



TRAFFIC CALMING

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MUNICIPAL
IMPLEMENTATION
TOOL #11

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Commission

What Is Traffic Calming?

Traffic calming is a Context Sensitive Solution (CSS) that uses mainly physical measures to alter driver behavior in order to fit the surrounding context. A CSS is an approach to transportation that respects the setting of the communities through which roadways pass. The result is an enhanced user experience for bicyclists and pedestrians with an emphasis on safety. Traffic calming is grounded in the principle that some roadways, namely residential and local streets, do not exist solely to facilitate automotive use. Roadway design should complement the local context and create a sense of place, meeting the needs of all users. This approach is often referred to as complete streets—accommodating drivers, transit riders, pedestrians, and bicyclists, as well as older people, children, and people with disabilities. In addition, traffic calming principles are consistent with Smart Growth values, which support the creation of walkable communities that provide a range of transportation choices.



View of a traffic circle in Princeton Junction, NJ. A traffic circle is one horizontal traffic calming measure used to help reduce travel speeds.

Source: Webshots online photo gallery

The Institute of Transportation Engineers (ITE) identifies the following as goals of traffic calming:

- Increasing the quality of life.
- Creating safe and attractive streets.
- Helping to reduce the negative effects of motor vehicles on the environment (e.g., pollution, sprawl).
- Promoting pedestrian, bicycle, and transit use.

ITE lists the following objectives of traffic calming:

- Achieving slow speeds for motor vehicles.
- Reducing collision frequency and severity.
- Enhancing the street environment (e.g., streetscaping).
- Increasing access for all modes of transportation.
- Reducing cut-through motor vehicle traffic.

This brochure is part of a series published by the Delaware Valley Regional Planning Commission (DVRPC) in support of the region's adopted long-range plan, *Destination 2030*. Additionally, it draws on aspects from the manuals listed below to provide an overview of the current state of traffic calming in the Delaware Valley region. Traffic calming is included in the bicycle and pedestrian component of *Destination 2030*, which states: "DVRPC promotes the implementation of traffic calming techniques in a context sensitive approach." By recasting roadways to match the surrounding context, traffic calming can help communities meet many of *Destination 2030's* goals, including the consideration of the land use impacts of transportation investments, the coordination and integration of transportation modes, and guaranteeing the safety and security of all users.

State policies in both New Jersey and Pennsylvania support traffic calming. The New Jersey Department of Transportation (NJDOT) has updated its roadway design manual to include traffic calming. The Pennsylvania Department of Transportation (PennDOT) published *Pennsylvania's Traffic Calming Handbook* in 2001. It provides guidance for PennDOT when considering the use of traffic calming techniques on state roadways, and provides municipalities with information on establishing a traffic calming program in their jurisdiction.

NJDOT and PennDOT, in conjunction with DVRPC, are currently drafting a joint publication: *Transportation Design Guidelines for Smart Growth in New Jersey and Pennsylvania*. The manual is expected to be released in the summer of 2007. It will support CSS and traffic calming by identifying roadway and roadside design values appropriate for different types of roadways in a variety of land use contexts,



recommend a process for implementing context-sensitive design projects, and provide guidelines for improving the transportation system in accordance with context-sensitive and Smart Growth principles.

Raised speed humps on a residential street in Voorhees, NJ.

Source: *Webshots online photo gallery*

Traffic calming can be pursued at a variety of levels, from **engineering** solutions to **education** campaigns and increased police **enforcement**. At the **policy** level, regulatory tools can be tailored to increase transportation choices and access.

The policy of traffic calming covers two areas: retrofits of existing problem areas and standards for new construction. The implementation of traffic calming retrofits requires a comprehensive approach. A framework to rank projects based on roadway characteristics and factors, such as vehicle speed, crashes, and proximity to schools should be established. Opportunities to add traffic calming measures when resurfacing roadways should be analyzed. Ideally, a retrofitting policy would be integrated into the transportation component of the local comprehensive plan.

Municipalities can avoid disruptive and costly retrofits by altering subdivision and land development ordinances to include traffic calming measures in new construction. If roadways that complement the surrounding land use are created at the outset, conflicts requiring corrective traffic calming measures are less likely in the future. For instance, requiring narrow lane widths in residential areas may lead to drivers exercising additional care and engaging in behavior more appropriate for a residential setting.



Some techniques used to alter driver behavior result in other attractive benefits beyond fulfilling traffic calming. For instance, bike lanes create a safe zone for cyclists and support alternative transportation modes.

A combined treatment with a chicane and center island.

Source: Fehr & Peers

Finally, the policy approach to traffic calming shares the proactive Smart Growth planning approach by setting standards that maintain mobility, create connectivity, and promote safety.

Education:

Education-based traffic calming measures include programs designed to regulate, warn, and educate motorists, bicyclists, and pedestrians. . The main drawback of this approach is that the benefits tend to be temporary. The education and safety programs listed below are typically low cost and can be implemented quickly.

- **Neighborhood Traffic Safety Campaigns** distribute mailings to residents citing statistics on speeding with the purpose of appealing to residents' sensibilities regarding the benefits of complying with traffic laws.
- **Drive 25 Campaigns** use advertising and media coverage to inform motorists of the community benefits of traveling at the speed limit. Increased policing can bolster the effectiveness of this program.
- **Safe Routes to School** funds a variety of initiatives that empower communities to make walking and bicycling to school a safe and routine activity.



*Window stickers like this one are displayed throughout Haddonfield as a reminder to residents to drive appropriately.
Source: DVRPC*

Enforcement:

Police enforcement is a means of raising awareness at select problem locations. It is cost prohibitive to simultaneously target multiple locations using enforcement. Although the influence of enforcement on driver behavior is temporary, strategic enforcement is a practical complementary strategy to educational efforts.

Enforcement techniques that do not require additional manpower are less costly. Examples of this approach are radar speed trailers and the *Neighborhood Speed Watch* program. A radar speed trailer displays a car's speed as it approaches; it is mobile and can be sited as needed. *Neighborhood Speed Watch* empowers local residents to act as extra sets of eyes for the police. Residents record license plate numbers of speeders and then forward this information to local police to warn the owners of the offending vehicles.

Engineering:

The purpose of **volume control measures** is to discourage or eliminate through traffic. The following table shows the most common engineering treatments used to control volume on a roadway:

Full-street Closures	Barriers placed across a street to close the street completely to through traffic, usually leaving only sidewalks or bicycle paths open.
Half-street Closures	Barriers that block travel in one direction for a short distance on otherwise two-way streets. Half-street closures are often used in sets to make travel through neighborhoods with grid streets circuitous rather than direct.
Diagonal Diverters	Barriers placed diagonally across an intersection, blocking through movement. Like half closures, diagonal diverters are usually staggered.
Median Barriers	Raised islands located along the centerline of a street and continuing through an intersection so as to block through movement at a cross street.
Forced Turn Islands	Raised islands that block certain movements on approaches to an intersection.

The purpose of **speed control measures** is to slow traffic with **vertical** treatments, **horizontal** treatments, and **narrowing**. Vertical treatments reduce speed via small changes in roadway elevation, such as:

Speed Humps	Rounded raised areas placed across the road.
Speed Tables	Flat-topped speed humps often constructed with textured materials on the flat section. Speed tables have higher design speeds than humps.
Raised Intersections	Flat-raised areas covering entire intersections with ramps on all approaches. They make entire intersections pedestrian territory.
Textured Pavements	Roadway surfaces paved with brick, concrete pavers, stamped asphalt, or other surface materials that produce surface relief.

Horizontal measures achieve speed reductions via curves and limited sightlines of the road ahead, including:

Roundabouts	Raised islands, placed in intersections, around which traffic circulates.
Chicanes	Curb extensions that alternate from one side of the street to the other, forming S-shaped curves.
Lateral Shifts	Curb extensions on otherwise straight streets that cause travel lanes to bend one way and then bend back the other way to the original direction of travel.
Realigned Intersections	Changes in alignment that convert T-intersections with straight approaches into curving streets that meet at right angles.

Narrowing limits roadway width to reduce speed. Examples include:

Neckdowns / Bulb-outs	Curb extensions at intersections that reduce roadway width curb to curb. Their primary purpose is to “pedestrianize” intersections by shortening crossing distances.
Center island	Raised islands located along the centerline of a street that narrow travel at that location. They are called “gateways” when located at a neighborhood entrance.
Chokers	Curb extensions at midblock that narrow a street by widening the sidewalk or planting strip.



*A full closure has been a boon for commercial activity on Church Street in Burlington, VT.
Source: Church Street Marketplace*

A common concern is that traffic calming measures may hinder emergency response times. According to *Pennsylvania's Traffic Calming Handbook*, a speed hump causes delays from 0-9 seconds, while roundabouts cause 1 to 11 seconds of delay. Electing not to install such traffic calming treatments on roadways that are major emergency response routes is one option. However, features like roundabouts and medians can be designed with skirts to allow emergency vehicles to simply drive over them. Impact on snow removal is a common concern, but when the locations of traffic calming treatments are clearly identified, municipalities have found the impact to be minimal. With any traffic calming program, it is vital that emergency responders and road crews be consulted during design and implementation.

Many of the emergency vehicle concerns with respect to speed humps and roundabouts also apply to transit vehicles. Additionally, bulb-outs at intersections may make it difficult for buses to pick up and drop off passengers. Coordination with transit agencies is essential to ensure that accessibility and convenience are not hampered.

Another concern regarding traffic calming treatments is the possible impact on drainage. It is true that poorly-sited bulb-outs and chicanes can impact drainage and lead to the accumulation of ice/water.

However, when properly designed, these features can serve as filtering strips that improve stormwater management.

Finally, traffic calming must accommodate all people in the community. Measures that impact pedestrian travel must be designed to meet the requirements set forth in the Americans with Disabilities Act (ADA).



Pedestrian walkway over grassy swale with culvert for stormwater runoff.

Source: Auto Zone, Pittsburg, CA. RHL Design Group

Funding is available from a variety of agencies that realize the significant benefits in safety, mobility, and aesthetics that result from the implementation of traffic calming techniques.



NJDOT funds traffic calming planning and implementation through the Local Technical Assistance Program (LTAP).

See <http://www.ltap.rutgers.edu/>



Pennsylvania municipalities may use Liquid Fuels funds for traffic calming if a "Traffic Calming Study and Approval Process" has been completed.

See <http://www.dot.state.pa.us/>



The Transportation and Community Development Initiative (TCDI) is a DVRPC grant program that funds planning and design for traffic calming treatments, sidewalks, and bike lanes in the region's core communities.

See <http://www.dvrpc.org/planning/tcdi.htm>



HOME TOWN STREETS
safe routes to school

The federal Safe Routes to School program awards each state a minimum of \$1,000,000 per year. Projects, such as sidewalk improvements, traffic calming, and off-street bicycle and pedestrian facilities, should improve students' ability to walk or bicycle to school.

See <http://safety.fhwa.dot.gov/saferoutes/> and contact DVRPC if interested in applying



Transportation Enhancements (TE) are community-based projects funded under the federal Surface Transportation Program. TE are "nontraditional"

projects designed to strengthen the cultural, aesthetic, and environmental aspects of the transportation system. Projects include bicycle and pedestrian trails and downtown streetscape improvements, both of which have traffic calming implications.

See <http://www.fhwa.dot.gov/environment/te/index.htm> and contact DVRPC if interested in applying

Pottstown Borough, Pennsylvania is a town of 21,000 in western Montgomery County. In 2003, Pottstown secured the permission of PennDOT to reconfigure High Street, its main thoroughfare, to better accommodate a range of user groups.

High Street was narrowed from four lanes to one lane in each direction, with a center turn lane and five-foot wide bike lanes on each side. Parallel parking was retained on the south side of High Street; however, back-in angle parking was established on the north side. This unique design increased downtown parking capacity by 21 percent. The new roadway configuration has aided downtown revitalization by slowing traffic, increasing on-street parking near stores, encouraging bicycling, and improving the safety of pedestrian crossings. As part of the Bike Pottstown program, additional bike lanes and traffic calming techniques are planned for future installation in other parts of the borough.

Design of the project was partially funded by DVRPC through a TCDI grant.



High Street
BEFORE Improvements

High Street
AFTER Improvements



*Source: Save Our Land,
Save Our Towns, Inc.*

Haddonfield Borough, in Camden County, New Jersey, conducted a comprehensive traffic calming study during the winter of 2004-2005. The study identified five areas that could benefit from traffic calming and offered “initial improvement concepts” for each. The first area to be implemented, Lincoln Avenue, was given priority due to high levels of cut-through traffic and proximity to a school. Improvements thus far consist of raised intersections and curb extensions.

Instrumental to the effort was a citizens’ committee called the Haddonfield Transportation and Pedestrian Safety Committee (TAPS).



TAPS identified problem locations for study and garnered local political support, which helped to secure state funding. Haddonfield’s program was a success due to broad-based support from municipal, county, and state governments, as well as from residents.

In addition to spearheading the traffic calming study, TAPS organizes an annual, weeklong *Drive 25* campaign during which citizens are reminded of the safety and quality-of-life benefits that accrue from reductions in vehicle speed through town. Haddonfield demonstrates how applying an integrated approach to traffic calming using the three E’s leads to success.

Downtown Haddonfield
 Source: Haddonfield Borough website



Haddonfield Business Improvement District
 Source: Haddonfield Borough website

"About Smart Growth." Smart Growth Network. <http://www.smartgrowth.org/about/default.asp>

"Context Sensitive Solutions." U.S. Department of Transportation, Federal Highway Administration. <http://www.fhwa.dot.gov/csd/index.cfm>

Ewing, Reid. *Traffic Calming: State of the Practice*. Institute of Transportation Engineers. 1999.

Hylton, Thomas. "The Walking Life." *Planning*. American Planning Association. February 2007.

"New Jersey FIT: Future in Transportation." New Jersey Department of Transportation. <http://www.state.nj.us/transportation/works/njfit/>

Pennsylvania's Traffic Calming Handbook. PennDOT Publication No. 383. January 2001.

Streetscape Master Plan: Better Streets San Francisco. San Francisco Public Utilities Commission. April 2007.

"Traffic Calming." Fehr & Peers Transportation Consultants. <http://www.trafficcalming.org/index.html>

Traffic Calming Toolkit. City of San Jose Department of Transportation. November 2001.

Created in 1965, the **Delaware Valley Regional Planning Commission (DVRPC)** is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC's website may be translated into Spanish, Russian, and Traditional Chinese online by visiting www.dvrpc.org. Publications and other public documents can be made available in alternative languages or formats, if requested. For more information, please call (215) 238-2871.



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