U.S. Experience with Traffic Calming

COMPARED WITH JURISDICTIONS OUTSIDE THE STATE, MANY FLORIDA JURISDICTIONS RELY EXCLUSIVELY ON TWO OR THREE TRAFFIC CALMING MEASURES.

BY REID EWING AND CHARLES KOOSHIAN

TRAFFIC CALMING HAS BEEN called the "most significant new idea in city planning in the last 30 years."[1] It certainly is among them. Traffic calming is part of a sea of change in the way transportation systems are viewed. Transportation planning is becoming more multimodal and more sensitive to the social costs of automobile use.[2] Our once single-minded pursuit of speed and capacity is being tempered by other concerns.[3] Traffic calming fits neatly into this new "less is more" world of ours.

Hired to develop a traffic calming plan for the town of Belleair, Florida, USA (in association with Hall Planning & Engineering of Tallahassee, Florida, USA), our first task was to learn more about the state-of-the-practice. The scattered published reports, mostly anecdotal, were insufficient to answer all questions, and assuage all concerns, of a local government about to invest in traffic calming. This prompted us to conduct the first (to our knowledge) in-depth survey of U.S. traffic calming programs, seven in our home state of Florida and 11 outside.

A written questionnaire was mailed out, and answers were recorded in lengthy, free-wheeling telephone interviews. Site visits were also conducted to see and photograph traffic calming measures around the state of Florida. A representative sample of photos appears throughout this article.

Our survey covered: types of traffic calming measures used and reasons for selecting these particular measures; before-and-after studies of traffic speed, volume and accidents; concerns of police, fire, public works and citizens, and how their concerns have been addressed; liability, lawsuits and damage claims associated with traffic calming measures; geometric design and spacing of measures; procedures followed by jurisdictions for consideration of and action on neighborhood traffic calming requests; and other thorny issues of implementation.

Figure 1. Center Island Narrowing (Orlando)

An abbreviated summary of our findings follows.

1. What traffic calming measures are used in your jurisdiction...?

(a) Florida jurisdictions use a limited array of traffic calming measures (Table 1). Individual communities typically have two or three favorites upon which they rely exclusively. Ft. Lauderdale, Florida, USA and Sarasota, Florida, USA are exceptions, testing several new measures as part of recent area-wide traffic calming plans.

(b) The jurisdictions outside Florida, most of which are acknowledged leaders in traffic calming, have experimented with more measures (Table 2). But with the exception of Seattle, Washington, USA, they too are not taking advantage of the full range of options from continental Europe, Britain and Australia.

(c) Speed controls are much more widely used than volume controls. Volume controls divert through-traffic rather than simply slowing it down. Those interviewed worry, rightly, about impacts on parallel streets.

(d) Insofar as certain measures slow traffic without causing much diversion, they are preferred in cases where residential streets will experience the spillover. This is one of the advantages of traffic circles and long speed humps, for exam-

ple, over street closures and standard speed humps.

(e) Many jurisdictions install traffic calming measures on a trial basis, at the end of which a decision is made to install them permanently or remove them. If they install temporary measures, such as construction barricades to simulate a traffic circle or plastic planters to simulate a street closure, they run the risk of public opposition solely due to aesthetics. The relatively few measures ever removed, according to our surveys, suggest the wisdom of installing permanent measures.

(f) Landscaping and other edge treatments complement engineering measures in two respects. First, they soften the appearance of speed humps and enhance the appearance of more aesthetic measures such as chicanes and traffic circles. Second, landscaping and other edge treatments can make engineering measures more effective (and safer) by highlighting the presence of the measures. Any vertical element—trees, shrubs, planters, bollards, signage—draws attention to traffic calming measures.

Figure 2. Chicane (Alachua)

(g) The need for areawide traffic calming is clear from several examples. In Gainesville, Florida, USA all-way stop signs were installed on one neighborhood street. They created a problem of cut-through traffic on another street as drivers sought to avoid the stops. The cut-through problem was solved only by treating the other street to create a circuitous route through the neighborhood.

(h) The national experience suggests that traffic calming should be planned on an areawide basis but not over such a wide area that it becomes difficult to achieve consensus on a plan. Having prepared plans for individual streets and for large subareas of the city, Portland, Oregon, USA has settled on the individual neighborhood as the optimal scale for planning purposes.

2. Do you have any before-and-after studies...?

(a) Studies of traffic calming impacts on speeds and volumes were furnished by Boulder, Colorado, USA, Ft. Lauderdale, Florida, USA, Naples, Florida, USA, Orlando, Florida, USA, Phoenix, Arizona, USA, Portland, Oregon, USA, Sarasota, Florida, USA, Seattle, Washington, USA and Tampa, Florida, USA. Additional studies have been promised by Arlington County, Virginia, USA,

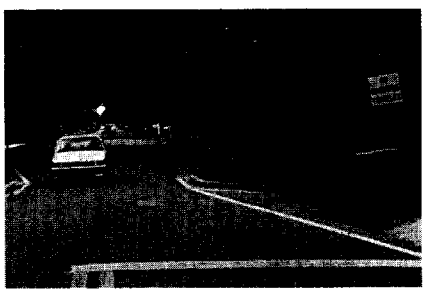

Figure 3. Choker (Sarasota)

Table 1. Traffic Calming Measures in Florida

	FT. LAUDERDALE	GAINESVILLE	NAPLES	SARASOTA	TALLAHASSEE	TAMPA
SPEED CONTROL MEASURES						
Standard Speed Humps	■	❒		■		■
Long Humps/Speed Tables	■	❒	❒	■	■	
Traffic Circles		■	■		❒	
Chicanes	■				■	■
Nubs			■	■	■	
Chokers	■		■			
Raised Junctions		❒				
VOLUME CONTROL MEASURES						
Street Closures	■	■		■		■
Full Diverters	■		❒			
Semi-Diverters	■	■	❒	❒		■
Restrictive One-Way Streets		■				■
AREAWIDE TRAFFIC CALMING	■			■		

■ measures in place ❒ measures proposed

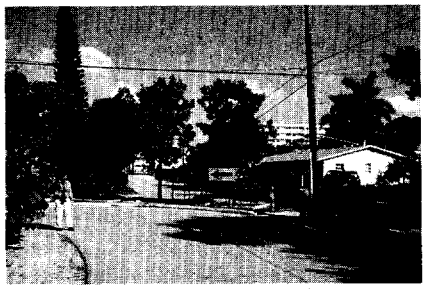

Figure 4. Full Diverter (Ft. Lauderdale)

Bellevue, Washington, USA, Berkeley, California, USA, Gainesville, Florida, USA, Gwinnett County, Georgia, USA, Howard County, Maryland, USA, Lee County and Tallahassee, Florida, USA. In our final report, we will make an attempt to summarize the mass of data from such studies.

(b) The importance of spacing between measures is apparent. Where measures are spaced far apart [600 to 1,000 feet (ft) apart], speeding occurs in-between. Where measures are closely spaced (200 to 300 ft apart), drivers have no time to speed up.

(c) On site visits, we came across a few traffic calming measures that were so clearly underdesigned that they compelled little or no reduction in speed. For speed control, there must be a sharp change in horizontal or vertical alignment. Even a dramatic narrowing may not bring speeds down appreciably.

(d) We requested data on accident rates before and after installation of traffic calming measures. One respondent commented that to her knowledge, before-and-after studies nearly always focus on speeds and volumes. She seems to be right. Only three surveyed jurisdictions have analyzed accident rates.

(e) The value of accident studies was recognized by another respondent, who noted that Seattle's success in implementing traffic calming measures may be due to its public emphasis on traffic safety. It is hard to go head-to-head with the fire chief when he is threatening

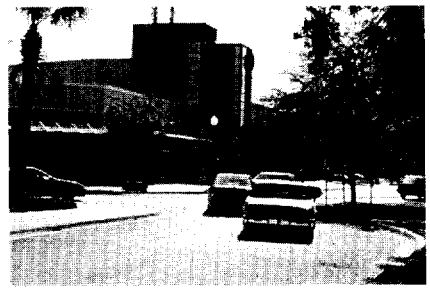

Figure 5. Jog (Tampa)

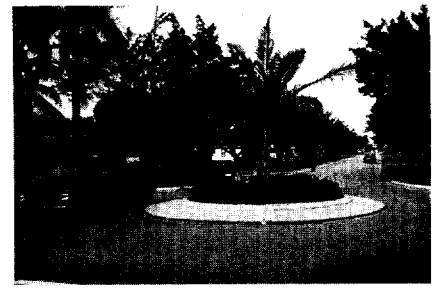

Figure 6. Mini-Traffic Circle (Naples)

longer emergency response times and you, the engineer or planner, can only offer a nicer street environment. It is easier when you are arguing one safety impact versus another.

3. Have you had problems implementing...?

(a) The response of emergency services to traffic calming measures has varied from place to place. In many places, police and fire have not reacted at all. In others, police have supported traffic calming measures but fire and ambulance services have opposed them. In a few places, such as Sarasota and Seattle, police and fire have opposed traffic calming measures initially but, after some experience, have come to support

Table 2. Traffic Calming Measures Outside Florida

	ARLINGTON Co., VA	BELLEVUE, WA	BERKELEY, CA	BOULDER, CO	GWINNETT Co., GA
SPEED CONTROL MEASURES					
Standard Speed Humps		■	■	■	■
Long Humps/Speed Tables	❒	❒	■	■	■
Traffic Circles	■	■	■	■	■
Chicanes		■	■	■	
Nubs	■	■	■	■	
Chokers		■			
Raised Junctions					
VOLUME CONTROL MEASURES					
Street Closures	■	■	■	■	■
Full Diverters	■		■	■	
Semi-Diverters	■		■		■
Restrictive One-Way Streets	■			■	■
AREAWIDE TRAFFIC CALMING			■	■	

■ measures in place ❒ measures proposed

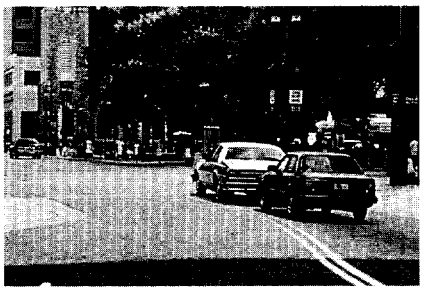

Figure 7. Nub (Jacksonville)

them. From the standpoint of emergency services, street closures and speed humps seem to be the most problematic measures.

(b) The police often support traffic calming measures for their potential to control speeding and reduce accidents. Engineering measures are self-enforcing, which takes some of the pressure off the police to enforce traffic laws. In four surveyed jurisdictions, the police also support certain measures, those restricting access, for their potential to reduce crime. Street closures are a standard strategy in the field of crime prevention through environmental design (CPTED).

(c) Fire chiefs (representing fire and emergency medical services) tend to be the most vocal critics of traffic calming. Three tactics have been used to assuage fire department concerns. One is to keep traffic calming measures off emergency response routes. In one locality, enough controversy has arisen to prompt a moratorium on new traffic calming along streets that may, eventually, be classified as emergency response routes. Two departments—traffic and fire—are working together to set limits on the number and type of traffic calming measures allowed on such routes. Another tactic is to conduct formal response time studies, as in Boulder, Portland and Sarasota. Delays are usually measured in seconds rather than minutes. The third tactic is to design traffic calming measures around the needs of fire depart-

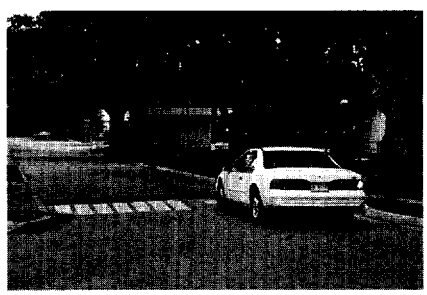

Figure 8. Raised Crosswalk (Palmetto)

Figure 9. Raised Junction (West Palm Beach)

ments. Many jurisdictions design traffic circles with mountable outer curbs or aprons, and some use removable bollards on street closures or diverters. Several are shifting to longer humps, speed tables or offset humps to accommodate fire equipment.

(d) Even doing everything possible to assuage them, fire chiefs may still oppose traffic calming measures. One fire chief is fond of saying, "One minute is a long time when you're not breathing." In such cases, the traffic engineer or planner must make his or her case based on quality of life, traffic safety and the rarity of such emergencies (compared to the constant problems of speeding traffic). With citizen support, some of those interviewed have pre-

Table 2-A. Traffic Calming Measures Outside Florida

	HOWARD Co., MD	PHOENIX, AZ	PORTLAND, OR	SACRAMENTO, CA	SEATTLE, WA
SPEED CONTROL MEASURES					
Standard Speed Humps	■	■	■	■	■
Long Humps/Speed Tables	■				■
Traffic Circles			■	❐	■
Chicanes				■	■
Nubs	■	■	■	❐	■
Chokers	■				■
Raised Junctions	■		■		■
VOLUME CONTROL MEASURES					
Street Closures		■	■	■	■
Full Diverters		■	■	■	■
Semi-Diverters		■	■	■	■
Restrictive One-Way Streets					■
AREAWIDE TRAFFIC CALMING	■			❐	■

■ measures in place ❐ measures proposed

Figure 10. Semi-Diverter (Gainesville)

vailed over stiff opposition from fire departments.

(e) With few exceptions, public works and waste management departments have been neutral about traffic calming. Often housed within the same departments as traffic engineering, collegiality prevails. In Boulder, problems of snow removal have caused the public works department to oppose standard speed humps. In Phoenix, trash collection was complicated by a semi-diverter; the problem was solved by having residents place their trash cans across the street.

4. Have any liability issues...?

(a) The issue of government liability always surfaces in discussions of traffic calming. "What if we close a street and a fire rages on?" "What if we install speed humps and a motorcyclist goes flying?" The answer seems to be, "You have little or no exposure, provided your traffic calming measures are well-designed, well-signed, well-lighted, and well-documented."

(b) Traffic calming programs structured as popularity contests, relying exclusively on neighborhood signature or ballot requirements to decide what to build, are inviting legal challenges. Those following a rational planning process are inoculating themselves. A rational process documents the existence and nature of traffic problems via speed and volume measurements; proposes traffic calming measures that are capable of solving documented problems; installs measures on a temporary basis subject to performance evaluations; and finally, takes speed and volume measurements to see if measures have performed as expected before making them "permanent."

Figure 11. Speed Table (Tallahassee)

(c) The majority of surveyed jurisdictions have had no legal problems at all, and the remainder have mostly experienced threats rather than actions. The legal threats have more often arisen from access limitations than safety concerns. And the legal maneuvering has more often involved city attorneys, concerned about potential liability, than private attorneys, claiming actual damages. In this and earlier research, no case was uncovered in which a court found a traffic calming measure unsafe or a local government negligent for installing such a measure.

(d) Six respondents have had claims against them in the wake of traffic accidents. A claim was filed against Sarasota when a motorcyclist was injured on a speed hump still under construction. While unsigned and unstriped, the hump was marked by a construction barricade, and the claim was ultimately dropped. A claim was filed against Howard County when a Corvette owner bottomed out on a raised junction; the claim, only $300, was denied by the county's risk management department. A claim was filed against Portland, and in this case a payment was made, when a contractor pulled warning signs too soon on a traffic circle that was still under construction. Boulder was sued when a driver breached signage, flags, bumper blocks and reflective pavement markers at a temporary traffic circle; the driver, whose windshield was smashed by a sign, ultimately dropped the suit without compensation. Ft. Lauderdale has paid claims for minor damage caused by vehicles striking the curbs on chokers along one particular, high-volume street. Seattle has been the object of threats (often for *failure* to calm traffic) and a number of damage claims following accidents. Payouts are infrequent, typically for $200 or less and are most often prompted by inadequate signage.

(e) In two or three jurisdictions, opponents of traffic calming have challenged the legality of measures on the ground that they do not appear in the *Manual of Uniform Traffic Control Devices* nor in other national manuals. Berkeley, whose traffic calming program dates back the furthest (to a 1974 traffic management plan), was sued in the early years for installing diverters. The matter was settled when the California legislature declared them legal traffic control devices. Over time, as installations have become commonplace, arguments over the legality of traffic calming measures have become academic.

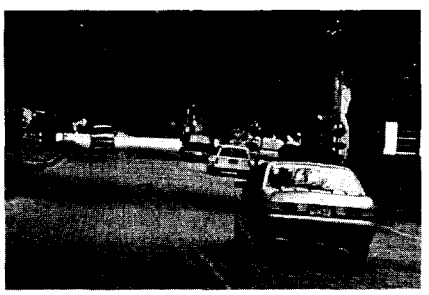

Figure 12. Textured Pavement (Orlando)

5. How have neighborhood residents reacted...?

(a) Most places surveyed report that traffic calming is a big winner politically. While a few citizens always complain about traffic calming measures, they are far outnumbered by supporters. The supporters are from the traffic-calmed neighborhoods and are intense in their support. The opponents are usually from other parts of town and are lukewarm in their opposition.

(b) As an example of traffic calming's political appeal, Ft. Lauderdale gave each of 10 city neighborhoods $100,000 for physical improvements of their choice. To the surprise of city staff, neighborhoods spent their funds almost entirely on traffic calming, and Ft. Lauderdale ended up with more traffic calming measures than anywhere else in Florida.

(c) Public support for traffic calming is also evidenced by the relatively few cases in which measures have been

removed. In most jurisdictions, the need to remove measures has been limited to a few isolated cases. Gainesville reports that 95 percent of all measures installed on a temporary basis become permanent. Of Seattle's 600-plus traffic circles, only two have been taken out at the request of neighbors. Of Portland's 300-plus speed humps, two have been removed due to improper construction, but both were replaced at the same locations. In 12 years of active programming, Bellevue has had to remove only one installation due to neighborhood opposition.

(d) One reason why so few measures are removed is the show of neighborhood support usually required to install measures in the first place. This prescreening seems to eliminate later problems. Before Phoenix adopted a 70 percent approval requirement in 1993, traffic calming measures had to be taken out occasionally. Since then, there have been no such cases. Bellevue's phased program, which starts with education and enforcement and escalates only if they fail, virtually guarantees neighborhood backing when the time comes for engineering measures. ■

References

1. Sucher, D. *City Comforts—How to Build an Urban Village.* Seattle, WA: City Comforts Press,1995:127.

2. Ewing, R. *Transportation and Land Use Innovations.* Chicago: American Planning Association (in cooperation with the Surface Transportation Policy Project and the Institute of Transportation Engineers), 1997.

3. Ewing, R. "Beyond Speed—The Next Generation of Transportation Performance Measures." In D. Porter (ed.), *Performance Standards for Growth Management.* Chicago: American Planning Association, 1996:31–40.

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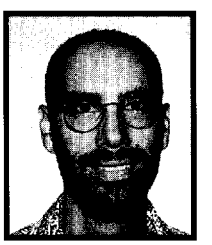

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