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# Speed management handbook

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## Best practice guide for speed management at temporary worksites in New Zealand

This handbook outlines the speed treatment options available to the STMS when it comes to reducing road users to safe speeds through a worksite.

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- Temporary Speed Limits (TSL)
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**Critical Risk Group**

# Speed treatments

## Positive traffic management

Speed treatments are enhancements to worksites that help to reduce road user speed. The different types of speed treatments are detailed here in order of preference, with an explanation of each treatment option.

This order of preference was based on trials by SCIRT as part of the CITTM initiative. More information on the findings from these trials is available in Appendix A.

Temporary speed limits (TSLs) are commonly used but as there are many worksites on the network at any one time, it is important to **only** use a TSL when absolutely necessary.

There are other speed treatment options that should be considered before a TSL is used. A TSL should always be used in conjunction with other speed treatments.

It is likely that there will be some sites where it is not appropriate to use certain treatments. The STMS must use their discretion to determine which treatments are suitable for each site (examples can be found on pages 6 to 12).

Most treatments can be implemented without RCA approval. Temporary speed humps, visibility screens, temporary speed limits (TSLs), speed feedback signs will need formal approval before using as details/specifications will be required for each site.

### CoPTTM Section C10.1

Worksites need positive traffic management controls, in almost all circumstances, to reduce vehicle speeds to the TSL.

Positive traffic management is any additional measure/s that safely reduces traffic speed to the TSL (Refer to subsection C4.3.1 Sign location).

Positive traffic management measures must be used when installing TSLs of:

- less than 70km/h in areas with permanent posted speed limits of 100km/h, or
- less than 50km/h in areas with a permanent posted speed limit of 70 or 80km/h.

### Speed treatments - in order of preference

- Side Friction
  - Threshold treatments (coned approaches/pinch points)
  - Lane narrowing
  - Reduced Cone spacing
- Additional Static signage (gated)
- Temporary speed limits (TSLs)
- TSL flashing warning Lights
- Temporary speed humps
- Speed Feedback signs
- Manual Traffic Control
- Barriers or Barricades
- Visibility screens (or device that blocks visibility longitudinally)
- Request Police onsite



# Temporary speed limits

## Not always the right option

Temporary speed limits (TSLs) can be an STMS' first call for reducing traffic speeds at a worksite. If used too frequently, however, by implementing an unnecessary TSL or one that is inappropriate (too low), road users become desensitised to TSLs and may ignore or simply not see TSLs at worksites.

### Advantages

The advantages of TSLs are that they slow road users to a safe speed through a site and can be enforced by police when the temporary traffic management (TTM) is setup as per the approved temporary traffic management plan (TTMP).

Police are not able to enforce TSLs that are not setup to the approved TTMP and will also have difficulty justifying enforcement of a TSL when it is obviously not appropriate for the conditions. Accurate documentation is required (refer to CoPTTM E1.6 onsite record form)

### Risks

The risks of TSLs are that, if the site is incorrectly setup, or an inappropriate TSL is being used and the road user cannot see the need for a TSL, road users are less likely to comply with the TSL and TSLs at other sites around the country.

On 50km/h permanent speed limit roads, if road users can safely traverse the site at 35km/h or more with only minor alterations to normal driving behaviour, then 30km/h TSLs should **not** be used. This will normally require the following conditions to be met:

- Deficiencies are no more than minor
- Visibility is available (greater than Warning distance B, e.g. 50m minimum for level 1 and 75m minimum for level 2 roads)

- Road users are able to see hazards or understand them through TTM devices/signs or approaches to the site, so they naturally slow down to a suitable speed
- The type of work presents a low accident risk to workers and road users

If conditions at the site require traffic speed of 35km/h or less for safety reasons, then a posted TSL of 30km/h or less **should** be used. This may be necessary where:

- Major deficiencies exist, such as tight geometrics, narrow lanes or rough/unsealed surface

- Visibility is restricted below Warning distance B, e.g. 50m minimum for L1 roads and 75m minimum for L2 roads)
- Hazards are not clearly visible to road users when they are approaching at the permanent speed limit
- The type of work has a high accident risk for workers or road users, e.g. repeated work on foot close to the live lane.



# CoPTTM guidelines

## Code of practice for temporary traffic management

The Code of practice for temporary traffic management (CoPTTM) 4th edition July 2015 Section C4C covers general requirements for TSLs.

The list below is a selection of common requirements; refer to CoPTTM for more detailed information.

- TSL signs are to be gated unless the road is under 500 vpd and the plan is approved with single side TSLs.
- Repeaters to be used at intervals no greater than 400m.
  - Gated on multi-lane roads.
  - Left-hand side on two-way two-lane roads.
- Existing permanent speed signs within a site need to be covered\* (as per CoPTTM C3.6).
- Record TSL details, including:\*\*
  - TSL installed (e.g. 30km/h TSL)
  - date/time of installation
  - placement location (e.g. house number location or RP location)
  - length of TSL (metres)
  - date/time TSL removed.

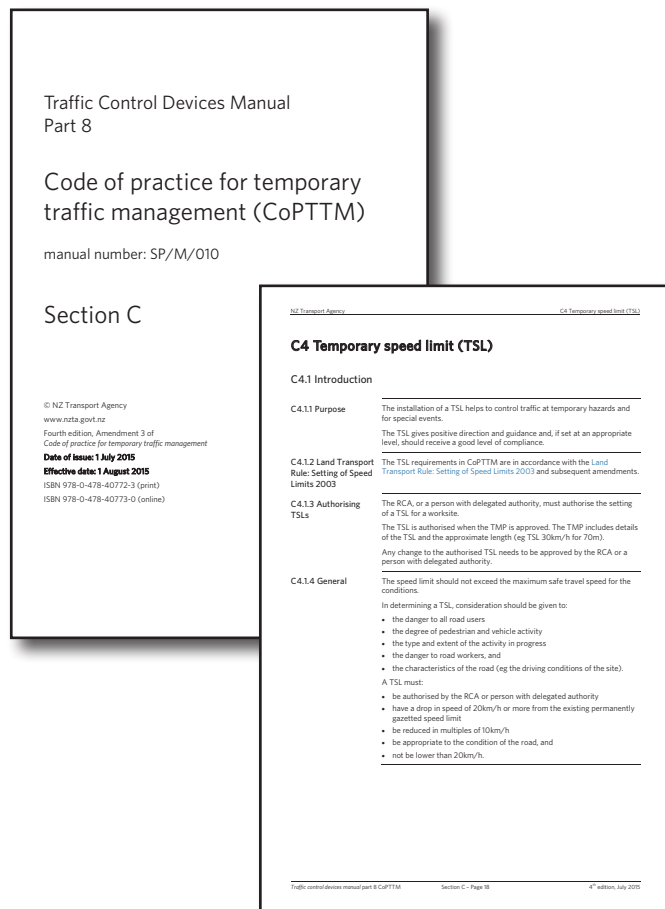
A TSL must:

- be authorised by the RCA or person with delegated authority
- have a drop in speed from the existing permanently gazetted speed limit as follows:
  - greater than 50km/h, at least 20km/h less than the permanent speed limit
  - 50km/h or less, at least 10km/h less than the permanent speed limit

- be reduced in multiples of 10km/h
- be appropriate to the condition of the road, and
- not be lower than 20km/h.
- A 30kph TSL is mandatory when using Manual Traffic Controllers (MTC), priority give way or traffic lights.
- TSL must be removed when not required.

\* All other signs that contradict the sites will also need to be covered or removed (CoPTTM C3.6). If the signs are part of another worksite you must speak with the other STMS before making changes that could affect the other site.

\*\* Accuracy of these details needs to be within +/- 20m. All TSL records must be kept for at least 12 months, or longer if the worksite is under investigation (CoPTTM E1.6 onsite record form).



# Speed trials

## Speed trials

## Results

### Side friction

Three variations

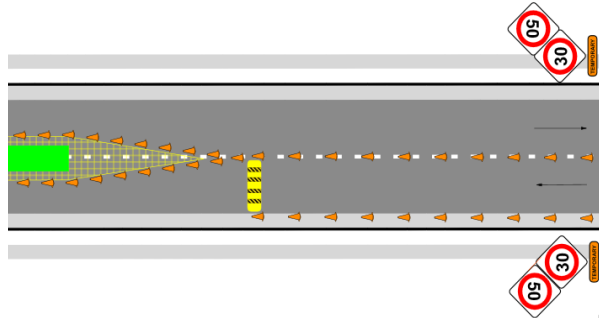
Side friction was found to be useful onsite to reduce speeds.  
As explained in the speed treatment section, there are several varieties of side friction. Each site should have some type of side friction that can be used.



### Speed humps

Two variations

Speed humps were found to be the most effective treatment



### VMS messages

Two variations

VMS messages were found to be slightly more effective than well maintained side friction.  
VMS boards are usually used for high profile sites. Overuse can, however, reduce their effect.



### Removal of TSLs

Two variations

The TSL was removed on two separate sites and data showed that motorists either did not change their speed or went slightly slower.  
This showed that a TSL is not always the correct option, **but remember you must follow the approved TTMP for your site.**



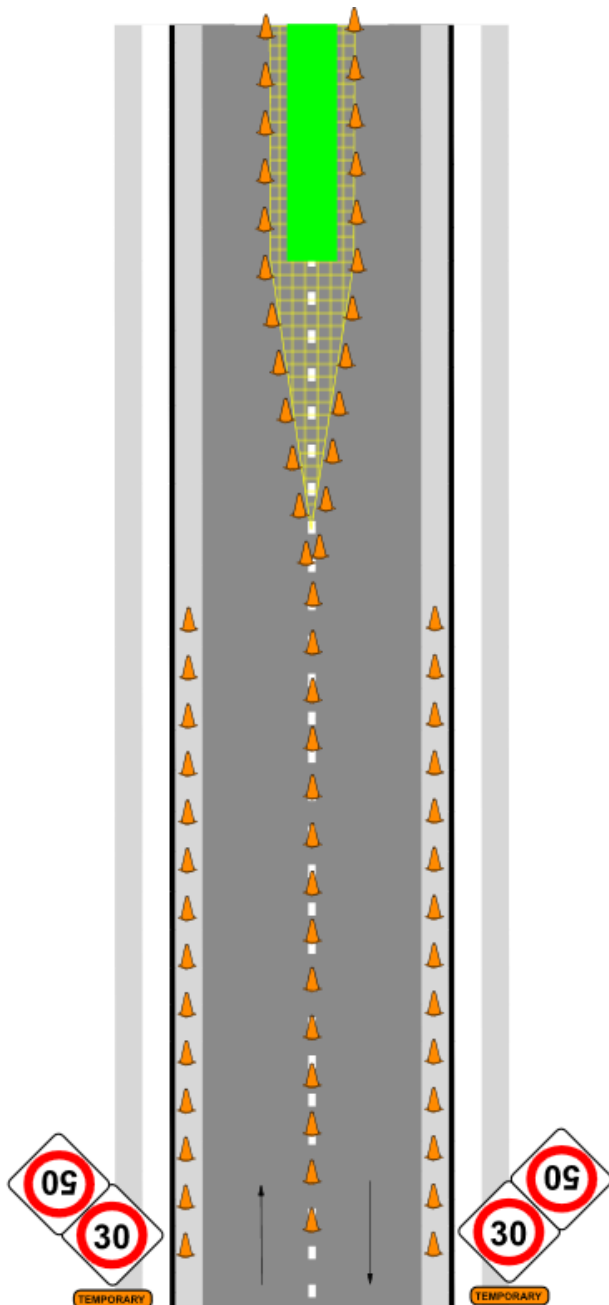
# Speed treatment examples

## Threshold treatment

CoPTTM C5.2

### Coned approaches

Additional cones that continue from the closest sign (e.g. TSL sign) to the start of the taper. For a two-lane two-way road this would generally be done on both the edge lines and the centre line.

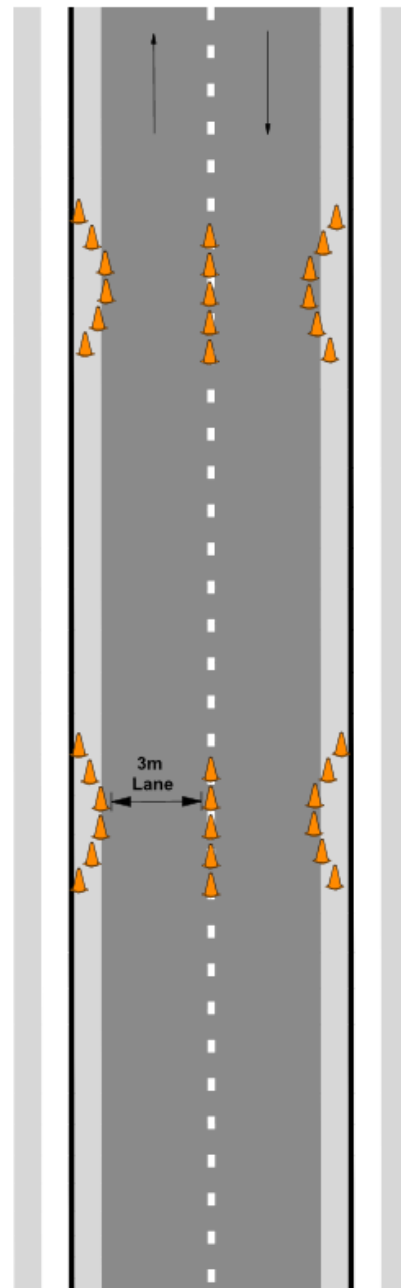


## Threshold treatment

CoPTTM C8.2.4

### Pinch points

Similar to lane narrowing and can be used in areas that do not need or cannot have the full length of road narrowed. An example of where pinch points could be used is at a long site with gaps between narrow areas or on detours where motorist's behaviour is a concern.



## Lane narrowing

CoPTTM C8.2.4

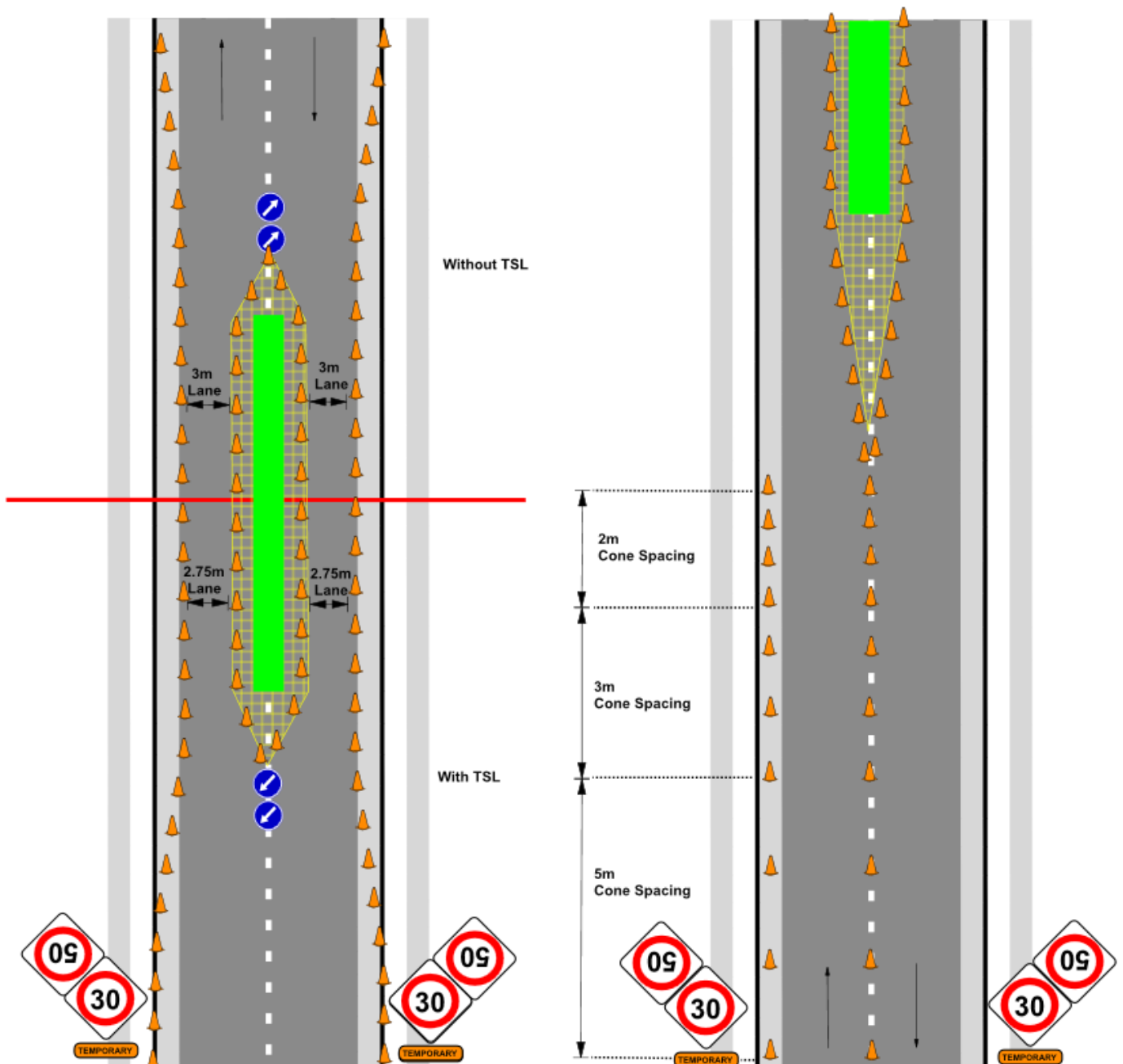
Reducing lanes down from the normal width. Most motorists are reluctant to drive too close to cones or other pieces of equipment, so they slowdown to ensure they do not collide with the cones.

This might only be useful on attended sites as cones might be knocked over.

## Reduced cone spacing

CoPTTM C5.2

Used to make drivers feel that they are driving faster through the site as they are passing cones faster than they are used to.



# Appendix B

## TSL warning flashing lights

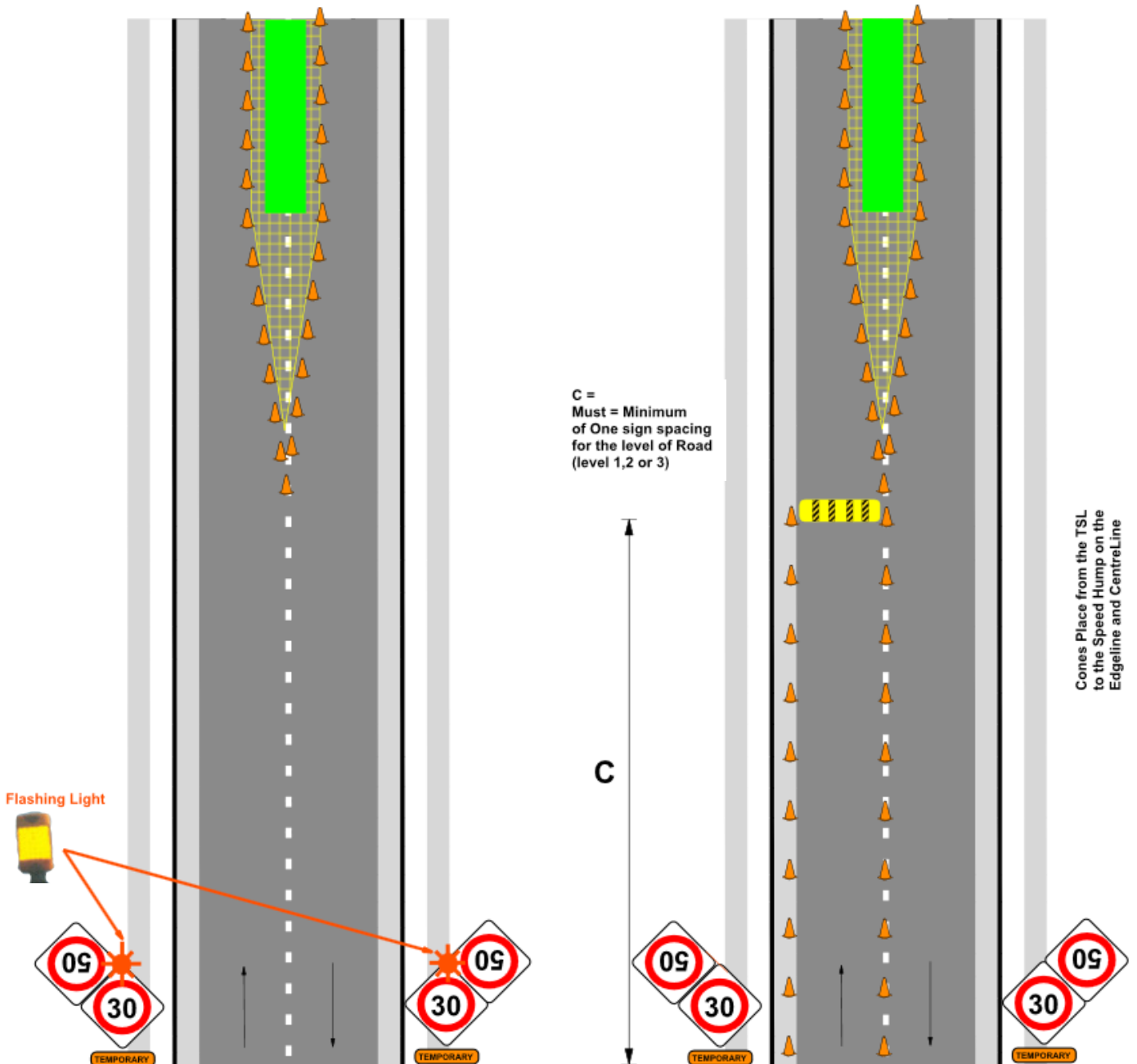
CoPTTM C10.1.2

Can be used on the TSL signage to grab the attention of the motorists as they approach the TSL. They can also be used on the advance warning signage, and should **only** be used on active sites.

## Temporary speed humps

CoPTTM C10.5.2

Used in the same way as a permanent speed hump. You must get approval from the RCA. You must also have a row of cones, on both the edge line and the centre line starting from the TSL to the temporary speed hump.



## Speed feedback signs

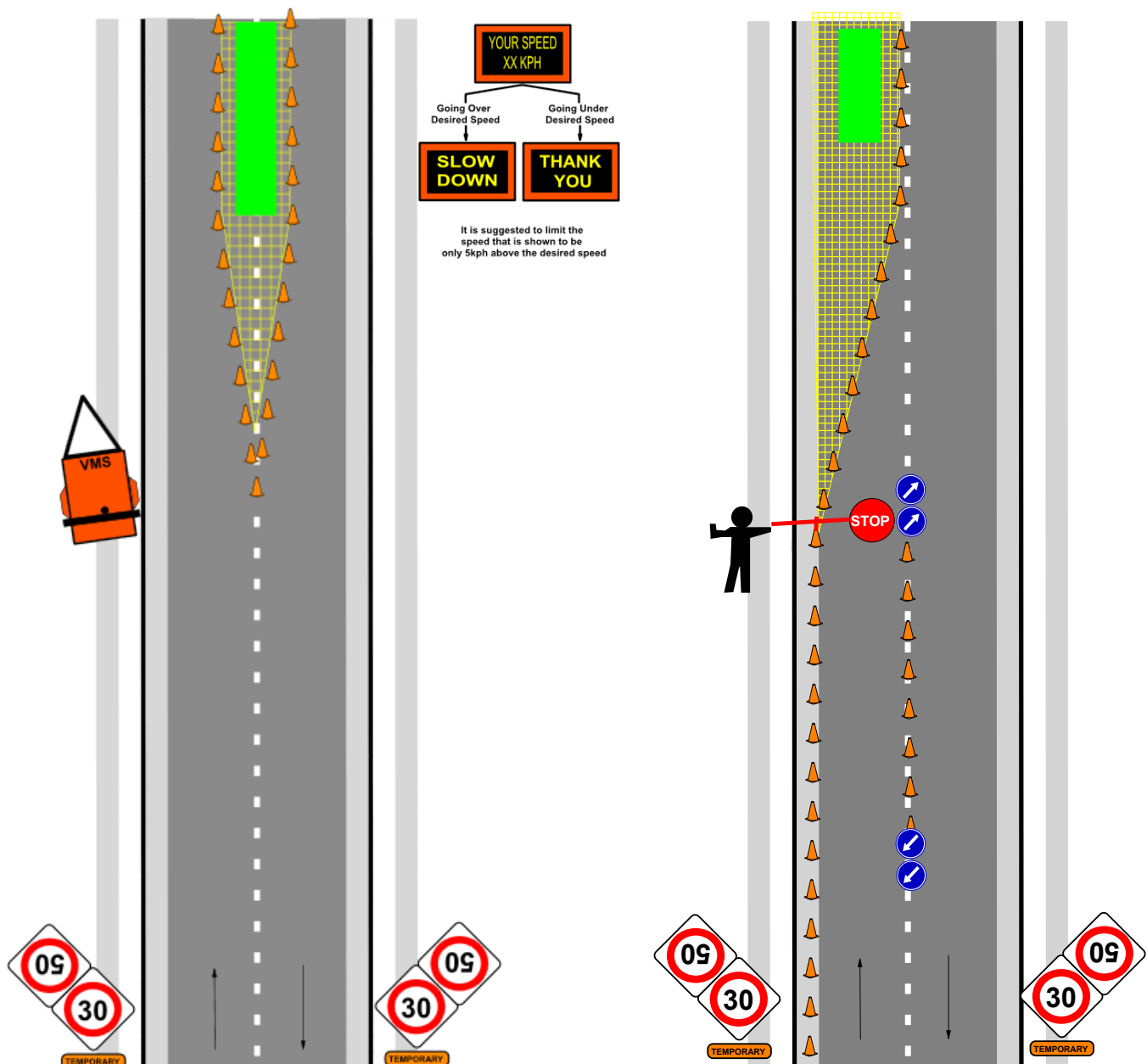
CoPTTM C10.1.1

These have a radar inside them that can tell how fast a car is travelling. When used as part of a TTM operation, these signs can display vehicle speeds up to the highest value of the TSL. The VMS boards can be programmed to flash "SLOW DOWN" to any vehicles going above the TSL while vehicles obeying the TSL will get a "THANK YOU" message.

## Manual traffic control

CoPTTM C10.2.3

Can be used by having the Gibney paddle on stop until the vehicle has slowed down to the desired speed.



## Additional static signage

### Advance warning

These can be used to enhance visibility for motorists of the worksite ahead. **All** TSLs must be gated on Level 1, 2, 3 roads. These can also be custom made signs specific for the site (must have RCA approval). These are usually used to advise motorists of why the work site is in place, if this is not immediately clear, for example, “workers under bridge”.

### Barriers

CoPTTM C18.1

Used as a way to enhance side friction. The most effective way to use barriers to slow motorists is by narrowing the lanes against the barriers

### Visibility Screens

CoPTTM C18.8

A meshed material that is generally placed on 1.8m fences within a TTMP site. This reduces visibility and slows motorists as they drive through the site.

### Police onsite

In extreme cases a request can be made to the Police to attend a site to monitor and enforce the relevant TSL.

Note: Your TTM must be compliant with your approved Temporary traffic management plan (TTMP) for tickets to be enforceable.



Visibility screens are to be used to help prevent motorists being distracted by the works to facilitate improved and safer traffic conditions.

### Pace vehicle

CoPTTM C10.4

The pace vehicle (pilot) method is very useful in restricting vehicle speeds through a long worksite.

This method involves a pilot car leading a queue of vehicles through the worksite.

MTCs are positioned at each end of the closure to stop traffic until a pilot car is available.







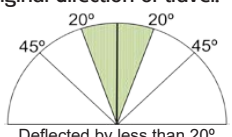
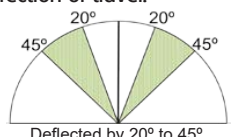
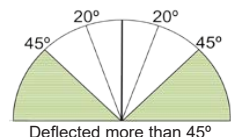





The TV1 sign is mounted on the rear, or the roof, of the pilot car.

# TSL decision-making matrix

## Instructions

Select the appropriate road condition description for each of the four factors, and in the right hand circle list the chosen TSL for that road condition. Transfer **lowest** TSL to the bottom circle. If the **lowest** TSL is at least 20km/h below the permanent speed limit, that TSL should be applied.

|   | Excellent  | Average   | Below average  | Poor   | Possible temporary speed limit  |
|---|--|---|--|--|---|
|   |   |    |   |   |   |
| <b>1</b>  | <b>Minimum lane width</b>  |   |  |  |   |
|   | 3.5m   | 3.25m   | 3.00m  | 2.75m  |    |
| <b>2</b>  | <b>Pavement/surface condition</b>  |   |  |  |   |
|   | The shoulder and lane is clear of loose or greasy material and the traveled way is smooth.   | The road is close to normal condition except for a few minor defects (eg. small pot holes or a few pieces of loose aggregate).<br><br>70km/h where new seal has been swept but not marked.  | Defects and/or loose material on the lane (eg. unattended reseals).<br><br>50km/h for protection of a new seal.  | There are major defects and/or significant loose material on the lane (eg. recently milled surface, large stones, steel plates).   |   |
| <b>3</b>  | <b>Visibility and alignment</b>  |   |  |  |   |
|   | There is greater than 140m visibility to the first cone in taper.<br><br><b>And</b><br>The worksite has not imposed a change in alignment. | There is less than 140m visibility to the first cone in taper.<br><br><b>Or</b><br>Vehicles are deflected by 20 degrees or less from the original direction of travel.<br><br><br>Deflected by less than 20° | There is less than 60m visibility to the first cone in taper.<br><br><b>Or</b><br>Vehicles are deflected by 20-45 degrees from the original direction of travel.<br><br><br>Deflected by 20° to 45° | There is less than 30m visibility to the first cone in taper.<br><br><b>Or</b><br>Vehicles are deflected by more than 45 degrees from the original direction of travel.<br><br><br>Deflected more than 45°                                  |  |
| <b>4</b>  | <b>Site clutter</b>  |   |  |  |   |
|   | Low site clutter, clear vehicle lanes, cycle lanes and footpaths.  | Some site clutter, either plant or materials. Vehicle lanes, cycle lanes and footpaths are lightly trafficked.  | Considerable site clutter. Requires additional management to guide vehicles through the site. Some queues of road users.   | Has numerous driver distractions including construction traffic. Cycle lanes or footpaths are closed.<br><br>30km/h for portable traffic signals, MTC operations or where traffic has to traverse the actual active working space (either in a delineated single lane or where traffic is not separated from the working space). |  |
| <b>Is the lowest TSL at least:</b>                                    |  |   |  |  |   |
| - 20km/h below the permanent speed limit on roads greater than 50km/h |  |   |  |  | <b>Yes</b>  |
| - 10km/h below the permanent speed on roads 50km/h or less            |  |   |  |  | <b>No</b>   |
|   |  |   |  |  | Use this temporary speed limit.   |
|   |  |   |  |  | No temporary speed limit required.  |
|   |  |   |  |  |  |

