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Corridor Analysis

Pinellas Point Drive

Department of Transportation & Parking

07/07/20

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Executive Summary

This is a planning report undertaken to determine what actions could be taken along the Pinellas Point Drive corridor to help address ongoing concerns with motor vehicle speeding. The corridor analysis is based on existing conditions and what is possible to undertake in the short, medium and long term and include all engineering, education, enforcement, equity and evaluation options available.

Since the corridor is classified as a "Collector Roadway" in the City's Comprehensive Plan, only horizontal defections are allowed. Vertical features like speed humps are not an option, without a reclassification to "Neighborhood Collector", which is a long-term option, should short and midterm countermeasures not prove as effective as anticipated.

Traditional go-to countermeasure will be evaluated initially in order to determine what might be appropriate to implement in the short-term, including police enforcement of the posted 35 MPH speed limit, implementation of their Speed Awareness Monitor, all-way stops, and monitoring of effectiveness before proceeding to mid-term options.

An evaluation of existing pavement markings is available as a result of a pavement resurfacing project that is schedule this year. This mid-term opportunity will allow a review of future conditions / needs to determine if any modifications are required, following the guidance and recommended facilities in the Complete Streets Implementation Plan. We will also re-evaluate speed studies after education and enforcement.

The City has over twenty-years of experience implementing various traffic calming features, as part of area-wide neighborhood traffic plans and can draw on that experience in the mid-term to develop and analyze appropriate features, in cooperation with the local residents and neighborhood association for a comprehensive long-term solution. This corridor analysis report has identified that the most appropriate traffic calming feature to address current traffic safety issues would be neighborhood traffic circles, at specified intersections along the corridor.

Our plan is to release this report to the association and residents that have contacted the department, for comments. Once we finalize their comments, we would plan a wider neighborhood review and comment period, depending on options available during current Covid-19 restrictions. Should the consensus be to proceed, the requirement to complete a petition of residents along the corridor would need to be completed by resident volunteers. Once finalized, the action plan would be forwarded to our Engineering and Capital Improvement Department to confirm feasibility and constructability, with final designs later in fiscal year 21. The Engineering and Capital Improvement Department's design will determine ultimate viability. Temporary features could be implemented during the final design phase, in order to confirm appropriateness and allow motorist time to become accustom before final construction.

Funding for all recommendations, as part of this corridor analysis, will be from current and future fiscal year budget allocations within the department. While some discretionary funds are available to address short and mid-term planning, design and countermeasures implementation; construction of permanent traffic calming features must be programmed without diminishing allocations to other ongoing neighborhood programs City-wide. This may require a phased approach, depending on costs estimates and all competing priorities.

1 Introduction

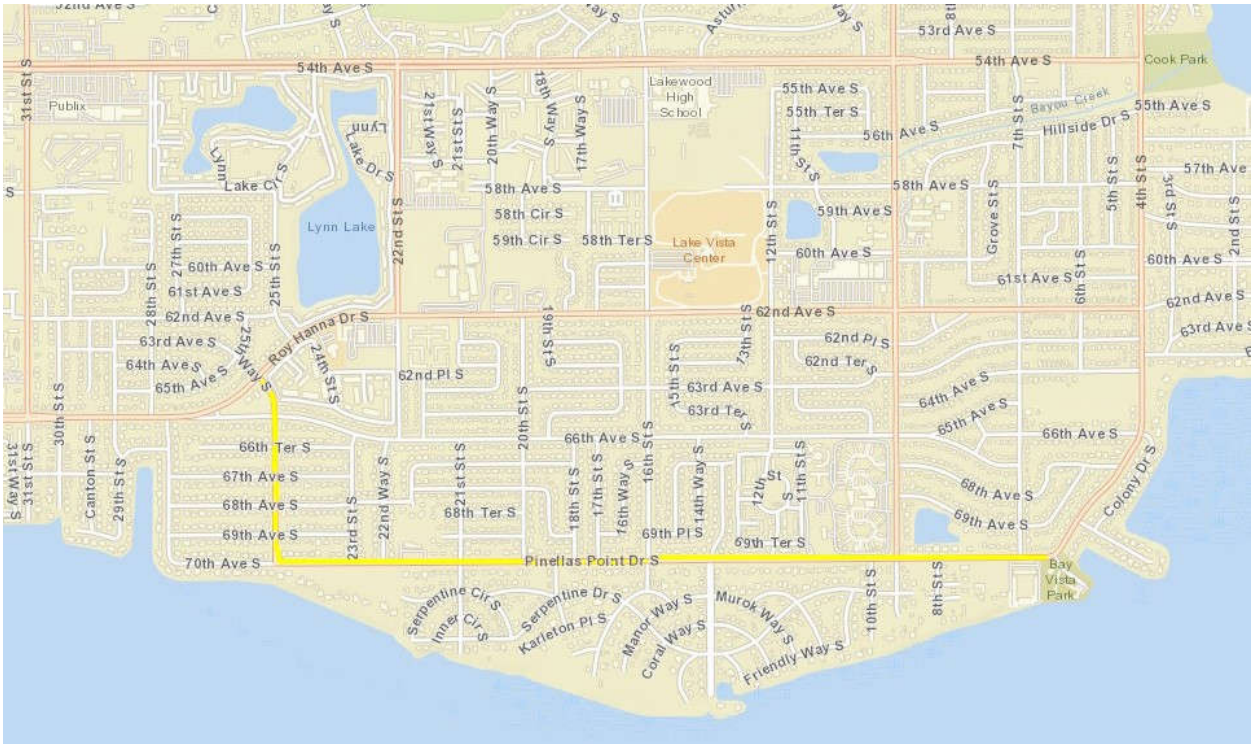
1.1 Background, Purpose and Scope

In response to ongoing calls from local residents and cyclists regarding excessive vehicle speeds by motorists, a review of historical vehicle speed data has determined a pattern of excessive speeds over time from both east and west bound motorists on Pinellas Point Drive between 4th Street and Roy Hanna Drive S.

Transportation Department staff therefore are undertaking an analysis to determine what countermeasures could be applied in order to help reduce the frequency of speeding in the future. This analysis will look at short, medium and long-term strategies that will include all engineering, education, enforcement, equity and evaluation options available.

1.2 Project Location

The corridor under review is Pinellas Pont Drive between 4th Street and 62nd Avenue S / Roy Hanna Drive



- Pinellas Point Drive is classified in the City's Comprehensive Plan as a "Collector Road".
- Pinellas Pont Drive is a 2-lane undivided roadway with no existing dedicated left or right turn lanes.
- The posted speed limit along the corridor is 35 MPH.
- Bicycle lanes are marked on both sides of Pinellas Point Drive along the whole corridor. (< 4')
- Sidewalks are location on one side of the roadway with crossings at Dr. Martin Luther King Jr. Street.
- Bus stops are located on both sides of the corridor for transit in both directions.
- Streetlights are located on the north side of the corridor, which were recently converted to LED.
- Pavement markings are currently clear and visible along the corridor.
- There are no traffic control signals along the corridor.
- Pinellas Point Drive has a 100' right-of-way and the roadway is 30' wide.
- Lane widths for motor vehicles are 11' – wide and < 4' for bicyclists.
- This is a single-family residential area.
- There are 21 intersections along the corridor 17 - local and 4 – Collector roadways,
- There is one All-Way Stop at 66th Avenue S and a marked crosswalk at Dr. Martin Luther King Jr. Street.
- The City's Comprehensive Plan also classify these roadways as "Collector Road" -
    1. 62nd Avenue S / Roy Hanna Drive
    2. Dr. Martin Luther King Jr. Street
    3. 16th Street
    4. 4th Street

2 Analysis

2.1 **Short-Term** (March thru July)

2.1.1 Engineering

Transportation Department staff have conducted traffic studies to determine if there are intersections that would meet the criteria for an all-way stop, reviewing historical vehicle speed and volume data, conducting crash analysis, evaluating streetlight levels, and conducted speed limit analysis.

See results –	Crash analysis -	Appendix - D
	Streetlight levels -	Appendix - E
	Speed limit analysis -	Appendix - F
	All-way stop analysis -	Appendix - G

2.1.2 Education

The Police Department deployed their Speed Awareness Monitor (SAM) along Pinellas Point Drive, starting May 5, 2020, in order to educate those motorists who are exceeding safe residential speeds. This educational technique has a short-term effect of lowering those top-end speed and decrease the speed differential between the high and low speed motorists. This closer grouping of speeds helps to increase traffic safety by reducing the variance between vehicles travelling along the same route reducing the chance of a crash. In addition.

Our most vulnerable roadway users, bicyclists and pedestrians have a higher chance of survival in a crash with lower speeds.

Police Speed Awarness Monitor

2.1.3 Enforcement

The Police Department have deployed their officers to patrol this route since early March, when staff were available. A total of 5 citations were issued early in the campaign. They report that they were on site with significant presence this first week of May conducting additional enforcement.

Prior experience indicates that a Police presence over time along any given route helps motorists understand that speeding along this route is not acceptable social behavior. Enforcement reinforces social norms that have a lasting effect on the roadway users.

2.1.4 Equity

Equity refers to the consideration for the fair distribution of impacts for any proposed modification, including benefits and costs and whether they are considered appropriate. This review will consider various perspectives and impacts for all roadway users. including vulnerable users, (people walking, riding bicycles or using transit). The planning process should reflect each community's concerns and priorities, so public involvement is important for equity analysis. We therefore will ultimately require the Greater Pinellas Point Neighborhood Associations review and concurrence for all proposed major modifications.

The short -term countermeasures identified involving engineering, education and enforcement are intended to positively affect the usage of the roadway and deemed socially and professionally to be compatible for all roadway users, adjacent residents, neighborhood and greater community.

2.1.5 Evaluation

The short-term countermeasure will form the base of this evaluation and help to establish the benchmarks from which further study results will be measured.

2.2 **Medium-Term** (May thru October)

2.2.1 Engineering

A review of existing pavement markings will be started since this corridor is scheduled to be resurfaced in FY-21. This opportunity will allow a review of future conditions / needs to determine if any modifications are required, following the guidance and recommended facilities in the Complete Streets Implementation Plan. We will also re-evaluate speed studies after education and enforcement.

Transportation Department staff will also update traffic studies to determine if the Police Departments' education and enforcement efforts had any effect on lowering vehicle speeds through the corridor.

Traffic Calming is defined by The Institute of Transportation Engineers (ITE) 'as the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users. Implementation procedures for all traffic calming measures are summarized in Appendix B. Implementation of approved features must however take into consideration the classification of the roadway being traffic calmed, and in this case, the City's Comprehensive Plan classifies Pinellas Point Drive as a "Collector Roadway".

The Transportation Element T8-3 indicates *Collectors Roadways* shall not be eligible for vertical traffic calming measures but shall be eligible for horizontal traffic calming measures such as lane narrowing's, neck outs (also referred to as Bulb-outs), chicanes, landscaped medians, traffic circles and roundabouts where practical. Horizontal features introduce a lateral shift in the travel lane, which breaks up the long straight run of the roadway and helps to reduce vehicles speeds as a result. Past analysis by transportation practitioners indicates as much as a 5 MPH speed reduction could be achieved along the corridor, through implementation of these features at intersections, depending on proximity.

We may therefore consider horizontal traffic calming measures as a medium / long-term strategy.

Narrowing's, bulb-outs, chicanes landscaped medians as mid-block features, without an overall roadway widening, would adversely affect the existing marked on-street bicycle lanes, which are to be retained under the Complete Streets Program designation. Therefore, these countermeasures will not be considered in this review.

Narrowing's, bulb-outs, landscaped medians and traffic circles as intersection features would not adversely affect the existing marked on-street bicycle lanes and therefore could be considered. These design features, implemented appropriately, would help to control vehicles speeds along the corridor and at the intersections. Each feature has its own pro's and con's and would need to be evaluated and analyzed to determine both goals and objectives, as well as the best benefit / cost ratio.

The City has over twenty-years of experience implementing these features, as part of area wide neighborhood traffic plans and can draw on that experience in the mid-term to develop and analyze appropriate features, in cooperation with the local residents and neighborhood association for a comprehensive long-term solution.

2.2.1.1 Traffic Calming Measures

A series of fact sheets providing an overview of several traffic calming measures, from the Institute of Traffic Engineers (ITE), are illustrated in Appendix H. A photograph of a typical application as well as a plan-view sketch are included within each fact sheet.

Two types of design features are summarized:

- Horizontal shifts,
- Vertical deflections

Each are intended to reduce vehicle speed and enhance the street environment for non-motorists and increase travel safety for all roadway users.

The information provided on these fact sheets has been obtained from the research and experience of transportation engineering and planning professionals. The information is intended for informational purposes only and does not include ITE or FHWA recommendations on the best course of action.

2.2.1.2 Analysis – Horizontal Deflections

A review of the Pinellas Point Drive corridor has identified a total of four (4) major intersections where these features could be considered for installation, as follows:

- Dr. Martin Luther King Jr. Street
- 14th / 16th Street
- 21st Street
- 70th Avenue S

The lateral distance between these intersections varies between 1,700 and 2,600 feet. Experience indicates that operational speeds between features at these distances would remain close to existing speeds. However, the high end speeds should drastically reduce by 10 to 20 percent. Speeds at the intersections would drop to between 15 MPH and 30 MPH, depending on which feature was implemented.

Therefore, the goal would be to implement the feature(s) that would attain the most dramatic speed reduction, for motorists travelling at the highest speeds, at the lowest possible implementation cost. The objective would be to increase travel safety for all roadway users along the corridor. A description of the anticipated positive outcomes and potential consequences is outlined for various treatments, along with staff recommendations below.

2.2.1.2.1 Corner Extensions / Bulb-outs

Pros – Effective method for narrowing pedestrian crossing distances and increasing visibility.
Appropriate for arterial and collector roadways.
Appropriate for any travel speed.
May affect drainage ay the intersections.

Cons - Effects on vehicle speed are limited due to lack of deflection.
Requires either widening of the roadway or drops the bicycle lane at the intersection forcing cyclists into the path of vehicles at the intersections.

Cost - Based on recent prices for recent projects the design costs at four intersections could reach $100,000 and construction as high as $400,000.

Feasibility - Would not achieve our goal reducing vehicle speeds or objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure would not be recommended for further review.

2.2.1.2.2 Median Islands

Pros - Effective method for narrowing pedestrian crossing distances and increasing visibility.
Appropriate for arterial and collector roadways.
Appropriate for any travel speed.
Landscaped trees in the median break-up long sight distances along the corridor.

Cons - Effects on vehicle speed are limited due to minimum deflection.
Requires either widening of the roadway or drops the bicycle lane at the intersection forcing cyclists into the path of vehicles at the intersections.

Cost - Based on recent prices for recent projects the design costs at four intersections could reach $5,000 and construction as high as $200,000.

Feasibility - Would not achieve our goal reducing vehicle speeds or objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure would not be recommended for further review.

2.2.1.2.3 Mini Roundabout

Pros - Requires drivers to slow to a speed (20 to 30 MPH) that allows them to comfortably maneuver through the deflection and yield to other traffic in the intersection.
Appropriate for collector and local roadways.

Appropriate for low travel speed.

Cons - Slight speed reductions
Larger vehicles / busses typically drive over the center island.
Recommended that bicyclists be prohibited in the circular roadway.

Cost - Based on recent prices for recent projects the design costs at four intersections could reach $60,000 and construction as high as $200,000.

Feasibility - Would not achieve our goal reducing vehicle speeds or objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure would not be recommended for further review.

2.2.1.2.4 Neighborhood Traffic Circle

Pros - Requires drivers to slow to a speed (15 to 20 MPH) that allows them to comfortably maneuver through the deflection and yield to other traffic in the intersection.
Landscaped trees in the circle break-up long sight distances along the corridor.
Suitable for roadways with bicycle lanes due to the forced slowing of motor vehicles through the intersection mixed zone.
Appropriate for local roadways.
Appropriate for low travel speed.
Appropriate speed reductions.

Cons - Motorists from the main street often don't yield to traffic from the minor street.

Cost - Based on recent prices for recent projects the design costs at four intersections could reach $60,000 and construction as high as $200,000.

Feasibility - Would help achieve our goal of reducing vehicle speeds and objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure is recommended for further review.

2.2.2 Education

Continue with Speed Awareness Monitor.
Communication through neighborhood association, CONA and residents.

2.2.3 Enforcement

Continue with directed patrols.

2.2.4 Equity

Continue to gather feedback from modal-priority roadway users, resident's and neighborhood association.

2.2.5 Evaluation

Continue to update results of our analysis.

2.3 **Long-Term** (July thru January +)

2.3.1 Engineering

Implement any of the solutions developed as a result of the short and medium – term evaluation, including all-way stops, crash analysis, streetlight levels, speed limit analysis and start horizontal traffic calming measures design phase.

2.3.2 Education

Continue with Speed Awareness Monitor.

2.3.3 Enforcement

Continue with directed patrols.

2.3.4 Equity

This long-term strategy is to embark on an analyze to determine if we can reclassify Pinellas Point Drive to "Neighborhood Collector" which would allow "vertical" traffic calming to be considered by the residents. Both Pinellas Point Drive and 62nd Avenue S / Roy Hanna Drive are currently both designated as "Collector" roadways in the City's Comprehensive Plan. This proposal is intended to more equally balance the roadway hierarchy, distributing heavier volumes of traffic to non-residential roadways designated as "collector", that are better equipped to accommodate higher vehicle volumes, that are in close proximity to Pinellas Point Drive. Considerations of the City's Comprehensive Plan and Vision 2050 will also be included in this analysis.

Roadway Definitions are as follows:

- Local Road - A roadway providing service, which is of relatively low traffic volume, short average trip length or minimal through traffic movements, and high-volume land access for abutting property.

- Collector Road - A roadway providing service which is of relatively moderate traffic volume, moderate trip length, and moderate operating speed. Collector roads collect and distribute

traffic between local roads and arterial roads and are designed to provide both mobility and land access within residential, commercial and industrial areas.

- Neighborhood Collector - A specialized type of collector road. While they function as a collector, they primarily serve residential areas. Designation as a neighborhood collector is intended to recognize the role that the roadway plays in the overall thoroughfare system while acknowledging the importance of preserving adjacent residential neighborhoods through traffic calming techniques.

The City's Comprehensive Plan – Transportation Element - OBJECTIVE T8: States -

The City shall preserve neighborhood integrity by using appropriate traffic calming features to minimize traffic intrusion and protect neighborhoods from the adverse impacts of through traffic.

Policies:

T8.1 The City shall place a high priority on the funding and scheduling of projects which will aid traffic flow on principal and minor arterial streets and collector roads so as to protect neighborhoods from the intrusion by vehicles seeking to avoid areas of high delay and heavy traffic congestion.

T8.2 The City shall conduct neighborhood traffic studies to analyze traffic volumes, crash rates, operational speed, and traffic characteristics in a continuing effort to protect the quality of life of St Petersburg's residential neighborhoods.

T8.3 Vertical traffic calming measures such as speed plateaus and raised intersections shall be reserved for local roads and neighborhood collectors. Principal and minor arterials and collectors shall not be eligible for vertical traffic calming measures but shall be eligible for horizontal traffic calming measures such as lane narrowing's, neck outs, chicanes, landscaped medians, traffic circles and roundabouts where practical.

T8.4 The City shall develop and adopt a Neighborhood Transportation Management Program to establish specific policies and procedures related to the implementation of traffic management strategies in the City of St. Petersburg. City Council approved neighborhood/transportation plans shall be considered in the development and implementation the City's Neighborhood Transportation Management Program.

T8.5 The City shall enforce designated truck routes and restrictions on hours of operation on these routes. Trucks shall only be permitted on routes not designated for trucks if the driver's final destination is on the street.

T8.6 The City shall support a proposal that reduces the traffic carrying capacity of the road network, such as the conversion of one-way streets to two-way streets or a reduction in the number of through lanes or lane widths or an increase in the number of on-street parking spaces, if the proposal's benefits, such as neighborhood preservation, community and economic development, and promotion of alternative modes of transportation, outweigh the loss of roadway capacity.

The neighborhood collector classification was created approximately 20 years ago and a number of collector streets where reclassified to neighborhood collectors. This was done to recognize that these roads play an important role in moving traffic through neighborhoods, from local roads to collectors and arterials, but they are treated like local roads, in terms of the ability to install vertical traffic calming measures. A list of all Neighborhood Collector roadways can be found in Appendix A.

Transportation Department staff could review this option in order to determine if this concept is feasible, should other horizontal measures prove insufficient and the results of the review added to this long-term solution once completed.

2.3.4 Analysis – Vertical shifts

2.3.4.1 Raised Intersection

Pros - Appropriate if a dedicated bicycle lane passes through the intersection.
Reduction in through movement speeds likely at intersection.
Can make the entire intersection more pedestrian friendly.

Cons - Typically installed at all-way stop intersections.
Typically used at intersections with a maximum speed of 35 MPH.
Storm drain modifications are likely and may void the installation.
Reduction in mid-block speeds typically less than 10%.
Up to a 7 second delay for emergency vehicles.

Cost - Based on recent prices for recent projects the design costs at four intersections could be $6,000 and construction as high as $200,000.

Feasibility - Would achieve our goal of reducing vehicle speeds and objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure should only be recommended for further review once “horizontal” measures have been installed, evaluated and a determination that additional measures are required to achieve our goal and objective.

2.3.4.2 Speed Table

Pros - Appropriate for residential local and neighborhood collector roadways.
Appropriate for roadway with 85th%ile speeds < 45 MPH
Achieves an 85th %ile speed between 25 MPH & 35 MPH along the corridor

Cons - May adversely effects cyclists if installed in the bicycle lane. If not installed in the bicycle lane motorists will “cheat” to swerve around the hump going into the bicycle lane.
Up to a 7 second delay for emergency vehicles response time.

Cost - Based on prices for recent projects there is no design costs and construction costs would be $2,500 ea.

Feasibility - Would achieve our goal of reducing vehicle speeds and objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure should only be recommended for further review once "horizontal" measures have been installed, evaluated and a determination that additional measures are required to achieve our goal and objective.

2.3.4.3 Speed Cushion

Pros - Appropriate for residential local and neighborhood collector roadways.
Appropriate for roadway with 85th%ile speeds < 45 MPH
Achieves an average speed reduction of between 20 and 25% between each feature.

Cons - Speed limit is typical 30 MPH or less.

Cost - Based on prices for recent projects there is no design costs and construction costs would be $2,500 ea.

Feasibility - Would achieve our goal of reducing vehicle speeds and objective to increase travel safety for all roadway users along the corridor.

Conclusion - This traffic calming measure should only be recommended for further review once "horizontal" measures have been installed, evaluated and a determination that additional measures are required to achieve our goal and objective.

2.3.4.5 Speed Hump

Pros - Appropriate for residential local and neighborhood collector roadways.
Appropriate for roadway with 85th%ile speeds < 45 MPH
Achieves an 85th %ile speed between 25 MPH & 35 MPH along the corridor

Cons - May adversely effects cyclists if installed in the bicycle lane. If not installed in the bicycle lane motorists will "cheat" to swerve around the hump going into the bicycle lane.
Speed limit is typical 30 MPH or less.
Up to a 7 second delay for emergency vehicles response times.

Cost - Based on prices for recent projects there is no design costs and construction costs would be $1,500 ea.

Feasibility - Would achieve our goal reducing vehicle speeds and objective to increase travel safety for all roadway users along the corridor.

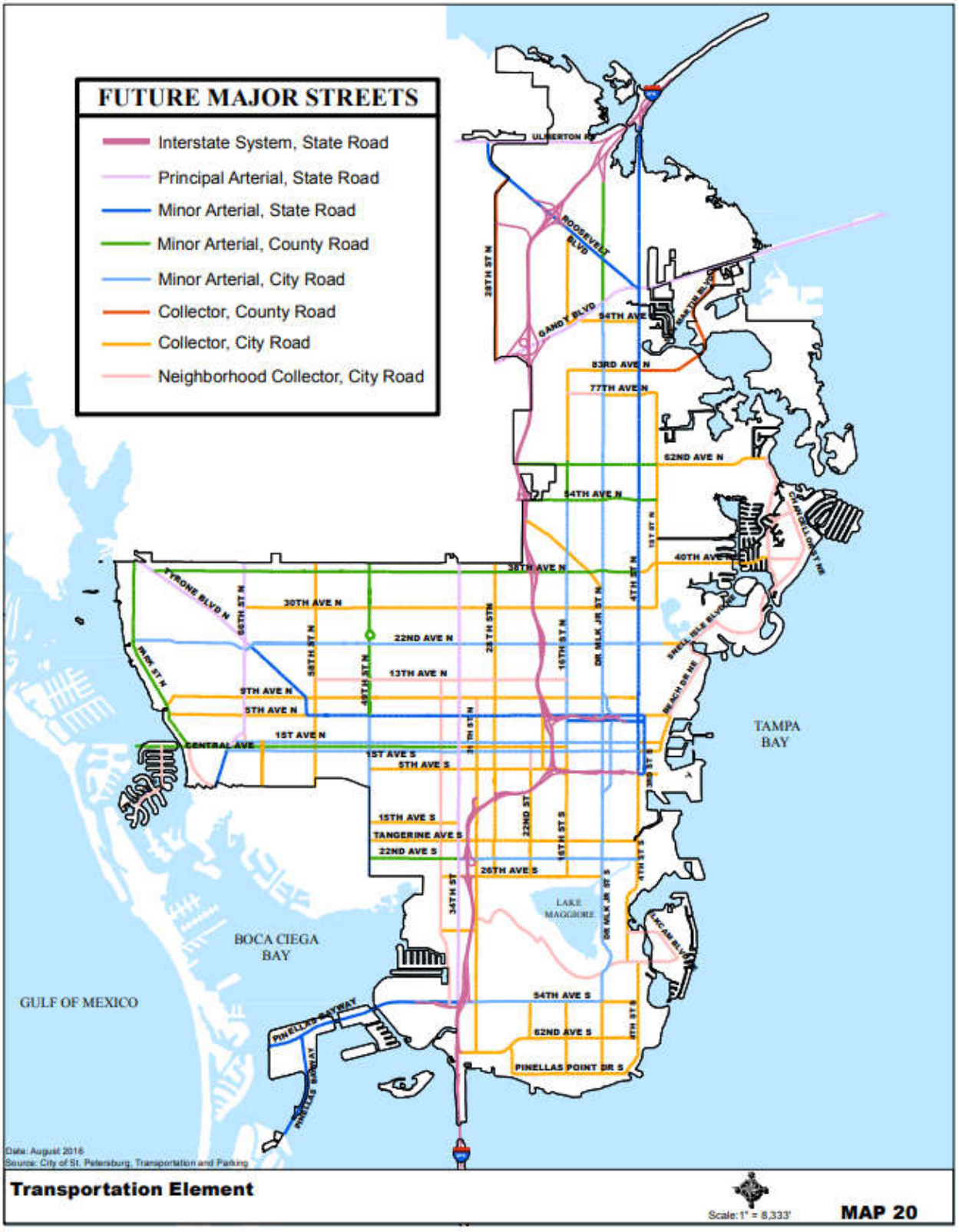
Conclusion - This traffic calming measure should only be recommended for further review once “horizontal” measures have been installed, evaluated and a determination that additional measures are required to achieve our goal and objective.

2.3.5 Evaluation

Recent vehicle volume and speed studies have verified that the threshold speed of 35 MPH has been attained, in order to meet / exceed the requirements to have traffic calming considered. See Appendix B. Since the posted speed limit is 35 MPH this isn’t unexpected, therefore a review of operating speeds after Short and Medium Term Solutions will be required to confirm qualifying speeds.

The Maximum Desired Operating Speed in the Complete Streets Implementation Plan is 30mph. At the time of resurfacing, the roadway can be considered to be “redesigned” following this new design speed, and the addition of circles and narrowing the travel lanes to bring the bike lanes up to minimum widths can support posting the corridor at 30mph at completion of that project.

MAP – Roadway Classifications – Comprehensive Plan



Appendix – A Neighborhood Collector Roadways

Street	From	To
22nd St N	1st Av N	Central Av
22nd St S	Central Av	1st Av S
22nd St S	1st Av S	5th Av S
31st St N	9th Av N	5th Av N
37th St N	13th Av N	9th Av N
37th St N	9th Av N	5th Av N
37th St N	5th Av N	1st Av N
37th St N	1st Av N	Central Av
37th St S	Central Av	1st Av S
37th St S	1st Av S	5th Av S
37th St S	5th Av S	15th Av S
37th St S	15th Av S	18th Av S
37th St S	18th Av S	22nd Av S
37th St S	22nd Av S	26th Av S
37th St S	26th Av S	38th Av S
37th St S	38th Av S	54th Av S
79th St S	Treasure Isle Causeway	Causeway Isle Bridge
79th St S	Causeway Isle Bridge	80th St S
13th Av N	16th St N	34th St N
13th Av N	34th St N	58th St N
39th Av S	Elkcam Bl	6th St S
45th Av S	Lewis Bl	4th St S
45th Av S	6th St S	4th St S
45th Av S	9th St S	6th St S
Bayou Grande Bl NE	62nd Av N	Venetian Bl NE
Beach Dr	Coffee Pot (S)	9th Av NE
Beach Dr	9th Av NE	8th Av NE
Chancellor St	Nebraska Av N	Shore Acres Bl
Chancellor St	Overlook Dr N	Shore Acres Bl
Coffee Pot Dr	22nd Av N	Beach Dr
Connecticut Av/Arkansas Av	Overlook Dr	Shore Acres Bl
Country Club Wy	9th St	Green Wy S
Elkcam Bl	39th St	Lewis Bl
Fairway Av	Green Wy S	35th Terr
Green Wy S	Country Club Wy	Fairway Av
Lewis Bl	Elkcam Bl	4th St S
Overlook Dr	Chancellor St	Connecticut Av
Overlook Dr	Connecticut Av	Shore Acres Bl
Overlook Dr	Shore Acres Bl	Bridge (Snell
Park St	Central	1st Av S
Shore Acres Bl	Chancellor St	Venetian Bl NE
Shore Acres Bl	Venetian Bl NE	40th Av NE
Shore Acres Bl	40th Av NE	Overlook Dr
Snell Isle Bl	Bridge (Overlook Drive)	Coffee Pot Bl
Venetian Bl NE	Bayou Grande Bl NE	Shore Acres Bl NE

Appendix – B

City of St. Petersburg

Department of Transportation and Parking

Neighborhood Transportation Management Program

The City's Neighborhood Transportation Management Program (NTMP) was created to help address issues of speeding and cut thru traffic. This is a multi-step program requiring the participation of an active neighborhood association and an individual citizen like yourself, willing to be the contact.

For a roadway segment to qualify for any type of traffic calming, traffic counts must reflect excessive speeds and/or volumes. Once the department receives a request, we conduct 24-hour speed and volume studies. The average operating speed of recorded vehicles over 24-hours would have to be above 35mph to meet the speed minimum threshold, and/or volumes would (at a minimum) need to exceed 10 trips per day per household within the study area, to meet the volume threshold.

Once we verify the speed and/or volume thresholds are met, the next step in the process requires the contact person to circulate a petition, provided by the department, for traffic calming and obtain signatures from 66% or 2/3rds of the households within the study request area (renters can sign). The contact person is required to circulate the petition and obtain notification of the property owners in the affected area. Keep in mind the affected area may extend beyond just the property owners abutting the calmed street. The completed petition must be returned to the department for verification.

Once we verify the petition thresholds are met, we prepare a traffic calming plan or amendment to an existing Traffic Plan for calming the roadway. We then send the request, speed and volume data, and petition to the Neighborhood Association for consideration and approval. Once we receive their written approval, we issue a work order to implement the approved feature(s). This program is funded through Penney for Pinellas and there is no additional costs to the home owners.

Speeding is also an enforcement issue that is often best handled by the Police Department. Please feel free to contact the Traffic Section Selective Enforcement Unit for assistance at 727-893-7632.

Electronic speed feedback signs are also available to use to attempt to address speeding and/or cut thru issues. Along with increased enforcement, we can offer our Neighborhood Speed Watch Program (radar speed feedback - post mounted sign). We can deploy it on your street for a week in each direction, if that is of interest to you. We can also offer Neighborhood Flyers to distribute regarding speeding in the neighborhood. If you would like to try the Neighborhood Flyers or the Neighborhood Speed Watch Program, please contact me and I can make those arrangements.

Appendix - C Traffic Data Summary (Pinellas Point Drive)

Location	Between	Date	Direction	Vehicle Volume		24-Hr Average Speed	% > Speed Limit
				Peak	24-Hour		
Pinellas Point Dr S	through curve @ 4 Street S	10/05/09	NB/EB	48	609	32.99	8.67
			SB/WB	58	624	26.33	2.42
Pinellas Point Dr S	at MLK Street S	08/21/17	EB	96	1,188	43.99	39.81
			WB	63	844	43.85	54.03
Pinellas Point Dr S	east of 14 Street S	11/19/19	EB	169	1,897	46.07	80.18
			WB	158	2,065	43.99	66.78
Pinellas Point Dr S	at 16 Street S	07/31/12	EB	120	1,400	46.29	74.09
			WB	134	1,848	43.18	61.64
Pinellas Point Dr S	west of 21 Street S	11/19/19	EB	226	2,293	48.28	48.54
			WB	236	2,524	47.19	80.19
Pinellas Point Dr S	at 70 Avenue S - through curve	03/31/14	SB	176	1,794	22.27	0.51
			WB	200	2,160	32.92	4.71
Pinellas Point Dr S	Btn 67th & 68th Avenue S	08/30/18	NB	247	2,425	46.21	78.64
			SB	245	2,278	43.40	69.58
Pinellas Point Dr S	Btn 4th & MLK Streets	05/27/20	EB	65	682	41.52	54.40
			WB	68	736	43.75	61.14
Pinellas Point Dr S	Btn MLK & 16th Streets	05/27/20	EB	93	1,173	45.81	64.62
			WB	119	1,220	43.88	52.13
Pinellas Point Dr S	Btn 16th & 21st Streets	05/27/20	EB	150	1,739	43.93	70.85
			WB	137	1,903	47.35	79.30
Pinellas Point Dr S	Btn 21st St & 70th Ave S	05/27/20	EB	168	1915	49.55	90.13
			WB	158	2164	46.78	81.47
Pinellas Point Dr S	Btn 67th & 68th Avenues S	05/27/20	NB	170	2,322	42.91	61.67
			SB	202	2,123	39.09	39.94

Appendix - D Crash Analysis

A quick review showed there were 20 crashes within the Pinellas Point corridor between 4th Street and 62nd Avenue S. / Roy Hanna Drive over the past 5-years.

16 - Speed Not a Factor (as noted in reports of estimated speed)

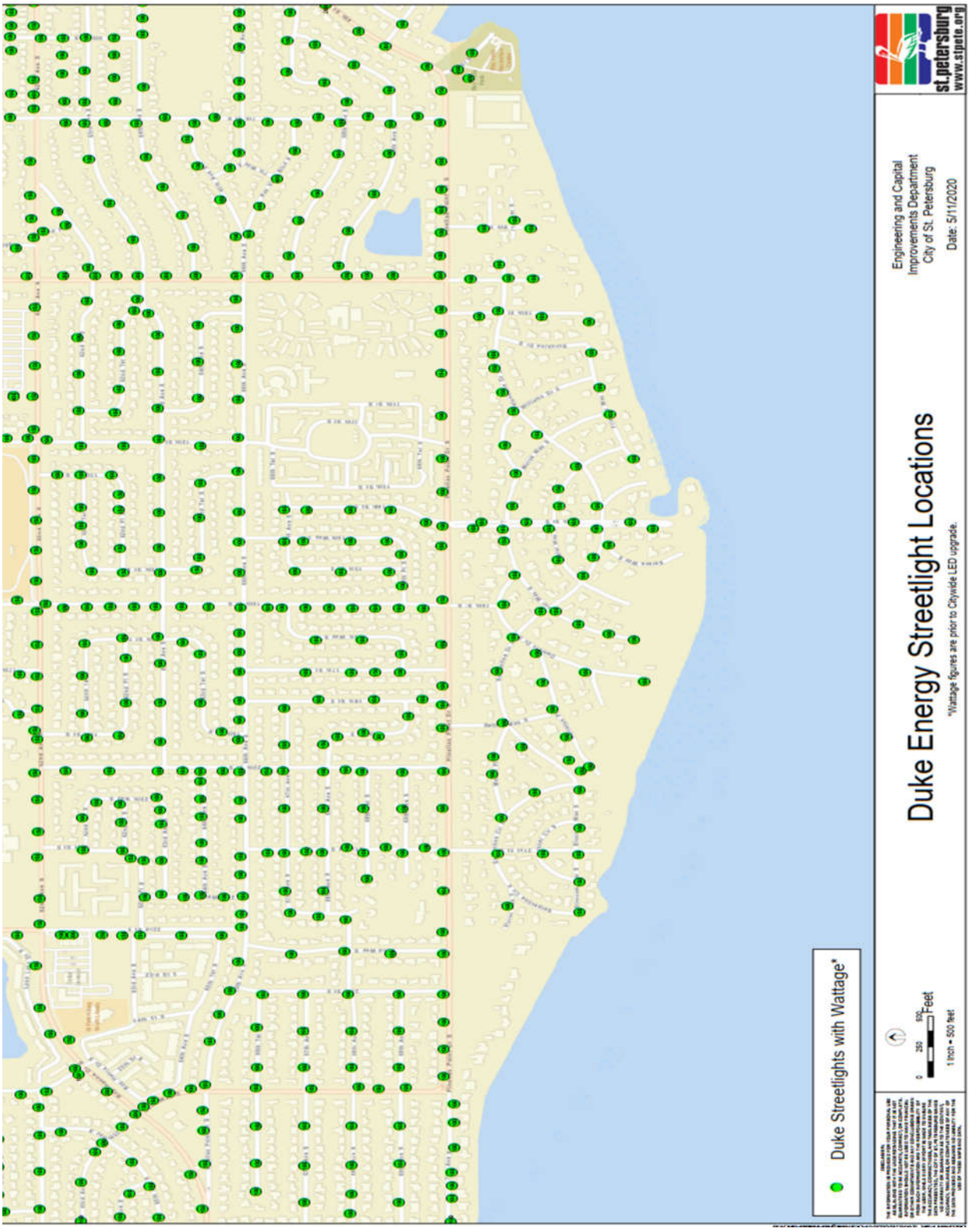
2 - Hit & Run (no speed noted)

1 - Speeding on Pinellas Point Drive (Nov. 2018 near 22 W/S est. 50 mph – driver cited for Careless Driving)

1 - Speed from an intersecting Roadway (single vehicle crash est. 60 mph – stolen vehicle hit curb driver fled).

Appendix - E Street Lighting

Streetlights are evenly distributed and have been upgraded to LED.



Appendix - F

Topic No. 750-010-002, Rule 14-15.012, F.A.C. March 1997
Speed Zoning for Highways, Roads and Streets in Florida
Revised: August 2018 Manual Adoption Procedure

SPEED ZONING FOR HIGHWAYS, ROADS AND STREETS IN FLORIDA

The FDOT encourages the consideration and implementation of facilities that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Paramount to this effort includes careful evaluation (or re-evaluation) of speed zone locations and proper selection of appropriate posted speed limits.

Florida Statutes require an engineering and traffic investigation to be conducted for any alteration of speed limits, mandated in Sections 316.187 and 316.189 F.S. These investigations would include, but are not limited to, the measurements of vehicular speed and other traffic engineering evaluations as contained in this Manual. These investigations are intended to be used as a guide when evaluating new potential speed zones or when periodically evaluating existing speed zones on a routine basis.

Studies historically have shown that the observed 85th percentile speed generally reflects the collective judgment of the vast majority of drivers as to a reasonable speed for given traffic and roadway conditions. Additionally, whenever minimum speed zones are used, the minimum posted speed should be within 5 mph of the observed 15th percentile speed. The upper and lower 15% of the observed speeds are therefore generally considered too fast or too slow for most reasonable drivers under ideal conditions. These extreme high and low out of range operating speeds are reasons the practice of speed zoning strives to achieve its objective of providing realistic speed restrictions to which meaningful enforcement can be applied.

Research has also shown that higher traveling speeds are not necessarily associated with an increased risk of being involved in a crash. When drivers travel at the same speed in the same direction, even at high speeds, as on interstates, they are not passing one another and cannot collide as long as they maintain the same travelling speed. Conversely, when drivers travel at different rates of speed, the frequency of crashes increases, especially crashes involving more than one vehicle. The key factor is speed variance. The greater the speed variance or the distribution of speeds the greater the number of interactions among vehicles. Thus, drivers attempting passing maneuvers due to speed variance increase the risk of having collisions.

The posted speed limit shall be rounded to the nearest multiple of 5 mph of the observed 85th percentile speed or upper limit of the 10 mph pace, whichever is less. The 10 mph pace is the 10 mph band of travel speeds containing the largest number of observed vehicles. An observed 85th percentile speed that exceeds the 10 mph pace could result from a small percentage of vehicles exceeding the posted speed limit to a greater degree than the average driver traveling within the 10 mph pace.

With rounding, the posted speed limit should not differ from the 85th percentile speed or upper limit of the 10 mph pace (whichever is less) by more than 3 mph. Speed limits of more than 8 mph below the 85th percentile speed is not authorized. **A speed limit of 4 to 8 mph less than the 85th percentile speed shall be authorized if supported by a supplemental investigation, which identifies the following:**

(a) There are road or roadside features not readily obvious to the normally prudent driver, such as length of section, alignment, roadway width, surface condition, sight distance, traffic volume, crash experience, maximum comfortable speed in curves, side friction (roadside development), signal progression, etc.;

(b) Other standard signs and markings have been tried but found ineffective; or

(c) To support a context classification target speed.

The existing speed limit within a speed zone will not be changed if the 85th percentile speed or upper limit of the 10 mph pace is within +/- 3 mph of the posted speed limit, unless a supplemental investigation identifies the need for a change.

Target speed is the highest speed at which vehicles should operate on a thoroughfare in a specific context, consistent with the level of multi-modal activity generated by adjacent land uses, to provide both mobility for motor vehicles and a safe environment for pedestrians, bicyclists, and public transit users.

The target speed is influenced by elements of roadway design that are governed by design speed, as well as the form and function of the adjacent uses beyond the right-of-way. When determining the speed limit based on this Chapter, consideration should be given to the land use context classification and allowable speed range as provided in Table 201.4.1 of the FDOT Design Manual.

The last five traffic studies, along the free-flow sections of Pinellas Point Drive, have resulted in an averaged 85th percentile speed of 45.25 MPH. Based on the Florida Speed Zoning Manual, the posted speed limit should therefore be set at 40 MPH, which is 5 MPH below the 85th %ile speed. (4 to 8 MPH less than the 85th %ile speed).

Conclusion:

The corridor is currently posted at 35 MPH, which is supported by the Target speed.

Additional measures are however required in order to reduce the upper 10 MPH pace, with an average percentage of 65.35 % exceeding the speed limit.

Appendix - G All-way Stop Analysis

A review of vehicle volumes along the corridor indicate that they have not been any significantly changes over the past few years. Therefore, the following all-way stop analysis is sufficient, until such time as traffic patterns return to normal and we can re-study / evaluate.

ALLWAY STOP WARRANT SUMMARY

City: **St. Petersburg** Technician: **M Stone**
County: **Pinellas** Date: **April 29, 2008**

Major Street: **Pinellas Point Drive** Lanes: **1** Critical Approach Speed: **25.8**
Minor Street: **70th Avenue South** Lanes: **1**

Warrant A:	Satisfied: ☐ Yes	■ No	**A.**	Satisfied: ☐ Yes ■ No
Warrant B:	Satisfied: ☐ Yes	■ No	**B.**	Satisfied: ☐ Yes ■ No
Warrant C - 1:	Satisfied: ☐ Yes	■ No	**C.**	Satisfied: ☐ Yes ■ No
Warrant C - 2:	Satisfied: ☐ Yes	■ No	**D.**	Satisfied: ☐ Yes ■ No
Warrant C - 3:	Satisfied: ☐ Yes	■ No		
Warrant D:	Satisfied: ☐ Yes	■ No		

ALLWAY STOP WARRANT SUMMARY

City: **St. Petersburg** Technician: **M. Stone**
County: **Pinellas** Date: **August 1, 2012**

Major Street: **Pinellas Point Drive South** Lanes: **1** Critical Approach Speed: **44.4**
Minor Street: **16th Street** Lanes: **1**

Warrant A:	Satisfied: ☐ Yes	■ No	**A.**	Satisfied: ☐ Yes ■ No
Warrant B:	Satisfied: ☐ Yes	■ No	**B.**	Satisfied: ☐ Yes ■ No
Warrant C - 1:	Satisfied: ☐ Yes	■ No	**C.**	Satisfied: ☐ Yes ■ No
Warrant C - 2:	Satisfied: ☐ Yes	■ No	**D.**	Satisfied: ☐ Yes ■ No
Warrant C - 3:	Satisfied: ☐ Yes	■ No		
Warrant D:	Satisfied: ☐ Yes	■ No		

ALLWAY STOP WARRANT SUMMARY

City: St. Petersburg
County: Pinellas

Technician: M Stone
Date: August 21, 2017

Major Street: Pinellas Point Dr S
Lanes: 1

Minor Street: Dr. Martin Luther King Jr. St S
Lanes: 1

Critical Approach Speed: 43.9

ALLWAY STOP WARRANT SUMMARY

Warrant A:	Satisfied:	☐ Yes	■ No	A.	Satisfied:	☐ Yes	■ No
Warrant B:	Satisfied:	☐ Yes	■ No	B.	Satisfied:	☐ Yes	■ No
Warrant C - 1:	Satisfied:	☐ Yes	■ No	C.	Satisfied:	☐ Yes	■ No
Warrant C - 2:	Satisfied:	☐ Yes	■ No	D.	Satisfied:	☐ Yes	■ No
Warrant C - 3:	Satisfied:	☐ Yes	■ No				
Warrant D:	Satisfied:	☐ Yes	■ No				

Appendix H Horizontal Shifts –

Traffic Calming Fact Sheets

May 2018 Update

Corner Extension/Bulb-Out

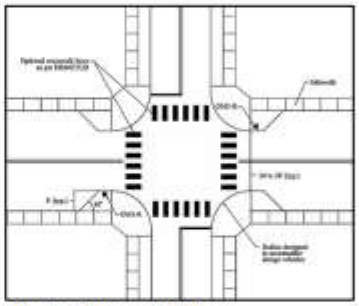
Description:

- Horizontal extension of the sidewalk into the street, resulting in a narrower roadway section
- If located at a mid-block location, it is typically called a choker

Applications:

- When combined with on-street parking, a corner extension can create protected parking bays
- Effective method for narrowing pedestrian crossing distances and increase pedestrian visibility
- Appropriate for arterials, collectors, or local streets
- Can be used on one-way and two-way streets
- Installed only on closed-section roads (i.e. curb and gutter)
- Appropriate for any speed, provided an adequate shy distance is provided between the extension and the travel lane
- Adequate turning radii must be provided to use on bus routes

(Source: James Barrera, Horrocks, New Mexico)



(Source: Delaware DOT)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- Effects on vehicle speeds are limited due to lack of deflection
- Must check drainage due to possible gutter realignment
- Major utility relocation may be required, especially drainage inlets
- Typical width between 6 and 8 feet
- Typical offset from travel lane at least 1.5 feet
- Should not extend into bicycle lanes

Potential Impacts:

- Effects on vehicle speeds are limited due to lack of deflection
- Can achieve greater speed reduction if combined with vertical deflection
- Smaller curb radii can slow turning vehicles
- Shorter pedestrian crossing distances can improve pedestrian safety
- More pedestrian waiting areas may become available
- May require some parking removal adjacent to intersections

Emergency Response Issues:

- Retains sufficient width for ease of emergency-vehicle access
- Shortened curb radii may require large turning vehicles to cross centerlines

Typical Cost (2017 dollars):

- Cost between $1,500 and $20,000, depending on length and width of barriers

Traffic Calming Fact Sheets

May 2018 Update

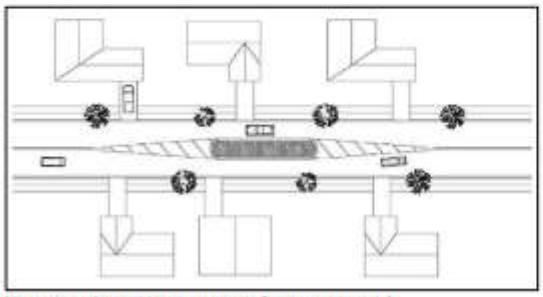
Median Island

Description:

- Raised island located along the street centerline that narrows the travel lanes at that location
- Also called median diverter, intersection barrier, intersection diverter, and island diverter

Applications:

- For use on arterial, collector, or local roads
- Can often double as a pedestrian/bicycle refuge islands if a cut in the island is provided along a marked crosswalk, bike facility, or shared-use trail crossing
- If placed through an intersection, considered a median barrier



(Source: Delaware Department of Transportation)

(Source: James Barrera, Horrocks, New Mexico)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- Potential legal issues associated with blocking a public street (e.g., business or emergency access)
- Barriers may consist of landscaped islands, mountable facilities, walls, gates, side-by-side bollards, or any other obstruction that leave an opening smaller than the width of a passenger car
- Can be placed mid-block or on the approach to an intersection
- Typically installed on a closed-section roadway (i.e. curb and gutter)
- Can be applied on roads with or without sidewalks and/or dedicated bicycle facilities
- Maximum appropriate speed limits vary by locale
- Typically not appropriate near sites that attract large combination trucks

Potential Impacts:

- May impact access to properties adjacent to islands
- No significant impact on vehicle speeds beyond the island
- Little impact on traffic volume diversion
- Safety can be improved without substantially increasing delay
- Shortens pedestrian crossing distances
- Bicyclists may have to share vehicular travel lanes near the island
- May require removal of some on-street parking
- May require relocation of drainage features and utilities

Emergency Response Issues:

- Appropriate along primary emergency vehicle roads or street that provides access to hospitals/emergency medical services

Typical Cost (2017 dollars):

- Cost between $1,500 and $10,000, depending on length and width of island

NOTE: This feature can also be installed “at” each leg of an intersection.

Traffic Calming Fact Sheets

March 2019 Update

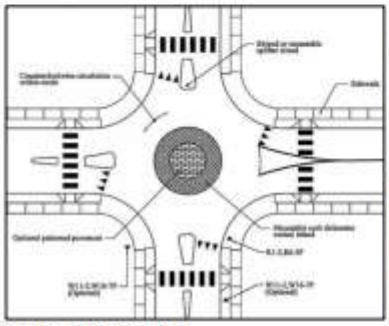
Mini Roundabout

Description:

- Raised islands, placed in unsignalized intersections, around which traffic circulates
- Motorists yield to motorists already in the intersection
- Require drivers to slow to a speed that allows them to comfortably maneuver around them
- Center island of mini roundabout is fully traversable, splitter islands may be fully traversable

Applications:

- Intersections of local and/or collector streets
- One lane each direction entering intersection
- Not typically used at intersections with high volume of large trucks or buses turning left
- Appropriate for low-speed settings



(Source: Delaware DOT)

(Source: Gary Schatz)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation:

- See NCHRP Report 672 for design details
- Typically circular in shape, but may be an oval shape
- Controlled by YIELD signs on all approaches with pedestrian crosswalks, if included, one car-length upstream of YIELD bar
- Preferable for roadway to have urban cross section (i.e., curb and gutter)
- Can be applied to road with on-street parking
- Can be applied to roads both with and without a bicycle facility. Bicycle facilities, if provided, must be separated from the circulatory roadway with physical barriers; cyclists using the circulatory roadway must merge with vehicles. Bicycle facilities are prohibited in the circulatory roadway to prevent right-hook crashes.
- Key design features are the fastest paths and path alignment.

Potential Impacts:

- Slight speed reduction
- Little diversion of traffic
- Bicycle and motorist will share lanes at intersections because of narrowed roadway
- Large vehicles/buses usually drive over the center island for left turns

Emergency Response:

- Emergency vehicles maneuver using the center island at slow speeds

Typical Cost

- Cost is similar to bulb-outs because pedestrian ramps and outside curb lines usually have to be relocated

Traffic Calming Fact Sheets

May 2018 Update

Traffic Circle

Description:

- Raised islands placed in unsignalized intersections around which traffic circulates
- Approaching motorists yield to motorists already in the intersection
- Require drivers to slow to a speed that allows them to comfortably maneuver around them
- Approaches not designed to modern roundabout principals - no deflection

Applications:

- Appropriate at intersections of local streets
- One lane each direction entering intersection
- Not typically used at intersections with high volumes of large trucks or buses turning left
- appropriate for both one-way and two-way streets in urban and suburban settings

(Source: Scott Batson)

(Source: Scott Batson)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- Typically circular in shape but may be an oval shape
- Usually have landscaped center islands
- Recommend YIELD signs on all approaches
- Preferable for roadways to be closed-section (i.e. curb and gutter)
- Can be applied to roads with on-street parking
- Can be applied to roads both with and without dedicated bicycle facilities; bike lanes not striped in circulatory roadway
- Key design features include: offset distance (distance between projection of street curb and center island), lane width of circulatory roadway, circle diameter, and height of mountable apron for large vehicles

Potential Impacts:

- Minimal anticipated traffic diversion
- Bicyclist and motorists will share lanes at intersections because of narrowed roadway
- Large vehicles/buses usually not able to circulate around center island for left turns
- Landscaping needs to be designed to allow adequate sight distance, per AASHTO
- Minimize routing of vehicles through unmarked crosswalks on side-streets
- May require additional street lighting

Emergency Response Issues:

- Emergency vehicles maneuver intersections at slow speeds
- Constrained turning radii typically necessitates a left turn in front of the circle for large vehicles

Typical Cost (2017 dollars):

- Typical cost is $15,000, with a range between $10,000 and $25,000

Vertical Deflections

Traffic Calming Fact Sheets

May 2018 Update

Speed Hump

Description:

- Rounded (vertically along travel path) raised areas of pavement typically 12 to 14 feet in length
- Often placed in a series (typically spaced 260 to 500 feet apart)
- Sometimes called road humps or undulations

Applications:

- Appropriate for residential local streets and residential/neighborhood collectors
- Not typically used on major roads, bus routes, or primary emergency response routes
- Not appropriate for roads with 85th-percentile speeds of 45 mph or more
- Appropriate for mid-block placement, not at intersections
- Not recommended on grades greater than 8 percent
- Work well in combination with curb extensions
- Can be used on a one-lane one-way or two-lane two-way street

(Source: City of Boulder, Colorado)

(Source: PennDOT Local Technical Assistance Program)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- ITE recommended practice - "Guidelines for the Design and Application of Speed Humps"
- Typically 12 to 14 feet in length; other lengths (10, 22, and 30 feet) reported in practice in U.S.
- Speed hump shapes include parabolic, circular, and sinusoidal
- Typically spaced no more than 500 feet apart to achieve an 85th percentile speed between 25 and 35 mph
- Hump heights range between 3 and 4 inches, with trend toward 3 - 3 ½ inches maximum
- Often have associated signing (advance warning sign before first hump in series at each hump)
- Typically have pavement markings (zigzag, shark's tooth, chevron, zebra)
- Taper edge near curb to allow gap for drainage
- Some have speed advisories
- Need to design for drainage, without encouraging means for motorists to go around a hump

Potential Impacts:

- No impact on non-emergency access
- Average speeds between humps reduced between 20 and 25 percent
- Speeds typically increase approximately 0.5 to 1 mph midway between humps for each 100 feet Beyond the 200-foot approach and exit of consecutive humps
- Traffic volumes diversion estimated around 20 percent; average crash rates reduced by 13 percent

Emergency Response Issues:

- Impacts to ease of emergency-vehicle throughput
- Approximate delay between 3 and 5 seconds per hump for fire trucks and up to 10 seconds for ambulances with patients

Typical Cost (2017 dollars):

- Cost ranges between $2,000 and $4,000

Traffic Calming Fact Sheets

May 2018 Update

Speed Table/Raised Crosswalks

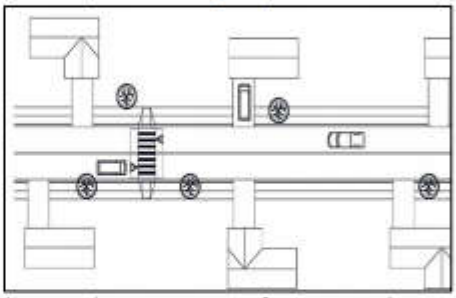
Description:

- Long, raised speed humps with a flat section in the middle and ramps on the ends; sometimes constructed with brick or other textured materials on the flat section
- If placed at a pedestrian crossing, it is referred to as a raised crosswalk
- If placed only in one direction on a road, it is called an offset speed table

Applications:

- Appropriate for local and collector streets; mid-block or at intersections, with/without crosswalks
- Can be used on a one-lane one-way or two-lane two-way street
- Not appropriate for roads with 85th percentile speeds of 45 mph or more
- Typically long enough for the entire wheelbase of a passenger car to rest on top or within limits of ramps
- Work well in combination with textured crosswalks, curb extensions, and curb radius reductions
- Can be applied both with and without sidewalks or dedicated bicycle facilities
- Typically installed along closed-section roads (i.e. curb and gutter) but feasible on open section

(Source: Google Maps, Boulder, Colorado)



(Source: Delaware Department of Transportation)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- ITE recommended practice – "Guidelines for the Design and Application of Speed Humps"
- Most common height is between 3 and 4 inches (reported as high as 6 inches)
- Ramps are typically 6 feet long (reported up to 10 feet long) and are either parabolic or linear
- Careful design is needed for drainage
- Posted speed typically 30 mph or less

Potential Impacts:

- No impact on non-emergency access
- Speeds reductions typically less than for speed humps (typical traversing speeds between 25 and 27 miles per hour)
- Speeds typically decline approximately 0.5 to 1 mph midway between tables for each 100 feet beyond the 200-foot approach and exit points of consecutive speed tables
- Average traffic volumes diversions of 20 percent when a series of speed tables are implemented
- Average crash rate reduction of 45 percent on treated streets
- Increase pedestrian visibility and likelihood of driver yield compliance
- Generally not appropriate for BRT bus routes

Emergency Response Issues:

- Typically preferred by fire departments over speed humps, but not appropriate for primary emergency vehicle routes; typically less than 3 seconds of delay per table for fire trucks

Typical Cost (2017 dollars):

- Cost ranges between $2,500 and $8,000 for asphalt tables; higher for brickwork, stamped asphalt, concrete ramps, and other enhancements sometimes used at pedestrian crossings

Traffic Calming Fact Sheets

May 2018 Update

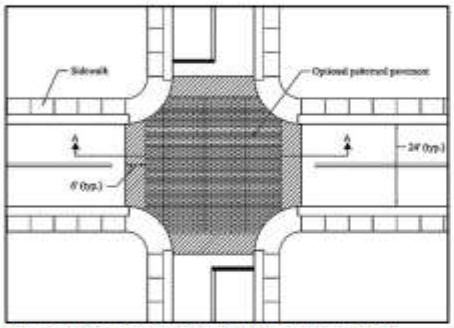
Raised Intersection

Description:

- Flat raised areas covering entire intersections, with ramps on all approaches and often with brick or other textured materials on the flat section and ramps
- Sometimes referred to as raised junctions, intersection humps, or plateaus

Applications:

- Intersections of collector, local, and residential streets
- Typically installed at signalized or all-way stop controlled intersections with high pedestrian crossing demand
- Works well with curb extensions and textured crosswalks
- Often part of an area-wide traffic calming scheme involving both intersecting streets in densely-developed urban areas



(Source: Delaware Department of Transportation)

(Source: Chuck Huffine, Phoenix AZ)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- Used at intersections with a maximum speed limit of 35 mph
- Typically rise to sidewalk level; appropriate if crosswalks exist on all four legs
- Appropriate if a dedicated bicycle facility passes through the intersection
- Detectable warnings and/or color contrasts must be incorporated to differentiate the roadway and the sidewalk
- May require bollards to define edge of roadway
- Storm drainage/underground utility modifications are likely necessary
- Minimum pavement slope of 1 percent to facilitate drainage

Potential Impacts:

- Reduction in through movement speeds likely at intersection
- Reduction in mid-block speeds typically less than 10 percent
- No impact on access
- Can make entire intersections more pedestrian-friendly
- No data available on volume diversion or safety impacts

Emergency Response Issues:

- Slows emergency vehicles
- Appropriate for primary emergency vehicle routes and streets with access to a hospital or emergency medical services

Typical Cost (2017 dollars):

- Costs range between $15,000 and $60,000

Traffic Calming Fact Sheets

May 2018 Update

Speed Cushion

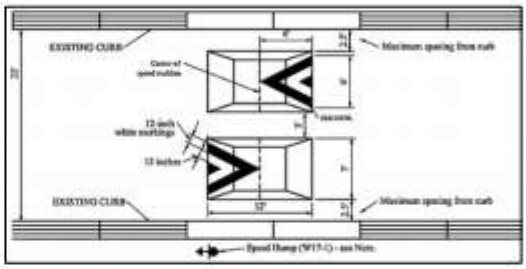
Description:

- Two or more raised areas placed laterally across a roadway with gaps between raised areas
- Height and length similar to a speed hump; spacing of gaps allow emergency vehicles to pass through at higher speeds
- Often placed in a series (typically spaced 260 to 500 feet apart)
- Sometimes called speed lump, speed slot, and speed pillow

Applications:

- Appropriate on local and collector streets
- Appropriate at mid-block locations only
- Not appropriate on grades greater than 8 percent

(Source: James Barrera, Horrocks, New Mexico)



(Source: Delaware Department of Transportation)

ITE/FHWA Traffic Calming EPrimer: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm

Design/Installation Issues:

- Two or more cushions at each location
- Typically 12 to 14 feet in length and 7 feet in width
- Cushion heights range between 3 and 4 inches, with trend toward 3 - 3 ½ inches maximum
- Speed cushion shapes include parabolic, circular, and sinusoidal
- Material can be asphalt or rubber
- Often have associated signing (advance-warning sign before first cushion at each cushion)
- Typically have pavement markings (zigzag, shark's tooth, chevron, zebra)
- Some have speed advisories

Potential Impacts:

- Limited-to-no impact on non-emergency access
- Speeds determined by height and spacing; speed reductions between cushions have been observed averaging 20 and 25 percent
- Speeds typically increase by 0.5 mph midway between cushions for each 100 feet of separation
- Studies indicate that average traffic volumes have reduced by 20 percent depending on alternative routes available
- Average collision rates have been reduced by 13 percent on treated streets

Emergency Response Issues:

- Speed cushions have minimal impact on emergency response times, with less than a 1 second delay experienced by most emergency vehicles

Typical Cost (2017 dollars):

- Cost ranges between $3,000 and $4,000 for a set of rubber cushions