

M A S S INTERCHANGE

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Traffic Calming...

Traffic calming is a term used for actions that reduce the amount of street traffic and the speed of motor vehicles within residential and local service areas, making neighborhoods safer and more oriented to people. This is intended to keep arterial traffic on arterials and local traffic on local roads. Therefore, implementation of traffic calming geometric restraints should not be applied to arterial roadways.

Traffic calming has four objectives:

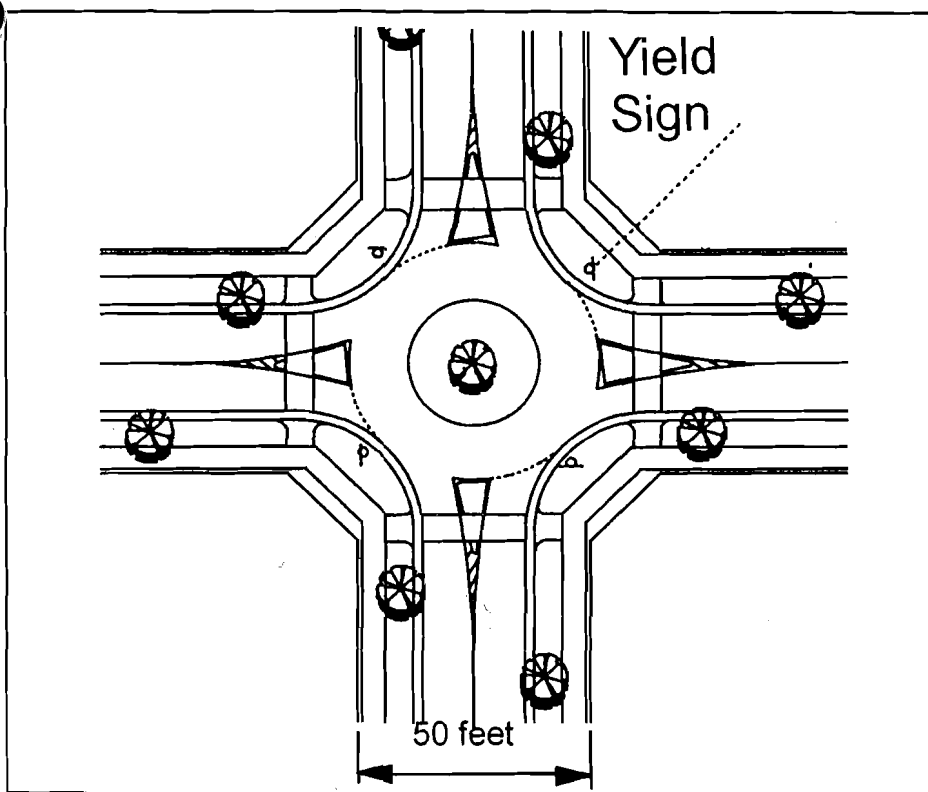
- Eliminate potential accident sites
- Minimize pollution and noise
- Recapture urban space for people
- Achieve harmony in scale and appearance

Traffic calming has become a subject of great interest to many city and county engineers throughout Massachusetts. Increasing traffic volumes on the arterial street network

are shifting drivers onto the local street networks, resulting in a general decline in the quality of life for residents who live on the local roadways. This has led to an increasing number of requests made by citizens to "calm" the traffic in their communities.

One of the ways traffic is being calmed is through the incorporation of devices which alter the appearance or actual geometry of the roadway. An illustration can be found to the left. It is the intent that these devices will either make drivers seek alternate routes, or by creating a sense of shared space between the driver and resident, make them want to slow down on the local roads. The great majority of traffic calming devices make slight alterations to the street's geometry, reducing its real or perceived width, or causing the driver to negotiate curvature or pavement texture. These modifications, almost always made within the public right-of-way, are usually accompanied by extensive landscaping, and serve as neighborhood landmarks as well as traffic calming devices. Borrowing heavily from European and Australian experience, U.S. cities have installed hundreds, possibly thousands, of traffic calming devices over the past decade. Originally seen as devices to "retrofit" existing streets, traffic calming is now also seen as part of original street design in new communities.

continued on pg. 7



Example of local street roundabout design

Choosing the Successful Solution!

A successful traffic calming project will not only depend on whether or not traffic speeds or volumes are reduced, but also on whether or not the residents and businesses who are directly affected approve of the device. Since the public is often the one to initiate the desire to have the traffic calmed in their community, it is crucial that they be involved in the decision-making process. Engineers and city officials must work with the public to first define the actual program, develop options, and then work with residents and service providers, including fire, emergency, maintenance crews, and school and transit officials, to determine what the best solution may be. Funding should also be addressed early on in the decision-making process so as to avoid any problems in the future. Residents may object strongly to the installation of a traffic calming device if they are misled or did not receive fair warning that they would be assessed for the improvements.

In addition to community involvement, designers must give careful consideration to the overall design plan. Traffic calming projects which not only solve the problem at hand, but also add to the residents' general quality of life will be perceived as more successful. Success becomes heightened when amenities such as environmental enhancements, including additional greenery, are incorporated into the design plan. It is also important for designers to incorporate the needs of all members of the community. Pedestrians, bikers, and people with disabilities may experience a decline in quality of life if the device makes it difficult for them to move about in their community. For this reason,

sidewalks, bike paths, and wheelchair access ramps should be provided wherever possible, along with proper lighting, to ensure residents' safety.

A good design plan also pays careful attention to the architecture of the community. Traffic calming devices which match existing structures in the community and are aesthetically appealing will generate much more positive reactions. Experimental, temporary devices can be installed whenever possible allowing for a low cost trial of one option. Residents should be forewarned that the device is only temporary and, if installed permanently, will be much more aesthetically pleasing.

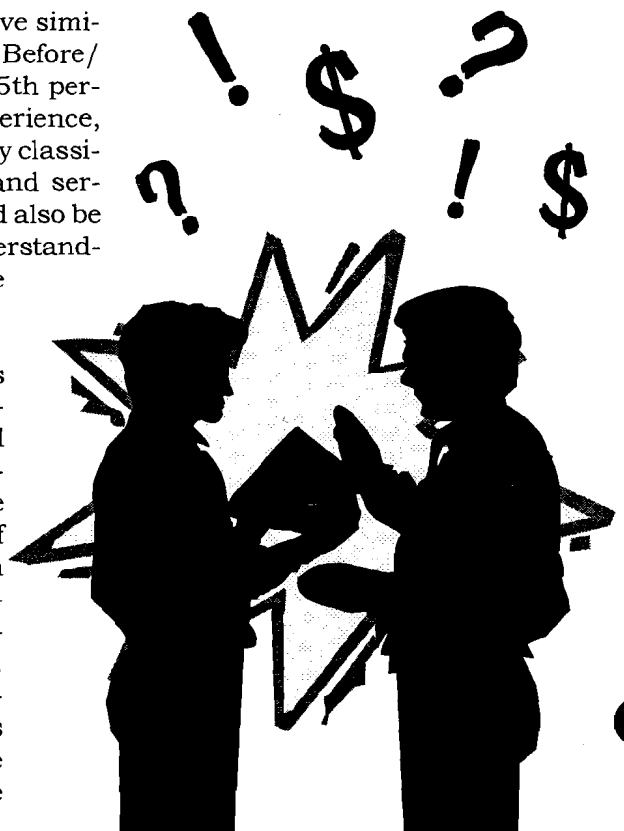
It is also important to collect and document the public's reactions to the traffic calming devices both before and after implementation. This will not only assist in selecting alternative measures to solve the current problem, but will help to solve similar problems in the future. Before/after data including ADT, 85th percentile speed, accident experience, residents' reactions, roadway classification, funding sources, and service provider impacts should also be collected to gain a better understanding of how the devices are affecting driver behavior.

Since traffic calming devices often are installed at the request of citizens, devices will often be retrofitted to existing roadways. To minimize the intrusion into the lives of the community, construction should be carefully scheduled and monitored to assure quality workmanship. Residents may view the device negatively if contractors have to come back to make changes or repairs or if the

project goes beyond the proposed finish date. Therefore, engineers and city officials should take any measure necessary to ensure that projects go smoothly, disruption is held to a minimum, and deadlines are met.

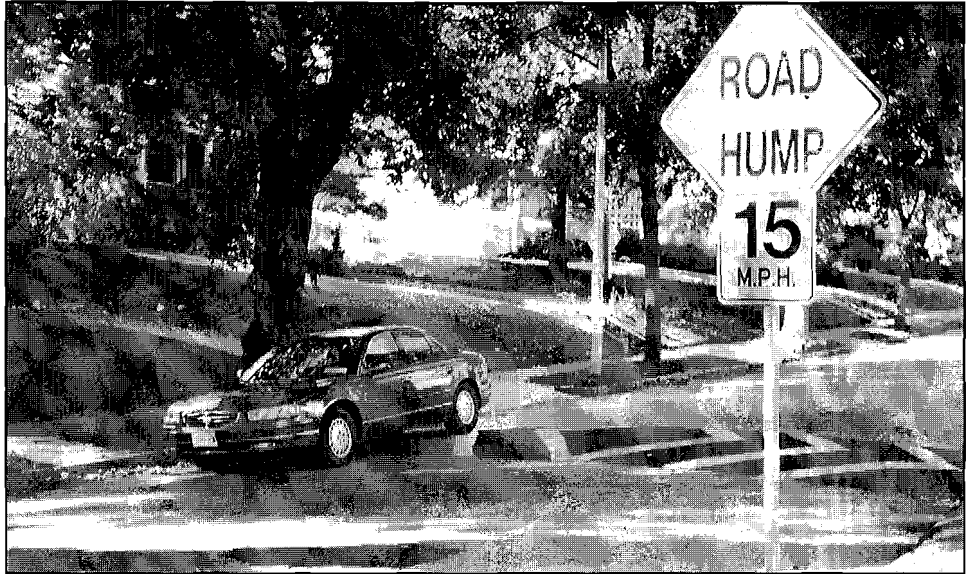
Not only is the implementation process important, but it is also crucial that the most appropriate traffic calming device be installed and that it be effective. Success will depend on the intended purpose of the device, estimated cost, pros and cons, service provider impacts, residents' reactions, and overall effectiveness. A list of the most common traffic calming devices, which can be grouped in the five categories, is shown on page 4.

Extracted from Effective Traffic Calming Applications and Implementation, Minnesota Local Road Research Board, October 1998.



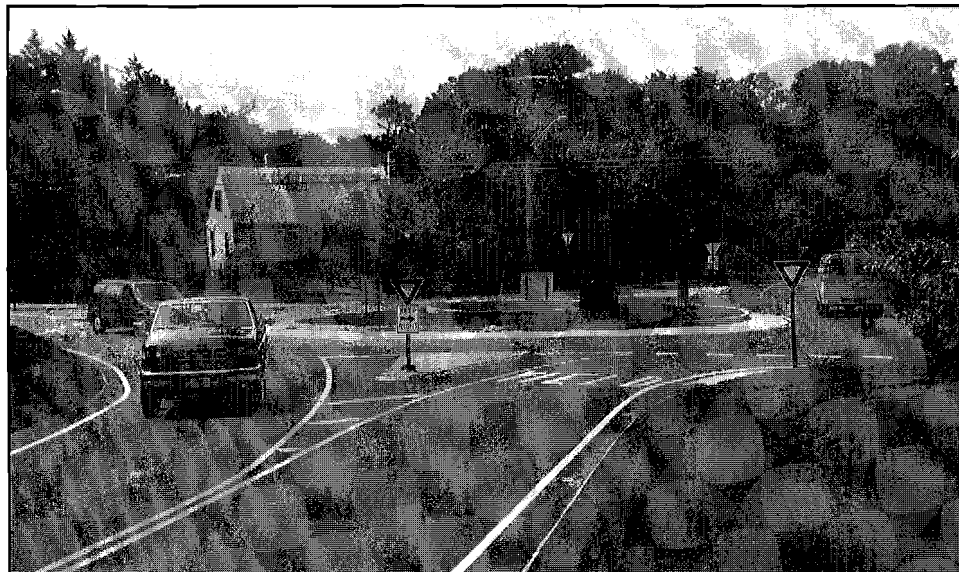
A Tale of Two Cities in Massachusetts

The **City of Worcester** has been experimenting with traffic calming devices in response to requests from residents in two neighborhoods. Two speed humps on two streets have been installed based on complaints of speeding in residential areas, especially during rush hours. The object is to slow traffic and discourage use of these streets by creating obstacles. The city's traffic engineering division will evaluate the effectiveness of these measures in reducing the volume and speed of traffic. According to Ali Khorasani, P.E. and principal traffic engineer, particular attention will be paid to any shifts in volume from one street to another with these installations over the one-year trial period. Mr. Khorasani said that the engineering division has worked with police, fire officials, and other service providers to make sure that their abilities are not diminished with these measures. An evaluation impact report will be submitted to the City Council which will decide whether to expand the use of these devices. Neighborhood residents, who initially petitioned the city, will be interviewed for their reactions to the advantages or disadvantages created.



Speed hump installed on Westland Street, Worcester, MA

The **Town of Barnstable** looked at intersections where there were long delays and decided that Race Street & Rt. 149 was ideal for a successful traffic calming installation. It met the threshold for number of vehicles at each leg and, afforded enough space for a roundabout, eliminating the need for land taking. John Hunter, P.E. and project engineer, has overseen this project from the beginning and was convinced of this philosophy after attending a Baystate Roads training course. Tom Mullins, director of the DPW, was a driving force in selling the plan to various officials, agencies, and the public. A major PR campaign alerted the public of a temporary installation with signage and lighted barrels while the design was tested. Traffic was also shut down for a day to adjust the



Traffic calming installation at Race Street & Rte. 149, Barnstable, MA

geometry and physical tests performed for the largest turning radius. "Although there was some confusion at first, it has caught on especially with commuters who do not have to wait in mile-long traffic anymore," said Mr. Hunter. "Trucks had initial difficulty negotiating the circle but adjustments were made to this intersection that used to be a 4-way stop." The engineering division has received both compliments and criticism, but overall the roundabout has been favorably received. Next time you are on the Cape, check out the final beautification stage which has its own landscape irrigation system because a water source "just happened to be near the site."

Traffic Calming Applications

Application

Purpose

Effectiveness

STREET WIDTH ADJUSTMENTS

Street Narrowing	Loss of pavement width will cause drivers to slow down	Little/no effect on volume; vehicle speed changes insignificant; minimal effect on traffic accidents
Chokers	Narrow road widths cause drivers to slow down; also facilitates pedestrian crossings	Volumes may be reduced if one direction traffic used; pedestrian safety improved
Median Islands	Reduce road width; cue drivers to pedestrians; provide pedestrian refuge	Pedestrian safety; minimal influence on drivers
On-Street Angled Parking/ Protected Parking Bays	Reduce roadway widths, causing reduced vehicle speeds	Effective at reducing speed

TRADITIONAL TRAFFIC CONTROL TECHNIQUES

Vehicle Restrictions	Prohibits vehicles from entering a roadway	Traffic volumes reduced dramatically on streets if sign is enforced
Turn Restrictions	Prohibits vehicles from entering a roadway	Extremely effective where cut-through traffic is a problem
One-Way Streets	Controls traffic in residential neighborhoods	Diverging/converging one-way reduces volumes of cut-through traffic; alternating one-ways have no effect on volume; one-way pairing increases volume on one street/decreases volume on adjacent streets
Variable-Speed Display Board	Influences behavior by alerting drivers of actual speed	Speeds reduced; little effect on traffic volume
Marked Crosswalks	Protection for pedestrians; alerts drivers to slow down	No vehicle speed reduction; more effective if combined with chokers or pinch points
Stop Signs	To slow traffic	Reduces speed only near sign; overuse can encourage acceleration between signs
Basket-Weave Stop Signs	Allows some control in residential areas	Extremely effective at reducing accidents

Application

Purpose

Effectiveness

VERTICAL OR HORIZONTAL REALIGNMENTS

Speed Humps	Reduces vehicle speeds	Very effective at reducing speed
Speed Bump	Reduces vehicle speeds	Effective at reducing speed
Speed Table	Reduces vehicle speeds	Reduces speed and volume
Traffic Circle	Reduces number of angle/turning collisions; slows traffic	Lowers speed and collisions
Roundabout	Reduces queues/accidents	Reduces accidents; shorter delay times; improves capacity
Chicane	Reduces traffic speed	Effectively reduces speed

ROUTE MODIFICATION

Street Closure (cul-de-sac)	Eliminates cut-through traffic	Very effective at reducing traffic volumes and speed
Diagonal Diverter	Reduces traffic volume	Very effective at reducing traffic volume
Semi-Diverter	Reduces traffic volumes	Reduces traffic volume
Median Barriers	Reduces traffic volume if significant number of left turn movements at site	Very effective at reducing traffic volume; some speed reduction

PERCEPTUAL ENHANCEMENTS

Streetscape material or landscape plantings	Encourages driver concentration	Reduced speed
Change in road surface material or color	Breaks up monotony which encourages driver concentration	Reduced speed

Information for this chart was culled from Effective Traffic Calming Applications and Implementation produced by the Minnesota Local Road Research Board. The full book can be obtained from Baystate under publication number TRA-66.

Traffic Calming: Is It Right for Your Community?

To avoid congestion on our major roadways, especially during the construction season, many motorists resort to using local streets. Unfortunately, they often ignore speed limits, causing residents to express concern about the safety and livability of their neighborhoods. In response, some areas are exploring "traffic calming" strategies to correct traffic problems. Possible ways to implement traffic calming devices can be found on pages four and five of this issue of *Mass Interchange*. However, prior to actually installing any type of traffic calming device in your community, you should consider three important items.

Determine the Appropriate Technique

Not all traffic calming techniques are equally effective at addressing all undesirable traffic characteristics. For example, the installation of additional STOP signs has proven very effective at improving traffic safety, only marginally effective at reducing vehicle speeds, and ineffective at reducing traffic volumes. Speed humps/bumps, on the other hand, have proven to be very effective at reducing vehicle speeds, marginally effective at reducing traffic volumes, and ineffective at improving traffic safety. Therefore, the initial step should be to conduct a

traffic engineering investigation to identify the problem. You should follow this with an effort to evaluate alternative techniques and then determine the most appropriate solution for the documented site-specific problem.

Be Aware of Liability Issues

Nationally, standards have been set for speed humps by the Institute of Transportation Engineers and for roundabouts in the new *Manual on Uniform Traffic Control Devices* (MUTCD); the latter should be available within the next 18 months. Sections of this revised MUTCD will be released as they are completed. These established guidelines should be followed to avoid exposure to liability associated with the

deployment of traffic calming devices.

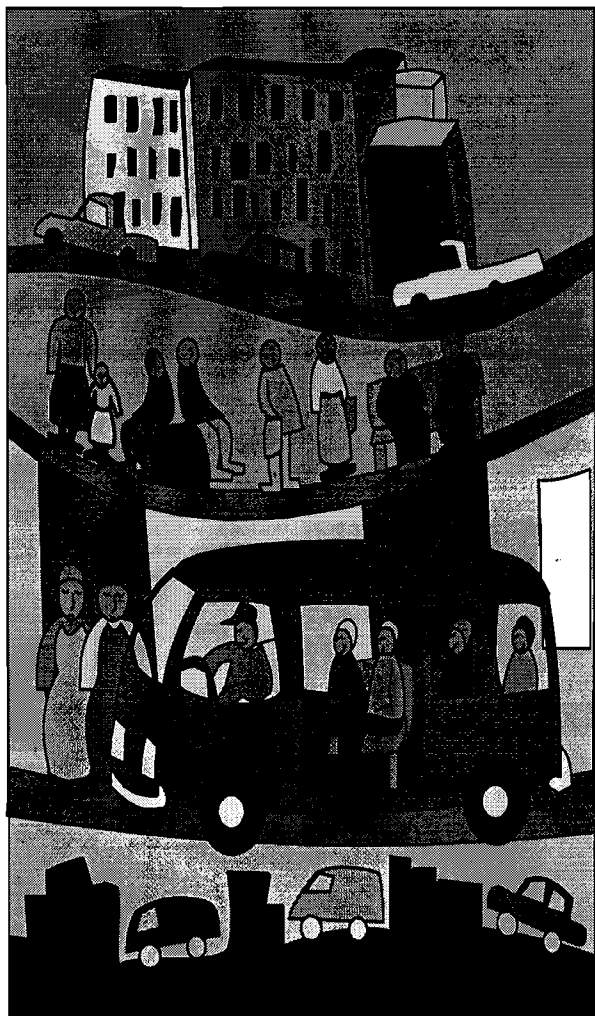
There have been several methods of handling claims of negligence in the past. One technique included first conducting a study that both documents the magnitude of the problem and then identified and evaluated a variety of alternatives before arriving at a preferred recommendation. The second method involved having the decision-making body adopt written policies relative to the deployment of various traffic calming devices. All traffic engineers' decisions relative to deployment fell under the umbrella of discretionary immunity.

Diagnose the Disease, Not the Symptom

It should be noted that many traffic problems on local streets are symptoms of major problems on nearby arterials. Traffic volumes or vehicle speeds may be too high because vehicles have diverted from a heavily congested parallel route. If this is the case, deploying traffic calming on a local street would likely result in merely shifting the problem to an adjacent local street if the problems on the arterial are not also addressed.

The Institute of Transportation Engineers (ITE) has two publications that provide additional information about traffic calming: *The Traffic Engineers Tool Box* (Chapter 23), and *Neighborhood Traffic Control* (prepared by the North Central Section ITE and available from MN/DOT's Office of Traffic Engineering).

Extracted with permission from Technology Exchange, Minnesota LTAP, Vol. 4, Issue 2.



publications and videos



Please FAX your requests by code number to Baystate Roads at 413-545-6471 or call 413-545-2604.



PUBLICATIONS

- | | |
|--|--------|
| Traffic Calming | TRA-45 |
| Neighborhood Traffic Calming Program: Speed Humps | TRA-60 |
| Take Back Your Streets: How to Protect Communities from Asphalt and Traffic | PLA-44 |
| Effective Traffic Calming Applications and Implementation | TRA-66 |
| Intelligent Transportation Systems: The Future of Transportation Starts Here | PLA-48 |



VIDEOS



- | | |
|--------------------------------|--------|
| Traffic Barriers | MO-181 |
| Building a Notched Wedge Joint | DC-169 |

Traffic Calming (continued)

Why Calm Traffic?

Traffic calming measures are proposed in response to these widely-experienced problems:

Cut-Through Traffic

Cut-through traffic has neither its origin nor its destination within the neighborhood, but rather is passing through the neighborhood on its local streets. Traffic engineers intend that through traffic use the major arterial streets, not neighborhood streets. This does not always happen, and cut-through trips seek out the local streets, sometimes because they are faster, and often because they are more pleasant and, therefore, seem to be faster.

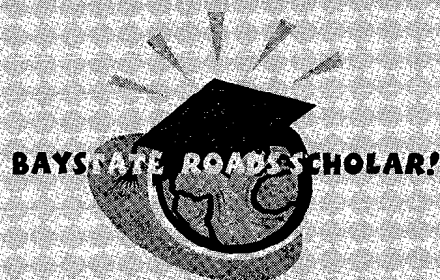
Many motorists (neighborhood residents as well as "cut-throughs") drive too fast on local streets. While some speeding is by irresponsible drivers, the majority is done by normally responsible drivers who find themselves "invited" to speed by the road's design features, such as excessively wide pavements, straight sections of road, and absence of vegetation. In addition to safety issues, speeding vehicles degrade the quality of the street for all other users, signaling that the street is extremely devoted to traffic, imparting a general feeling that things are "not right" in the neighborhood.

Excessive traffic speeds are a threat to neighborhood security, causing residents to retreat into their homes, essentially abandoning the street to vehicles and whoever else wants to claim it. Reducing traffic speeds and volumes through traffic calming measures are powerful ways for residents to start to reclaim their streets for their own needs.

Wide expanses of pavement devoted solely to the movement of traffic have taken over much of our communities in the name of "traffic service." Traffic calming provides the opportunity to use streets not only for moving cars, but also as an aesthetically pleasing focal point for the community.

Extracted from Vermont Local Roads News, March 1994 and Effective Traffic Calming Applications and Implementation, October 1998.

Congratulations to the newest Baystate Roads Scholars on their fine achievement. Keep saving those certificates and you could also be listed here!



**LARRY CALDWELL
AYER DPW**

**THOMAS EMERICK
NORTHBRIDGE DPW**

**ANDREA FOURNIER
FALL RIVER DPW**

**DAVID KIDDER
AYER DPW**

**MERYL ANN MANDELL
SOUTH HADLEY DPW**

**RICHARD F. STINSON
DANVERS DPW**

A SHORT COURSE IN HUMAN RELATIONS

The 6 most important words:

"I admit I made a mistake."

The 5 most important words:

"You did a good job."

The 4 most important words:

"What is your opinion?"

The 3 most important words:

"If you please."

The 2 most important words:

"Thank you."

The 1 most important word:

"We"

The least important word:

"I"

in this issue...

Traffic Calming	Page 1
Choosing the Successful Solution	Page 2
A Tale of Two Cities	Page 3
Traffic Calming Applications	Page 4
Traffic Calming: Is it Right for Your Community?	Page 6
Publications/Videos/BaystateScholars	Page 7

The Baystate Roads Program, which publishes *Mass Interchange* each quarter, is a Technology Transfer (T2) Center created under the Federal Highway Administration's (FHWA) Local Technical Assistance Program (LTAP). FHWA is joined by the Massachusetts Highway Department, the Department of Civil and Environmental Engineering at the University of Massachusetts/Amherst, and local public works departments in an effort to share and apply the best in transportation technologies.

In addition to publishing *Mass Interchange*, the Baystate Roads Program facilitates information exchange by conducting workshops, providing reports and publications and videotapes on request, and offering one-to-one technical assistance on specific roadway issues. Because the program relies on input from many sources, inquiries, articles, and ideas are encouraged.

LTAP Local Technical Assistance Program

To contact the Baystate Roads Program call (413) 545-2604 or FAX 413-545-6471.

8



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