

LOCAL AREA TRAFFIC MANAGEMENT PRACTICE – A COMPARATIVE UPDATE

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Abstract

Traffic calming has been effective in improving the safety, amenity and liveability of local areas in Australia, New Zealand and elsewhere for decades. In 2008 a new Austroads "Local Area Traffic Management" guideline was released - an update on a 2004 guideline developed for practitioners in this field. In order to assess the effectiveness of the new guideline, extensive research was undertaken in 2010 and responses from more than 100 local government authorities throughout Australia and New Zealand were received. This paper outlines the findings of that research from a local government perspective, addressing questions such as the effectiveness of traffic calming measures used, their cost and application, the methods used in decision making, design considerations, and so forth. The evaluation compares data from earlier research conducted in 2006 and draws conclusions that will be of wide interest to traffic engineering and management professionals not only in Australasia but also elsewhere

Key Words: Traffic calming, speed management, local area traffic management

Introduction

Local Area Traffic Management (LATM), otherwise known as traffic calming, is a practice employed to assist with the planning and management of road traffic within a local area. It involves the use of physical devices, streetscaping treatments and other measures to influence vehicle operation and reduce the impacts of vehicles on urban areas (Damen, Brindle and Gan 2004).



Figure 1: Good practice example of a roundabout in Melbourne

The use of LATM treatments throughout Australasia is widespread but the approach adopted has often been quite variable. In order to understand changing trends and patterns research was undertaken in 2010 building on earlier research undertaken in this field by the author (Damen 2003 and 2006).

Research Method

The research method included the design and analysis of an internet survey, which was directed at local government practitioners. In addition to the Internet survey, a small number of local government representatives were interviewed over the phone, providing additional information. The analysis focussed both on the most recent results obtained in 2010 and the comparison with those obtained in 2006.

Local government practitioners were consulted on a broad spectrum of different topics ranging from the types of devices that are in common use through to device

effectiveness and application, cost of treatments, etc.

Survey Response

In total, practitioners from 109 local government authorities responded to the survey.

Local government authorities were classified as either: urban capital; urban development; urban regional; urban fringe; rural; or remote. This classification is a measure of the degree of remoteness of an authority and is based on the Australian Classification of Local Governments using population, population density and the proportion of the population categorised as 'urban' to classify them. This process was employed to ensure the validity and consistency of the respondent sample.

In Australia there are approximately 560 local government authorities and in New Zealand there are 67 territorial authorities giving a grand total of 627 authorities within Australasia with local roads responsibilities. Based on the 109 survey responses received, a 17% response rate was achieved across Australia and New Zealand. As revealed in Table 1, the majority of respondents came from urban development settings. This aligns well with where the majority of LATM activity is perceived to be occurring.

Table 1: Distribution of Councils across Australia and New Zealand

Council Classification	WA	SA	VIC	TAS	NSW	QLD	ACT	NZ	NT
Urban Capital City	1	1	*	1	1	1	*	*	*
Urban Development	10	5	11	1	11	1	*	4	1
Urban Regional	6	*	5	2	2	2	*	1	*
Urban Fringe	1	2	2	*	2	*	*	1	*
Rural	8	5	2	3	3	*	*	1	*
Remote	3	*	*	1	*	*	*	*	*
Unknown	3	1	2	*	1	*	*	*	*
TOTAL	32	13	21	8	20	4	0	7	1

*NB. Responses were not obtained from these local government categories

Responses were received from each state and territory in Australia and New Zealand. Western Australia had the most respondents to the survey, with 32. With the exception of Queensland, the response rate was

reasonably consistent relative to the number of local government authorities in each state and territory.

The response received from Mackay Regional Council (Queensland), who explicitly identified that they were dedicated to an ongoing LATM program, is an example where additional information was obtained over and above the standard survey response. Their particular program is understood to be a proactive treatment of traffic issues through the process of community engagement. The program is suggestively looking at LATM as a holistic treatment of entire traffic precincts and, as such, does not rely or depend upon individual or isolated traffic calming treatments. Mackay Regional Council representatives expressed the view that their LATM program is more complex than the simple installation of traffic calming devices as a reactive treatment to traffic related issues.

Scope of the Consultations

A summary of the major findings of the 2010 survey are given in the following sections. Where the earlier or previous survey is mentioned it refers to the 2006 survey reported in Damen (2007).

Frequency of use

Table 2 that follows lists the LATM devices commonly used by local government authorities in Australia and New Zealand. The most common devices being used in 2010 were reported as:

- lane narrowing/kerb extensions
- school zones
- speed limit signs
- centre blister islands
- one-way, stop and give way signs
- roundabouts

Perhaps unsurprisingly, the use of speed limit signs was the most widespread, however, two local government authorities indicated that that they do not use them at all as part of LATM schemes.

Table 2: LATM devices in current use

LATM Device
Bicycle Lanes
Bus Lanes
Centre Blister Islands
Driveway Links
Flat Top Road Humps (Raised Tables)
Full Road Closure
Half/Part/Diagonal Road Closure
Lane Narrowing/Kerb Extensions
Left-in/Left-out Islands
Median Treatments
Modified "T" intersection
One-way, Stop, and Give-way Signs
Pedestrian Crossings
Prohibited Traffic Movement Signs
Raised Pavements
Road Cushions
Road Humps (Round-Profile)
Roundabouts
School Zones
Shared Zones
Slow Points
Speed Limit Signs

Some devices were much less popular:

- 58% indicated that driveway links were infrequently used
- 56% reported that they do not use bus lanes
- 54% indicated they do not use wombat crossings
- 48% remarked they don't use half / part / diagonal road closures

While school zones appear to be in common use, indication was given by six (6) local government authorities that they don't use them.

When compared to the results of the research conducted in 2006, there were some noticeable similarities as well as some differences. In 2006, one-way, stop and give-way signs were the most commonly used devices followed by roundabouts, speed limit signs and lane narrowing/kerb extensions. This is consistent with the 2010 survey and indicates that the devices in most common use have not changed in any significant way.

Effectiveness

Figure 2 illustrates the reported effectiveness of LATM devices in both 2006 and 2010.

Overall, roundabouts were most commonly viewed as an effective LATM device with more than 70% reporting that they were "very effective". This is consistent with the earlier survey that also highlighted roundabouts as being the most effective device.

Other devices that were considered "very effective" included full road closures, flat-top road humps, wombat crossings and median treatments.

Signage was only seen to be somewhat effective and is considered a complimentary set of devices that are most effective if implemented with other devices as part of a whole of street treatment.

Prohibited traffic movement signs and tactile surface treatments were the most common devices to be considered "not at all" effective by respondents (22% and 23% respectively) (refer to Figure 3).

When comparing the results of the 2010 survey to the one conducted in 2006, it is evident that:

- The reported effectiveness of raised pavements has significantly increased
- Those devices that are now considered noticeably more effective include driveway links, road closures, road cushions, road humps, wombat crossings and bus priority treatments.
- Those devices that are now considered noticeably less effective include prohibited movements signs and tactile surface treatments.

Installation Costs

The cost to install particular LATM devices appears to vary quite widely across local government. The reason for the variance is unclear and further research on this topic may prove useful.

Of those devices that were installed at a cost to the authority, half of the respondents indicated that speed limit signs and one way stop and give way signs cost up to \$5000, although six (6) local government authorities reported that they spent between \$20,000 and \$40,000 for the installation of a series of one way stop and give way signs.

Twenty-seven (27) local government authorities indicated spending up to \$200,000 on any one LATM device. The most common device that incurred such costs was roundabouts. Roundabouts were the most expensive device but are also considered the most effective and therefore good value for money.

Byron Shire Council (NSW) indicated that costs incurred for device installation was often "one off" and unpredictable. Council only spend money when the need arises to install a device or maintenance is required. Similarly, the local government authority in Kangaroo Island in South Australia reported that they do not spend more than \$5,000 for any LATM device. Kangaroo Island indicated they only invest in new and extensive LATM schemes when private land developers fund the initiative.

It should be noted that the most common reason given why local government authorities do not implement LATM schemes was budgetary constraints.

Complaints

While speed limit signs were reportedly the most commonly used LATM device (refer Figure 3) and were viewed as somewhat effective, they were also the most commonly complained about LATM device (refer Figure 4). Around 51% of local government authorities reported receiving complaints about speed limit signs; 50% received complaints about road humps; 44% received complaints about prohibited traffic movement signs and 39% received complaints about one-way, stop and give-way signs. Wombat crossings and threshold treatments were reported as the LATM devices least complained about by the public. For wombat crossings this outcome may in part be due to the reported low usage rate of these devices,

particularly in those states where they are not in common use or there is no clear warrant for their implementation.

The findings in relation to speed limit sign complaints are a major departure from that reported in 2006 when speed limit signs came in fourth with 6% of all complaints.

Road (round profile) humps continue to be heavily complained about due in large part to the perceived downsides of the device including their severity and noise impacts.

It was suggested by some local government authorities that complaints were predominantly made following recent road changes (e.g. changes in speed zoning). On the other hand, wombat crossings and threshold treatments were less likely to be complained about and criticised by drivers and the rationale behind this was simply that they were not as frequently used as other devices. Complaints often increased as specific LATM device use also increased with road users subsequently likely to question their validity. For example, it was identified that complaints about speed signs increased when drivers were exposed to frequently changing speed zones along a section of road. Presumably drivers started to question the applicability of LATM devices in such circumstances where they may have appeared to be over-used. In addition, wombat crossings and threshold treatments are generally confined to shopping, school and pedestrian precincts which inherently require slower speeds and greater driver attention.

Removal of Devices

Figure 4 summarises the reported frequency of LATM devices being removed in the previous 12 month period as a function of the number of authorities responding.

Road cushions were reported as being removed by eight (7%) local government authorities while flat-top road humps (raised tables) were removed by six (5.5%).

While road cushions were reported as having been removed the most frequently of any device they are not the most complained about device by the public.

Reasons for removal of road cushions and other devices varied and included:

- Noise impacts;
- Risks associated with approaching the devices at high speeds (i.e. speed differential);
- Risks associated with driver distraction and task overload;
- Induced traffic congestion;
- Devices non-compliant with standards.

Devices reported as not having been removed by any of the 109 responding local government authorities in the preceding 12 months included:

- Full road closures;
- Lane narrowings / kerb extensions;
- Raised pavements;
- School zones;
- Shared zones.

Interestingly, despite the rate of complaints that local government authorities received about speed limit signs, only one reported actually initiating the removal of any speed limit signs in the 12 months prior to the survey. This is despite the fact that speed limit signs are seen by most as only somewhat effective.

Post Construction Monitoring

Speed surveys, traffic volumes, crash analysis and residential/public attitudes are the most common methods used to monitor LATM schemes. Of the 109 respondents to the 2010 survey, 76 (69%) reported that they “always” use measures of traffic volumes in assessing device effectiveness post construction (refer Figure 5). This is similar to the response received in 2006.

Likewise, in both 2006 and 2010 speed surveys were rated as the second most commonly used form of post construction monitoring. In 2010 a total of 69 (63%) of respondents indicated they always measure this parameter.

In contrast, origin and destination surveys were reported as “never” being used by 56% of respondents.

Placement and Spacing

The majority of local government authorities use the requirements of the Australian standard AS1742.13 (Standards Australia 1991) to determine the correct placement and spacing of LATM devices. However, other factors were also reported as being of help to determine the placement and spacing of devices including speed-based design principles; community based requirements; political guidance; environmental agendas and financial/budget constraints. Of the alternative factors, local councils oscillated between speed-based design principles and financial/budgetary constraints as a major determinant.

As an added comment, several local government authorities (restricted to the State of Victoria) indicated that they also use the Victorian Government's ResCode to determine correct placement of LATM devices and the City of Marion in South Australia reported using the South Australian code of practice for the installation of traffic control devices (DTEI 1999).

Traffic Issues

Local government authorities were asked to indicate how much of a concern certain traffic issues were to them. This included:

- Traffic speed;
- Traffic volume;
- Road crashes;
- Parking availability;
- Through traffic;
- Commercial vehicles;
- The local environment;
- Bus access;
- Cyclist use.

Figure 6 illustrates the results.

The most commonly reported issue that was “very” concerning was traffic speed, potentially explaining why only one local government authority decided to remove speed signs in the preceding 12 months even where those devices were found to be ineffective.

Road crashes, access to parking and traffic volumes were the next most highly ranked issues of concern.

Alternative Treatments

Local government authorities were asked to indicate whether they use other non-physical traffic calming options to those listed in Table 2. The results are given in Figure 7.

Education and community advertising as well as urban/design and landscaping are practices commonly employed. For example, the City of Stirling (Western Australia) uses a variety of programs, such as bin stickers and the council’s “safe speed promise” program. Bin stickers were also reportedly used by the City of Casey (Victoria). Different road environments were also altered to encourage safe driving behaviour.

Enforcement is another common alternative employed to regulate and manage traffic. Enforcement was often used in combination with education and advertising. Enforcement varies by state and includes police presence, speed cameras and use of hotlines, e.g. the City of Casey (Victoria) reported the use of a Hoon Hotline.

The use of variable message signs was also common with just under half of the respondents employing this traffic calming technique. The majority of the users of this method were located in either Victoria or regional/rural Western Australia. This finding generally reflects empirical literature with the use of variable message signs widespread in urban, regional and rural Victoria.

The use of Travelsmart programs was quite high in Victoria and Western Australia but largely restricted to those states.

Rockdale City Council, New South Wales, listed a range of alternative methods that they employ. They are as follows:

- The use of white transversal thermo plastic lines;
- Median turning lanes for wider roads;
- One-way spike and gate to close popular car parks near beaches;
- The relocation of the position of STOP priority control lines;
- Use of pedestrian signalised crossings;
- Implementation of temporary one-way street arrangements during the Christmas and New Year period;
- The installation of tadpole islands to assist pedestrians crossing roads;
- The use of anti-hoon gates to ban right turning movements on nights during the weekends.

The most commonly reported reason for local government authorities not adopting other traffic calming options was budget constraints rather than there not being a need for it.

Conclusion

Local area traffic management continues to be widely used in local areas to reduce the impacts of traffic on the amenity and liveability of local communities. The LATM devices in common use are those that are considered highly effective (e.g. roundabouts) or those that are required for regulatory control (e.g. signs).

The relationship between a device’s effectiveness, cost and the amount of complaints generated by it is a complex one and the success of a LATM scheme can be measured in a number of different ways making it difficult to draw comparisons.

While innovation in LATM continues to occur in Australia and New Zealand it would appear that there has been very little change in recent times to what is well-accepted practice.

Finally, while Australian and New Zealand practitioners seem to have a reasonably good

understanding of local area traffic management practice and are routinely applying their knowledge to the application of the science, increased dissemination and sharing of the knowledge would help to increase awareness and improve the effectiveness of what is being done.

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Figure 2: Effectiveness of LATM Devices

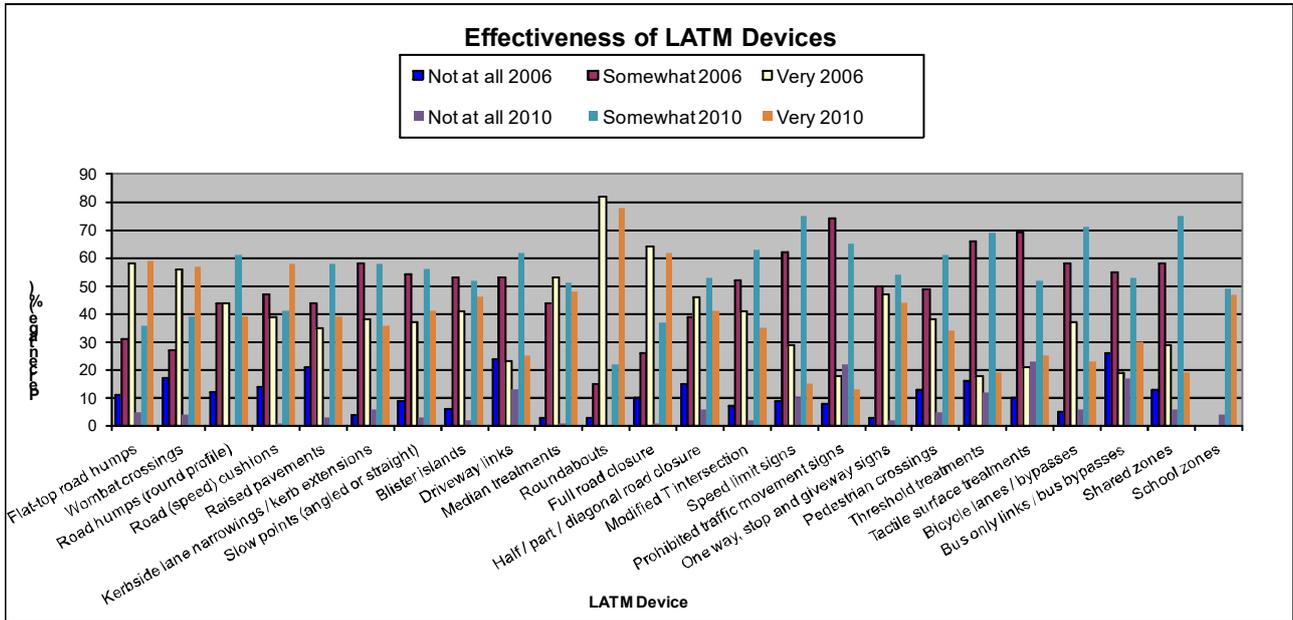


Figure 3: Number of Local Government Authorities Receiving Complaints about LATM Devices

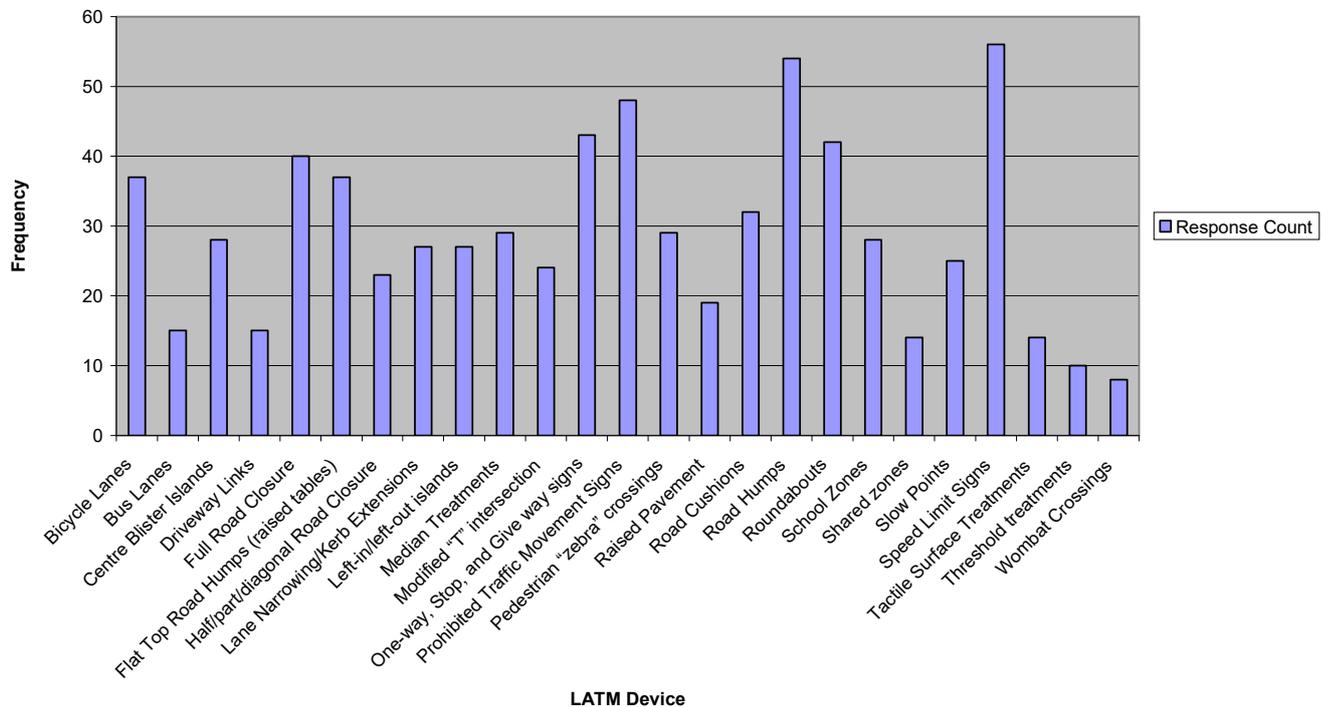


Figure 4: Number of Local Governments that have removed a LATM device within 12 months

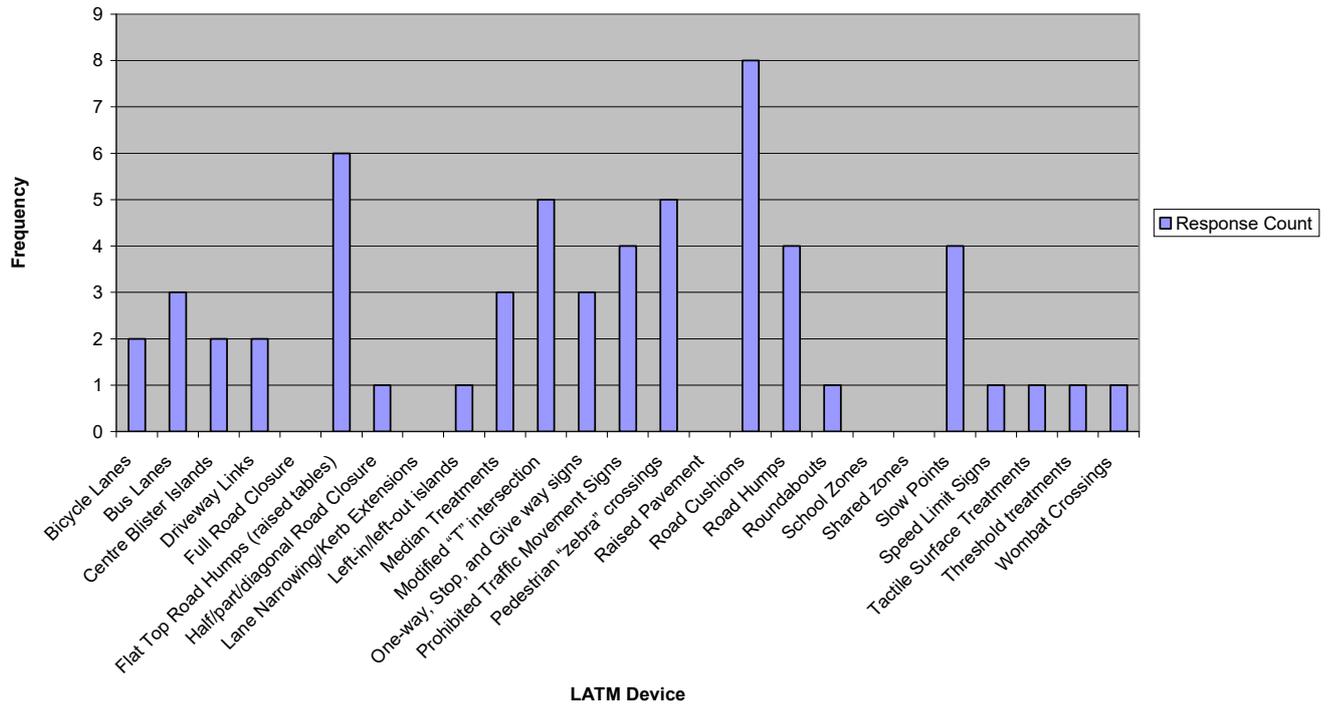


Figure 5: Number of respondents (frequency) using each measure to monitor LATM installation

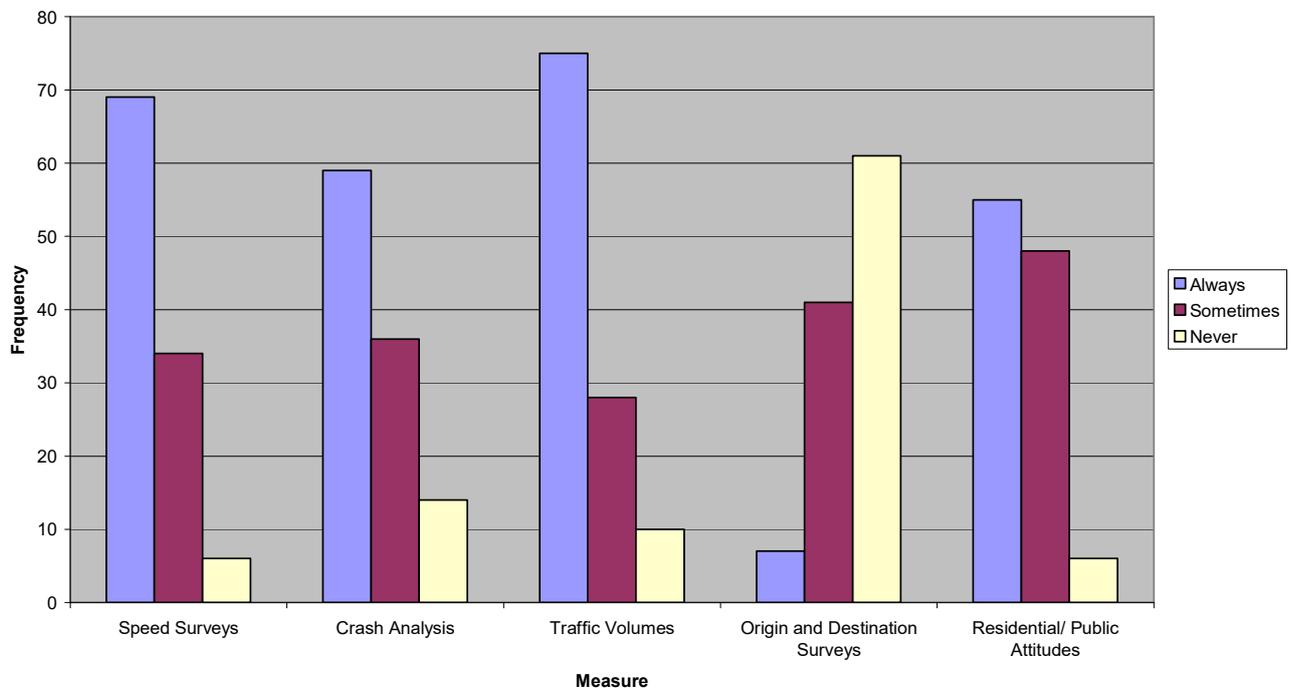


Figure 6: Traffic Issues of Major Concern to Local Government Authorities

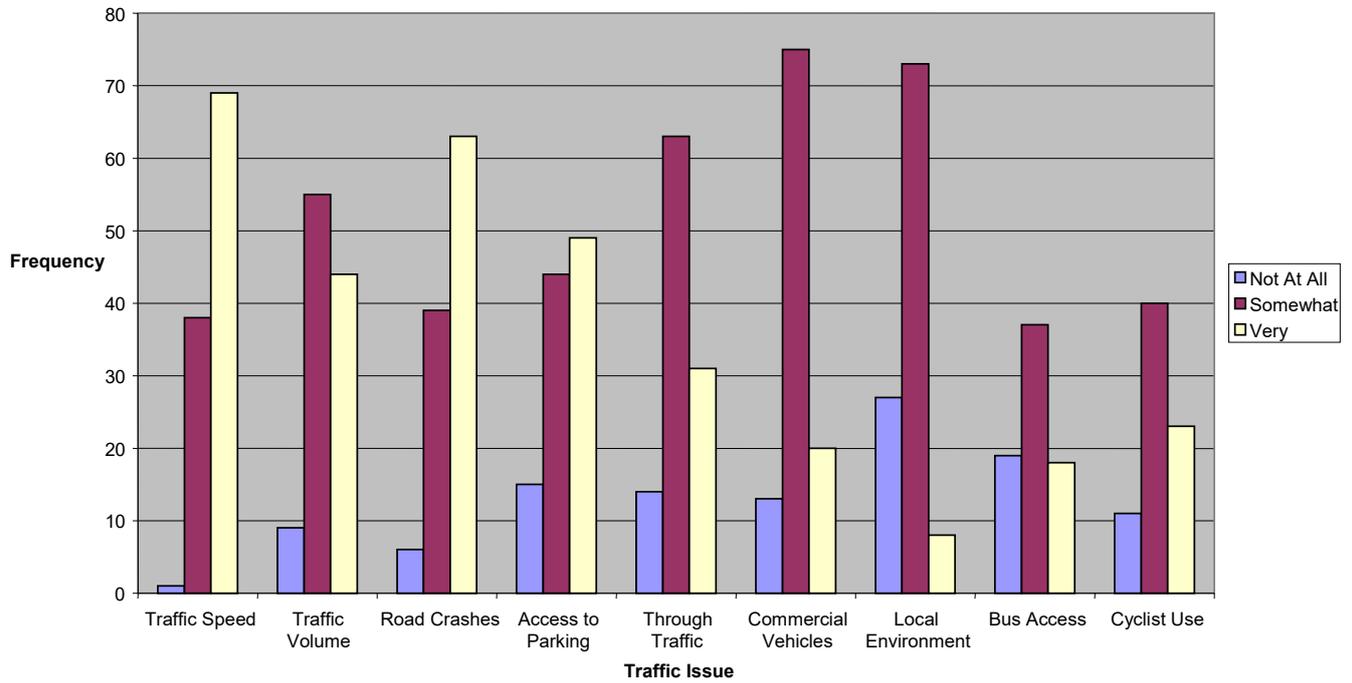


Figure 7: Other Traffic Calming Methods Used By Local Government

