

**RESOLUTION No. 19-195**

**A RESOLUTION OF THE MAYOR AND THE CITY COUNCIL OF  
THE CITY OF DORAL, FLORIDA, ADOPTING THE SPEED  
HUMP/BUMP INSTALLATION GUIDELINES AND DESIGN  
STANDARDS; AND PROVIDING FOR AN EFFECTIVE DATE**

**WHEREAS**, Section 77-52.a.3 of the City of Doral's Land Development Code does not allow speed bumps and/or speed humps; and

**WHEREAS**, the Public Works Department (PWD) has received multiple requests from residential communities for the installation of speed humps or speed bumps on local/private residential roads; and

**WHEREAS**, speed humps and speed bumps are vertical traffic calming devices intended to slow traffic speeds on low volume, low speed roads; and

**WHEREAS**, speed tables are the only vertical traffic calming devices allowed on City owned right-of-way to reduce speeding as they are allowed per Miami-Dade County standards; and

**WHEREAS**, speed tables are midblock traffic calming devices that raise the entire wheelbase of a vehicle to reduce traffic speed which require a length of 22 feet and often difficult to implement on local residential roads due to driveway spacings or short block lengths.; and

**WHEREAS**, Miami-Dade County does not regulate traffic control devices on private right-of-way; and

**WHEREAS**, the City of Doral completed the Speed Hump/Bump Installation

Guidelines and Design Standards dated July 2019 to develop guidelines for the installation of speed humps/bumps on local/private residential roads which will assist in determining the need and application of speed humps/bumps to control vehicular traffic speed along local or private residential streets within the city limits; and

**WHEREAS**, a copy of the Speed Hump/Bump Installation Guidelines and Design Standards is attached as Exhibit “A”; and

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF DORAL AS FOLLOWS:**

**Section 1. Recitals.** The above recitals are confirmed, adopted, and incorporated herein and made part hereof by this reference.

**Section 2. Approval.** The City Council hereby approves the adoption of the Speed Hump/Bump Installation Guidelines and Design Standards update dated July 2017.

**Section 3. Authorization.** The City Manager is authorized to adopt the findings and recommendations as outlined in the Speed Hump/Bump Installation Guidelines and Design Standards.

**Section 4. Implementation.** The City Manager and the City Attorney are hereby authorized to take such further action as may be necessary to implement the purpose and the provisions of this Resolution.

**Section 5. Effective Date.** This Resolution shall take effect immediately upon adoption.

The foregoing Resolution was offered by Vice Mayor Mariaca who moved its adoption. The motion was seconded by Councilmember Cabral and upon being put to a vote, the vote was as follows:

Mayor Juan Carlos Bermudez	Yes
Vice Mayor Claudia Mariaca	Yes
Councilwoman Digna Cabral	Yes
Councilman Pete Cabrera	Yes
Councilwoman Christi Fraga	Yes

PASSED AND ADOPTED this 13 day of August, 2019.

  
\_\_\_\_\_  
JUAN CARLOS BERMUDEZ, MAYOR

ATTEST:  
  
\_\_\_\_\_  
CONNIE DIAZ, MMC  
CITY CLERK

APPROVED AS TO FORM AND LEGAL SUFFICIENCY  
FOR THE USE AND RELIANCE OF THE CITY OF DORAL ONLY:

  
\_\_\_\_\_  
LUIS FIGUEREDO, ESQ.  
CITY ATTORNEY

# EXHIBIT “A”

**CITY OF DORAL**

# **SPEED HUMP/BUMP**

INSTALLATION GUIDELINES  
AND DESIGN STANDARDS

*Prepared by A&P Consulting Transportation Engineers, Corp.*







# City of Doral Speed Hump/Bump Installation Guidelines

Prepared by A&P Consulting Transportation Engineers, Corp.

July 15, 2019





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APPENDIX D - Sample of Speed Hump Design Plans
APPENDIX E - Speed Hump Application
APPENDIX F - Statement of Understanding
APPENDIX G - Petition Supporting the Installation of Speed Humps



8401

LEED

PLATE

## EXECUTIVE SUMMARY

The City of Doral (Doral) has retained A&P Consulting Transportation Engineers, Corp. (A&P) to develop guidelines for the installation of speed humps/bumps on local/private residential roads, as well as recommending the appropriate standards for their design and installation. The primary reason for compiling this guidance is to provide the City with specific information that will assist in determining the need and application of speed humps/bumps to control vehicular traffic speed along local or private residential streets within the city limits.

Doral is a fast-growing city in Florida, currently holding 154 residential communities, of which thirty-three (33) had speed bumps installed prior to City incorporation. The City's Public Works Department has been using the Miami-Dade County's Policy on Speed Humps as a guide to review and approve requests for speed humps installation in private residential communities. However, the City recognizes the need to have specific guidelines to account for the type of street and type of traffic calming measure, e.g., speed bump, speed hump, or speed table, when considering the installation of these devices along local and private residential roads within the city limits.

The format of this report includes two sections: Section 1 Speed Hump/Bump Research and Analysis, and Section 2 Guidelines for the Installation of Speed Humps/Bumps in City of Doral. Section 2 is intended to be used by the City in their day-to-day work when evaluating a request for speed humps/bumps installation.

A&P researched multiple sources of information to develop a set of guidelines that is consistent with current engineering practice. The literature review included standardized procedures and warrants at the local and national level. A&P also visited and documented the application of speed humps/bumps at five private residential communities; four with access restriction (gated) and one open to public travel (un-gated).

The report presents the lessons learned and best practice principles when considering the installation of these traffic calming

## Executive Summary

devices on local and private residential streets:

- The design should follow the ITE recommended practice - “Guidelines for the Design and Application of Speed Humps and Speed Tables” 2011 edition.
- The decision to install speed humps should be documented by a traffic engineering report.
- Speed humps are installed on roadways functionally classified as local streets and on neighborhood or residential collector streets as defined in AASHTO’s “A Policy on Geometric Design of Highways and Streets”.
- Speed humps have a traverse distance of about 12 to 14 feet and span the width of the road.
- The height of a speed hump ranges from 3 to 4 inches, with a typical range between 3 and 3 ½ inches.
- Speed hump shapes include parabolic, circular, and sinusoidal profile.
- Speed hump design must meet Americans with Disabilities Act (ADA) requirements.
- The typical spacing should be no more than 500 feet and the minimum spacing ranges from 200 feet to 350 feet, to achieve an 85th percentile speed between 25 and 30 mph.
- The speed hump material can be precast Portland cement concrete cast in situ and asphalt concrete or rubber devices.
- Traffic control devices and pavement markings should be installed in conformance with Manual on Uniform Traffic Control Devices (MUTCD) guidelines. A speed hump (W17-1) sign supplemented by an advisory speed plaque (W13-1P) should be installed at the speed hump location. Speed humps markings (12-inch white markings) should be installed to warn drivers of the location of speed humps.
- Tapered edge near curb should be provided to allow gap for drainage.
- Speed humps should be designed in a way that discourages motorists to go around and skip the hump.
- Requests for speed humps installation requires public education and involvement as well as input from relevant agencies such as emergency services and transit services.
- Liability problems might be related to whether motorists were properly warned of the presence of speed humps, and whether they were constructed according to specifications and adequately maintained.

The installation guidelines presented in Section 2 were divided into two subsections: Design and Application of Speed Humps/Tables and Design and Application of Speed Bumps. This distinction was established to account for the difference of these devices regarding their application and implementation process.

The Request and Implementation Process is presented in a flowchart in order to clearly communicate to the public the steps that need to be followed when requesting the installation of speed humps/bumps. Some of the documents required to be completed in the process, such as the Application form, Statement of understanding, and Petition supporting the installation, are provided.

Lastly, as requested by the City, this report has been written from a policy perspective as the City plans to establish an ordinance requiring that requests for the installation of these devices to be managed in accordance with an official process granting the City's Public Works Director the decision to approve, modify or deny the subject public request.







SECTION 1

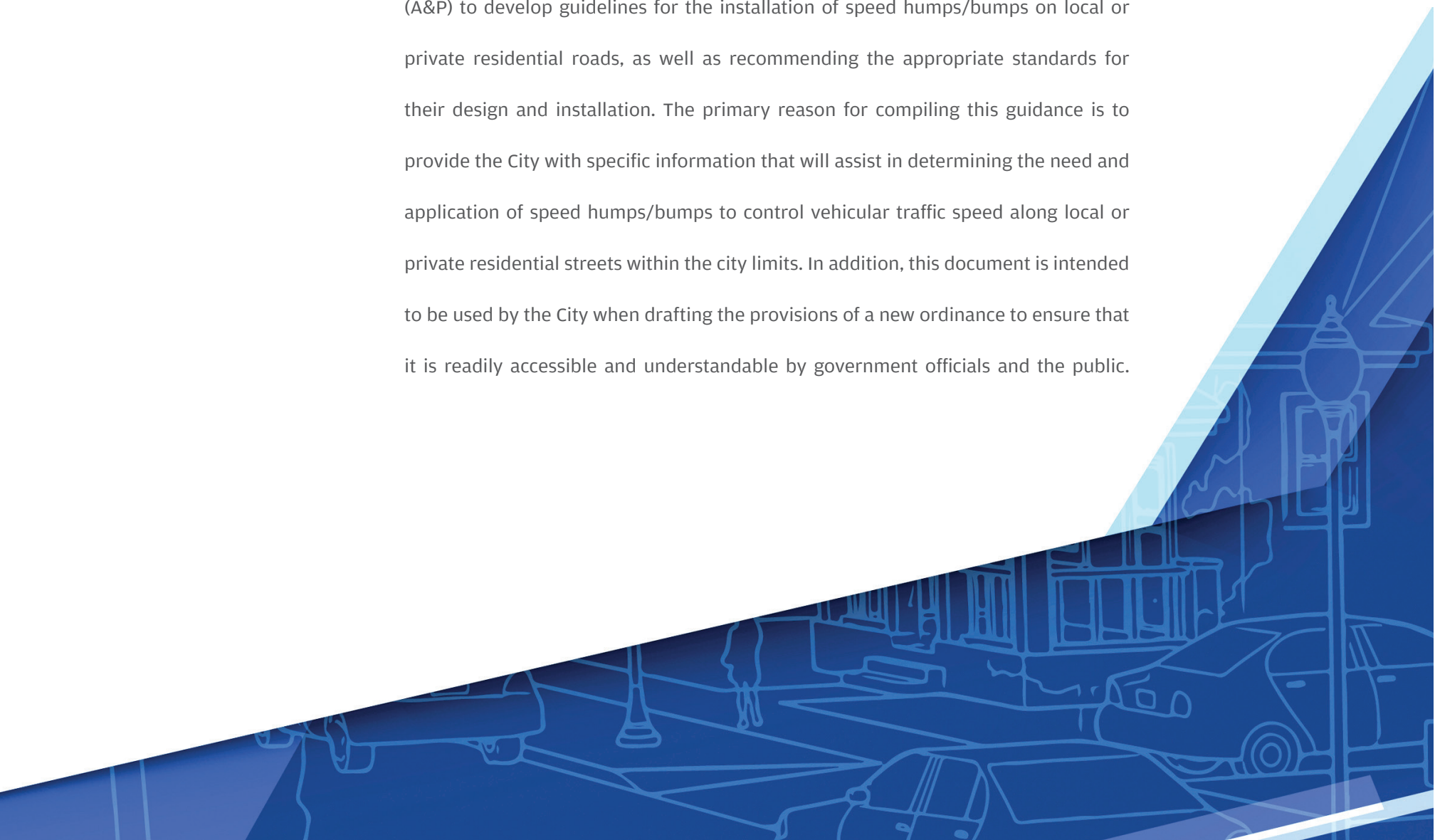
**SPEED HUMP/BUMP  
RESEARCH AND ANALYSIS**



## SECTION 1 | **SPEED HUMP/BUMP RESEARCH AND ANALYSIS**

### **1.1 INTRODUCTION**

The City of Doral has retained A&P Consulting Transportation Engineers, Corp. (A&P) to develop guidelines for the installation of speed humps/bumps on local or private residential roads, as well as recommending the appropriate standards for their design and installation. The primary reason for compiling this guidance is to provide the City with specific information that will assist in determining the need and application of speed humps/bumps to control vehicular traffic speed along local or private residential streets within the city limits. In addition, this document is intended to be used by the City when drafting the provisions of a new ordinance to ensure that it is readily accessible and understandable by government officials and the public.



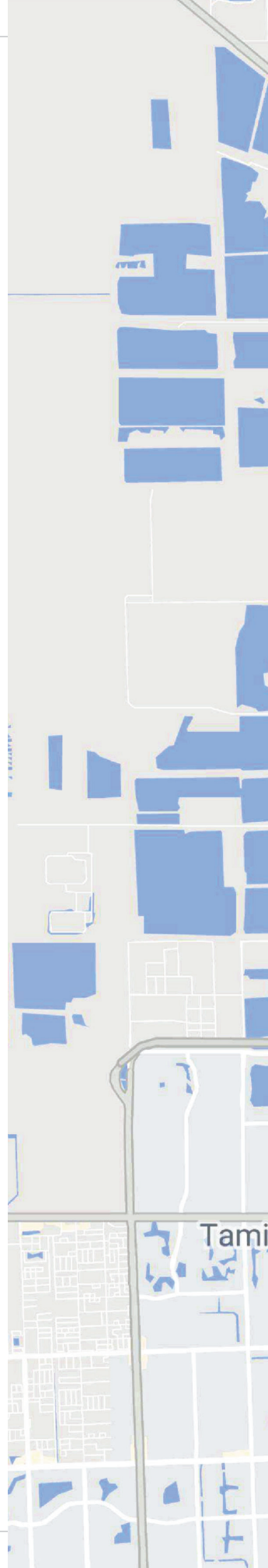
## 1.2. BACKGROUND INFORMATION

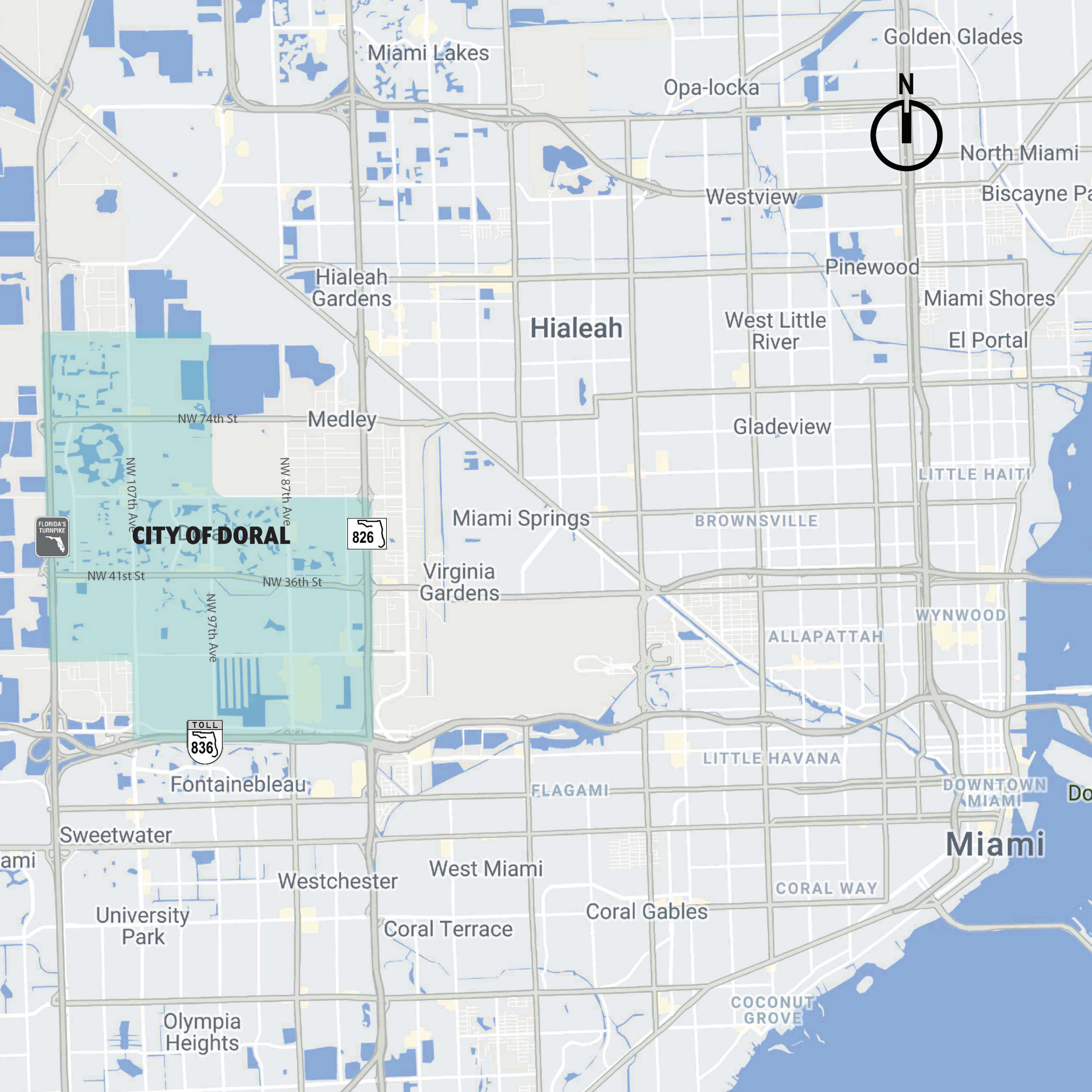
The City of Doral is a city in Miami-Dade County, Florida. It is located approximately one mile from Miami International Airport (MIA) and approximately 13 miles from Downtown Miami. The City occupies a land area of approximately 15 square miles, bordered by the Florida's Turnpike to the west, SR 826/Palmetto Expressway to the east, the Town of Medley to the north, and the City of Sweetwater to the south. The City of Doral is a principal city within the Miami Metropolitan Area, with a population of 6,012,331 people based on the 2015 census. Figure 1 shows the location of the City of Doral within the Miami Metropolitan Area.

Currently, the City of Doral is going through a development transformation with high-end residences and businesses in areas such as Downtown Doral, City Place Doral, and Midtown Doral. The City has a total of 154 residential communities. As such, the City's Public Works Department has received numerous requests from communities and individuals to install speed humps/bumps within their neighborhoods.

A policy on speed humps established by Miami-Dade County Public Works Department (MDCPWD) has been used by the city as a guide in the decision process and review of requests for speed humps/bumps along local residential streets. However, no standard guidelines exist for speed humps/bumps installation on roads outside Miami-Dade County's jurisdiction, which is the case of private residential roads and roads solely under the City of Doral's jurisdiction. Figure 2 depicts the right of way designation and location of roads within the city.

Right Page | **FIGURE 1**





Golden Glades



Miami Lakes

Opa-locka

North Miami

Westview

Biscayne Pa

Hialeah Gardens

Pinewood

Miami Shores

Hialeah

West Little River

El Portal

NW 74th St

Medley

Gladeview

LITTLE HAITI

NW 107th Ave

NW 87th Ave

826

Miami Springs

BROWNSVILLE

**CITY OF DORAL**

NW 41st St

NW 36th St

Virginia Gardens

WYNWOOD

NW 97th Ave

ALLAPATTAH

TOLL 836

Fontainebleau

LITTLE HAVANA

DOWNTOWN MIAMI

FLAGAMI

Sweetwater

**Miami**

Westchester

West Miami

CORAL WAY

University Park

Coral Terrace





Coral Gables

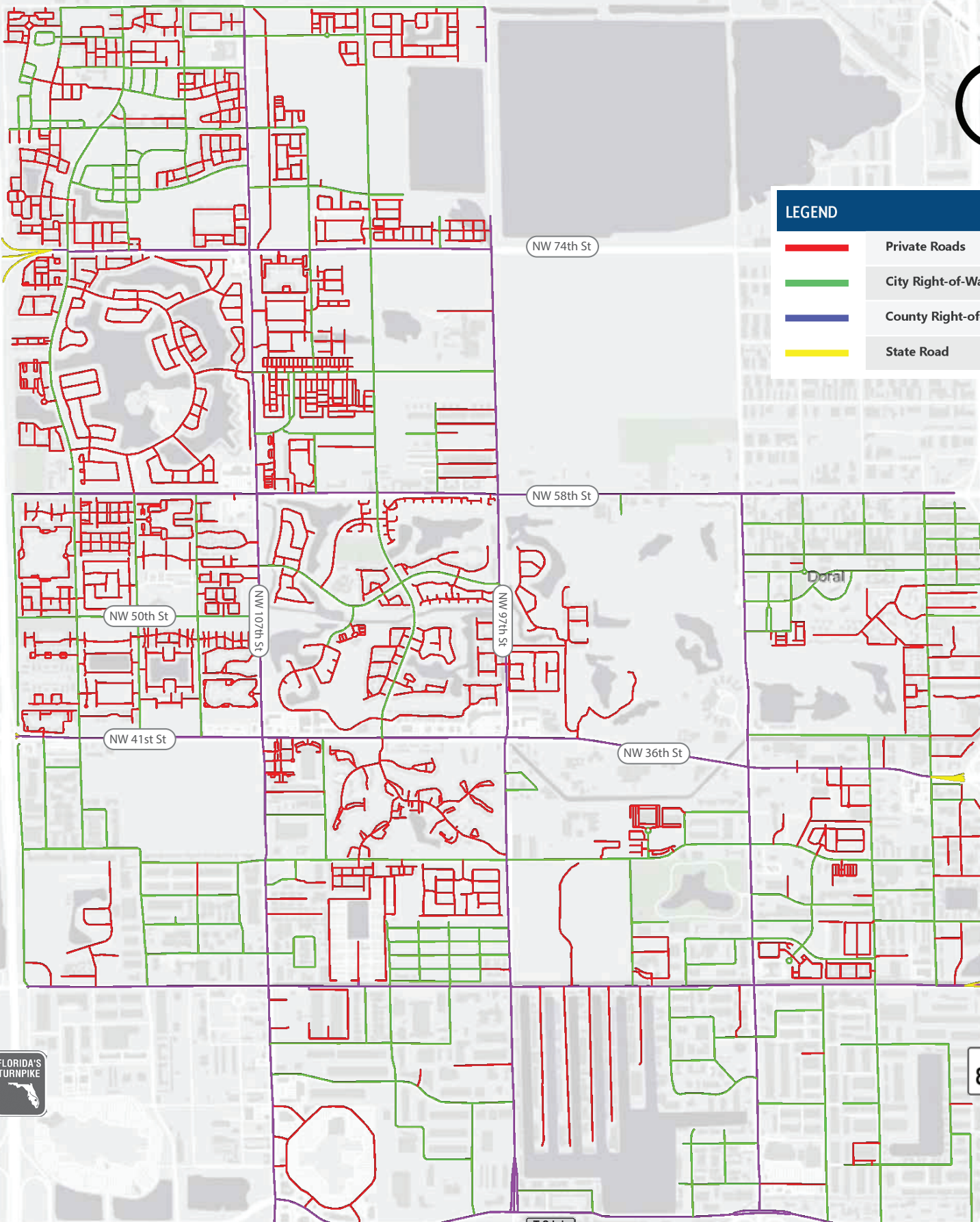
Olympia Heights

COCONUT GROVE



### LEGEND

-  Private Roads
-  City Right-of-Way
-  County Right-of-Way
-  State Road



826

TOLL  
836

### 1.3. PURPOSE

The purpose of this document is to provide specific guidance for the installation and design of speed humps on local and private residential streets under the City of Doral's jurisdiction.

### 1.4. METHODOLOGY

The methodology used in this document includes the following tasks:

- Literature Review
- Visit communities where speed humps/bumps have been installed
- Summarize the lessons learned
- Identify best practices
- Develop installation guidelines and design standards

### 1.5. LITERATURE REVIEW

In an effort to build upon the work of previous studies and to ensure consistency with other official documents, A&P conducted a literature review to learn about existing speed humps/bumps guidelines and governing policies. The documents reviewed included standardized procedures and warrants followed by other local municipalities, the Miami-Dade County Policy on Speed Humps as well as the guidelines for the design and application of speed humps and speed tables from the Institute of Transportation Engineers (ITE) and other accredited organizations. The documents were classified into two broad categories: guiding documents and local guidelines and standards.

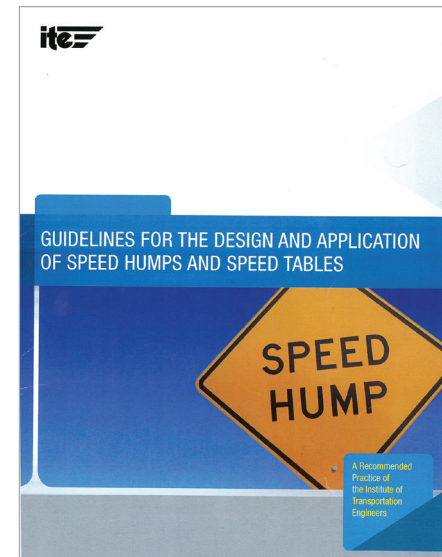
*Left Page* | **FIGURE 2**

## ▶ 1.5.1. GUIDING DOCUMENTS

### ● 1.5.1.1. ITE GUIDELINES FOR THE INSTALLATION AND APPLICATION OF SPEED HUMPS AND SPEED TABLES

This report provides guidelines for the design and application of speed humps and speed tables, and geometric design techniques that may be used to physically reduce vehicular traffic speeds along a roadway. The report also documents the experiences of various agencies implementing speed humps and speed tables. The information provided in the report includes:

- Considerations for speed humps and speed tables use: identifies the general elements for an agency to consider before speed hump or speed table installation.
- Community relations and administrative procedures: describes the most common formal process agencies utilize for implementing speed humps. The five key elements recommended are: 1) appropriate legislation, 2) request procedure, 3) evaluation of requests, 4) consultation, and 5) removal process.
- Design guidelines: recommends design guidelines, including dimensions, cross-sections, roadway edge treatments, spacing and locations, signs and pavement markings, and other aesthetic considerations.
- Construction and maintenance guidelines: provide guidelines of proper construction procedures, construction materials, and maintenance.
- Monitoring and evaluation: recommends the development of a formal process for monitoring and evaluating speed humps/tables. The process should include data collection and analysis of vehicle operating speeds, traffic volume changes, and traffic diversions.
- Other key considerations: provides a discussion of liability and enforcement.





### 1.5.1.2. FEDERAL HIGHWAY ADMINISTRATION (FHWA) – TRAFFIC CALMING

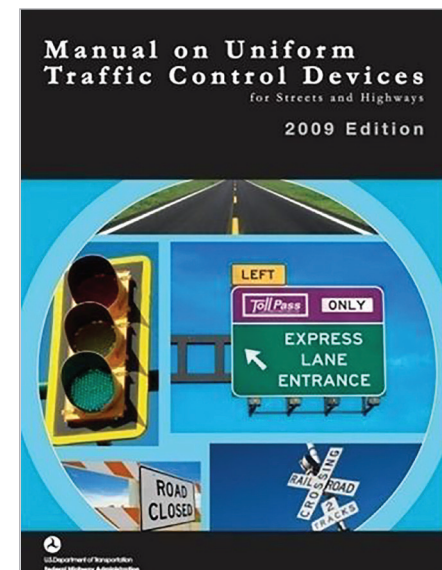
This FHWA document provides further guidance and clarification of the ITE Guidelines for the Design and Application of Speed Humps. The document provides the following guidance and clarification:

- Appropriate application: includes variables such as type of street, location whether intersection or segment, roadway cross-section, speed limit, traffic volumes, emergency route, transit route, access route, and roadway grade.
- Effects and issues: includes variables such as vehicle speed, vehicle volume, safety and mobility of pedestrians, bicyclists, motorists, emergency vehicles and large vehicles, accessibility to adjacent properties, environment and design issues.
- Additional design considerations: provides a sample design of the speed hump.

### 1.5.1.3. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) 2009 EDITION

The MUTCD includes the following sections relevant to speed hump application:

- Section 2C.29 SPEED HUMP Sign
- Section 3B.25 Speed Hump Markings
- Section 3B.26 Advance Speed Hump Markings



It should be noted that the MUTCD does not include provisions regarding speed hump/bump design. In Section 1A.08 Authority for Placement of Traffic Control Devices it is stated:

*“Although some highway design features, such as curbs, median barriers, guardrails, speed humps or tables, and textured pavement, have a significant impact on traffic operations and safety, they are not considered to be traffic control devices and provisions regarding their design and use are generally not included in this Manual.”*

## ▶ 1.5.2. LOCAL GUIDELINES AND STANDARDS

### ● 1.5.2.1. MIAMI-DADE COUNTY’S POLICY ON SPEED HUMPS



Miami-Dade County has a document which contains the guidelines for the installation of speed humps on local residential streets. The speed hump requests are evaluated on a case-by-case basis and are allowed only on local residential streets. The document describes the criteria, application procedure, petition process, speed hump removal and alteration process, and design and specifications. The Miami-Dade County Policy on Speed Humps is a part of the Traffic Flow Modification(s) Street Closure(s) Procedure, which is provided in Appendix A.

#### **CRITERIA:**

1. The street must be a local residential street. Speed humps shall not be constructed on collector and arterial roadways.
2. The street shall not have more than one traffic lane in each direction.

3. The street must be at least 750 feet long, with no intersecting roadways in between.
4. Traffic volumes on the street must be equal or exceed 750 vehicles per day.
5. The street is posted at or has a speed limit of 30 MPH or less.
6. The traffic engineering study has determined that the 85th percentile speed on the street is at least 10 MPH over speed limit.
7. The speed humps will not be considered within 250 feet of a traffic signal, within 50 feet of an intersection, in front of a driveway, within an intersection or adjacent to fire hydrants.
8. The speed humps will not be considered in, or on the approaches, to a horizontal or a vertical curve where visibility of the hump is restricted.
9. The street should not be located along an emergency response route, regional transit or school bus route and must be approved by the respective agencies for the installation of speed humps.
10. Installation of these devices shall not cause the traffic to divert to other neighborhood streets.
11. 2/3 of the residents/property owners of the block(s) concur with the installation of the speed humps.
12. The District Commissioner approves the use of People's Transportation Plan (PTP) funding for the installation.

**APPLICATION PROCEDURE:**

- The Applicant must submit a request in writing to the Chief of the Traffic Engineering Division.
- The Traffic Engineering Division will verify if the street meets the criteria for the installation of speed humps or if other measurements may be taken to resolve the resident's concerns.
- If the street does not meet the criteria, the request is denied.
- If the street meets the criteria, a petition packet will be mailed to the Applicant.
- Once the approved petition is received, the Applicant will be notified of the Public Works Department recommendations.
- If approval is granted, the Traffic Engineering Division will seek approval of PTP funding.

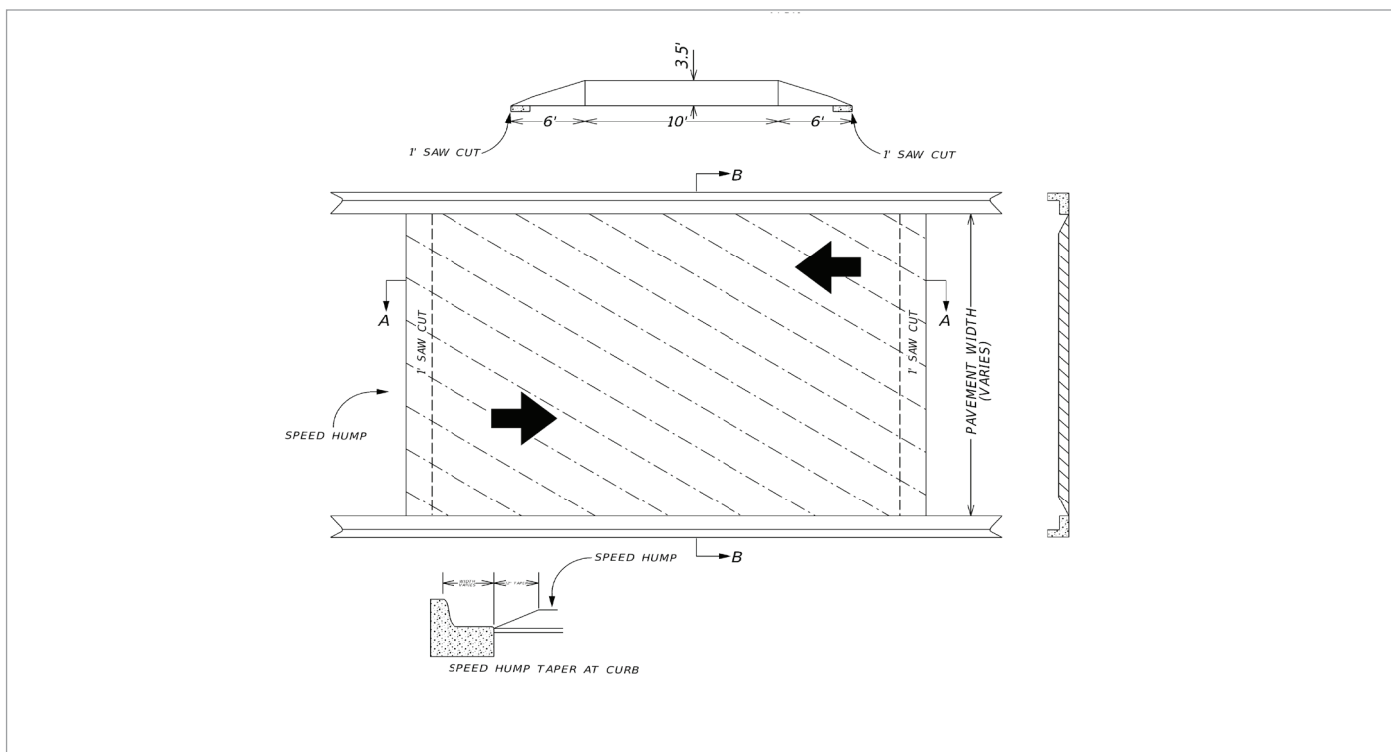
## SECTION 1 | Speed Hump/Bump Research and Analysis

- Upon approval, the Public Works Department will initiate the design and subsequently proceed with the installation of the traffic calming devices.
- The initial installation will be allowed for a 6-month trial period. The final determination on the retention/removal of the speed humps will be made at the expiration of the trial period.

### **SPEED HUMP REMOVAL AND ALTERATION:**

The process for the alteration or removal is similar to the process for installation, except that if the device is installed by a municipal jurisdiction, such entity will be responsible for the removal of such device upon approval from the Public Works Department at no cost to the County.

**DESIGN:** The following design is adopted by PWD as the County's Standard for Speed Hump (s):



### ● 1.5.2.2. **CITY OF MIAMI BEACH: PUBLIC WORKS MANUAL, SECTION 1 – TRAFFIC CALMING**



This manual provides a methodology that includes policies, techniques, and procedures to install traffic calming devices. Speed humps are among the traffic calming devices accepted by the City of Miami Beach. The City of Miami Beach Traffic Calming Section is provided in Appendix B.

Based on this document, the points to consider in the design of any traffic calming device include:

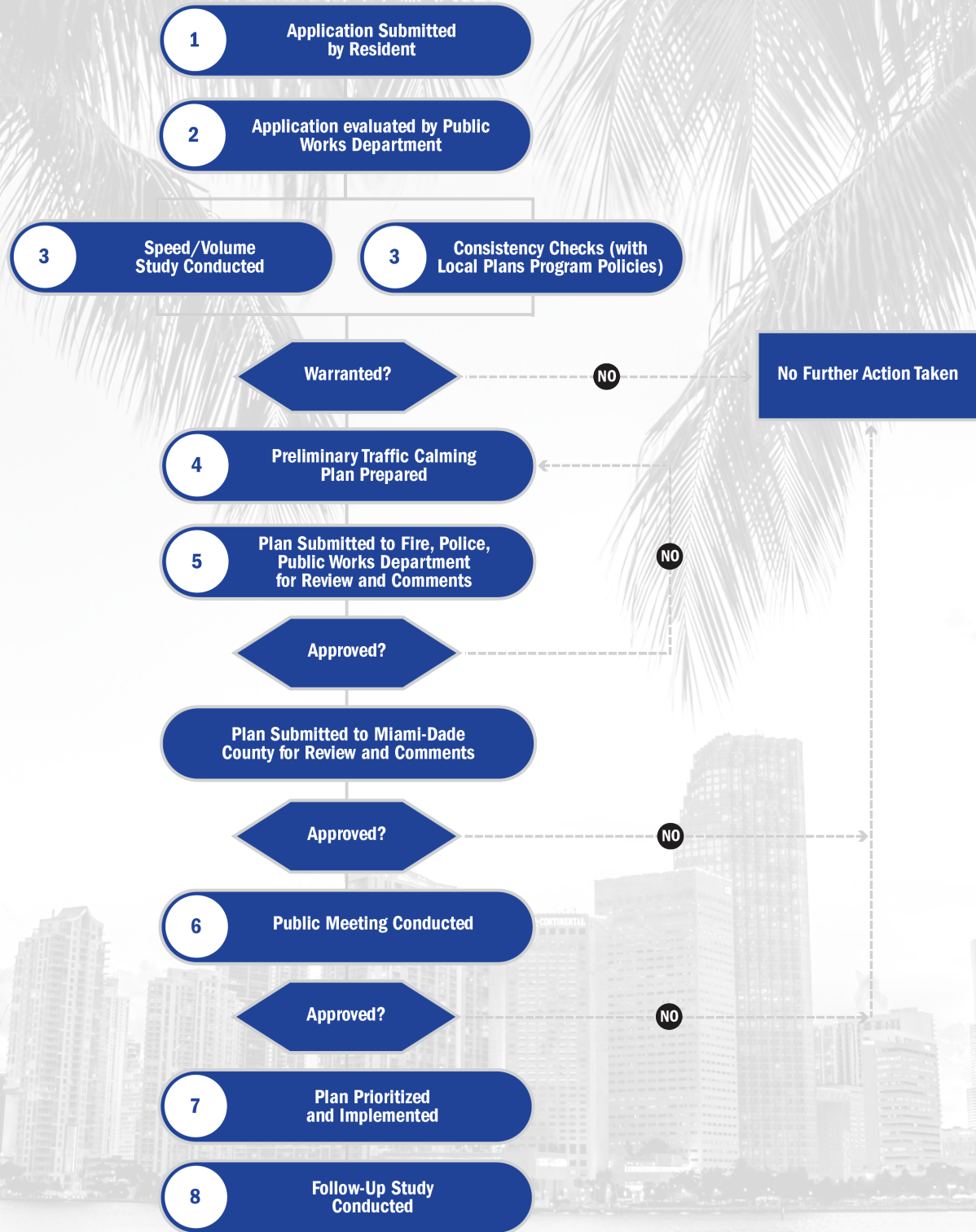
- Streets that are classified as arterial, collector or higher shall not be considered under this traffic calming guidelines.
- Emergency vehicles access must be preserved. Fire and Police Departments should be involved from the beginning.
- The cut-through traffic should be routed back to collector and arterial roadways.
- Public Works Department should look at the redistribution of traffic in adjacent streets. The impacts on adjacent streets and arterials must be measured.
- Public Works Department should look at the origin of the problem. No one uses a short-cut unless there is a reason to.
- Buses need to be able to negotiate traffic calming features safely, without undue discomfort to passengers and at a reasonable operating speed.
- Signing to ensure that Heavy Goods Vehicles (HGVs) and other ‘through’ traffic choose suitable routes that reduce the environmental impact of their journeys.
- Pedestrians and bicyclists access must be accommodated. Provision for pedestrians and cyclists should be of a high quality to promote the shift from the private car to more sustainable modes of transport. Adequate widths and carefully considered routes and priorities coupled with arrangements to make access for disabled people as easy as possible are required.



## CITY OF MIAMI BEACH

### FIGURE 3

is a flow chart that graphically depicts the City of Miami Beach's process and procedures followed when evaluating the installation of traffic calming devices.



As shown in the flow chart, the process consists of eight (8) steps, which are described as follows:

**STEP 1 | APPLICATION:**

An application form should be completed and submitted to the Public Works Department. Note that the City of Miami Beach will initiate a preliminary traffic calming study due to a resident complaint, the request of a neighborhood association, or a Commissioner's request.

**STEP 2 | APPLICATION EVALUATION:**

The City's staff will identify the study area, collect preliminary traffic data and complete the evaluation of the traffic calming request. The evaluation is based on a point system with thresholds for the speed and traffic volumes.

**STEP 3 | CHECK CONSISTENCY WITH CITY AND METROPOLITAN PLANNING ORGANIZATION (MPO) PLANS AND PROGRAMS:**

The City will ensure that the proposed physical traffic modifications will be consistent with City and County short and long range transportation plans and programs.

**STEP 4 | PREPARE THE DRAFT TRAFFIC CALMING PLAN:**

A preliminary traffic calming plan will be developed. Factors such as, the location of the proposed traffic calming device relative to driveways, traffic control devices, location of inlets, manholes, light poles will be taken into consideration.

**STEP 5 | SUBMIT PLAN FOR APPROVAL:**

A draft plan set of the design will be submitted to the Fire Department, Police Department, and the Miami-Dade County for review and comments. The plan will be revised to address any concern expressed by these agencies.

**STEP 6 | CONDUCT NEIGHBORHOOD WORKSHOP:**

If the area of concern meets the minimum criteria, City’s staff will conduct a neighborhood workshop meeting to review the results of preliminary studies and to receive comments on the preliminary design of the traffic calming plan. Once the study is complete and a neighborhood meeting has been held, a ballot will be sent to each affected property owner. Approval of at least two-thirds (2/3) of the affected property owners is needed to proceed with the traffic calming plan.

**STEP 7 | PRIORITIZE AND IMPLEMENT PROJECT:**

Projects are prioritized by the City based on the point score determined in Step 2: APPLICATION EVALUATION. The highest-ranking projects will be undertaken first. Then, the City staff will finalize the design and implementation process for the proposed traffic calming devices. Specific techniques may be installed as a “test site”, while others will be installed permanently. “Test sites” will be monitored and evaluated for effectiveness. After a period of evaluation, measurable objectives and performance measures will be established on a case-by-case basis. It is noted that the City’s Traffic Engineering Standards will be consulted for adherence in relation to any proposed traffic calming measures.

**STEP 8 | EVALUATE PROJECT:**

Immediately following the installation of the project, City staff will begin an evaluation of the project’s effectiveness. If the project has not met the objectives during the evaluation period, staff will notify the community’s representatives. City staff and community representatives may then decide to make modifications to the current plan. These modifications may include the implementation of additional or different techniques, or the removal of the traffic calming devices.

Table 1 summarizes the characteristics taken into consideration when implementing speed humps within the City of Miami Beach.



**TABLE 1.** *Speed Hump Considerations - City of Miami Beach*

MEASURE	VOLUME REDUCTIONS	SPEED REDUCTIONS	NOISE	EMERGENCY & SERVICE ACCESS	COST EFFECTIVENESS
Speed Humps/ Speed Cushions	Possible	Possible	Increase	Some problems	Moderate (\$2-\$5K)
	Advantages	Disadvantages	Effectiveness		
	<p>Relatively inexpensive</p> <p>Relatively easy for bicycles to cross if designed appropriately</p> <p>Very effective in slowing travel speeds</p>	<p>“ cause rough ride” for all drivers, and can cause severe pain for people with certain skeletal disabilities</p> <p>force large vehicles, such as emergency vehicles and those with rigid suspensions, to travel at slower speeds</p>	<p>FOR A 12-FOOT HUMP:</p> <ul style="list-style-type: none"> <li>• Average of 22% decrease in the 85th percentile travel speeds</li> <li>• Average of 11% decrease in accidents</li> </ul> <p>FOR A 14-FOOT HUMP:</p> <ul style="list-style-type: none"> <li>• Average of 23% decrease in the 85th percentile travel speeds</li> <li>• Average of 41% decrease in accidents</li> </ul>		

1.5.2.3. **TOWN OF CUTLER BAY - TRAFFIC CALMING MASTER PLAN**



The traffic calming master plan includes the process necessary for the installation of a traffic calming device in the Town of Cutler Bay. The traffic calming section is provided in Appendix C.

**STEP 1 | TRAFFIC CALMING REQUEST:**

Request from residents must be sent to the Town Public Works Department, then the request is documented in a Traffic Calming Request Form.

**TABLE 2.** *General Requirements - Town of Cutler Bay*

MINIMUM THRESHOLD			
No.	Traffic Criteria	Residential Local Streets	Residential Collector Streets
1	85th Percentile	Greater than 10 mph over posted speed limit	Greater than 10 mph over posted speed limit
2	Peak Hour Volume	Excess 150 vph	Excess 300 vph
3	Average Daily Traffic Volume	Greater than 1,500 and less than 3,000 vpd	Greater than 300 and less than 8,000 vpd
4	Crashes	Street averages more than 3 crashes per year on residential street or more than 6 crashes per year on residential collectors	
5	Concurrence from affected resident/property owners	2/3 of the residents/property owners of the block (s) concur with the installation of the devices	

**STEP 2 | GENERAL REQUIREMENTS AND CONSTRAINTS:**

The following criteria must be met in order for a roadway to be considered for traffic calming improvements. These criteria are based on Miami-Dade County Guidelines. Table 2 summarizes the criteria.

The following restrictions also apply in addition to the criteria included in Table 2:

- Roadways where the device will be installed shall be residential streets or generic residential collectors.
- The posted speed limit may not be more than 30 mph for residential streets or 35 mph for residential collectors.
- Roadways shall be streets with only two travel lanes.
- Roadway should not be used as a primary route for emergency or fire rescue vehicles.
- Roadway shall not have curves or obstacles.
- Roadway shall not be a through truck route.
- Pedestrians and/or bicyclist safety shall not be affected.
- Roadway drainage shall not be affected.

**STEP 3 | PUBLIC INVOLVEMENT:**

The Town of Cutler Bay involves the community to get their input and consensus on the issues that affect the community. After receiving the input from residents, conceptual sketches of the proposed traffic control devices are presented to the public in a final workshop.

**STEP 4 | TOWN COUNCIL APPROVAL:**

The recommended traffic measure is presented to the council for the final approval and funding.

**STEP 5 | FINAL DESIGN PLANS:**

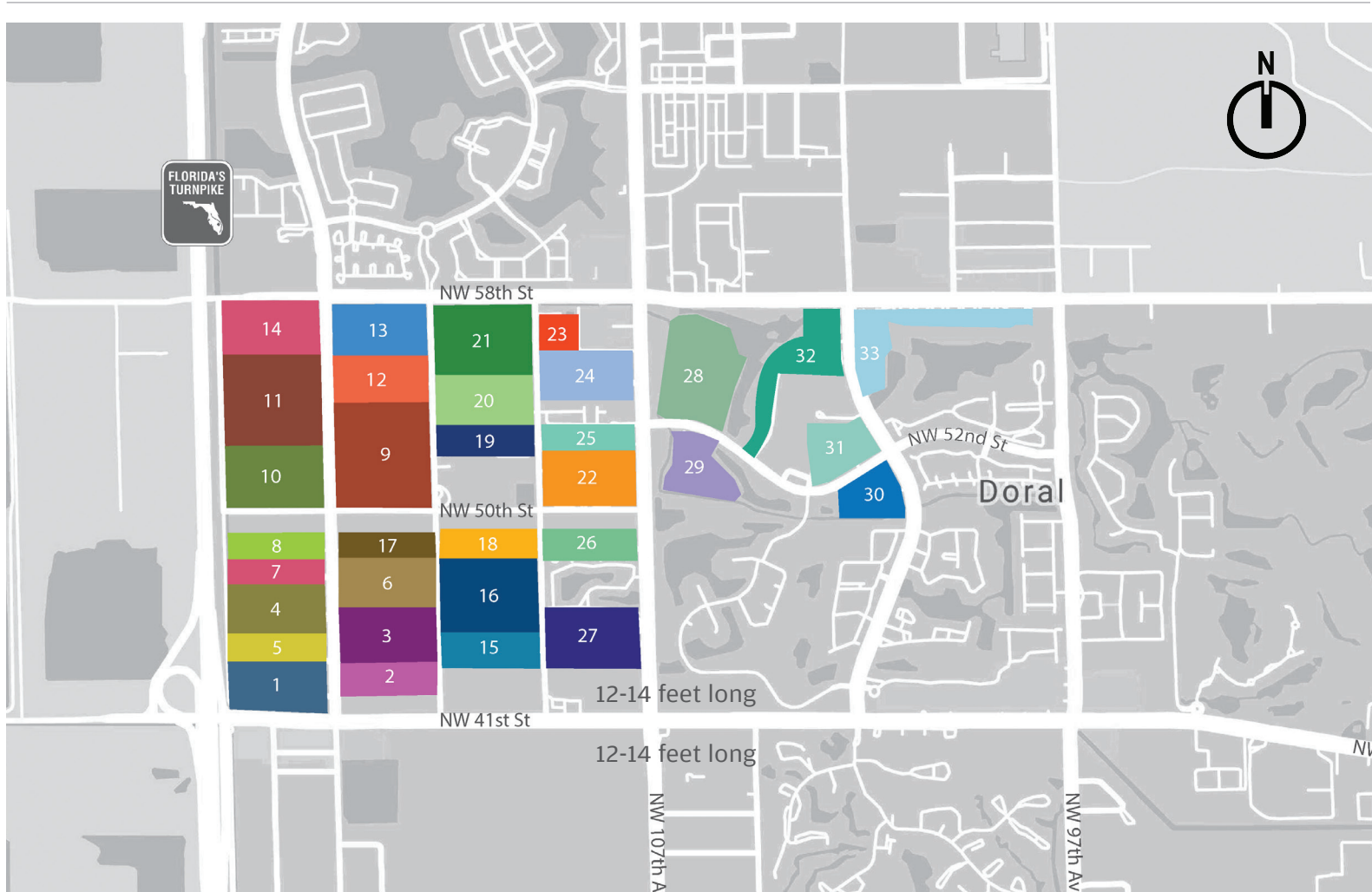
Final construction documents are prepared for review and approval by the Fire Department and Public Works Department.

## 1.6. LOCAL SPEED HUMP/BUMP APPLICATION



A total of 33 communities had speed humps and/or speed bumps installed prior to City of Doral incorporation. Figure 4 and 4.1 graphically shows the location of each of these communities within the City of Doral.

**FIGURE 4.** Communities with speed humps and/or speed bumps within the City of Doral



**FIGURE 4.1.** Communities with speed humps and/or speed bumps within the City of Doral

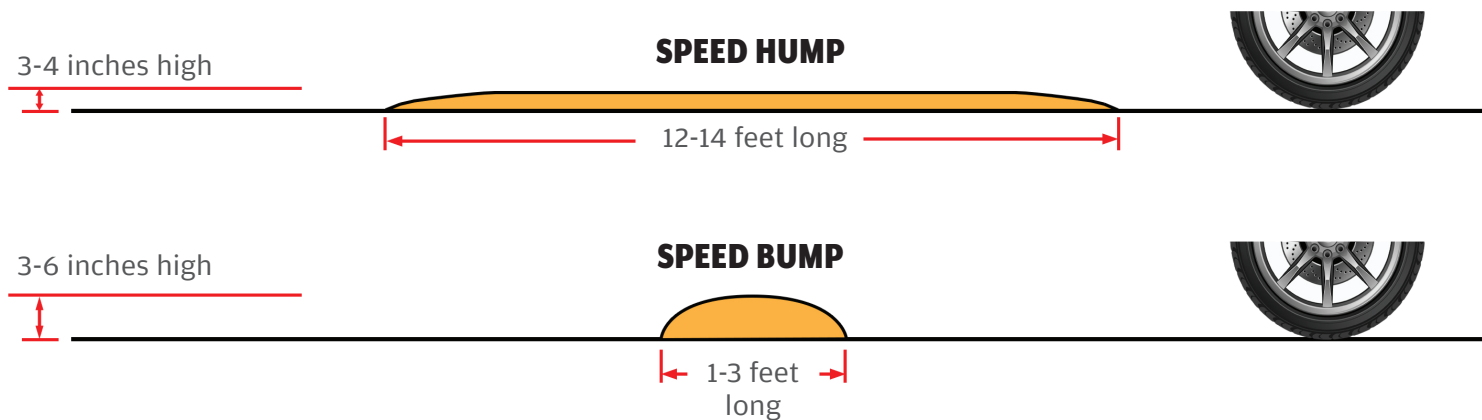
ID #	COMMUNITY NAME	LOCATION	ID #	COMMUNITY NAME	LOCATION
1	Amli at Doral	N.W. 41 East of Turnpike	18	Costa Bella	4843 N.W. 109th Path, Doral, Florida 33178
2	Hawksnest	NW 42nd Terrace, Doral, Florida 33178	19	Veranda	5685 N.W. 84 Ave, Doral, Florida 33166
3	Balmoral Lakes	11293 N.W. 43 Ter. Doral, Florida 33178	20	Doral Gardens	4190 N.W. 79th Ave, Miami, Florida 33166
4	Camden Doral Villas	4600 Ave, N.W. 114th, Doral, Florida 33178	21	The Palms of Doral	5511 N.W. 112th Ave, Doral, Florida 33178
5	Sandcastles at Doral	11428 N.W. 43rd Ter. Doral, Florida 33178	22	Doral Terrace	10825 N.W. 50th St, Doral, Florida 33178
6	Biarritz	11237 N.W. 46th Ln, Doral, Florida 33178	23	Doral Grand	5675 N.W. 109th Ave, Doral, Florida 33178
7	Villa Doral	4720 N.W. 114th Ave Unit 104, Doral, FL.	24	Costa Linda	5402 N.W. 107th Ave, Miami, Florida 33178
8	Dimensions at Doral	4833 N.W. 114th Ct, Doral, Florida 33178	25	Plaza Vecchia	10896 N.W. 51st Ln, Doral, Florida 33178
9	Doral Landings East	5098 NW 113th Passage, Doral, FL 33178	26	Costa Brava	4839 N.W. 108th Pl, 4839, Doral, FL. 33178
10	Doral Landings West	5049 NW 114th Ct, Doral, FL 33178	27	The Enclave	4300 N.W. 107th Ave, Doral, Florida 33178
11	Doral West Luxury Apartments	5400 N.W. 114th Ave, Doral, Florida 33178	28	Doral Sands	10601 N.W. 52nd Ter, Doral, Florida 33178
12	Las Cascadas at Doral	7033 N.W. 36th Ave, Miami, Florida 33147	29	Doral Glen	5163 N.W. 106th Ave, Doral, Florida 33178
13	Sonoma at Doral	5701 N.W 112th Ct, Doral, Florida 33178	30	Doral Cove	10238 N.W. 51st Ter, Doral, Florida 33178
14	Las Brisas at Doral	5610 N.W. 114th Pl, Doral, Florida 33178	31	Doral Greens	10230 NW 52nd Ln, Doral, FL 33178
15	Eagle Cove	4361 N.W. 112th Ct, Miami, Florida 33178	32	The Village of Doral Palm	5611 N.W. 112th Ave, Doral, Florida 33178
16	Doral Meadows	11555 N.W. 58th St, Doral, Florida 33178	33	Doral Pines	10080 N.W. 54th Ter, Doral, Florida 33178
17	Costa Bonita	11279 N.W. 51 Te, Doral, Florida 33178			

It should be noted that the terms “Speed Humps” and “Speed Bumps” are often used interchangeably. Although they both are roadway geometric features whose primary purpose is to reduce the speed of vehicles, from an operational standpoint, they have critically different impacts on vehicles. For a clearer understanding of the following section, their design and application are provided below. Figure 5 shows a graphic representation of a speed hump and a speed bump. National guidelines such as the FHWA Traffic and Safety Informational Series describe these features as follows:

Speed Humps are raised pavement areas across the roadway. They are typically parabolic, circular, or sinusoidal in shape. Their height ranges between three and four inches and their maximum length is 12 feet (although 14 foot and longer are becoming more common). They are designed to reduce the speed of vehicles to about 15 miles per hour (mph). They are appropriate for residential local streets and residential/neighborhood collectors.

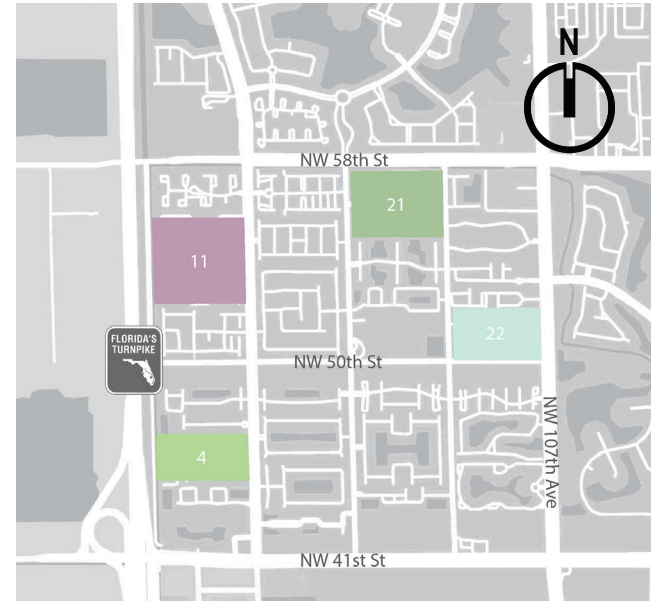
Speed bumps have a more abrupt design than speed humps, being this the reason for their more restricted use. They are typically installed along private roadways and in parking lots. Their height is typically between three and six inches and their length is usually only one to three feet long. They are designed to reduce the speed of vehicles to about five miles per hour (5 mph).

**FIGURE 5.** *Graphic representation of a speed hump and a speed bump*



## ▶ 1.6.1. FIELD REVIEWS

A sample of five communities where speed humps/speed bumps are present were selected to conduct field reviews. The purpose of the field reviews was to identify the type of traffic calming device and assess the overall operations and site conditions. Since many of these communities have access restrictions, the City of Doral staff assisted in the coordination with the communities' maintenance associations and/or homeowner associations for A&P to obtain access to the communities. As a result of this effort, field reviews were conducted at four (4) gated communities within the city. Figure 6 graphically illustrates the location of the communities that were visited. A&P also visited a residential community (un-gated) outside the city limits where speed bumps were installed. The community is located in the area of Kendall, Florida. The field reviews were conducted on Monday, December 3rd, 2018 and on Monday, December 10th, 2018, from 9:00 AM to 1:00 PM.



**FIGURE 6.** Communities visited

	ID#	COMMUNITY NAME	LOCATION
	4	Camden Doral Villas	4600 N.W. 114th Ave, Doral, Florida 33178
	11	Doral West Luxury Apartments	5400 N.W. 114th Ave, Doral, Florida 33178
	21	The Palms of Doral	5511 N.W. 112th Ave, Doral, Florida 33178
	22	Doral Terrace	10825 N.W. 50th St, Doral, Florida 33178
Out of the City Limits		Kendall Breeze	12300 S.W. 125th Court, Miami, Florida 33186

The following is a summary of key observations for each community:

### ● 1.6.1.1. **THE PALMS OF DORAL**

The Palms of Doral is a gated rental community located at 5611 NW 112th Ave, Doral, FL 33178. The community consists of apartment homes with resort style amenities.



#### **SPEED BUMP DETAILS:**

- The speed bumps are located on a private residential road with no posted speed limit signs.
- The road is undivided with one lane in each direction.
- The speed bumps are located along the main circulating road of the community.
- Speed bumps are installed on each lane and are painted yellow.
- There is parking on both sides of the road where the speed bumps are present.
- A warning sign is provided to inform motorists of the presence of speed bumps.
- There are no objects blocking the visibility of the speed bumps.



### ● 1.6.1.2. CANDEM DORAL VILLAS

The Camden Doral Villas is a gated community located at 4600 Ave, NW 114th, Doral, FL 33178 with two-story townhomes.



#### **SPEED BUMP DETAILS:**

- The speed bumps are located on a private residential road with no posted speed limit signs.
- The road is undivided with one lane in each direction.
- The speed bumps are located along the main circulating road of the community.
- Speed bumps are installed on each lane and are painted yellow.
- There is parking on both sides of the road where the speed bumps are installed.
- There are no objects blocking the visibility of the speed bumps.
- There are no speed bumps located along horizontal curves.
- The spacing between the speed bumps varies.

### ● 1.6.1.3. DORAL WEST APARTMENTS

Doral West Apartments is a gated rental community located at 5400 NW 114th Ave, Doral, FL 33178. The community consists of townhome-style apartments with resort-style amenities.



#### **SPEED BUMP DETAILS:**

- The speed bumps are located on a private residential road with a posted speed limit of 10 mph.
- The road is undivided with one lane in each direction.
- The speed bumps are located along the main circulating road of the community.
- Speed bumps are installed on each lane and are painted with yellow stripes.
- There is parking on both sides of the road where the speed bumps are installed.
- There are no objects blocking the visibility of the speed bumps.
- The spacing between the speed bumps is approximately 250 ft.

#### ● 1.6.1.4. **DORAL TERRACE**

Doral Terrace is a gated rental community located at 10825 NW 50th St, Doral, FL 33178. The community consists of apartment with resort style amenities.



#### **SPEED BUMP DETAILS:**

- The speed bumps are located on a private residential road with a posted speed limit of 10 mph.
- The road is undivided with one lane in each direction.
- The speed bumps are located along the main circulating road of the community.
- Speed bumps are installed on each lane and are painted yellow.
- There is parking on both sides of the road where the speed bumps are installed.
- There are no objects blocking the visibility of the speed bumps.
- The spacing between the speed bumps varies from approximately 250 ft to 370 ft.

● 1.6.1.5. **KENDALL BREEZE**

Kendall Breeze is a private residential community located at 12300 SW 125th Court, Miami, FL 33186. Kendall Breeze is a mixed-residential community comprised of single-family homes and townhouse units. The community has interior roadways, parking areas and perimeter walls with three entrances open to public travel.



**SPEED BUMP DETAILS:**

- The speed bumps are located on private residential roads with a posted speed limit of 15 mph.
- The road has one lane in each direction generally separated by a narrow-landscaped median.
- The speed bumps are present on each road in the community, except for some street blocks that are in a horizontal curve.
- Speed bumps are installed on each lane and are painted yellow.
- A speed Hump sign (W17-1) has been provided at the location of each bump.
- “No Thru Traffic” and “No Trucks” signs are provided on each entrance.
- Parking is provided on both sides of the road in some areas and on one side of the road in other areas.
- There are no objects blocking the visibility of the speed bumps.

A&P visited the Homeowners Association Office to inquire about the process and design guidelines that were followed for the speed bump installation in the community. We learned that the design plans and construction specifications were prepared by a private engineering firm, and then reviewed and approved by the Community District Development (CDD) Traffic Engineer. This process is in accordance with MUTCD guidance that states *“Jurisdictions, or owners of private roads open to public travel, with responsibility for traffic control that do not have engineers on their staffs who are trained and/or experienced in traffic control devices should seek engineering assistance from others, such as the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.”*

## 1.7. LESSONS LEARNED

Through the review and analysis of the information obtained from the field review observations, the following aspects were identified that will assist in the development of the speed hump/bump guidelines for the City of Doral. A set of design plans is provided in Appendix D to better illustrate these aspects.

### **PURPOSE:**

Speed bumps were installed with the purpose of reducing vehicle travel speeds within a private gated community or a residential community where no thru traffic is allowed.

### **LOCATION:**

Speed bumps were installed on private residential roads with one lane in each direction (two-lane roads) and generally along the main circulation road of the community.

### **PAVEMENT MARKINGS:**

Speed humps pavement markings are a series of white markings in a triangular shape placed on the speed hump while speed bumps are completely painted yellow.

**SIGNAGE:**

In some cases, the speed bumps are accompanied by a speed hump sign and an advisory speed plaque. In other cases, only the speed hump sign is used at the location of each bump.

**VISIBILITY:**

Speed bumps were installed at locations where there are no sight obstructions.

**DESIGN AND SPACING:**

While the design of speed bumps is an easier to follow or straightforward process, spacing decisions requires sound engineering judgment. The speed bumps and humps in the communities that were visited appeared to be constructed within the range of acceptable dimension sizes. Their spacing however varies from case to case. Nonetheless, it was noted that the bumps location and spacing followed good engineering practice, which accounted for site specific conditions such as accessibility of driveways, presence of horizontal curves, etc.

## 1.8. BEST PRACTICES

Speed humps/speed bumps are traffic calming measures that control vehicle speeds. The purpose of these roadway design features is to reduce the speed of vehicles traveling along a roadway. There are three types of speed control measures: vertical measures, horizontal measures, and narrowing. Speed humps and speed bumps are vertical measures to control vehicle speed because they use the forces of vertical acceleration to discourage speeding. Speed control through vertical deflection is achieved from the discomfort experienced by motorists traversing these roadway features and subsequently reducing the speed to minimize discomfort. Vertical measures include:

- Speed humps
- Speed tables
- Speed bumps
- Modified speed hump (also called speed cushions)

The following aspects are typically the best practices when considering the installation of speed humps on residential streets

- The design should follow the ITE recommended practice - *“Guidelines for the Design and Application of Speed Humps and Speed Tables”* 2011 edition.
- The decision to install speed humps should be documented in a traffic engineering report.
- Speed humps are installed on roadways functionally classified as local streets and on neighborhood or residential collector streets as defined in the AASHTO’s *A Policy on Geometric Design of Highways and Streets*.
- Speed humps have a traverse distance of about 12 to 14 feet and span the width of the road.
- The height of a speed hump ranges from 3 to 4 inches, with a typical range between 3 and 3 ½ inches.
- Speed hump shapes include parabolic, circular, and sinusoidal profile.
- Speed hump design must meet Americans with Disabilities Act (ADA) requirements.
- The typical spacing should be no more than 500 feet to achieve an 85th percentile speed between 25 and 30 mph.
- The speed hump material can be precast Portland cement concrete cast in situ and asphalt concrete or rubber devices.
- Traffic control devices and pavement markings should be installed in conformance with MUTCD guidelines. A speed hump (W17-1) sign supplemented by an advisory speed plaque (W13-1P) should be installed at the speed hump location. Speed humps markings (12-inch white markings) should be installed to warn drivers of the location of speed humps.
- Tapered edge near curb should be provided to allow gap for drainage.
- Speed humps should be designed in a way that discourages motorists to go around and skip the hump.
- Requests for speed humps installation requires public education and involvement as well as input from relevant agencies such as emergency services and transit services.
- Liability problems might be related to whether motorists were properly warned of the presence of speed humps, and whether they were constructed according to specifications and adequately maintained.







SECTION 2

**GUIDELINES FOR THE INSTALLATION  
OF SPEED HUMPS/BUMPS  
IN CITY OF DORAL**

## SECTION 2. **GUIDELINES FOR THE INSTALLATION OF SPEED HUMPS/BUMPS IN CITY OF DORAL**

### 2.1. **INTRODUCTION**

The City of Doral recognizes that the conditions of residential roads affect the livability of a neighborhood. Therefore, the City developed guidelines for the installation of speed humps and speed bumps to be used as a framework, allowing City staff to work with the residential communities requesting the installation of these devices to ensure safe and pleasant conditions for residents, pedestrians, bicyclists, and motorists.

### 2.2. **BACKGROUND INFORMATION**

Speed humps (a version of speed bumps) are an accepted traffic calming device and the most widely used in the United States. The primary objective of speed humps and speed bumps is to improve the environment and safety of a road by physically controlling vehicle speeds.

Speed humps were developed in the early 1970s by the Transport and Road Research Laboratory (TRRL) in Great Britain. Various hump sizes and shapes were tested by the TRRL using different types of vehicles and speeds. Then, the U.S. Federal Highway Administration (FHWA) tested the TRRL profile humps and deemed them safe to be used in public streets.

In June 1997, the Institute of Transportation Engineers (ITE) published Guidelines for the *Design and Application of Speed Humps: A Recommended Practice*. Two other ITE reports on speed humps have been published, one in August 2007 and the latest one in June 2011. Each new edition superseded the previous recommended practice for speed hump application as it incorporates comments and revisions from the previous report.

The ITE standards for construction, signage and markings of speed humps were adopted by the FHWA and were included in

the Manual on Uniform Traffic Control Devices (MUTCD). At the time, the FHWA announced that a section on speed humps was going to be included in the MUTCD for those jurisdictions choosing to install them. Hence, it has been inferred that the decision to use speed humps is a local decision. As such, the City of Doral has decided to develop these guidelines to establish the circumstances and criteria under which speed humps/bumps will be considered for installation on roads within the city limits.

## 2.3. DEFINITIONS

This section introduces the basic concepts needed for understanding the speed hump/bump installation guidelines.

**Functional Classification of Roads:** Streets and highways are grouped and classified according to the character of service they are intended to provide. Elements of functional classification or functional hierarchy include arterials, collectors, and local roads. The map in Figure 7 shows these types of roads within the City of Doral.

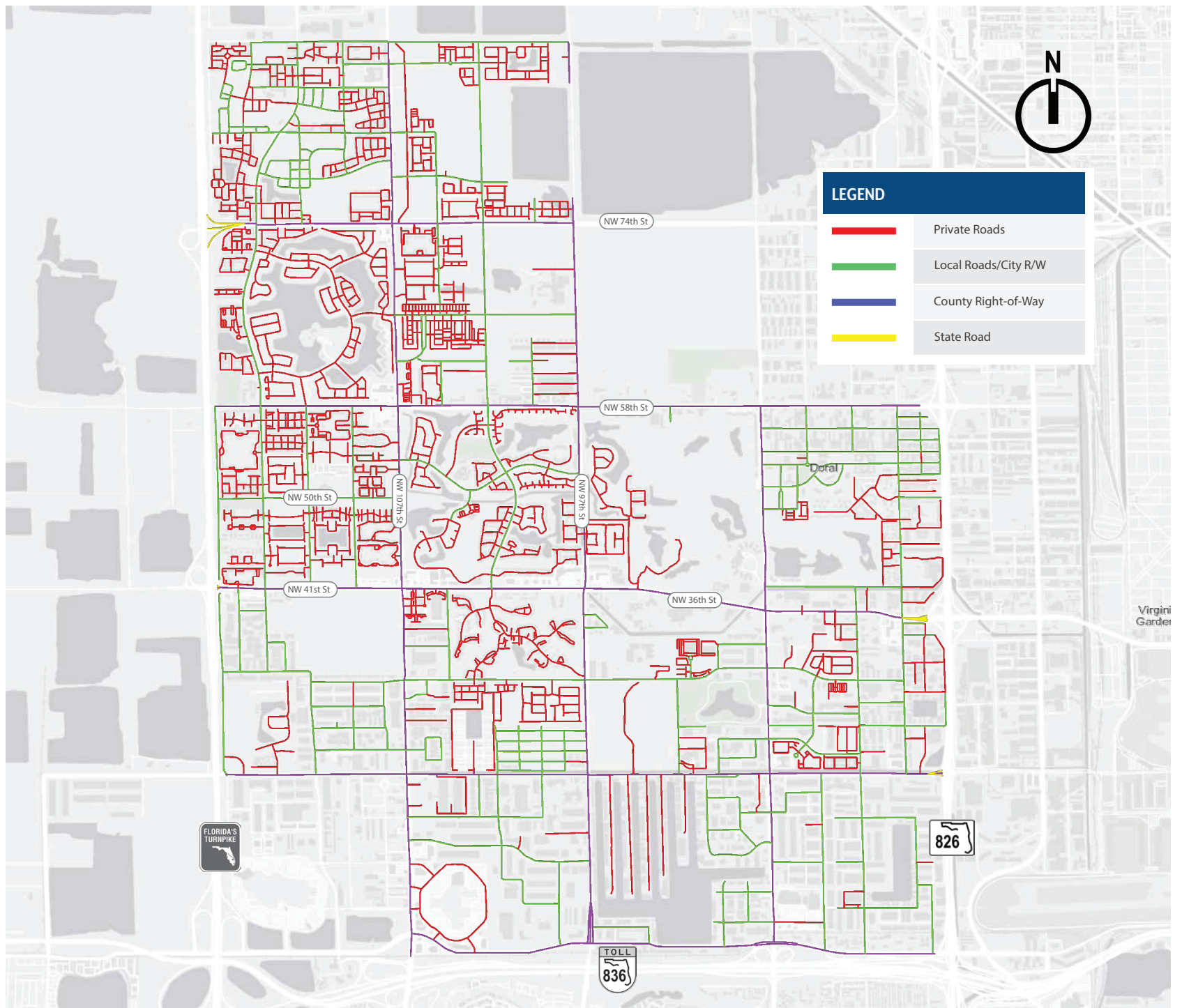
**Arterial:** Highway that provides a high degree of mobility for the longer trip length. They provide as high an operating speed as practical.

**Collector:** Route that provides some degree of mobility and also serves abutting property. Thus, an intermediate design speed is appropriate.

**Local Road and Street:** Roads that provide direct access to abutting lands and discourage through traffic. Thus, they have relatively short trip lengths and lower design speeds.

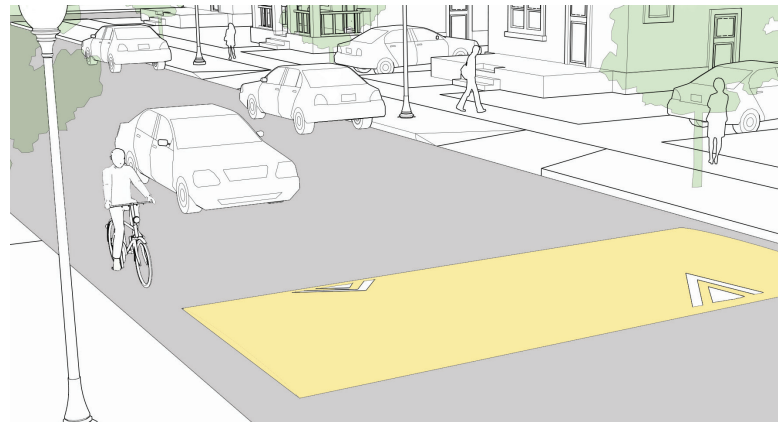
**Private Road:** Road owned and maintained by a private individual, organization or company rather than by a government. The most common type of private road is a residential road maintained by a homeowner's association, housing co-op, or other group of individual homeowners.

Figure 7. Types of roads within the City of Doral.



**Speed Hump:** A raised pavement area on the roadway extending transversely across the travel way. Most agencies implement speed humps with a height that ranges between 3 and 3.5 inches and a travel length of 12 to 14 feet. Speed humps are generally used on local streets. Speed humps should only be used on one-way or two-way streets and are not recommended on arterial roads or on streets with more than two travel lanes. Figure 8 shows a sample of a speed hump.

**Figure 8.** *Sample of Speed Humps*



**Speed Bump:** A raised pavement area installed across the roadway. Most agencies implement speed bumps with a height that ranges between 3 and 6 inches and a travel length of 3 feet. Speed bumps are generally used on residential private streets and parking lots. Figure 9 shows a sample of a speed bump.

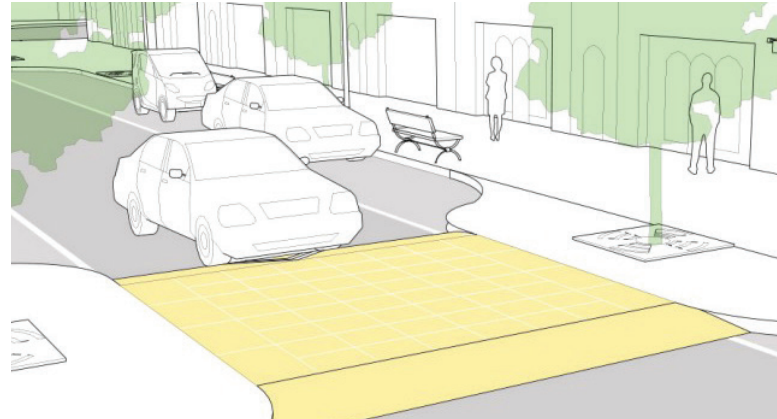
**Figure 9.** *Sample of Speed Bumps*



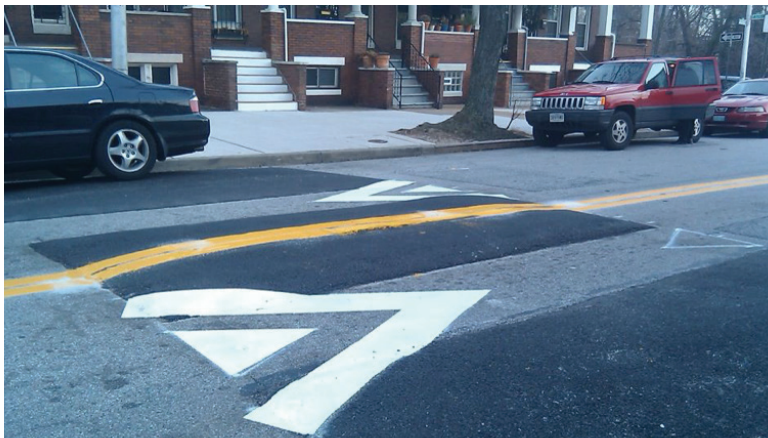
**Speed Table:** A flatted-topped speed hump. Most agencies implement speed tables with a height of 3 to 3.5 inches and a travel length of 22 feet. Speed tables are generally used on local streets, residential collectors, emergency routes, or transit routes. Figure 10 shows a sample of a speed table.



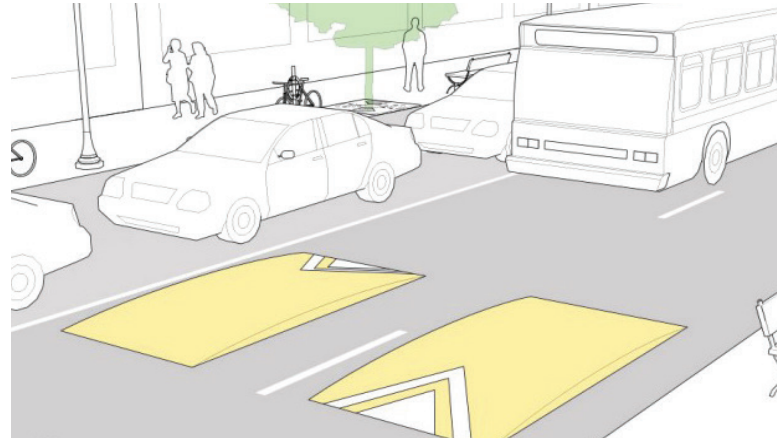
**Figure 10.** Sample of Speed Tables



**Speed Cushion/ Speed Lump:** These are modified speed humps designed to accommodate emergency vehicles. Most agencies implement speed cushions and speed lumps with a height that ranges between 3 and 3.5 inches and a travel length of 12 to 14 feet. The humps are divided into two or more sections, separated by a flat surface set at the track width of the emergency vehicle. Figure 11 shows a sample of a speed cushion/speed lump.



**Figure 11.** Sample of Speed Cushions | Speed Lumps



## 2.4. INSTALLATION GUIDELINES FOR SPEED HUMP/TABLE

This section provides the installation guidelines for speed humps/tables; including the eligibility criteria, implementation, removal, and modification processes, and design guidelines.

### ▶ 2.4.1. SPEED HUMP/TABLE ELIGIBILITY CRITERIA

The following minimum criteria shall govern installation of speed humps/tables in the City of Doral (note that “speed hump” will be used as a general term to also refer to “speed table” unless a distinction needs to be made).

1. Speed humps will be considered only after other less intrusive traffic calming measures have been determined to be ineffective or not feasible to reduce vehicles’ speed.
2. The street must be a local street.
3. The street shall not have more than one traffic lane in each direction.
4. Traffic volumes on the street must be equal to or exceed 750 vehicles per day.
5. The street is posted at or has a speed limit of 30 mph or less.
6. Speed humps will not be considered within 250 feet of a traffic signal, within 50 feet of an intersection, in front of a driveway, within an intersection or adjacent to fire hydrants.
7. Speed humps will not be considered in, or on the approaches to, a horizontal or a vertical curve where visibility of the hump is restricted.
8. The street should not be located along an emergency response route, transit route, school bus route or truck route, and must be approved by the respective agencies for the installation of speed humps.
9. Installation of these devices shall not cause the traffic to divert to other streets.
10. Speed humps will only be installed if two-thirds of the residents/business owners signing a petition concur with the installation of speed humps.

► 2.4.2. **SPEED HUMP REQUEST AND IMPLEMENTATION PROCESS:**

The flowchart shown in Figure 12 presents the speed hump application and implementation process. As shown in the flow chart, the process consists of seven (7) steps, which are described as follows:

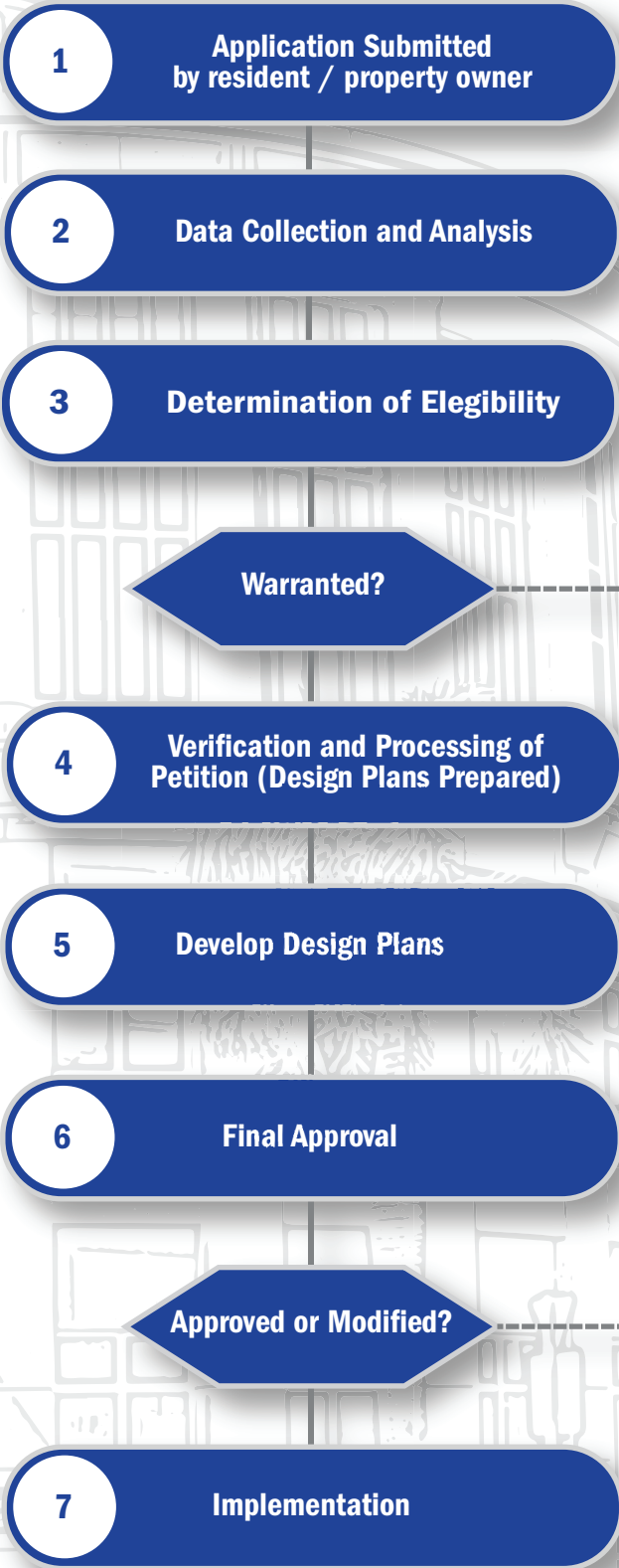


**STEP 1 | SPEED HUMP APPLICATION:**

An application form should be completed and submitted to the City of Doral Public Works Department. The Public Works Department will initiate a preliminary evaluation of the request due to citizen complaint, request of a neighborhood association, or a Commissioner's request. A copy of the application form is included in Appendix E.

The City reserves the right to install speed humps or similar traffic calming devices without a resident petition on roads under the city's jurisdiction either on existing roads (retrofit) or as part of a new roadway or resurfacing project, as circumstances require.





**Figure 12.**  
*Speed hump application and implementation process in the City of Doral.*

Re-evaluation after two years by Petition

**STEP 2 | DATA COLLECTION AND ANALYSIS:**

Once the City staff has determined that an application has been properly submitted and identifies a potential problem for which speed humps may be appropriate, the City may request to conduct a traffic speed study. Other data collection tasks may be requested by the City, if needed. Data collection needs will be evaluated by the City on a case by case basis.

**STEP 3 | DETERMINATION OF ELIGIBILITY:**

If the data collected and analysis indicate that the road does not meet the criteria for a speed hump installation, the Applicant will be notified in writing of the reason why the road is not eligible. The location will be eligible for re-evaluation after a two-year waiting period from the date of this determination. However, the City staff may determine that other measures such as public education and traffic enforcement may be appropriate.

If the speed data supports the speed hump request, the City staff will evaluate the severity of the matter and will identify the adequate roadway design features to reduce the speed of vehicles. The design features could be any of the following:

- Speed hump
- Speed table
- Modified speed hump (also called speed cushions)

The city staff will also ensure that the proposed physical traffic modification(s) will be consistent with City of Doral and Miami-Dade County short- and long-range transportation plans and programs.

Upon determination that a road is eligible for further consideration, the Applicant will be advised to submit statements of understanding and a petition document supporting the installation of speed humps by at least 2/3 of the residents/owners of abutting properties on the subject street (See Appendix F and G).

**STEP 4 | VERIFICATION AND PROCESSING OF PETITION:**

Upon receipt of a complete petition containing the required number of signatures, the Applicant will be notified of the approval or denial of the request.

**STEP 5 | DEVELOP DESIGN PLANS:**

If approval is granted, the Applicant will prepare design plans for the speed humps installation and submit to the City's Public Works Department. Factors such as the location of the proposed devices relative to driveways, traffic control devices, location of inlets, manholes, light poles shall be taken into consideration.

A copy of the draft design plans will be submitted to the Fire Department, the Police Department and any other necessary parties for review and comment.

**STEP 6 | FINAL APPROVAL:**

The Applicant will gather the revised plans from the Fire Department, the Police Department, and other entities involved in the plan's revision. The Applicant will address all comments and/or concerns and will proceed with the final design. The final design set of plans will be presented to the Public Works Department and the City Manager for review and final approval.

**STEP 7 | IMPLEMENTATION:**

Once the final design is approved by the Public Works Department and the City Manager, the Applicant may proceed with the installation of the speed humps.



### ▶ 2.4.3. **SPEED HUMP REMOVAL OR MODIFICATIONS**

Speed humps installed upon resident or any other organization's petition pursuant to these guidelines may be removed by the Applicant either at the request of the City upon a determination that the removal is required for safety reasons, or by a petition approved by 2/3 of the owners of the abutting properties within the same geographic area as petitioned for the humps. If removal is by petition, the residents and/or property owners shall pay the cost of removal. If the City determines the devices must be removed due to safety reasons, the cost will be covered by the Applicant.

The process for speed humps modifications requested by residents will follow the same steps as the process for installation. If the City determines that existing humps need to be updated according to modified design standards or need to be modified for any unforeseen problem, the device will be redesigned by the Applicant and modified accordingly.

### ▶ 2.4.4. **DESIGN GUIDELINES FOR SPEED HUMPS AND SPEED TABLES**

This section provides recommended design and specifications for the application of speed humps and speed tables based on the ITE report: Guidelines for the Design and Application of Speed Humps and Speed Tables.

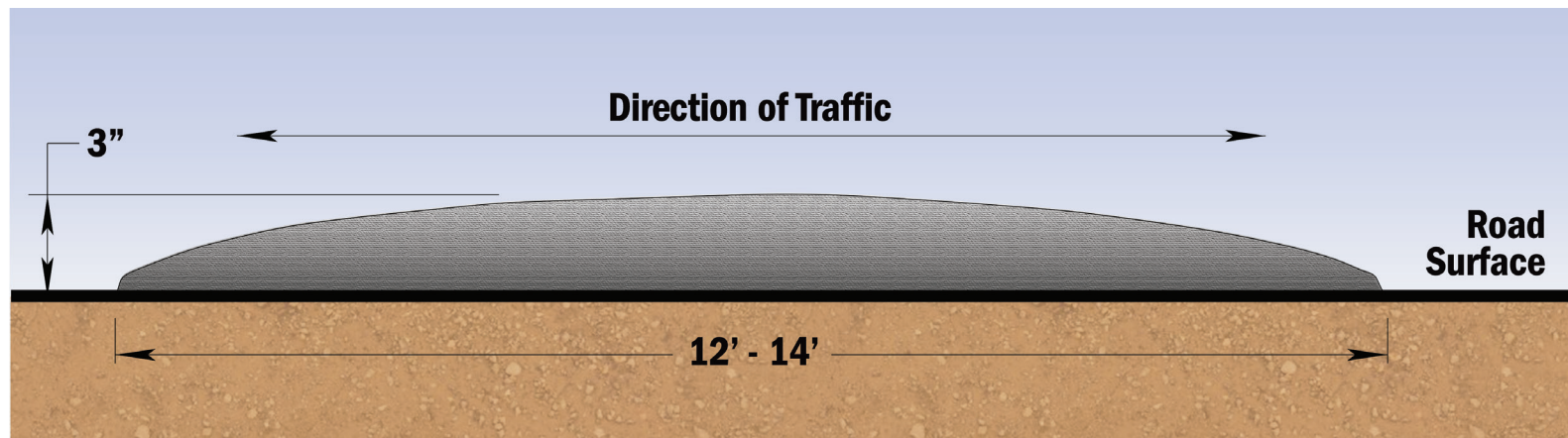
#### ● 2.4.4.1. **SPEED HUMP DIMENSIONS AND CROSS SECTIONS**

Typical speed humps dimensions and cross sections are as follows:

- Height: 3 to 3.5 inches
- Length: 12 to 14 feet
- Profile: parabolic or sinusoidal

The recommended dimensions and cross-sections for typical parabolic speed humps and for typical sinusoidal speed humps are shown in Figures 13 and 14, respectively.

**Figure 13. Parabolic Speed Hump**



**12 FOOT PARABOLIC SPEED HUMP DEVELOPMENT IN U.S. CUSTOMARY UNITS**

DISTANCE (FEET)	0.0	1.0	2.0	3.0	4.0	5.0	6.0
FINISHED HEIGHT (INCHES)	0.0	0.9	1.7	2.3	2.7	2.9	3.0

**METRIC UNITS**

DISTANCE (FEET)	0.000	0.305	0.610	0.914	1.219	1.524	1.829
FINISHED HEIGHT (INCHES)	0.0	23	42	57	68	74	76

**14 FOOT PARABOLIC SPEED HUMP DEVELOPMENT IN U.S. CUSTOMARY UNITS**

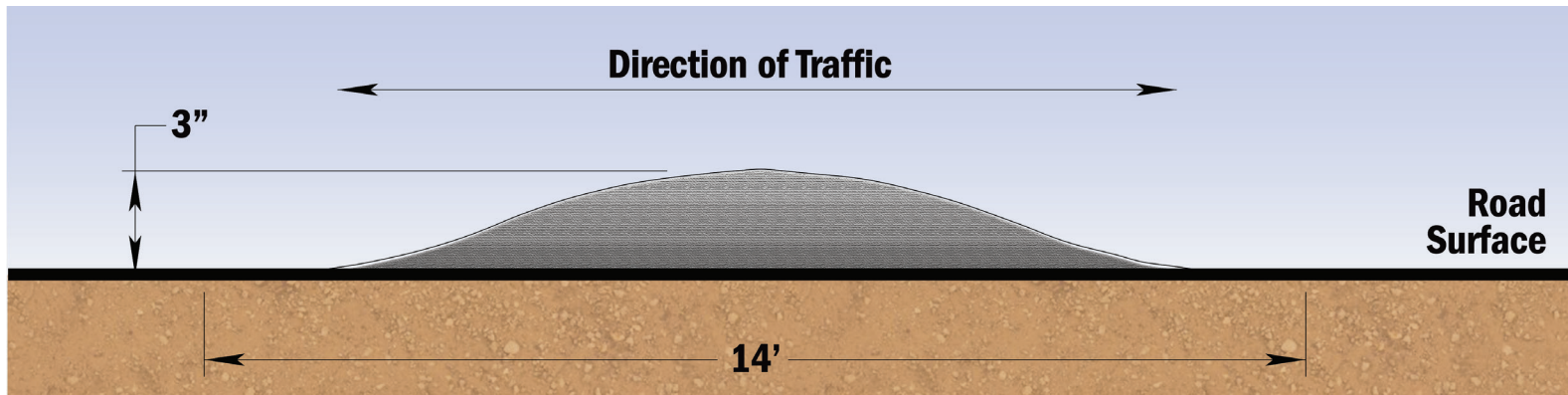
DISTANCE (FEET)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
FINISHED HEIGHT (INCHES)	0.0	0.8	1.5	2.0	2.4	2.8	2.9	3.0

**METRIC UNITS**

DISTANCE (FEET)	0.000	0.305	0.610	0.914	1.219	1.524	1.829	2.134
FINISHED HEIGHT (INCHES)	0	20	38	51	61	71	74	76

**Source:** ITE Guidelines for the design and application of Speed Humps and Speed Tables

Figure 14. Sinusoidal Speed Hump



SINUSOIDAL SPEED HUMP DEVELOPMENT IN U.S. CUSTOMARY UNITS															
DISTANCE (FEET)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
FINISHED HEIGHT (INCHES)	0.00	0.04	0.15	0.33	0.56	0.85	1.17	1.50	1.83	2.15	2.44	2.67	2.85	2.96	3.00
METRIC UNITS															
DISTANCE (m)	0.000	0.152	0.305	0.457	0.610	0.762	0.914	1.067	1.219	1.372	1.524	1.676	1.829	1.981	2.134
FINISHED HEIGHT (mm)	0	1	4	8	14	22	30	38	47	55	63	68	72	75	76

Source: ITE Guidelines for the design and application of Speed Humps and Speed Tables

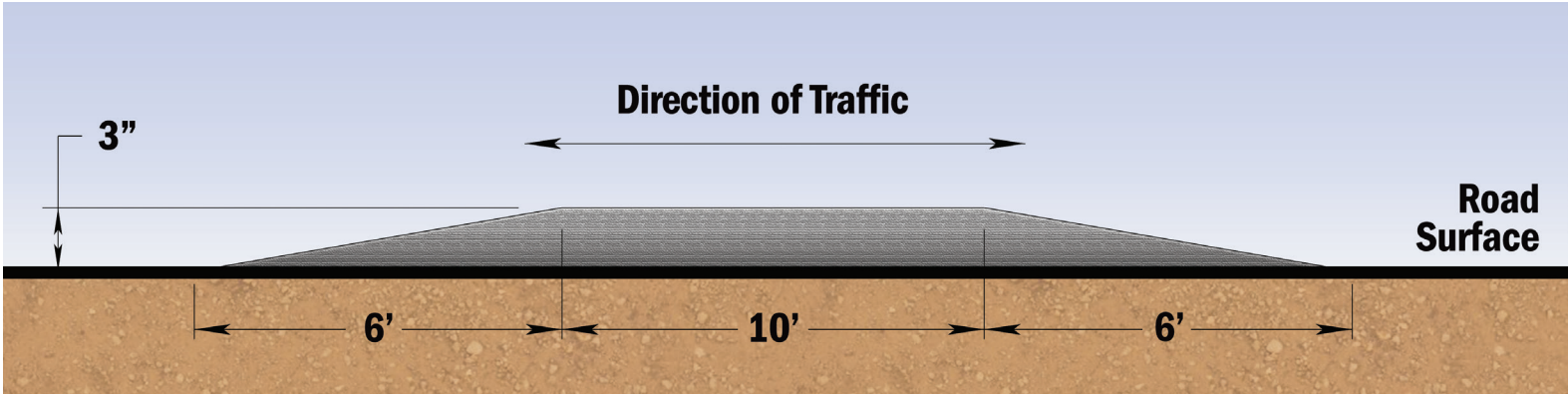
### ● 2.4.4.2. SPEED TABLE DIMENSIONS AND CROSS SECTIONS

Typical speed tables dimensions and cross sections are as follows:

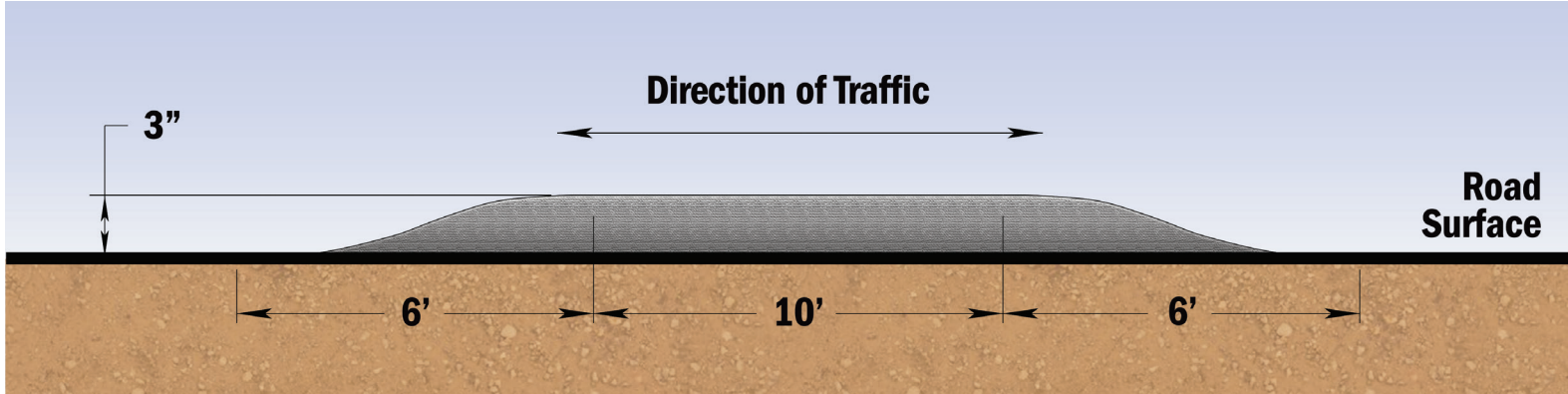
- Height: 3 to 3.5 inches
- Length: 22 feet
- Profile: straight, parabolic or sinusoidal

The recommended dimensions and cross-sections for typical straight, parabolic, and sinusoidal speed tables are shown in Figure 15.

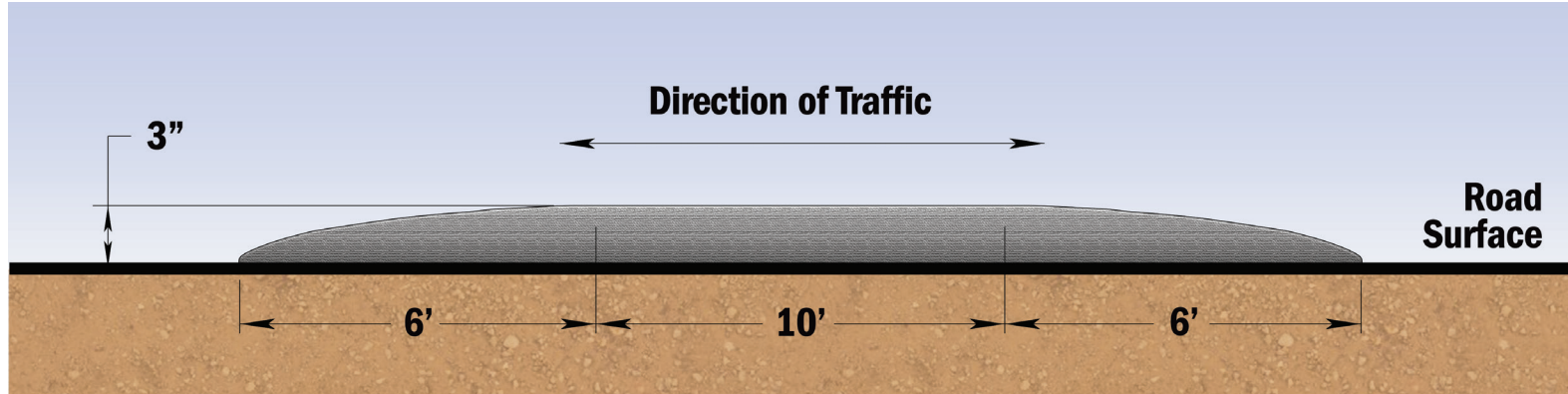
Figure 15. Recommended dimensions and cross-sections for typical straight, parabolic, and sinusoidal speed tables.



Typical **straight** approach Speed Table. Note: not to scale.



Typical **sinusoidal** approach Speed Table. Note: not to scale.



Typical **parabolic** approach Speed Table. Note: not to scale.

Source: ITE Guidelines for the design and application of Speed Humps and Speed Tables

The recommended dimensions and cross-sections for speed humps and speed tables are summarized in Table 3.

**TABLE 3.** Recommended dimensions and cross-section for speed humps/tables.

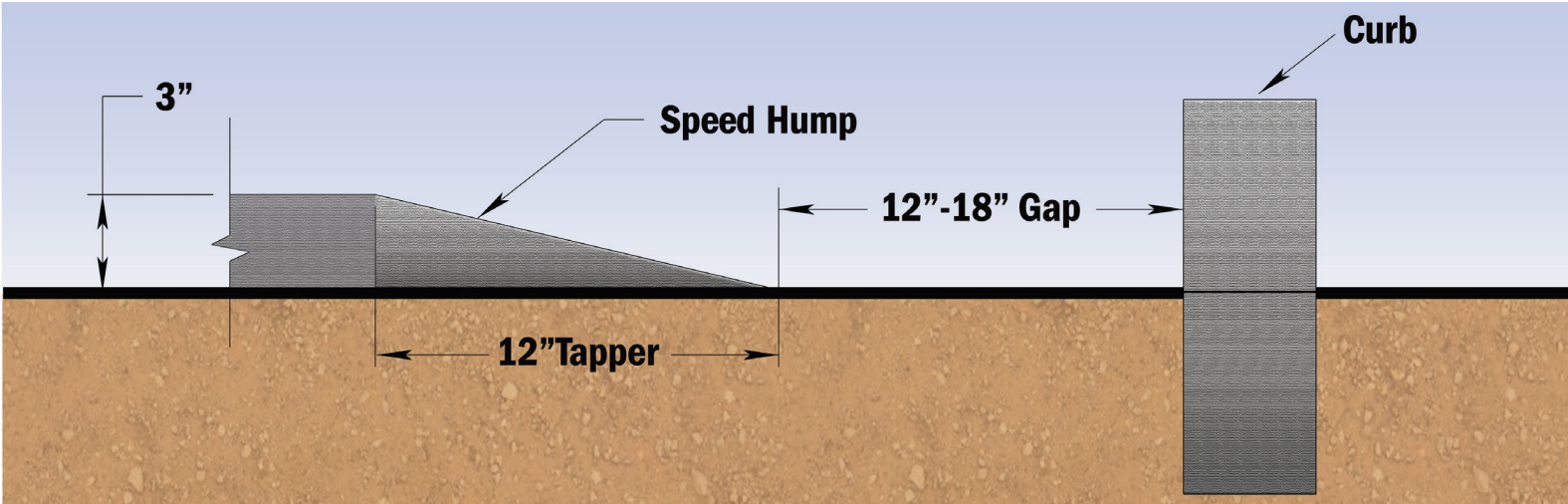
TYPE	STREET	CROSS-SECTION	LENGTH	HEIGHT
<p><b>SPEED HUMPS</b></p>	<p>Residential Locals</p>	<p>Parabolic</p>	<p>12 Ft. (3.7m)</p>	<p>3 in. (76mm)</p>
			<p>14 Ft. (4.3m)</p>	
		<p>Sinusoidal</p>	<p>14 Ft. (4.3m)</p>	
<p><b>SPEED TABLE</b></p>	<p>Residential collectors, emergency vehicle, or transit routes</p>	<p>Parabolic</p>	<p>22 Ft. (6.7m)</p>	<p>3 in. (76mm)</p>



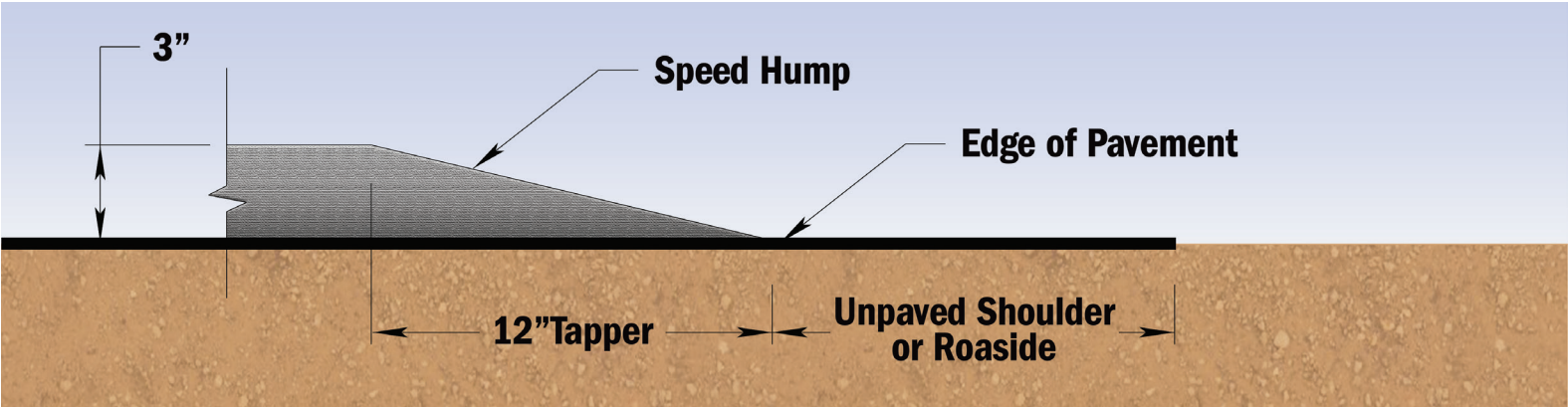
**2.4.5. ROADWAY EDGE TREATMENTS**

These treatments are important to prevent the avoidance of the speed hump/table and to avoid drainage issues. Figure 16 shows the typical speed hump/table edge treatment on roadways with curbs and Figure 17 shows the typical speed hump/table edge treatment on roadways without curbs.

**FIGURE 16.** Speed hump edge treatment on roadways with curbs.



**FIGURE 17.** Speed hump edge treatment on roadways without curbs.



**Source:** ITE Guidelines for the design and application of Speed Humps and Speed Tables

## 2.4.6. SPACING AND LOCATION

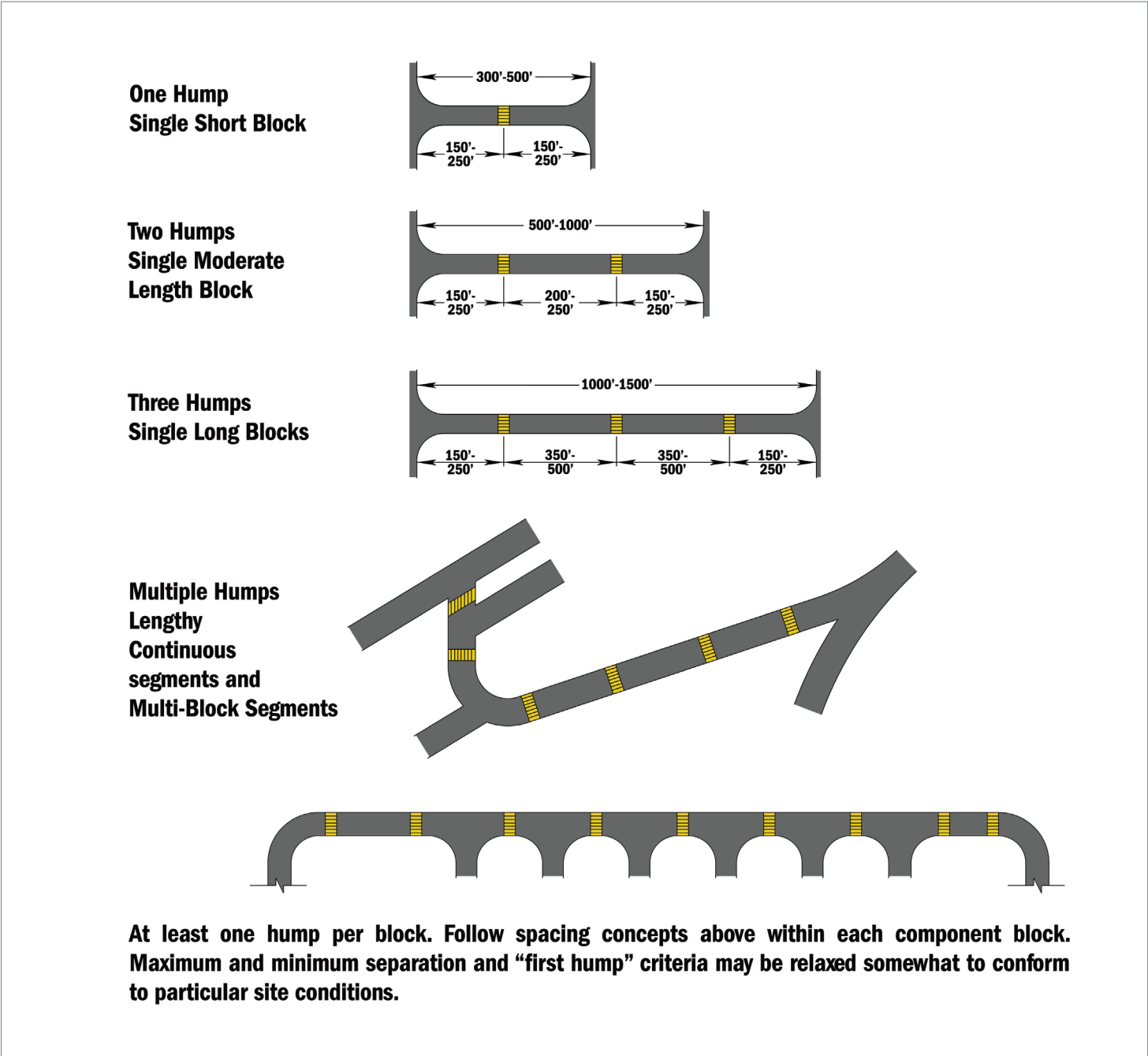
The general spacing is determined by comparing the measured 85th percentile speed and the desirable 85th percentile speed. The ITE Guidelines for the Design and Application of Speed Humps and Speed Tables recommends spacings as illustrated in Figure 18.

The exact location depends on the actual conditions of the site and, in general, should take into consideration the following aspects:

- Street vertical alignment
- Street horizontal alignment
- Location of nearby intersections
- Location of nearby driveways
- Street lighting
- On-Street parking
- Pedestrian crossings
- Installation angle
- Location of drainage and utilities



**FIGURE 18.** Spacing of Speed Humps



*Source: ITE Guidelines for the design and application of Speed Humps and Speed Tables*

## 2.4.7. TRAFFIC CONTROL DEVICES

### ▶ 2.4.7.1. SIGNS

Based on the 2009 MUTCD, a speed hump (W17-1) sign supplemented by an advisory speed plaque (W13-1P) should be installed to warn motorists of the presence of speed humps. Signs are to be placed at the speed hump on both approaches. Specific details can be found in sections 2C.28 and 2C.29 of the MUTCD. Figure 19 shows the sign and the advisory speed plaque.

**FIGURE 19.** *Speed Hump Signs*



W17-1 SIGN

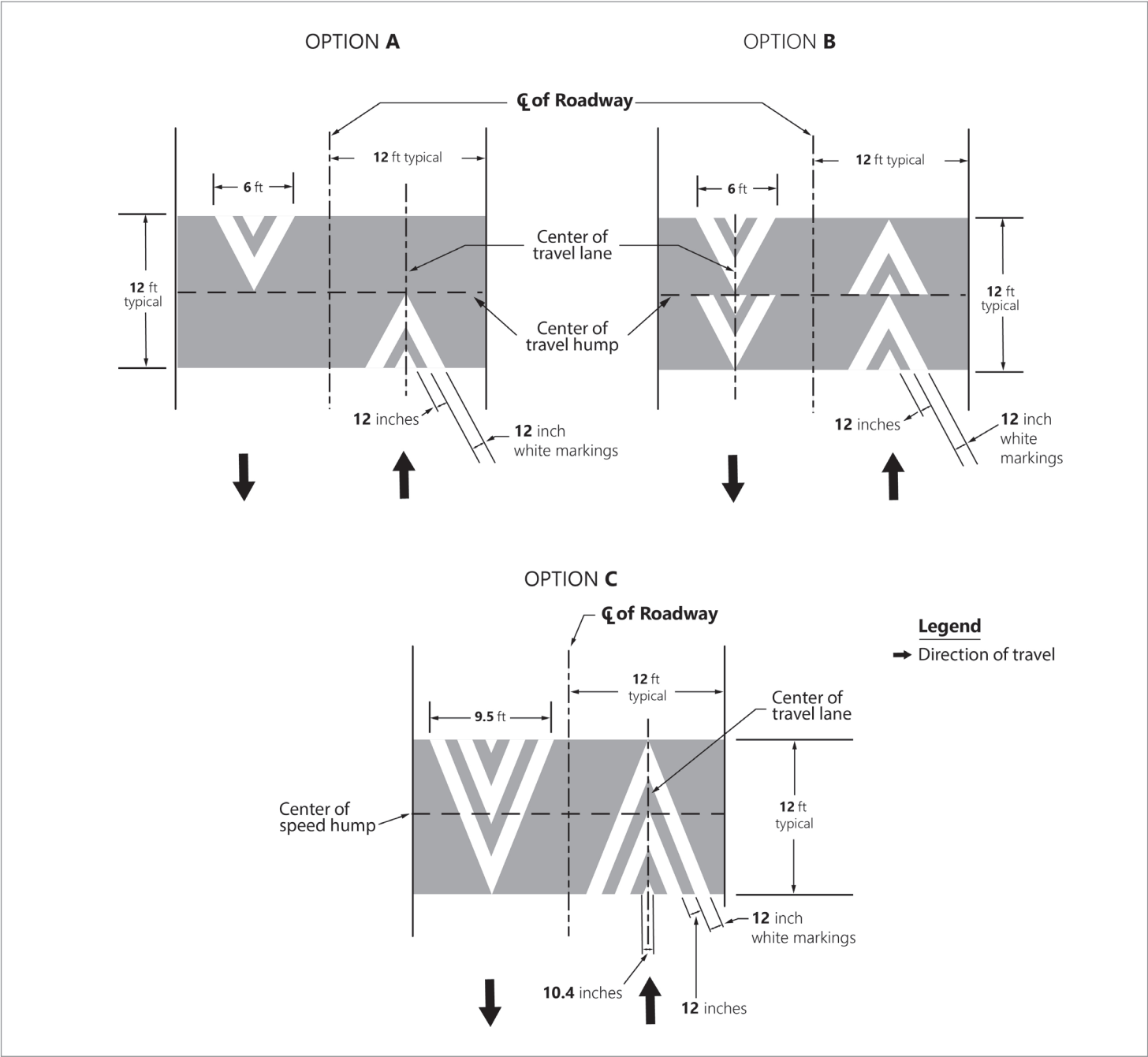


W13-1P SIGN

### ▶ 2.4.7.2. PAVEMENT MARKINGS

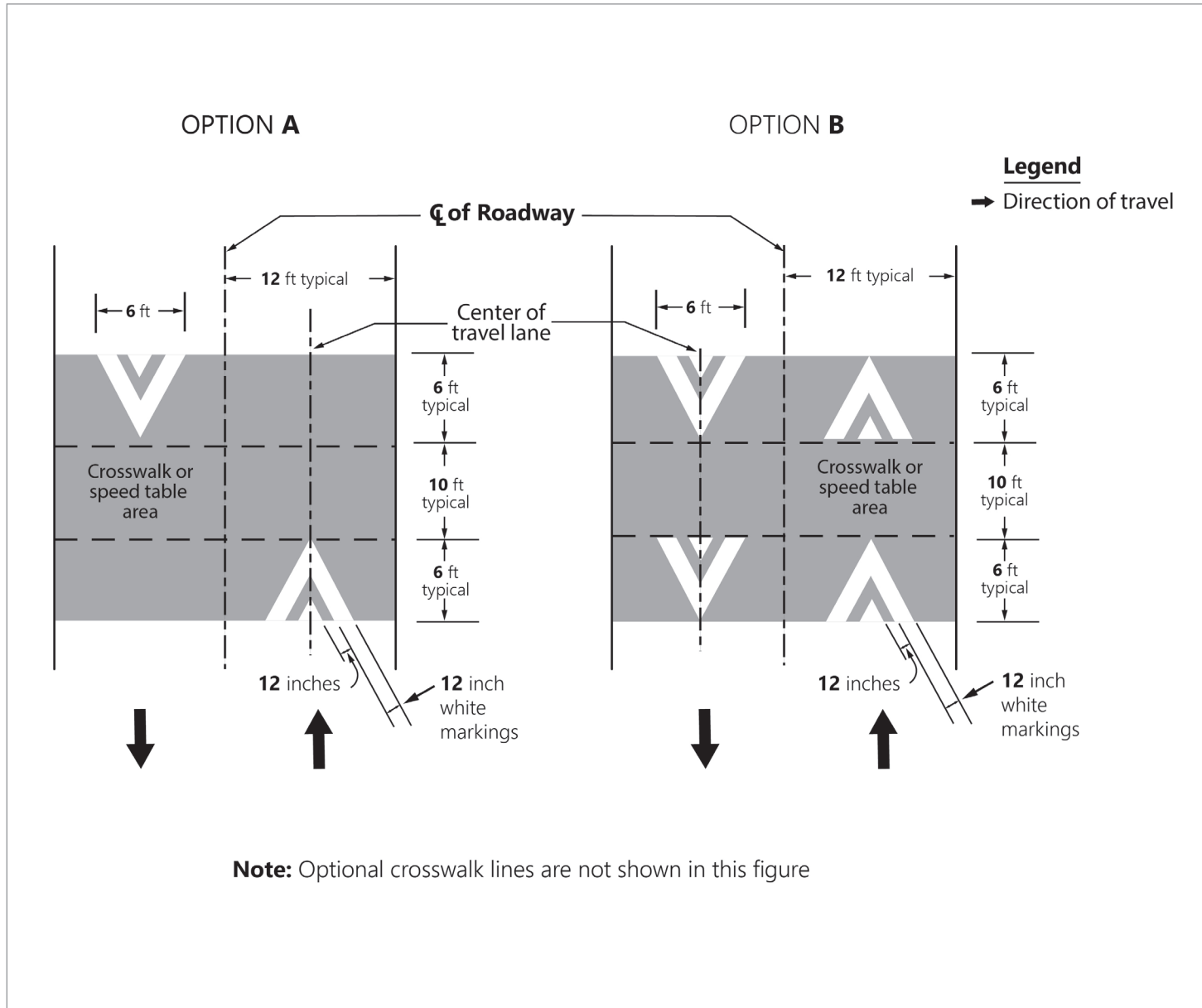
Pavement markings indicate motorists the location of the speed hump/speed table. Figures 20 and 21 show the typical pavement markings.

FIGURE 20. Typical Pavement Markings



Source: ITE Guidelines for the design and application of Speed Humps and Speed Tables

**FIGURE 21** | Pavement markings for speed humps or speed tables with crosswalks



**Source:** ITE Guidelines for the design and application of Speed Humps and Speed Tables

## 2.5. INSTALLATION GUIDELINES FOR SPEED BUMPS

This section provides the installation guidelines for speed bumps; including the eligibility criteria, implementation, removal, and modification processes, and design standards and specifications.

### 2.5.1. SPEED BUMP ELIGIBILITY CRITERIA

Speed bumps are made of an abruptly raised portion of pavement, which can produce substantial driver discomfort and damage to vehicle if encountered at a relatively high speed. For these reasons, their use is restricted to very specific areas. The following minimum criteria shall govern the installation of speed bumps in the City of Doral:

1. The street must be a private street within a residential development, community or neighborhood (usually where through traffic is discouraged).
2. Speed bumps will be considered only after other less intrusive traffic measures have been determined to be ineffective or not feasible to reduce vehicles' speed.
3. The street shall have a posted speed limit of 30 mph or less.
4. Speed bump installation shall follow an area-wide approach (not just spot installation) to avoid diversion of traffic to parallel untreated streets and to ensure the impacted area is compatible with the speed bump application.
5. Speed bumps will not be considered within 250 feet of a traffic signal, within 50 feet of an intersection, in front of a driveway, within an intersection or adjacent to fire hydrants.
6. The speed bumps will not be considered in, or on the approaches, to a horizontal or a vertical curve where visibility of the bump is restricted.
7. Speed bumps will be placed between 200 feet to 500 ft apart. Other spacing may be used based upon engineering judgement.
8. Speed bumps will only be installed if 2/3 of the occupants of residences in the neighborhood signing a petition concur with the installation of the speed bump.
9. Drainage structures shall not be impacted.
10. The Applicant agrees to pay for the cost of design and installation of the speed bumps, along with the associated signage and pavement markings.

## 2.5.2. SPEED BUMP REQUEST AND IMPLEMENTATION PROCESS

The speed bump implementation process will follow all the steps but Step 2 (Data Collection and Analysis) from the speed hump implementation process shown in 12 (on page 45). The process consists of six (6) steps, which are described as follows:

### **STEP 1 | SPEED BUMP APPLICATION:**

An application form should be completed and submitted to the City of Doral Public Works Department. The city staff will initiate a preliminary evaluation of the request due to citizen complaint, request of a neighborhood association, or a Community Development District. A copy of the application form is included in Appendix E (same as Speed Hump).

### **STEP 2 | DETERMINATION OF ELIGIBILITY:**

The city staff will identify the location and analyze whether the speed bump application area is eligible for further consideration. If the analysis indicates that the area does not meet the criteria for speed bump installation, the Applicant will be notified in writing of the reason why the area is not eligible or if any changes in the area boundaries are required.

Upon determination that a road is eligible for further consideration, the Applicant will be advised to submit statements of understanding from owners of the residents or facilities adjacent to the proposed speed bumps (See Appendix F) and a petition documenting support of at least a 2/3 of the owner of abutting properties on the subject street (See Appendix G).

### **STEP 3 | VERIFICATION AND PROCESSING OF PETITION:**

Upon receipt of a complete petition containing the required number of signatures, the Applicant will be notified of the approval or denial of the request.

### **STEP 4 | DEVELOP DESIGN PLANS:**

If approval is granted, the Applicant will be advised to submit a draft design plans by a traffic engineering consultant for review and approval. Factors such as the location of the proposed devices relative to driveways, traffic control devices, location of



inlets, manholes, and light poles shall be taken into consideration. A copy of the draft design plans will be submitted to the Fire Department, the Police Department and any other necessary parties for review and comment.

**STEP 5 | FINAL APPROVAL:**

The Applicant will be responsible for collecting the draft set of plans from every party involved in the plans' revision. The Applicant shall address any concern expressed by these agencies and submit a revised design plan set to the City. The design plans should follow local and national traffic engineering practices and the City of Doral design guidelines and standards. The final design plan set will be presented to the City Manager for review and final approval.

**STEP 6 | IMPLEMENTATION:**

Once the final design is approved by the City Manager, the Applicant may hire a licensed contractor and proceed with the installation of the speed bumps.

### 2.5.3. SPEED BUMP REMOVAL OR MODIFICATIONS

Speed bumps installed upon resident or any other organization's petition pursuant to these guidelines may be removed by the Applicant either upon a determination that the removal is required for safety reasons, or by a petition approved by 2/3 of the owners of the abutting properties within the same geographic area as petitioned for the bumps. If removal is by petition, the residents and/or property owners shall pay the cost of removal. If the City determines that a problem was originated after the speed bumps installation, the device must be removed and the cost covered by the Applicant.

The process for speed bumps modifications requested by residents is similar to the process for installation. Once the speed bump modifications are approved by the City, the Applicant may proceed with the modification implementation. Note that the City will not be responsible for any associated costs. If the City determines that existing bumps need to be updated according to modified design standards or need to be modified for any unforeseen problem, the device should be redesigned by the Applicant.

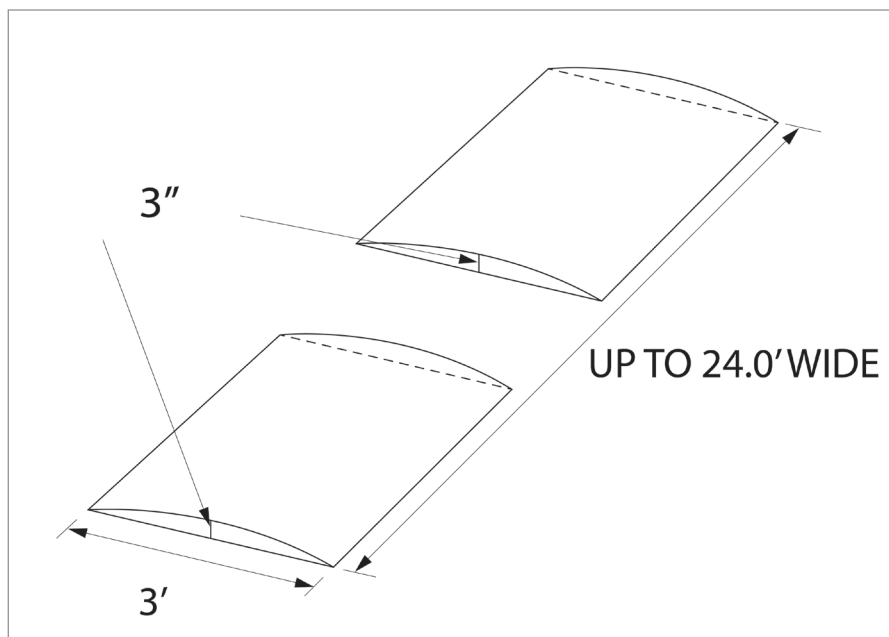
## 2.5.4. DESIGN STANDARDS AND SPECIFICATIONS

This section provides recommended design and specifications based on the ITE Guidelines for the Design and Application of Speed Humps and Speed Tables.

### ▶ 2.5.4.1. DIMENSIONS AND CROSS SECTIONS

The speed bump recommended dimensions and cross-sections are shown in Figure 22.

- Height: 3 inches
- Length: 3 feet
- Profile: circular

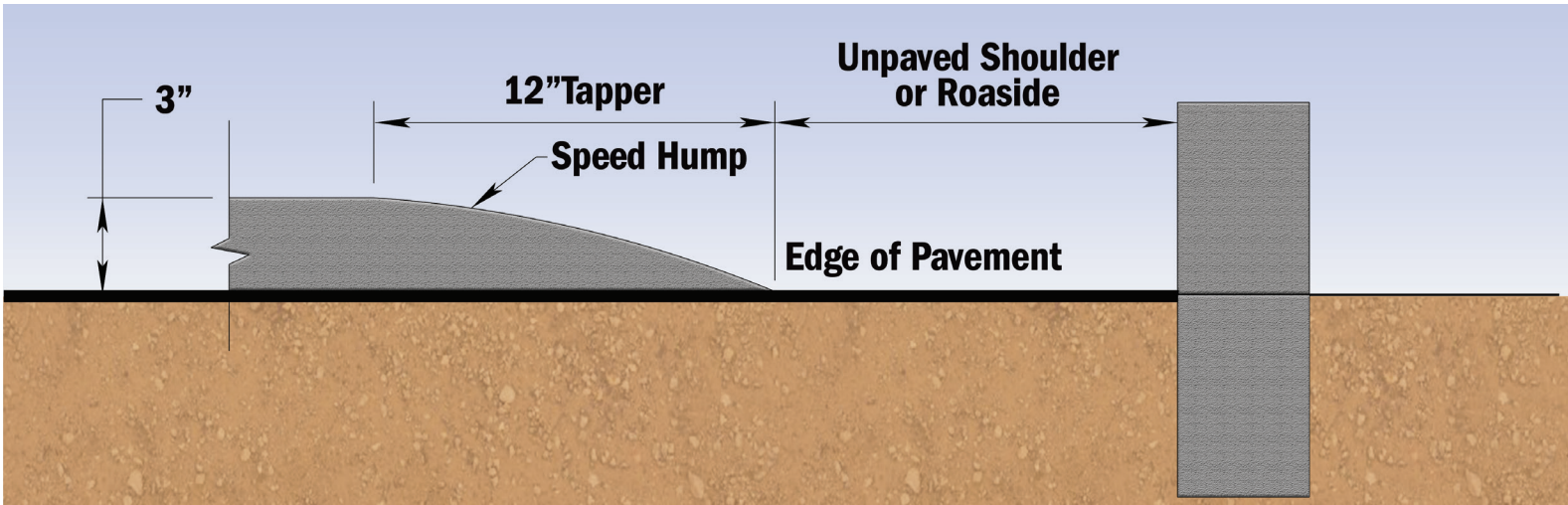


**FIGURE 22**  
*Speed bump recommended  
dimensions and  
cross-sections*

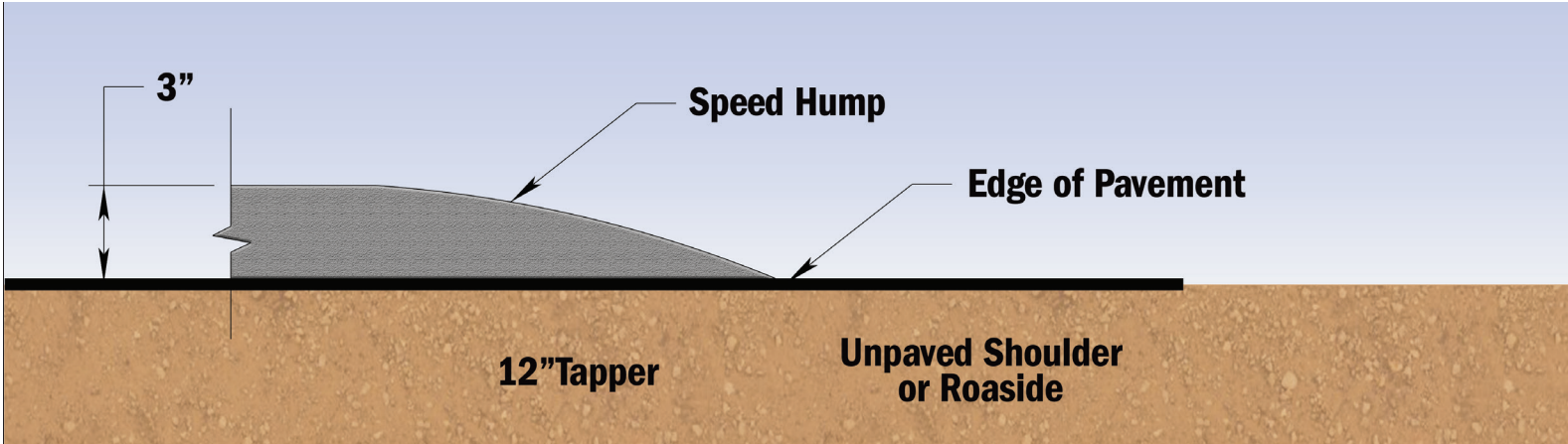
**2.5.5. ROADWAY EDGE TREATMENTS**

The typical speed bump edge treatments are similar to those for speed humps on both roadways with curbs and roadways without curbs. Figures 23 and 24 show each of these treatments.

**FIGURE 23.** Roadway edge treatment on roadways with curbs.



**FIGURE 24.** Roadway edge treatment on roadways without curbs.



**Source:** ITE Guidelines for the design and application of Speed Humps and Speed Tables

### 2.5.6. SPACING AND LOCATION

The spacing between speed bumps is typically between 200 feet and 500 feet considering the following:

- On short blocks (300 feet to 500 feet) a single bump positioned near the midpoint is usually sufficient.
- On blocks of moderate length (500 feet to 1000 feet) two bumps are usually adequate.
- On long blocks (greater than 1000 feet) three or more bumps may be necessary.

The exact location depends on the actual conditions of the site and in general should take into consideration the following aspects:

- Street vertical alignment
- Street horizontal alignment
- Location of nearby intersections
- Location of nearby driveways
- Location of stop signs
- Street lighting
- On-Street parking
- Landscaping
- Pedestrian crossings
- Installation angle
- Location of drainage and utilities

## 2.5.7. TRAFFIC CONTROL DEVICES

### ▶ 2.5.7.1. SIGNS

According to the MUTCD, the speed hump (W17-1) sign supplemented by an advisory speed plaque (W13-1P) should be installed to inform motorists of the presence of a vertical deflection in the roadway. If a series of speed bumps exists in close proximity, the advisory speed plaque may be eliminated in all but the first speed bump sign in the series. The legend SPEED BUMP may be used instead of the legend SPEED HUMP on the W17-1 sign. Signs are to be placed at the speed bump on both approaches. Specific details can be found in sections 2C.28 and 2C.29 of MUTCD. Figure 25 shows the typical speed bump signs.

**FIGURE 25.** *Speed Bump Signs*



W17-1 SIGN



W13-1P SIGN

▶ 2.5.7.2. **PAVEMENT MARKINGS**

Speed bumps are typically painted yellow as shown in Figure 26.



**FIGURE 26.** *Speed bumps pavement markings*

## 2.5.8. **PREFABRICATED SPEED BUMPS**

Prefabricated speed bumps are typically made of recycled rubber or plastic materials. However, their sizes, styles and mounting hardware differ from manufacturer to manufacturer. Figure 27 shows examples of pre-fabricated speed bumps. In order to maintain a uniform and consistent application of speed bumps, prefabricated speed bumps will only be allowed for installation on local streets or private residential streets within a residential development, community or neighborhood within the City of Doral if they comply with the dimensions and cross section criteria shown on Figure 22 of this report.

**FIGURE 27.** Examples of prefabricated speed bumps

