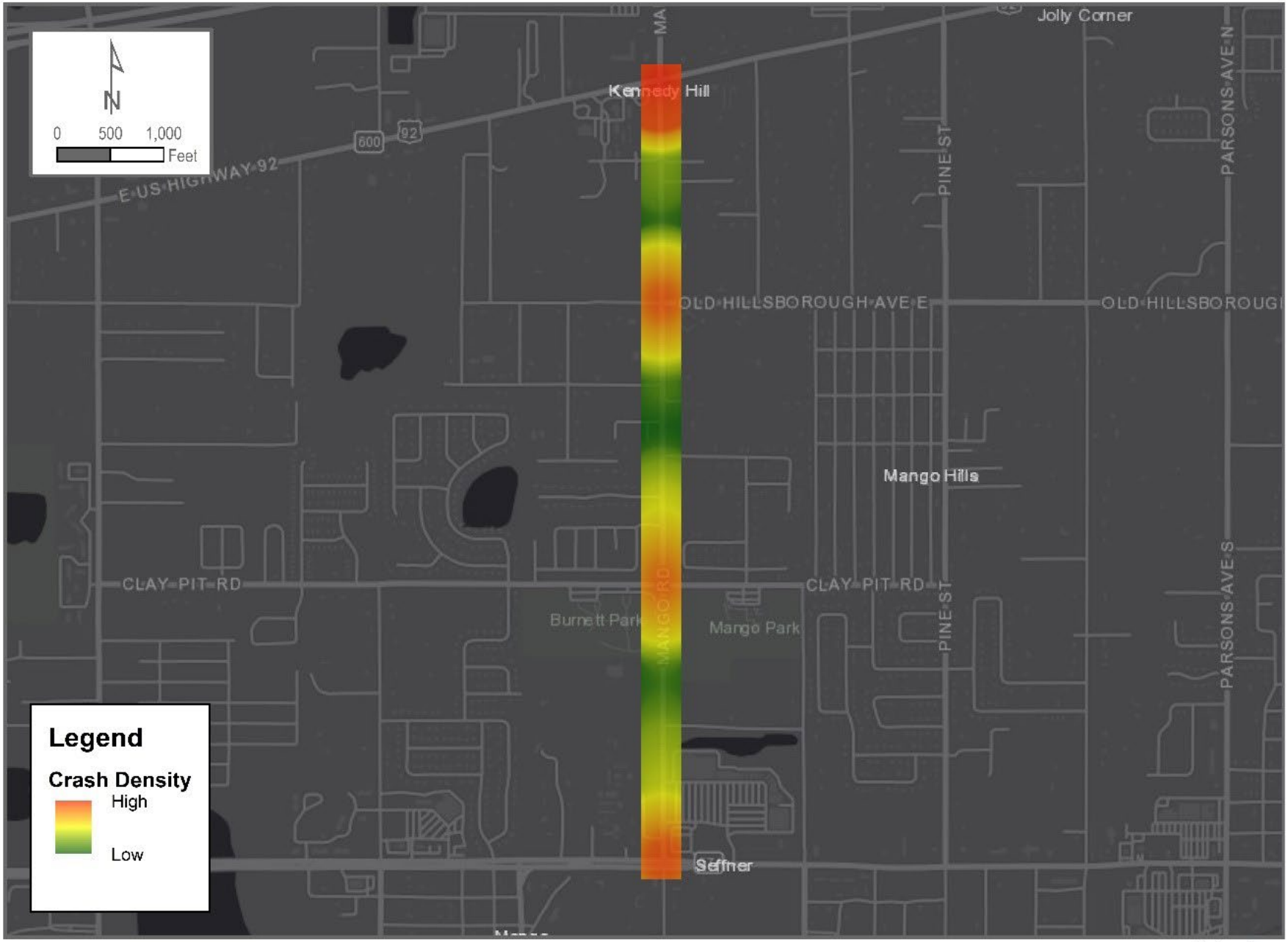
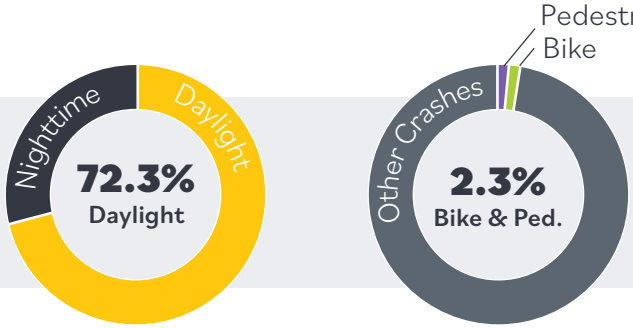


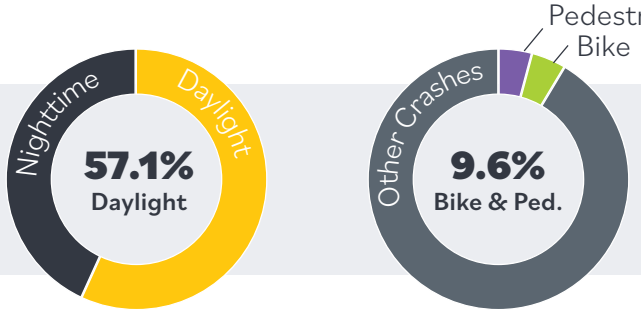
Figure 13 - Crash Summary and Map

Total Crash History (2014-2018)



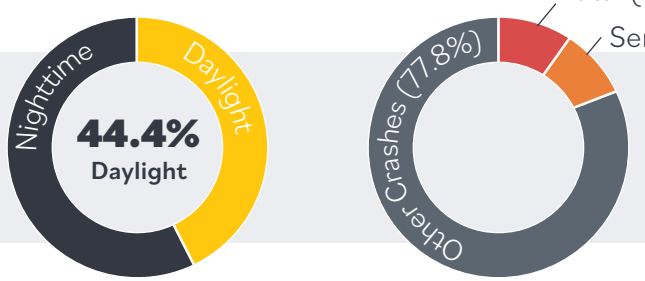
400
Total Crashes

Fatal & Severe Crash History (2014-2018)

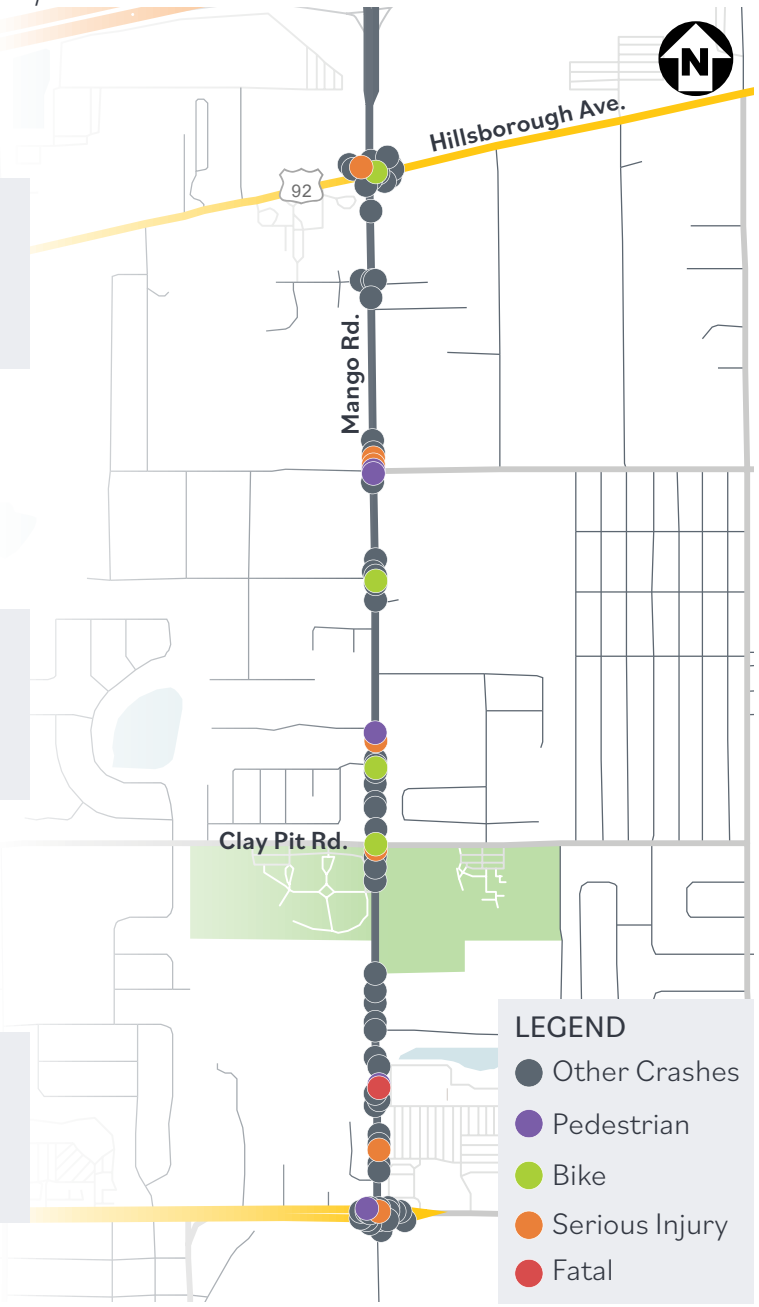


21
Fatal and Severe Crashes

Bike & Pedestrian Crash History (2014-2018)



16
Bike and Pedestrian Crashes



Crash Reports (2015 to 2020)

To better understand the nature of the serious injury and fatal crashes, the crash reports from the most recent fatal and serious injury crashes reported on Mango Road were reviewed. Between 2015 and 2020, one fatal and 16 serious injury crashes were reported on or in proximity to the corridor. The single reported fatal crash occurred near the intersection of US 92 and Kennedy Hills Dr (almost 1,000 feet from the Mango Road corridor. The crash was an angle crash as a result of a motor vehicle crossing into oncoming traffic on US 92. Most severe crashes were motor vehicle collisions with other motor vehicles due to failure to stop or yield right of way at intersections and driveways, as well as rear-end crashes. Three severe injury crashes involved motorcycles.

Road Safety Audit

A road safety audit and field review of existing conditions on Mango Road was conducted on June 23, 2020 by the consultant team and representatives from Hillsborough County and the MPO. While traffic conditions were observed, these conditions may not be representative of typical conditions as the due to the impact of COVID-19. During the safety audit the conditions along the corridor were reviewed with a focus on the existing maintenance, safety, and connectivity provided for pedestrians, cyclists, and vehicles. The findings from the audit include the need for maintenance along the corridor to address obstacles blocking the sidewalk and shoulder erosion **(Figure 14)**, the removal of debris from drainage structures **(Figure 15)**, restriping of degraded pavement markings **(Figure 16)**, and the replacement of cracked sidewalk **(Figure 17)**. The detailed audit for Mango Road can be found in **Appendix B**.

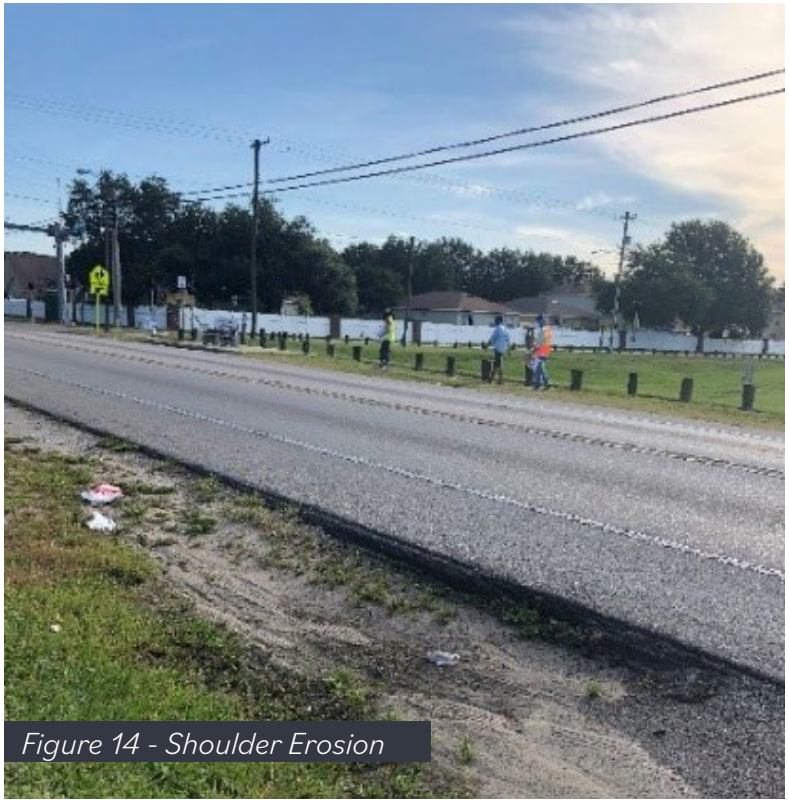


Figure 14 - Shoulder Erosion

Figure 15 - Debris

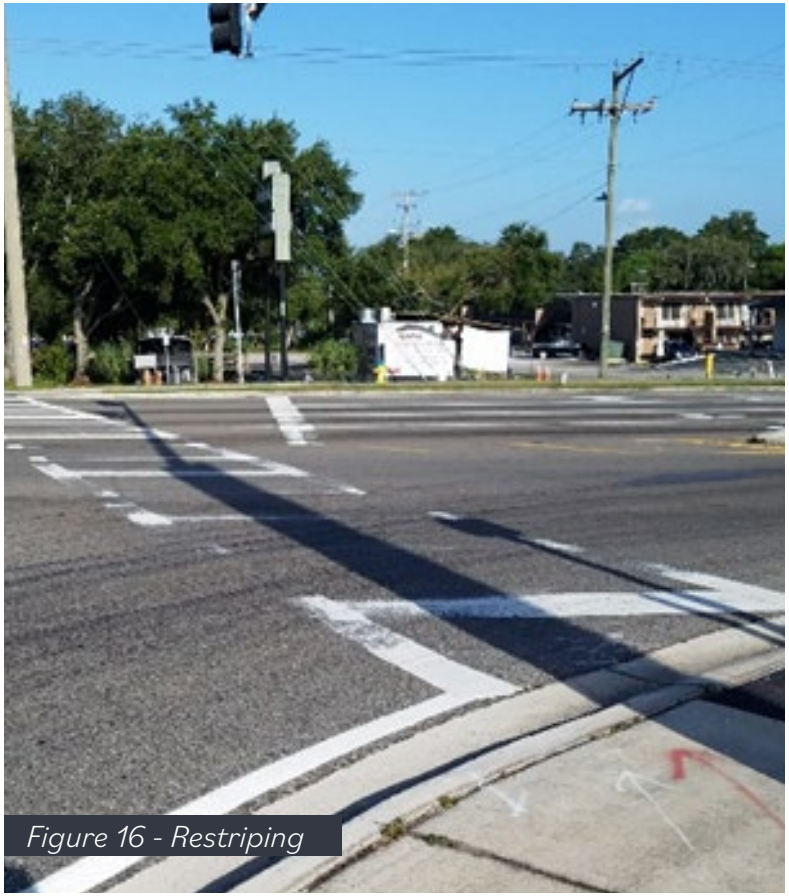


Figure 16 - Restriping

Figure 17 - Sidewalk Cracking

PUBLIC ENGAGEMENT AND INPUT

Public engagement efforts were conducted to further understand existing community, mobility, and safety needs and to define the recommended safety improvements for Mango Road. Public engagement for Mango Road included virtual and physical outreach efforts.

Both online and paper versions of a project survey were advertised via the MPO's Vision Zero webpage, emailed to neighborhood associations, and distributed along the corridor. The Mango Road project factsheet used to advertise the surveys is provided in **Figure 18** and **Appendix C**. The online survey was conducted through MetroQuest, an online public engagement website. In order to capture public input from those without internet access a one-page paper version of the online survey was create and distributed along the corridor. The paper version of the survey was made available in both English and Spanish languages.

Figure 18 - Project Factsheet

Public Engagement Results

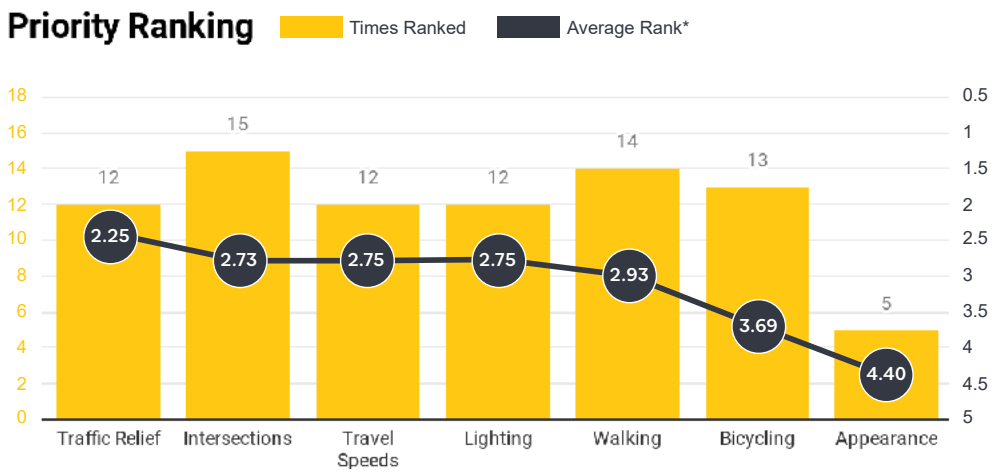
MetroQuest

MetroQuest Studio, a public engagement online website, was used to inform the public about the Vision Zero project and collect feedback on safety needs, preferences, and priorities for Mango Road using five interactive and visual screens. The survey was open for public input from September 1st, 2020 to September 30th, 2020 and was advertised via the Hillsborough MPO's project webpage, official MPO social media channels, local media news outlets, and emails to neighborhood groups in the Mango Road project area. Within the survey, participants were asked to rank safety priorities, rate potential safety improvement options, and map areas of concern and projects ideas along the corridor. In total, the survey had 19 participants that contributed approximately 300 total data points and over 50 written comments.

Priority Ranking

Participants were asked to rank their top five safety priorities including bicycling, corridor appearance, intersections, lighting, traffic relief, travel speeds, and walking improvements. As indicated in **Figure 19**, Traffic Relief and Intersections improvements had the highest average ranks of all safety priorities for Mango Road and were closely followed by Travel Speeds and Lighting improvements. Appearance and Bicycling received the lowest average ranks for safety priorities. Although bicycling was ranked a relatively high amount of times, those who ranked it ranked it lower on average.

Figure 19 - Priority Ranking



* Improvement were ranked on a scale of 1 to 5 with 1 being the highest

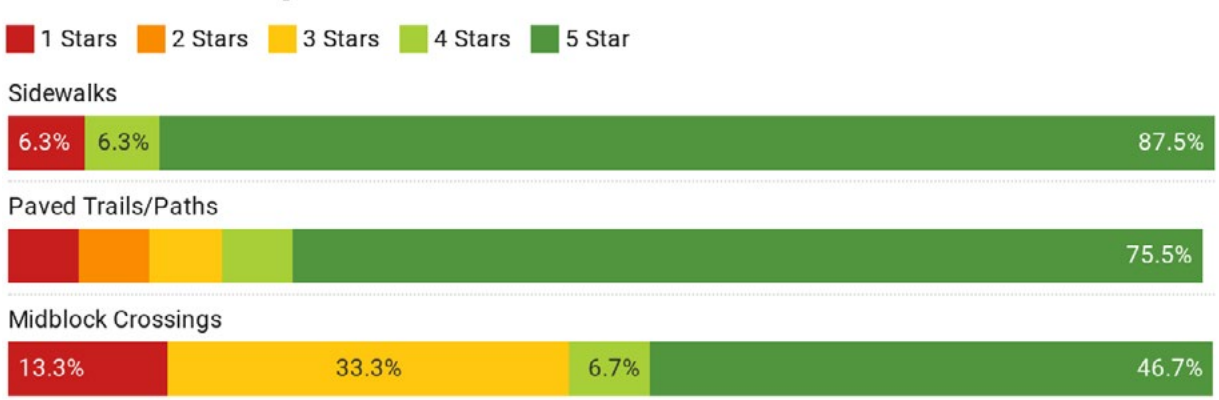
Preferred Improvements

Participants were asked to rate potential safety improvement options for bicyclists, intersections, streets, pedestrians, and bus service on Mango Road. Participants were shown three to five improvement options for each category and asked to rate the improvements with one to five stars. One star being the least preferred option and five stars being the most preferred option. For pedestrian improvements participants rated their preferences for midblock crossings, paved trails/paths, and sidewalks **(Figure 20)**. Of the three options, sidewalks received the highest average rating, closely followed by paved trails/paths **(Table 4)**.

Table 4 - Pedestrian Improvements

	Average Rating
Sidewalks	4.69
Paved Trails/ Paths	4.41
Midblock Crossings	3.73

Figure 20 - Pedestrian Improvements

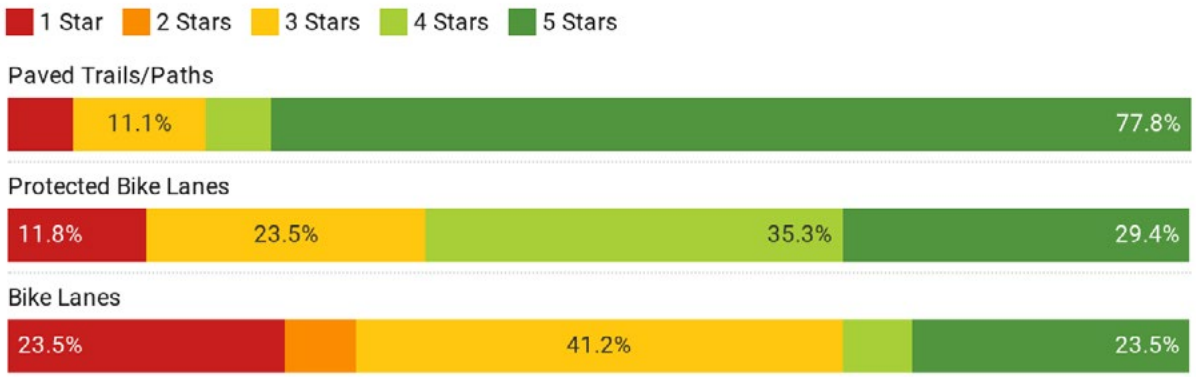


For bicyclists improvements, participants rated their preferences for bike lanes, protected bike lanes, and paved trails/paths **(Figure 21)**. Of the three options, paved trails/paths received the highest average rating and bike lanes received the lowest average rating **(Table 5)**.

Table 5 - Bicyclist Improvements

	Average Rating
Paved Trails/Paths	4.50
Protected Bike Lanes	3.71
Bike Lanes	3.00

Figure 21 - Bicyclist Improvements

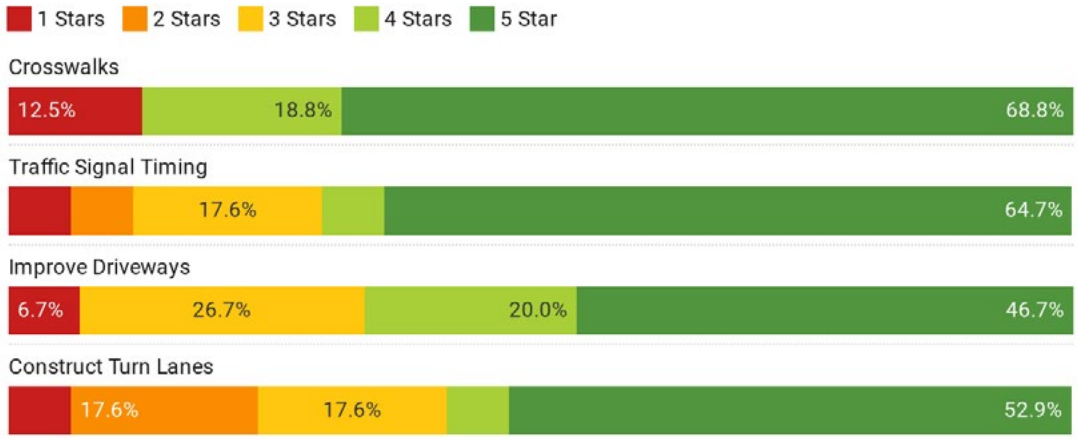


For intersection improvements, participants rated their preferences for crosswalks, turn lanes, improved driveways, and traffic signal timing **(Figure 22)**. Of the four options, crosswalks received the highest average rating and turn lanes received the lowest average rating **(Table 6)**.

Table 6 - Intersection Improvements

	Average Rating
Crosswalks	4.31
Traffic Signal Timing	4.18
Improve Driveways	4.00
Construct Turn Lanes	3.82

Figure 22 - Bicyclist Improvements

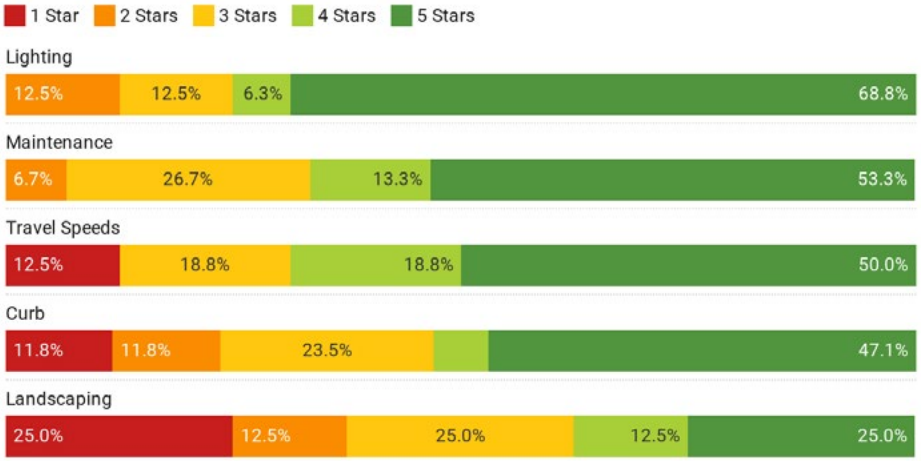


For street improvements, participants rated their preferences for curbs, landscaping, lighting, maintenance, and travel speed **(Figure 23)**. Of the five options, lighting received the highest average rating and landscaping received the lowest average rating **(Table 7)**.

Table 7 - Street Improvements

	Average Rating
Lighting	4.31
Maintenance	4.13
Travel Speeds	3.94
Curb	3.65
Landscaping	3.00

Figure 23 - Street Improvements

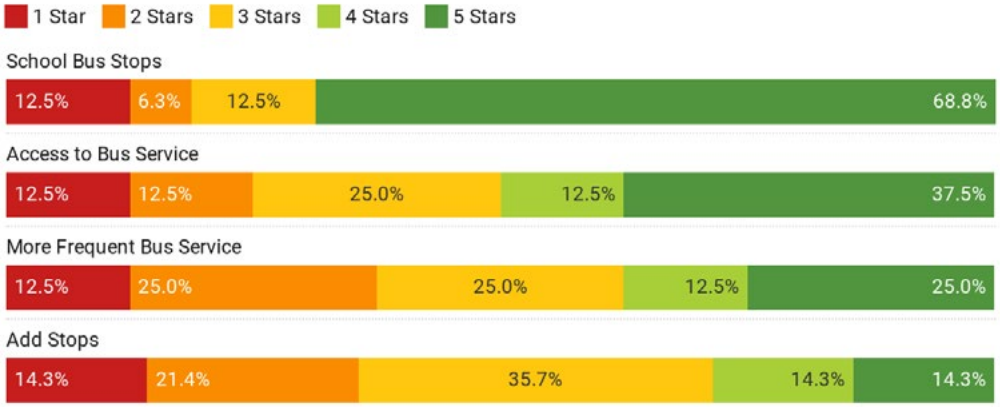


For bus service improvements, participants rated their preferences for access to service, additional stops, more frequent bus service, and school bus stops **(Figure 24)**. Of the four options, school bus stops received the highest average rating and add bus stops received the lowest average rating **(Table 8)**.

Table 8 - Bus Stop Improvements

	Average Rating
School Bus Stops	4.06
Access to Bus Service	3.50
More Frequent Bus Service	3.13
Add Stops	2.93

Figure 24 - Bus Stop Improvements



Areas of Concern

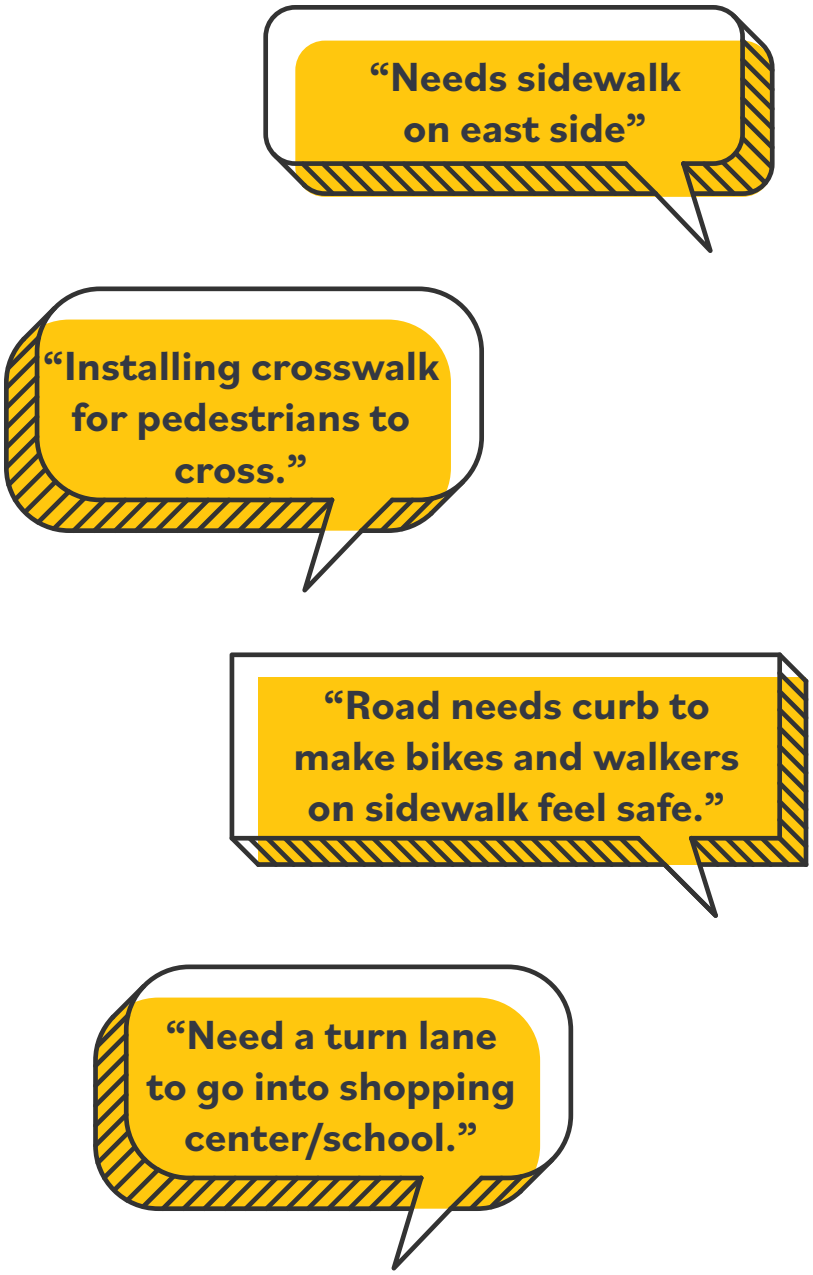
To further understand safety issues and project opportunities on Mango Road, survey participants were asked to pinpoint their concerns and ideas on an interactive map within the survey. Participants had the opportunity to drop pins related to destinations, project ideas, safety concerns, traffic, and "anything else". In total, 51 pins were added to the map. A summary of the map inputs is shown in **Appendix D**.

Safety concerns were largely indicated at intersections while project ideas were spread throughout the corridor. Examples of indicated safety concerns on Mango Road include the lack of sidewalk on the east side of the roadway near Colony Hill Drive and north of Old Hillsborough Avenue and pedestrian and vehicle conflicts at the Clay Pit Road intersection. Identified project ideas included a turn lane into the shopping plaza located at the northeast corner of the SR 574 intersection, curbing the roadway that fronts the park south of Clay Pit Road, a crosswalk between the two parks south of Clay Pit Road, and sidewalk on the east of the roadway near the park and near Colony Hill Drive.

Traffic concerns were also identified relatively frequently as well as school traffic near Old Hillsborough during weekday mornings and peak-hour traffic at the US 92 and SR 574 intersections.

Corridor Vision

Lastly, participants were asked about their future vision for Mango Road. When asked to describe Mango Road as it is today in one word, the words that were submitted most frequently were "dangerous", "unsafe", "uncomfortable", and "congested". When asked to describe their vision for Mango Road in one word, the words that were submitted most frequently were "safe" or "safer", "comfortable", and "inviting". The participants' one-word responses indicate a need for safety improvements on Mango Road, as well as allude to their desires for a safer, more comfortable corridor in the future.



IMPROVEMENTS AND TOOLS

The recommended safety improvements were developed and refined based on the existing conditions, crash data, and public engagement and input. The recommended safety improvements were discussed through agency coordination with the MPO and Hillsborough County Public Works Department before being finalized. The final recommendations presented in this section offer ways to improve safety and enhance mobility for all modes and users that traverse Mango Road. The recommended safety improvements include corridor-wide improvements and specific intersection improvements. Planning level costs for the intersection improvements are provided in **Appendix E**.

Corridor-Wide Improvements

Recommended corridor-wide improvements consist of maintenance, pedestrian safety, lighting, and landscaping improvements. Maintenance improvements include updating pavement markings such as crosswalks, stop bars, turn lane arrows, and lane lines throughout the Mango Road corridor where the markings have become faded and worn due to general wear and tear and shoulder erosion. The maintenance improvements also include drainage maintenance needs. As documented in the audit, drainage infrastructure throughout the corridor needs clearing and cleaning. In some locations, the landscaping and debris is creating unsafe walking and inaccessible conditions for pedestrians on the sidewalk.

Corridor-wide pedestrian safety improvements include adding crosswalks and detectable warnings to all minor streets on Mango Road and filling the existing gaps in the sidewalk network on the east side of Mango Road. Currently, a sidewalk is missing between the Walmart shopping plaza and Clay Pit Road and between Mango Grove Boulevard and Sunlight Lane. A long-term recommended pedestrian safety improvement is the construction of a continuous shared use path along the west side of Mango Road corridor between Mango Elementary School and Burnett Park. A shared use path will provide a safer and more comfortable option for both pedestrians and bicyclists traveling on Mango Road. The addition of a shared use path should be designed so it is consistent with the typical section for suburban two lane undivided roadways which is being updated as part of the Hillsborough County Context Classification documentation. Additional engineering will be required to determine drainage impacts for the shared use path.

Hillsborough County policy states that bicycle needs should be addressed by a shared use path and do not generally include the addition of bicycle lanes on roadways with speed limits greater than 35 miles per hour. Until a shared use path is provided on the corridor, the existing shoulder does provide a functional bicycle accommodation. Shoulder repair and maintenance should be considered to improve the short-term bicycling conditions.

Lighting improvements for the corridor include short-term and long-term improvement recommendations. Short-term lighting improvements consist of upgrading all intersection lighting to the latest Hillsborough County intersection lighting standards. The addition of lighting along the entire corridor will enhance safety for all modes at night. Currently, lighting is not present on the corridor except for in spot locations near or at intersections.

Lastly, recommended landscaping improvements include the addition of small-scale landscaping along the corridor to provide a buffer between the sidewalk and roadway where feasible. The additional buffer will contribute to a more walkable environment of the corridor.

Intersection Improvements

Mango Road and US 92

The intersection of Mango Road and US 92 at the north end of the project corridor is a large intersection with separate left turn lanes provided at all four approaches and separate right turn lanes provided for all approaches except for the south approach. Angle, left turn, and rear end crashes made up most of the reported crashes at the intersection between 2014 and 2018. Existing pedestrian facilities at this intersection consist of high visibility crosswalks, curb ramps with sidewalk connections, and pedestrian signals at all approaches. The pedestrian crossing distances on the north and south approaches are approximately 100 feet. The crossing distances on the east and west approaches are approximately 70 feet.

The recommended safety improvements for the intersection consist of replacing the existing five-section signal heads for the left turn lanes with separate four-section signal heads and three-section signal heads for the left turn movements. The left-turn movements should be evaluated for protective phasing in the future. It is also recommended to add signal backplates to the north and south approach signals to improve the visibility of the signals. In order to slow drivers approaching or crossing through the intersection, it is recommended to add a raised landscape median to the currently striped median and extend the curb on the south approach to reduce the turning radius and reduce the travel lane **(Figure 25)**. Pedestrian related safety improvements at the intersection consist of reconstructing the southeast curb ramps and restriping the crosswalks at all intersection approaches.

Existing Conditions

Existing Conditions

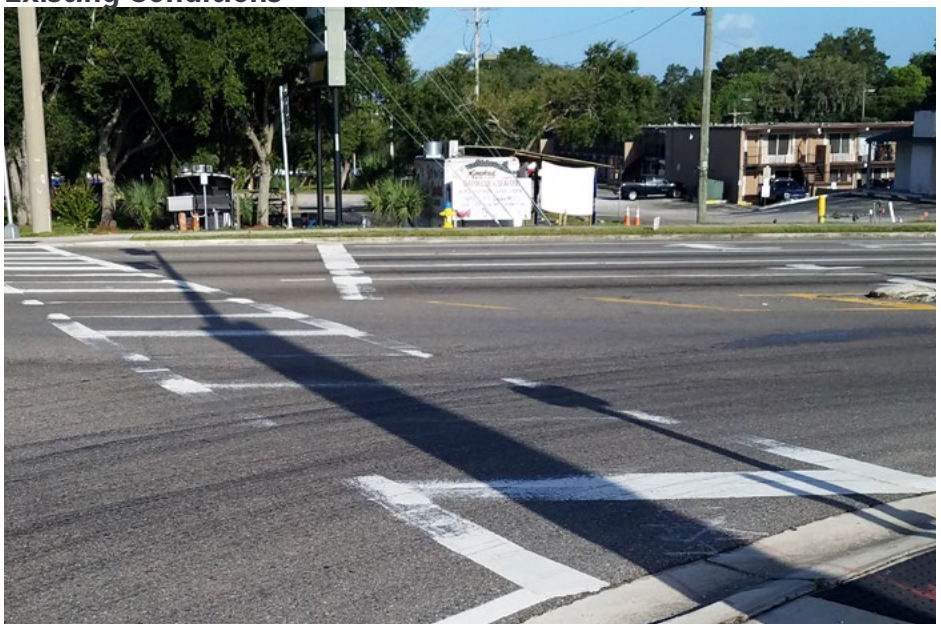
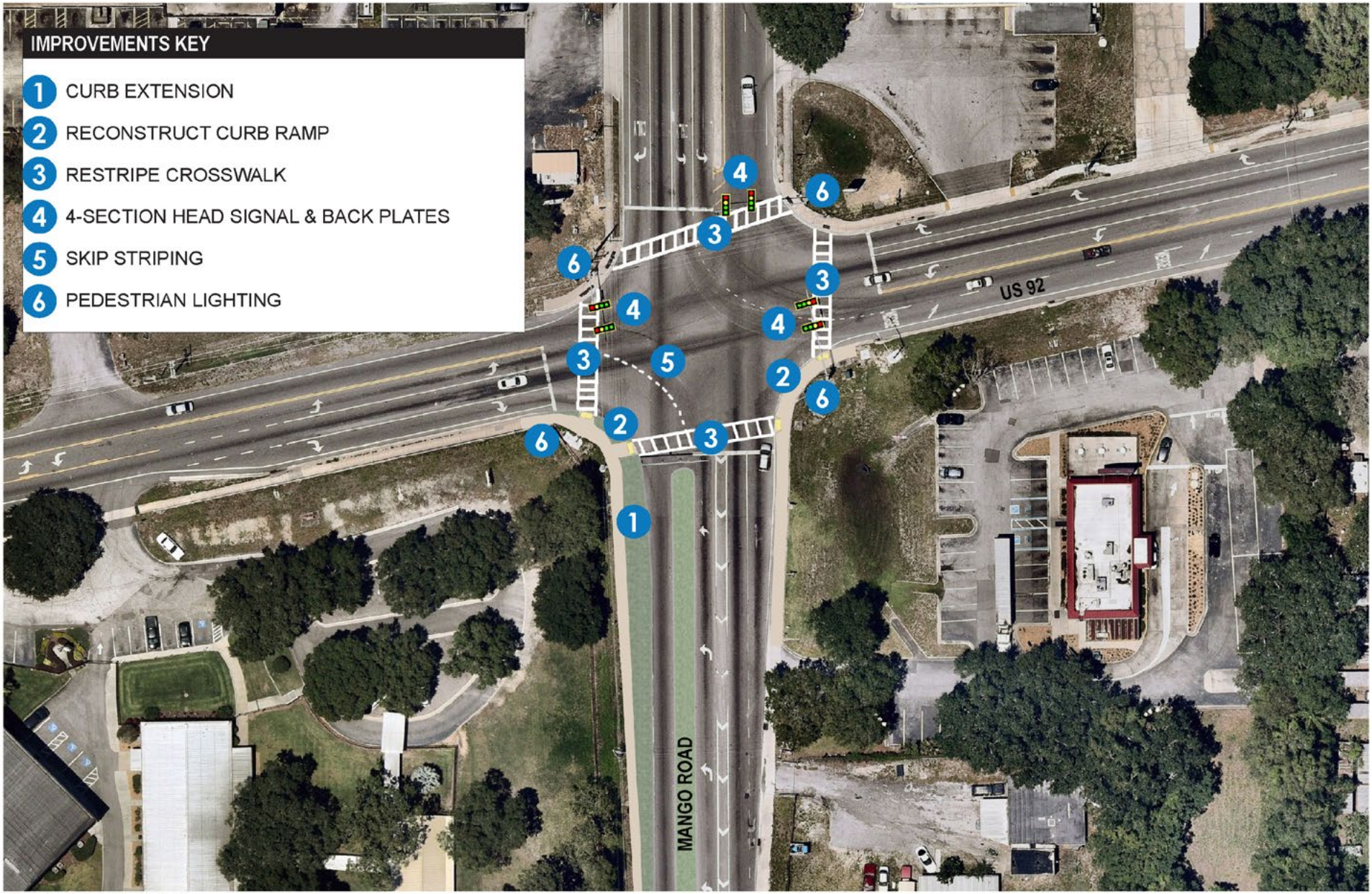


Figure 25 - Mango Road and US 92



Mango Road and Clay Pit Road

The intersection of Mango Road and Clay Pit Road is the only signalized intersection provided along the corridor between the two signalized intersections at the ends of the project limits. The intersection provides a signalized crossing for pedestrians accessing the adjacent park areas.

The recommended safety improvements at the intersection consist of safety enhancements for all modes that travel through the intersection. At the Mango Road and Clay Pit Road intersection it is recommended to restripe the existing worn crosswalks on all approaches and adjust the signal timing to allow for Leading Pedestrian Intervals (LPIs) due to the high level of pedestrian activity and proximity to the County parks. LPIs give pedestrians a “head start” to cross the intersection before any vehicles receive the concurrent green signal, enhancing the visibility of pedestrians in crosswalks **(Figure 26)**.

Other recommended improvements for the intersection include installing backplates on all signal heads and constructing curb and gutter along the roadway shoulder adjacent to Burnett Park to address the existing shoulder and sidewalk erosion. The construction of curb and gutter will increase the buffer distance between the sidewalks and roadway. A long-term improvement recommendation is the construction of sidewalk on the east side of the Mango Road between Clay Pit Road and the northern Walmart access driveway.

Existing Conditions

Figure 26 - Mango Road and Clay Pit Road

Mango Road and Canterbury Drive

Canterbury Drive is a local residential road north of Clay Pit Road. Two serious injury crashes were reported at Canterbury Drive between 2014 and 2018. Both crashes were rear end crashes. In total, ten crashes occurred in proximity to Canterbury Drive during this time. Of the ten crashes, eight crashes were rear end crashes.

The recommended safety improvements at Canterbury Drive include widening the roadway at the intersection to include a left turn lane for enhanced access onto Canterbury Drive **(Figure 27)**. The installation of the left turn will limit delay along Mango Road at this intersection and allow left turning vehicles to be separated from the through travel lane. Additional improvements at this location include installation of curb and gutter on both sides of the road through the intersection and south to Clay Pit Road to provide an additional buffer for pedestrians using the sidewalk. The installation of curb and gutter along the roadway will also serve as a traffic calming element in this portion of Mango Road. A high emphasis crosswalk should be added at Canterbury Drive. ADA curb ramps including the detectable warning pads surfaces should be added.

Existing Conditions

Existing Conditions

Figure 27 - Mango Road and Canterbury Drive

Mango Road from Mango Ridge Boulevard to Mango Groves Blvd

The section of Mango Road between Mango Ridge Boulevard and Mango Groves Boulevard provides connections to local residential roads and driveway access to residences. The safety improvements for this section of Mango Road consist of converting the existing striped median to a raised concrete median north of Mango Ridge Boulevard **(Figure 28)**. The transformation of the median to a curbed concrete median will provide a traffic calming element to this residential section of Mango Road.

The recommended raised median can be considered for mid-block crossing locations in the future to provide an additional pedestrian crossing on Mango Road. The current distance between pedestrian crossings is approximately half a mile between Martin Luther King Jr Boulevard and Clay Pit Road and approximately eight tenths of a mile between Clay Pit Road and US 92. The planned intersection improvements at Old Hillsborough Avenue will add east and west crosswalks to reduce the crossing distance between Clay Pit Road and US 92.

High emphasis crosswalks should be added at both Mango Ridge Boulevard and Mango Groves Boulevard. The curb ramps should be relocated at Mango Ridge Boulevard. The existing curb ramps are set back from the intersection but there are worn pedestrian paths outside of the existing path, as shown in **Figure 28**.

Existing Conditions

Figure 28 - Mango Road and Mango Ridge Blvd.

Mango Road and Valencia Drive

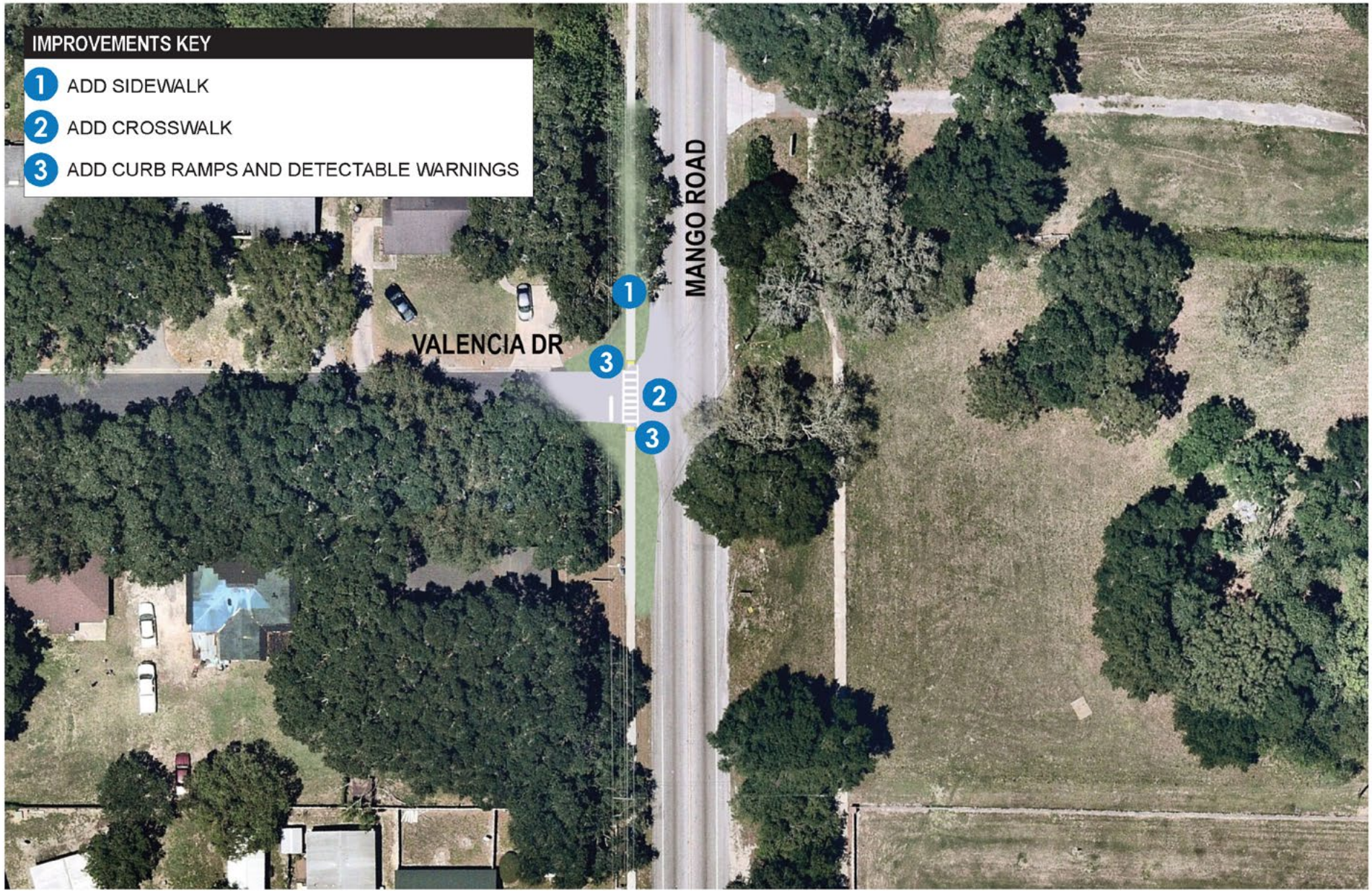
Valencia Drive is a local residential road located north of Canterbury Drive. Between 2014 and 2018, nine crashes were reported near Valencia Drive, one crash was a serious injury rear end crash and another crash involved a pedestrian.

The recommended safety improvements at Valencia Drive consist of adding a crosswalk and detectable warning across Valencia Drive and adding sidewalk to connect the existing sidewalk to the crosswalk from the north and south of the intersection. The existing sidewalk was covered by pavement which should be removed. The crosswalk and detectable warning will provide a safer crossing for pedestrians and provide a visual warning for drivers that pedestrians are present in the area **(Figure 29)**.

Existing Conditions

Existing Conditions

Figure 29 - Mango Road and Valencia Drive



Mango Road and north Walmart Driveway

The northern access driveway to the Walmart shopping plaza is located on the east side of Mango Road between the Mango Elementary School driveways. In order to enhance pedestrian safety within the school zone, it is recommended to install high emphasis crosswalks and detectable warnings at the two school driveways on the west side and the Walmart driveway on the east side.

In conjunction with the recommend improvements to the south Walmart driveway (described below), it is recommended to construct a southbound left turn lane into the north Walmart driveway **(Figure 30)**. The addition of an exclusive left turn lane will remove stopped vehicles from the through lanes, reducing the potential for rear-end crashes at this location. Sight distance should be further evaluated during the design phase to ensure vehicles have adequate line of sight exiting the driveway. Based upon the crash reduction factor for the installation of a left-turn lane, there is a potential 44% reduction of all crash types with the addition of a turn lane.

Existing Conditions

Figure 30 - Mango Road and north Walmart Driveway

Mango Road and south Walmart Driveway

The southern access driveway to the Walmart shopping plaza is located on the east side of Mango Road approximately 280 feet from the SR 574 intersection. Between 2014 and 2018, five crashes including one rear end and two angle crashes were reported at the driveway.

The recommended safety improvements for the southern Walmart driveway consist of installing a concrete median in place of the existing striped median **(Figure 31)**. The concrete median will limit access to and from the driveway to right turns in and right turns out. By prohibiting left turns into and out of the driveway, the conflict points between vehicles entering and exiting the driveway will be reduced. Hillsborough County is currently evaluating school zone upgrades to this section of the corridor.

Existing Conditions

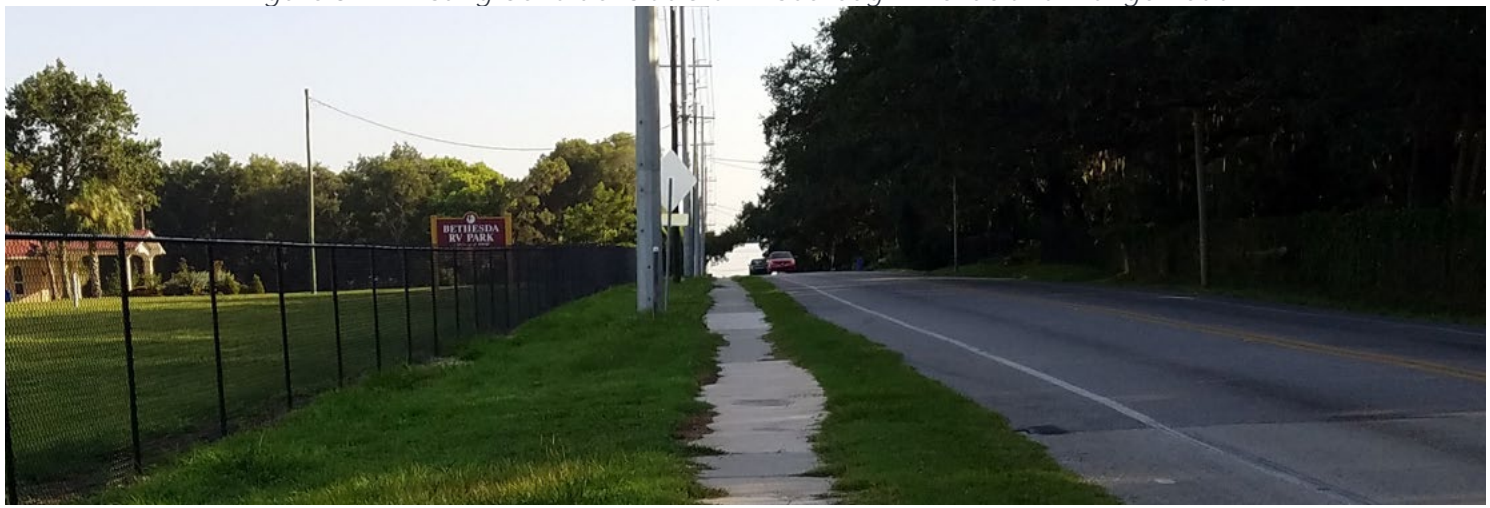
Existing Conditions

Figure 31 - Mango Road and south Walmart Driveway

Mango Road and Old Hillsborough Road

A speed feedback sign should be considered on the west side near the intersection of Old Hillsborough Road and Mango Road in the interim of the intersection project as there is a grade change at this location. A speed feedback sign will alert drivers to their current speed as they are approaching the intersection. Also in the interim, maintenance of the grass encroachment should be addressed at this location **(Figure 32)**. Additional pedestrian safety improvements at this location are anticipated as part of the CIP improvements (see Planned Improvements).

Figure 32 - Existing Conditions at Old Hillsborough Avenue and Mango Road



NEXT STEPS

The purpose of the Mango Road Vision Zero project was to identify short -term safety improvement recommendations that align with Vision Zero goals. The recommended safety improvements were developed through a review of existing conditions, technical analysis, and public engagement. The recommended safety improvements for Mango Road were developed at the planning level and are just the beginning of the implementation process.

The next step for the improvement concepts is the preliminary engineering design phase. The preliminary engineering design phase will include additional public engagement and will document engineering and environmental analyses in support of future decision-making related to the safety improvements on Mango Road.


Clay Pit Rd
11700 11600
Burnett Park

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