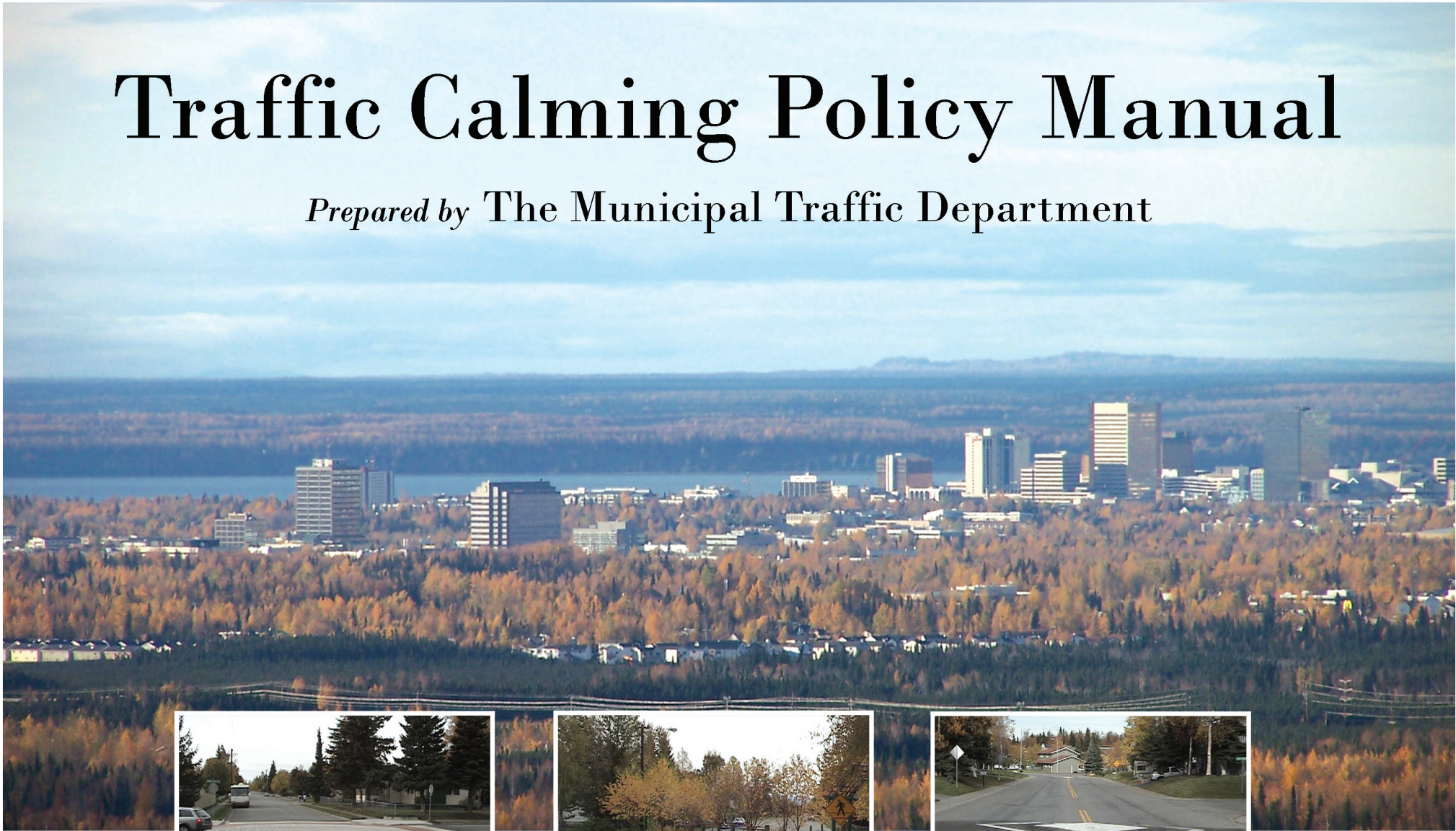


December 2005

Traffic Calming Policy Manual

Prepared by The Municipal Traffic Department



Section 1 – Introduction

✚ What is Traffic Calming?

Speeding and unsafe driving habits are a major concern throughout communities in the United States. The Municipality of Anchorage is no exception with many neighborhoods expressing similar concerns. In order to assist residents, Community Councils, and decision makers in addressing the major concerns of neighborhood speeds and safety, the Municipality has developed this Traffic Calming Policy Manual. "Traffic calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and cut-through volumes in the interest of street safety, livability, and other public purposes." (As defined in the Institute of Transportation Engineers' (ITE), *Traffic Calming State of the Practice*, Ewing, 1999.) Non-engineering measures such as enforcement, signage and striping are not included. Traffic control devices, particu-

larly STOP, SPEED LIMIT and CHILDREN AT PLAY signs, require increased enforcement and are not a part of the program. Traffic calming measures, by contrast, are intended to be self-enforcing.

In March of 2001 the Municipal Traffic Department published the *Traffic Calming Protocol Manual*, (TCPM) prepared by DOWL Engineers. The TCPM provides a toolbox of traffic calming measures, their effectiveness and some basic guidelines for their implementation. This Manual provides a complete picture of the traffic calming program.



The Municipality's traffic calming program is outlined as follows:

1. Introduction

- a. Overview of Traffic Calming Program
- b. Types of traffic calming measures
- c. Location of traffic calming
- d. Service Area Factors

2. Temporary Speed Hump Program

- a. Introduction
- b. Street Criteria
- c. Petition
- d. Data Collection
- e. Speed and Volume Criteria
- f. Placement

3. Permanent Speed Hump Program

- a. Introduction
- b. Criteria
- c. Placement

4. Specific Area Studies

- a. Introduction
- b. Study Process
- c. Types of Traffic calming Measures

5. Summary of Traffic Calming Measures

1a. Overview of Traffic Calming Program

The Municipality of Anchorage's traffic calming program is intended to work as a partnership between the Traffic Department and the community. Each group has specific responsibilities in order to make the program work. Traffic calming can and should be considered with all new developments. All traffic calming devices, including type, use and design, must be approved by the Municipal Traffic Engineer.

There are three distinct categories of the traffic calming program. The Program is designed to cover the full spectrum of measures by providing short, intermediate and long term solutions.

Temporary Speed Humps are a rubberized device that extends across a roadway providing a 3 inch rise over a 14 foot length. Temporary speed humps are used during summer months only and are considered a short term measure. The program functions with the use of a petition so the

local residents can decide if it is an acceptable technique for slowing traffic in their neighborhood. Volume and speed warrants are used to ensure the humps are placed in critical locations. Due to installation requirements, temporary speed humps can only be placed on roadways improved with asphalt paving. More specifics on the temporary speed hump program are discussed in Section 2 of this manual.

Permanent Speed Humps are an extension of the temporary speed hump program. After placement of temporary speed humps for up to two seasons, the Traffic Department will work with the local residents and the area Community Council to determine if permanent speed humps are desired. A permanent speed hump can be installed without the placement of a temporary first; however:

1. a petition and Community Council approval is required,

2. the installation must meet the same volume and speed criteria as temporary speed humps,

3. and is subject to funding availability.

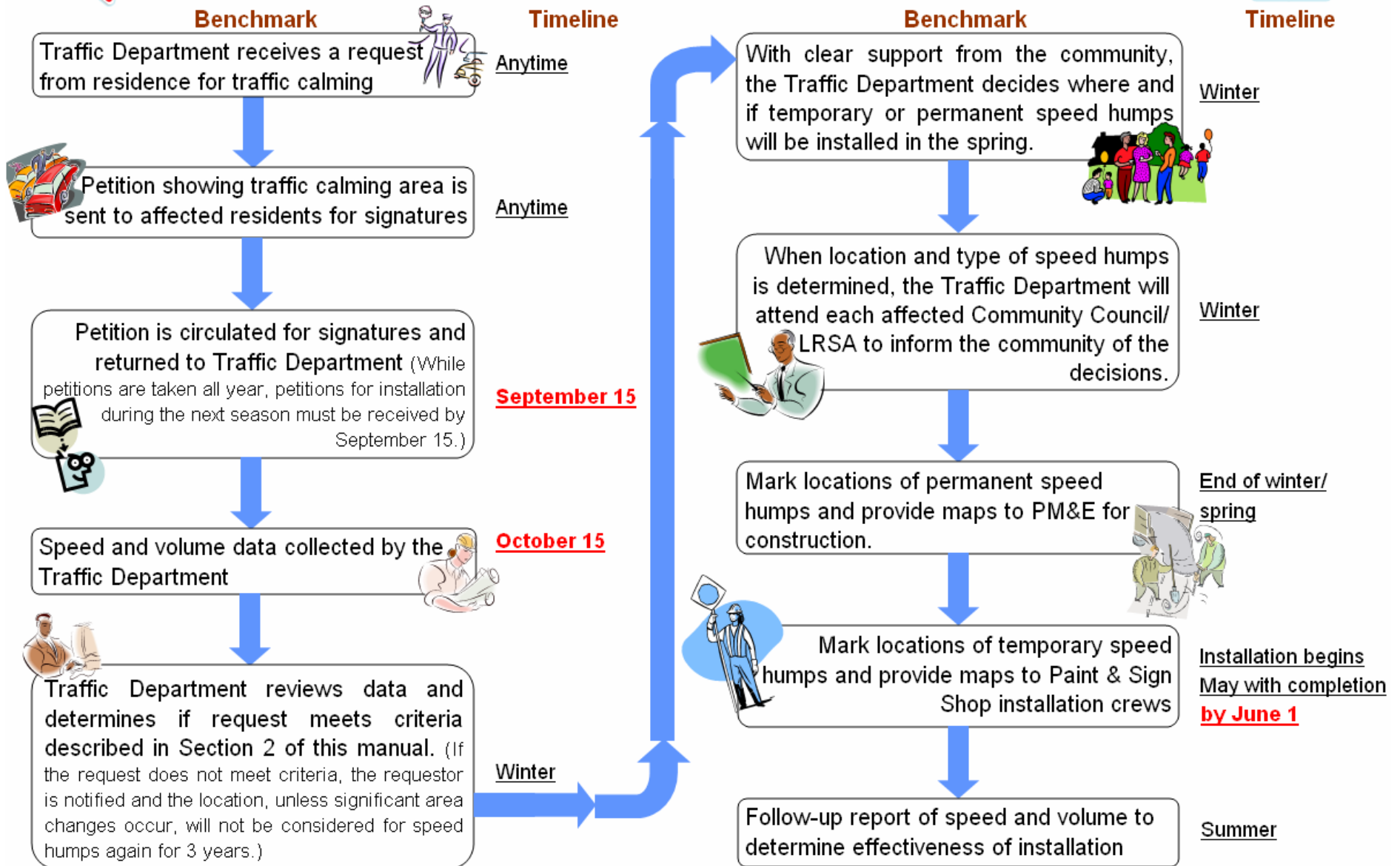
More specifics on the permanent speed hump program are discussed in Section 3. Temporary and permanent speed hump program benchmarks and timelines are shown in Table 1-1 on the following page.



Paint and Sign Shop installation crews work on the placement of a temporary speed hump.



Traffic Calming Policy and Timeline - Temporary and Permanent Speed Humps





Specific Area Studies encompass a wide area, usually defined as Community Council boundaries, which engage an entire community to determine broad measures which can be implemented to reduce traffic speeds and cut-through traffic as well as enhance safety and livability. A specific area study develops long term solutions. Multiple traffic calming measures are used to target identified locations. The various traffic calming measures available are discussed in greater detail in Section 4 with examples shown in Section 5.

The Traffic Department currently receives annual Anchorage Roads and Drainage Service Area bond funds for traffic calming. The bond is used to support traffic calming programs by allowing the Traffic Department to purchase and place temporary speed humps; to install permanent speed humps; install recommended traffic calming measures from previous area studies, and to initiate new studies.

✚ 1b. Types of Traffic Calming Measures

Traffic calming can be divided into three categories:

1. **Volume control measures:** consist of modifications that reduce the quantity of vehicles that use a specific roadway.
2. **Vertical speed control measures:** are elevated segments of roadway and gateway/landscape treatments which require vehicles to slow down.

- 3. **Horizontal speed control measures:** alter the typical straight line traveled way or narrow a specific roadway to reduce speed.

These three categories comprise the Municipality of Anchorage’s traffic calming toolbox and have varying effects on speeds and volumes. All categories of traffic calming can be utilized in some aspect of the traffic calming program.

Table 1-2 lists specific traffic calming measures which constitute the Municipality of Anchorage’s traffic calming toolbox. Greater detail on these measures, and their effectiveness, are shown in Section 5 of this Policy Manual or the Protocol Manual.



Mini traffic circle

Table 1-2

Traffic Calming Measures	
Volume Control	Full Street Closures
	Half Street Closures
Vertical Speed Control	Forced Turn Islands
	Diverters
Horizontal Speed Control	Speed humps
	Speed Tables
	Gateway/Landscape
	Raised Crosswalks
Horizontal Speed Control	Raised Intersections
	Mini traffic Circle
	Roundabouts
	Road Narrowings
	Lateral Shifts
	Chicanes
Horizontal Speed Control	Neckdowns
	Chokers
Horizontal Speed Control	Island Narrowings

1c. Location of Traffic Calming

Traffic calming is primarily suited to residential streets and low volume neighborhood collector streets. Collector streets, or streets that act as the main access to a particular neighborhood, will generally have horizontal traffic calming measures

only; however, some raised intersections and/or raised crosswalks can be considered for locations where posted speeds are 30 miles per hour or less. Vertical measures are designed for the lower speed limits and cannot be installed on routes with posted speeds greater than 30 miles per hour.

In addition, emergency response must be considered on the collector streets and main neighborhood access streets. Emergency vehicle access routes must be identified and accounted for when deciding the types of traffic calming measures to employ. Some vertical measures on critical routes can significantly slow emergency response.

1d. Service Area Factors

Service areas are identified areas which are established to perform a specific maintenance function. Section 9.01 of the Anchorage Charter provides for the creation of service areas within the Municipality of Anchorage. Alaska Statute Section

29.35.450 states: *Special services include services not provided by the unified municipality or a higher or different level of services.* While the Traffic Department's responsibilities are areawide, capital improvement bonding is done by service areas. The Traffic Department works to implement traffic calming measures jointly with the following service areas:

- Anchorage Roads and Drainage Service Area (ARDSA)
- Chugiak, Birchwood, Eagle River Rural Road Service Area (CBERRRSA)
- Limited Road Service Areas (LRSA) - various
- Glen Alps Service Area (GASA)
- Girdwood Valley Service Area (GVSA)

In addition, for the purpose of the traffic calming program, the Traffic Department will also work with the Home Owners Associations (HOA) outside of any other service area.

Maps showing the individual service areas are shown below. All service areas will follow the

same criteria outlined in the Sections which follow.

ARDSA traffic calming requests and studies will be accomplished by the Municipality of Anchorage Traffic Department in conjunction with the requesting community. Costs for all studies and construction of identified improvements will use traffic bond funds.

Limited Road Service Area (LRSA) and Homeowner's Association (HOA) within Anchorage traffic calming requests will be investigated and analyzed by the Traffic Department in association with the requesting service area. All traffic calming requests must meet the same criteria for placement and installation as presented in this Manual. Cost for the purchase of temporary speed humps or the construction of permanent speed humps (including permitting, temporary traffic control, and signing and striping) is the responsibility of the specific service area. All work in the

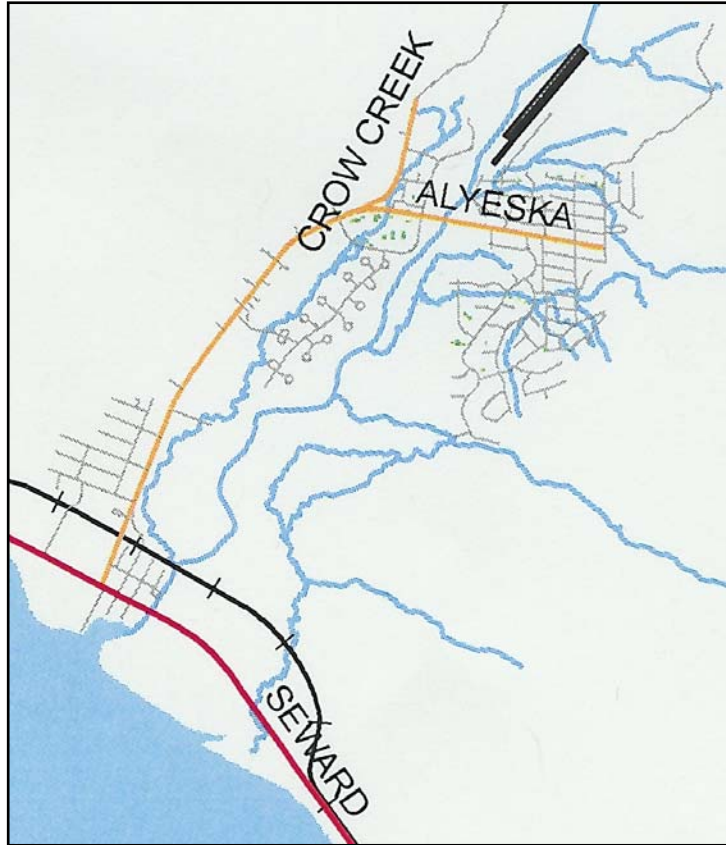
right-of-way must have a right-of-way permit (which includes location and design of all proposed improvements) before work can take place. If a service area desires an area study, as outlined in Section 4, the responsibility for payment of the study resides with the particular service area. Consultant selection for the study must follow Municipal purchasing procedures and the project will be managed by the Traffic Department. Construction costs associated with improvements identified in the specific area study are the responsibility of the service area. This does not, however, eliminate the possibility of the use of other traffic calming measures in addition to speed humps.

Chugiak Birchwood Eagle River Rural Road Service Area (CBERRRSA)

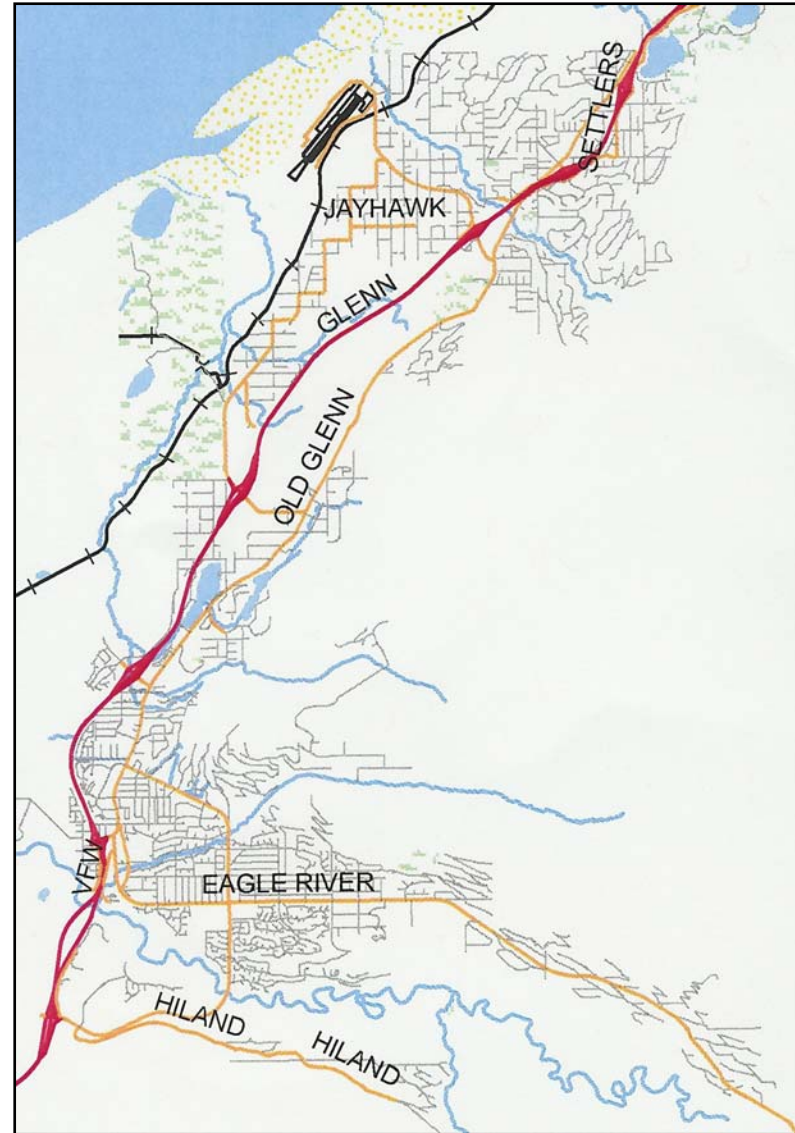
Similar to our process for traffic calming projects throughout Anchorage, a local resident of the

CBERRRSA will contact the Traffic Department and obtain a petition to collect the signatures of the adjacent residents supporting the project. The roadway must meet the criteria established in the MOA Traffic Calming Policy Manual in order to install speed humps. A letter supporting the traffic calming devices and accepting maintenance and construction financial responsibility has to be supplied by the Home-owners Association (if applicable) and sent to the Traffic Department. Based upon a Traffic Department review of the request, the petitioner will request an approval/non-objection motion from the CBERRRSA Board. Following CBERRRSA review, a letter or a copy of the meeting minutes stating approval (non-opposition) from the CBERRRSA must be supplied to the Traffic Department.

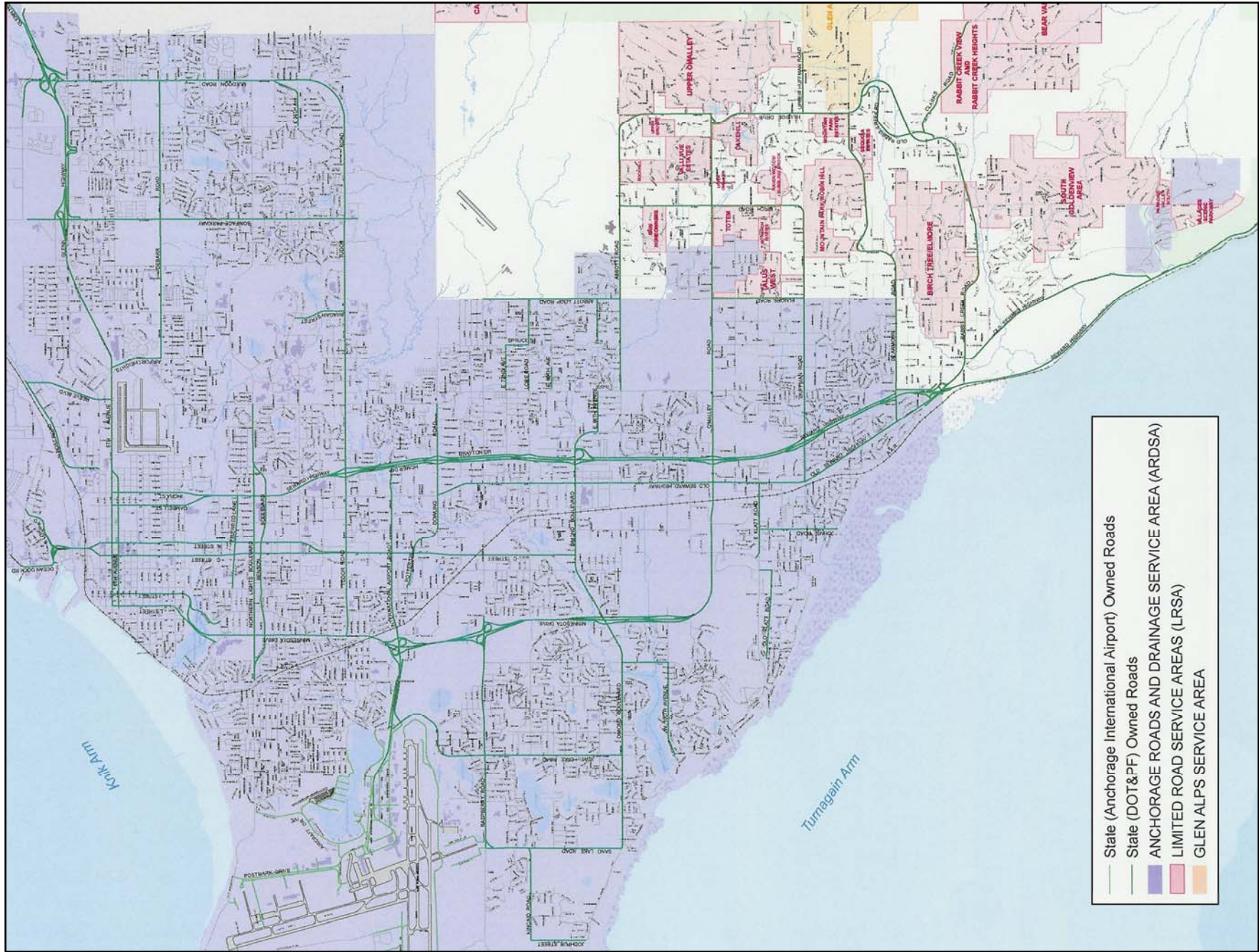
GVSA



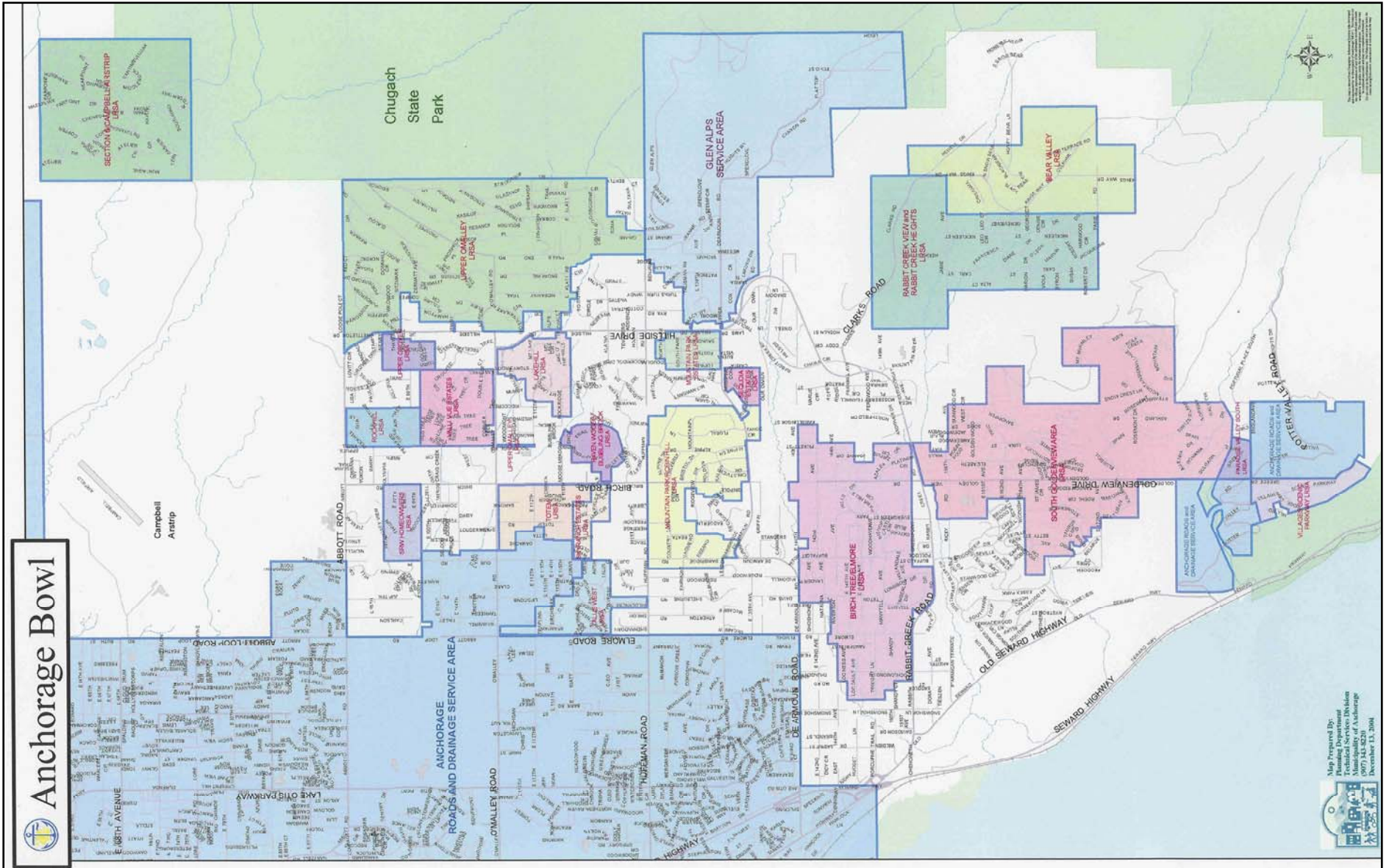
CBERRRSA



ARDSA



LRSA and GASA



[Section 2 – Temporary Speed Hump Program](#)

2a. Introduction

Traffic Calming is a growing concern throughout the United States and Europe. Speeding and unsafe driving habits are becoming a major concern with the public. Excessive speeding and unsafe driving habits can threaten the safety and livability of neighborhoods. In order to address these concerns, the first step of the Municipality's Traffic Calming Program is a quick response approach and is considered a short term solution. Temporary speed humps fit the need of this first phase of the Municipality's Traffic Calming Program. The Program's main purpose for temporary speed humps is not to solely reduce speed, but to give neighborhoods an idea of what a speed hump is before the possible implementation of phase 2 of the Traffic Calming Program – placement of permanent speed humps. Temporary speed humps are intended for a two season maximum installa-

tion time period. This allows time for determination of an appropriate permanent fix.



Temporary speed humps are 14 feet in length and varies to a maximum of 3 inches in height.

2b. Street Criteria

Temporary speed humps will be installed on a priority basis based on speed and volume of the identified roadways. Due to the overwhelming requests for temporary speed humps, requests un-

der consideration will be limited to through streets with a posted speed limit of 25 miles per hour or less. Cul-de-sacs and dead ends will not be considered. In addition, temporary speed humps will be placed on roadways paved with asphalt paving only. Temporary speed humps cannot be placed on the following roadway surface types:


- chip sealed,
- Recycled Asphalt Paving,
- or gravel roads.

These road surface types will not hold temporary speed humps in place and will cause damage to the roadway as well as increased call-outs for the speed hump maintenance crews.

2c. Petition

When a request is submitted to the Traffic Department, the requestor will be sent a petition form which will outline the temporary speed hump

process. In addition, a map or other descriptive information will be sent which details the area to be canvassed for concurrence signatures. The petition will ensure residents in the area are aware of the temporary speed hump request and are in favor of the installation of the devices. Consideration of temporary speed hump installation will proceed only if a minimum of 51% of the residents concur with their installation (one signature per household).

		TEMPORARY SPEED HUMPS REQUEST PROCEDURE
<p>Temporary speed humps will be installed on a priority basis based on speed and volume of the identified roadways. Due to the overwhelming requests for temporary speed humps, requests under consideration will be limited to through streets – cul-de-sacs will not be considered. In addition, temporary speed humps will be placed on roadways paved with asphalt paving only. Roadways which are chip-sealed, Recycled Asphalt Paving, or gravel roads will not hold temporary speed humps in place and will cause damage to the roadway.</p>		
<p>Date: _____</p>		
<p>We the residents of _____ would support the Municipality of Anchorage installing a temporary speed hump(s) on _____ (Street Name)</p>		
<p>Note: Temporary speed humps are placed on 25 MPH municipal paved roads from June through September. Attached is a picture of a temporary speed hump.</p>		
<p>Return signed petition to: MOA Traffic Department, P. O. 198650, Anchorage, AK 99519-8650.</p>		
Printed Name	Street Address	Signature

Petition currently used by the MOA.

✚ 2d. Data Collection

Once the petition is received in the Traffic Department, data collection will occur. Collection will include volume and speed counts for the requested roadway. The data will be collected on regular weekdays and not on holidays or weekends.



Data Technicians assemble volume study using pressure-activated tubing attached to a digital vehicle counter.

The Traffic Department must have BOTH the signed petition and the collected data before a

neighborhood is considered for temporary speed hump installation.

✚ 2e. Speed and Volume Criteria

The Traffic Department reviews all data collected for each requested road. The following criteria must be met before speed hump installation is considered:

- **Criteria 1**—500 vehicles per day and 85th percentile speed greater than 25 mph.
- or
- **Criteria 2**—Less than 500 vehicles per day and 85th percentile speed greater than or equal to 30 mph.

The volume and speed criteria shown above target the majority of traffic using a given roadway. The 85th percentile speed is the speed at or below which 85 percent of the motorists drive on a given road (in good conditions) and is the speed at

which motorists feel safe traveling. When 85th percentile speeds exceed the posted speed, traffic calming measures are an appropriate method to help reduce speeds.

✚ 2f. Placement



Many physical constraints dictate the placement of temporary speed humps. Compared with permanent speed humps, more latitude exists for the use of temporary speed humps due to their placement during summer months only. Installation of temporary speed humps begins in May each year and removal must take place prior to snowfall; therefore, all of the humps must be re-

moved by October 15th each year. The following is a list of placement constraints:

- Curves
- Steep grades
- Driveway location
- At least 50 feet away from intersection

For all areas outside ARDSA, the purchase, installation, and maintenance of temporary speed humps is the responsibility of the specific service area. The Traffic Department, will work with each service area to determine if the humps are warranted as well as locations for installation. Speed hump type and design must conform to Traffic Department requirements (14 feet in length by 3 inches in height) and installed per manufacturers specifications. All work in the right-of-way must have a right-of-way permit before work can take place. A right-of-way permit can be obtained from the Municipality of Anchorage Right-of-Way Section (343-8240).

Section 3 – Permanent Speed Hump Program

✚ 3a. Introduction



Permanent speed humps are intended as an extension of the temporary speed hump program. While permanent speed humps could be considered an interim step in the Traffic Calming Program, in many cases they can be a long term solution. Permanent speed humps are an effective means to reduce traffic speeds in residential neighborhoods. Two sizes of speed humps can be considered for construction: 13 feet and 22 feet. Permanent speed humps are constructed with as-

phalt paving and are 3 inches in height with a specific sinusoidal design. The 22 foot speed humps are typically placed on major neighborhood access routes. A different color can be used when constructing speed humps when approved by the Municipal Traffic Engineer.



See Section 5 for specifications and detailed drawings.

✚ 3b. Criteria

After placement of temporary speed humps for up to two seasons, the Traffic Department will work

with the local residents and the area Community Council to determine if permanent speed humps are desired. A permanent speed hump can be installed without the placement of a temporary first; however, a petition and Community Council approval is required and the installation must meet the same volume and speed criteria as temporary speed humps. The process for moving from temporary to permanent speed humps is listed below:

- Temporary humps, following the criteria outlined in Section 2, are placed for up to two seasons.
- The Traffic Department will send out surveys to the residents along the roadway under consideration (and associated neighborhood) to receive community feedback in order to determine if there is support for the installation of permanent speed humps.

- The Traffic Department will also meet with the area's particular community council, and/or service area representatives, to ensure all concerns are identified and addressed.

These meeting will ensure overwhelming consensus exists with affected residents and the community council and/or service area before proceeding with the installation of permanent speed humps.

3c. Placement

Many physical constraints dictate the placement of permanent speed humps. While there is more latitude for the placement of temporary speed humps, they are placed during the summer months only, placement of permanent speed humps, which are in place during icy winter months, require careful consideration. In addition, emergency response must be considered on the

collector streets and main neighborhood access streets. Emergency vehicle access routes must be identified and accounted for when deciding the types of traffic calming measures to employ. Some vertical measures on critical routes can significantly slow emergency response. Consideration for emergency response is extremely important and is provided for in both the location and design of permanent speed humps. Following is a list of placement constraints:

- Curves
- Steep grades
- Driveway locations
- Roadway intersections – must be placed at least 50 feet away from intersection
- Placed on a property line, if possible.

For all areas outside ARDSA, the construction of permanent speed humps (including permitting, temporary traffic control, and signing and striping) is the responsibility of the specific service

area. All work in the right-of-way must have a right-of-way permit before work can take place. A right-of-way permit can be obtained from the Municipality of Anchorage Right-of-Way Section (343-8240). Following is a list of items which must accompany the right-of-way permit application:

- Map showing speed hump locations as approved by the Traffic Department,
- Location of SPEED HUMP warning signs,
- Striping detail, and
- Design detail which includes specifications.

General sign locations, striping details, and design details including specifications are shown in Section 5. The required warning signs must be in place as soon as the speed hump is open for traffic. Striping must be placed as soon as possible after speed hump installation.

Section 4 – Specific Area Studies

✚ 4a. Introduction

Specific area studies are area wide studies, usually defined as Community Council boundaries, which engage an entire community to determine broad measures which can be implemented to reduce traffic speeds and cut-through traffic as well as enhance safety and livability. A specific area study is focused on long term solutions.

✚ 4b. Study Process

Following is the typical process to initiate and complete a new specific area study:

- Study area nomination/funding
- Consultant selection/contract approval
- Public involvement
 - Meet with Community Council
 - Form traffic calming work group
 - Public meetings

- Identify areas of concern
- Collection of data
 - Volume
 - Speed
 - Cut-through
 - Transit
 - Safety/Emergency vehicle routes
- Analysis and report
 - Results of analysis
 - Which traffic calming measures are appropriate and fit with community
 - Graphical map showing improvements
 - Prioritized improvement listing with estimated cost

Public involvement and working groups help identify critical and priority needs in neighborhoods. This process also works to keep the community in the loop and apprised of the decisions and progress of the study. A sample of the recommenda-

tion from the area study is shown at the end of this section.

4c. Types of Traffic Calming Measures

Traffic calming can be divided into three categories:

1. **Volume control measures:** consist of modifications that reduce the quantity of vehicles that use a specific roadway.
2. **Vertical speed control measures:** are elevated segments of roadway and gateway/landscape treatments which require vehicles to slow down.
3. **Horizontal speed control measures:** alter the typical straight line traveled way or narrow a specific roadway to reduce speed.

These three categories comprise the Municipality of Anchorage’s traffic calming toolbox, shown in Table 4-1, and have varying effects on speeds and volumes, illustrated in Table 4-2. All catego-

ries of traffic calming can be utilized in some aspect of the traffic calming program. Greater detail on these measures, and their effectiveness, are shown in Section 5 of this Policy Manual or the Protocol Manual.

Table 4-1

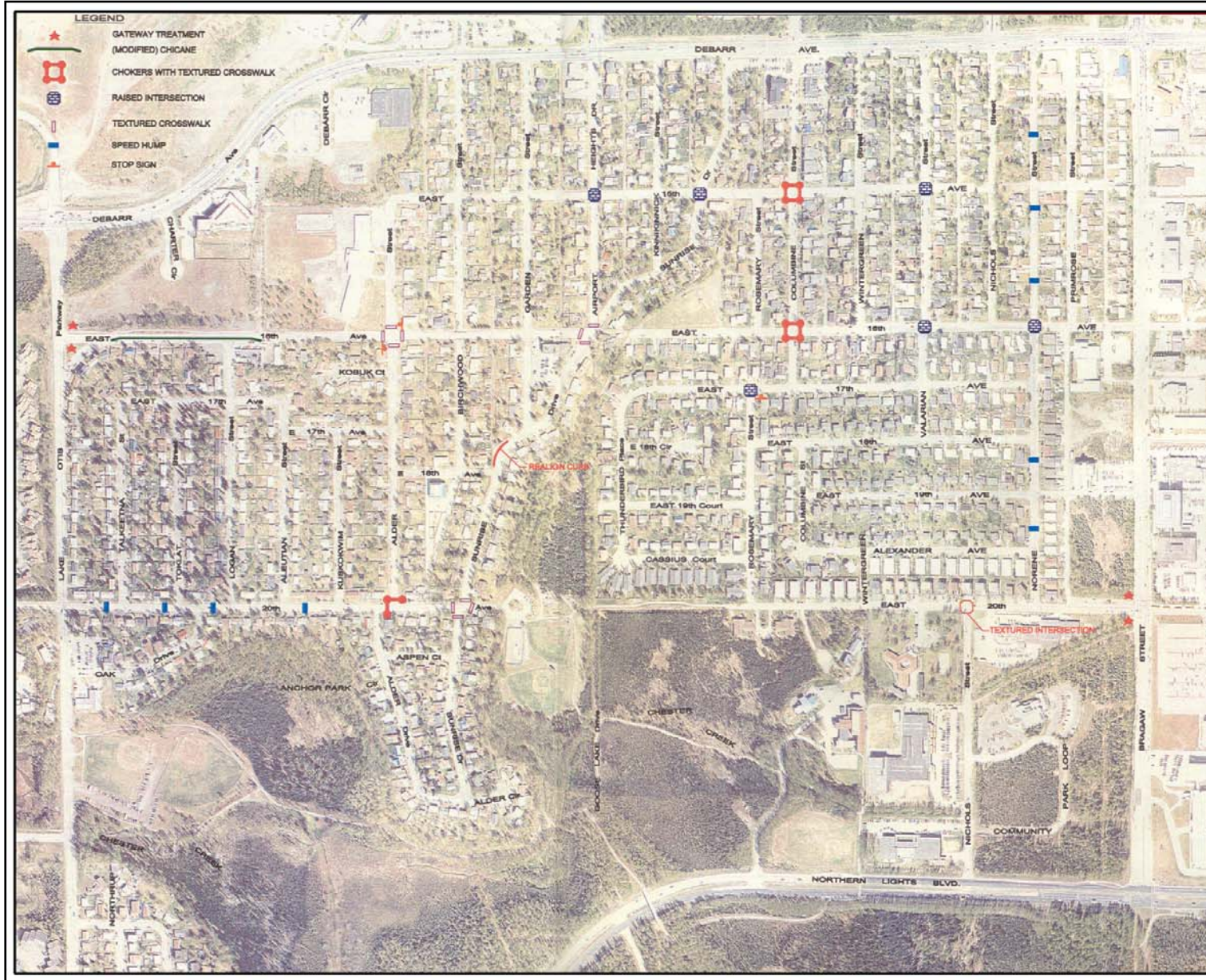
Traffic Calming Measures	
Volume Control	Full Street Closures
	Half Street Closures
	Forced Turn Islands
	Diverters
Vertical Speed Control	Speed humps
	Speed Tables
	Gateway/Landscape
	Raised Crosswalks
	Raised Intersections
Horizontal Speed Control	Mini traffic Circle
	Roundabouts
	Road Narrowings
	Lateral Shifts
	Chicanes
	Neckdowns
	Chokers
	Island Narrowings

Table 4-2

TRAFFIC CALMING TOOL BOX	Volume Reduction	Speed Reduction	Safety Improvement	Pollution Reduction	Access Restriction	Emergency Access	Maintenance Issues	Community Acceptance	Cost
Full Closures	●	●	⊖	●	●	●	●	○	●
Half Closures	⊖	⊖	⊖	↔	●	●	○	○	●
Forced turn islands/ Diverters	⊖	⊖	⊖	↔	●	●	●	○	●
Speed Humps/Tables/ Raised Crosswalk/Raised Intersection	⊖	●	○	○	○	●	⊖	○	⊖
Traffic Circle/Roundabouts	○	⊖	⊖	○	○	●	⊖	○	●
Lateral Shifts/Chicanes	⊖	○	⊖	○	○	○	○	●	●
Neckdowns/Chokers	⊖	⊖	⊖	○	○	○	○	○	●

- Low, Unlikely, No
- K ⊖ Mid, Moderate, Possible
- E ● High, Likely, Yes
- Y ↔ Traffic Shift
- n/a Not applicable

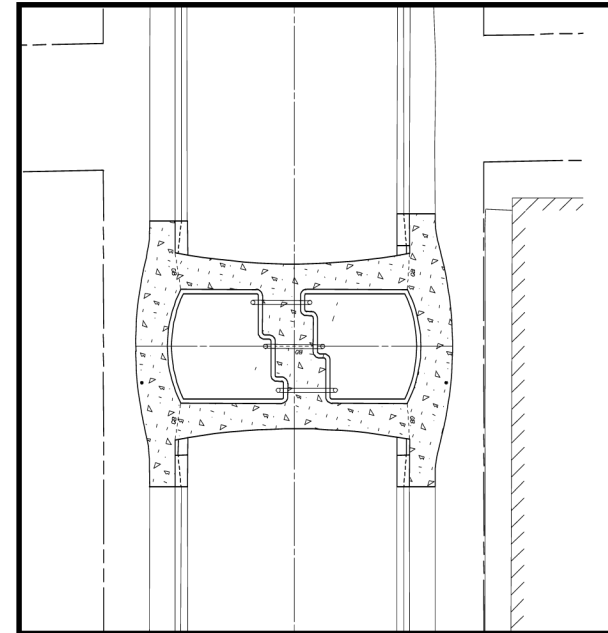
Sample of recommendation from an area study



AIRPORT HEIGHTS TRANSPORTATION STUDY
1999 FINAL DRAFT PLAN

Section 5 – Summary of Traffic Calming Measures

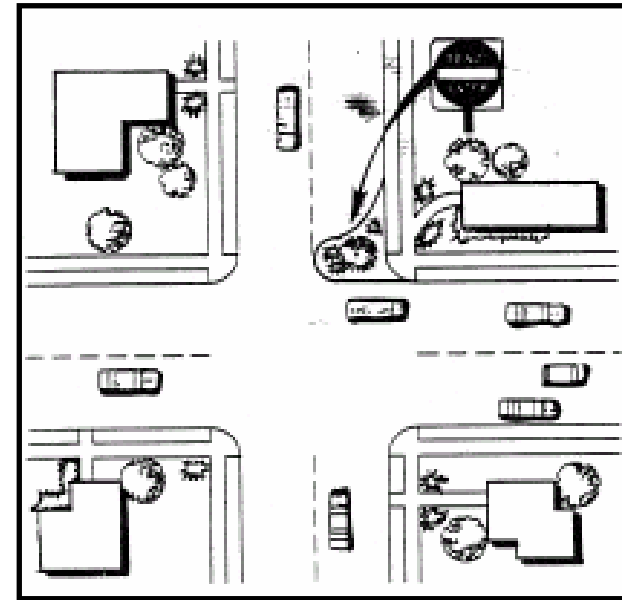
Full Street Closures



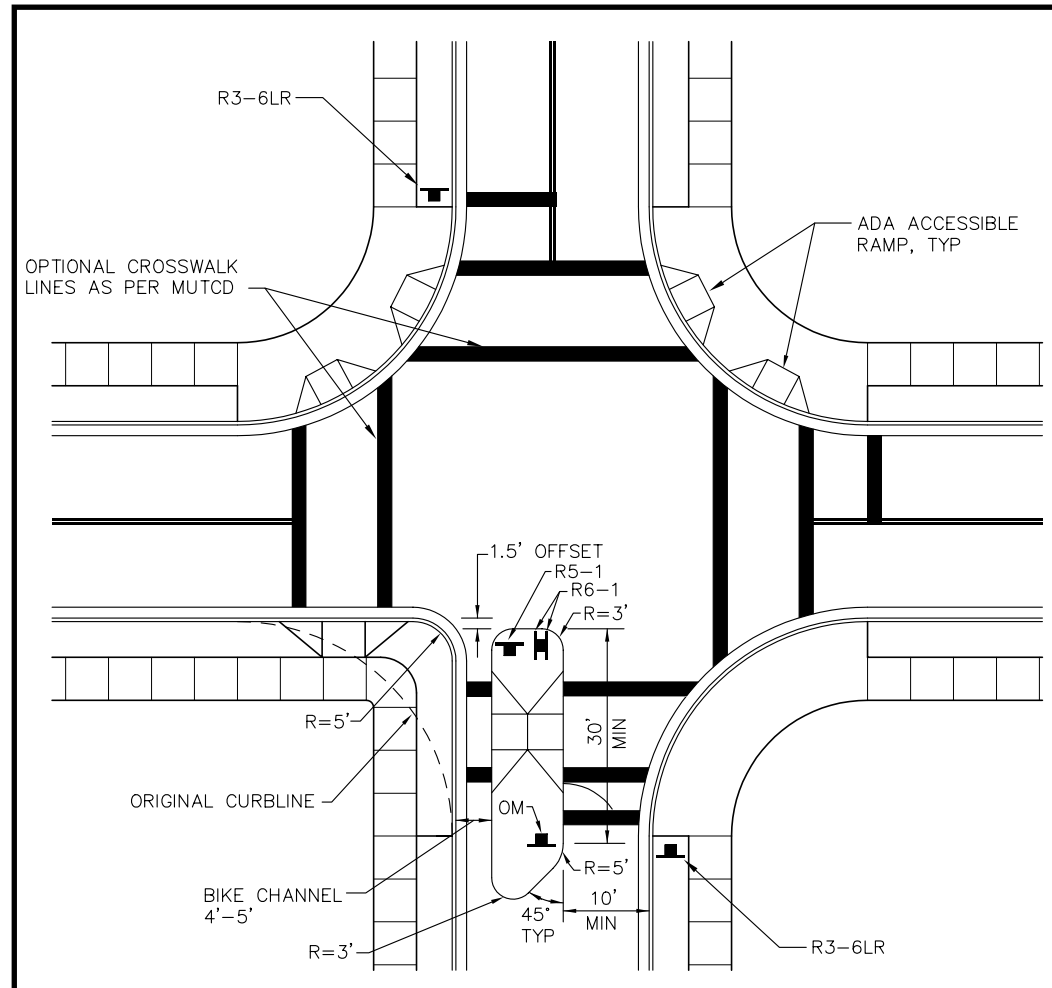
Full street closures are barriers placed across a street to completely close the street to through traffic usually leaving only sidewalks open. Examples of full street closures include hammer heads, cul-de-sacs, and dead-ends. Closure barriers may consist of landscaped islands, walls, gates, side-by-side bollards, or any other obstructions that leave an opening smaller than the width of a passenger car.

Given the fact that full closures can be designed in so many ways, no typical design is included in this manual.

Half Street Closures

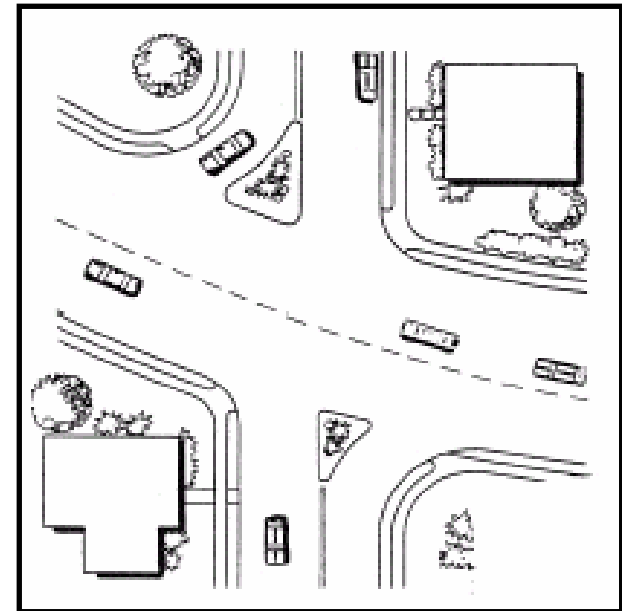


Half street closures are barriers that block travel in one direction for a short distance on otherwise two-way streets. They are also sometimes called *partial closures* or *one-way closures*. When two half closures are placed across from one another at an intersection, the result is a *semi-diverter* that blocks through movement on a cross street.

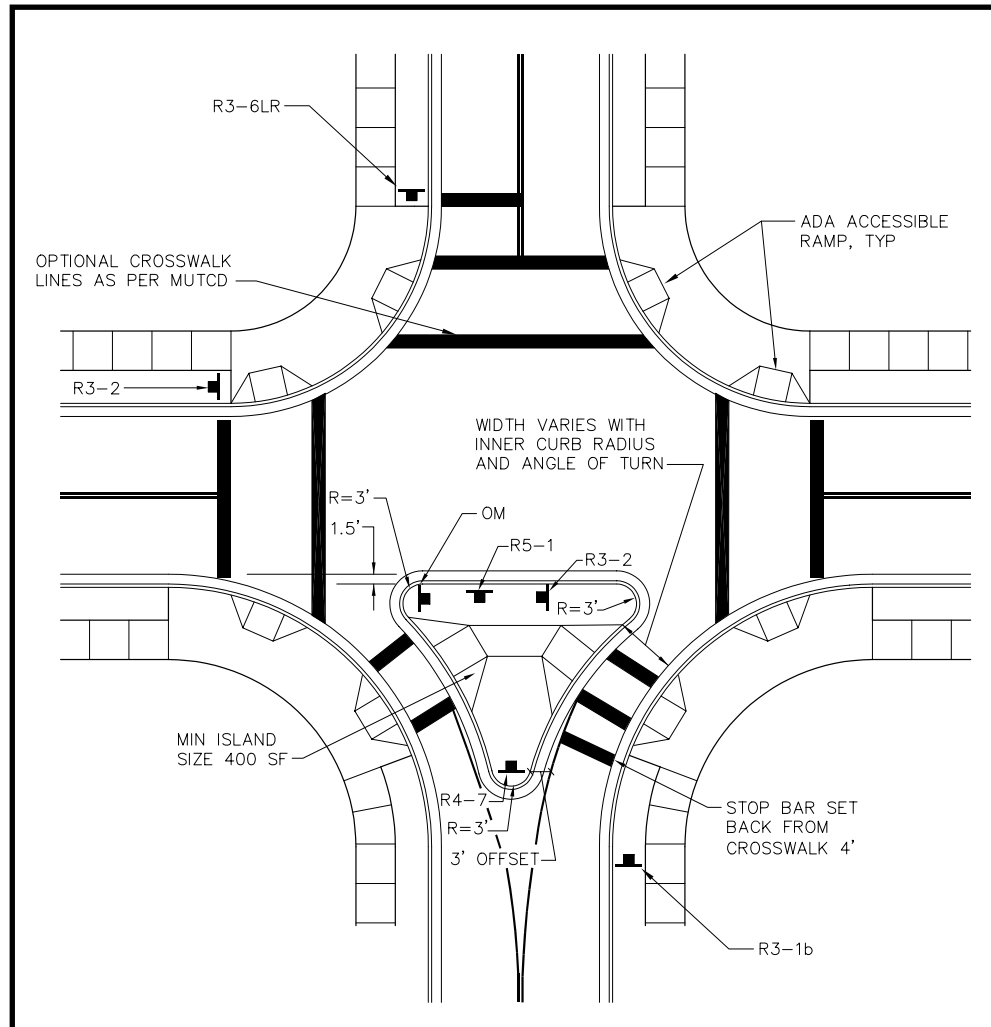


The typical *half closure* has two geometric features designed to encourage compliance with the one-way restriction. First, the curb extension or edge island extends more than a car length along the roadway. Second, the curb extension or edge island extends all the way to the centerline of the street or beyond on a wide street.

Forced Turn Islands

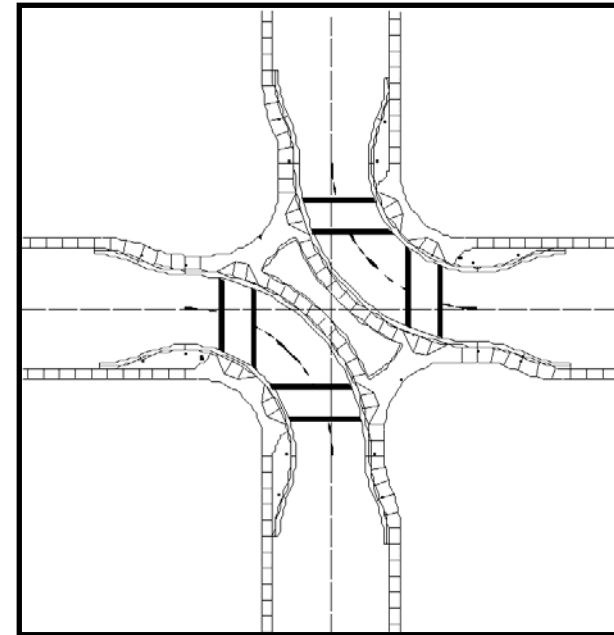


Forced turn islands are raised islands on approaches to an intersection that block certain movements. They are sometimes called *forced turn channelizations*, *pork chops*, or in their most common incarnation, *right turn islands*.

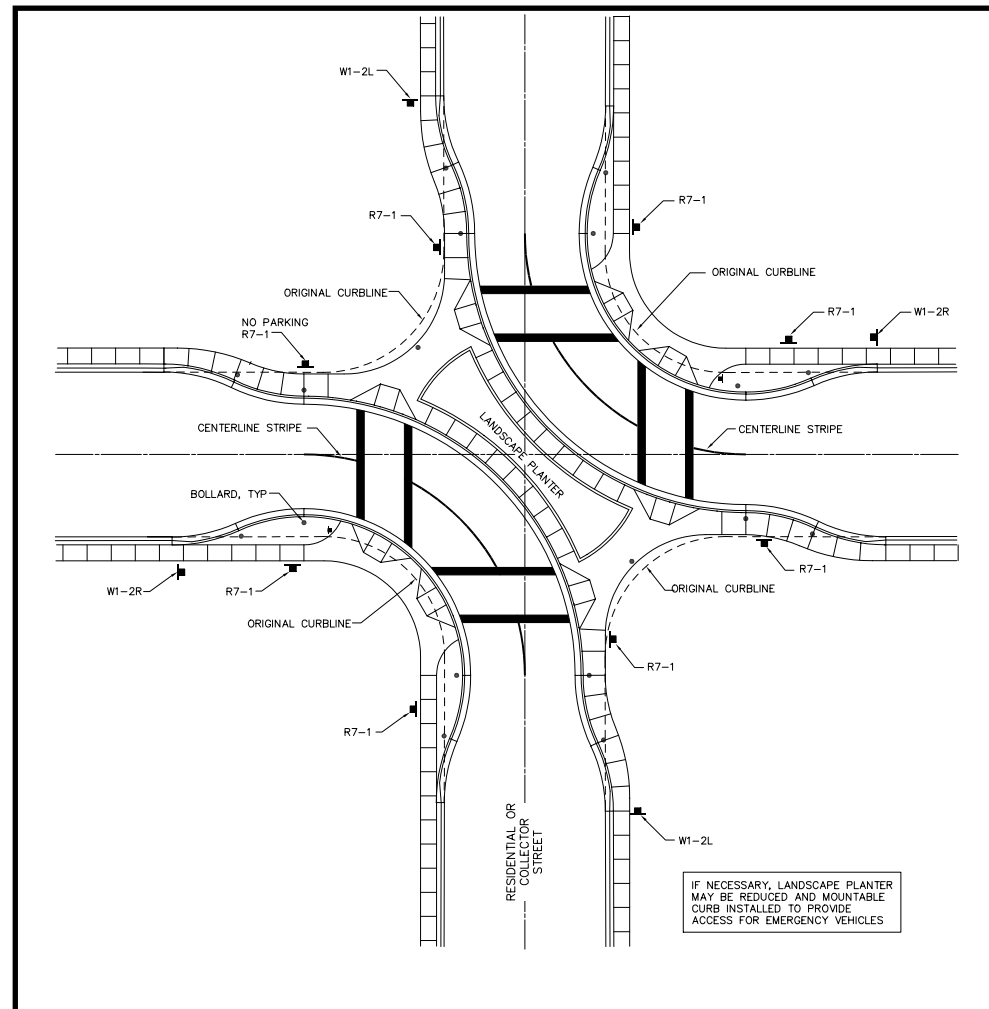


Forced turn islands will have clear widths sufficient for single-unit trucks (or buses if a transit route) to make turns at treated intersections without encroaching into opposing lanes. In addition, islands will be sharply angled toward the right on the approach to discourage wrong-way movement.

Diagonal Diverters

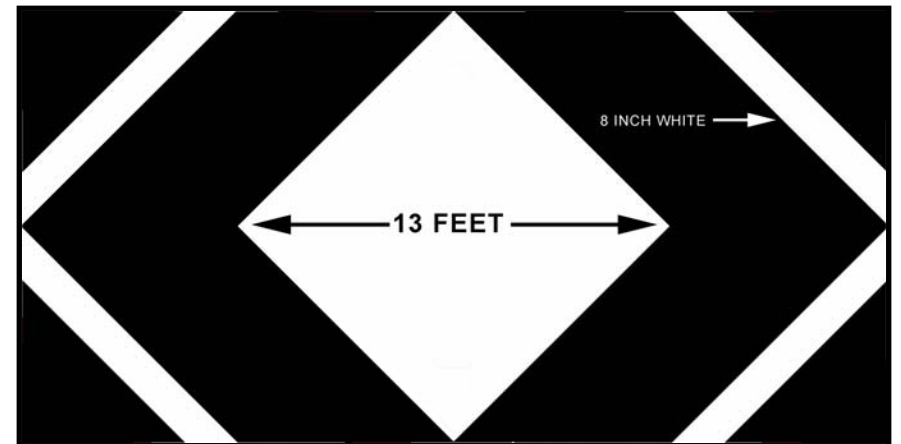


Diagonal diverters are barriers placed diagonally across an intersection blocking through movement. They are also called *full diverters* and *diagonal road closures*.

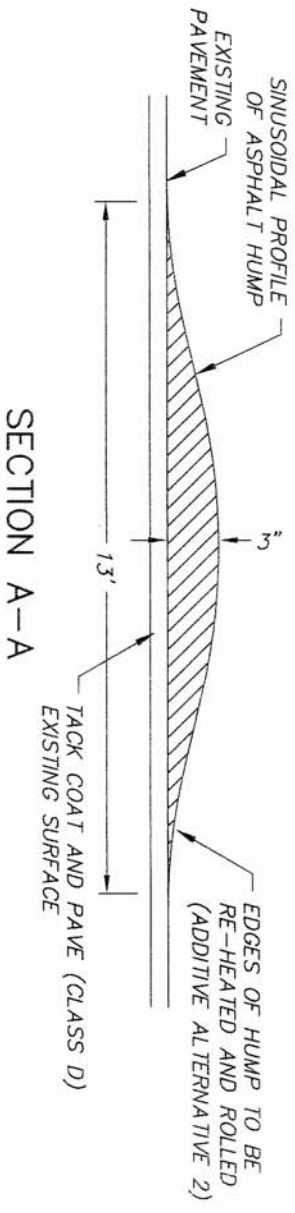
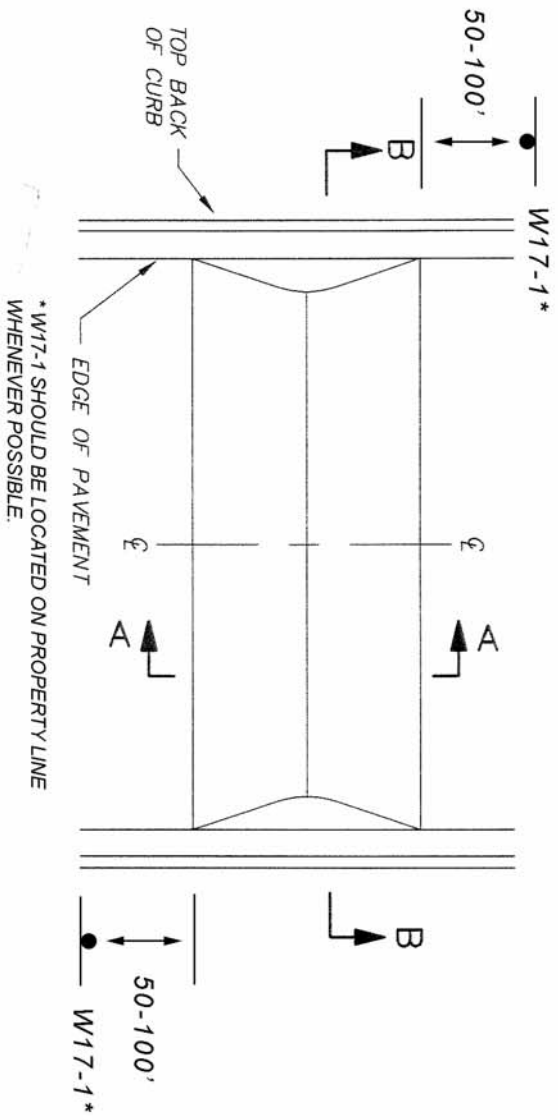


Diagonal diverters will have clear widths sufficient for single-unit trucks (or buses if a transit route) to make turns at treated intersections without encroaching into opposing lanes. They will have openings five to six feet, sufficient for bicyclists to pass through barriers, but not for motorists to do so.

Speed Humps

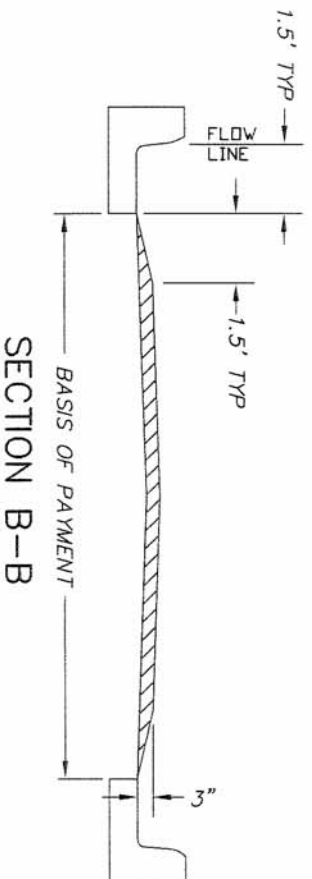


Speed humps are rounded raised areas placed across the road. They are also referred to as *undulations*. The standard or Watts profile hump, developed and tested by Britain's Transport and Road Research Laboratory, is the most common speed control measure in the United States (U.S.). It is the only speed control measure, at present, for which ITE provides design and application guidance.



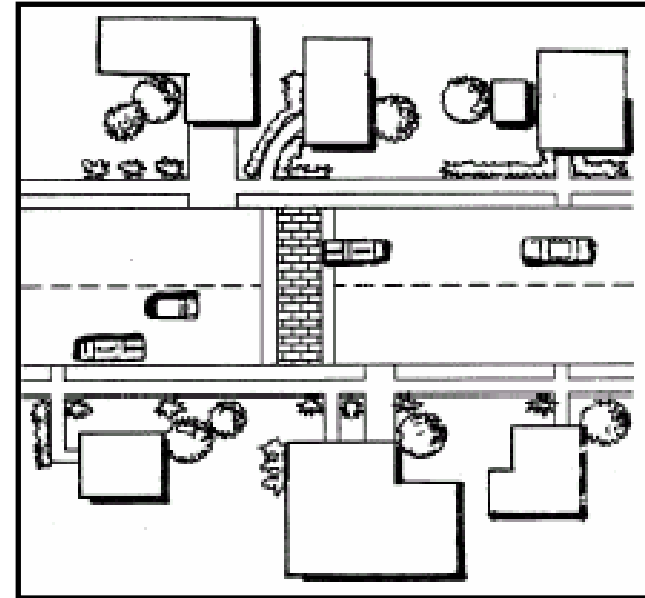
SINUSOIDAL PROFILE OF HUMPS

DISTANCE (FT)	0.0	0.41	0.82	1.23	1.64	2.05	2.46	2.87	3.28	3.69	4.10	4.51	4.92	5.33	5.74	6.00	6.50
FINISHED HT. (IND)	0.0	0.04	0.12	0.26	0.47	0.71	0.98	1.26	1.57	1.89	2.17	2.44	2.68	2.87	2.95	3.00	3.00

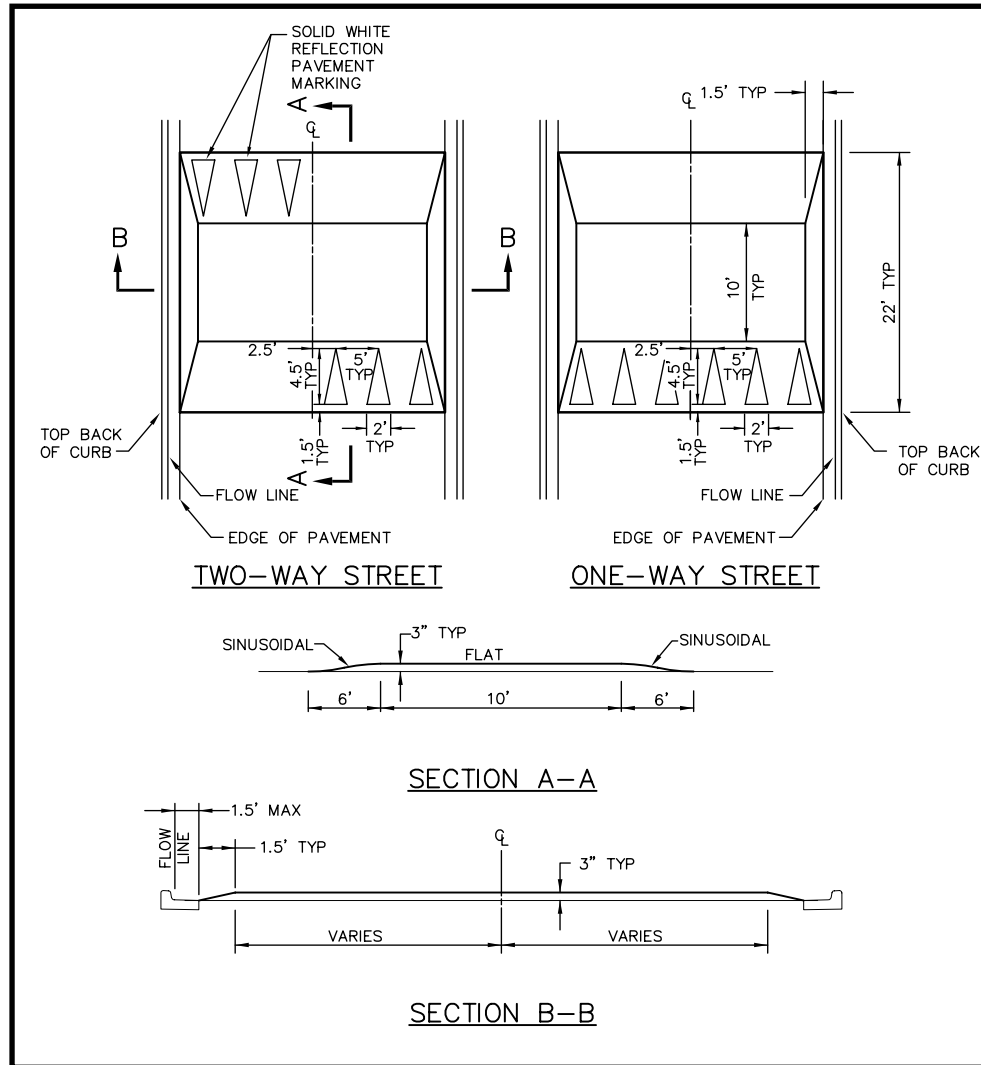


TYPICAL 13' SPEED HUMPS

Speed Tables

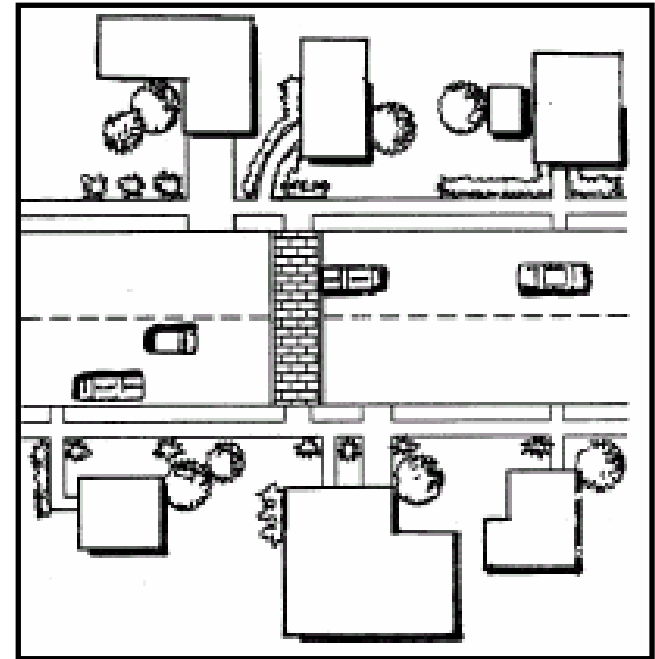


Speed tables are flat-topped speed humps often constructed with a brick or other textured materials on the flat section. They are also called *trapezoidal humps*, *plateaus*, and if marked for pedestrian crossing, *raised crossings* or *raised crosswalks*. Speed tables are typically long enough for the entire wheelbase of a passenger car to rest on top. Their long flat fields give speed tables higher design speeds than humps.

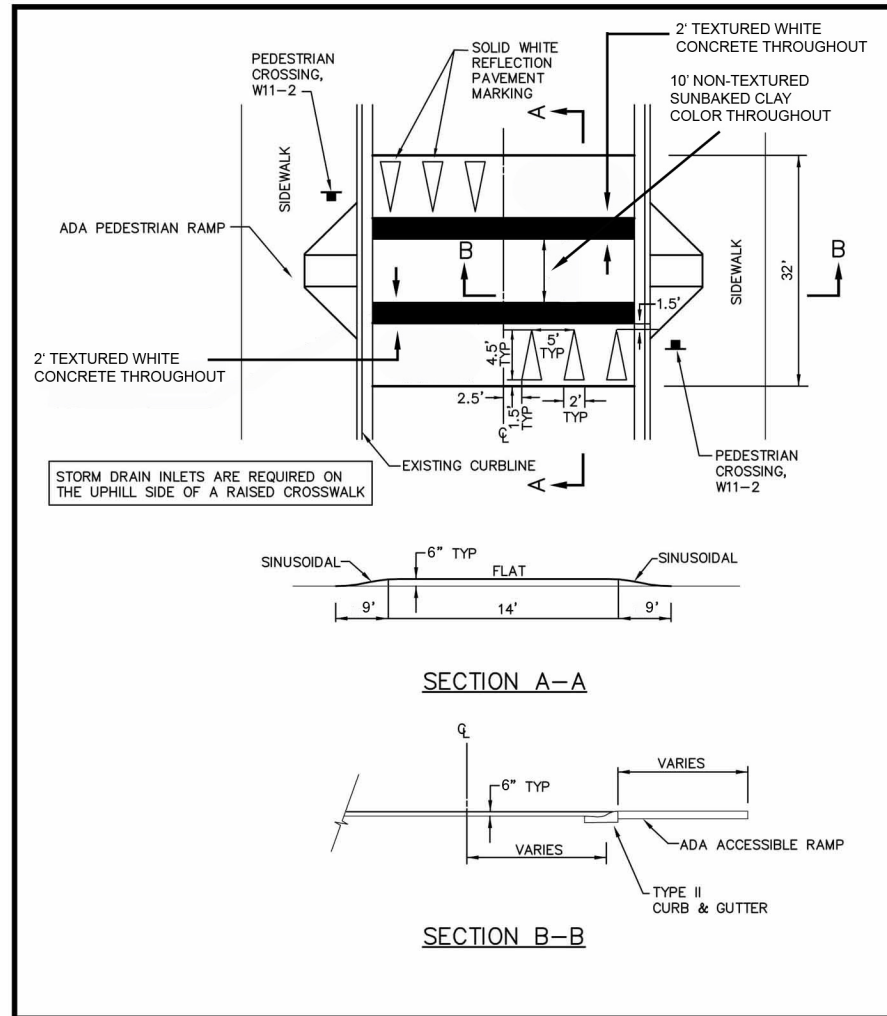


The typical *speed table* is three inches high and 22 feet long in the direction of travel. The plateau (flat top) is 10 feet long and each ramp is six feet long. The plateau is made of asphalt, concrete, stamped asphalt or concrete, or other patterned materials as approved by the MOA Traffic Engineer. The ramps are sinusoidal in shape and ordinarily made of asphalt, though concrete, brick, and concrete pavers are also used. The sides taper off at the gutter.

Raised Crosswalks

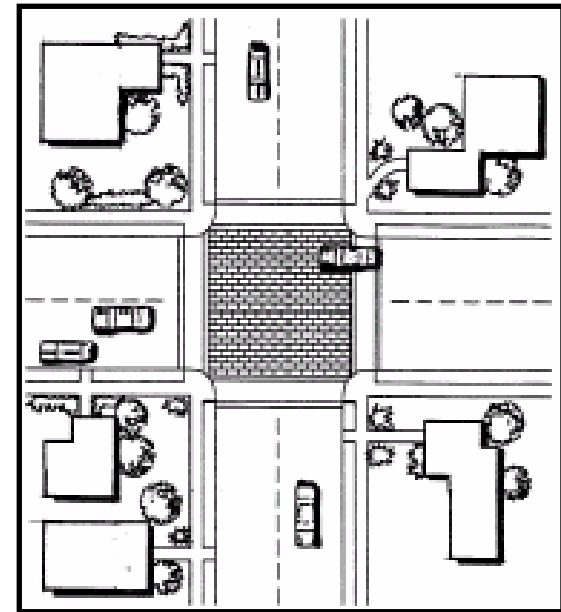


Raised crosswalks are speed tables marked for pedestrian crossing. Unlike speed tables, raised crosswalks extend the full width of the roadway.

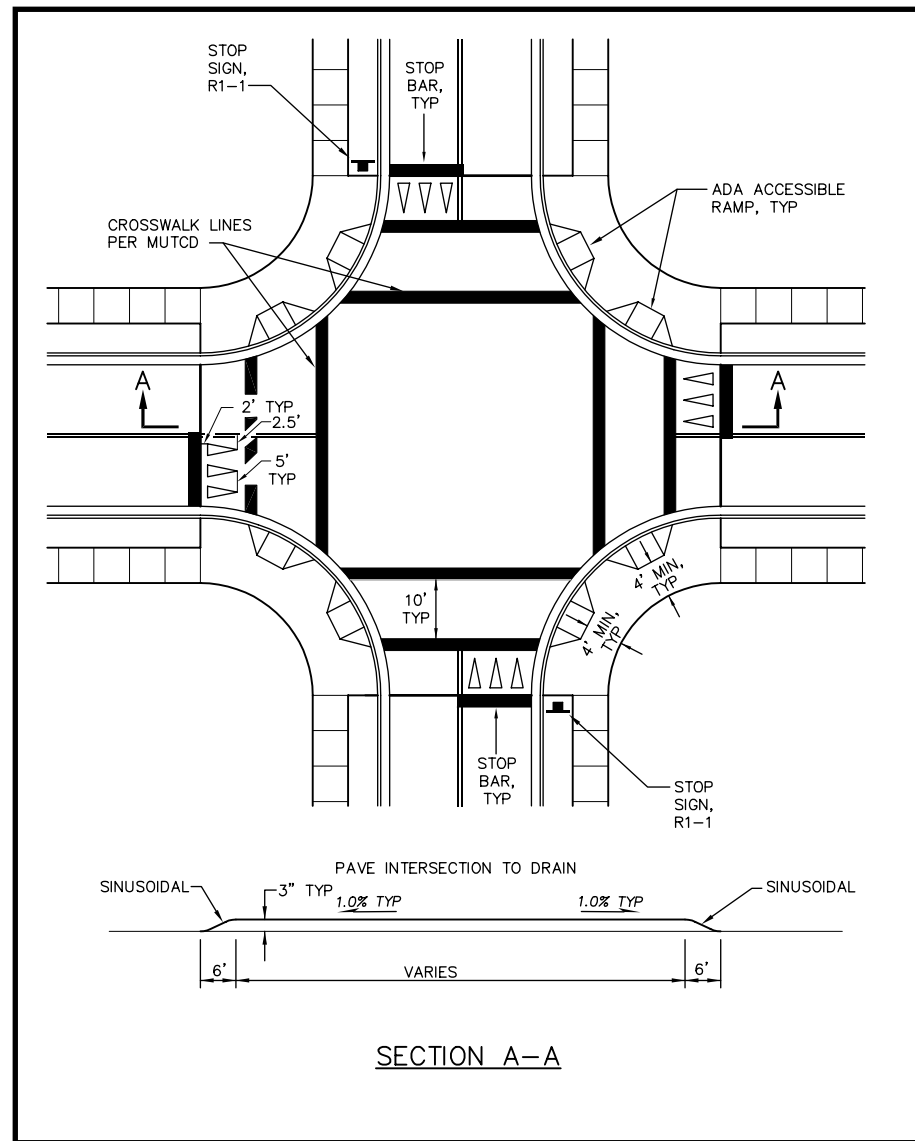


A *raised crosswalk* is a speed table marked and signed for pedestrian crossing. The only geometric differences between the two are: the raised crosswalk extends from curb-to-curb rather than tapering off at the gutter, and a raised crosswalk may be longer and higher than a typical speed table to bring it up to the sidewalk level.

Raised Intersections

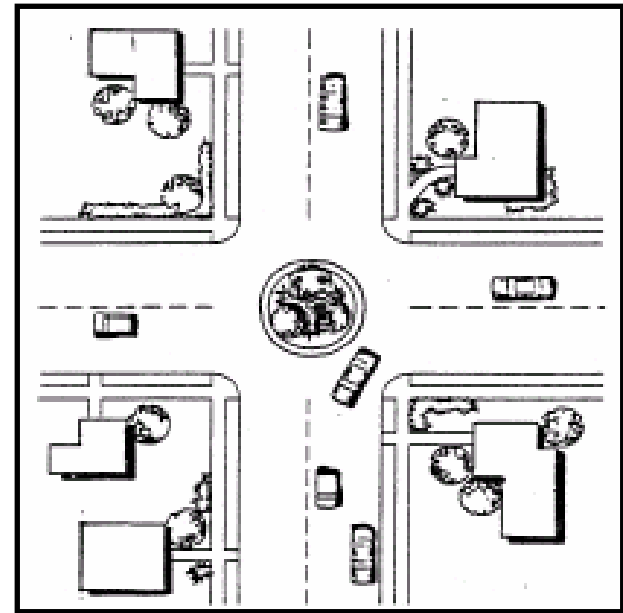


Raised intersections are flat raised areas covering entire intersections with ramps on all approaches and often with brick or other textured materials on the flat section. They are also called *raised junctions* or *intersection humps*. They usually rise to sidewalk level or slightly below to provide a “lip” for the visually impaired. They make entire intersections, crosswalks and all, pedestrian territory.

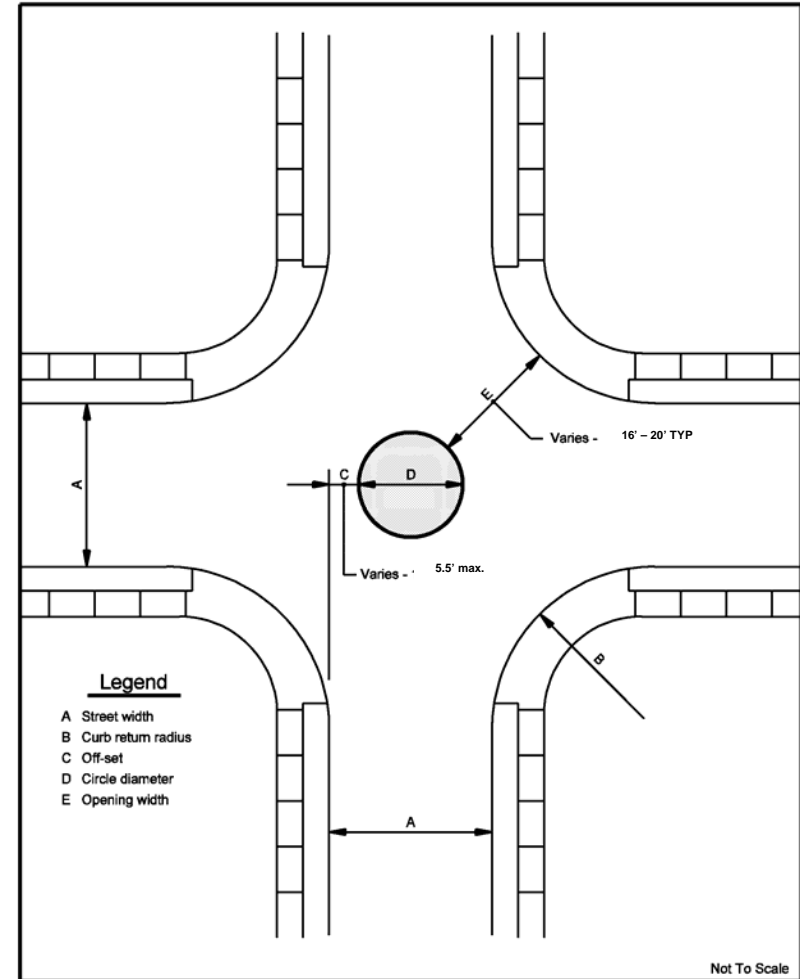
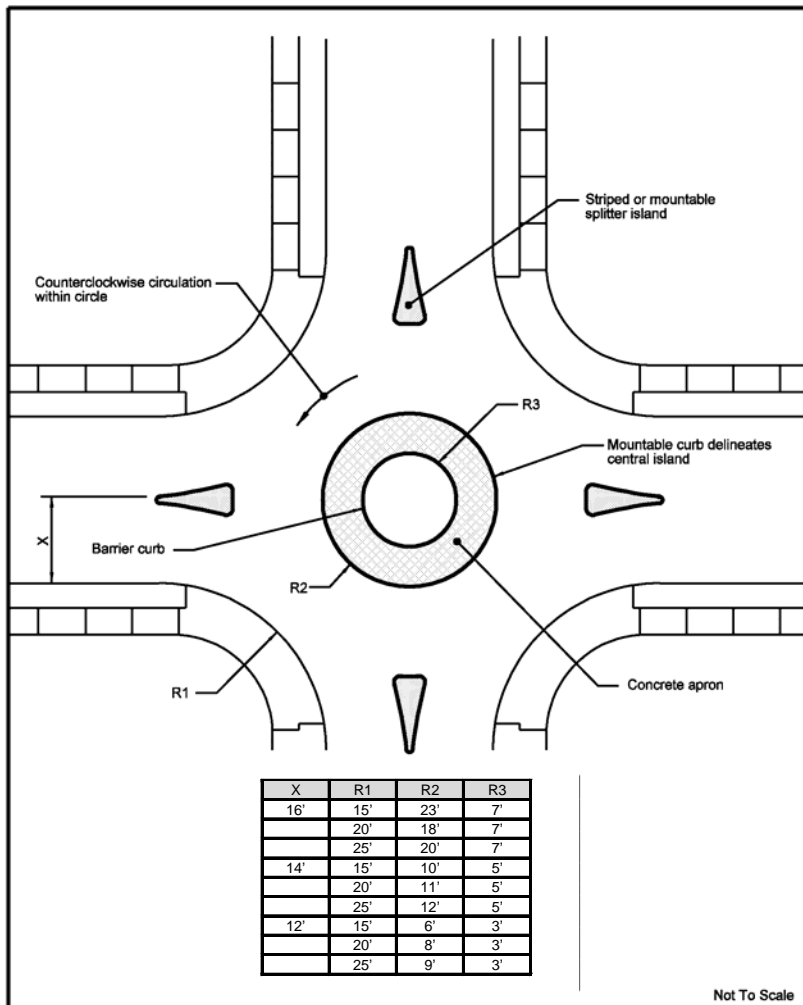


A *raised intersection* is a speed table covering an entire intersection. All other geometric requirements for speed tables apply to raised intersections as well.

Traffic Circle

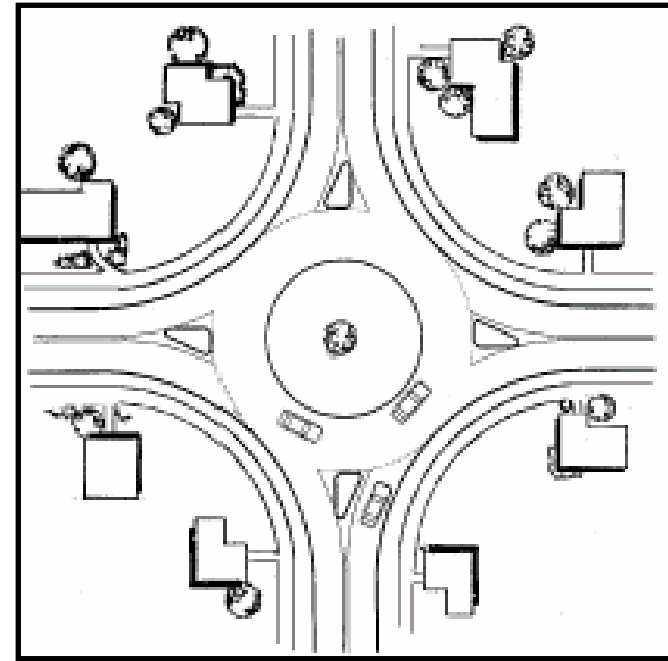


Traffic circles are raised islands placed in intersections around which traffic circulates. They are sometimes called *intersection islands*. They are usually circular in shape and landscaped in their center islands, though not always. They often have outer rings (called truck aprons) or conical shapes (with "lips") that are mountable so large vehicles can circumnavigate their small curb radii.

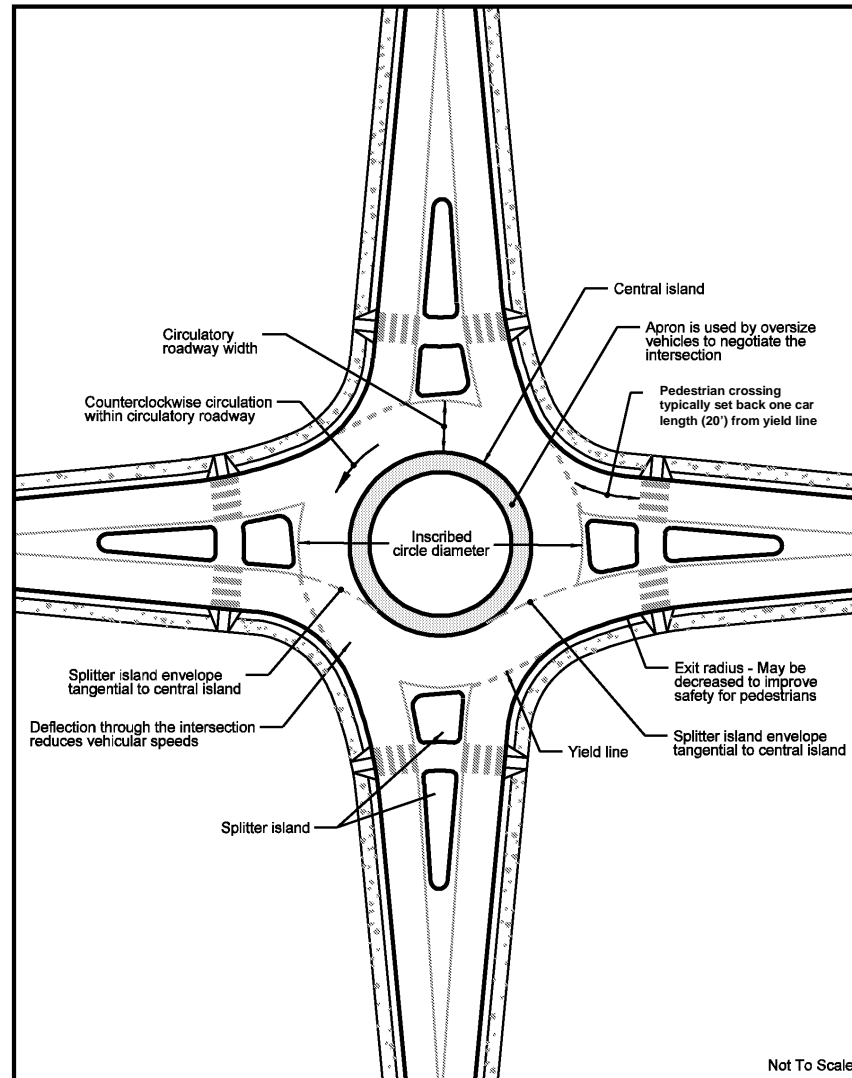


Most *traffic circles* have circular center islands and circular perimeters formed by the intersection corners. Where intersecting streets differ significantly in width, the center island may be elongated to better fit the intersection. An elongated circle consists of half-circles with tangent sections between them. Most traffic circles are deployed at four-way intersections, for this is where the greatest safety benefits accrue.

Roundabouts



Roundabouts, similar to mini traffic circles in that traffic circulates around center islands, are used at higher volume intersections to allocate ROW among competing movements. Roundabouts in the U.S. are found primarily on arterial and collector streets, often substituting for traffic signals or all-way stops. They are larger than mini traffic circles, are designed for higher speeds, and have raised splitter islands to channel approaching traffic to the right.



Roundabouts are distinguished from traffic circles by larger radii, correspondingly higher design speeds and capacities, and splitter islands on all approaches to slow traffic and discourage wrong-way movements.

Road Narrowings

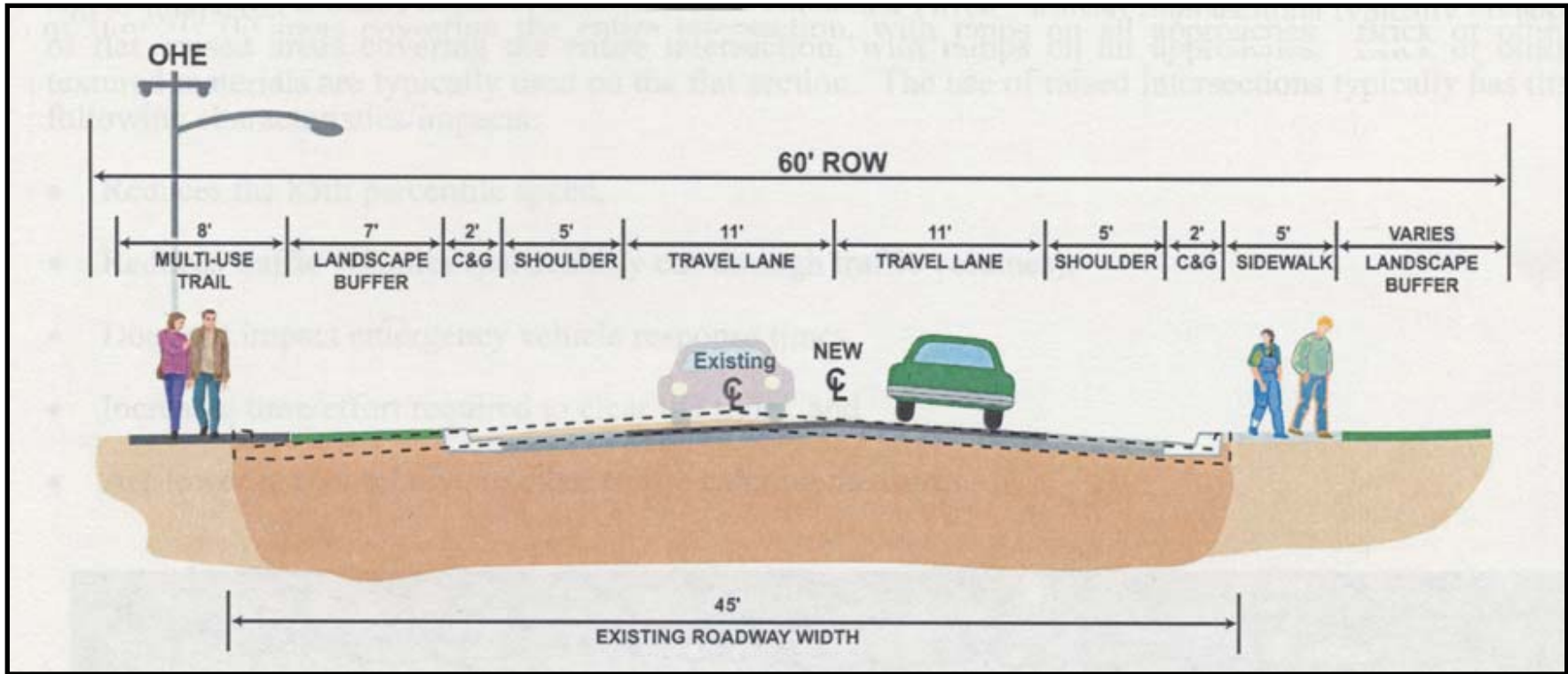


Before



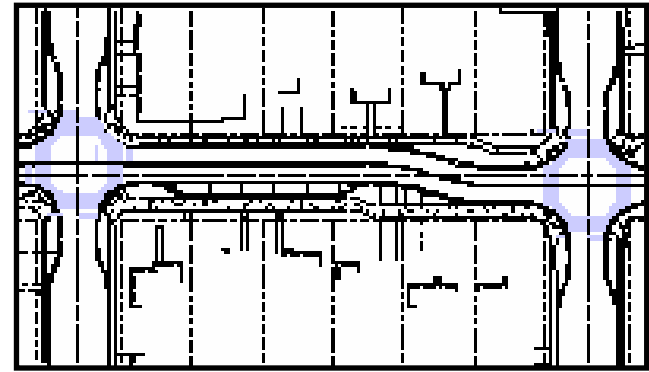
After

Road narrowings are a speed control technique which takes an existing cross-section and reduces the overall width of the roadway. Parking is typically eliminated, except at specific locations.

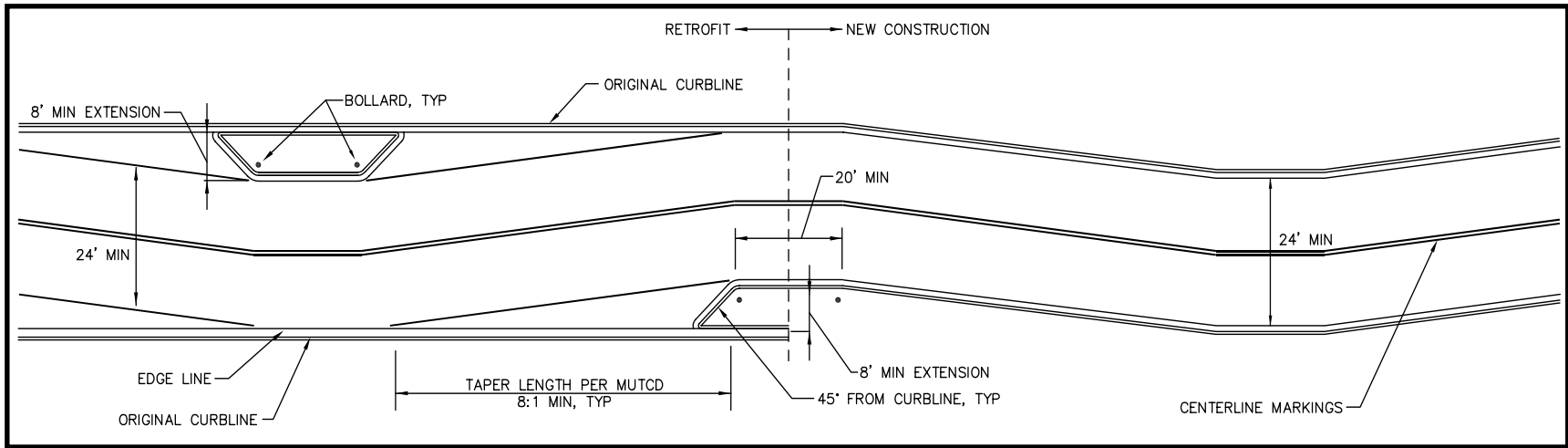


An example of road narrowing used on Aero Avenue.

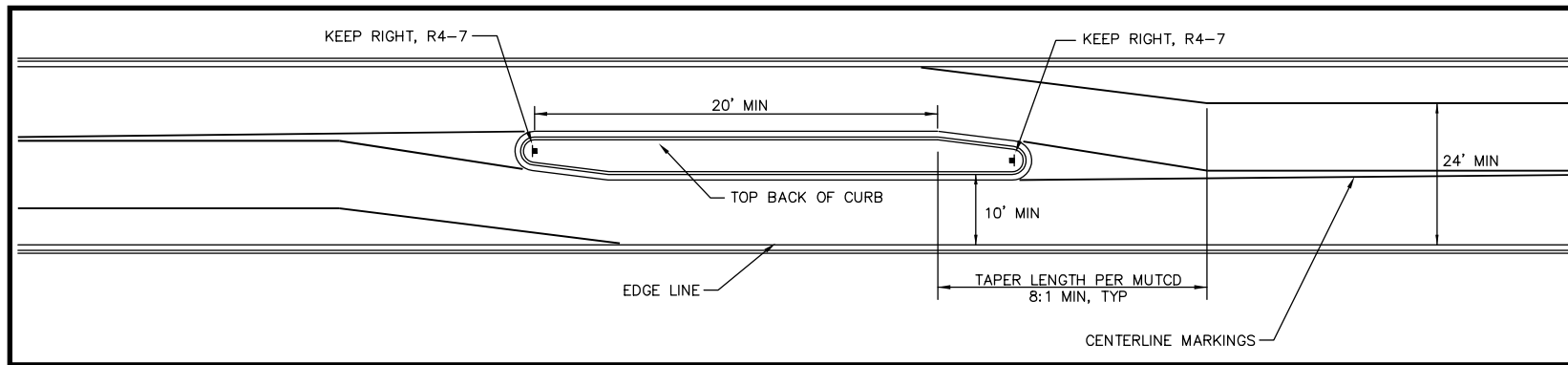
Chicanes/Lateral Shifts



Chicanes are curb extensions that alternate from one side of the street to the other forming s-shaped curves. They are also referred to as *deviations*, *serpentes*, and *reversing curves*. *Realigned intersections* are changes in alignment that convert "T" intersections with straight approaches into curving streets meeting at right angles. A straight shot along the top of the "T" becomes a turning movement. Realigned intersections are sometimes called *modified intersections*. The typical *lateral shift* is one-half of the typical chicane.



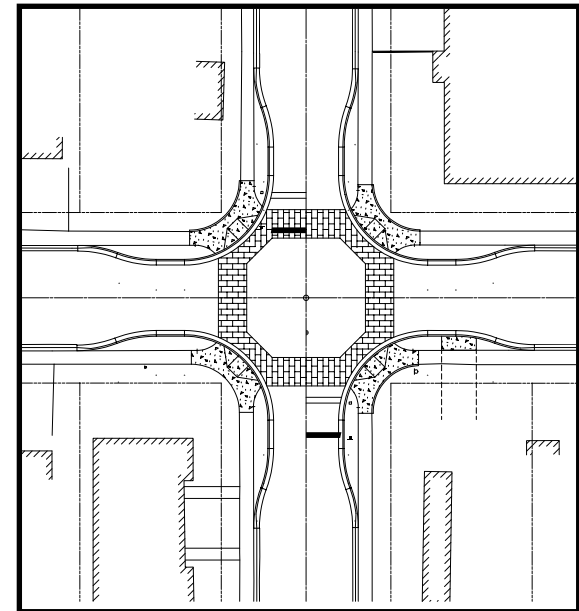
Chicane



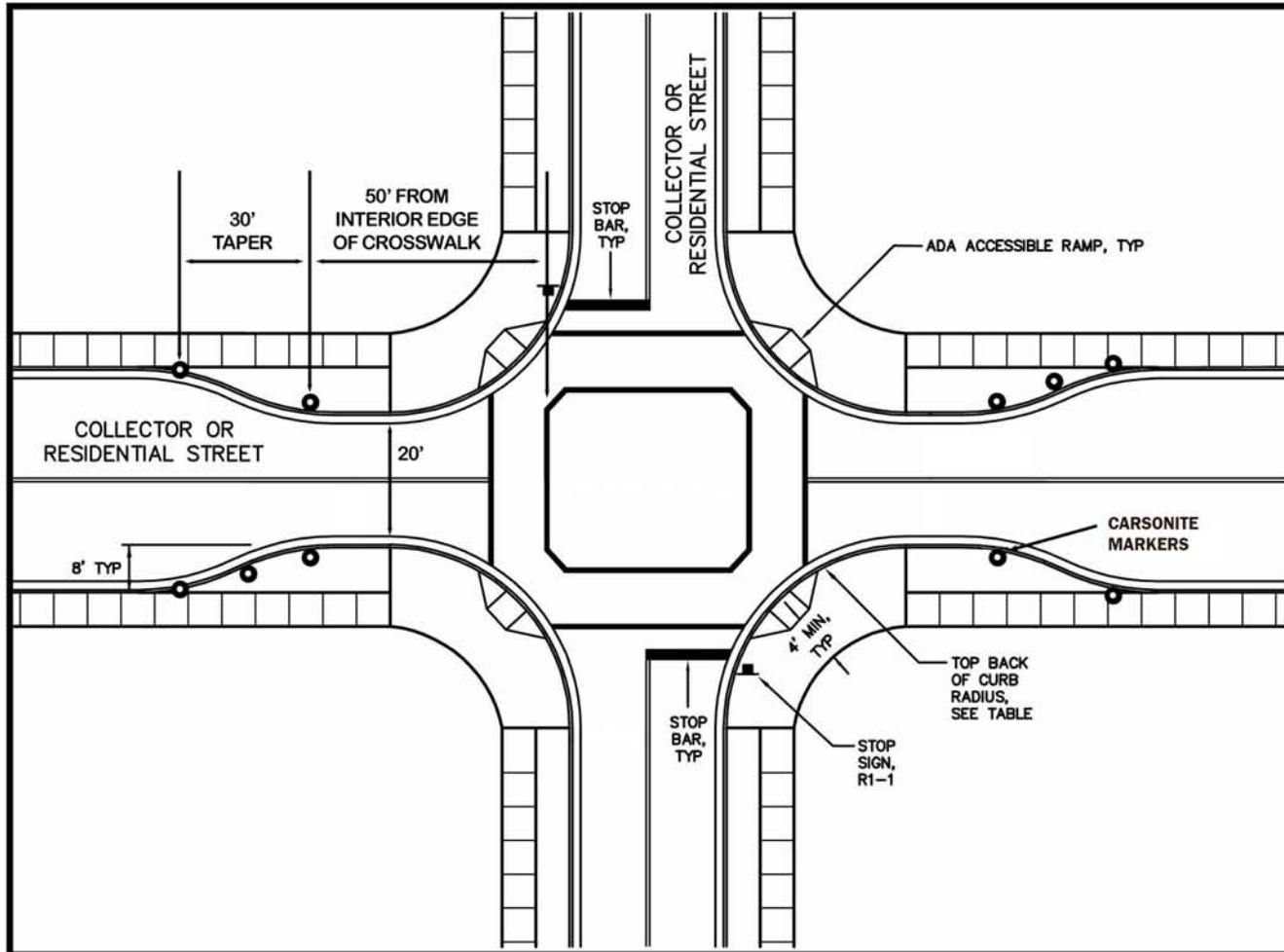
Lateral shift

Chicanes can be created either by means of curb extensions or edge islands. Curb extensions or edge islands that form chicanes should have vertical elements to draw attention to them. Trees and other landscape materials meet this requirement. Barrier curbs should be used on curb extensions and edge islands that form chicanes. The typical lateral shift is just one half of the typical chicane.

Neckdowns

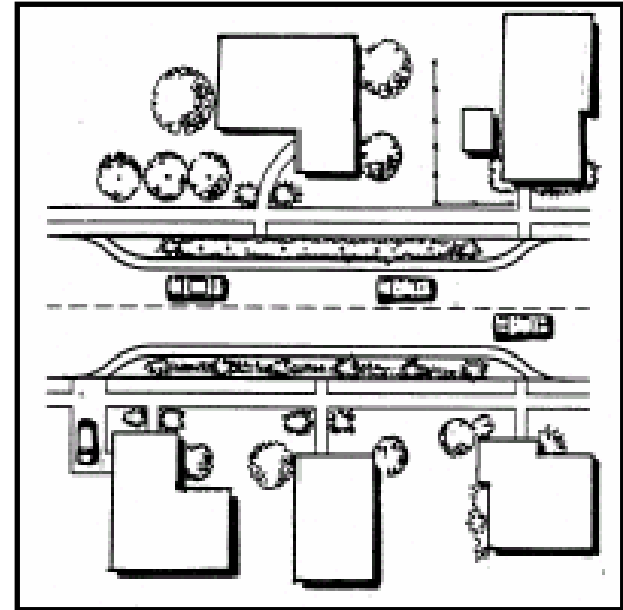


Neckdowns are curb extensions at intersections that reduce roadway width curb-to-curb. They are sometimes called *nubs*, *bulbouts*, *knuckles*, or *intersection narrowings*. If coupled with crosswalks, they are referred to as *safe crosses*. Placed at the entrance to a neighborhood, often with textured paving between them, they are called *gateways*. Their effect on vehicle speeds is limited by the absence of pronounced vertical or horizontal deflection. Instead, their primary purpose is to “pedestrianize” intersections.

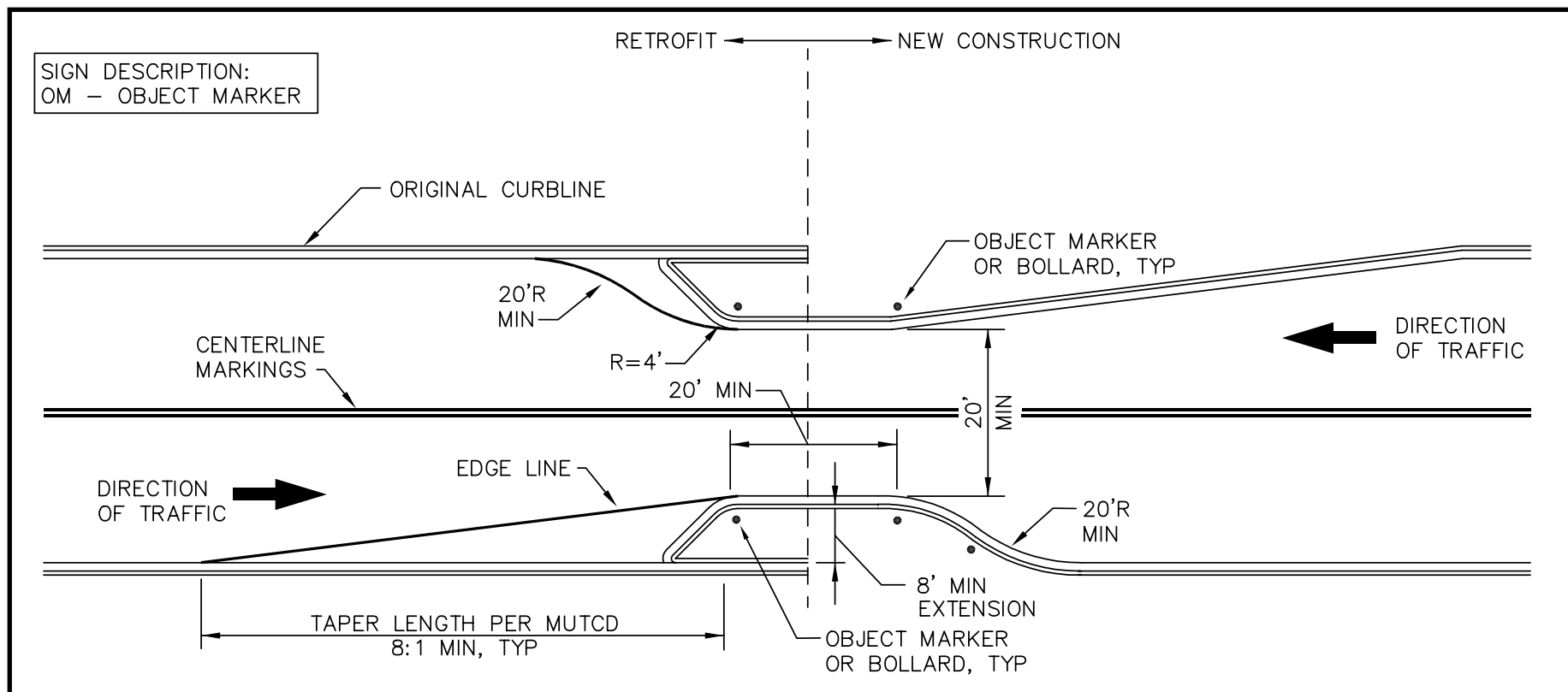


The typical *neckdown* is used in connection with on-street parking and, unlike a conventional intersection with a large curb return radius, offers a short crossing distance and high visibility for pedestrians. In the typical design, the curb return radii and street widths are such that single unit trucks can stay to the right of the centerlines when making right turns.

Chokers



Chokers are curb extensions or edge islands at midblock that narrow a street at that location. In different configurations, they are called *midblock narrowings*, *midblock yieldpoints*, and *pinch points*. If marked as crosswalks, they are also called *safe crosses*. Chokers can leave the street cross section with two lanes, albeit narrower lanes than before, or take it down to one lane. In the MOA, only two-lane chokers are permitted on two-way streets.

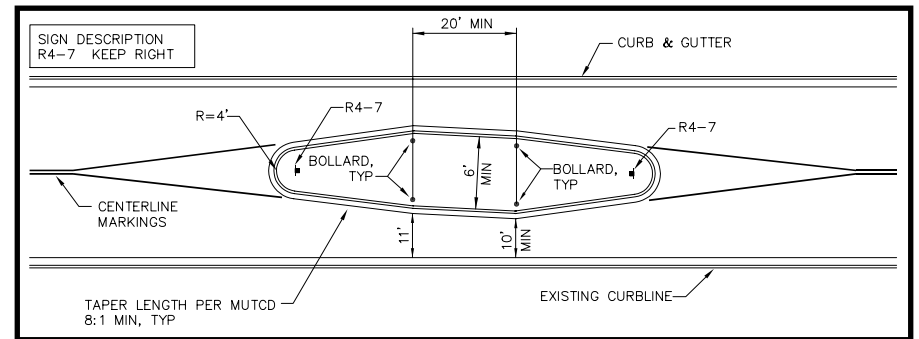
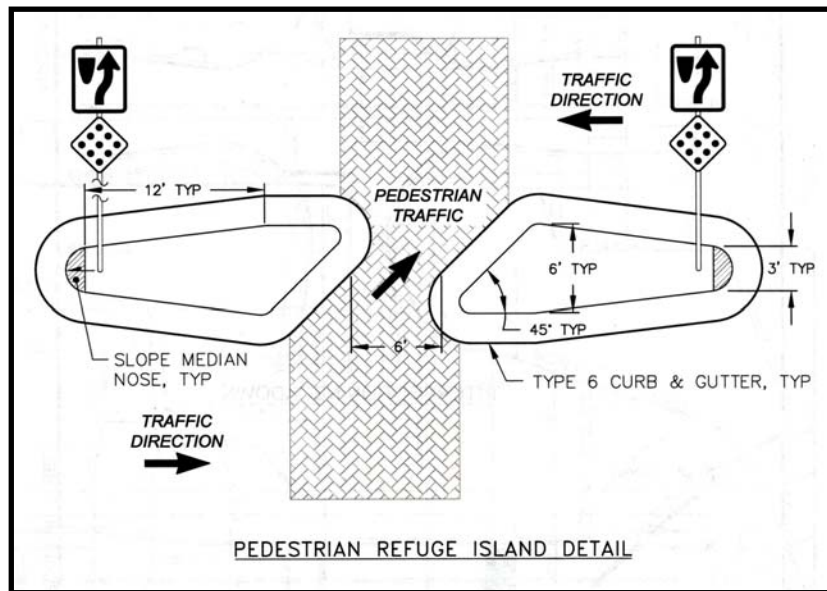


The typical two-lane *choker* is 25 feet from curb face to curb face. It has a minimum constricted length of 20 feet in the direction of travel, the length of a passenger car. The constricted length is kept short to avoid blocking driveways and displacing curbside parking.

Island Narrowings



Island narrowings are raised islands located along the centerline of a street that narrow the street at that location. They are also called *midblock medians*, *median slow points*, and *median chokers*. Placed at the entrance to a neighborhood, often with textured paving on either side, they are called *gateways*. They may be nicely landscaped to provide visual amenity and neighborhood identification as well as modest speed reduction. Pedestrians can also be accommodated at trail crossings.



When center islands are placed at pedestrian crossings, ADA requires that they have pass-throughs that are traversable by the disabled.

