THE DYER PARTNERSHIP
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M E M O R A N D U M

DATE	April 7, 2025
TO	City of Sweet Home Cecily Pretty, Administrative Services Director
FROM	Ryan Quigley, PE
PROJECT NAME	City of Sweet Home – 1st Avenue Traffic Reduction Summary of Recommendations
PROJECT NO.	215.01

Background

The City of Sweet Home has received complaints from 1st Avenue residents for a number of years concerning the number of vehicles utilizing 1st Avenue as a connector between Highway 20 and Highway 228 to avoid the highway intersection traffic light. The City Council has requested a trial installation of temporary traffic control devices on 1st Avenue for a period of six months to evaluate the effectiveness of the reduction of vehicle trips on 1st Avenue.

1st Avenue is a fully improved two-lane local residential street with a 25 mph speed limit. The Right-of-Way (ROW) is 40 feet wide and the curb-to-curb width is 32 feet. It runs between Highway 20 (Main Street) and Highway 228 (W. Holley Road) and contains a tee intersection with Nandina Street. 1st Avenue is approximately 1,480 feet long, straight, and relatively flat. The City collected two weeks of traffic data from April 11, 2024 through April 25, 2024 and measured approximately 1,500 to 2,000 vpd (vehicles per day). Traffic consisted of a mix of passenger and commercial vehicles including large trucks.

The City has requested The Dyer Partnership provide recommendations and cost estimates for temporary devices on 1st Avenue.

Researched Solutions

Dyer researched traffic reduction and traffic calming measures as published by the Oregon Department of Transportation (ODOT), Federal Highway Administration (FHWA), Institute of Transportation Engineers (ITE), and National Association of City Transportation Officials (NATCO).

If the initial six-month trial period proves effective, then the City may proceed with design and installation of a permanent version of the selected traffic calming measure. An assessment of which permanent devices was performed. An evaluation of temporary versions of the selected devices for potential use for the trial period was also completed.

Dyer conducted a site visit on February 4, 2025 to review existing conditions. Crash data provided by the Police Department was also reviewed to inform which measures are recommended for this project. Six of the seven accidents appear to be related to this section of roadway based on the reported crashes from August 2022 through June 2024. One accident involved the Main Street intersection; three accidents involved the Holley Road intersection; and two accidents involved midblock incidents with the residents' vehicles.

Countermeasures that specifically target volume reduction typically include permanent physical features such as traffic signals, lane channelization, and one- or two-way closures. Speed reduction countermeasures, commonly known as traffic calming measures, may also produce a secondary effect of volume reduction.

Traffic calming measures which may be effective on both speed and volume reduction include:

Chicane (Lateral Shift)

- *Pros:* Reduces the length of straight stretches. Horizontal alignment shifts encourage slower traffic. Can be achieved by roadway striping (low cost) depending on site conditions.
- *Cons:* Need to reduce curbside parking to accommodate lane shifts. Risk of drivers ignoring striping and continuing to drive in a straight path. High capital cost if achieved by roadway geometry changes.

Corner Extension Bulb-Outs

- *Pros:* Narrowed lane width at bulb-out encourages slower traffic. Shortened pedestrian path to cross the street.
- *Cons:* Moderate construction cost. Potential impacts to gutter drainage must be considered.

Chokers (Narrowing)

- *Pros:* Can be installed mid-block. Narrowed lane width at bulb-out encourages slower traffic. Shortened pedestrian path to cross the street.
- *Cons:* Moderate construction cost. Potential impacts to gutter drainage must be considered.

Raised Intersection

- *Pros:* Improved driver awareness of intersections and pedestrian crossings. Vehicles slowed at the on/off ramps.
- *Cons:* High construction cost. Anticipated to be less effective at slowing traffic than other measures due to the length of the raised path.

Midblock Crosswalk

- *Pros:* Pedestrian signage and crosswalk striping may reduce vehicle speeds, especially if paired with a stop sign. Low construction cost.
- *Cons:* A midblock stop sign would be an atypical use of this traffic control device as per the Manual of Uniform Traffic Control Devices (MUTCD). Installing a midblock crosswalk without a stop sign may encourage pedestrians to cross where traffic does not expect them, potentially increasing the public safety hazard.

Traffic Circle

- *Pros:* Physical barrier installed at intersections and/or midblock would break up the straight line of travel and reduce speeds.
- *Cons:* High construction cost. May need to reduce curbside parking to accommodate lane shifts.

Median Island

- *Pros:* Narrowed lane width encourages slower traffic.
- *Cons:* High construction cost. The existing roadway geometry is already narrow when allowing for parking on both curbs. May need to remove parking on one side to accommodate emergency vehicles.

Median Delineators

- *Pros:* Narrowed lane width encourages slower traffic. Low construction cost.
- *Cons:* The existing roadway geometry is already narrow when allowing for parking on both curbs. May need to remove parking on one side to accommodate emergency vehicles. High likelihood of vehicle collisions with delineators based on observations for recently installed Main Street pedestrian crossings.

Speed Hump

- *Pros:* Vertical change in the roadway reduces traffic speeds. Design speed 15 to 20 mph at each hump is suitable for residential roads. Low construction cost.
- *Cons:* Cumulative effect of multiple humps slows emergency vehicle response times.

Speed Cushion

- *Pros:* Similar to a speed hump for passenger vehicles. Cushions spaced to accommodate the wheel base of emergency vehicles means response times are not affected.
- *Cons:* Commercial vehicles having the same wheel base as emergency vehicles will also not be affected.

Speed Table

- *Pros:* Reduced effect on emergency vehicles compared to speed humps.
- *Cons:* Design speed of 25 to 45 mph is above the posted speed limit and therefore not likely to be effective at reducing traffic volume at this site. Moderate construction cost.

Measures affecting lane alignments (chicanes, traffic circles, and islands) may not be received favorably by area residents based on the crash history involving at least one lane departure. Therefore, it was determined the measures which do not affect the lane alignments would be preferable for this installation.

Measures involving lane narrowing (bulb-outs, chokers, and medians) tend to have higher construction costs.

Measures Selected for Further Evaluation

Speed humps and speed cushions are the most likely traffic calming measures to be effective at reducing traffic speeds (and therefore traffic volume, which is the primary goal) for this particular project based on the above preliminary evaluation.

Dyer also researched installation guidance in the MUTCD 2009 and 2023 editions, published by FHWA; and the Oregon Supplement to the MUTCD, 2011 edition and proposed 2023 edition which are published by ODOT. The MUTCD is the governing standard for roadway signage, striping, and other control devices. The 2009 edition and the corresponding Oregon Supplement is currently in effect in Oregon. The 2023 edition has not yet been approved by the Oregon Transportation Commission, but is anticipated to be adopted with its corresponding Oregon Supplement in the next year or two.

Option 1: Speed Humps

Generally, vendors and local agencies use inconsistent terminology in regards to speed bumps, humps, and tables. This memo has followed ITE and FHWA terminology as found in the attached ITE fact sheets.

Speed humps are parabolic mounds on the pavement which are typically three to four inches in height and 12 to 14 feet in length. They are suitable for speed reduction on local streets with posted speed limits of 30 mph or less and relatively low daily traffic volumes (below 4,000 vpd).

A single speed hump reduces speeds to approximately 15 to 20 mph over the hump and also influences speeds for approximately 100 feet on either side. The NACTO guidance indicates spacing of 500 feet or less is needed to achieve an 85th percentile speed of 25 to 35 mph. Typical installation spacing is 400 to 500 feet with closer spacing of 300 feet occasionally chosen for more severe speeding problems. Observations of local installations in Oregon have found spacing as close as 250 feet.

The intended benefit of speed humps is reduced speed. Reduced traffic volume may occur as a secondary benefit. The ITE estimates speed humps reduce traffic volumes by approximately 20 percent. This percentage is expected to be influenced by factors such as spacing and the posted speed limit.

Speed humps are typically installed across nearly the entire road width, with one to three feet left clear against each curb to allow for drainage. The MUTCD Sections 2C.27 and 3B.29 cover speed hump signage and markings, respectively. Speed humps should be accompanied by the Speed Hump W17-1 Sign in advance of the hump. A series of speed humps may be served by a single sign in advance of the first hump. The ODOT standard detail DET4560 (attached) also provides typical speed hump markings.

Additionally, double installation of speed humps were considered similar to speed bumps in parking lots. Two humps would be spaced very closely to further reduce speeds. However, a reference was not found for the installation in the industry references. Therefore, there is no data on its effectiveness compared to conventional speed hump installations or any unforeseen negative effects.

Design spacing of 250 feet was selected for this project. Specific locations were selected to avoid conflicts with driveways and utilities. A total of four speed humps and four (4) Speed Hump Signs are proposed.

Generally, advertised temporary speed humps measure three feet or less in the direction of travel and thus would be more accurately called speed bumps. Those are not suitable for this application. In order to accurately evaluate the effectiveness of the trial installation, it is required to use equipment of approximately the same size and shape as would be used in a permanent installation.

Only one manufacturer was identified for temporary speed humps that are dimensionally similar to permanent asphalt humps. They produce modular rubber units that can be configured multiple ways as speed humps or cushions. Product literature is attached. These units are advertised as being durable for long-term installation, so they could be left in place if the trial is successful. However, it appears installation is very labor-intensive. Each hump assembly would contain approximately 78 tiles and 468 bolts drilled into the existing road.

The cost estimate for this option is $43,800 for materials and freight. Labor costs have not been estimated but are expected to be significant due to the number of panels to make up the speed hump.

For comparison, the estimated material costs to install temporary asphalt humps on top of the existing road surface is $8,400.

Option 2: Offset Speed Humps

Conventional speed humps affect all vehicles including emergency response. Use of multiple speed humps on main emergency response routes is undesirable as the cumulative effect can cause noticeable delays in emergency response times. 1st Avenue is not considered a main emergency response route, but it does provide access to adjacent subdivisions. Therefore, a consideration of offset speed humps and speed cushions is also included.

Offset humps extend across a single travel lane rather than the entire street width. Humps for each direction of travel are separated by 50 feet or more. This separation allows emergency vehicles to weave around the humps without slowing.

A risk is that the traveling public may also weave around the humps. A 2003 installation of offset speed tables in Beaverton used only centerline striping to communicate to drivers to stay in their travel lane. After construction the City received many complaints of traffic weaving around the tables. Raised centerline markers were added on each approach and in the space between offsets. Complaints were reduced after installation of the raised markers. Therefore, including raised centerline markers in the cost estimate is recommended.

The cost estimate for this option using the modular rubber humps is $44,880 for materials and freight. The estimate for this option using asphalt humps is $9,440. Labor costs have not been estimated.

Option 3: Speed Cushions

Speed cushions are very similar to speed humps, but instead of extending across the entire travel lane, they are spaced to accommodate the wheel base of emergency vehicles. Emergency vehicles can drive straight through the speed cushion zone without being affected by a vertical hump. Speed cushions are recommended on main response routes where multiple streets with speed humps would have a large cumulative effect. 1st Avenue is not a main response route; therefore, the implementation of speed cushions is discretionary.

This option would require a set of three speed cushions at each location to span the street width. There are concerns that commercial vehicles having a similar wheel base would likely continue using 1st Avenue as a cutoff route. Although this measure is worth considering, it is expected to be less likely to meet the project goals than speed humps.

The cost estimate for this option using the modular rubber humps is $26,800 for materials and freight. The estimate for this option using asphalt humps is $7,960. Labor costs have not been estimated.

Conclusion and Recommendation

The listed options and costs are summarized in the attached cost estimate.

Dyer recommends Option 1: Speed Humps for configuration. This option offers the greatest effectiveness with the least anticipated drawbacks.

Additionally, Dyer recommends constructing temporary asphalt speed humps for materials selection. This option will be much more cost-effective and reduce the construction timeline over the modular rubber humps. Surface preparation of the existing roadway should include cleaning and tack coat. The tapered edges of the humps are likely to crack off over time but should be sufficient to determine effectiveness over the six-month trial period. If more durable installation is needed, then the existing pavement should be ground down two inches to provide for a thicker asphalt layer at the hump edges.

Preliminary Project Estimate - DRAFT

Option 1a - Modular Speed Humps (Full street width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 30' x 3" Rubber Speed Hump[1]	4	EA	$10,700	$42,800
2	Signage	4	EA	$250	$1,000
				Materials Cost	**$43,800**

Option 2a - Modular Offset Speed Humps (Half street width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 15' x 3" Rubber Speed Hump[1]	8	EA	$5,350	$42,800
2	Signage	4	EA	$250	$1,000
3	Pavement Markers	360	EA	$3	$1,080
				Materials Cost	**$44,880**

Option 3a - Modular Speed Cushions (7.5' width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 6' x 3" Rubber Speed Cushion[1]	12	EA	$2,150	$25,800
2	Signage	4	EA	$250	$1,000
				Materials Cost	**$26,800**

Notes:

1. Estimated freight is included in material unit cost.
2. Does not include design engineering.
3. Does not include installation costs.

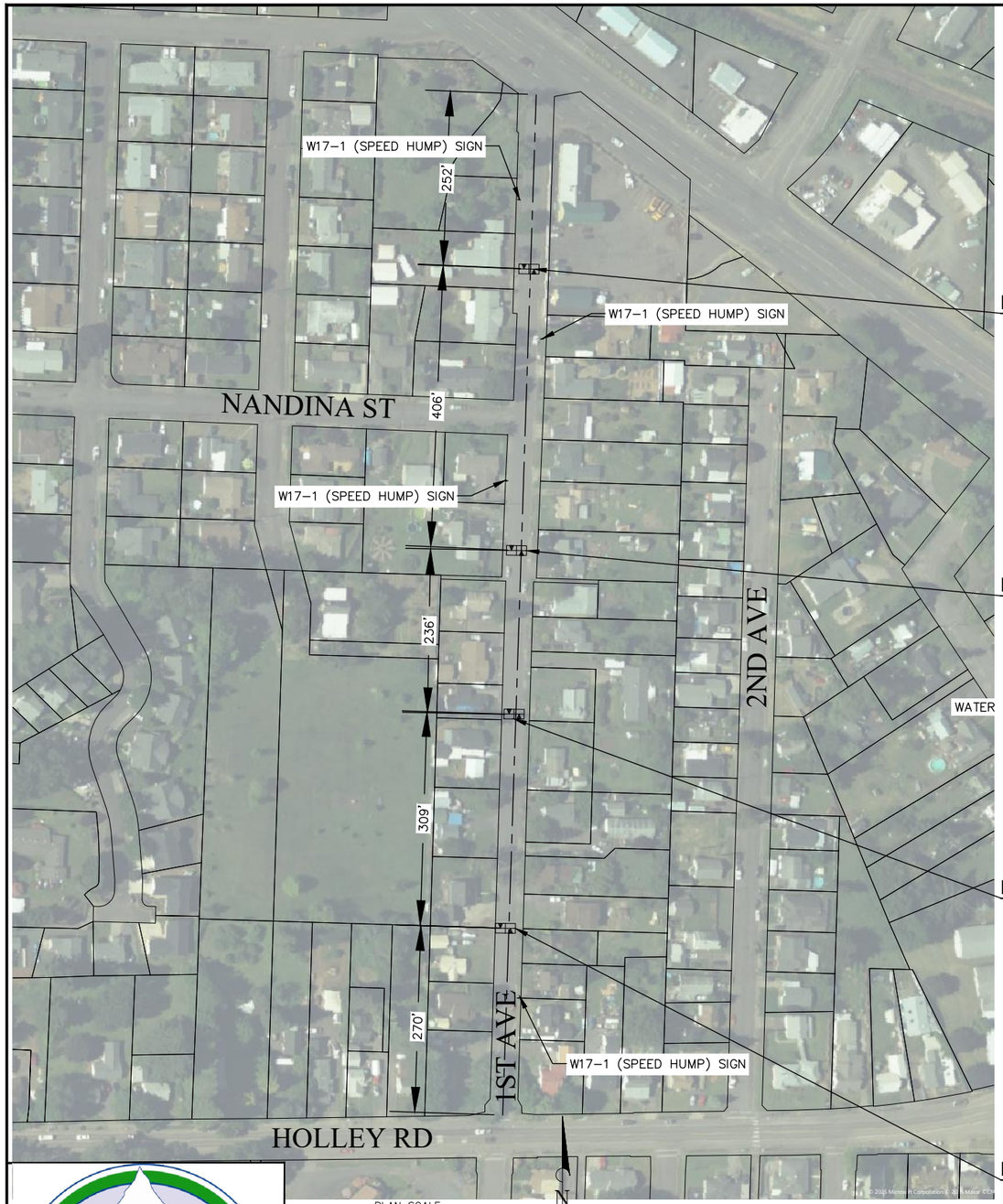
City of Sweet Home 3/21/2025
1st Avenue Traffic Calming
The Dyer Partnership Engineers & Planners, Inc.
Preliminary Project Estimate - DRAFT

Option 1b - Asphalt Speed Humps (Full street width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 30' x 3" Asphalt Speed Hump[1]	4	EA	$1,550	$6,200
2	Painted Hump Markings	8	EA	$150	$1,200
3	Signage	4	EA	$250	$1,000
				Materials Cost	**$8,400**

Option 2b - Asphalt Offset Speed Humps (Half street width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 15' x 3" Asphalt Speed Hump[2]	8	EA	$770	$6,160
2	Painted Hump Markings	8	EA	$150	$1,200
3	Signage	4	EA	$250	$1,000
4	Pavement Markers	360	EA	$3	$1,080
				Materials Cost	**$9,440**

Option 3b - Asphalt Speed Cushions (7.5' width, 14' long)					
No.	Description	Qty	Unit	Unit Cost	Total Cost
1	14' x 7.5' x 3" Asphalt Speed Cushion[3]	12	EA	$380	$4,560
2	Painted Hump Markings	16	EA	$150	$2,400
3	Signage	4	EA	$250	$1,000
				Materials Cost	**$7,960**

Notes:
1. Based on estimated 5.1 tons per hump and $300/ton small quantity asphalt cost.
2. Based on estimated 2.6 tons per half-street hump and $300/ton small quantity asphalt cost.
3. Based on estimated 1.3 tons per cushion and $300/ton small quantity asphalt cost.
4. Does not include design engineering.
5. Does not include installation costs.



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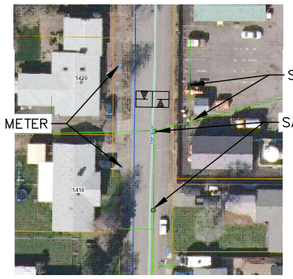
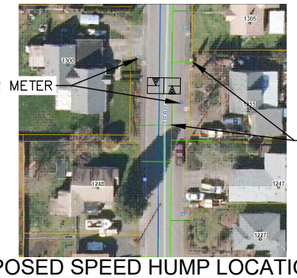


PROPOSED SPEED HUMP LOCATION 1 (2) C100



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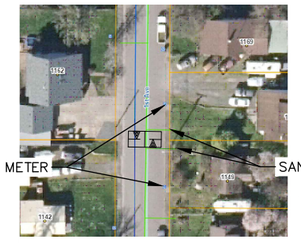

PROPOSED SPEED HUMP LOCATION 4 (5) C100

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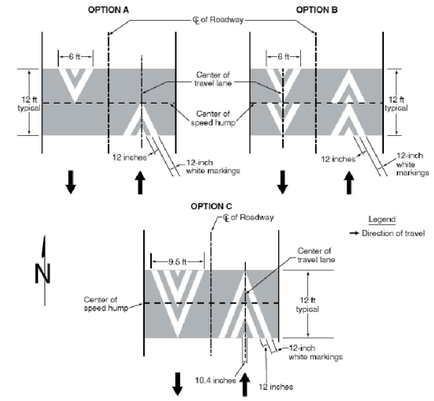
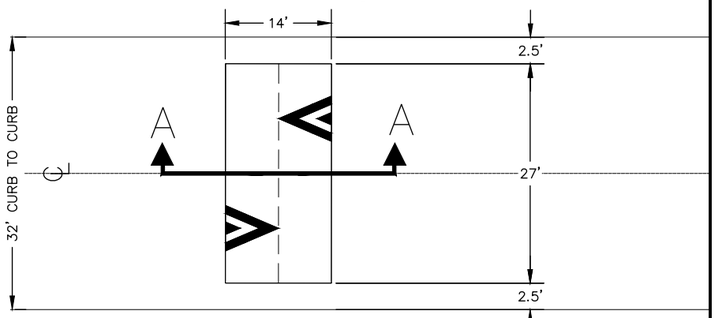
Figure 3B-26. Pavement Markings for Speed Humps without Crosswalks





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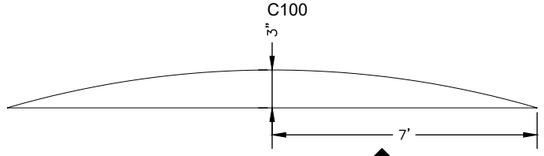

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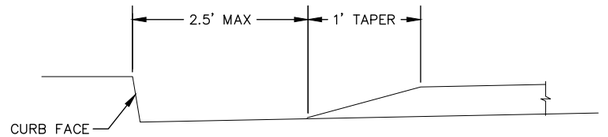

CURB DETAIL
NOT TO SCALE (7) C100

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REVISIONS

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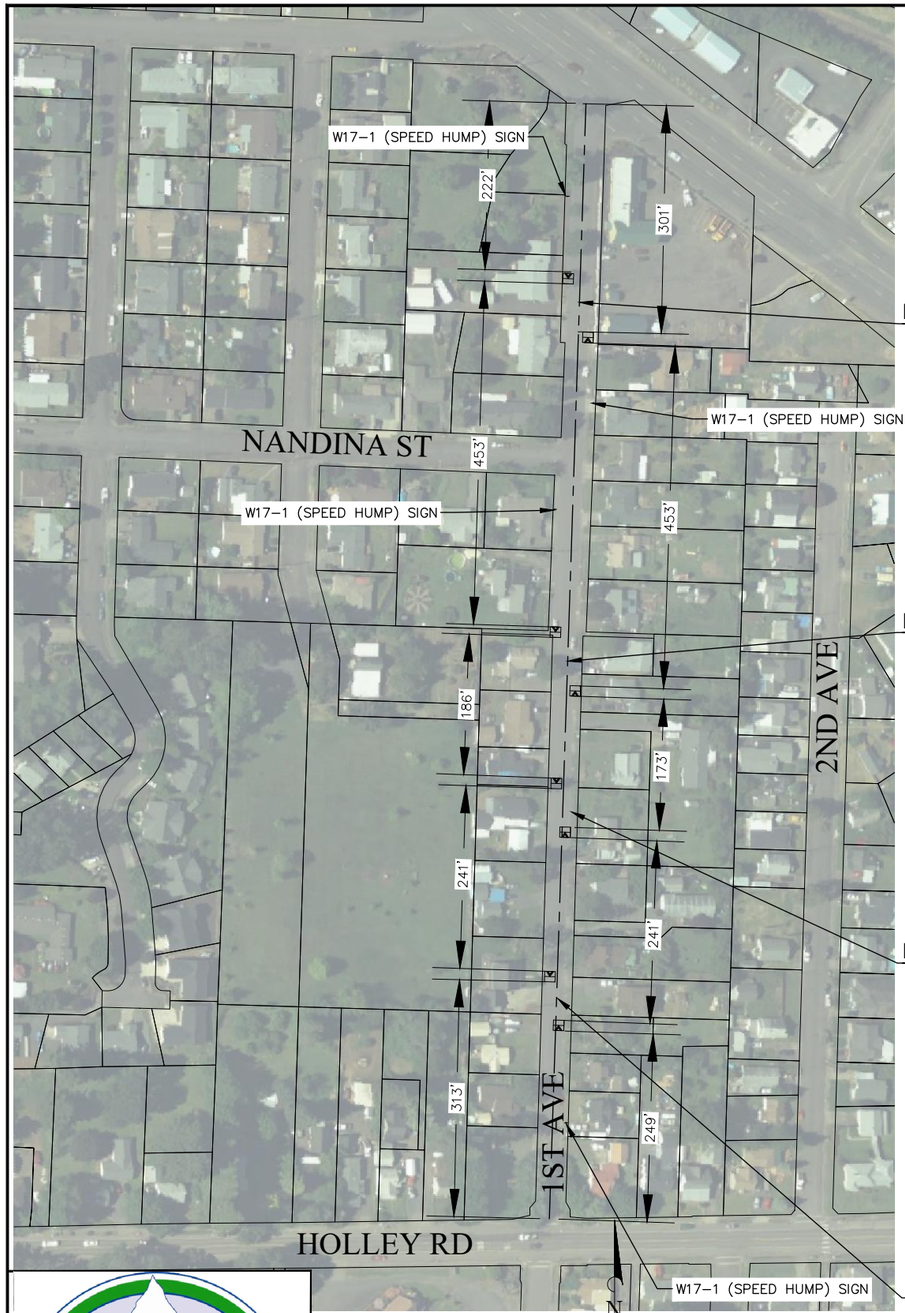
NW 1ST AVE TRAFFIC CONTROL
CITY OF SWEET HOME

OPTION 1
PROPOSED SPEED HUMP LAYOUT

PROJECT NO.	DRAWING NO.
215.01	C100
DATE	SHEET NO.
MAR 2025	1 OF 3

\\10.20.1.139\Dyer-Part\AAprojects\215 Sweet Home\215.01 First Ave Traffic Control\DWG\215.01 – M.dwg, 3/21/2025 3:57:15 PM PLOT DATE March 21, 2025



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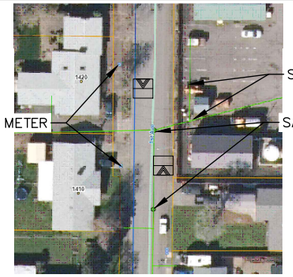
PLAN VIEW - NW 1ST AVE (1) C101



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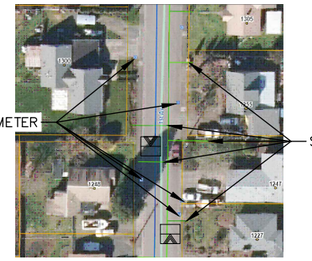

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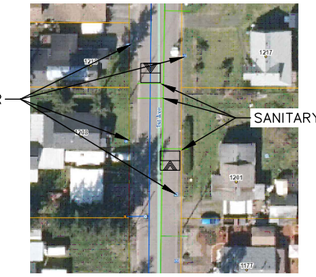

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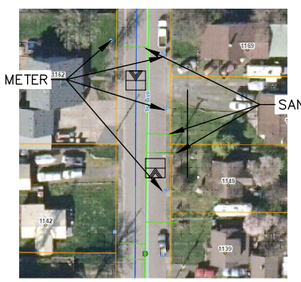

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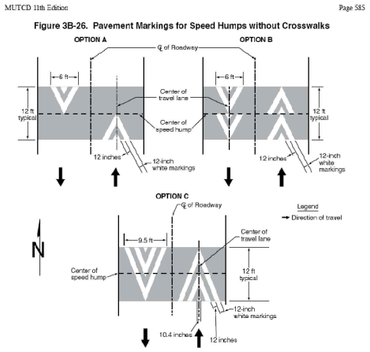

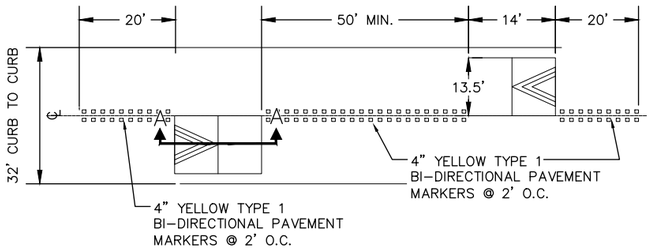

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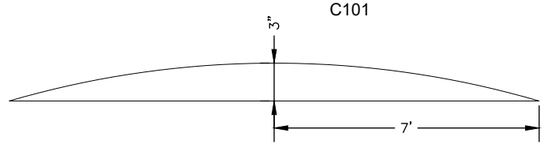

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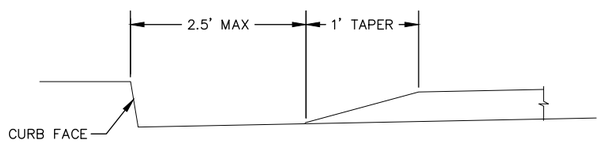

CURB DETAIL (7) C101
NOT TO SCALE

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REVISIONS

REVISED	DESCRIPTION	SUBMIT.	APPR'D.	DATE

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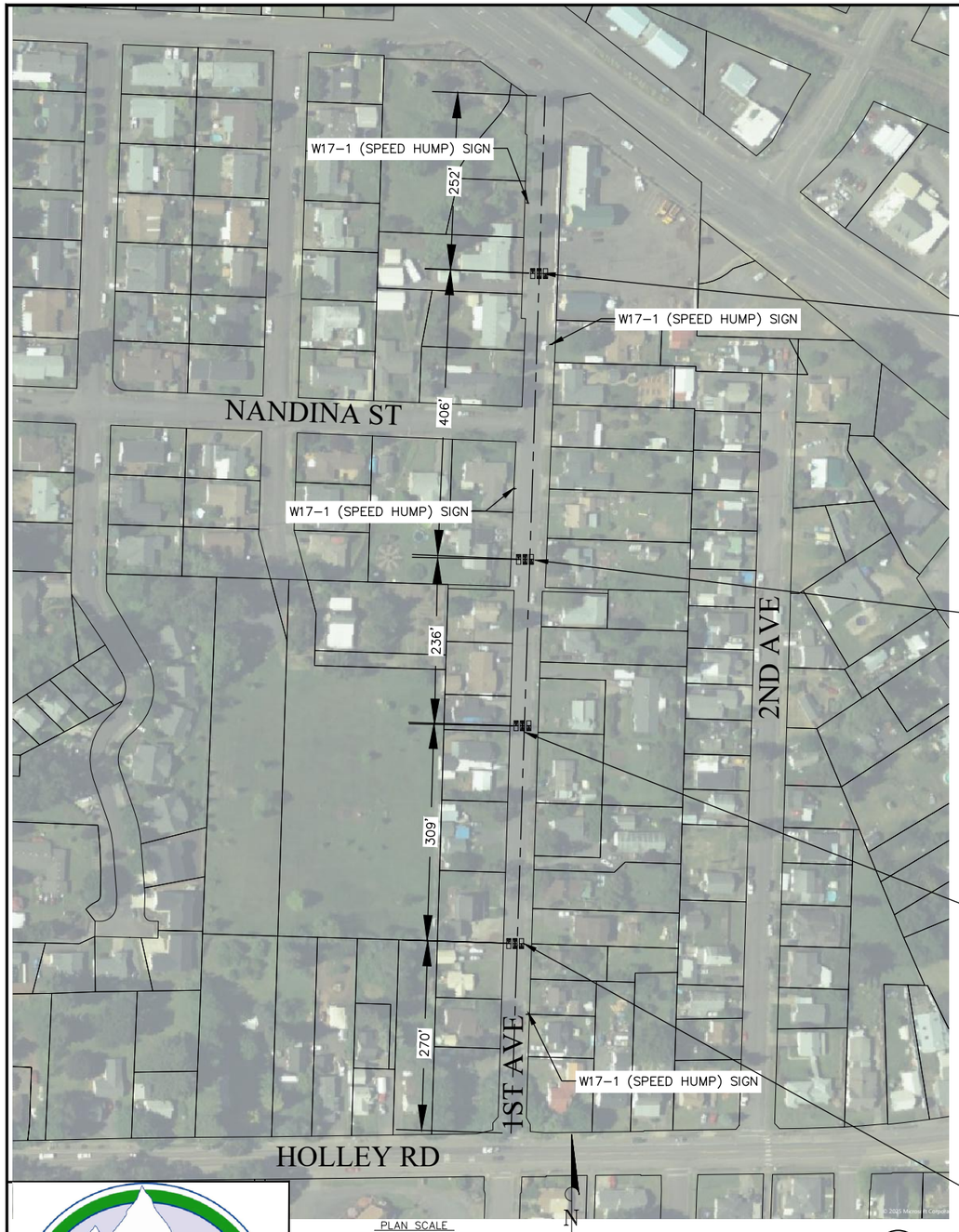
NW 1ST AVE TRAFFIC CONTROL
CITY OF SWEET HOME

OPTION 2
PROPOSED OFFSET SPEED HUMP LAYOUT

PROJECT NO.	DRAWING NO.
215.01	C101
DATE	SHEET NO.
MAR 2025	2 OF 3

\\10.20.1.139\Dyer-Part\AAprojects\215 Sweet Home\215.01 First Ave Traffic Control\DWG\215.01 – M.dwg, 3/21/2025 3:57:15 PM PLOT DATE March 21, 2025



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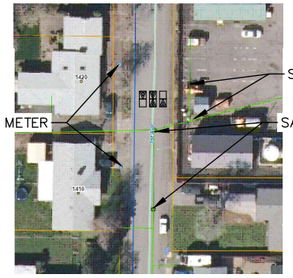

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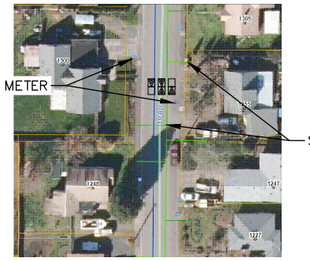

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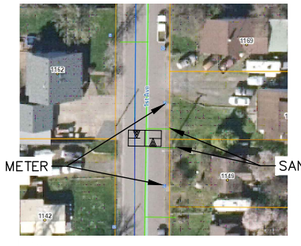

PROPOSED SPEED CUSHION LOCATION 4 (5) C102

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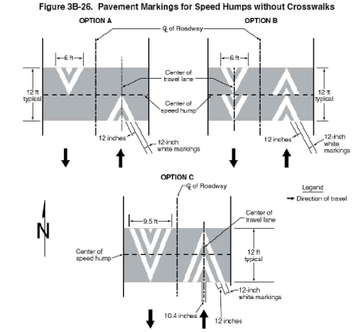
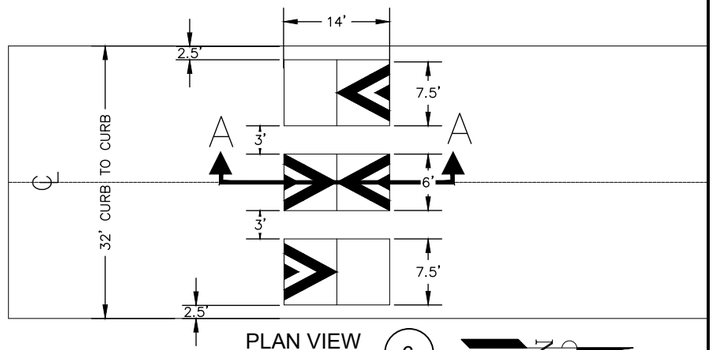
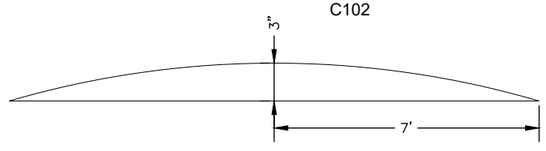
Figure 3B-26. Pavement Markings for Speed Humps without Crosswalks

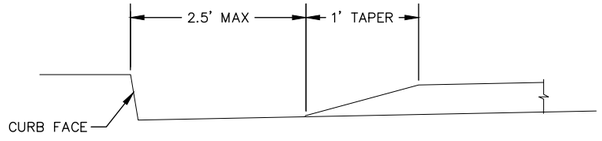




PLAN VIEW NOT TO SCALE (6) C102



TYPICAL SECTION A NOT TO SCALE C102



CURB DETAIL NOT TO SCALE (7) C102

Sweet Home Oregon at its best!

DESIGNED:	DRAWN:	APPROVED BY:
PGR	SWF	DATE:

REVISIONS

REVISED	DESCRIPTION	SUBMIT.	APPR'D.	DATE

THE DYER PARTNERSHIP
ENGINEERS & PLANNERS, INC.
481 S. MAIN ST.
LEBANON, OREGON 97355
TELEPHONE: (541) 405–4520
www.dyerpart.com

LINE IS 1 INCH AT FULL SCALE
IF NOT 1-INCH - SCALE ACCORDINGLY

NW 1ST AVE TRAFFIC CONTROL
CITY OF SWEET HOME

OPTION 3
PROPOSED SPEED CUSHION LAYOUT

PROJECT NO.	DRAWING NO.
215.01	C102
DATE	SHEET NO.
MAR 2025	3 OF 3

\\10.20.1.139\Dyer-Part\AAprojects\215 Sweet Home\215.01 First Ave Traffic Control\DWG\215.01 - M.dwg, 3/21/2025 3:57:15 PM PLOT DATE March 21, 2025

Traffic Calming Fact Sheets
May 2018 Update

Speed Hump

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

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

(Source: City of Boulder, Colorado)

(Source: PennDOT Local Technical Assistance Program)

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

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

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

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

Typical Cost (2017 dollars):
- Cost ranges between $2,000 and $4,000

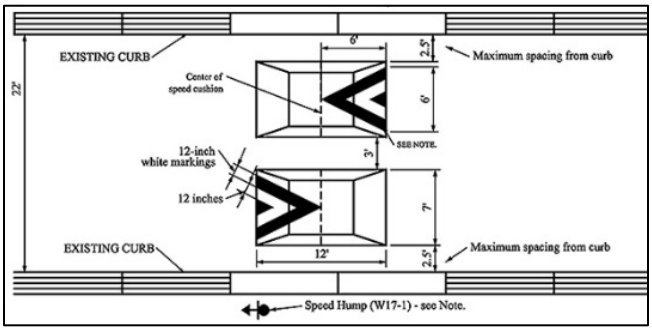
Traffic Calming Fact Sheets
May 2018 Update

Speed Cushion

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

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

(Source: James Barrera, Horrocks, New Mexico)



(Source: Delaware Department of Transportation)

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

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

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

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

Typical Cost (2017 dollars):
- Cost ranges between $3,000 and $4,000 for a set of rubber cushions

Speed Table/Raised Crosswalks

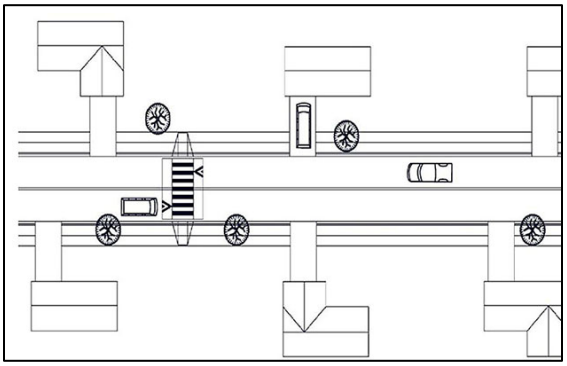
Description:

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

Applications:

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

(Source: Google Maps, Boulder, Colorado)



(Source: Delaware Department of Transportation)

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

Design/Installation Issues:

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

Potential Impacts:

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

Emergency Response Issues:

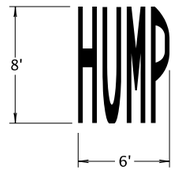
- Typically preferred by fire departments over speed humps, but not appropriate for primary emergency vehicle routes; typically less than 3 seconds of delay per table for fire trucks

Typical Cost (2017 dollars):

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

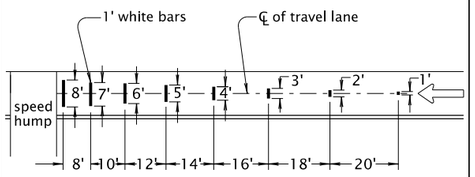
DET4560.dgn 30-OCT-2019

SH



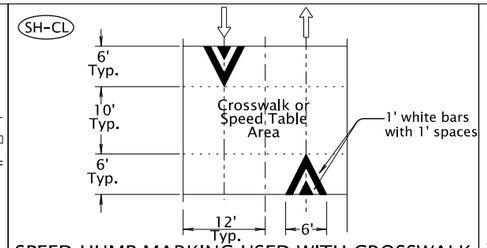
SPEED HUMP (white)
Center marking within lane width.
For letter proportion details, see current version of Standard Highway Signs.

SH-W



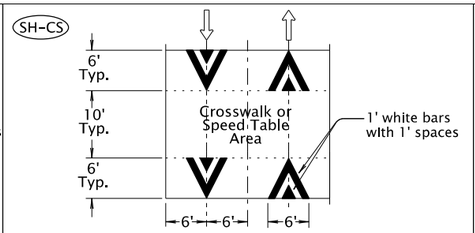
SPEED HUMP ADVANCE WARNING MARKING (white)

SH-CL



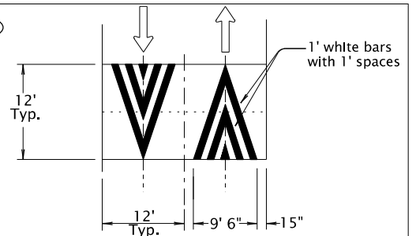
SPEED HUMP MARKING USED WITH CROSSWALK LEADING EDGE (white)

SH-CS



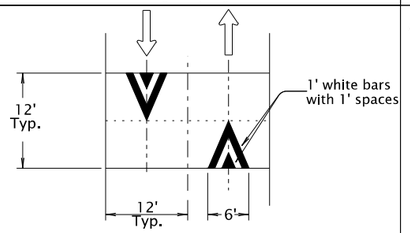
SPEED HUMP MARKING USED WITH CROSSWALK SYMMETRIC LEADING & TRAILING EDGES (white)

SH-A



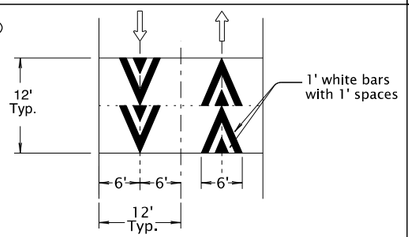
SPEED HUMP MARKING ASYMMETRIC LEADING & TRAILING EDGES (white)

SH-L



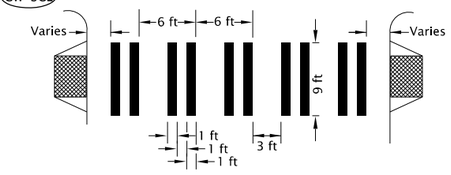
SPEED HUMP MARKING LEADING EDGE (white)

SH-S



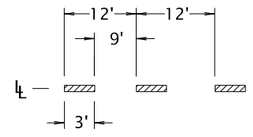
SPEED HUMP MARKING SYMMETRIC LEADING & TRAILING EDGES (white)

CW-SC2



STAGGERED CONTINENTAL CROSSWALK
1 ft WHITE BARS
Install per Standard Drawing TM530.

YB-SP



SHARED PATH BROKEN LINE
4" YELLOW LINE
For use on shared-use paths.

NOTE TO DESIGNERS:

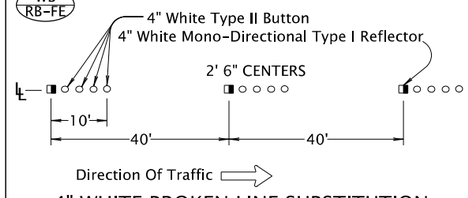
1.) Raised Pavement Marker Substitution details should no longer be used on state highways. Consider durable profiled lines instead.

2.) Speed hump markings generally not used on state highway right-of-way.

3.) When continental style crosswalks are to be installed on a project (this may require Region Traffic Engineer approval depending on the situation. See Traffic Line Manual for further information), do not use CW-SC2 in Regions 1 thru 4. Only use CW-SC2 in Region 5 if the region striping manager approves, otherwise use the standard CW-SC shown in Standard Drawing TM503.

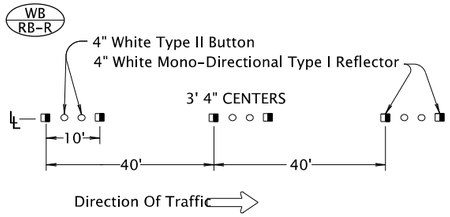
4) Shared Lane Marking should not be used on roadways with a speed limit above 35 mph.

WB RB-FE



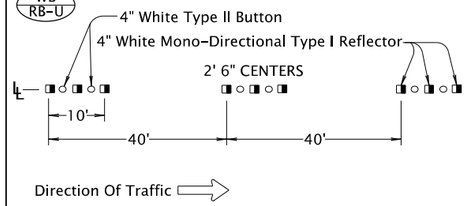
4" WHITE BROKEN LINE SUBSTITUTION
REFLECTOR/BUTTON
(for freeways & expressways)

WB RB-R



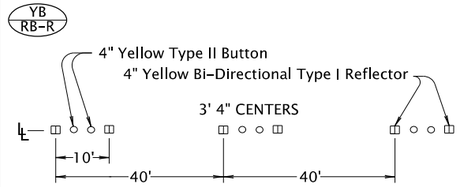
4" WHITE BROKEN LINE SUBSTITUTION
REFLECTOR / BUTTON (for rural highways)

WB RB-U



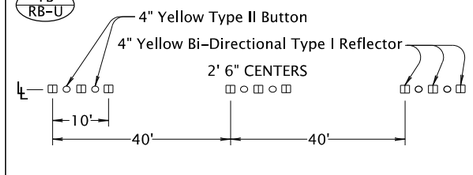
4" WHITE BROKEN LINE SUBSTITUTION
REFLECTOR / BUTTON (for urban highways)

YB RB-R



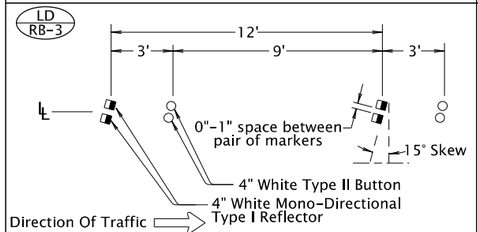
4" YELLOW BROKEN LINE SUBSTITUTION
REFLECTOR / BUTTON (for rural highways)

YB RB-U



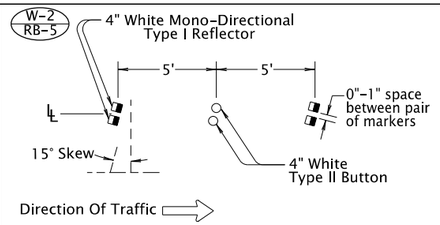
4" YELLOW BROKEN LINE SUBSTITUTION
REFLECTOR / BUTTON (for urban highways)

LD RB-3



8" WHITE LANE DROP LINE SUBSTITUTION
REFLECTOR / BUTTON

W-2 RB-5



8" WHITE LINE SUBSTITUTION
REFLECTOR / BUTTON

General note:

1.) Surface mount Raised Pavement Markers (RPMs) unless otherwise specified.

LEGEND

⇦ Direction Of Travel, Increasing Stationing Or Thru Traffic Side.

℄ — Lane line dimensions are shown on the striping plans.

◨ Mono-directional crystal white marker reflects white to the left in this symbol

◫ Bi-directional yellow marker reflects yellow both left and right in this symbol

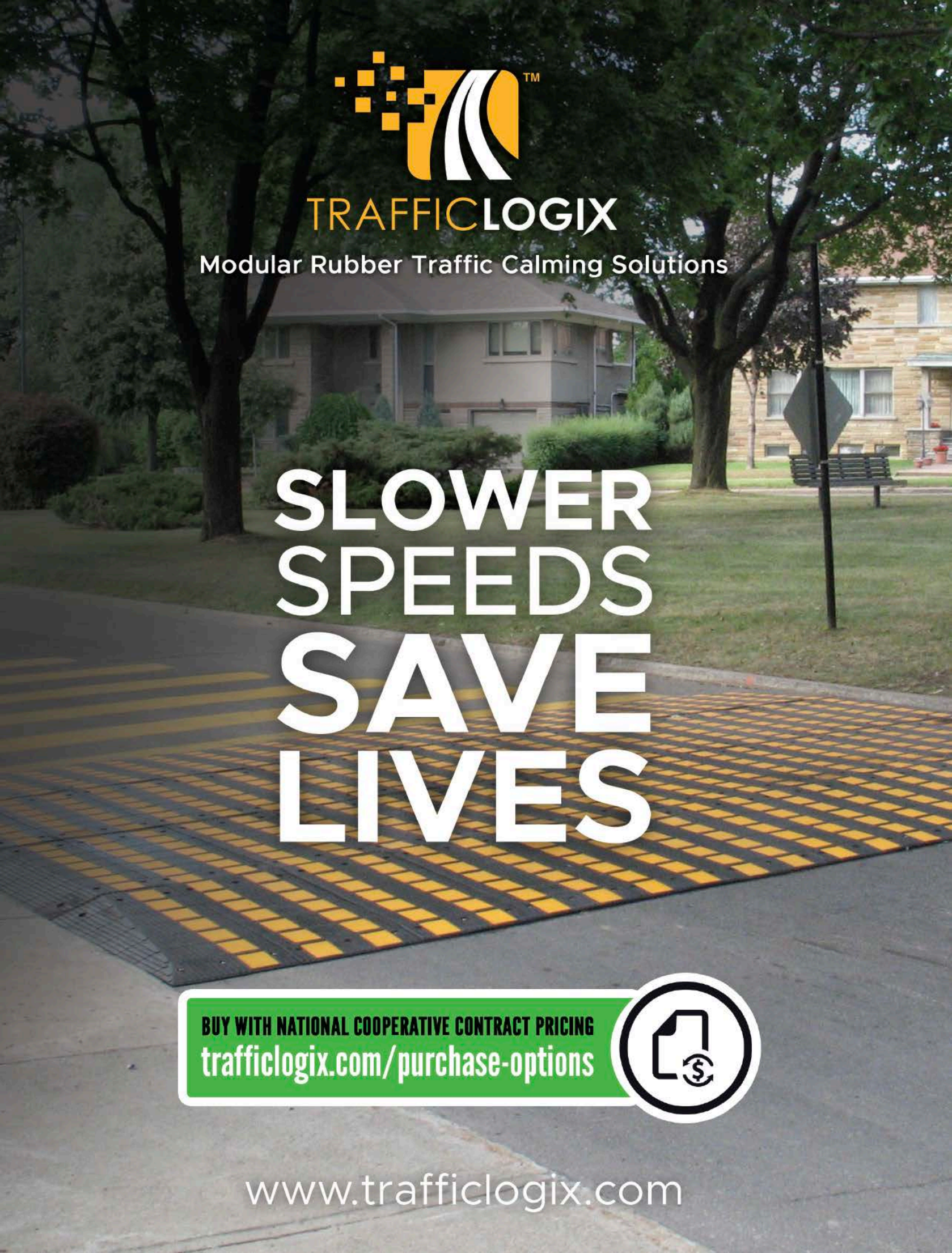
The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES
DETAILS

PAVEMENT MARKING DETAIL BLOCKS

DETAIL NO.
DET4560

DET4560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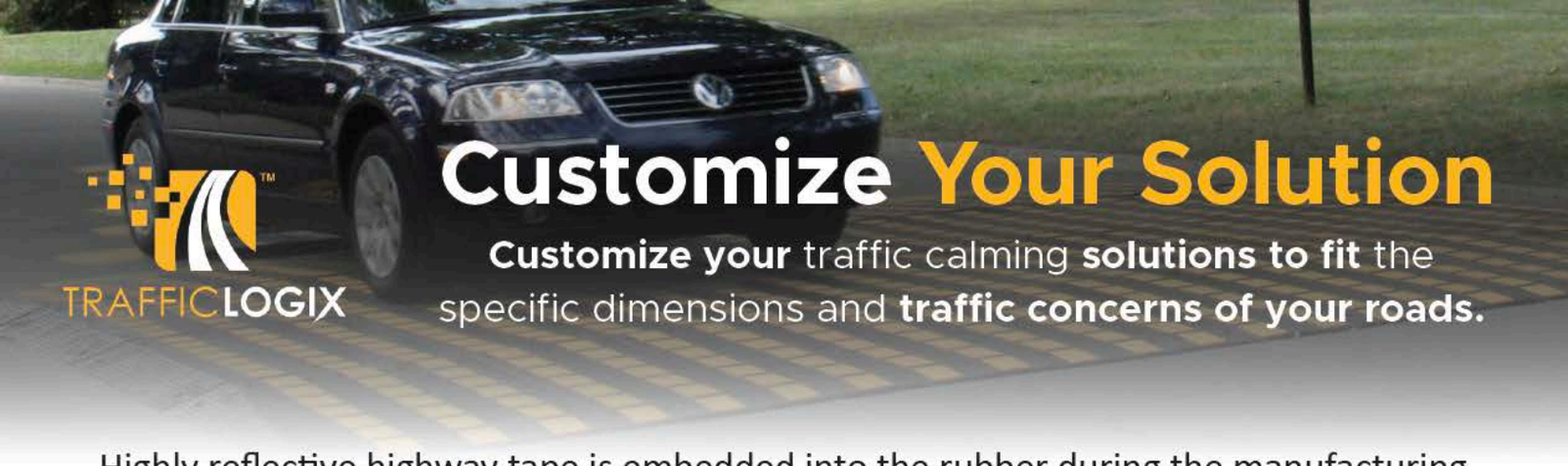
www.trafficlogix.com



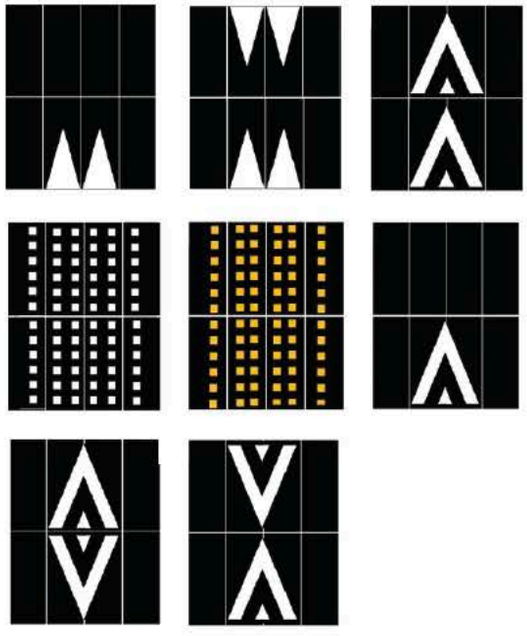
TRAFFICLOGIX

Customize Your Solution

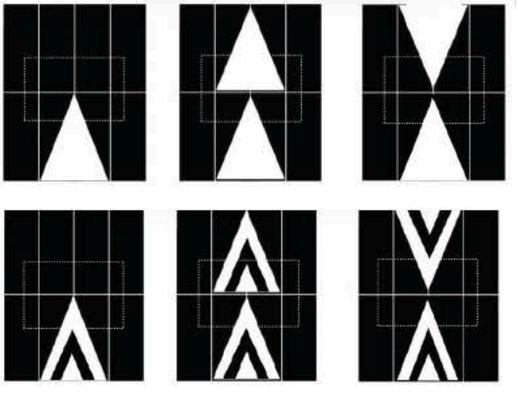
Customize your traffic calming **solutions to fit** the specific dimensions and **traffic concerns of your roads.**

Highly reflective highway tape is embedded into the rubber during the manufacturing process. Available in a choice of yellow/white squares or white arrows, marking designs can be fully customized to your specifications.

Standard Series:
Cushions, humps & tables

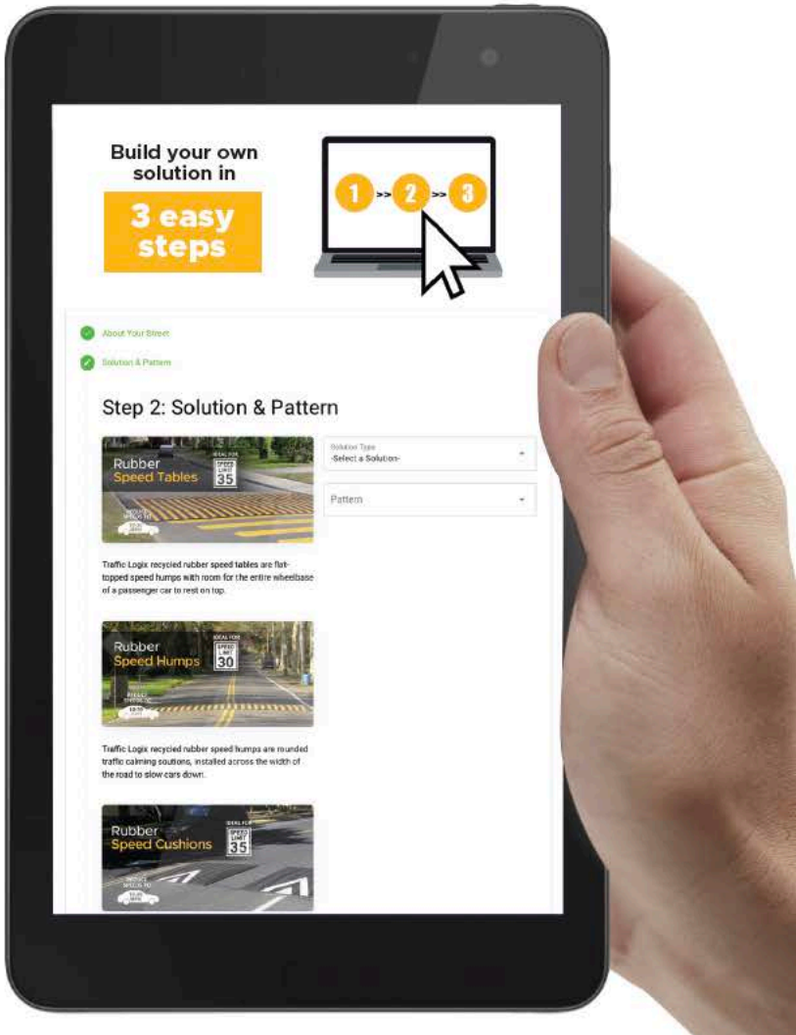


V3 Series:
Cushions



BUILD YOUR OWN SOLUTION ONLINE

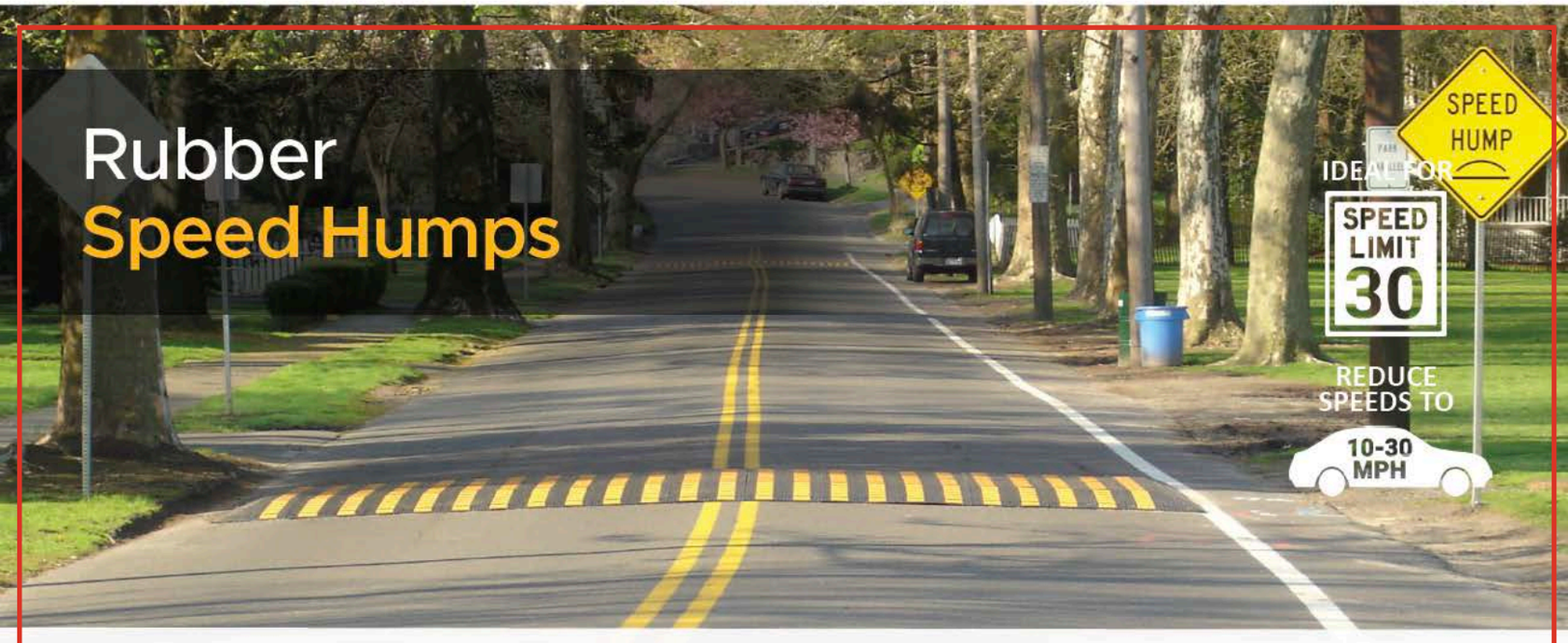
TRAFFICLOGIX.COM/BYOS



Rubber Speed Cushions

- Series of **small humps** with spaces between them
- Slow cars **without affecting emergency response** time
- Slows drivers while **allowing emergency vehicles to straddle** and pass
- Installed **across road width** in choice of lengths

7' Cushion Profile



Rubber Speed Humps

- Raised traffic calming devices with **sloped design**
- **Less abrupt than speed humps** due to longer length
- Recommended for roads with **low speed limits**
- Slow cars to **a range of speeds** based on chosen length

14' Hump Profile

Rubber Speed Tables

IDEAL FOR

SPEED LIMIT 35

REDUCE SPEEDS TO

20-30 MPH

- Flat-topped speed humps for more **gradual speed reduction**
- Allows entire vehicle to rest on top **for less abrupt slowing**
- Encourages **continued traffic flow** at reduced speeds
- Ideal for **residential roads**

14' Table Profile

Rubber Raised Crosswalks

IDEAL FOR

SPEED LIMIT 30

REDUCE SPEEDS TO

10-30 MPH

- **Surface marked walkways** for safe pedestrian passage
- Provides **visual marked pathway** to assist in safe crossing
- Effective **speed deterrent** slows speeding vehicles
- **Dual safety advantage** for superior pedestrian protection

14' Raised Crosswalk Profile

Rubber SuperFlex Curbs

- Highly flexible rubber allows shaping to **any configuration**
- Used for traffic circles, roundabouts, chicanes, safety islands, and lane narrowing
- **Versatile solution** for multiple usages
- Available in brick red or black with **choice of tape color**

Rubber Cycle Lanes

- Creates **dedicated bike lanes** to protect cyclists
- **Sloped** delineators keep vehicle and bike traffic **in their respective lanes**
- **Visual separation** defines traffic spaces
- Guides **cyclists back into lane** while preventing vehicle traffic from entering bike lane

Why Traffic Logix?

Our recycled rubber traffic calming solutions offer a **smarter, long-lasting alternative** to asphalt devices.

Reduced Speeds

Rubber solutions are proven effective in reducing 85th percentile speed by close to 20% and childhood injury or death by close to 60%.

Recycled Rubber

Made of 100% post consumer tires, Traffic Logix recycles more than 450,000 tires from landfills every year.

Customizable

Traffic Logix rubber solutions are made of individual units so you can use them to meet your specs, speed limits, and safety challenges.

Rubber		Asphalt
Will not fade or crack	Quality	Fades and cracks over time
Maintains consistent profile	Durability	Compresses with repetitive impact, uneven profile
No heavy equipment needed to install	Installation	Heavy equipment required for installation
Single lane closure	Disruption	Complete street closure during installation
Drivable immediately after installation	Usage	Only drivable after 2-3 days of cure time
Highly visible reflective markings	Markings	Markings need repainting after a few years
Can be removed, stored and relocated	Versatility	Must be destroyed for street repairs
Constructed of recycled rubber tires rescued from landfills	Impact	Petroleum based, depletes resources and pollutes water

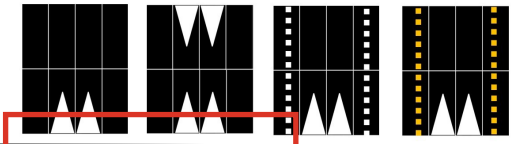
TRAFFIC LOGIX
Rubber Products Group
A Division of Logix ITS

Patterns - Speed Humps, Cushions and Tables

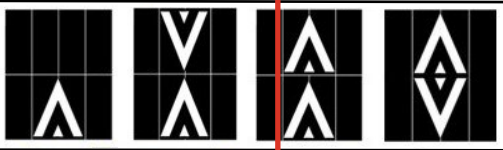
Cushion Examples Shown. Humps & Tables also available in similar patterns

Standard Series is available in various widths and lengths in creating (SC) Cushions, (SH) Humps and/or (ST) Tables

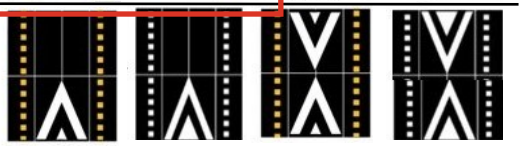
From left to right
SC-070603-2A
SC-070603-4A
SC-070603-2A-2W
SC-070603-2A-2Y



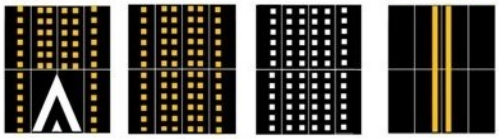
From left to right
SC-070603-M
SC-070603-2M-TW
SC-070603-2M-OW
SC-070603-DIA



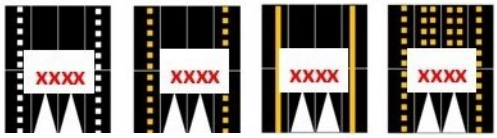
From left to right
SC-070603-M-2Y
SC-070603-M-2W
SC-070603-2M-2Y-TW
SC-070603-2M-2W-TW



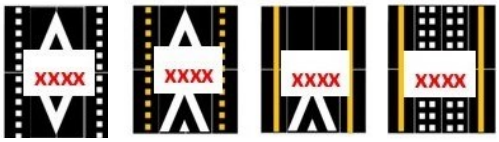
From left to right
SC-070603-M-Y
SC-070603-Y
SC-070603-W
SC-070603-2M-2Y-SLI



From left to right
* SC-070603-2A-2W
* SC-070603-2A-2Y
* SC-070603-2A-SLO
* SC-070603-2A-2Y



From left to right
* SC-070603-DIA-2W
* SC-070603-2M-2W-OW
* SC-070603-2M-2Y-SLO
* SC-070603-W-2Y-SLO



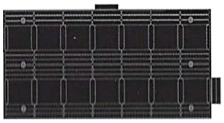
*** XXXX Non-Stock Item**

42" Approach and Exit Ramp

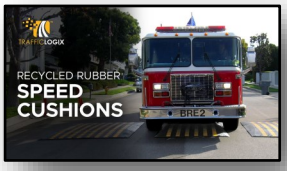
Cushions - 3' W, up to 9' W Lengths 7', 10.5', 14', 17.5', 21'
Height 3"

Humps - Various Widths Lengths 7', 10.5' 14', 21'
Heights 3", (4" -14' Length only)

Tables - Various Widths Lengths 14', 17.5', 21', 24.5'
Heights 3", (4" -14' Length only)
Flat Top any length Parabolic at 4" H (14' Length only)

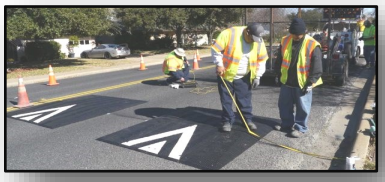


◊ All modules have patented dual interlocking tongue and grooves.
◊ Creates a bond among modules.
◊ Increases installed cushion vehicle impact resistance.
◊ Enhances long-term stability and product performance.



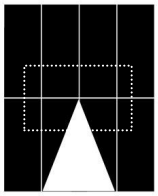
7' L x 6' W x 3" H Standard Series Cushion Profile Shown

V3 SERIES Cushions - 7'L x 6' W x 3"H **V3 SERIES Humps 7'L x Various Widths Only**

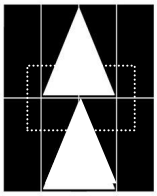


7' L x 6' W x 3" H V3 Series Cushion Profile Shown

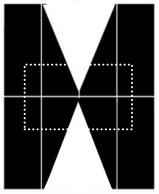
SCV3-070603-TC



SCV3-070603-TB

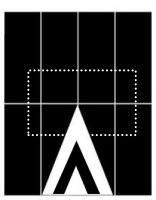


SCV3-070603-TA



Steeper Approach Angle
Flat Top Design
Designed Speed 5 - 8 mph

SCV3-070603-MTC



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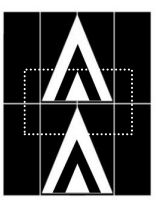
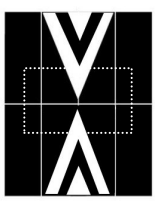


SCV3-070603-MTA



RUBBER CONDITIONAL USE WARRANTY

TRAFFICLOGIX
Rubber Products Group
A Division of Logix ITS

Conditional Use Terms
Rubber Traffic Calming Devices

1. Traffic Logix traffic calming devices (the “Traffic Calming Products”) are designed to be installed on local residential streets with posted speeds of 35 mph or less. Prior to installation, the Customer should determine if any federal, state, or local regulations govern the installation or use of Traffic Calming Products.
2. The installation location of any Traffic Calming Product should be reviewed by a Traffic Engineer.
3. Traffic Calming Products should only be used on roads with less than 5,000 vehicles per day.
4. Traffic Calming Products should be installed only on roads that are used primarily by passenger vehicles and/or emergency response vehicles with the roads themselves in respectable condition.
5. Traffic Calming Products should be installed in such a way that they are visible from at least 200 feet. For safe usage, Traffic Logix products must be installed in conjunction with appropriate signage in accordance with ITE’s State of the Practice on Traffic Calming, as well as ITE’s Manual on Uniformed Traffic Control Devices.
6. Traffic Calming Products should not be installed on roadways that have more than an 8% grade.
7. Traffic Calming Products should be installed with a minimum othree inches of asphalt or concrete underneath the device.
8. All bolts and anchors provided with product must be installed as instructed, and with Traffic Logix anchor adhesive that is also included with each product.
9. Quarterly inspection of each Traffic Calming Product is required. If the Traffic Calming Product has been damaged in any way, it should be replaced.
10. Traffic Logix Products should be removed prior to the first snowfall and should only be reinstalled in non-winter months.

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