# Courtesy Travel Speed Advisory Systems

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Courtesy travel speed advisory systems are used in most states of Australia with some evidence suggesting reduced vehicle speeds are a result. Their use is also as an advisory system to alert motorists to both their current speeds and the speeds they should be driving at. Some jurisdictions indicate that courtesy speed check systems have a use in advising motorists about speeds in areas before setting speed cameras at the locations. In this light the cameras are no longer seen as revenue raisers.

The current review of the literature has primarily shown positive aspects of the systems including: Reduction in speeds without the use of engineering interventions; Speed reductions without hampering service vehicles; Technology allowing the use of courtesy travel speed advice and messages in other situations (eg. lane closed), and systems that can be fully portable or fixed as gantries on major arterials and freeways. There tends to be agreement from most Australian state road authorities that the use of courtesy travel speed advisory systems should be owned and operated by personnel other than Police. This then frees them up for more important work. However, the perception of 'government revenue raising' activities can be diminished by promoting Police operation of non-prosecution activities associated with these systems. Most work with the systems in Australia to date is conducted by volunteers and Local Government personnel. Issues regarding training and use of the devices are noted. A model is suggested for use of the courtesy travel speed advisory systems in the short-term and for permanent installations.

## 1 INTRODUCTION

### 1.1 The concept

Courtesy speed checks are a system for speedometer calibration and have the effect of influencing drivers to comply with speed limits. They function by measuring the speed of individual vehicles and, if the vehicle is travelling above the target speed, direct a message to the driver telling them they are exceeding the speed limit or that they should slow down. The message may include the measured speed of the vehicle, and some particularly sophisticated versions of the equipment can read and display the number plate of the vehicle being monitored and to which the message is directed.

It is not entirely clear why this procedure is effective, but there would seem to be at least three factors at work, the importance of which will undoubtedly vary from situation to situation and from individual to individual. These factors are:

1. Making or raising awareness of the extent of speed limit violations. Some drivers may be unaware that they are speeding, or unaware of the extent to which they are exceeding the speed limit;
2. Conformity. The feedback sign provides a strong cue as to the expected behaviour in the particular environment. Most people feel uncomfortable if they are not doing the right thing and know they are being observed not doing the right thing. This contrasts with the situation where there is no monitoring and the dominant cue is the large proportion of other vehicles exceeding the limit, and
3. Fear of prosecution. Being monitored may make some drivers apprehensive that offenders may be prosecuted for exceeding the speed limit at the courtesy speed check site, either now or in the future, and this may encourage compliance.

### 1.2 Terminology and Underlying Technology.

The courtesy speed check concept is called different things in different jurisdictions. The favoured term in New South Wales is "courtesy speed check" and a number of programs have been run at a community level using this as the key phrase for publicising the project. The favoured term in Victoria appears to be 'Speed Observation Sign", and this term is being used by the Community Road Safety Councils to promote the program.

The most usual form of the apparatus consists of a microwave radar speed detection unit, a display sign, and some processing device that connects the radar device to the display. Earlier versions of the apparatus were trailer-mounted, but more recent devices may be fully portable, semi permanent or permanent installations.

## 2 EVALUATIONS OF COURTESY SPEED SYSTEMS

Courtesy speed signs of one form or another have been around twenty years or more. For example, van Houten (1980) demonstrated that traffic speeds could be reduced by a weekly change in a sign announcing the percentage of motorists who were speeding when passing that spot, measured unobtrusively by radar. One of the authors recalls seeing signs in France in the early 1980's which flashed the advisory speed at motorists who approached curves at too great a speed, although it has not been possible to find documentation of this system or its success.

There are few facilities available to motorists to enable them to regularly calibrate their speedometers. Courtesy speed systems provide such an opportunity, so that drivers can be more confident in the accuracy of their speedometers. This service to the community is expected to be appreciated by a significant proportion of responsible motorists.

Courtesy speed signs have been used as a stand-alone treatment to discourage drivers from exceeding speed limits for some time now. Despite some encouraging results, there has been general scepticism that feedback signs alone would be a an effective treatment in the longer term.

The work of Van Houten et al (1980) demonstrates that a very simple procedure feeding back information about the speed distribution on a road on a weekly basis can be effective in reducing speeding. A notice was posted next to a highway with text indicating the percentage of vehicles speeding. Traffic speeds were measured each week, using covertly located radar, and the percentage value in the sign varied in accordance with this. Over a period of several weeks, the percentage of vehicles speeding through the site showed a small but steady decline. A similar type of sign was trialed in Victoria in the early 1990's, but the results were inconclusive due to problems with equipment and methods (M. Tziotis, personal communication).

Vehicle-actuated speed feedback signs have proved to be effective in a number of different applications. Webster (1995) reports successful early trials of speed feedback signs installed at a small number of sites. The signs were installed downstream from speed limit signs on major roads passing through small villages in the UK, Europe and the USA. Vehicle speeds were measured via loop detectors in the pavement. Speed reductions of approximately 3.5 km/h were achieved at the signs and in the centres of the villages. One finding of this early work was that motorists preferred signs which gave only the direct speed information, other messages being superfluous. The cost of the signs was reported to be approximately $A12,500 - $25,000 at 1995 prices, depending on factors such as the cost of connection to the electricity supply.

Farmer, Barker and Mayhew (1998) describe a development of this work involving a trial of dynamic interactive signs on the approaches to six villages in Norfolk, England. Average reductions of 7 km/h on mean speed and 9 km/h in 85$^{th}$ percentile speed in the vicinity of the signs were obtained following installation. No increase in speed was evident one year later. Speeds in the centres of the villages also reduced, but to a lesser degree.

Similar findings have been obtained with movable changeable message signs used to reduce traffic speeds at roadworks (eg. Garber and Patel, 1994). This equipment uses radar to measure vehicle speeds, and displays a message instructing the driver to slow down. Significant reductions in the proportions of vehicles exceeding the roadworks speed limit were found.

The Municipality of Kogarah, New South Wales has embarked on a similar program using laser speed measurement and a changeable message sign mounted on a trailer (Dudgeon 1998). The cost of the unit was $23,600. Although the initial reaction was reported as encouraging, no results relating to the effectiveness of the equipment in reducing speeds were available at the time the paper was published.

Early work conducted with speed cameras in the Netherlands also used traffic responsive feedback signs (Oei 1994). The driver first encountered a sign advising of a "Radar check", followed by a second fixed sign advising either that the maximum speed was 80 km/h or that a safe speed was 60-80 km/h, the former on roads where slow vehicles permitted, and the latter on roads where slow vehicles were prohibited. This was followed by a switchable sign, in the former case displaying the text "You are driving too fast", and in the latter case "60-80". After seven months, speeds on the experimental roads had fallen compared to speeds on control roads, mean speed by 5 km/h, 85$^{th}$ percentile speed by 8 km/h, the standard deviation by 2 km/h and the percentage of speeders by 10%. In the four years following the introduction of the signs and enforcement, accidents fell by 15% on control roads and by 46% on the treatment roads. A further check of the road three years later revealed there had been only slight increases in speed, and the reductions had been largely maintained. Thus, this form of enforcement appears to be highly effective in reducing speeds and crashes.

A particularly useful demonstration of the potential of courtesy speed signs is provided by Bloch (1998). He undertook a direct comparison between photo-radar speed enforcement and courtesy speed feedback signs displaying vehicle speed. Both types of device reduced average speeds by 8 to 9 km/h while they were present at the site, and were found to be particularly effective in reducing the number of vehicles travelling 16 km/h (ie ten miles per hour) or more above the speed limit. They also reduced speeds 0.5 kilometres downstream by a

smaller but still substantial amount (eg. the number of vehicles exceeding the speed limit by 16 km/h or more was reduced by approximately 50). The effects were even greater with intermittent enforcement of the limit, with 10 km/h reductions in mean and 85$^{th}$ percentile speeds at both the deployment site and 0.5 kilometres downstream, and an 85% reduction in the number of vehicles exceeding the limit by 16 km/h or more at the downstream site. Although not specified in the paper, the costs data presented indicate that the intermittent enforcement consisted of a motorcycle officer present for half the time that the equipment was deployed.

A further development of this approach is to incorporate automatic licence plate recognition technology similar to that discussed in Section 3.2. Hill and Adaway (1994) describe such a system. The system was not used for prosecution, but the message board displayed the registration number and speed of vehicles exceeding a roadworks speed limit. Previous attempts to manage speeds by frequent police patrols had proved unsuccessful. However, the individualised feedback halved the number of speed violations after two weeks' deployment, and at the end of the roadworks program after 52 days of operation, the 85$^{th}$ percentile speed had stabilised very close to the roadworks speed limit. There were very marked reductions in the proportions of vehicles substantially exceeding the speed limit.

While the identification of the individual number plates may make feedback signs more effective, this must be assessed against the cost of this additional level of sophistication. Costs were not available at time of writing. However, in the longer term the cost of the licence plate recognition software is likely to fall substantially. So long as the cost remains high, it will be necessary to demonstrate that sufficient additional speed reduction is obtained through displaying the individual number plates to justify this additional expense.

## 3 PRACTICAL DIFFICULTIES

This section is based on one of the authors' experiences in reviewing community road safety programs for Austroads and for RTA New South Wales, and developing Road Safety Strategies for Local Governments in Victoria.

Generally, the implementation of courtesy speed checks has been left to community volunteers. In some cases, it has been very difficult to find volunteers to operate the equipment over several hours, especially during key periods (eg. school finishing time when many of the prospective volunteers have family commitments which preclude them from participation at that particular time). If equipment is to be used by volunteers then it is essential that the equipment be robust, simple to operate and that it be easy to learn how to use it.

Having automatic equipment that did not require an operator to be present all the time may be a viable solution to this problem provided two issues can be addressed. The first is the risk of unsupervised equipment of this nature being vandalised. Everyday experience demonstrates that this occurs frequently with passive traffic survey equipment, so the likelihood is that equipment which has connotations of enforcement is more likely to be a focus of resentment.

A further difficulty faced by community programs is the need to share equipment among several municipalities. This means that not only do municipalities have limited access to the apparatus, especially at holiday times, but volunteers may become disillusioned with the process because of the long waits involved between deployments of the equipment. It is therefore critical that any program be adequately resourced if the apparatus is to be operated by volunteers.

### 4.1 Potential for Misuse of Permanent Installations.

There is considerable potential for misuse of the permanent and even semi-permanent installations of courtesy speed checking systems. Firstly, there has been sufficient anecdotal evidence to suggest that where a permanent (eg. gantry-mounted) system is used, an upper limit of speed displayed should be set. There have been occasions where systems without upper boundaries tend to lend themselves to motorists attempting to set high speed records. The motorists will soon learn that due to the lack of enforcement of the device, the system will enable the driver to check just how fast they can make the vehicle travel through that section. As a result, systems generally have an upper speed limit set slightly higher than the posted limit.

There is also the opportunity for the familiarity of courtesy speed checking systems to have an impact on the level of respect a motorist will afford the system. Without a Police presence in the area, motorists will soon learn to disregard the warning they may be receiving from the devices. Any instant change in motorist behaviour through the systems tends to be lost after repeatedly driving through without any form of prosecution. Unfortunately, there has been a lack of published research to suggest that having a Police presence at the sites would have a larger influence on reduced speed than stand-alone systems. However, Police are quick to point out that when they operate the hand-held lasers and radars, motorist behaviour appears to be considerably more conforming than mounted measurement systems (Pintabona, 2001 personal communication). Many of the Australian state road authority personnel have mentioned that the use of Police enforcement as a follow up to the initial courtesy speed checking systems tends to have a high impact on reducing speeds and also serves to

support the use of speed cameras in the area (instead of the public view of them being used solely as revenue raisers).

### 4.2 Legal Issues

There were no published examples found of legal issues due to inaccurate display of speed information to motorists. There are known differences in the use of radar and laser detection devices, however. This is important as the radar equipment may detect the speed of a larger mass vehicle that is in the vicinity of the object vehicle and display the speed of the larger mass vehicle. If the feedback speed is only used in an advisory role, then the issue is somewhat removed as there will be no penalties imposed. However, in the remote instance that such a system may be used and a driver is led to believe (through feedback of speed from other vehicle) they are travelling slower than their speedo indicates, they may speed up and be detected further downstream with an enforcement device (eg. speed camera, hand-held laser). In this case, a legal issue would likely ensue.

### 4.3 Responsibility for Use of Signs

*Comments from Peter Metropolis:*
Main Roads WA would be reluctant to delegate powers for the erection of regulatory signs to other than "Responsible Authorities" such as Local Authorities or the WA Police Service, to maintain confidence in the appropriate use of these systems. MRWA would retain authority to approve such devices to ensure that their method of operation, purpose for installation and form are consistent with safe road operations, and that consistency is maintained across the State. The liability of the erecting authority in the case of misuse or malfunction needs further consideration. Risk minimisation strategies need to be developed in this area, and where possible, incorporated into the procedures and the devices themselves.

## 5 USE BY AUSTRALIAN & NEW ZEALAND JURISDICTIONS

The following responses were gained by liaison with state road authority personnel from Vicroads, the RTA NSW, Queensland Transport, NT Transport & Works, Transport South Australia and the Land Transport Safety Authority, New Zealand.

### 5.1 Victoria

Contact – Sam Pirrotta

Sam was not aware of the use of courtesy speed checking systems at roadworks. He mentioned that many local councils are hiring trailer-mounted devices for use in their 50 km/h zoned local areas. There has been no formal feedback on this application thus far. Sam discussed the application of overhead gantry-mounted systems on the Hume, Ballarat and Geelong Highways. Sam's only concern was that many drivers are noticing that their speedometers are showing slower speeds than the courtesy speed systems. For example, a driver notices that his speedometer reads as travelling at 71 km/h and the courtesy speed system displays 67 km/h. The driver will adjust his speed up by 3 km/h. This act is in conflict with the original intention of the courtesy speed system.

### 5.2 New South Wales

Contact – John Wall

John mentioned that NSW are using trailer-mounted courtesy travel speed checks at school zones and some local access roads. The RTA are about to commence a trial at school zones but there is little feedback at present. Local Governments have been using the trailer-mounted systems on 50 km/h urban streets. Generally, the Local Government bodies and volunteers such as Rotary have been the main operators of the systems. John feels that the Local Government bodies and volunteers should have ownership of the systems such that Police can be free to conduct other duties.

A trial in the Hunter Region was conducted recently near blackspot areas. Overall, the results showed a positive improvement at the sites with some reduction in speed limits. A paper with full results is being presented to the 2001 Road Safety Research, Policing and Education Conference for acceptance. Please note that this paper has not included the findings of the above paper.

### 5.3 Queensland

Contacts – Jon Douglas, Dearne Chisholm, Brian Donaghee.

Dearne and Brian discussed the work that Qld Transport have been conducting in increasing awareness at schools. They mentioned that the community love the systems and they are often featured in local newspapers and on the television. Most of the original work was conducted using trailers, however, there have been issues

using them in built up areas due to parking availability. They currently own 25-30 hand-held radars and use car boot-mounted displays. Dearne, Brian and Jon believe that the systems are most useful when used in isolation or mobile instances, but that their effects on vehicle speeds are likely to diminish over time in any one area.

### 5.4 Northern Territory

Contact – Ken Grattan

Ken mentioned that the Northern Territory are not using courtesy speed checking systems at all. Sometimes a Police blitz will be held at roadworks if considered necessary to reduce speeds through the area. Contractors are using variable message signs at present but mostly in an advisory role.

### 5.5 South Australia

Contact – Bob Henty, Roger Oliver

Bob stated that South Australia does not use courtesy speed checking systems to his knowledge. There has been some use of trailer-mounted advisory VMS message boards but not with courtesy speed systems. Roger mentioned that they use VMS on gantries over the expressway and tunnel. However, the use of such is confined to messages not regarding speed.

### 5.6 New Zealand

Contact – Bob Gibson

Bob mentioned that there are quite a number of organisations now using these but unfortunately has not received any formal evaluation information. The Land Transport Safety Authority calls the devices "Speed Indicator Devices" or SID and has developed 'Traffic Note 23' for the correct operation of the systems. The Traffic Note lists the operating policy, operational procedures, characteristics of the display, content of the display, the use of advertising on the devices, and placement of the device.

## 6 TYPE OF SYSTEMS

The technology for roadside speed testing and feedback is advancing at a rapid rate. There are several differences between system technology and concepts. The differences in technologies are important in that they impact upon where the systems may be placed and the accuracy of what is fed back to drivers.

### 6.1 System Technologies

#### 6.1.1 Use of Radar or Laser Speed Measurement

The main difference between systems that utilise radar or laser speed measurement is that radar speed measurement is not as accurate in the detection of vehicles being measured. Where laser equipment can pinpoint vehicles, radars may accidentally measure the speed of a larger mass vehicle within the detection field. This has ramifications if feeding back the wrong information to drivers. Drivers may soon lose confidence in the system or may think that their speedometer is incorrect.

Devices that utilise radar speed measurement are generally limited to operating in one lane only where there is generally some distance between vehicles. This ensures that the speed measurement of one vehicle is not displayed to the driver of a different vehicle. The use of radar speed measurement systems is generally limited to local access roads or roadworks with single lanes of traffic. They are not recommended for use on multi-lane roads, roads with high numbers of access points or other slow points (causing congestion), or where larger mass vehicles might be detected instead of the vehicle in the field of detection.

#### 6.1.2 Car and Trailer Mounted Systems

Car mounted systems are usually able to be mounted on the car boot or roof with either an in-built or hand-held speed detector. The practical utility of these systems are generally limited to whether or not there is safe operating room for the personnel using the system, the level of training with the device and the type of speed measurement system (radar or laser) as previously mentioned.

Many of the people contacted for this project mentioned that there were circumstances where they could not use a car roof or car boot mounted system due to the lack of a safe and strategic location to park the vehicle. For this reason, the use of car-mounted systems were found to be somewhat limited.

Trailer-mounted systems sometimes alleviated the above problem with devices getting continually smaller and more compact (thus taking a smaller area of space on the roadside). One of the major issues surrounding the use of trailer-mounted systems is whether it can be left unattended or if there may be a problem with vandalism of the unit.

Training will be an issue whether the system is car-mounted or trailer-mounted. Although the systems are generally user-friendly with full instructions included with the device, there is still room for error if the personnel is not trained to use the device correctly. As previously mentioned, incorrect information fed back to drivers will soon result in a loss of confidence in the systems and possibly a lack of respect.

### 6.2 System Concepts

The concept of the courtesy speed device can be ascertained by the technology involved. For example, the following points highlight what information the device can feedback to the motorist:

- Nature of the problem;
- Extent of the problem, and
- To whom the courtesy message is directed.

Therefore, whether the device is either sublime, semi-prescriptive or fully-prescriptive, is evident in what form of feedback is offered to the driver of the passing vehicle.

#### 6.2.1 Sublime Devices

A device can be said to be sublime if it lets the driver know that a problem has been detected. That is, the message fed back remains constant. An example of such a system would be a device that flashes up the current speed limit if a motorist is detected as having driven too fast past the speed detection device. In this case the device has shown that the nature of the problem is vehicle speed. The extent of the problem is not known as the detected speed is not displayed. The message may also not be particularly directed at any particular vehicle. This would be the case when a radar system is used to measure vehicle speeds in two or more lanes or with close headway distances. Therefore, the radar may not be capable of accurate detection of any particular vehicle. Sublime devices do not act as courtesy travel speed advisory systems as the road user does not have the benefit of being able to check their speedometer against the measured speed.

#### 6.2.2 Semi-Prescriptive Devices

A semi-prescriptive device is one that would detect a speeding vehicle and feed back information relating to the nature and extent of the problem. In this scenario, the device will be activated when a vehicle exceeds the regulated speed (showing nature of the problem) and also display the current travelling speed of the vehicle passing the device (showing the extent of the problem). Thus, the feedback should be used by the motorist to reduce speed to the posted limit. Where there may be more than one lane but only one displayed speed, road users will not be able to check their speedometer against the displayed travel speed.

These systems ***may*** indicate the required remedial action to alleviate the problem.

#### 6.2.3 Fully-Prescriptive Devices

A fully prescriptive device is one that is able to perform all of the above tasks but can direct the message to an individual vehicle. This would generally be a device utilising a laser speed detection system (mounted or hand-held) that can single out each vehicle and detect the travelling speed. If used on a single-lane road with opposing traffic it can be either hand-held or mounted on a vehicle, trailer or pole. Used on a multi-lane carriageway, the devices can be gantry-mounted above each lane of traffic. The feedback will be displayed to each motorist that exceeds the speed limit.

These systems will also indicate the required remedial action to alleviate the problem.

### 6.3 Use on Varying Roadways

#### 6.3.1 Local Access Roads

Trailer-mounted or car boot-mounted devices can be used on local access roads. Use is limited to how many traffic slow points there are (eg. accesses). There are issues with who would operate the system regarding having adequate training in its use and calibration of the device. Should Police be utilised or should they spend their resources on other more important issues? Another issue is deciding whether the personnel should remain with the device or risk vandalism if left in-situ.

### 6.3.2 Local/District Distributors with Single Opposing Lanes

Pole-mounted is recommended, perhaps moved around similar to red light cameras. Use is limited to how many traffic slow points there are (eg. accesses). Perhaps useful for school zones on high-speed roads. Again, there will be issues of vandalism.

Consider courtesy system for one-week followed by speed camera enforcement. This may help to dispel the notion that speed cameras are used purely as revenue raisers.

### 6.3.3 Local/District Distributors & Highways with Multiple Opposing Lanes

Laser system required for multi-lane detection of vehicles. Pole-mounted, perhaps moved around similar to red light cameras. Use is limited to how many traffic slow points there are (eg. accesses).

Consider courtesy system for 1 week followed by speed camera enforcement. As above, this may help to dispel the notion that speed cameras are used purely as revenue raisers.

### 6.3.4 Freeways

Gantry-mounted systems would be the most appropriate system for use on freeways. Can utilise a variable message sign (VMS) function to display information until speeding car activates speed display. On high-speed roads an upper speed display limit should be set so that drivers do not try and set high speed records.

## 7 RECOMMENDED MODEL FOR USE

The following table sets out suggested temporary and permanent use of courtesy travel speed advisory systems for roadworks, local, distributors and freeways. The contents of the table have been drawn from the researched literature and discussions with people mentioned within this report. There is insufficient evidence available to ascertain exactly what would be the best application in each case and further work will need to be undertaken to achieve this end.

The use of courtesy travel speed advisory systems is often recommended for use at school zones. Main Roads WA have recently implemented new school crossing flags for use at warden assisted crossings and have been trialing flashing amber lights. Further, MRWA have also been actively placing 40 km/h patches on the roadways at the commencement of school zones. As such, it would be wise to defer any trials of courtesy speed advisory systems in school zones until the other devices have been adequately assessed.

**Table 2: Recommended use of Courtesy Travel Speed Advisory Systems.**

| Term | Device concept | Roadworks | Local Access Roads | District/Local Distributors<br>Two opposing lanes | District/Local Distributors & Highways<br>Multi-lane | Freeways |
|---|---|---|---|---|---|---|
| | | 40/60 km/h | 40/50 km/h | 60/70 km/h | 60/110 km/h | 80/100 km/h |
| Temporary | Sublime | ✓ | ✓ | ✓ | ✓ | Unlikely to derive benefits |
| | Semi-prescriptive | ✓ | ✓ | ✓ | ✓ | Unlikely to derive benefits |
| | Fully-prescriptive | ✓ | ✓ | ✓ | ✓ | Unlikely to derive benefits |
| Permanent | Sublime | N/A | Not recommended – security issues | ✓ | ✓ | Unlikely to derive benefits |
| | Semi-prescriptive | N/A | Not recommended – security issues | ✓ | ✓ | Unlikely to derive benefits |
| | Fully-prescriptive | N/A | Not recommended – security issues | ✓ | ✓ | ✓ |

**Legend:**

**Sublime:** Systems where a problem is identified, although the nature and extent of the problem is not specified. Nor is the party identified to whom the problem applies.

**Semi-prescriptive:** Systems where the nature and extent of the problem is identified. The party to whom the problem applies is not identified. Such systems may or may not indicate required remedial action to alleviate the problem.

**Fully prescriptive:** Systems where the nature and extent of the problem are identified, as well as to whom it applies. Such systems will also indicate the required remedial action for the problem.

## 8 CONCLUSIONS

The evidence from past research indicates that the use of courtesy travel speed advisory systems can result in speed reductions of 3.5 to 8 kilometres per hour. The reduction in vehicle speeds are often quite long-lasting and are aided by the use of Police presence and enforcement. It is unfortunate that the research thus far has used different devices and most likely different road types. Therefore, one should not assume that any of the devices will have a similar effect on any road type. Clearly, there is not enough research evidence to suggest a speed reduction is imminent with the use of a courtesy travel speed advisory system.

There is a reasonable amount of evidence to suggest that the public generally embraces the use of the systems and finds the feedback from the devices useful. It is unknown whether or not this creates a road safety benefit of any form. However, if there is evidence that the public perceive the devices to be useful, then the use of such in conjunction with intermittent speed enforcement could provide many road safety benefits. This has shown to be the best speed reduction measure and also has the benefit of showing the public that the speed enforcement is warranted (usually by their own speeding behaviour).

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