BEST PRACTICES FOR TRAFFIC CALMING

This best practices paper provides a discussion of traffic calming in the United States by combining national state of the practice data and our experiences with traffic calming. The information in this paper illustrates the current trends in traffic calming, with emphasis placed on traffic calming program structure and implementation.

The first section of this paper provides an in-depth look at the current practices in the United States by presenting findings from our traffic calming survey of leading jurisdictions. This section also revisits topics discussed in Traffic Calming State-of-the-Practice (ITE and FHWA, August 1999) and highlights current trends in traffic calming. The second section presents the findings from our traffic calming survey conducted in Southern California. The final section discusses the best approaches to traffic calming, what works and what doesn’t work. This later section is based on our experience with numerous traffic calming projects within the State of California.

A. NATIONAL TRAFFIC CALMING SURVEY AND TRAFFIC CALMING STATE-OF-THE-PRACTICE

This section summarizes a 2004 survey of traffic calming practices of 21 leading jurisdictions, and the results are compared to surveys conducted for a national report almost a decade ago (Traffic Calming State-of-the-Practice, ITE and FHWA, August 1999). Some of the most significant changes are: mainstreaming of traffic calming programs within transportation or public works departments; less apparent public controversy surrounding programs; greater reliance on private financing of construction; more public involvement in planning through neighborhood traffic committees; limited expansion of eligibility is some communities to include arterials; and expansion of individual toolboxes to include a greater range of speed control measures.

A recent survey of 21 jurisdictions across the USA was conducted with respect to their traffic calming programs. The surveyed jurisdictions were selected based upon their perceived leadership in the field. The survey was conducted for Sacramento County, as input in updating its traffic calming program. The following table summaries the subjects covered by the survey
This paper summarizes the range and commonality of practices followed by these jurisdictions. The commonalities suggest preferred approaches to traffic calming, and the ranges represent distinct choices available to jurisdictions.

In addition to summarizing the practices of the jurisdictions surveyed, this section compares current practices to those documented previously. This survey was the first detailed look at U.S. traffic calming programs since surveys conducted for the August 1997 ITE Journal and for Traffic Calming State-of-the-Practice, a report for the Institute of Transportation Engineers (ITE) and Federal Highway Administration (FHWA). As such, this paper demonstrates how policies and practices have evolved as the field has matured.

Who Was Surveyed

The jurisdictions surveyed were selected from a list of more than 100 jurisdictions known to have traffic calming programs. The selection was based on knowledge acquired from the Traffic Calming State-of-the-Practice project, consulting activities of the authors, and review of on-line information. Western jurisdictions were favored in the sample selection.

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The 21 surveyed jurisdictions were:

- City of Albuquerque, NM
- City of Austin, TX
- City of Bellevue, WA
- Broward County, FL
- City of Charlotte, NC
- City of Charlottesville, VA
- City of Colorado Springs, CO
- City of Dallas, TX
- City of Eugene, OR
- Gwinnett County, GA
- Howard County, MD
- Los Angeles County, CA
- City of Minneapolis, MN
- Montgomery County, MD
- City of Portland, OR
- Pima County, AR
- City of Riverside, CA
- City of Sacramento, CA
- City of Seattle, WA
- City of Vancouver, WA
- City of Walnut Creek, CA

PROGRAMMATIC FINDINGS

Program Staffing

Engineers are the most common professional background in the traffic calming field, while planners are also well-represented. Sometimes persons from both disciplines are involved in the administration of a given program (as in Bellevue, Charlottesville, and Gwinnett County). Beyond the program administration, engineers are clearly involved in the safety and design aspects of all programs.

While the surveys for Traffic Calming State-of-the-Practice did not ask comprehensively about staff backgrounds, it is our impression that program administration has shifted somewhat toward engineering backgrounds. If true, this could reflect the mainstreaming of traffic calming within the transportation engineering profession.

Program Budgets

The largest capital budget is Sacramento’s at $600k per year. The typical earmarked program has a capital budget between $100k and $250k. Several programs have no set budget, but instead compete for transportation or public works department funds generally or are funded primarily by residents on a demand basis. Several programs operate on shoestrings, including one of the best known, Portland’s, with a $50k operating budget and a $30k capital budget. Two programs, Eugene’s and Howard County’s, have been left unfunded by budget cuts during the recent fiscal crisis.

Seattle’s success in competing for local funds was highlighted in Traffic Calming State-of-the-Practice. It was attributed both to Seattle’s emphasis on, and success in, reducing traffic collisions, and its combination of proactive and reactive approaches to fund allocation.

One big change since Traffic Calming State-of-the-Practice is the greater reliance on neighborhood residents to help finance their own traffic calming projects. At that earlier time, many jurisdictions had a bias against any funding mechanism that might be perceived to favor wealthy neighborhoods. Now, perhaps due to local fiscal constraints, about half of the governments surveyed rely partially or fully on private financing: Bellevue (fully for gateway treatments but not other measures); Broward County (fully); Charlottesville (fully in the speed hump
Vancouver has proposed a POP (Property Owner Purchased) program. Portland will soon have three matching levels: 25, 50, and 100 percent privately funded. The private contribution can be through an up-front fee or local improvement district. Gwinnett County levies a $12 per year maintenance fee on residents of the plan area through the county property tax. Eugene sometimes requires residents to pay for traffic calming measures, and plans to rely more heavily in the future on local assessment districts. For speed humps, Dallas charges a resident fee which varies according to the pre-treatment roadway speeds.

**Controversies and Litigation**

Approximately half of the surveyed programs report controversies. Most sound minor and specific to individual plans (as opposed to general and spilling over to the program as a whole). The level of controversy seems diminished compared to that reported in *Traffic Calming State-of-the-Practice*. Portland, for example, had experienced controversy over emergency response and a streamlined approval process. At this time, program personnel report that “up-front public involvement has avoided significant controversy” and that “Fire Bureau concerns were solved in 1998 with new street classification Primary Emergency Response Routes.” Up-front public involvement and avoidance of emergency routes are two ways of minimizing controversy. Other reported approaches involve planning for the entire street network (not just individual streets), formalizing program policies (as opposed to more ad hoc treatment), and requiring applicants to work through neighborhood associations.

Most surveyed agencies reported either no litigation or nothing in recent years. Only three lawsuits were reported by the surveyed agencies since publication of *Traffic Calming State-of-the-Practice*. One was settled out of court, and the other two were decided in the cities’ favor. So the earlier conclusion, that a carefully designed and administered program can avoid liability, seems to still hold.

For old cases, see Chapter 6 of *Traffic Calming State-of-the-Practice*. New cases were: in Montgomery County, a person injured on a speed hump received a $10,000 out-of-court settlement; in Portland, a driver claiming injury due to “incomplete speed humps” lost his lawsuit; and in Seattle, the City was not held liable when a boy hit at an intersection where a traffic circle had been requested but not installed. The last two suits, and a threatened suit in Bellevue over the removal of speed tables, illustrate an interesting trend towards litigation for failure to calm traffic rather than the misapplication of traffic calming. The decision to spend money on traffic calming, or to spend money on a particular street, is a discretionary function of government, not a ministerial function. As such, lawsuits over the failure to calm traffic are unlikely to be successful.

In addition to the above lawsuits, only a couple damage claims were reported (vehicles impacting traffic calming devices), and these involved small payouts.

**Application in New Developments**

*Traffic Calming State-of-the-Practice* foresaw a shift in emphasis from retrofits to traffic calming within new developments. This shift has occurred only to a limited degree.

Albuquerque, Eugene, Minneapolis, and City of Sacramento make case-by-case recommendations as part of the development review and approval process. None reported opposition from developers. Charlotte and Vancouver are developing formal policies on traffic calming in new developments. Vancouver reports that developers are more receptive to traffic calming than they once were. Howard County already has such a policy in place. Slow points are required at regular intervals between 600 and 1,000 feet. Adopting formal requirements today may be the best way to avoid the need for retrofits in the future.
PROCESS ISSUES

Project Initiation

Traffic Calming State-of-the-Practice predicted a more proactive, staff-driven approach to project initiation in ensuing years. Instead, project initiation has remained largely reactive; projects are initiated mainly through complaints or petitions from residents. Even in Seattle, known for proactively targeting high collision locations, approximately 95 percent of projects are resident-initiated.

Within complaint-driven processes, different threshold levels of neighborhood support are required before any action is taken. Some (Bellevue and Howard County) allow individuals to initiate a needs study with a phone call, written request, or on-line request. Others (Charlotte and Tucson) require petitions signed by a specified number or percentage of residents. Still others (Montgomery County and Vancouver) require the responsible neighborhood association (or city council member where no association exists) to request a study. And a few (Broward County and Minneapolis) first require a petition with signatures, and then concurrence of a neighborhood association. The emphasis on neighborhood associations is a new trend since Traffic Calming State-of-the-Practice.

Priorities and Resource Allocation

The great majority of surveyed jurisdictions have adopted rating systems to determine priority among competing traffic calming projects. The reason for doing so is to achieve a degree of objectivity and effectiveness in funding decisions in the face of public demands exceeding the supply of available funds.

In Colorado Springs, priorities are established based on vehicle speeds, cut-through traffic volumes, collisions, proximity to schools, hospitals, or parks, and volumes of pedestrian and bicycle traffic. Charlottesville includes speed, volume, collisions, and proximity to schools in its formula as well (these are most common factors across rating systems) but replaces the remaining factors in the Colorado Springs formula with residential density, street width, and absence of sidewalks.

One interesting variation on a priority rating system is Howard County’s street-type priorities. Priority is assigned in the following order: school walking routes, connector or through streets, and cul-de-sacs or isolated networks.

The main alternative to priority-based systems is first come, first served. This is the approach taken in Gwinnett County and Minneapolis. An uncommon alternative is a lottery, used by the City of Sacramento when it first initiated its program (subsequent requests were taken in the order of application).

Public Involvement

In approximately half of the places surveyed, public involvement is limited to passing petitions, voting on plans, or voicing opinions at public hearings. The public reacts to plans, but does not participate in the development of them. It is an up or down, go or no-go, support or oppose decision for the public.

Those agencies that involve citizens in planning use one of two mechanisms: 1) Involvement occurs informally through citizen surveys to solicit ideas, meetings with staff to discuss ideas, or open houses to get comments on a draft plan; or 2) a formal neighborhood traffic calming committee is established to work with staff or consultants on a plan. Since Traffic Calming State-of-the-Practice, the latter approach has gained in popularity. Practitioners include Albuquerque, Bellevue, Howard County, Los Angeles, Montgomery County, and the City of Sacramento.

The appropriate type of public involvement may depend on the nature of the treatment. On simple speed hump projects, Portland staff prepares a plan and holds an open house, while residents pass petitions and gather funds.
On complex projects, a volunteer committee is formed and staff acts as consultant to the committee regarding policies and technical options.

**Public Approval**

With three exceptions, all jurisdictions surveyed require a vote (usually by mail) before plans are adopted and implemented. The exceptions, such as Gwinnett County and Riverside, use initial petitions to judge public support for projects, and the projects themselves involve only simple traffic calming devices. Charlotte also relies on petitions at present, but will add a public vote on the final plan as it diversifies its program.

For the jurisdictions with voting requirements, those living in the “affected area” or the “study area” are eligible to vote. The definition of affected area differs by jurisdiction. In some jurisdictions, staff has discretion to draw boundaries subject only to general guidance. In Los Angeles, the affected area includes, but is not limited to, “properties where normal travel routes… are to be altered by the neighborhood traffic management and calming measures, and/or properties that are significantly impacted by traffic that is to be diverted.” In other jurisdictions, the affected area is defined by major physical features. In Minneapolis, it consists of all surrounding blocks bounded by through streets or other natural barriers. And in still other jurisdictions, the affected area is defined as the treated street and certain connecting streets. In Montgomery County, it includes all properties that front on the street in question and cul-de-sacs and streets connecting through this street.

Typically, all residents, both property owners and renters, are eligible to vote on traffic calming plans. In about half the surveyed jurisdictions, eligibility extends to business proprietors.

Every jurisdiction has its own plurality requirements for plan approval. Minimum approval rates vary from 30 percent of those voting on temporary measures in Charlottesville, to 100 percent of those voting for permanent measures paid for with special assessments in Broward County. The median approval requirement for jurisdictions surveyed is two-thirds of those voting.

Some jurisdictions also have required response rates for those eligible to vote. Such requirements are imposed to ensure a degree of general public acceptance. Minimum response rates vary from 25 percent for speed control measures in the City of Sacramento to 90 percent for any measure in Los Angeles. For those jurisdictions with such requirements, the median required response rate is 50 percent (not an easy requirement to meet).

**Road User Needs (Fire, Ambulance, Waste)**

Fire department interests are most often accommodated by allowing them to review and comment on traffic calming plans. This mechanism is used in at least nine of the surveyed jurisdictions. In one jurisdiction, Riverside, the fire department not only reviews and comments but also must approve speed hump installations. Riverside reports that the department usually grants its approval.

Another way in which fire interests are accommodated is in the geometric design of measures (refer to Figure 1 on the following page). In this survey, only Gwinnett County mentioned selecting a speed table profile based on the needs of fire-rescue. But *Traffic Calming State-of-the-Practice* cites other examples from Portland, Seattle, and elsewhere.
A third way in which fire interests are accommodated is the designation of primary emergency response routes, which are subsequently ineligible for some or all traffic calming measures. Designation of such routes ended the moratorium on traffic calming in Portland. Primary emergency response routes in the City of Sacramento limit the use of vertical devices to speed lumps. Figure 2 illustrates the primary emergency response routes and proposed traffic calming devices of a local NTMP. Conversely, Vancouver avoids placing traffic calming devices on primary emergency response routes and, in addition, seeks to make street connections that provide alternate routes to fire emergencies.
Chapter 7 of Traffic Calming State-of-the-Practice reports other approaches to reconciling traffic calming and emergency response goals, including the use of experimental measures such as speed cushions and split humps.

Medical emergency responders are accommodated in the same way as fire responders. They are often one and the same, as fire-rescue operations provide emergency medical services and fire engines are often the first on the scene at medical emergencies. Three jurisdictions reported that ambulance services, in particular, are considered secondary to fire services and are given less priority in traffic calming plans.

Waste collection is either not considered at all or accommodated indirectly through planning for fire response. In Portland, the SU-30 design vehicle is used to design traffic calming devices for waste collection, while larger vehicles are used for fire response.
TECHNICAL ISSUES

Street Eligibility

Surveyed jurisdictions vary in the types of streets eligible for traffic calming. Some such as Broward County and Seattle limit traffic calming to local streets. More jurisdictions, including Albuquerque, Montgomery County, and Portland, extend eligibility to collector streets.

Traffic Calming State-of-the-Practice predicted an expansion of U.S. programs to streets higher up the functional hierarchy. To a limited degree, this has occurred. Six surveyed jurisdictions – Bellevue, Charlottesville, Eugene, Howard County, Portland, and Vancouver – indicated that they would consider treating arterials for speed problems. None of these agencies would install vertical measures on a street. The City of Eugene allows for roundabouts, parking bays, raised medians, surface markings, and landscaping. Two surveyed agencies have experimented with signal timing to slow speeds.

Almost half of surveyed jurisdictions limit traffic calming to residential streets. Among them are Albuquerque, Charlotte, Gwinnett County, Los Angeles, and Riverside.

Guidelines/Warrants for Device Eligibility

Over half of the surveyed jurisdictions have warrants or guidelines for installation of different traffic calming measures. Warrants are minimum requirements that must be met before individual measures are installed, while guidelines are advisory and context-sensitive. The national trend has been away from warrants and towards guidelines, with the exception being speed humps, which are typically governed by warrants for historical reasons.

In Seattle, speed humps are warranted only for local streets with 85th percentile speeds of 35 mph or more and traffic volumes of 400 vehicles per day or more. In Riverside, the minimum qualifying 85th percentile speed is 6 mph over the speed limit, and the minimum qualifying traffic volume is 500 vehicles per day. Dallas requires traffic volumes to be less than 6,000 vehicles per day and 85th percentile speeds to be in excess of 35 mph.

Guidelines often address the selection of a device in consideration of several factors: the type of problem, the location (intersection, mid-block, school, etc.) and street type (local, collector, arterial). Bellevue, Charlotte, Minneapolis, Portland, and Vancouver have guidelines for their different measures based upon criteria such as 85th percentile speed and daily traffic volume.

Toolboxes

Two surveyed jurisdictions have small traffic calming toolboxes. While it has experimented with other measures, Gwinnett County has settled on 22-ft speed tables as the tool of choice. Riverside currently uses only speed humps and stop signs.

Many jurisdictions have large toolboxes but limit specific tools to certain street types. Howard County has a large toolbox for local streets but limits major collectors to restriping, roundabouts, chokers, and medians (and then only if enforcement and education have proven ineffective). Vancouver is similar with respect to local streets, but limits arterials to landscaping, high visibility striping, roundabouts, chokers, medians, and photo enforcement. Portland excludes volume control measures such as partial closures from neighborhood collectors. Eugene excludes speed humps and Charlottesville excludes all vertical measures from collectors and arterials.

Most jurisdictions are open to new ideas and experiments but few have identified good candidate devices. Bellevue has a $50,000 annual budget towards the development of new devices. Two respondents reported
experimenting with measures that are new to them but were developed decades ago and were in regular use at the time of *Traffic Calming State-of-the-Practice*: Charlottesville has built its first diagonal diverter and Sacramento its first raised crosswalk.

**SUMMARY OF PRACTICES**

The following table summarizes the findings from the 2004 survey. Since *Traffic Calming State-of-the-Practice*, the field of traffic calming has matured. Some of the most significant changes are: mainstreaming of programs within transportation or public works departments; less apparent public controversy surrounding programs; greater reliance on private financing of construction; more public involvement in planning through neighborhood traffic committees; limited expansion of eligibility beyond local streets to collectors and arterials; and expansion of individual agency toolboxes to include a greater range of speed control measures.

Policies and practices that have not changed significantly since *Traffic Calming State-of-the-Practice* include: relatively small budgets and staffs; minimal litigation and few paid damage claims; preference for in-house planning and design; project initiation largely in reaction to citizen complaints; near universal reliance on petitions and/or balloting to judge public support for projects; accommodation of fire-rescue agencies; use of priority rating systems to allocate scarce resources; and limited innovation in the nature of devices.

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<thead>
<tr>
<th>Issue</th>
<th>Findings</th>
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<tr>
<td>Program Budget</td>
<td>Program capital budgets range from $30,000 to $600,000 per year. Of the agencies surveyed, approximately 50% are either unfunded or rely exclusively on resident funding.</td>
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<tr>
<td>Resident Funding</td>
<td>Approximately half of the agencies rely on resident’s to fund some or all of the construction costs.</td>
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<tr>
<td>Installed with New Development</td>
<td>Approximately half of the agencies incorporate traffic calming devices into new developments. Two agencies have adopted guidelines for traffic calming in new developments.</td>
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<tr>
<td>Public Involvement</td>
<td>All agencies surveyed rely on resident or neighborhood associations to submit petitions requesting treatment. Some agencies would also consider staff or commission appointed petitions. More than half involve the public through a committee or neighborhood association to help develop a plan.</td>
</tr>
<tr>
<td>Fire Department Involvement</td>
<td>All of the agencies surveyed involve the Fire Department in the design of the available devices and/or during the plan development process. Some agencies give veto power to the Fire Department, and several agencies have designated primary emergency response routes that preclude certain types of treatments.</td>
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<tr>
<td>Treatment of Arterials</td>
<td>Six of the surveyed agencies consider treating arterials, with limited toolbox of eligible devices. None of these agencies allow the use of vertical devices on arterials.</td>
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<td>Priorities</td>
<td>75% of the agencies rely on some form of a quantifiable priority ranking system to determine priorities. Some agencies treat problems in the order petitions are received; while two agencies rely on resident funding and therefore no prioritizing system is needed.</td>
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<tr>
<td>Device Eligibility</td>
<td>A majority of agencies use warrants or guidelines to determine device eligibility, and the remaining eight agencies rely on a staff determination.</td>
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<td>Toolbox</td>
<td>All but two of the agencies have comprehensive toolboxes. Almost half of the agencies reject stop signs as a traffic calming devices.</td>
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B. SOUTHERN CALIFORNIA TRAFFIC CALMING SURVEY

In late fall of 2005, we conducted a survey of Southern California jurisdictions that have, or were in the process of implementing, a neighborhood traffic management program. Of the requests for information sent out, we received responses from the following six jurisdictions:

- City of Culver City
- City of Irvine
- County of Ventura
- City of Ventura
- City of Newport Beach
- City of West Hollywood/County of Los Angeles

Several of the jurisdictions that responded currently have a proposed program. All of these jurisdictions have updated their program since its inception. The following sections discuss the results of the survey as they pertain to neighborhood traffic management program structure, plan procedures, installation, and design and maintenance.

Program Structure

The number of full-time employees dedicated to the jurisdictions’ programs range from none to three. The City of Irvine has three full-time employees who work in the program with a varying annual capital budget dependent on grant money. Two of the jurisdictions have no annual capital budget allocated to their traffic calming program while Culver City and Newport Beach have less than $100,000 and $50,000, respectively. Additionally, Newport Beach is the only jurisdiction that allows more elaborate devices to be constructed with local neighborhood funding. The City and County of Ventura are the only respondents that require residents to participate in the funding of devices. Additional funding sources identified by the respondents are gas tax, general budget fund allocations, and grants.

The County of Ventura requires residents to fully fund speed humps (the only devices allowed). This method of funding has been problematic and has led to very few installations. The City of Ventura has also experienced a resident’s unwillingness to fund improvements. Requiring residents to fund improvements can become problematic, especially when collecting funds from residents who are against the installation of the planned traffic calming devices.

Other controversies with programs include the inability to reach a consensus in a community or powerful groups that have blocked the use of certain devices. Another controversy, affecting the City of Irvine, is the perceived degradation of property values for those locations near a traffic calming device. Despite these controversies, there has been no litigation brought against any of the respondents’ programs.

Plan Procedures

For the majority of the respondents, the neighborhood traffic management selection process begins by a residents’ complaint. Additionally the majority of the respondents establish priorities between the streets/neighborhoods on a first come first served basis. Of the respondents, only West Hollywood/Los Angeles County use a priority points system.

When a plan is developed to treat a street or area, all of the respondents involve the public in the development of the plan. However, only Culver City and West Hollywood/Los Angeles County use public committees.
In addition to developing the plan, the public is asked to vote on the proposed treatment plan before its adoption for all jurisdictions which responded. The percentages of approval for neighborhood acceptance vary by jurisdiction. Culver City’s approval percentages vary within their program from a high of 75% to a low of 50%+1 for plan acceptance. The other respondents’ approval rates fell within Culver City’s range. Of those that responded all require a minimum response rate from the surveys/ballots distributed. The minimum response rate required to grant tallying of the votes ranges from a low of 50%+1 to a high of 90%. Both the County of Ventura and Newport Beach require a minimum response rate of 90%.

Environmental review is often needed before implementation of a treatment. A categorical exemption was the type of review used by the respondents.

The governing council (or board) may need to approve each neighborhood treatment plan. In the case of the jurisdictions that responded, 80% always need to gain approval from their council or board while 20% only need to gain approval some of the time.

**Installation**

The following table summarizes the actions/devices that the respondents have included as part of their traffic calming toolboxes. All the respondents have established guidelines that have limited the use of certain treatments.

<table>
<thead>
<tr>
<th>ACTIONS/DEVICES IN TOOLBOX</th>
<th>Percentage of Respondents</th>
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<tbody>
<tr>
<td>Humps</td>
<td>60%</td>
</tr>
<tr>
<td>Lumps of Cushions</td>
<td>20%</td>
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<tr>
<td>Other vertical devices</td>
<td>0%</td>
</tr>
<tr>
<td>Bulb-outs</td>
<td>60%</td>
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<tr>
<td>Traffic Circles</td>
<td>60%</td>
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<tr>
<td>Roundabouts</td>
<td>40%</td>
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<tr>
<td>Other horizontal devices</td>
<td>20%</td>
</tr>
<tr>
<td>Narrowings</td>
<td>60%</td>
</tr>
<tr>
<td>Targeted Enforcement</td>
<td>80%</td>
</tr>
<tr>
<td>Targeted Education</td>
<td>80%</td>
</tr>
<tr>
<td>Other – cul-de-sacs and closures</td>
<td>20%</td>
</tr>
<tr>
<td>Other – signing and striping</td>
<td>20%</td>
</tr>
</tbody>
</table>

Four of the jurisdictions surveyed have used stops signs for traffic calming purposes. These instances of stop sign installation have all been politically driven.

Culver City and the City of Ventura construct both lateral and horizontal traffic management devices on dedicated emergency response routes. Installations in the City of Ventura are made only after approval from the fire and police departments, while the fire department holds veto power over any proposed treatment plan. Culver City fire department drives the temporarily installed devices to quantify the impact to emergency responses and formally express their opinions. In Newport Beach, the fire department is provided an opportunity to comment on the proposed treatments. In Ventura County, the fire department is not involved in the neighborhood traffic.
calming process. However, in both the County of Ventura and Newport Beach traffic management devices are not allowed to be constructed on dedicated emergency response routes.

After the installation of traffic calming devices it can be beneficial to evaluate the effectiveness of the treatment. Three of the respondents conduct evaluations of the constructed devices. During evaluations some of the jurisdictions have permanent devices while some only have temporary devices (Culver City and the City of Ventura install devices for a trial period of 6 months). Sometimes the device is found to not be as affective as anticipated and removal of the device may be necessary. Culver City removes devices if they are found to have not accomplished their purpose. Newport Beach and Ventura County remove devices (speed humps) if there is neighborhood opposition to them. Ventura County requires residents to pay for the removal of the speed humps. In the City of Ventura the neighborhood votes to make the installation of devices permanent after their trial period has ended (City Council has the final vote).

Of the jurisdictions surveyed only the City of Ventura indicated that they require traffic calming devices be included in new developments.

**Design and Maintenance**

Traffic calming treatments need to be aesthetically pleasing to neighborhood residents. This often involves landscaping within the devices. Although beneficial, landscaping often becomes a burden and some jurisdictions prefer to have the public maintain landscaping in the devices. Newport Beach and the City of Ventura responded that they require the public to maintain landscaping in traffic calming devices.

Proper signing and striping is necessary to help ensure appropriate maneuvering of the devices. All of the respondents use signing and striping specified in the *Manual on Uniform Traffic Control Devices*. This helps to avoid motorists’ confusion by not introducing new signs or roadway striping (i.e., signing and striping will not be specific to the jurisdiction).

Traffic circles can be a useful traffic management device. One of their important design features is turning radius. Often large vehicles (fire trucks, waste removal vehicles, etc.) will be allowed to make a left-turn in front of the traffic circle without having to navigate around the circle. Two of the respondents, Culver City and the City of Ventura, allow large vehicles to make left-turns in front the center island.

Consultants prepare the final designs for Culver City, while Newport Beach prepares its own designs. Ventura County residents must hire their own consultant to prepare the designs.

**C. CALIFORNIA EXPERIENCES**

This section presents our opinion on what has worked best with respect to neighborhood traffic management programs and traffic calming projects, particularly within California. Our opinion is based upon our direct experiences in more than 25 communities, our research, and our review of other’s work.

Neighborhood traffic management programs differ by jurisdiction. One jurisdiction may work from a full toolbox, while a neighboring jurisdiction’s fire department refuses to allow vertical devices. One jurisdiction may include the public in the development of a treatment plan, while the neighboring jurisdiction does not. Since no two locations are the same, the best information comes from knowledge and experience of the methods and fundamentals that are working best regardless of location.
Items/Actions to Include

The following have been found to be most effective in establishing and executing a traffic calming program:

- Establish a program that sets “the rules” before developing plans for a specific neighborhood. The program defines procedures such as: who gets treatments, how devices are selected, how the treatments are funded, how consensus is defined, etc.
- Use a petition process to identify that a significant number of people are concerned about a problem, rather than allowing a single person to cause the agency to devote resources to the issue.
- Develop some type of prioritization process to identify the sequence in which eligible neighborhoods will receive attention.
- Set clear goals/purpose of the treatment plan which can be used as a benchmark to determine the success of the implemented treatment.
- Use public committees in the development of a treatment plan. Include input from non-neighborhood affected residents as well.
- Involve affected agencies (fire department, transit agencies, etc.) throughout plan development.
- Determine general public support with a vote/survey. Include a minimum response rate, but do not set it too high that it is extremely difficult to achieve.
- Prevent proposed plan from continuous altering if approval is not granted after several attempts.
- Establish funding sources. If residents are required to fund devices establish a funding mechanism to help avoid funding disputes.
- Remember that it may be necessary to develop phasing opportunities if full funding of devices is not available.
- Consult affected agencies (fire department, transit agencies, etc.) on final design of treatment. It may even be necessary to have agencies test the proposed devices before finalizing the design.
- Monitor treatments 3-6 months after implementation to determine plan effectiveness and possibly to determine next steps.
- Allow time for final step after plan implementation. Should the treatment be left as-is, should the plan be modified, or should the treatment be removed?