Demonstration Project Planning

Appendix

C

SAFE STREETS PINELLAS

Memorandum

Date:	November 16, 2020
To:	Sarah Caper, AICP, Forward Pinellas
From:	Kathrin Tellez, AICP, PTP, Fehr & Peers Laura Herrscher, AICP, PGA
Subject:	**Safe Streets Pinellas Nursery Road/Duke Energy Trail Demonstration Summary**

Introduction

Several demonstration projects are being developed and implemented as part of the Safe Streets Pinellas project, which is the Vision Zero effort for Pinellas County. The goal of these demonstration projects is to build interest around Vision Zero by showcasing how transportation safety projects, including transportation safety campaigns, can be implemented in Pinellas County and to test countermeasures that could be included in the Vision Zero Action Plan. The nature of the demonstration projects varies and incorporates a range of elements. The concept, process followed, and intended performance measures for each demonstration will be documented in a series of memos and the final Action Plan.

This memorandum summarizes an educational event that was held at the Nursery Road crossing of the Duke Energy Trail and serves as an update to our technical memorandum dated July 14, 2020 (attached for reference). As the demonstration projects also serve as a guide to future collaborations between Forward Pinellas and partner agencies, the following describes pre-event activities, day-of-event activities, and an event summary.

Event Preparation

Pinellas County and the City of Clearwater had planned to install a rectangular rapid flashing beacon (RRFB) at the Duke Energy Trail crossing on Nursery Road, which was identified as a potential safety device that could be installed at the crossing after a May 2019 collision in which a bicyclist was killed while crossing the roadway at this location. Numerous factors are considered in the identification of identify candidate locations for RRFB installations, including the posted speed limit and prevailing travel speeds, amount of vehicle travel, amount of bicycle and pedestrian travel, expected yielding rates, number of travel lanes and crossing distance, and presence of parking. Additional details are provided in the July 14, 2020 memorandum.

Installation of the RRFB was scheduled for October 2020. Since RRFBs are not new to Pinellas County, the demonstration project was centered around honoring the crash victim, Carmen Charrez, as well as education around how to correctly use the device as both a person who is driving, or a person who is walking or bicycling.

Prior to the event

Prior to the event, there were several coordination calls between Forward Pinellas, City of Clearwater, and Pinellas County staff to finalize the construction schedule and other event details. Field visits were also conducted around the time the RRFB was being installed to document the process. The following specific items were conducted in preparation for the event:

- Create Save the Date notice to disseminate via e-mail, social media, and website to communicate date, time, location, and event details sent two weeks prior to event (see Figure 1

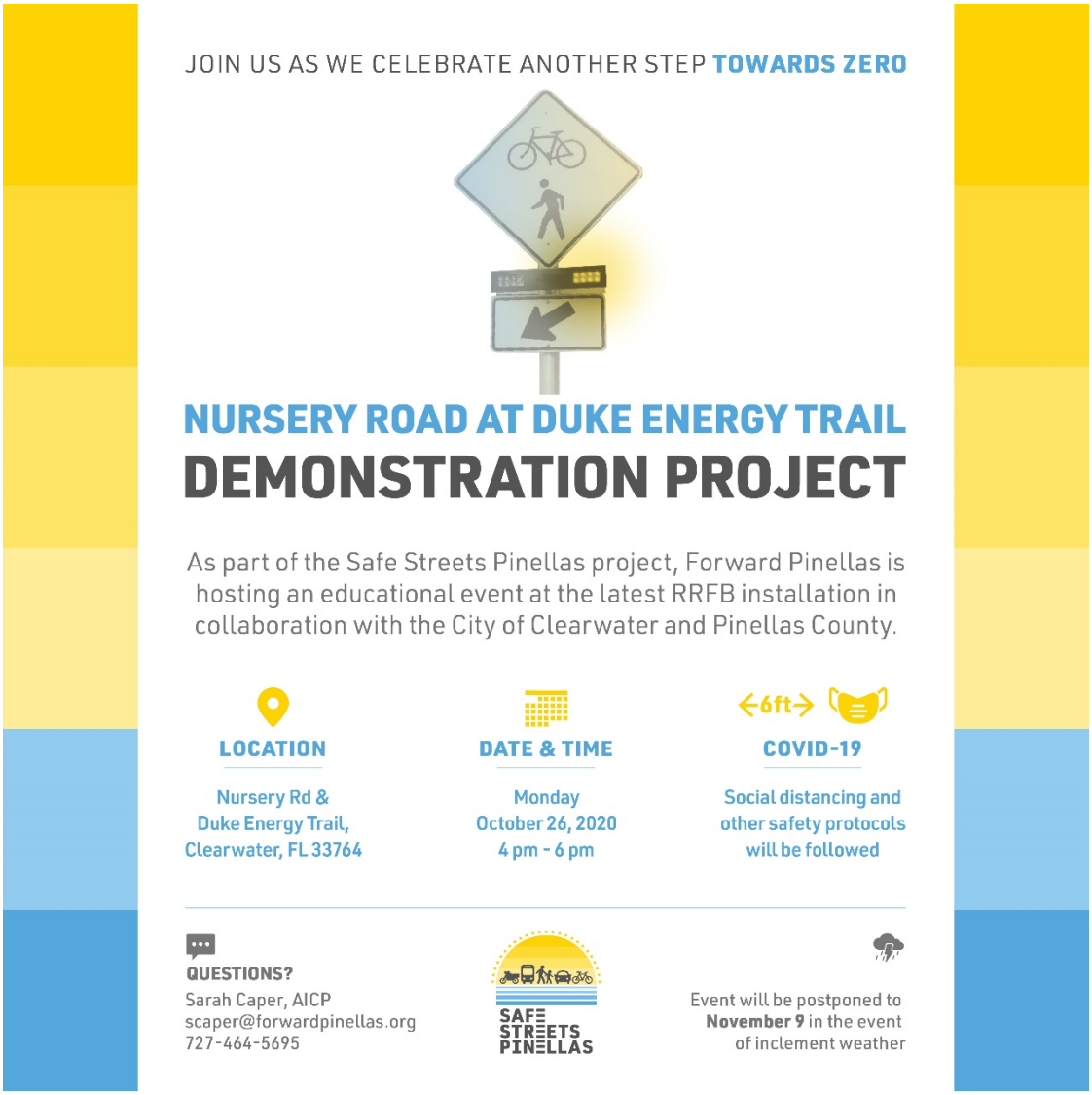


Figure 1 Save the Date Announcement

- Outreach to the family of the crash victim to coordinate their participation as well as installation of a memorial
- Outreach to local media with press release and invitation to the event
- Coordinate with Task Force, Ambassadors and local government staff
- Develop COVID-19 protocols and plan for social distancing, sanitizing, etc.
- Develop materials list for day of event, including tables, table clothes, tents, pens, garbage bags, clip boards, tape, tape measure, easels, safety vests, sanitizing items, velocity reader, Safe Streets Pinellas stencils and spray chalk, water, and snacks, and identify team member responsible for bringing each item
- Develop informational materials, such as the collision summary board (See Figure 2)
- Develop survey instrument and QR code with printed cards and QR code displays to obtain feedback from trail users and event attendees
- Develop/source educational materials (Figure 3) and other items, such as the Safe Streets Pinellas coloring books, pins, and logo bags
- Prepare name tags for elected officials, local government staff, and project team staff attending event

Staff from Forward Pinellas and the consulting team arrived a few hours early to set-up the tables, place Safe Streets Pinellas logos on the trail surface, and prepare for the event.

Figure 2 Collision Trends Board

In addition to honoring the crash victim, Carmen Charrez, another focus of the event was to raise awareness of the purpose of RRFBs and the correct usage for all roadway users. Custom educational materials were developed and are available as a 5 X 7 flyer, as well as electronically for use on social media.

Figure 3 RRFB Educational Flyer

Event Summary

The event was held on Monday, October 26, 2020 from 4:00 – 6:00 PM and consisted of three main elements.

1. Ceremony honoring the victim of a fatal collision at this location

Family members and friends of the crash victim, Carmen Charrez, attended the event and ceremony to unveil a roadside memorial. Commissioner Dave Eggers began by acknowledging how safety improvements such as RRFBs will increase roadway safety and underscored the importance of the Safe Streets Pinellas project because there is much more work to be done in driving down fatal and serious injury crashes on the transportation system. The victim's sister spoke on behalf of the family and expressed their hope that other lives will be saved because of the attention and recognition that improvements must be made. Whit Blanton, Forward Pinellas Executive Director, concluded the ceremony by discussing the importance of creating a safety-focused culture of all users of the transportation system. The roadside memorial was unveiled.

2. Public engagement and education

This demonstration was an opportunity to provide education about proper use of an RRFB and general safety information for trail users. A tent and table on either side of the road were set up with educational materials, a feedback survey with QR code to access, comment forms, and staff to answer questions and discuss the Safe Streets Pinellas project with trail users. Forward Pinellas Staff were also interviewed by local media outlets, and video of use of the RRFB was collected for use in developing a public safety video.

On this day, there were about 25 trail users during the two-hour event, which is in the range of recorded trail users for other days (15 to 35 users in a 2-hour period). The record high temperatures on this day may have deterred some from using the trail during the event time period. Comments were collected and some included concerns about speeding, high truck traffic, and a lack of regard for safety around the trail crossing. Suggestions included speed bumps to enhance traffic calming. Comment forms and completed surveys are included in the final plan documentation.

3. Informal observations and data collection of trail users and motorists

Data collection and observations of traffic and trail user behavior were taken during the event. A velocity reader was used to gauge the speed of vehicles approaching the RRFB; vehicle, pedestrian, and bicyclist counts were taken, correct use and yielding to the RRFB were observed and recorded, as well as other data and general observations. General summary of data and observations during the demonstration event:

- 12 pedestrians
- 9 bicyclists
- All pedestrians activated RRFB to cross
- 2 bicyclists activated RRFB to cross
- Vehicle yield rate to RRFB was 89 percent
- Speeds captured ranged from 15-55 mph (posted speed is 35 mph)
    - Average speed – 37 mph
    - 50th percentile – 50 mph
    - 85th percentile – 43 mph
    - Average speeds were higher for vehicles traveling eastbound on Nursery Road

Lessons Learned

This was the first collaboration of Forward Pinellas with the City of Clearwater and Pinellas County to host an educational event at a new RRFB. While the event overall was a success, there were elements that could be improved and other elements that were unexpected, like record temperatures in October.

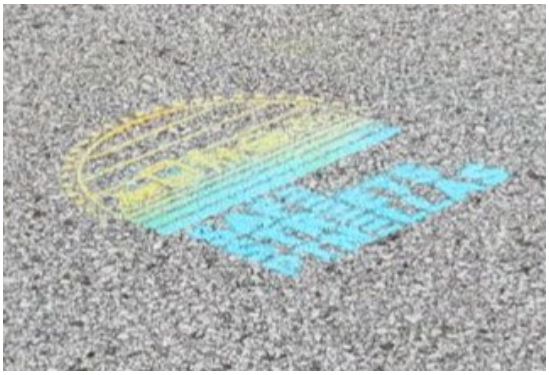
Successes

- RRFB was installed and operational as scheduled prior to the event
- Memorial sign was installed prior to the event to family specifications
- Materials developed for this event are available for future events
- High yield rate suggests a positive impact of the RRFB, and is consistent with other published data on the benefits of RRFBs

Opportunities for Refinement

- Event activities and visibility may have impacted speed and behaviors; vehicles may have traveled slower and yielded at higher rates due to the level of activity during the event, meaning that the observed yielding rates may not reflect typical conditions, and more typical travel speeds could be higher that documented. Plan for data collection to occur separate from a large event that could skew results.
- Low use of RRFB by bicyclists may indicate the placement of the buttons may not be convenient to the travel path of the trail. Push buttons are typically placed to maximize visibility by people driving (near-side of crossing) which is a less convenient place for people who are bicycling to activate. At other crossings, installation of dual push buttons could be considered as well as passive activation, meaning the trail user does not need to push the button. However, these design treatments tend to significantly add to the cost of device installation and could reduce the number of locations where safety devices are installed.
- Other treatments that could be considered paired with an RRFB include speed feedback signs, additional pavement markings and advanced warning signs, and the potential for targeted enforcement. A more expansive treatment would be to widen the roadway in the vicinity of the crossing to provide a median refuge as a way to introduce horizontal deflection in the path of vehicle travel, and allow people who bicycle and walk to cross one lane of travel at a time. However, those types of improvements can often require reconstruction of the roadway.

Event Photos



This completes our summary of the Nursery Road demonstration project. Please call Kathrin Tellez at (321) 754-9902 if you have questions.

Memorandum

Date: July 14, 2020

To: Sarah Caper, Forward Pinellas

From: Kathrin Tellez, Fehr & Peers
Laura Herrscher, PGA
Peyton McLeod, PGA

Subject: Safe Streets Pinellas Nursery Road Demonstration Project Concept

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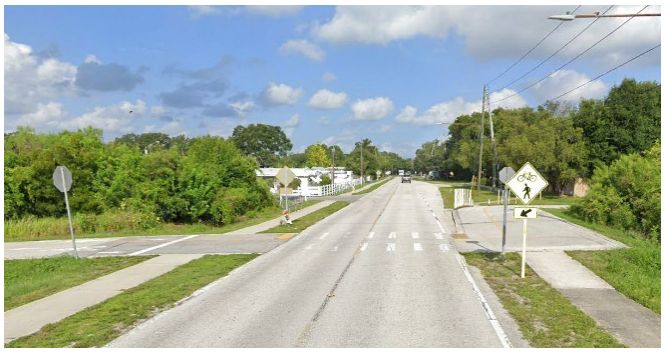
Introduction

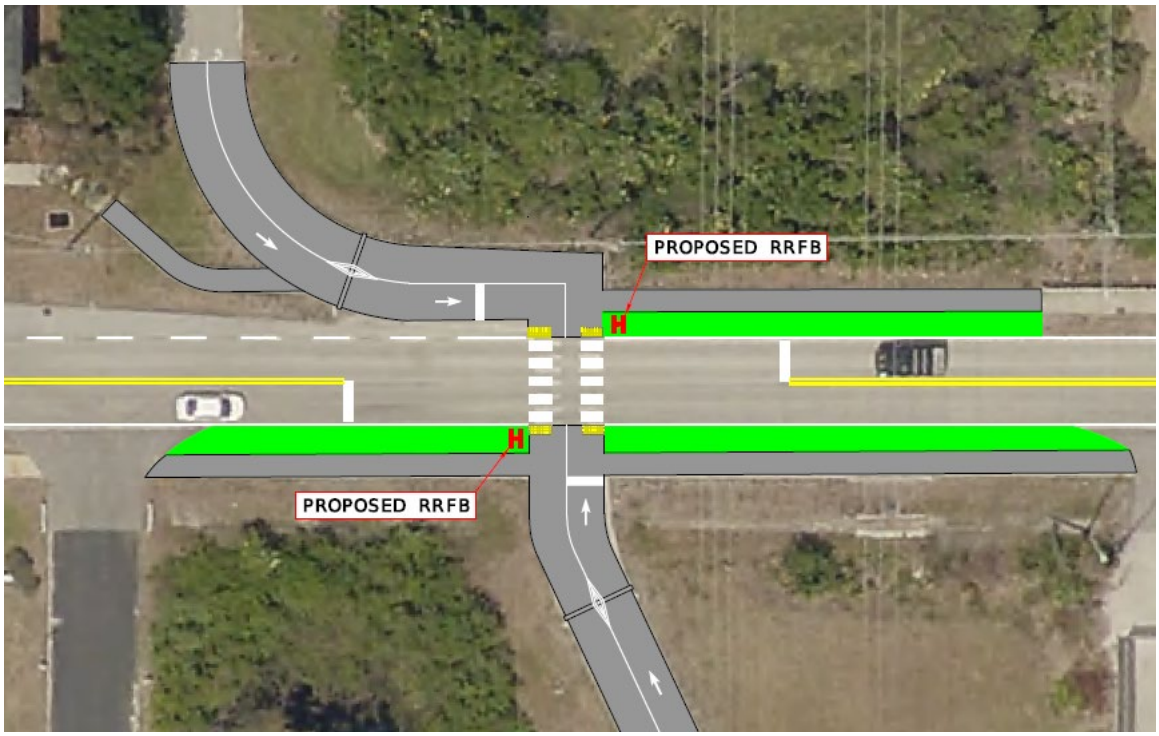
Up to four demonstration projects are scheduled to be developed and implemented as part of Safe Streets Pinellas. The goal of these demonstration projects is to build interest around Vision Zero by showcasing different transportation safety projects and transportation safety campaigns can be implemented in Pinellas County, and to test potential countermeasures that could be included in the Vision Zero Action Plan. The nature of the demonstration projects will be varied and incorporate a range of elements. Discussion with the project Task Force and Forward Pinellas staff, and review of historical collision data, led to interest in conducting a demonstration project at trail crossings. Based on a review of the collision data, and conversations with Pinellas County and City of Clearwater staff, the Duke Energy Trail crossing of Nursery Road (Figure 1) was identified as a candidate demonstration project location.

Figure 1. Duke Energy Trail Crossing at Nursery Road



Pinellas County and the City of Clearwater are planning to install a rectangular rapid flashing beacon (RRFB) at this location using the County's standard design plans for RRFBs. This installation was identified after a May 2019 collision in which a bicyclist was killed while crossing Nursery Road at the Duke Energy Trail. As part of the research conducted to determine the appropriateness of an RRFB at this location, the County collected extensive data that includes video-based trail user counts by mode, motor vehicle speed, and volume data for Nursery Road at the trail crossing. Preliminary discussions with County staff indicate installation of the RRFB could be coordinated with the demonstration project. A concept plan of the standard RRFB design at the crossing is shown as Figure 2.

Figure 2. Preliminary RRFB Concept



The following summarizes an evaluation of the crossing to identify if an RRFB is the most appropriate crossing treatment, and if there are other crossing treatments that could be paired with installation of an RRFB. Following the evaluation, two demonstration project options are outlined for consideration by Forward Pinellas, Pinellas County and the City of Clearwater, followed by a discussion of next steps.

Crossing Evaluation

As shown on Figure 1, Nursery Road is a two-lane roadway. It has a posted speed limit of 35 miles per hour, and based on data collected in 2019, the average daily traffic volumes on Nursey Road at the crossing are approximately 6,500 vehicles per day. Average speeds for vehicles approaching the crossing are in-line with the speed limit of 35 miles per hour; however, the 85th percentile speed of vehicles approaching the crossing is 40 miles per hour. On a typical summer

day, between 20 and 50 pedestrians and between 20 and 75 bicyclists cross Nursery Road at the Duke Energy Trail (variation due to day of week and weather).

Operations of the trail crossing were evaluated to confirm the appropriateness of the previously identified RRFB and identify other potential candidate crossing treatments. For this assessment, we used the Xwalk+ tool developed by Fehr & Peers based on research from the National Cooperative Highway Research Program, Federal Highway Administration, Institute of Transportation Engineers' (ITE) Pedestrian/Bicycle Council, and interviews with various cities throughout the country. The tool combines academic research on crosswalk treatment effectiveness with national best practices. Key inputs for the tool are noted below, with the inputs used for this analysis noted in parenthesis:

- speed limit (or observed speed if available) (40 miles per hour)
- crossing volume (15 pedestrians/bicyclists in peak hour)
- roadway volumes (650 vehicles in peak hour)
- crossing distance (20 feet)
- number of lanes (2 lanes)
- presence of bicyclists (yes)
- presence of transit (no)
- presence of a median (no)
- presence of on-street parking (no)
- expected motorist compliance (yielding) (moderate)

Based on the results of the assessment (analysis worksheet is attached), the level of service (LOS) for pedestrians and bicyclists crossing Nursery road is poor (LOS F), primarily due to the prevailing speed of vehicles traveling on Nursery Road. Results of the analysis indicate that a RRRB is an appropriate crossing treatment, that could also be paired with high visibility crosswalk markings, advance yield lines and advance signage for maximum benefit. A demonstration project on Nursery Road at the Duke Energy Trail could incorporate some or all of these elements, in addition to an educational component.

Demonstration Project Options

Two options are proposed for a demonstration project at this location. Option 1 would tie the demonstration project to the installation of the RRFB and include educational and awareness components. Option 2 includes temporary installation of safety countermeasures and an educational event to raise awareness of pedestrian and bicyclist safety. The second option is provided in the event that installation of the RRFB is scheduled beyond the 2020 calendar year with Option 1 being the preferred demonstration project option.

Option 1 - Coincides with RRFB Installation

Based on the initial conversation with staff from Forward Pinellas, Pinellas County, and City of Clearwater, installation of the RRFB could occur within the next three to six months. An education and awareness campaign centered on the installation itself would raise awareness about the proper use of RRFBs. Since observational data was recently collected, this option offers an opportunity to conduct a before and after study of data.

Phase 1 (before RRFB installation)

- Review and summarize previously collected volume (trail and road) and speed data, including notable findings such as speed by direction, trail volume, and time of day user counts to identify nighttime and use of the trail after closing hours.
- Conduct a motorist yielding study by reviewing existing video footage using an established protocol for what constitutes appropriate yielding behavior.
- Assist with potential refinement of the standard RRFB plan such as identifying other crossing enhancements, additional trail signage and markings, roadway signage and markings, and crossing treatments.
- Coordinate with Pinellas County and City of Clearwater to determine feasibility of temporary enhancements to test during Phase 2. Some temporary features could be:
    - an extended barrier along the north side of the trail to better channelize pedestrian and bicycle movements to the crosswalk
    - a mirror for southbound trail users to aid in the crossing
    - temporary lighting
    - refreshed trail pavement markings if not part of planned improvements
- Prepare a detailed logistics plan for remaining Phase 1 and Phase 2 activities.
- Share pre-event information on social media platforms to raise awareness.
- Encourage Task Force and project ambassadors to share event information with their networks.
- Conduct outreach with Bike/Walk Tampa Bay and other interested advocacy groups.
- Inquire whether family members of the crash victim would like to participate in the event and share their story.
- Invite media to attend and participate.
- Encourage members of these groups, Task Force members, and others to gather at the event to demonstrate a visible presence at the site.

Phase 2 (with RRFB installation)

- Convene a team of event facilitators on site to coordinate the event, collect data, take photos, coordinate social media messaging, and support other needs of the event. Depending on the complexity of the final event, and the number of temporary crossing elements, a minimum of 6 people would be needed to stage the event. For an event with more temporary elements that require set-up, monitoring, and removal, approximately 10-12 people would be needed. It is expected that the event would include Forward Pinellas staff, local government staff, task force members, and consultant staff members.
- Prepare and disseminate educational materials about how to use the RRFB. Other related educational materials could also be handed out.
- Conduct trail volume counts while on-site to supplement existing data, use for event documentation, and inform elements of the before and after study.
- Prepare a trail user survey to gather input and feedback
- Prepare and staff an “energizing station”

    - Stock table with water, snacks, Safe Streets Pinellas project information, and general safety materials.
    - Hand out survey cards with website and information about completing the survey. Survey responses will provide useful information such as origin and destination of trail trips, trip purpose, demographics, user knowledge of RRFBs, desired trail system improvements, other safety concerns, etc.

Phase 3 (after RRFB installation)

- Conduct a second motorist yielding study and compare results to Phase 1 findings. It is not recommended to conduct this task during Phase 2 to avoid effects related to the awareness event.
- Prepare report summarizing before and after study findings, notable trends, event participation with performance measurements, and survey results.

Option 2 - Temporary Demonstration Project

Option 2 describes temporary features that can be installed prior to the RRFB if it appears the timing of Pinellas County's project will not coincide with the schedule and pace of the Safe Streets Pinellas project. Many elements are the same as Option 1 and will inform the final Safe Streets Pinellas improvement plan.

Phase 1

- Review and summarize previously collected volume (trail and road) and speed data, including notable findings such as speed by direction, trail volume, and time of day user counts to identify nighttime and use of the trail after closing hours.
- Conduct a motorist yielding study by reviewing existing video footage using an established protocol for what constitutes appropriate yielding behavior.
- Assist with potential refinement of the standard RRFB plan such as identifying other crossing enhancements, additional trail signage and markings, roadway signage and markings, and crossing treatments.

  Through the course of contributing to the design, we would identify crossing elements that could be installed on a temporary basis, including advanced stop markings, Safe Streets Pinellas logo on the crossing approach, additional trail channelizers to discourage street crossings outside of the crossing, median signage indicating that vehicles must yield to pedestrians within the crosswalk.

  Pending the resources of partner agencies, a speed trailer could be staged on Nursery Road in advance of the crossing to alert drivers to their travel speed during the event. If available, temporary signage could also be installed for the duration of the demonstration. All materials for the demonstration project would be selected to be temporary in nature and allow for an evaluation for a more permanent installation.

- Prepare a detailed logistics plan for remaining Phase 1 and Phase 2 activities, based on the final design of temporary crossing elements.
- Share pre-event information on social media platforms to raise awareness.
- Encourage Task Force and project ambassadors to share event information with their networks.
- Conduct outreach with Bike/Walk Tampa Bay and other interested advocacy groups.
- Inquire whether family members of the crash victim would like to participate in the event and share their story.

- Invite media to attend and participate.
- Encourage members of these groups, Task Force members, and others to gather at the event to demonstrate a visible presence at the site.

Phase 2 (without RRFB installation)

- Convene a team of event facilitators on-site to implement the temporary design identified in Phase 1. As more elements are expected to be temporary in nature, it is expected that up to 10-12 people might be needed to stage the event and will include Forward Pinellas staff, local government staff, task force members, and consultant staff.
- Share information about permanent improvements planned for the crossing.
- Conduct trail volume counts while on site to supplement existing data, use for event documentation, and inform elements of the before and after study.
- Prepare a trail user survey to gather input and feedback
- Prepare and staff an “energizing station”
    - Stock table with water, snacks, Safe Streets Pinellas project information, and general safety materials.
    - Hand out survey cards with website and information about completing the survey. Survey responses will provide useful information such as origin and destination of trail trips, trip purpose, demographics, user knowledge of RRFBs, desired trail system improvements, other safety concerns, etc.

Phase 3 (Design Feedback)

- Prepare report summarizing event participation with performance measurements, survey results, and assessment of effectiveness of temporary crossing elements.
- Contribute to the final design of crossing treatments based on feedback from the demonstration project.

Next Steps

We welcome discussion about each demonstration project option. Once an option has been selected, we will begin with Phase 1 planning.

The schedule for Option 1 will largely depend on coordination with Pinellas County and City of Clearwater staff, availability of preliminary design plans, and the potential schedule of RRFB installation. The schedule for Option 2 would be dependent on partner availability to select a date, and provide feedback on temporary measures, but could be implemented within 2 months.

Following review and discussion with partner agencies a final plan with details on needed materials, volunteers and event logistics will be prepared.

Attachment:

Trail Crossing Assessment

XWalk+

Location Nursery Road at Duke Energy Trail

User Kathrin Tellez

Date : 7-14-2020

Type Uncontrolled Intersection

Input Parameters	Value
Speed Limit	40
Peak Hour Pedestrian Vol	15
Major Road Peak Hour Volume Total	650
Major Road Peak Hour Vol Dir 1	300
Major Road Peak Hour Vol Dir 2	350
Avg Pedestrian Walking Speed	3
15th Percentile Crossing Speed	3
Ped start-up/end clearance time	5
Pedestrian Crossing Distance	20
1st Half Crossing Distance	10
2nd Half Crossing Distance	10
Number of Lanes	2
Actual Total Pedestrian Delay	0
Expected Motorist Compliance	Moderate

Intersection Characteristics	Yes	No
Frequent at-grade transit?	○	●
Bicycle lanes?	○	●
Heavy bicycle traffic?	●	○
Major/minor road intersection?	○	●
Midblock/off-set intersection?	●	○
Heavy truck traffic?	○	●
Existing infrastructure limit treatments?	○	●
On-street parking?	○	●
Downtown area?	○	●
Built-up area of an isolated community?	○	●
Median refuge island?	○	●
Sufficient width for a median?	○	●

1 of 2 Recommendations

Overhead Flashing Beacon or In-Pavement Flashers

TREATMENT IDENTIFICATION MATRIX FOR UNCONTROLLED LOCATIONS

PEDESTRIAN LEVEL OF SERVICE	EXPECTED MOTORIST COMPLIANCE		
	LOW (or Speed > 35 MPH)	MODERATE	HIGH
LOS A-D (average delay up to 30 seconds)	**LEVEL 3** 2 Lane Road: In-Pavement Flashers, Overhead Flashing Beacons Multi-Lane Road: RRFB Plus LEVELS 1 and 2	**LEVEL 2** Curb Extentions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge Plus LEVEL 1	**LEVEL 1** High Visibility Crosswalk Markings, Advanced Yield Lines, Advance Signage
LOS E-F (average delay greater than 30 seconds)	LEVEL 4 PHB*, RRFB, or Direct Pedestrians to Nearest Safe Crossing Plus LEVELS 1, 2, and 3	**LEVEL 3** 2 Lane Road: In-Pavement Flashers, Overhead Flashing Beacons Multi-Lane Road: RRFB Plus LEVELS 1 and 2	**LEVEL 2** Curb Extentions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge Plus LEVEL 1

Signalized or Unsignalized Crossing?	Unsignalized Crossing
Pedestrian LOS	F
Candidate Pedestrian Treatment Identified	**Overhead Flashing Beacon or In-Pavement Flashers**
Candidate for Median Refuge Island?	NO
Candidate for Road Diet?	NO
Other Treatments for Consideration**	RRFB
Paired Treatments for Consideration**	Curb Extensions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge, High Visibility Crosswalk Markings, Advance Yield Lines, Advance signage

Memorandum

Date: February 8, 2021

To: Sarah Caper, Forward Pinellas

From: Kathrin Tellez, Fehr & Peers

Subject: Safe Streets Pinellas Alt Route 19 at Curlew Road Near-Miss Analysis

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Introduction

This memorandum presents the results of a near-miss analysis conducted for the intersection of Alt Route 19 at Curlew Road in Dunedin. Near misses are defined as potentially high-risk interactions between roadway users that did not result in a crash. Combined with collision data, near-miss information can provide additional insights in understanding intersection safety concerns and identifying countermeasure strategies that not only address the observed collision causes, but underlying causes. The near-miss analysis was conducted as part of the Safe Streets Pinellas Vision Zero effort to provide proof of concept for near-miss technology, as well as help inform safety countermeasures that could be implemented at the intersection.

Existing Conditions

Alt Route 19 (also known as State Route 595) is a two-lane undivided highway with a posted speed limit of 40 miles per hour. There are bicycle lanes in both directions on Alt Route 19. Daily traffic volumes on this roadway are approximately 21,500 south of Curlew Road, and 16,000 north of Curlew Road. The Fred Marquis Pinellas Trail parallels Alt Route 19. This trail connects to the larger Pinellas Trail Loop and connects the area to Pasco County in the north as well as to the southern parts of Pinellas County.

Curlew Road is a two-lane divided highway with a center left-turn lane with a posted speed limit of 35 miles per hour. At the approach to Alt Route 19, a transition starts for westbound traffic to add a second travel lane. To the west of Alt Route 19, Curlew Road continues as Causeway Boulevard, a four-lane divided roadway with added turn lanes at intersections and a landscaped median. Typical daily traffic volumes on Curlew Road are approximately 14,200, and on Causeway Boulevard, daily volumes are approximately 10,000. Vehicle volumes are slightly lower on Saturdays and slightly higher on Sundays as compared to weekdays.

Recent bicycle/pedestrian counts collected at the intersection, which includes the Fred Marquis Pinellas Trail, indicate that based on 8-hours of data collection, at least 700 bicyclists and pedestrian cross the intersection on a weekday, 950 on a Saturday and 1,400 on a Sunday. This bicycle / pedestrian data was collected prior to the COVID-19 stay at home orders. Trail counts (permanent trail count station is located about 3/4th of a mile south of intersection on Alt Route 19 at Michigan Boulevard) from August 2020 show about 1,400 bicyclist and pedestrian crossings on weekends, and between 550 to 1,000 bicyclist and pedestrian crossings on weekdays, with lower volumes during periods of inclement weather.

The intersection of Alt Route 19 at Curlew Road is signalized, with the northbound, eastbound and westbound left-turns operating with permitted/protected phasing. To improve safety for Fred Marquis Pinellas Trail users, the southbound left-turn movement operates with protected phasing only, meaning that the left-turn movement does not operate concurrently with the trail crossing. There are also blank out “no right-turn arrow” signs for both the northbound and eastbound right-turn movement.

On average, there are between 30 and 45 reported collisions at the intersection each year, with five to six collisions per year resulting in severe injuries. Feedback from the community related to transportation safety at the intersection are mainly on the theme of bicyclist and pedestrian conflicts with people who drive, including:

- We need an overpass at this intersection for pedestrians and bicycles
- We need to move stop bars back, improve crosswalk visibility, provide pedestrian scale lighting and restrict right on red for all four approaches
- Drivers continue to turn despite no turn on red signal, placing trail users in danger. Maybe if flashing red lights were added it would help
- Westbound Curlew drivers frequently make right turns on red at Alt 19 northbound. Propose a lighted "no turn" sign similar to the one for North Bound Alt 19 and eastbound Curlew. The failure of drivers to obey the No Right on Red sign places users of the Pinellas trail at risk.
- The intersection of Curlew and the Causeway is highly trafficked and dangerous when crossing in any direction. Due to the Pinellas Trail crossing here as well the existing crosswalk system just isn’t enough to leave pedestrians feeling safe when crossing
- Intersection is EXTREMELY busy with traffic coming from all four directions, and bike/ped traffic on the Pinellas Trail as well as the Honeymoon Island Trail spur.

Existing collision data was reviewed for the intersection, representing all reported collisions at or within 50-feet of the intersection between 2015 and September 2020 (data available as of November 2, 2020). Not all collisions that occur within the intersection influence area (can be several hundred feet from the intersection) are included in the summary tables below as the near-miss analysis only includes potential collisions within the physical bounds of the intersection. This may result in the numbers reported below not matching the number of collisions at the intersection reported in other documents.

During this time period, a total of 88 collisions were reported at the intersection, including four that resulted in severe or incapacitating injuries, as shown on **Table 1,** with a collision diagram shown on **Figure 1**. Of the severe injuries, two were people riding motorcycles and two were people within a vehicle. Four collisions involved a person riding a bicycle, and one collision involved a person walking; injuries were not reported in those collisions. Collision types are presented in **Table 2,** which shows that rear-end collision are the most frequent collision types at the intersection (42 percent), followed by angle (14.8 percent), sideswipe (11.4 percent), and left-turn (10.2 percent). A rear-end collision is when the rear of one vehicle impacts the rear of another. An angle crash occurs when two vehicles impact at an angle – for example, the front of one vehicle impacts the side of another vehicle. Sideswipe collisions are when two vehicles traveling in the

same direction impact where the initial engagement does not overlap the corner of either vehicle. The impact swipes along the surface of the vehicle parallel to the direction of travel. Left-turn collision involve at least one vehicle turning left. In most instances, the other vehicle is traveling straight. **Table 3** presents contributing factors, which primarily include people driving in a negligent manner (41 percent), unknown or no information (28 percent), failing to yield right-of-way (10 percent), and following too closely (9 percent).

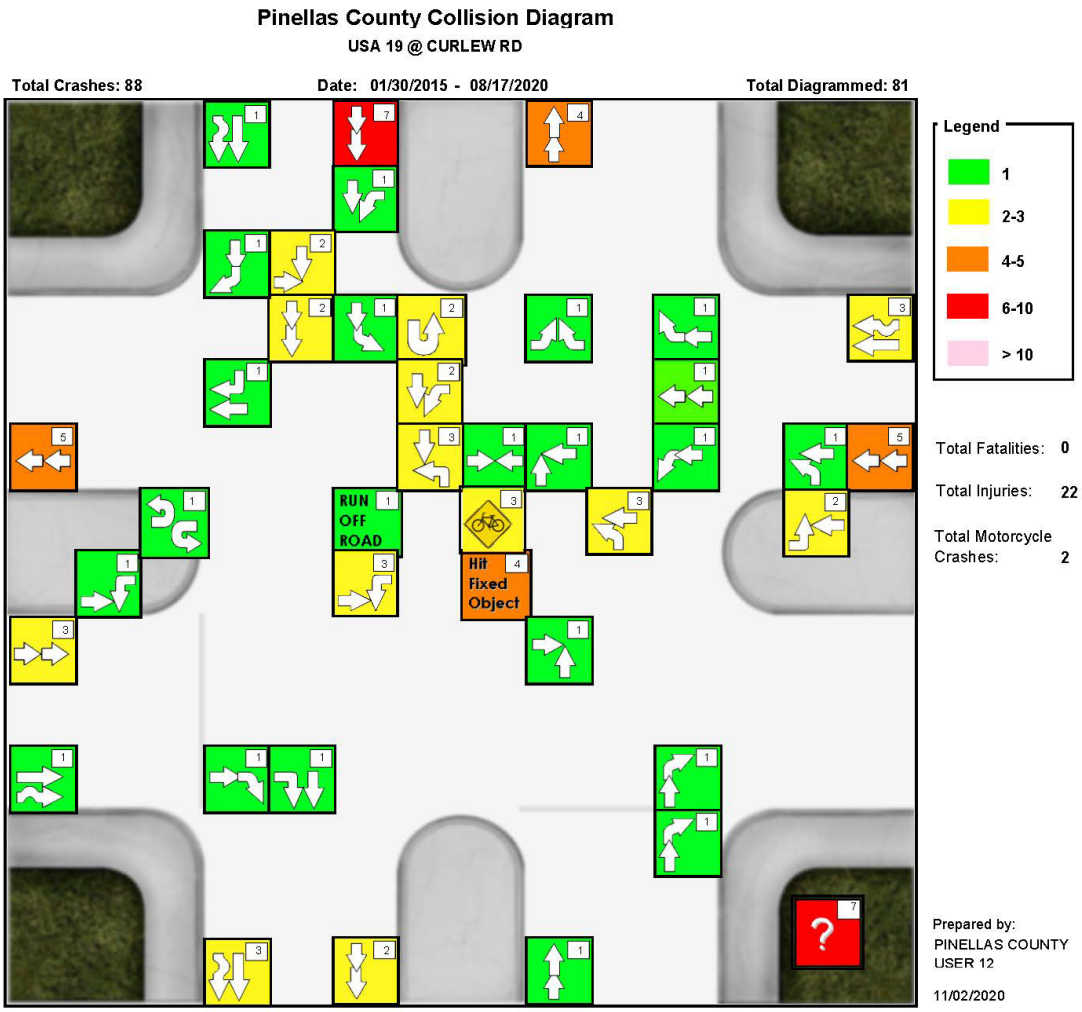

Figure 1 – Alt Route 19 at Curlew Road Collision Diagram (2015 – September 2020)

Table 1. Alt Route 19 at Curlew Road Collision Summary (January 2015 – September 2020)

Total	Fatal	Incapacitating	Possible Injury	Non-Incapacitating	None	Bicyclist	Pedestrian	Motorcycle
88	0	4	20	10	54	4	1	2 (both incapacitating)

Source: Fehr & Peers, Pinellas County CDMS.

Table 2. Alt Route 19 at Curlew Road Collision Type Summary (January 2015 – September 2020)

Angle	Bike	Head-on	Hit Fixed Object	Left-turn	Rear-end	Right-turn	Run off Road	Sideswipe	Single vehicle	Unknown	U-turn
13	3	3	4	9	37	2	1	10	1	2	3
14.8%	3.4%	3.4%	4.5%	10.2%	42.0%	2.3%	1.1%	11.4%	1.1%	2.3%	3.4%

Table 3. Alt Route 19 at Curlew Road Collision Contributing Factor Summary (January 2015 – September 2020)

Disregard Signs	Failed to keep in lane	Failed to yield ROW	Followed too Closely	Improper Backing	Improper Turning	Operated Vehicle in Negligent Manner	Run Off Road	Ran Red Light	Other	None	Unknown
1	2	9	8	1	1	36	1	4	5	13	7
1.1%	2.3%	10.2%	9.1%	1.1%	1.1%	40.9%	1.1%	4.5%	5.7%	14.8%	8.0%

Source: Fehr & Peers, Pinellas County CDMS.

While the collision data provides useful information related to the types of collisions that are occurring at the intersection, over 25 percent of reported collisions do not have information related to factors that contributed to the collision, and over 40 percent of collisions had driver behavior as a contributing factor. The near-miss data provides an opportunity to determine if there are more nuanced casual factors that could help inform intersection countermeasures.

Near Miss Analysis

To better inform the types of safety improvements that could be implemented at the intersection, a near-miss technology vendor was retained to collect and evaluate high definition video of the intersection to identify specific types of near-misses that are occurring. The firm Street Simplified collected video count data at the intersection over an approximately 4-day period in August 2020, including Saturday, Sunday and Monday operations. In total, the interactions between 91,900 people driving vehicles and 3,800 people walking and bicycling was captured. An additional 24-hours of weekday data was collected in October 2020, which captured the interaction between 28,2300 people driving vehicles and 880 people walking and bicycling. Between the August and October data collection windows, cycle lengths at the intersection were reduced by about 25 percent.

In addition to capturing the multi-modal count of each roadway user by movement, the automated video analytics catalog the speed of each roadway users, roadway user traveling through or across intersection when they do not have the right-of-way (red-light running), and every time two road users (bikes, pedestrians, or vehicles) cross paths (i.e., an interaction) and records the following information:

- Time between the arrival of both road users at a common point; this is referred to as Post Encroachment Time (PET)
- Speed of each road user
- Count of interactions
- Which road user arrived first
- Video of the interaction for further review

During August the data collection window, 360 people, representing about 0.75 percent of people driving through the intersection, were observed driving their vehicle through the intersection 10 or more miles in excess of the speed limit of 40 miles per hour on Alt Route 19 and 35 miles per hour on Curlew Road (with the southbound and westbound through movements accounting for the majority of speeding movements), 60 people who were driving ran the red light (0.07 percent of people driving), and 61 people who were bicycling or walking crossed when they did not have the crossing signal (1.6 percent of people walking or bicycling). Of the drivers whose vehicle was classified as running the red light, all vehicles were able to clear the intersection during the all-red phase. Many were traveling in excess of the posted speed limit. During the October data collection window, fewer people were observed driving through the intersection 10 or more miles in excess of the posted speed limit with 0.24 percent. The number of people driving, walking and bicycling who were classified as running the red light was similar to the August data collection period.

The PET value is an indicator of how close two roadway users were to occupying the same space at the same time. The smaller the PET value, the closer roadway users were to colliding. Within the observed data for Alt Route 19 at Curlew Road, the lowest PET value documented was 0.3 seconds for the data collection window. There were 3,003 roadway user interactions with an observed PET value between 0.3 and 5 seconds, or about 3.1 percent of roadway movements. A review of select videos with a PET value between 2 and 5 indicates that many of these

interactions were within expected gap acceptance given the movement, and that interactions with a PET of less than 2 were more problematic. Interactions with a PET less than 2 represent about 0.42 percent of travel through the intersection. The movement and frequency associated with the interactions where the PET is less than 2 is presented in **Table 4. Figures 2 through 4** highlight some of the movement trajectories for movements with the highest potential for near-miss interactions to result in a collision. The data in Table 4 also notes if the roadway user was a person driving a vehicle or a vulnerable roadway user (for this analysis, vulnerable roadway user only includes people who walk or bicycle as the technology was not able to consistently identify people riding motorcycles), as vulnerable roadway users are more likely suffer severe or fatal injuries if involved in a collision with a vehicle.

When reviewing the data in this table it is important to keep in mind the order of roadway user arrival. Take for example the interaction with the highest number of near misses, the southbound through movement and the opposing northbound left (107 interactions). As the southbound through movement occurred first and the northbound left-occurred second, most of these near-misses were left-turning vehicles waiting for a gap in traffic and turning after the opposing through movements cleared the intersection and created a gap. This is a similar circumstance for the other interactions where the through movement precedes the left-turn movement. No countermeasures were identified for these near misses.

For this same movement pair (southbound through and northbound left), there were 16 instances when the northbound left-turn movement was the first motion, and the southbound through was the second motion, meaning that a through vehicle almost collided with a left-turning vehicle. Should a collision occur, the average vehicle speed of 40 miles per hour for the vehicles making the southbound through movement indicates that there is a high likelihood for the collision to result in a severe injury or fatality for vehicle occupants. This is similar for the eastbound and westbound lefts. Since the southbound left-turn phase is protected, no vehicle-vehicle near misses were reported. There was a vehicle-vulnerable roadway user near-miss; however, in that instance, the vulnerable roadway user started crossing behind the vehicle and was not at risk for being struck.

Comparing the location of actual collisions to the location of near-misses, nine of the reported collisions involved a permitted left-turn movement and a through movement, meaning that the near-miss analysis is reflective of observed collision data. For collisions involving permissive left-turn movements, no severe or fatal injuries occurred. Other observed near-misses correlate to angle collisions, especially in the southeast and southwest corners of the intersection.

Comparison of the interactions between the August 2020 and October 2020 with problematic PETs shows the same top-three movement conflicts as presented in Table 4. Numerous problematic interactions that were observed August 2020 were not observed in October 2020. This is likely due to the smaller sample size in October versus a change in behavior as a result of the signal timing change. Additionally, as the October data was reflective of weekday conditions and August data was primarily reflective of weekend conditions, there could also be differences in weekday and weekend travel patterns, like more non-recurring trips through the intersection on weekends that may not be as familiar with intersection operations, and less congestion that could encourage higher travel speeds on weekends. Although the length of the traffic signal cycle was reduced between the August and October data collection periods, it is difficult to draw any conclusions about the effect of that change. For future studies where calculating effect of the change is desired, it is recommended that multiple days of data be collected and that data is collected on the similar days of the week (compare weekday conditions to weekday conditions).

Table 4. Alt Route 19 at Curlew Road Near-Miss Interaction Summary – PET < 2 seconds (Various Days in August 2020)

Count of Interaction	Motion 1 Movement	Motion 1 Mode	Motion 2 Movement	Motion 2 Mode	Average PET	Lowest PET	Average Speed Motion 1	Average Speed Motion 2
107	Bayshore Blvd (SB)-Through	Vehicle	Bayshore Blvd (NB)-Left	Vehicle	1.57	0.30	35.0	14.4
83	Causeway Blvd (EB)-Through	Vehicle	Curlew Rd (WB)-Left	Vehicle	1.52	0.50	27.9	14.2
51	Curlew Rd (WB)-Through	Vehicle	Causeway Blvd (EB)-Left	Vehicle	1.50	0.90	32.0	14.5
19	Bayshore Blvd (NB)-Right	Vehicle	Causeway Blvd (EB)-Through	Vehicle	1.54	0.60	17.3	30.6
16	Bayshore Blvd (NB)-Left	Vehicle	Bayshore Blvd (SB)-Through	Vehicle	1.56	0.50	16.2	40.4
14	Causeway Blvd (EB)-Left	Vehicle	Curlew Rd (WB)-Through	Vehicle	1.72	1.20	16.2	36.2
14	Curlew Rd (WB)-Left	Vehicle	Causeway Blvd (EB)-Through	Vehicle	1.73	0.80	15.8	31.9
13	Bayshore Blvd (NB)-Right	Vehicle	Bayshore Blvd (SB)-Left	Vehicle	1.79	1.10	17.8	20.0
10	Curlew Rd (WB)-Right	Vehicle	Causeway Blvd (EB)-Left	Vehicle	1.62	0.90	15.3	17.4
9	Bayshore Blvd (NB)-Right	Vehicle	East Crosswalk	Vulnerable[1]	1.58	0.40	17.4	7.4
8	Causeway Blvd (EB)-Right	Vehicle	Curlew Rd (WB)-Left	Vehicle	1.78	1.60	15.9	20.1
8	Causeway Blvd (EB)-Through	Vehicle	East Crosswalk	Vulnerable	1.40	0.90	31.2	8.0
5	Bayshore Blvd (SB)-Right	Vehicle	Bayshore Blvd (NB)-Left	Vehicle	1.84	1.60	15.5	18.3
5	Curlew Rd (WB)-Left	Vehicle	South Crosswalk	Vulnerable	1.68	0.90	17.1	10.8

Count of Interaction	Motion 1 Movement	Mode	Motion 2 Movement	Mode	Average PET	Lowest PET	Average Speed Motion 1	Average Speed Motion 2
4	Bayshore Blvd (SB)-Left	Vehicle	East Crosswalk	Vulnerable	1.75	1.50	19.1	9.1
3	Bayshore Blvd (SB)-Right	Vehicle	Curlew Rd (WB)-Through	Vehicle	1.90	1.90	16.7	26.6
3	Causeway Blvd (EB)-Left	Vehicle	North Crosswalk	Vulnerable	1.83	1.70	18.2	8.6
2	Causeway Blvd (EB)-Right	Vehicle	Bayshore Blvd (SB)-Through	Vehicle	1.55	1.30	17.1	28.9
2	Causeway Blvd (EB)-Right	Vehicle	Curlew Rd (WB)-Left	Vulnerable	1.20	0.60	14.3	12.7
2	Curlew Rd (WB)-Right	Vehicle	Bayshore Blvd (NB)-Through	Vehicle	1.35	1.20	18.8	24.9
2	Curlew Rd (WB)-Through	Vehicle	East Crosswalk	Vulnerable	1.70	1.40	43.5	10.3
1	Bayshore Blvd (NB)-Left	Vehicle	South Crosswalk	Vehicle	1.20	1.20	19.5	7.1
1	Bayshore Blvd (NB)-Through	Vehicle	North Crosswalk	Vulnerable	1.90	1.90	36.0	10.5
1	Causeway Blvd (EB)-Through	Vehicle	Bayshore Blvd (SB)-Through	Vehicle	2.00	2.00	24.6	13.7
1	East Crosswalk	Vulnerable	Bayshore Blvd (NB)-Right	Vehicle	2.00	2.00	15.0	18.1
1	Curlew Rd (WB)-Right	Vehicle	North Crosswalk	Vulnerable	2.00	2.00	16.5	7.3
1	Curlew Rd (WB)-Through	Vehicle	Bayshore Blvd (NB)-Through	Vulnerable	0.50	0.50	31.5	9.9

Note: 1. For this analysis, vulnerable roadway user only includes people who walk or bicycle

Source: Fehr & Peers, Street Simplified.

Figure 2 All Near Misses with PET < 2.0 (August 23 and 24)

Figure 3 Northbound Right-Turn Near Misses with PET < 2.0 (August 23 and 24)

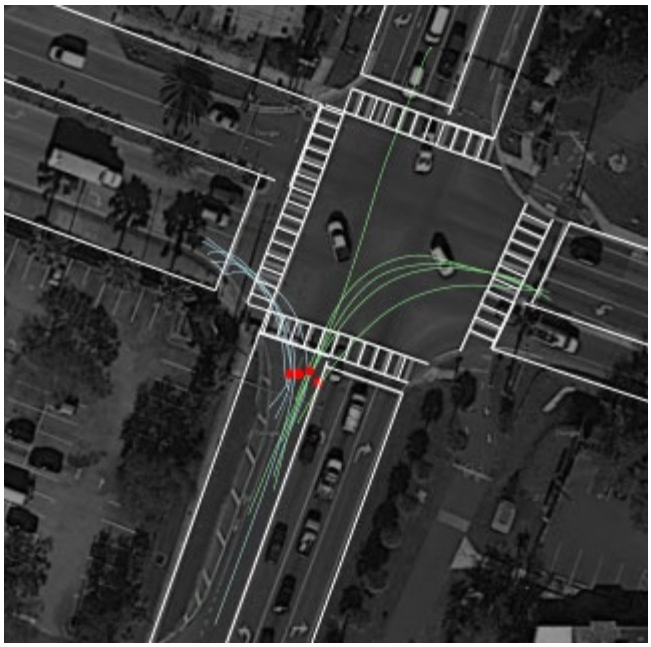

Figure 4 Eastbound Right-Turn Near Misses with PET < 2.0 (August 23 and 24)

Based on our review of the reported collision data, feedback from the public and near-miss analysis, we offer the following key findings and recommendations:

- Long cycle lengths may be a contributing factor to people driving, people walking and people bicycling running red lights. Consider reducing cycle length (In October 2020, the County reduced average cycle lengths by approximately 24 percent, reducing delay for people walking or bicycling, as well as for many for vehicle movements).
- Permitted left-turn movement conflicts with opposing through movements is one of the most prevalent near-miss interactions and represents about 10 percent of collisions. Consider eliminating permitted phasing, especially during off-peak hours, when bicycle and pedestrian volumes are the highest, and at night when the added capacity of the permitted-protected phasing is not needed, and sight distance can be limited.
- Northbound right-turn vehicles turning in front of eastbound through vehicles and southbound left-turn vehicles is also a prevalent near-miss. Given the northbound right-turn prohibitions during portions of the northbound through green phase, people who drive may be accepting smaller gaps to complete the northbound right-turn movement. Consider adding a northbound right-turn overlap that runs concurrent with the westbound left-turn movement (westbound U-turn movements are already prohibited).
- Vehicles traveling Westbound on Curlew Road and Southbound on Bayshore Boulevard are five times more likely to be traveling more than 10 miles per hour over the speed limit as they travel through the intersection than the northbound or eastbound through movements. There are a variety of contributing factors, including the distance from other signalized intersections and the widening of Curlew Road to provide two westbound travel lanes about 900 feet east of the intersection. Consider the installation of advanced signage altering people who drive that a signalized intersection is ahead, or solar powered speed feedback signs to alert people who drive that they are traveling in excessive of the posted speed limit.

This concludes our near-miss assessment of the Alt Route 19 at Curlew Road intersection. Please contact Kathrin Tellez at (321) 754-9902 if you have questions.

Memorandum

Date: July 23, 2020

To: Sarah Caper, Forward Pinellas

From: Kathrin Tellez, Fehr & Peers

Subject: Safe Streets Pinellas Alt Route 19 at Curlew Road Demonstration Project Concept

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Introduction

Up to four demonstration projects are scheduled to be developed and implemented as part of Safe Streets Pinellas. The goal of these demonstration projects is to build interest around Vision Zero by showcasing how different transportation safety projects and transportation safety campaigns can be implemented in Pinellas County, and to test potential countermeasures that could be included in the Vision Zero Action Plan. The nature of the demonstration projects will be varied and incorporate a range of elements.

Discussions with the project Task Force, Forward Pinellas staff, and FDOT staff, as well as feedback from the community, led to interest in conducting a near miss assessment of the intersection of Alt Route 19 at Curlew Road in Dunedin, which also includes a trail crossing of the Fred Marquis Pinellas Trail. Although this intersection is not on the draft High Injury Network developed as part of the Safe Streets Pinellas Project, there are 5 to 6 collisions at the intersection each year that result in severe injuries and multiple reports of near-miss collisions involving vulnerable roadway users.

FDOT previously evaluated the provision of an exclusive pedestrian phase at this intersection, and based on the level of vehicle, bicycle and pedestrian volumes, as well as the intersection crossing patterns, FDOT concluded that a pedestrian only phase would not be the most effective treatment at the intersection to improve safety and that other treatments would be evaluated.

The purpose of this memo is to outline steps that could be taken as part of a Safe Street Pinellas Demonstration Project to identify other improvements that could be implemented as well as pilot the use of near miss technology in the County to better identify safety strategies as specific locations. The following describes the existing conditions at the intersection, and outlines the steps that would be taken to conduct the near miss analysis and conduct additional analysis to identify a range of safety improvements, and assess the operational effects of those potential counter measures on overall intersection operations.

Existing Conditions

Alt Route 19 (also known as State Route 595) is a two-lane undivided highway with a posted speed limit of 40 miles per hour. There are bicycle lanes in both directions on Alt Route 19. Daily traffic volumes on this roadway are approximately 21,500 south of Curlew Road, and 16,000 north of Curlew Road.

Curlew Road is a two lane divided highway with a center left-turn lane. At the approach to Alt Route 19, a transition starts for westbound traffic to add a second travel lane. To the west of Alt Route 19, Curlew Road continues as Causeway Boulevard, a four-lane divided roadway with turn-pockets at intersections and a landscaped median. Typical daily traffic volumes on Curlew Road are approximately 14,200, and on Causeway Boulevard, daily volumes are approximately 10,000.

Recent bicycle/pedestrian counts collected at the intersection, which includes the Fred Marquis Pinellas Trail, indicate that based on 8-hours of data collection, at least 700 bicyclists and pedestrian cross the intersection on a weekday, 950 on a Saturday and 1,400 on a Sunday. This data was collected prior to the COVID-19 stay at home orders. During the stay at home period, trail use increased in the Dunedin area by over 100 percent.

The intersection of Alt Route 19 at Curlew Road is signalized, with the northbound, eastbound and westbound left-turns operating with permitted/protected phasing. The southbound left-turn movement operates with protected phasing only. There are also blank out “no right-turn arrow” signs for the both the northbound and eastbound right-turn movement.

On average, there are between 30 and 45 reported collisions at the intersection each year, with five to six collisions per year resulting in severe injuries. Feedback from the community related to transportation safety at the intersection are mainly on the theme of bicyclist and pedestrian conflicts with drivers, including:

- We need an overpass at this intersection for pedestrians and bicycles
- We need to move stop bars back, improve crosswalk visibility, provide pedestrian scale lighting and restrict right on red for all four approaches
- Drivers continue to turn despite no turn on red Signal, placing trail users in danger. Maybe if flashing red lights were added it would help
- West bound Curlew drivers frequently make right turns on red at Alt 19 northbound. Propose a lighted "no turn" sign similar to the one for North Bound Alt 19 and eastbound Curlew. The failure of drivers to obey the No Right on Red sign places users of the Pinellas trail at risk.
- The intersection of Curlew and the Causeway is highly trafficked and dangerous when crossing in any direction. Due to the Pinellas Trail crossing here as well the existing crosswalk system just isn’t enough to leave pedestrians feeling safe when crossing
- Intersection is EXTREMELY busy with traffic coming from all four directions, and bike/ped traffic on the Pinellas Trail as well as the Honeymoon Island Trail spur.

Preliminary analysis was conducted based on traffic volumes collected by FDOT in February/ March 2020, including bicycle, pedestrian and vehicle volumes through the intersection. Based on an initial review of the data, Sunday afternoon is when there are the highest levels of bicycle and pedestrian travel through the intersection. During the Sunday peak hour, the intersection operates at a high LOS D/low LOS E for vehicles, mostly due to long cycle lengths. Implementing a leading pedestrian interval, permanent prohibition of right-turns on red or changing signal phasing to convert one or more protected-permitted left-turns to protected would increase average intersection delay, but could yield safety benefits to other roadway users.

Near Miss Analysis

To better inform the types of safety improvements that could be implemented at the intersection, a near miss technology vendor will be retained to collect and evaluate high definition video of the intersection to identify specific types of near misses that are occurring such that appropriate countermeasures can be identified. The firm Street Simplified has been identified to collect video count data at the intersection for a 48-hour period to include a weekday and a weekend day, and employ their suite of safety analytics to identify potential near miss collisions, red-light running, speeding, and bicycle/pedestrian interactions. Motorcyclists and other roadway users (like scooters and golf-carts) would also be accounted for in the analysis. These analytics are intended to provide insights about what intersection features are potentially contributing to collisions, and what countermeasures might be appropriate for deployment.

Based on the results of the near miss analytics, we will conduct a detailed operations analysis of the intersection based on the higher volume of the count data collected between the prior data collection effort in February/March 2020, and data collected during the near miss data collection reflecting a peak weekday hour and a peak weekend hour for both vehicles and pedestrians/ bicyclists. It is expected that data collected in February/March 2020 could be more representative of typical conditions for vehicles, but July/August 2020 conditions could have higher levels of pedestrian and bicycle activity. We will provide a comparison of February/March and July/August vehicle and non-motorized counts for stakeholder buy-in prior to conducting detailed analysis. Based on the results of the near miss analysis and the intersection operations analysis, we will evaluate the effect of a range of potential counter measures both in terms of the expected safety benefit and their effect on intersection operations.

Based on the results of the assessment, we will develop two sets of countermeasure recommendations – the first would be strategies that could be implemented through signal timing and phasing adjustments such that they could be implemented immediately. The second would be longer-term improvements that may require some level of curb modification, restriping, or other reconfiguration of the intersection.

Should the signal timing and/or phasing adjustments be implemented within a two months of the completion of the assessment, we would then retain Street Simplified to conduct an after assessment to determine if the counter measures were effective in reducing the number of potential near-misses, and to assess if there were unintended consequences associated with the signal timing and/or phasing modification. This evaluation of near-miss technology is intended to serve as a proof-of-concept to deploy near miss technologies at a larger scale as part of the Safe Street Pinellas Action Plan implementation, and other safety related projects in Pinellas County.

Next Steps

Our next steps are to authorize Street Simplified to commence with the data collection, such that the near miss analysis can be completed in combination with the detailed analysis of intersection operations. We expect that we will share the initial results of the near miss analysis with interested stakeholders as we conduct the operations analysis such that the evaluated countermeasures consider a wide range of potential improvements that are of interest to Forward Pinellas, FDOT and Pinellas County.

This completes our initial outline for the near miss demonstration project for Alt Route 19 at Curlew Road.

Memorandum

Date:	October 9, 2020
To:	Sarah Caper, Forward Pinellas
From:	Kathrin Tellez, Fehr & Peers Laura Lockwood-Herrscher, Patel, Greene, and Associates
Subject:	**Safe Streets Pinellas** **1st Avenue S at 2nd Street Protected Intersection Demonstration Project Concept**

Introduction

Several demonstration projects will be developed and implemented as part of the Safe Streets Pinellas project. The goal of these demonstration projects is to build interest around Vision Zero by showcasing how transportation safety projects and transportation safety campaigns can be implemented in Pinellas County and to test safety countermeasures that may be included in the Vision Zero Action Plan. The nature of the demonstration projects is expected to vary and incorporate a range of elements. The concept, process followed, and intended performance measures for each demonstration will be documented in a series of memos and the final Action Plan.

Project Context

The City of St. Petersburg has identified the intersection at 1st Avenue S and 2nd Street S as a location to test the effectiveness of protected intersection concepts, as the intersection incorporates an urban crossing of the Pinellas Trail and has a high volume of bicycle and pedestrian travel that conflicts with turning vehicles. In 2008, the extension of the Pinellas Trail into downtown St. Petersburg opened using a repurposed travel lane along the south side of 1st Avenue S and is Florida's first urban cycle track. This segment of the trail travels within an urban environment along a one-way street with on-street parking and dense intersection spacing. Collision history at this intersection is minimal, but as bicyclists and users of the trail have increased, the potential for additional conflicts with vehicular traffic is rising and numerous close calls have been observed at several intersections along 1st Avenue S. Safety improvements along the trail are under consideration by the City and protected intersection treatments at 5th Street S and 6th Street S have already been designed with initial concepts. A street level Google Maps image of the intersection is provided in Figure 1.

Figure 1 *Source: Google Maps*

Protected intersections improve safety for bicyclists and pedestrians as they cross intersections. Corner islands, curb extensions, and colored paint are used to delineate the bicycle path across an intersection, parallel to the crosswalk and can allow a two-stage left turn. Figure 2 is an example of a protected intersection.

Figure 2 *Source: John Greenfield*

Approach

This demonstration project is intended to help inform City design standards for permanent protected intersections, and provide proof of concept to City staff, decision makers and the public. It will also serve as an example for other communities in Pinellas County. The demonstration project would use nonpermanent materials to install protected crossing elements at the southeast quadrant of the intersection at the location of the Pinellas Trail, and would not change the existing curb line.

Elements are planned to include:

- Physical barriers consisting of temporary curbing (Tuff curb), flexisticks, delineator posts and other approved materials
- Shape, size, and location of curb extensions and corner refuge islands
- Painted elements, such as forward stop bars and colored paint for the crossings
- Signal timing modifications, such as leading bicycle intervals
- Relocation of existing bicycle signal

Several meetings have been held amongst Forward Pinellas Staff, City transportation and engineering staff, and staff from the Safe Streets Pinellas consultant team to further develop the design concept, materials to be used, and duration of the temporary installation. Forward Pinellas and the consultant team will be responsible for developing scaled concept plans with materials specifications. City of St. Pete staff will be responsible for signing and sealing (if needed) the concept plan into a construction document and coordinating with other City departments and/or a contractor to install the demonstration project elements.

Performance Measures

Part of the demonstration project is the collection/documentation of before and after data to determine if the temporary design treatments yield the expected safety benefits. As part of the demonstration, we plan to collect and summarize the following information:

Before Installation

- Review and summarize overall collision history (2015 – 2019)
- Observe driver yielding behavior
- Observe bicyclist and pedestrian behavior
- Conduct spot speed survey of drivers turning from eastbound 1st Avenue S to 2nd Street S

Within Six-Weeks of Installation

- Observe driver yielding behavior
- Observe bicyclist and pedestrian behavior
- Conduct spot speed survey of drivers turning from eastbound 1st Avenue S to 2nd Street S
- Develop user-survey in collaboration with St. Pete and Forward Pinellas staff to solicit feedback from community

Longer-Term Performance Measures

- Review and summarize overall collision history post installation
- Track/monitor frequency of repair and replacement of elements, including the curb elements, delineators, and pavement markings

It is expected that the consultant team will partner with St. Pete and Forward Pinellas Staff for the before and near-term documentation of performance measures, with St. Pete responsible for the documentation of longer-term performance measures, if that information is desired. The before and short-term after performance measures findings will be summarized in a technical memorandum and incorporated into the final Action Plan.

Next Steps

A draft concept plan was presented and discussed on October 1, 2020. Based on that discussion and the feedback received, a refined concept plan is being prepared and will be provided to Forward Pinellas and St. Pete in advance of our next scheduled discussion on October 20, 2020. We expect one final round of revisions to finalize the concept plan and associated materials list.

The before installation performance measures documentation will be scheduled to occur within the next four weeks, with a goal for the consultant team to observe at least 100 interactions and obtain 100 vehicle speeds. A detailed data collection plan will be prepared and shared with St. Pete and Forward Pinellas prior to the commencement of data collection.

The after installation performance measures will be scheduled within six weeks of installation, provided installation occurs prior to December 31, 2020.

Memorandum

Date:	January 18, 2021
To:	Sarah Caper, AICP, Forward Pinellas
From:	Kathrin Tellez, AICP, PTP, Fehr & Peers Laura Herrscher, AICP, PGA
Subject:	**Safe Streets Pinellas Demonstration Project** **1st Ave S @ 2nd St S – St. Petersburg**

Introduction

As part of the demonstration projects developed and implemented as part of the Safe Streets Pinellas project, the installation of a protected intersection concept was identified for the intersection at 1st Avenue S and 2nd Street S in St. Petersburg. The City of St. Petersburg plans to construct the improvement in the next few months. Details of the process and intersection treatment are documented in a technical memorandum dated October 9, 2020. The purpose of this memorandum is to document initial "Before" installation roadway user behavior to compare to "After" installation data.

Data Collection

The Pinellas Trail operates as a two-way cycle track through the urban downtown area in St. Petersburg where there is a high volume of bicycle and pedestrian travel that conflicts with vehicles turning right from 1st Ave S to 2nd St S. On Saturday, November 7, 2020 data and observations were taken between 9 – 10:30 am at the southeast quadrant of the intersection of 1st Ave S and 2nd St S where the improvements will be installed. Data were subsequently collected during several weekday periods throughout December 2020 for a total of approximately three hours. A copy of the data collection instrument is attached.

Collecting this information before the improvement is constructed will provide base level data to compare against after the improvement has been open for use. During the data collection windows, approximately 300 vulnerable roadway users were observed crossing the intersection, and 95 people driving vehicles were observed making the eastbound right-turn. Several near misses were also observed. These are defined as an incident that could have resulted in a collision, but one or more roadway users took evasive action.

Key observations include:

- People driving yielded to people walking and bicycling 92 percent of the time.
- More than half of pedestrian groups started crossing the intersection either on the walk countdown or during a do not walk phase (53 percent)
- About 30 percent of bicycling groups started crossing the intersection on red light
- The mode split between bicyclists and pedestrians is notably different on the weekend (64 percent bicycles) than on weekdays (15 percent bicycles)

Vulnerable User Counts (on Pinellas Trail Crossing 2nd St S)

User Type	Count (Total)	Count (Weekend)	Count (Weekday)
Bicycle	153	144	10
Pedestrian	139	82	57
Scooter	10	8	2

Crossings by Signal Phase – Total

Pedestrian Signal Phase	# Incidents (groups crossing)	Bicycle Signal Phase	# Incidents (groups crossing)
Walk	40	Green	44
Don't Walk	32	Red	20
Flashing/Countdown	14		

Crossings by Signal Phase – Weekend

Pedestrian Signal Phase	# Incidents (groups crossing)	Bicycle Signal Phase	# Incidents (groups crossing)
Walk	19	Green	39
Don't Walk	20	Red	18
Flashing/Countdown	6		

Crossings by Signal Phase – Weekday

Pedestrian Signal Phase	# Incidents (groups crossing)	Bicycle Signal Phase	# Incidents (groups crossing)
Walk	21	Green	5
Don't Walk	12	Red	2
Flashing/Countdown	8		

Eastbound Right Turn Speed (1st Ave S to 2nd St S)

Characteristic	Speed (mph) - Total	Speed (mph) - Weekend	Speed (mph) - Weekday
Sample Size	95	35	60
Low Speed	5	14	5
High Speed	32	32	32
Mean Speed	17	21	16
50th Percentile	16	19	14
85th Percentile	23	28	19

Vehicle Yield on Green to Bike/Peds Crossing

Yield	Total	Weekend	Weekday
Yes	44	7	37
No	4	1	3

Summary of Conflicts/Near Misses

Trail User Mode	Mode in Conflict	Observation of Conflict
Bicycle	Vehicle	Very close call with a WB bicyclist and EB motor vehicle turning right. Signal was green for both, but driver failed to see bicyclist in the crosswalk. Both came to a complete stop facing each other in the crosswalk
Pedestrian	Vehicle	EB vehicle turning right on green signal stopped in crosswalk for 3 pedestrians
Bicycle and Scooter	Vehicle	2 bikes and 1 scooter crossing on red signal stopped midway in crosswalk when vehicle traveling NB on 2nd St approached and had green signal (vehicle had right of way)
Bicycle	Pedestrian	Pedestrian traveling SB crossing 1st Ave with "walk" signal (right of way) had near miss with bike traveling WB on trail with red signal. Bike swerved to miss pedestrian
Bicycle	Vehicle	Near miss for group of 3 bicyclists crossing on red signal with vehicle traveling SB on 2nd St with green light
Pedestrian	Vehicle	Near miss for 2 pedestrians crossing on "don't walk" signal with vehicle traveling NB on 2nd St. Vehicle came to a halt and waited for them to finish crossing.
Bicycle	Vehicle	EB cyclist yielded to vehicle turning right on green (both had green)
Bicycle	Vehicle	2 bicyclists waited in crosswalk for SB vehicle with green signal to pass – close
Bicycle	Bus	Bus turning right on green signal did not yield to 6 bicyclists also with green signal
Pedestrian	Vehicle	2 EB pedestrians crossing against the signal almost hit by motorist
Vehicle	Vehicle	Near rear end collision related to first motorist yielding to trail user
Bicycle	Vehicle	Bicyclist crossing against the signal had to brake hard to avoid collision
Pedestrian	Vehicle	Motorist had to brake hard to avoid collision with pedestrian crossing against the signal

Key Findings

The observations and data collection result in the following key-findings:

- Average vehicle speed through the intersection was 17 miles per hour, which is about the upper limit of survivability for a vulnerable roadway user who is hit by vehicle. Speed ranged from 5 to 32 miles per hour.
- Low compliance of vulnerable road users (VRUs) with bicycle and pedestrian signals
    - Compliance seemed to depend on whether the signal was red or already green upon arrival.
    - Only two instances of VRUs waiting for a green/walk signal were noted.
- Two incidents with bus:
    - Bus did not come to complete stop for red light, slowing to 14 mph, no VRUs present in crosswalk.
    - Bus did not yield to bicyclists using trail crossing when light was green for both vehicles and trail users. Bus slowed to 20 mph for turn.
    - Speed of buses observed turning were faster than one would have expected.
- Near misses:
    - Multiple near misses due to non-compliance of signals by VRUs
- Observed NB bicyclists using general use lanes and not complying with traffic signal.
    - One observation of a bicyclist having to stop in the middle of the intersection to avoid oncoming traffic from the opposite direction.

This completes our initial data collection summary. Please contact Kathrin Tellez at (321) 754-9902 if you have questions.


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1st Avenue S at 2nd Street S Observations

Data Collector: _____ Time Period: _____ Date: _____ Weather Conditions: _____ Sheet _____ of _____

	Vulnerable Roadway User Type (P,B,SK,SC,O)	Walk sign on? (Y/N)	Did crossing start during countdown Interval (Y/N)	Bike Signal On (WB/EB)?	Veh. Only (EBR)	Driver Action (RTOR/Green)	If RTOR,, complete stop behind stop bar (Y/N)?	Driver Yield? (Y/N/NA)	Approx. Driving Speed (EBR)	Following Driver Brake Hard? (EB/EBR)	Conflict involving invasive action?	Additional Observations
1.												
2.												
3.												
4.												
5.												
6.												
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19.												
20.												

Instructions to Record Data and Observations (Please read before going out into the field, and bring a copy)

Users of this survey instrument should have the ability to identify correct and incorrect behaviors of drivers, pedestrians, bicyclists and other roadway users. Basic knowledge and understanding of traffic laws pertaining to bicycle and pedestrians, vehicular traffic, traffic control devices, and general roadway safety are required. Information and observations should be recorded accurately and factually. Use the recommendations below as a guide to effectively collect data. See images on the following pages for guidance on where to stand and the focus of the observation efforts.

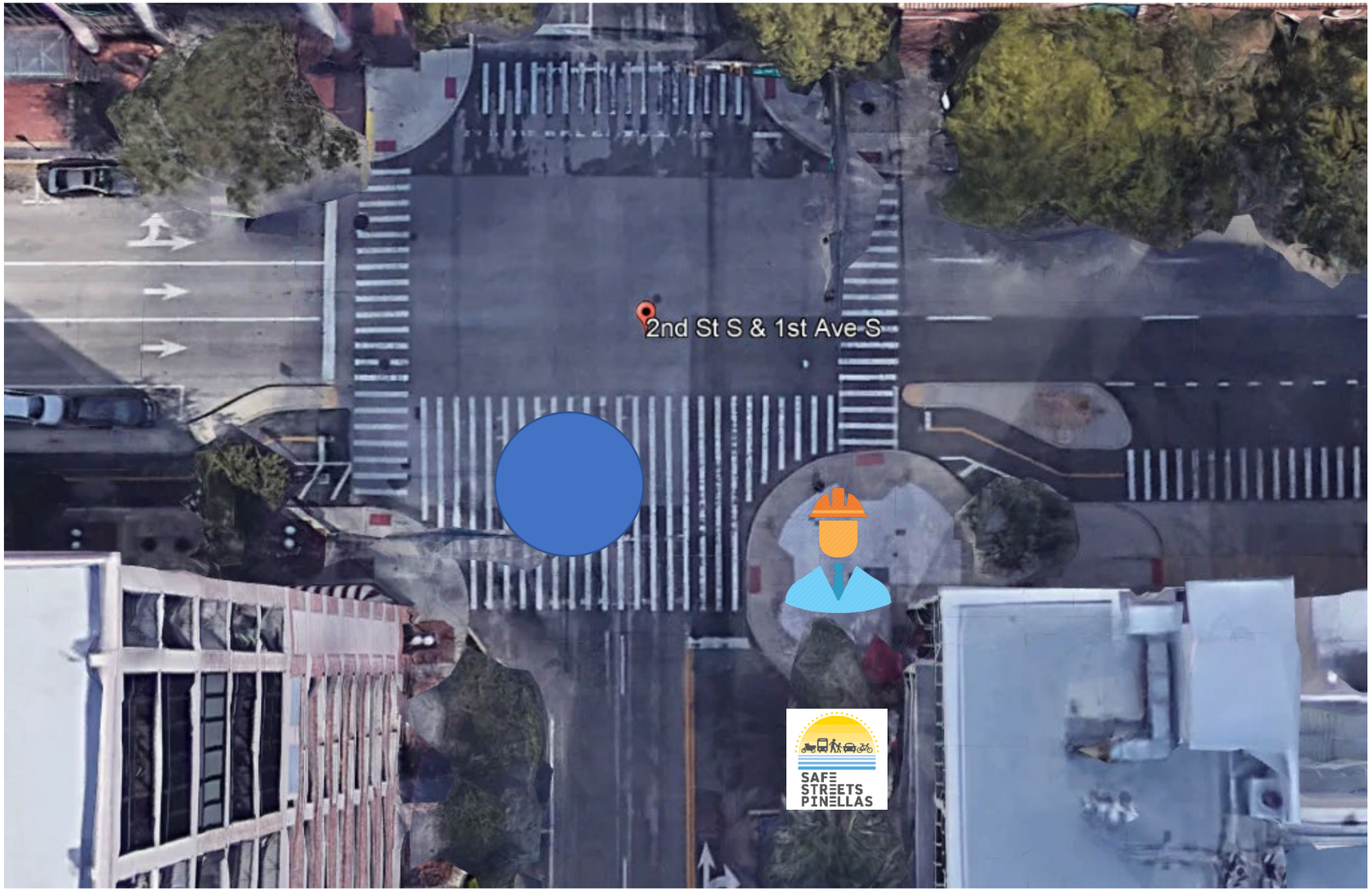
Column:

1. Vulnerable Roadway User – count of people using bicycles, people walking, people skateboarding, people using scooters, or people using other mobility devices. Count how many of each. P = Person Walking; B = Person Bicycling; SK = Person Skateboarding; SC = Person Scooting; O = Other, please note; for remainder of data collection element, please treat all persons using non-auto wheeled mobility devices except wheelchairs and strollers as bicycles. Treat all persons walking, persons in wheelchairs or persons in strollers as pedestrians.
2. Walk Sign On? – Y (yes) or N (no). The pedestrian phase at this intersection is set to recall, meaning that pedestrians do not have to push the button to activate the walk signal as the phase is automatically provided each cycle.
3. Did crossing start during Countdown Interval - Please note here if crossing started when the countdown timer was on. Please note if crossing was completed during the remaining crossing time.
4. Bike Signal On (WB/EB)? – Y (yes) or N (no). Westbound bicycles have a separate signal that is active with the east-west pedestrian phase as well as the eastbound vehicle/bicycle phase. For EB travel, note if signal was green.
5. Vehicle Only – Check this if this was a vehicle only event to document approximate speed drivers take the turn.
6. Driver Action – Note if the driver made a right-turn on red (RTOR), or if they had a green light to proceed.
7. If RTOR, complete stop behind stop bar – if the person driving made a right-turn on red, please note if the vehicle came to a full stop behind the stop bar. If not, please note in additional observations where the vehicle stopped if they stopped but not behind the stop bar.
8. Driver Proper Yield – Y (yes) or N (no) the driver yielded properly to the traffic control device and/or person in crosswalk. Did the driver come to a complete stop behind the stop bar? Did the driver give the right of way to the person in the crosswalk? Put NA if there was no interaction between the driver of a vehicle and other roadway user.
9. Vehicle Speed – If recording vehicle speeds using the speed gun, record approximate speed (mph) in this column when the vehicle is in the crosswalk (see blue area on attached maps). Should a collision occur, this would provide an approximation of how fast vehicles would be traveling at the point of impact. Take some sample measurements before formal data collection to identify best location in the field to collect speed data, as perpendicular readings may not be accurate. Aim at the center of the vehicle.
10. If there was a second vehicle following the first, note if the driver had to brake hard to avoid a collision. Otherwise, N/A. (EBR/EBT, if appropriate)
11. Conflict involving invasive action – was there a potential conflict or near-miss that required invasive action by any roadway user? Describe situation.
12. Additional observations – provide brief detail about user behavior. Include both positive and negative behaviors that may not have been covered by other data fields.

	Vulnerable Roadway User Type (P,B,SK,SC,O)	Walk sign on? (Y/N)	Did crossing start during countdown Interval (Y/N)	Bike Signal On (WB/EB)?	Veh. Only (EBR)	Driver Action (RTOR/Green)	If RTOR,, complete stop behind stop bar (Y/N)?	Driver Yield? (Y/N/NA)	Approx. Driving Speed (EBR)	Following Driver Brake Hard? (EB/EBR)	Conflict involving invasive action?	Additional Observations
1.	2 P	N				Green		Y	8	Y	Y	Ped crossing on red; driver stopped
2.	1 B		Y - WB			RTOR	Y	Y	6			
3.				X		Green	N/A	N/A	14			

It is recommened that the observer locate on the southeast corner of the intersection as the focus of the data collection effort is the eastbound right-turn movement with a primary focus on driver speeds across the crosswalk (see blue area) for right-turning vehicles, and overall roadway user behavior. There are bollards that could be used as informal seating (or bring a chair), or if you are lucky, you might snag the prime parking spot where the Safe Streets logo is placed (don't forget to pay for parking!) Please take some picutres to share, and bring business cards as people may stop and ask what you are doing. You can direct people to contact Cheryl Stacks at 727-892-5328 or cheryl.stacks@stpete.org with questions. Please coordinate your data collection time periods with Cheryl so she can inform their Downtown Police Offices to the activity.

Before device installation configuration:



After device installation configuration: