WAKA KOTAHI
NZ TRANSPORT AGENCY

STMS UNIVERSAL HANDBOOK

WAKA KOTAHI - NZ TRANSPORT AGENCY

VERSION 2.0

Participant name:

New Zealand Government

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More information

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This document is available on the NZ Transport Agency's website at http://www.nzta.govt.nz

Contents

ABOUT THE STMS UNIVERSAL TRAINING

Outcomes of the STMS Universal training

People who successfully complete the STMS Universal training will **know** the:

- STMS responsibilities
- Health and safety processes relevant to their role as an STMS.

They will also have the **ability** to:

- Locate information in CoPTTM
- Calculate TTM equipment for a worksite
- Identify, assess and manage risk
- Determine if a TMP is fit for purpose
- Complete worksite briefings
- Lead and give direction to the TTM crew and visitors
- Complete worksite checks and paperwork.

Key messages from the training

Here are a few key messages that we will reinforce during the training.

- The STMS is the leader of the crew.
- The STMS role is all about safety - keeping yourself, the crew and road users safe.

- The TTM Planner has completed a risk assessment and identified how to keep everyone safe and get the job done. It is vital that the STMS follows the TMP at the worksite.
- The STMS is responsible for completing ongoing risk assessments, identifying hazards and taking action to reduce the risk.
- Paperwork is important – track what you've done.
- Make sure people are aware of the risks and know how to keep themselves and others safe.
- Get it right. Don't just get it done.

CAREER PATH

Current situation

Level of TTM	Guidelines for AADT	Who is in charge
Level LV	AADT less than 500vpd	L1 STMS
• LV/low risk	AADT less than 250vpd	L1 STMS
Level 1	AADT up to: • 10,000vpd Rural • 15,000vpd Urban	L1 STMS
2LS	AADT over 15,000vpd Urban and permanent speed 60km/h or less	L2/3 STMS
Level 2	AADT over: • 10,000vpd Rural • 15,000vpd Urban	L2/3 STMS
Level 3	Motorways and expressways	L2/3 STMS

About the new TMO and STMS warrants

The new TMO and STMS warrants are based on categories of road environment.

Each road environment deals with a different type of risk.

There are different risk profiles depending on the road environment you are working in.

Considerations on low speed roads:

- Pedestrians and pedestrian crossings
- Cyclists and cycle lanes
- Shared pedestrian and cyclist paths
- Restricted parking areas in the form of bus stops, loading zones, taxi stands, coupon parking, resident parking etc
- Higher number of intersections and accessways
- Many distractions.

Considerations on high speed roads:

- Higher speed – longer stopping distances
- More heavy vehicles
- Visibility of the worksite (vertical and horizontal curves)
- Shoulder and pull over areas
- Slower driver reaction time.

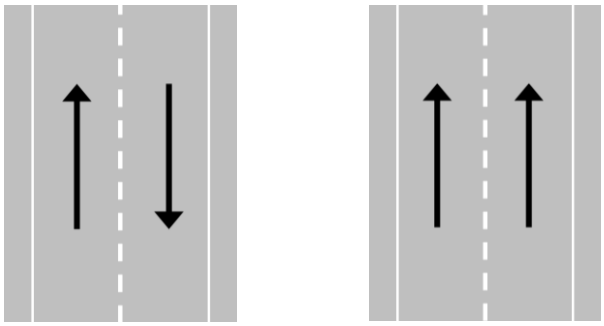
Categories of road environment

Category A: Low speed roads (60km/h and less)

- Includes LV, L1 and L2 low speed roads
- Using either type A or B signs

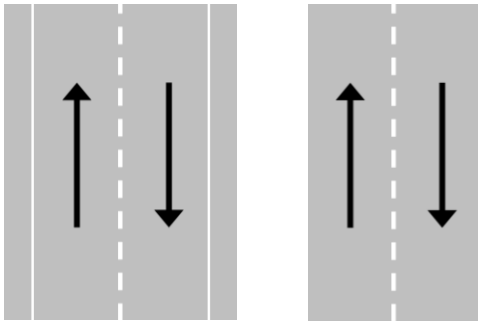
Type A Type B

- Includes two-way two-lane and multi-lane roads.



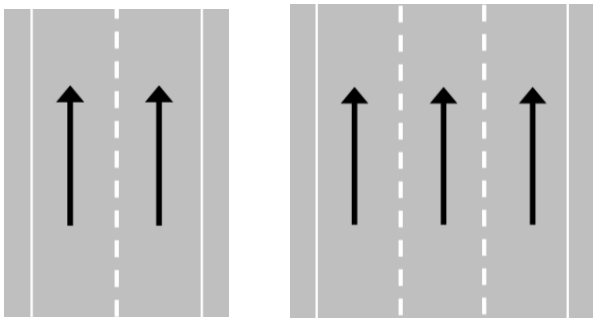
Category B: High speed two-way two-lane roads (70km/h and more)

- Includes LV, L1 and L2 high speed roads
- Using both type A and B signs (depending on requirements)
- Includes roads with or without shoulders.

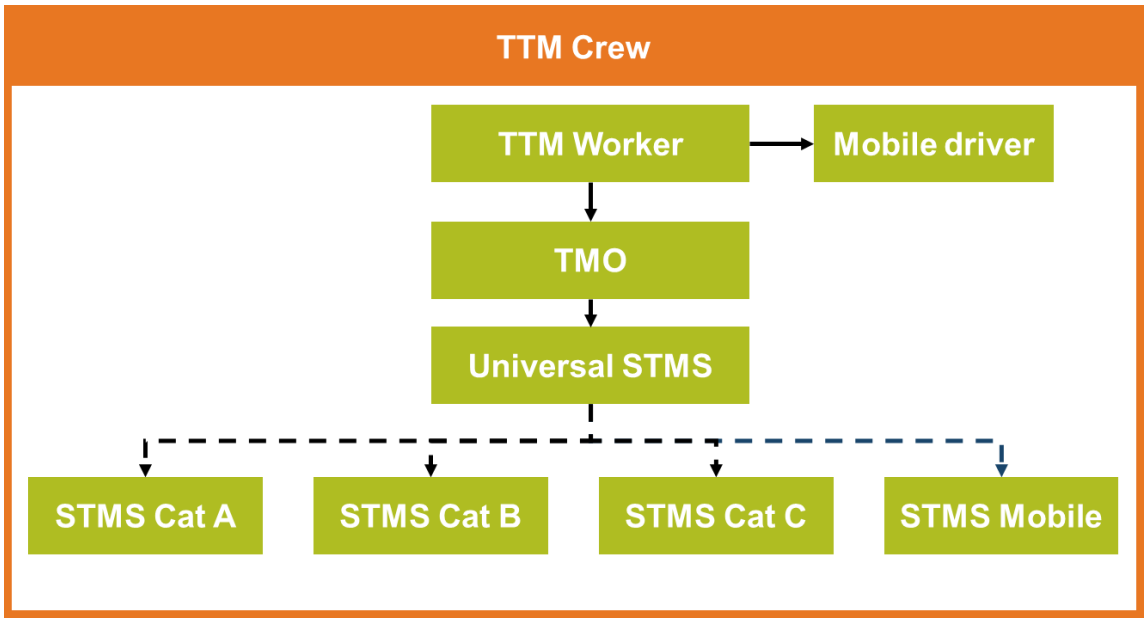


Category C: High speed multi-lane roads (70km/h and more)

- Includes high speed L1, L2 and L3 multi-lane roads
- Using both type A and B signs (depending on RCA requirements).



Career path for TTM crew



Training, mentoring and assessment

3 key parts of the learning are:

- Training
- Mentoring
- Assessment.

NZTA warrants

The NZTA warrants are either non-practising or practising

Warrant	Explanation
Non-practising	Successfully completed the workshop.
Practising	Successfully completed the workshop **and assessed as competent.**

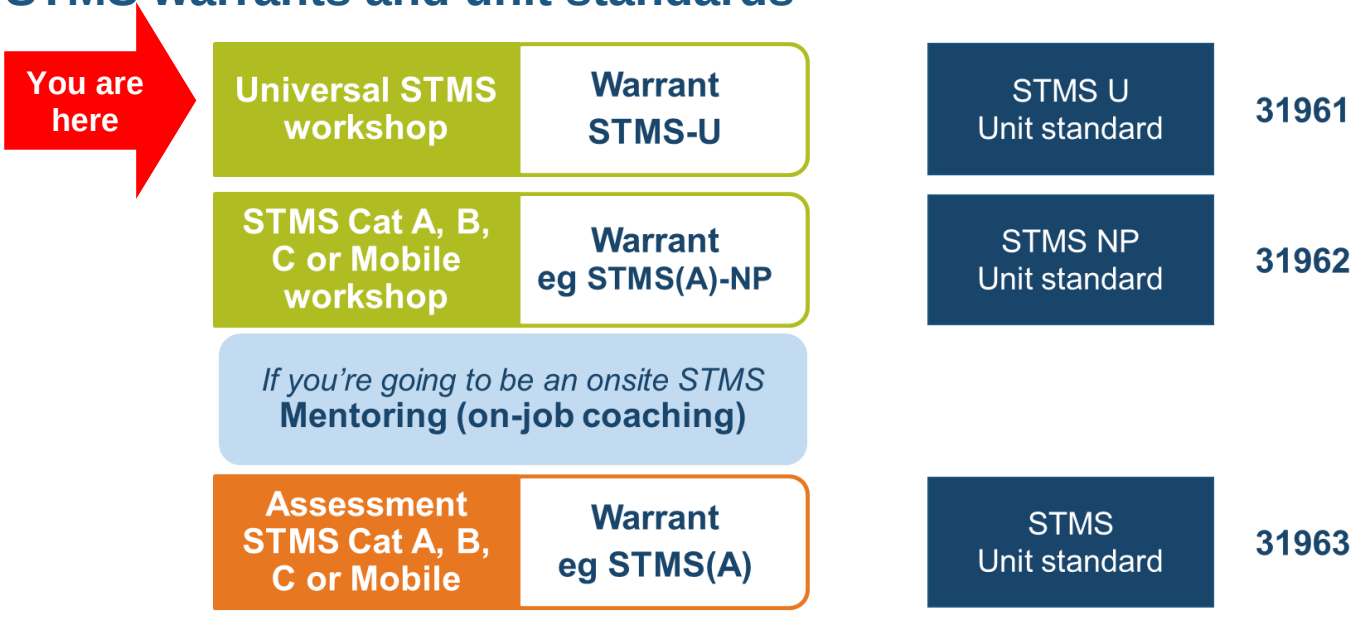
Unit standards

Here are the Temporary Traffic Management unit standards.

Learning block	Unit standard	Title
TTM Worker	**31958**	Explain the role of and operate as a TTM worker on the worksite under temporary traffic management.
TMO Non-practising	**31959**	Demonstrate knowledge of stakeholders and operational requirements for temporary traffic management.
TMO Practising	**31960**	Maintain the worksite under temporary traffic management.
Universal STMS	**31961**	Explain the requirements for the worksite under temporary traffic management.
STMS Non-practising	**31962**	Explain the requirements for the worksite under temporary traffic management for a road environment as defined in CoPTTM.
STMS Practising	**31963**	Operate as a practising Site Traffic Management Supervisor (STMS) within a road environment as defined in CoPTTM.

A person who achieves all of the unit standards can be awarded the NZ Certificate in Temporary Traffic Management at a Worksite.

STMS warrants and unit standards



USING CoPTTM

CoPTTM contains TTM industry approved best practice guidelines which provide consistent standard of TTM throughout NZ.

It is divided into sections. Each section has a title page, a copyright page, a table of contents (which is good way of locating information). Each section is divided into numbered subsections.

Section	Name	What it covers
Section A	**Introduction and general**	Glossary, A4 Levels of road, A5 responsibilities and A7 The TMP process
Section B	**Equipment**	Manufacturer's specifications for TTM equipment
Section C	**Static operations**	Operations that are within a protected closure (not moving along the road)
Section D	**Mobile operations**	Operations that move along the road eg mowing, spraying
Section E	**Standard forms and descriptions**	All of the forms including TMPs and audit forms
Section F	**Level 1 example layouts**	Level 1 traffic management diagrams (TMDs) for common situations
Section G	**Level 2 example layouts**	Level 2 TMDs for higher volume roads
Section H	**Level 3 example layouts**	Level 3 TMDs for motorways and expressways
Section I	**Specific activities**	A range of special activities. These are available electronically only

HSWA: Section 36 - Primary duty of care

Identifies responsibilities for:

- **PCBU** (Person Conducting a Business or Undertaking) – the company you work for
- **Officer** (Director, CEO)
- **Worker** (including STMS, TC, crew).

PRIMARY DUTY OF CARE

A PCBU must ensure, so far as is reasonably practicable, the health and safety of workers, and that other people are not put at risk by its work

What this means for you in your STMS role

STMS is in charge of the TTM at the worksite. They are responsible for ensuring:

- The workers are protected from the road users (eg drivers, pedestrians, cyclists)
- Road users are protected from the work activity.

You need to be always assessing risk and taking action to reduce risk. For example:

Category	Risks	Actions to reduce risk
Work crew	Speeding drivers Worker in no/Go zone	• Install positive traffic management • Tell them to get out of the no/go zone
Pedestrians	Trips Slips Falls	• Remove trip hazards • Use non-slip surfaces • Fence excavations
Drivers	Confused drivers Speeding drivers	• Add directional arrows (RD6L/R) • Add positive traffic management (side friction to encourage drivers to slow down)

It is important that you apply the TMP correctly and follow your company's procedures so that you assist your company to fulfil its health and safety obligations.

Incidents

If something goes wrong at a worksite – **report it.**

Report any incident resulting in damage to any installed TTM equipment, vehicles, plant or injury to a person. Crashes at a worksite must be notified to the RCA within 24 hours.

Complete the CoPTTM Incident Report and submit it to copttm.incident@nzta.govt.nz.

Other notifications that me need to be completed include notifying the RCA within 24 hours of any crashes or notifying Worksafe of any notifiable incidents. Your safety manager or management team will normally do these notifications.

THE STMS PROCESS

STMS process for setting up, maintaining, and removing a worksite

1. In the yard - Check TMP and resources

- Review TMP(s) for worksites for the shift
- Establish equipment requirements and load truck
- Pre-start checks of all vehicles
- Brief drivers about meeting point
- Complete notification as required (eg TOC, TMC)
- Depart to site

2. At the site - Check TMP is right for site

- Complete drive through of site to identify any issues
- Compare TMP to site - decide if fit for purpose (and if not, what amendments can be made)
- Complete Hazard ID and risk assessment **for the site**
- Work out placement of TTM (site dimensions)
- Complete traffic count (if required) and decide if implementation appropriate based on traffic count
- Complete Hazard ID, risk assessment and controls **for installation of TTM**
- Complete safety briefing for TTM Crew

3. At the site - Lead team during installation

- Lead the crew to install TTM
- Provide feedback to TTM crew as appropriate
- Complete drive through and initial inspection of site
- Adjust TTM as required

4. At the site - Manage the worksite

- Complete paperwork (On-site record, etc)
- Complete TTM induction for work crew and induct visitors as they arrive
- Complete regular checks of the TTM (at least every 2 hours) - complete On-site record progressively throughout the day
- Apply contingencies as required (planned or emergency)
- Complete hand over to another STMS or delegate to aTMO/TC as required
- Work with Auditors to agree changes to site if required
- Work with Contractor to manage/track 'critical milestones

5. At the site - Lead team during changes to worksite

Note: *STMS must be onsite and in charge of any TTM changes on the lane*

- Compare TMP to site - decide if planned change is fit for purpose (and if not, what amendments can be made)
- Complete Hazard ID and risk assessment **for the site**
- Work out new placement of TTM (site dimensions)
- Complete notification (eg TOC, TMC) as required
- Work with contractor to either migrate work crew off-site or adjust working space as required
- Complete Hazard ID, risk assessment and controls **for changes to TTM**
- Brief the TTM crew
- Lead the crew to make changes to TTM at the worksite
- Complete a drive through of the changed worksite
- Complete On-site record and paperwork

6. At the site - Lead team during removal

Note: *STMS must be onsite and in charge of removal of TTM on the lane*

- The work crew, equipment and materials must be removed from the working space prior to removal of TTM
- Complete Hazard ID, risk assessment and controls for removal of TTM
- Brief TTM crew
- Lead the crew to remove TTM
- Complete final drive through of site
- Complete On-site record and paperwork

7. Repeat steps 2 to 6 for other worksites to be installed, maintained and removed

Travel to next worksite

- Repeat the process for the other worksites to be installed, maintained and removed during your shift

8. In the yard - Complete back at yard actions

- Replace any damaged or below standard TTM equipment
- Report any vehicle issues
- Complete final yard actions as per company procedures
- If required, review tomorrow's work schedule and TMPs

LEADING THE TEAM

The STMS leads the team at all parts of the STMS process. But there are 3 steps in the process where leading the team is critical:

- Leading the team during installation of TTM at the worksite
- Leading team during changes to TTM at the worksite
- Leading team during removal.

How to be a good leader

A good leader:

- Knows what the requirements are
- Knows how to do the job
- Sets the bar - leads by example
- Gets it right - rather than just getting it done
- Is consistent.

Reinforce good work

Act on areas for improvement

Communication skills that will help

Some communication skills that will help you lead the team are:

- Giving information
- Allocating tasks to crew
- Providing strength-based feedback.

Giving information

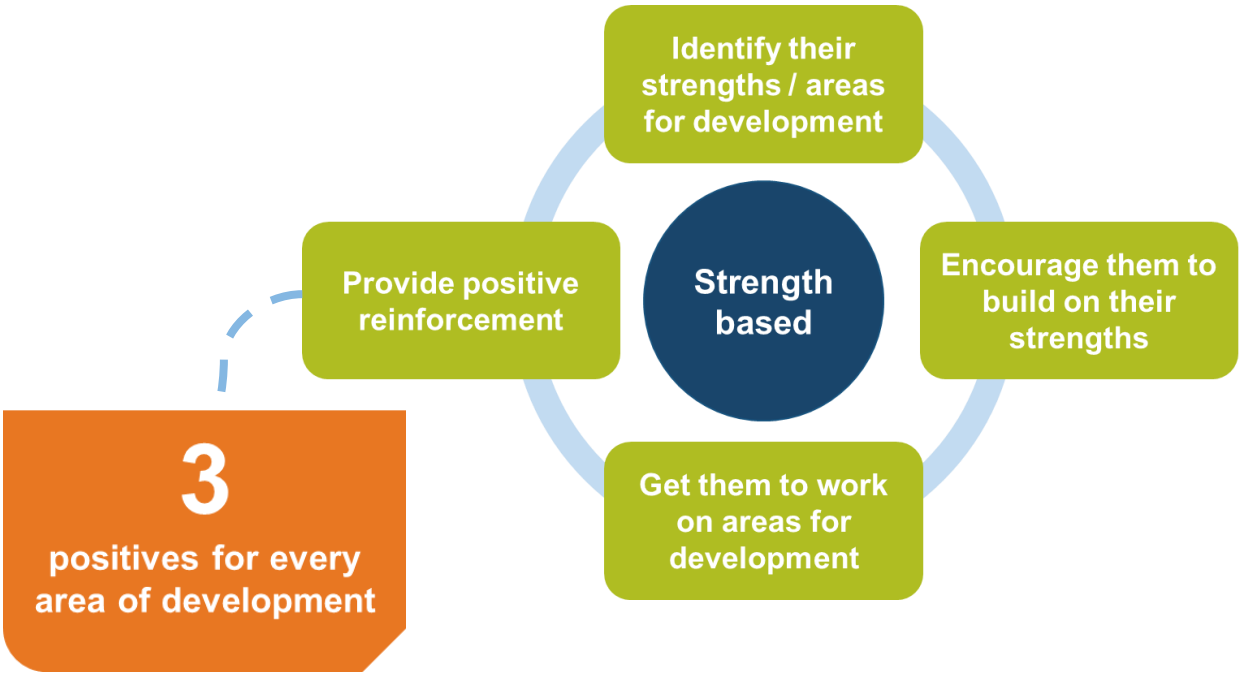
- Make your statements short and to the point
- Explain your reasoning/thinking.

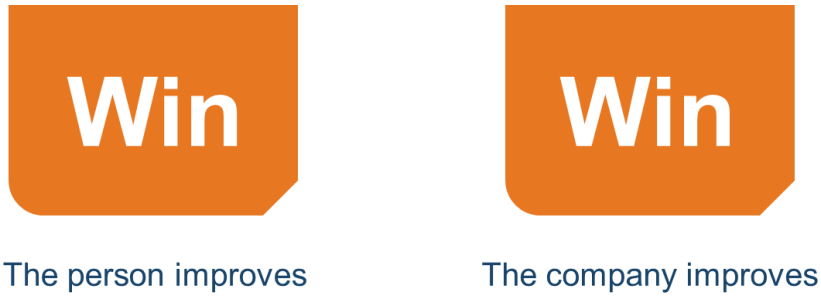
Katrina. I can't let you drive the tail pilot vehicle as you have not been assessed as competent as a mobile driver. Also I do not have enough people here today to have someone sit in the vehicle with you for coaching.

Allocating tasks to staff

Tip	Examples of what to say	Examples of what NOT to say
Be direct. Make statements rather than asking questions	**OK team. The maximum time on Go for this worksite is 3 minutes**	*You know what the maximum time on Go is, don't you?*
Use clear and specific commands	**When you are placing the cone in front of the first stopped vehicle, I do not want you entering the lane. Reach out and place the cone with your feet behind the inside row of cones**	*Be careful when you stop them driving off.*
Give instructions one at a time	**The speed sign has fallen into the lane. I need you to act as a spotter while I get it off the lane**	*The speed sign has fallen into the lane and drivers are swerving towards approaching traffic to avoid it. I need you to act as a spotter while I get it off the lane. I will then need your help to reinstall the sign. You will need to remind me to record it on the on-site record. You can take your lunch break after that but remember to ring the office and sort out your leave. Otherwise I will be working with you on Saturday rather than you being on holiday with your family over the long weekend.*
Keep explanations simple	**I need you to come with me to help install another advance warning sign further down the road**	*The TMP shows that there is a likelihood of queuing and that there is the potential for delays exceeding 5 minutes. They have used an AADT of 22,000vpd and divided that by 8 to arrive at the vph which has been used for the delay calculations.* *Based on the potential queue lengths, the TTM Planner wants an additional sign installed if there are queues rather than shifting the first sign back.*

Provide strength-based feedback





Recognising good performance

A STMS can do the following things to recognise good performance:

- Provide reinforcement
- Tell managers about the good work
- Mentor the person to get even better
- Help them to become CoPTTM competent
- Increased responsibilities (develop for future roles).

Add others:

Correcting performance

FACT	IMPACT	FUTURE
What has been done incorrectly	**Why this is important to get right**	**What you want to see in the future**

FACT	IMPACT	FUTURE
Kahu, you are facing away from approaching traffic when you are placing cones in the taper	You could get hit by a vehicle if the driver does not see you	In the future you need to face towards approaching traffic when you are placing cones

Report ongoing performance issues

An ongoing performance issue would be one where:

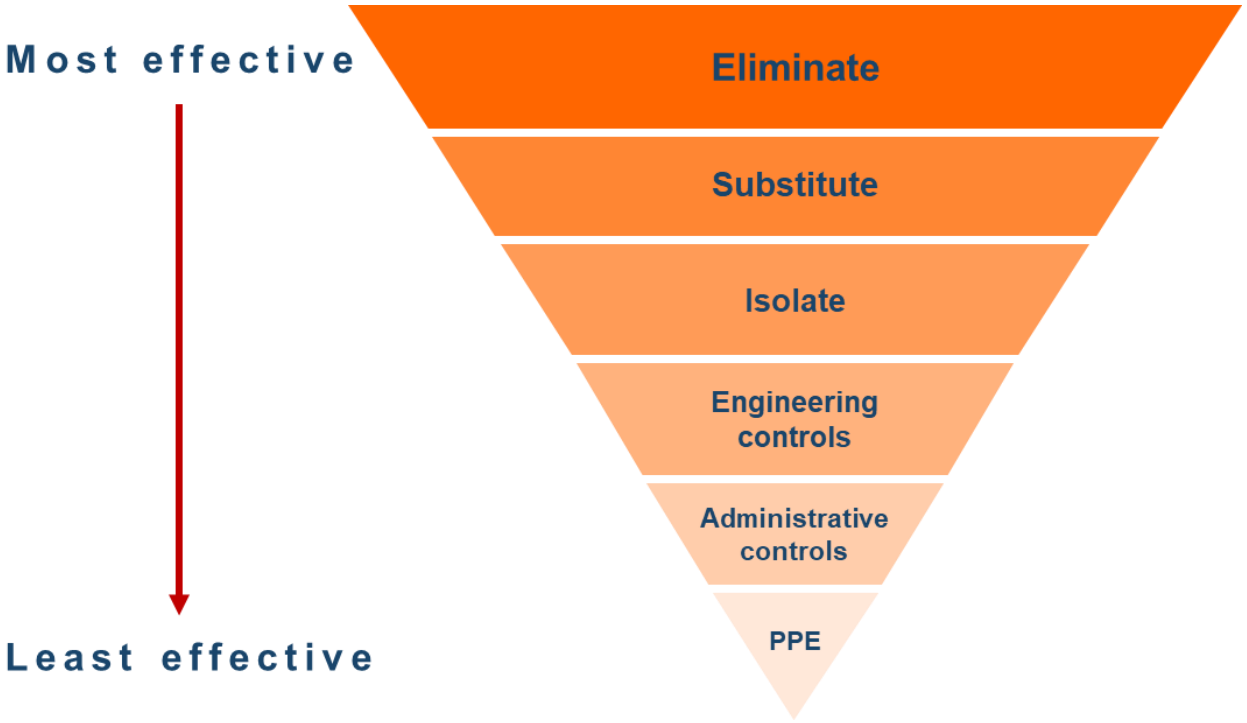
- You have tried to correct a minor performance issue, but performance does not improve
- You have dealt with minor performance issues, but they are replaced by different performance issues
- There is ongoing conflict between members of your team, or with one of your team and stakeholders (eg residents or members of the working space crew).

Inform your manager of ongoing performance issues. It is their role to deal with these.

Hierarchy of controls

There is a hierarchy of controls that we all have to apply. The most effective controls need to be considered first.

If any control is not practical, a lower control can be used.

Hierachy	Examples of TTM related controls
	This is always the first option considered during planning. **Close the road** and detour traffic Substitute Stop/Go for **portable traffic signals Controller** can be located **away from live traffic** Use **barriers** to isolate the workers from risk of passing traffic Use a **TMA to provide extra protection** for road users and shadow vehicle driver **Mark on the TMP where the safety (no go) zones are** and brief crew about not entering these zones. Record briefings **High vis garment is the lowest safety control.** PPE as primary safety control (eg inspection activity for 3 minutes) is only permitted **when it is not practical to use any other control**

When this hierarchy is applied

- A risk assessment is completed by the TTM Planner as part of the development of the TMP

- Before the TTM is installed the STMS completes a **risk assessment on the site** as part of ensuring the TMP is fit for purpose (right for site)
- If the STMS decides to proceed with installation of the TTM, they also complete a **risk assessment on the task** of installing the TTM at the worksite
- Once the worksite is installed the STMS continues to monitor risks to identify:
  - Changes to existing risks
  - New risks
- When the TTM is to be removed, the STMS completes a risk assessment on the task of removing the TTM from the worksite

Example form – Risk assessment

STMS identifies the tasks, hazards and controls:

- Worksite fit for purpose
- Installation of TTM
- Risk assessment of TTM related to working space
- Change to TTM
- Removal of TTM.

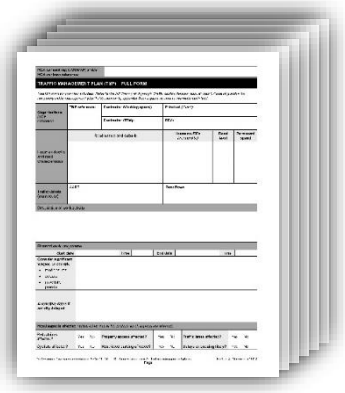
Use your company risk rating tool.

Use as the basis for briefing.

BEFORE YOU SETUP										
Risk Assessor Name:				***Location:***						
TMP considerations	**Environmental considerations**			**Road user considerations**	**Likelihood:**	**nsequences: How severely could it affect health & Safe**				
						no injuries	first aid only	medical attention	extensive injuries	fatality
No TMP	Surface of road			Speeding road users						
TMP not fit for purpose	Rain	Ice	Fog	Other non-compliant behaviour	Almost certain - expected	3	3	4	4	4
TMP not legible	Heat	Wind	Glare	Pedestrians at risk	Likely - probably	2	3	3	4	4
	Sun	Flooding		Cyclists at risk	Possible - might occur	1	2	2	4	4
Vehicle considerations	**Equipment considerations**			**TTM Crew considerations**	Unlikely - could occur	1	2	2	3	4
Vehicle WoF CoF Reg no current	Not enough TTM signage/cones			Crew not wearing/using PPE	Rare - may occur	1	2	2	3	3
Light/beacon/arrowboard fault	Not enough fencing/ramps			Not enough crew members						
Unsafe non compliant vehicle	Condition of TTM equipment			Crew behaviour/inexperience	Risk Ratings		Low 1	Medium 2	High 3	Very High 4
	Equipment not secured									
What was unsafe?			**before applying control**	***How will you make it safer?***					**after applying control**	

	Consequences: How severely could an event effect health & safety?				
Likelihood: what is the chance that something could happen?	Insignificant (no injuries)	Minor (first aid treatment only)	Moderate (medical treatment)	Major (extensice injuries)	Catastrophic (death)
Almost certain - expected in most cases	3	3	4	4	4
Likely - probably occur in most cases	2	3	3	4	4
Possible - might occur at some time	1	2	2	4	4
Unlikely - could occur at some time	1	2	2	3	4
Rare - may occur, only in exceptional circumstances	1	2	2	3	3

ABOUT TMPS



The TMP sets out how TTM is used to keep workers and road users safe while the work takes place.

It sets out how the TTM at a worksite is to be installed, maintained, and removed.

The TMP provides the authority to vary the normal operations of the road. It addresses the safety of both the road user and those carrying out the activity.

The TMP is developed by the TTM Planner who normally uses the Full TMP (but if it is a simple activity, they may use the Short TMP). The TMP is approved by the TMP Approver.

A TMP is required for all activities that vary the normal operating conditions of a road.

TMPs are also required for activates outside the road reserve (eg tree felling).

You need to read the TMP, so you understand how to do your job:

- Safely, and
- In compliance with the RCA and CoPTTM requirements.

Important parts of TMP

- Worksite details (location, road characteristics).
- Planned work programme.
- Proposed traffic management methods.
- TSL (and positive traffic management measures).
- Contingency plans.
- On-site monitoring plan.
- Contact details.
- Traffic management diagrams (pictures).

Alternative layouts

Some TMPs will have multiple diagrams to cover a range of potential situations. For example, the main diagram might be for Stop/Go but the TMP may also include a diagram for a lane diversion just in case there is enough room to keep both lanes open (which results in fewer delays and queues).

Check the TMP for contingency diagrams as part of your getting ready to leave the yard. If there are contingency layouts included in the TMP, make sure the extra TTM equipment required is onboard before you leave for the worksite.

PRE-START CHECKLIST

Importance of pre-start check

It is important to complete a pre-start check before you leave the yard and head to the worksite. The pre-start check ensures that:

- **There are enough people to do the work.** If there are not enough workers the job could take longer, and could also risk someone being injured
- **The vehicles to be used in the operation are operating correctly and compliant.** If a vehicle is not available (or is not compliant) it could put people at risk.
- **The required amounts of TTM equipment are on the truck.** Ensures road users and workers are protected, traffic flows efficiently and all RCA requirements are met.

It is important that the worksite is set up correctly and according to the TMP.

Doing your checks ensures that Road users and workers are protected, that traffic flows without significant delays and that the RCA requirements are met.

Pre-start checks

Completed in the yard before departure to site. Includes a check of:

Vehicle:

- Vehicle compliance
- All electronic signs operating
- Beacons operating
- TMA operation

TTM equipment and resources:

- All required TTM equipment loaded (for example cones, signs, stands, ballast, cone bars, safety fences, pedestrian ramps)
- TTM equipment in acceptable condition
- PPE
- Comms.

It is the company's responsibility to ensure Pre-Start checks are completed.

Prestart checks can be recorded on a checklist or in an app.

TTM VEHICLE PRE-START CHECKLIST

Use this check list to check TTM vehicle equipment is in an acceptable condition, working order and sufficient for the installation and management of the TTM activity.

Vehicle Type:		**Date:**	
Vehicle Registration:		**Person carrying out inspection:**	

TTM Compliance and Operation: Mobiles	**Yes-No or N/A**	**Comments**
Non-LAS/AWVMS Tail pilot and lead pilot vehicle have compliant beacons and advanced warning signage?		
Non-LAS Shadow work and lead pilot vehicle have compliant beacons and direction & protection signage?		
AWVMS Top, bottom and base display panels are compliant and operating correctly?		
AWVMS has compliant beacons and hatched retro-reflective panel at rear of the vehicle (tailgate chevron)		
AWVMS rams operating to raise and lower the display correctly?		
ARROW-BOARD display is CoPTTM compliant and working correctly?		
ARROW-BOARD hatching is CoPTTM compliant and PASS WITH CARE above or below the hatching?		
LAS xenon strobes CoPTTM compliant and working correctly and lamp array displays left/right and cross configurations?		
LAS/RD6 displays left/right configurations and does not display up or down arrow positions?		
TMA is MASH compliant for road speed and these specifications are visible on the side of the TMA?		
TMA good condition and has compliant ground clearance and is parallel to the road surface in the down position?		
TMA is fitted with a working lamp to illuminate the RD6 sign, correct ground clearance with hatching visible on the down position and is in good condition?		

TTM RESOURCES AND EQUIPMENT PRE-START CHECKLIST

Use this check list to check TTM resources are in an acceptable condition, working order and sufficient for the installation and management of the TTM activity as detailed in the approved TMP.

Job Number/Location:		**Date:**	
STMS Incharge:		**Person carrying out inspection:**	

TTM Compliance and Operation: Miscellaneous	**Yes-No or N/A**	**Comments**
Are the number of signs, stands & bases as per the approved TMP and CoPTTM Compliant?		
Are the number of delineators as per the approved TMP and CoPTTM Compliant?		
Are ballast requirements as per the approved TMP and CoPTTM Compliant?		
Is CoPTTM compliant fencing being used where there are significant hazards, heavy machinery or where the site will be left unattended and do you have enough?		
Are CoPTTM complaint ramps being used where pedestrian transitions traverse kerb and channel and do you have enough?		
Does your PPE meet company, project & minimum CoPTTM requirements? (whichever is greater)		
Have you included the additional TTM apparatus to cover contingencies in the approved TMP?		
Where there is low light or night works do you have sufficient lighting equipment for MTCs		

TRAFFIC QUEUES

Managing traffic queues

TMP may include traffic volume details and instructions for STMS to do a traffic count. The cut off limits are stated as vehicles per hour (vph).

STMS to talk to TTM Planner if estimate of vph is above the threshold for installing the worksite.

The STMS may be required to delay the installation.

Lane closures at peak times can cause significant queues/delays.

The longer the lane closure is in place, the longer the queues/delays will be.

The length of queue/delay is impacted by:

- Number of vehicles per lane
- Average speed passing the closure
- Space between the vehicles and length of vehicles (average length)
- Length of closure.

Calculating delays

Vehicle lane occupancy equals **length of typical vehicle** (allowing for some long vehicles) **PLUS** the **space between** vehicles.

Guidelines:

Type of queue	Vehicle lane occupancy
Slow moving queue	**15m**
Stationary queue	**8m**

Traffic count

The TMP may include traffic count details and instructions for STMS to do a traffic count.

The STMS may be required to delay the installation if traffic volumes are above a certain level. The cut off limits are stated as vehicles per hour (vph).

Traffic counts are simply counting vehicles past a point for a period of time (say 2 minutes) and then multiplying the total to get an estimate of **vehicles per hour.**

The count can be recorded by using:

- Tally marks (gate system) 
- A traffic counting App on your phone.

Estimating vehicles per hour (vph)

Options include:

- **2 x 30 = 60.** Count vehicles for 2 mins then multiply total vehicles by 30 mins to reach an estimate of vehicles per hour
- **3 x 20 = 60** Count vehicles for 3 mins then multiply total vehicles by 20 mins to reach an estimate of vehicles per hour.

In the yard - Checks TMP and resources

Check that the TMP is complete and fit for the task in hand. Specific items to be checked are that:

- The drawing reflects the road environment that the operation will take place on
- The drawing is clear and easily understood
- The drawing meets requirements of CoPTTM
- TMP is approved
- Date of installation is within the approved date range
- All necessary authorisations and approvals have been obtained for all affected roads including:
  - Temporary speed limits
  - Road closures
  - Non-standard signs
  - Variable message signs
  - Portable traffic signals
- Delay calculations have been made where reduced carriageway capacity will lead to delays
- Does the TMP cover all phases of the operation including:
  - Installation, modification and removal procedures
  - Attended worksite
  - Unattended worksite.

Onsite - STMS checks TMP is right for site

Complete drive through to compare TMD to proposed site and decide if fit for purpose/right for site. Look for issues like:

- Incorrectly parked vehicles
- Side roads not shown on TMD
- Conflicting activities
- Inadequate site distances
- Potential for TTM to obscure existing visibility for road users.

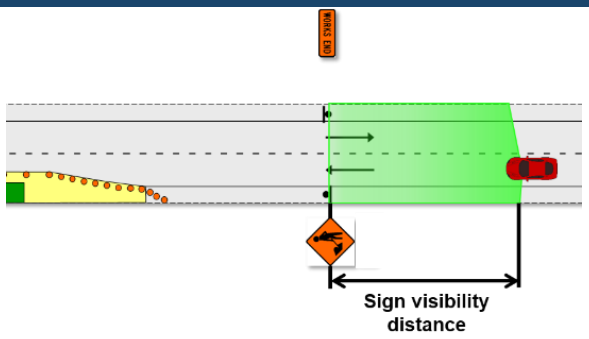
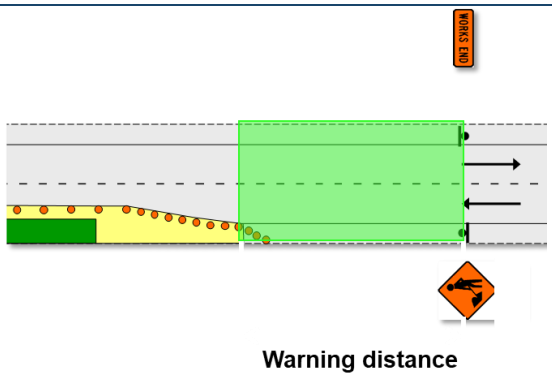
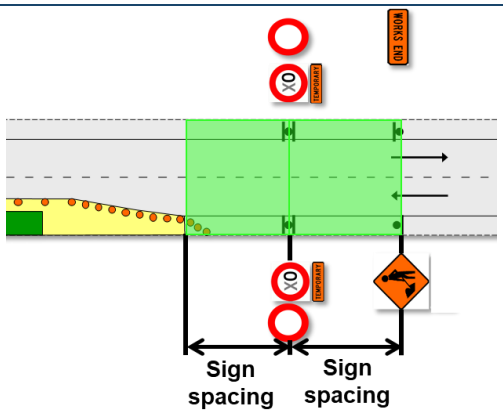
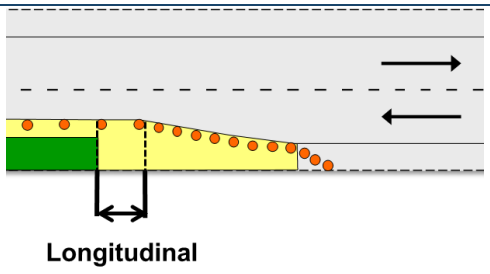
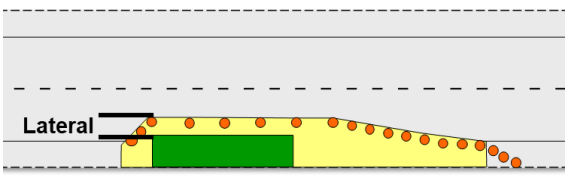
Inform property owners who will be impacted by the worksite (includes residential properties and businesses):

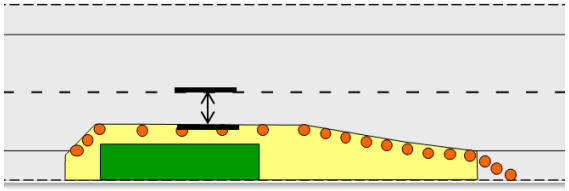
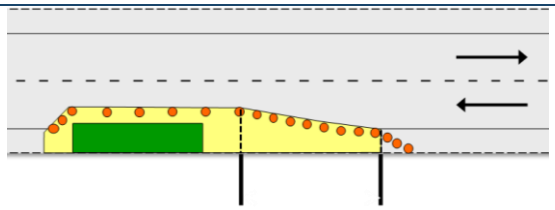
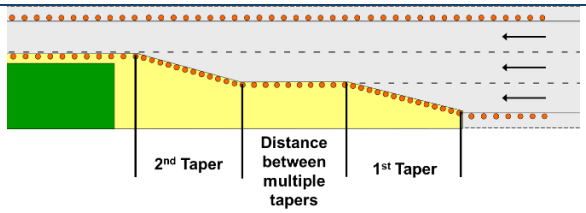
- Explain appropriate options for their vehicle access which could include:
  - Signal a worker when wanting to leave or access the property
  - move vehicles out of the way before working space is installed
  - install a plate for access
- Agree actions with the property owner.

Check the layout dimensions for each part of the worksite:

TMP detail	What needs to be checked?
Advance warning	Drivers will be able to easily see the first sign and they have enough distance to slow down.
Direction and protection	There is enough room to fit all of the signs and cones in and maintain the appropriate safety (no go) zones. The signs and cones will provide clear guidance to road users.
End of works	The instructions for the road users to return to normal driving conditions will be clear.
Contingencies	If there are planned contingencies (for example a detour) these will be able to be implemented quickly without any unplanned impacts.

LAYOUT DIMENSIONS

Dimension	Description	Location at worksite
A = Sign visibility distance	How far away the first sign can be seen by an approaching driver.	
B = Warning distance	The distance from the first sign to the first cone of the closure. The warning distance only applies when there is one sign in advance of the closure.	
C = Sign spacing	When there are 2 or more signs in advance of the closure, we use dimension (C), Sign spacings. This tells us how far apart the signs have to be.	
D = Longitudinal safety zone	This gives an emergency braking area out front of the working space.	
E = Lateral safety zone	Dimension (E) is the Lateral safety zone which gives a 1m separation from workers and traffic. It runs along between the working space and the live lane.	

Dimension	Description	Location at worksite
F = Lane width	Lane width is the distance available for traffic. It is set off either the permanent speed or a temporary speed limit if that is being used.	 **Lane width**
G = Taper length	Tapers are used to change the direction of traffic, shifting it past the working space.	 **Taper**
K = Distance between multiple tapers	This only applies on multi-lane roads where you have 2 or more tapers. It provides some space for the drivers to complete the merge before commencing the next merge.	 **2nd Taper** **Distance between multiple tapers** **1st Taper**

Level 1 Layout distance table

Permanent speed limit or RCA-designated operating speed (km/h)		≤50	60	70	80	90	100
Traffic signs							
A	Sign visibility distance (m)	50	60	70	80	90	100
B	Warning distance (m)	50 or 30*	80	105	120	135	150
C	Sign spacing (m)	25 or 15*	40	50	60	70	75
Safety zones							
D	Longitudinal (m)	10 or 5*	15	30	45	55	60
E	Lateral (m)	1	1	1	1	1	1
	Lateral behind barrier installation	As specified by the Installation Designer					
Tapers							
G	Taper length (m)#	30	50	70	80	90	100
K	Distance between tapers (m)	40	50	70	80	90	100
Delineation devices							
Cone spacing in taper (m)		2.5	2.5	5	5	5	5
Cone spacing: Working space (m)		5	5	10	10	10	10

* Larger minimum distances apply on all state highways and also on all multi-lane roads. The smaller minimum distances may be applied on other roads to accommodate road environment constraints.

\# 1. On non-state highways with speeds 50km/h or less, a **10m taper** (with cones at 1m centres) may be used when there are road environment constraints (eg intersections and commercial accesses).

2. On all roads where the shoulder width is less than 2.5m and the activity does not affect the live lane, a **10m shoulder taper** is permitted (with at least 5 cones at no greater than 2.5m centres).
3. A **taper of 30m** (with cones at 2.5m centres) **must** be used where manual traffic control (stop/go), portable traffic signals or priority give way are employed.

Lane widths (based on permanent speed or TSL if applied)

Speed (km/h)		30	40	50	60	70	80	90	100
F	Lane width (m)	2.75	2.75	3.0	3.0	3.25	3.25	3.5	3.5

Except for delineation device spacings, which are maximum values, the distances specified in the above tables are minimum values.

Minor and major changes

Type of change	Examples	STMS action
Minor changes *Things I can change at the worksite*	• Extend sign spacing • Extend warning distance • Relocate the position of a Stop/Go operator • Add centreline delineation	Make minor changes. Record these on the On-site record *(or on the TMP with an initial to show who has made the change).*
Major changes *Things that I need approval to change*	• Install TSLs that are not included in the TMP • Change the speed of TSLs that are included in the TMP • Extend the closure across side streets • Shorten any site dimensions below minimums (eg shortening tapers when not approved) • Close a lane when it is not approved in the TMP • Install Stop/Go when not approved in the TMP	Either you (or the TTM Planner) **must** contact the TMC for approval before major changes can be made to the planned worksite.

WORKSITE BRIEFINGS

The STMS completes the following briefings:

- TM crew briefing
- TTM Induction briefing (work crew and visitors)
- Briefing of delegated TC
- Handover to another STMS.

These briefings include information about:

- The procedure to be followed for the task
- Hazards and associated risks
- How risks will be managed.

TM crew briefing

About the TM crew briefing?

A TM crew briefing covers the:

- Task to be completed
- How it will be completed
- Roles and responsibilities for the task
- Hazards and mitigations
- Contingencies.

You complete a TM crew briefing with the TTM crew:

- **Before completing the installation of TTM**
- **Before making any subsequent amendments or changes to the worksite**
- **Before the TTM is removed.**

The whole idea of the TM crew briefing is to prepare the TTM crew for the task and make sure they know what to do to keep themselves and others safe during the task.

STMS actions before the TM crew briefing include:

- Meeting with the person in charge of the working space (best completed close to where the working space will be but not at the working space)
- Completing a risk assessment for the **task of installing TTM** and identifying how risks will be managed.

Potential hazards

Hazards could include:

- High wind
- Slippery steps if wet
- Lack of vehicle visibility if setting up over brow of a hill or around a corner
- Passing traffic in a live lane
- Speed of passing vehicles
- High number of heavy vehicles.

As part of the risk assessment, you will also identify how the hazards will be managed.

Where to do the briefing

Complete the TM crew briefing in a safe location away from hazards and noise.

Everybody needs to be able to hear what is being said and see any resources that are displayed.

This location can often be agreed as the assembly point before you leave the yard.

Content of the briefing

Adapting your briefing

You may need to adapt your briefing to fit the crew.

The TM crew briefing can be a:

- Full briefing
- Customised briefing

Full briefing

Examples of when you would provide a full briefing include:

- You are working with a new crew or have a new crew member
- A visitor (eg auditor or assessor) will be observing the completion of your task and needs the extra information contained in the full briefing
- The TTM setup is different to what you normally work on *(for example you normally set out alternating flow worksites but now you will be setting out a lane closure with a detour)*
- You are working in a different area
- **You are completing a weekly briefing to a crew you work with every day doing the same type of tasks.**

Content of the full briefing could include:

- Personal safety
- Crew duties
- TMP for worksite
- Activity and closure type
- Risk assessment for the task
- Safety (no go) zones
- Communication and Comms check
- Installation procedure
- Contingency plans
- Signing the hazard register/briefing sheet.

Customised briefings

Customised briefing

Examples of when you would provide a customised briefing include doing a briefing for a crew you work with daily setting up and removing TTM.
Note: *You would still complete a full briefing with the crew once a week*.

Content of the customised briefing could include:

- Activity and closure type
- Summary of installation procedure
- Risk assessment and mitigation for the task
- Contingency plans (only anything specific to this worksite)
- Signing the hazard register/briefing sheet.

What to cover in the full TM crew briefing?

Companies will have their briefing procedures and forms. Most company procedures will cover at least the topics listed below. Each briefing will have different content depending on the task to be completed.

Here is the content you need to cover for a **Full TM crew briefing** for the installation of TTM.

Item	What to cover	EXAMPLE of what to say
STMS Introduction	Name, role and authority	Hi. My Name is Tom Ngatai. I'm the STMS for this site. My job is to manage the traffic management at the worksite and to act on any safety issues related to traffic management. Please follow all of my instructions and talk to me straightaway if you don't feel safe or you see something that is dangerous.
Personal safety	• Assembly/evacuation point • First aid • Closest medical centre • PPE gear check: – Hi-Viz (compliant, worn correctly, acceptable condition) – Other PPE (as required by NZTA and your company).	The **assembly and evacuation point** for this worksite is… I am a **certified first aider** and the **first aid kit is** behind the passenger seat in the TTM equipment vehicle **Rego VSP6873.** The nearest **medical centre** for this worksite is xxxxxx, but if it is a major injury we call 111, ask for the ambulance service and follow their instructions. Before we go any further, **I need to check your PPE.** *Check high visibility garment is in good condition and meets requirements for the worksite.*
Crew duties	• Vehicles to be used • Roles of TTM crew – AWVMS driver – Shadow vehicle driver – Work vehicle driver	To install this worksite, we will be **using the following vehicles:** • **Tail pilot vehicle** – Mary you will be the driver • **Shadow vehicle** – Kahu you are driving that • **The signs vehicle** – which I will drive

Item	What to cover	EXAMPLE of what to say
	– Deck crew • Deck crew to be in cab of work vehicle for loops	Martin and Maria, you are **deck crew** on the back of the signs truck. Remember that you need to **be in the cab when we do any loops.**
TMP for worksite	• Location of TMP • Explain any EEDs • Hand out relevant parts (eg TMD to be installed)	The **TMP is going to be with me and I am going to be in** the equipment vehicle. There are no EEDs attached to this TMP. **Here is a copy of the TMD** we are setting up.
Task and closure	• What the task is (install, modify or remove TTM) • Type of closure (eg lane drop/merge, alternating flow)	There are 2 lanes in each direction separated by a median strip. We're installing a left-hand lane drop on this side.
Risk assessment for the task	• Hazards / risks to be aware of (eg traffic speed, sun glare, wet conditions, slippery deck, other identified site hazards) • Also explain the controls that are in place to manage the hazards	*State the hazards for the **task** – for example:* The hazards for this task are: • **It is raining so the steps will be slippery.** *Remember to ensure you have 3 points of contact when using the steps* • **The vehicles are speeding through here at the moment, especially in the rain** *Mary I want you to radio through if you see speeding vehicles (especially heavies) approaching us. Maria and Martin, I want you straight back on the signs vehicle if I tell you to. That's the safest place for you if there is a speeding vehicle. OK?*

Item	What to cover	EXAMPLE of what to say
Safety (no go) zones	• No go areas/safety zones for installation and removal of TTM eg – 10m roll ahead – 1m lateral safety zone – No going into live lane ***Note:*** *For changes to and maintenance of TTM at a worksite, the no go areas/safety zones could also include the longitudinal safety zone and plant operating zones*	Maria and Martin, you will be the only crew on foot. You will need to stay out of the 10m roll ahead distance in front of vehicles at all times. I also want you to be 1m clear of passing traffic and I do not want you going into the live lane. If something goes wrong, talk to me on the radio before you do anything.
Procedure to be followed procedure	• Go to diagram(s) and summarise layout and sequence of mobile operation. • Include: – **Tail pilot/AWVMS** – location, display ***Note****: You may need to identify the exact locations that you want the tail pilot/AWVMS driver to stop – a separate drive through with them may be helpful* – **Shadow vehicle** – location, position of vehicle to enable crew to safely exit and enter the work vehicle, pad down, display • Cover the TTM sequence. Use the procedures in the TMP as the basis for this part of your briefing	We're installing a left-hand lane drop on a multilane road. We're installing signs and side friction cones on the left-hand side first. The sign spacing is XXm and the cone spacing is Xm. We will loop around… (location of turning points). Remember that deck crew have to be in the cab for loops. Then we'll install signs and side friction cones on right hand side. And loop again. We will then come back around and install the taper (XXm) and longitudinal safety zone (XXm). The shadow vehicle will need to be positioned at the start of the taper during this phase. I will move the signs truck inside the closure and complete installing the taper and longitudinal safety zone. At this point (after the longitudinal safety zone is installed) the shadow vehicle will drive off and wait at the assembly point.

Item	What to cover	EXAMPLE of what to say
		I will complete the installation of signs, cones alongside working space and the site access point. The tail pilot and I will then do the final loop and complete my drive through check of the worksite. And then we all meet back at the assembly point.
Contingency plans	• Briefing to include details on contingencies and actions eg: – Weather – Delays – Emergency services through site – Traffic incidents (crashes/breakdowns) – Spillage of hazardous substances – Other site-specific contingencies that are outlined in the TMP.	I have checked the weather and it is expected to get better in the next few hours. If it deteriorates before we get the taper in, we will pause the rest of the installation until the weather improves. I have completed a traffic count and we are well under the cut off limit for significant delays. We could still get some queueing during installation. Kahu, remember that you do not wave people past your shadow vehicle. Let them make the decision to merge. Mary, I need you to alert us all if emergency services are passing through our site at speed. That is one of the times I will get Maria and Martin back on to the vehicle for their own safety. If you see a crash at the worksite, let me know and follow my instructions. I do not want anybody rushing into the live lane to provide assistance until we have some form of protection in place. OK? If emergency services attend an incident at the worksite, we will provide assistance as required, but do not move any of the installed TTM or add additional TTM without checking with me. If there is a spillage, we have got an environment clean up kit on board the shadow vehicle. Again, let me know and follow my instructions. Safety is the main priority.

Item	What to cover	EXAMPLE of what to say
Communication and comms check	• Ensure TTM crew have their radio sets • Inform crew of channel • Confirm call signs • Complete comms check • Explain emergency call eg: **emergency, emergency, emergency** then everybody follows my instructions • I will have my phone for calls to TOC, Police, TMC, etc • If the radios fail, contact me by phone to confirm our return to the assembly point. My phone number is _____	I want to check that everyone has their radios on and set to channel 6. Identify yourself when you are talking on the radio – start conversations with your name and who you want to talk to. For example, Kahu if you want to talk to me, say **Kahu to Tom.** If you want to talk to everyone then say **Kahu to all.** So, let's check the radios now. I want each of you to call me and say radio check. So Kahu you would say **Kahu to Tom - Radio check.** *Ensure each radio is set to right channel and working.* If there is a high risk situation, for example a speeding heavy vehicle, I will say **emergency, emergency, emergency** then the action I want. I need you to follow my instructions immediately. All clear on that? I will have my phone for calls to TOC, Police and the TMC. If the radios fail, contact me by phone to confirm our return to the assembly point. My phone number is _____ .
Signing the hazard register/briefing sheet	• Check for questions from TTM crew **(IMPORTANT)** • Get them to sign your company's hazard register/briefing sheet	Who has got any questions or concerns? I would like you to sign the hazard register to confirm that you understand the hazards and mitigations for this site and you have no further questions.

Quick reference checklist for FULL briefing

1 STMS role

- Name, role and authority

2 Personal Safety

- Assembly/evacuation point
- First aid
- Closest medical centre
- PPE gear check:
  - Hi-Viz (compliant, worn correctly, acceptable condition)
  - Other PPE (as required by NZTA and your company)

3 Crew duties

- Vehicles to be used
- Roles of TTM crew
  - AWVMS driver
  - Shadow vehicle driver
  - Work vehicle driver
  - Deck crew
    Note: Deck crew ride in cab of work vehicle for loops

4 TMP for worksite

- Location of TMP
- Explain any EEDs
- Hand out relevant parts (eg TMD to be installed)

5 Activity and closure

- What the activity is (install, modify or remove TTM)
- Type of closure (eg lane drop/merge, alternating flow)

6 Risk assessment for the task

- Hazards/risks to be aware of (eg traffic speed, sun glare, wet conditions, slippery deck, other identified site hazards)
- Also explain the controls that are in place to manage the hazards

7 Safety (no go) zones

- No go areas/safety zones eg
  - 10m roll ahead
  - 1m lateral safety zone
  - No going into live lane

8 Procedure to be followed

- Go to diagram(s) and summarise layout and sequence of mobile operation.
- Include:
  - Tail pilot/AWVMS - location, display
  - Shadow vehicle – location, position of vehicle to enable crew to safely exit and enter the work vehicle, pad down, display
  - Cover the TTM sequence. Use the procedures in the TMP as the basis for this part of your briefing

9 Contingency plans

- Briefing to include details on contingencies and actions eg Weather, Delays, Emergency services through site, Traffic incidents (crashes/breakdowns), Spillage of hazardous substances, Other site-specific contingencies

10 Communication and Comms check

- Ensure TTM crew have their radio sets
- Inform crew of channel
- Confirm call signs
- Complete comms check
- Explain emergency call eg: emergency, emergency, emergency then everybody follows my instructions
- I will have my phone for calls to TOC, Police, TMC, etc
- If the radios fail, contact me by phone to confirm our return to the assembly point. My phone number is _____

11 Signing the hazard register/briefing sheet

- Check for questions from TTM crew
- Get them to sign your company's hazard register/briefing sheet

Tips on giving a briefing

TIPS

- Talk clearly and loud enough for everyone to hear
- Be confident
- Keep the “umms” and “ahhs” to a minimum
- Have a checklist of the key headings or key points to cover. You can modify this for each worksite and task being performed
- Practice giving briefings for each task (install, amend, remove) until you can do them without having to think what comes next
- Create a discussion - ask or prompt questions to ensure understanding
- Ensure information is site specific (not generic)
- Maintain eye contact where possible - keep your head up

Add others here:

What to cover in a customised TM crew briefing?

A customised briefing is a shorter briefing focusing on the task to be completed. You use this if you are working with the same crew doing the same type of work every day. Remember that you still need to complete a full briefing **weekly** with the crew or if there is a change to either the crew or type of activity they are performing.

Content of the customised briefing could include:

Item	What to cover	EXAMPLE of what to say
Activity and closure type	• What the task is (install, modify, or remove TTM) • Type of closure (eg lane drop/merge, alternating flow)	There are 2 lanes in each direction separated by a median strip. We're installing a left-hand lane drop on this side.
Summary of installation procedure	• Summarise layout and sequence of mobile operation • Include: - Tail pilot/AWVMS - location, display - Shadow vehicle - location, position of vehicle to enable crew to safely exit and enter the work vehicle, pad down, display • Cover the TTM installation sequence. Use the installation procedures in the TMP as the basis for this part of your briefing	We're installing signs and side friction cones on the left-hand side first. The sign spacing is XXm and the cone spacing is Xm. We will loop around…. (location of turning points). Then we'll install signs and side friction cones on right hand side. And loop again. We will install the taper (XXm) and longitudinal safety zone (XXm). The shadow vehicle will need to be positioned at the start of the taper during this phase. I will move inside the closure and complete installing the taper and longitudinal safety zone. After the longitudinal safety zone is installed the shadow vehicle will drive off and wait at the assembly point. I will complete the installation of signs, cones alongside working space and the site access. The tail pilot and I will then do the final loop and complete my drive through check of the worksite. And then we all meet back at the assembly point.

Item	What to cover	EXAMPLE of what to say
Risk assessment and mitigation for the task	• Hazards/risks to be aware of (eg traffic speed, sun glare, wet conditions, slippery deck, other identified site hazards) • Also explain the controls that are in place to manage the hazards	*State the hazards for the **task** – for example:* The hazards for this task are: • **It is raining so the steps will be slippery** *Remember to ensure you have 3 points of contact when using the steps* • **The vehicles are speeding through here at the moment, especially in the rain** *Mary I want you to radio through if you see speeding vehicles (especially heavies) approaching us. Maria and Martin, I want you straight back on the equipment vehicle if I tell you to. That's the safest place for you if there is a speeding vehicle. OK?*
Contingency plans (specific to this worksite)	• Briefing to include details on contingencies and actions eg – Weather – Delays – Other site-specific contingencies	I have checked the weather and it is expected to get better in the next few hours. I have completed a traffic count and we are well under the cut off limit for significant delays.
Signing the hazard register/ briefing sheet.	• Check for questions from TTM crew • Get them to sign your company's hazard register/briefing sheet	Who has got any questions or concerns? OK let's sign the hazard register and get into it.

TTM induction briefing

Who to brief?

You need to brief all people arriving at the worksite. This includes anyone arriving at the worksite to:

- Enter the worksite or the working space
- Deliver materials to the worksite
- Assist with TTM
- Audit the TTM (or the activity within the working space).

When to complete the briefing

Brief individuals or groups as they arrive at the worksite and before they enter the working space.

If they are entering the working space, then they will also get a briefing from the person in charge of the working space. You may be able to combine your briefing with their briefing.

Note: You still have to do the briefing about the TTM.

Where to do the briefing

Complete the briefing in a safe location away from hazards and noise.

What to cover in the briefing?

Companies will have their own hazard briefing procedures and forms. Most company procedures will cover at least the topics listed below. Cover the following items in your briefing:

Item	What to cover	EXAMPLE of what to say
STMS role	• Your **role** in managing safety on site related to TTM	I am the STMS responsible for temporary traffic management at this worksite. Talk to me If there are any issues with the signs, cones, pedestrians, cyclists, and drivers.
PPE	• Ensure that the person is wearing the **correct PPE** • If PPE is not correct, the STMS must ensure that it is supplied or ask the person to leave the worksite	Before we go any further, I need to check your PPE. *Check high visibility garment is in good condition and meets requirements for the worksite.*
Activity and closure	• What the activity is • What type of closure is currently installed	The work being carried out is XXXXX and we have installed a YYYY closure.
Hazards	• Explain the hazards related to TTM at the worksite. These may include: – Traffic passing by or through the working space – Weather conditions • Also explain the controls that are in place to manage the hazards	*State the hazards for the worksite – for example:* The hazards at this worksite are: • Traffic driving by the working space and we have reduced the speed to 30km/h to reduce this risk • The rain makes the stopping distance of vehicles longer, so we have extended our signs further down the road than normal.
Safety (no go) zones	• The purpose of safety (no go) zones	There are safety (no go) zones that wrap around the working space to provide protection for people in the working space. You cannot enter any of the safety (no go) zones or place equipment and materials in them.

Item	What to cover	EXAMPLE of what to say
Locations and dimensions of safety (no go) zones	• Use the TMD to identify the **locations and dimensions of the safety (no go zones):** – Tapers – Longitudinal – Lateral – Roll ahead distance in front of vehicles involved in an operation.	I have the traffic management diagram for this worksite. You can see the sections coloured in yellow. These are the safety (no go) zones. They start with the taper which is 30m long. There is the emergency stopping area immediately in front of the working space which is 60m long. I have marked this area off with cones and cones bars so everyone in the working space knows where this begins. We also have the lateral safety zone along the side of the working space which is 1m wide. You also cannot be within 10m of the front of a vehicle involved in an operation.
First aid / Emergency	• Location of **first aid kit** • Identify certified **first aiders** • Nearest emergency centre	I am a certified first aider and the first aid kit is in my vehicle which is over there - Rego number **VDP4532.** The nearest **medical centre** for this worksite is xxxxxx, but if it is a major injury, we call 111, ask for the ambulance service and follow their instructions.
Evacuation point	• Location of evacuation point	The evacuation point is for this worksite is…
Mobile number	• Get them to record your **mobile number** ***Note:*** *If the person is in charge of the activity in the working space (eg Site Foreman) you could give them a radio on a separate channel so they can have direct contact with the STMS*	Here is my mobile number so you can contact me if there are any issues with the signs or cones.

Item	What to cover	EXAMPLE of what to say
Sign register	• Get them to sign your company's hazard briefing sheet	Do you have any questions? I would like you to sign the hazard register to confirm that you understand the hazards and mitigations for this site and you have no further questions.

Briefing of delegated TMO/TC

Warrant	Road environment/level of road	Delegation
TMO	**On category A and B road environments** *(may include LV, level 1, level 2 and 2LS roads)*	The TMO can be delegated responsibility to maintain the worksite within the current phase when the STMS is away from a static worksite.
TC	**On LV and level 1 roads**	The TC can be delegated responsibility to maintain the worksite within the current phase when the STMS is away from a static worksite.

The STMS briefs the TMO/TC every time they are to be delegated responsibility for the worksite when the STMS is absent from the worksite.

Details of the briefing are recorded on the On-site record in the **Delegation** field.

Delegation					
Worksite control accepted by TC/STMS-NP					
	Name	*ID Number*	*Warrant expiry date*	*Signature*	*Time*
	Tick to confirm briefing completed				

The briefing needs to cover:

Key information from the TMP	• Key information from the TMP: - Planned work programme (and any key milestones) - Proposed traffic management methods - Positive traffic management measures - Contingency plans - On-site monitoring plan - Relevant traffic management diagram (TMD).
Risk assessment and mitigation for the worksite	• Hazards / risks at the worksite and how these are managed • Also cover likely situations that may occur, which could include: - Non-compliant high visibility garments - Intrusions into safety (no go) zones - Signs or cones falling into lane - Contractor asking for changes to TTM - Long queues - Vehicles obscuring sign and cone visibility - Vehicles speeding through the site - Vehicles requiring site access - Weather issues - High wind, low visibility, and extreme rain - Pedestrians and cyclists not sticking to the protected paths provided.

Communication between STMS and TMO/TC	• Confirm how the TMO/TC is to communicate with the STMS • Agree when the TMO/TC is to communicate with the STMS
Complete Delegation field of On-site record	• Check for questions from the TC • Complete the **Delegation** field of the On-site record • Get the TMO/TC to sign confirming they understand their responsibilities and the instructions given by the STMS and that they have no further questions

Handover to replacement STMS

Where one STMS hands over control of the worksite to another STMS (eg where shift work is involved), the STMS needs to brief the replacement STMS.

The handover briefing should include the following:

Key information from the TMP	• Key information from the TMP: - Planned work programme (and any critical milestones) - Proposed traffic management methods - Positive traffic management measures - Contingency plans - On-site monitoring plan - Relevant TMDs.
Risk assessment and mitigation for the worksite	• Hazards / risks at the worksite and how these are managed
Completing the On-site records	• Check for questions from the replacement STMS • Complete the **Worksite handover accepted by replacement STMS** field of the On-site record • Get the replacement STMS to start a new On-site record for the worksite

The on-site record records the handover of the worksite to the replacement STMS and confirms that the briefing took place.

Worksite handover accepted by replacement STMS					
	Name	*ID Number*	*Warrant expiry date*	*Signature*	*Time*
	Tick to confirm handover briefing completed				

The replacement STMS starts a new On-site record recording the time that they took charge of the worksite.

WORKSITE CHECKS AND THE ON-SITE RECORD

When STMS completes worksite checks

The STMS must ensure that TTM is:

On category A and B road environments level LV and level 1 roads, the STMS can delegate worksite responsibility to the TMO/TC while absent from the worksite.

How to complete the worksite check

There are a variety of ways of completing the site checks. The best way is to drive through the worksite as a driver would and walk through any temporary footpaths as a pedestrian would do.

This gives you the best idea of what each type of road user is experiencing when they are passing by or through the worksite.

What to look for

As you complete the drive-through/walk-through, look for:

- Good advance warning
- High-visibility garments are worn by all
- Signs are still visible (not blocked by parked cars)
- There are no conflicting signs
- Clear direction for drivers (cones and signs)
- Lane widths are right for the speed and type of vehicles using the road
- There are no long queues or delays
- Clear guidance for cyclists
- Residents and other stakeholders have access to their properties.

Add others:

When you check temporary pedestrian paths, look for:

- Clear guidance for pedestrians (signs, safety fences/cone bars)
- No trip hazards on temporary paths.

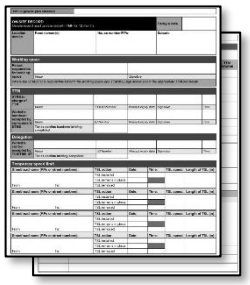
Add others:

Taking corrective action

When taking corrective action for any issues, ensure you:

- Act within your TMP
- Make CoPTTM compliant changes to the worksite
- Comply with local operating standards
- Get approval for any major changes to the worksite
- Stay safe (have a spotter if you are completing an inspection type activity and are in the lane).

About the On-site record



- On-site record completed for every site.
- At least one per day.
- Completed by TC if delegated responsibility.
- **Records worksite details and site checks.**
- There are guidelines for completion of the on-site record.

Record your observations/actions on the on-site record:

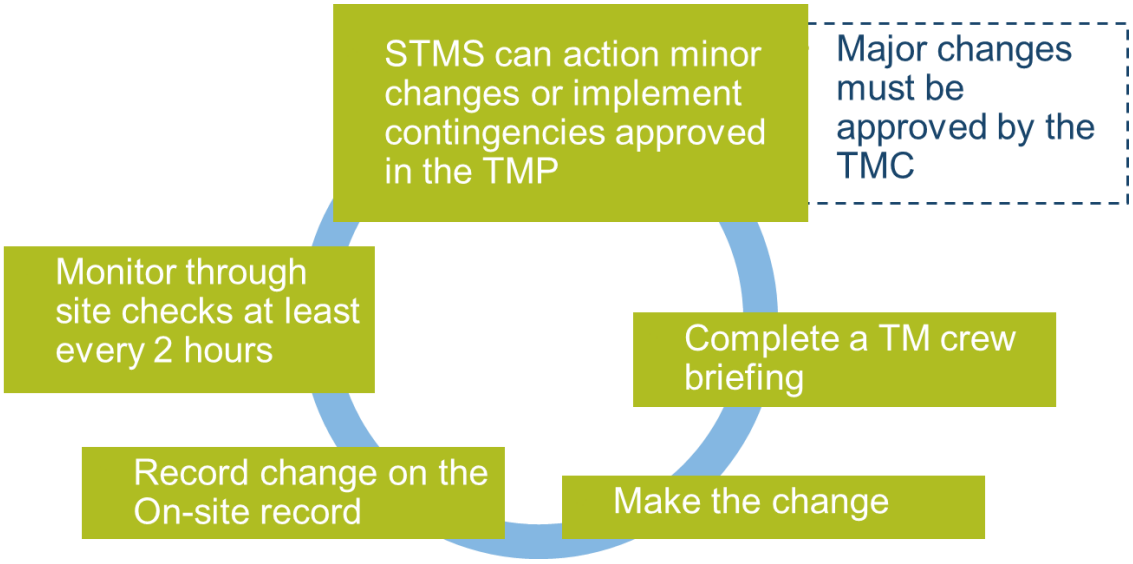
- Items checked OK / not OK
- Time of check
- Signature
- Time of any change and what adjustment was made.

Changes to TTM controls

Situations where TTM controls may need to be changed and/or a contingency implemented include:

- Fog causing visibility problems
- Heavy traffic flows due to an incident elsewhere
- Increased wind
- Crashes.

Making changes



CRITICAL MILESTONES

Contractors completing work inside the working space will normally be working to timeframes. Some of these timeframes will be critical (eg concrete truck will be here between 10.30 and 10.45). These are called critical milestones.

The TTM crew also has critical milestones related to TTM (eg must have TTM off the lane by 2.45pm).

Agreeing the key milestones (work and TTM) allows you to:

- Track the contractors progress and discuss any likely issues
- Meet your TTM critical milestones.

Work with Contractor to manage/track 'critical milestones'

How to manage a site towards critical milestones

Ask the contractor questions like:

- What are your critical timeframes today?
- What stages of work are you completing today?
- How long will that take?
- What time will you be finished that by?

Let them know your TTM critical milestones:

- I need to start removing TTM by…
- I must have all TTM clear of the lanes by…

Actions if it appears milestones will not be met

Talk to the contractor – check timeframes for this (and the next) stage of work.

Reinforce your critical TTM milestones. Discuss what can be completed in available timeframe. Agree actions with contractor.

Actions if contractor has run over time

Contact TTM Planner and discuss issues. Either you or the TTM Planner contacts the TMC to discuss issues. Act on the direction from TTM Planner and TMC.

Agree actions with contractor which could include:

- Contractor stopping work and vacating working space
- Reducing size of working space
- Adding additional advance warning signs (longer queues).

Critical Milestone Planning Tool

This tool can be used by the TTM Planner or the STMS to map the contractors critical milestones for the activity period against the approved working times which should include TTM install and removal times. Adherence to milestones during the activity period reflects a site that is on track to meet daily objectives including TTM removal or a modified TTM setup to manage the non-work activity period.

TMP Reference:		**TMD reference for activity:**	
Site Briefing Start Time:	am/pm	**TTM Install Start Time:**	am/pm
Site Briefing Finish Time:	am/pm	**TTM Install Completion time:**	am/pm
Work Start Time:	am/pm	**TTM Removal Start Time:**	am/pm
Work Completion Time:	am/pm	**TTM Removal Finish time:**	am/pm

What time does the contractor need to have the site completed, reinstated or made safe in order for the TTM to be removed or a modified setup to be installed to manage the non-work activity period?		am/pm
Was the supervisor made aware of this at the site briefing?	Yes	No

Activity Milestone 1 (to be agreed with contractor):	**Estimated completion time**	**Actual completion time**
	am/pm	am/pm
Actions taken by the contractor and STMS if the completion time is later than the estimated completion time:		

Activity Milestone 2 (to be agreed with contractor):	**Estimated completion time**	**Actual completion time**
	am/pm	am/pm
Actions taken by the contractor and STMS if the completion time is later than the estimated completion time:		

Activity Milestone 3 (to be agreed with contractor):	**Estimated completion time**	**Actual completion time**
	am/pm	am/pm
Actions taken by the contractor and STMS if the completion time is later than the estimated completion time:		

STMS name and signature:	**Contractor/Supervisor name and signature:**

TEMPORARY SPEED LIMITS

Authorising TSL

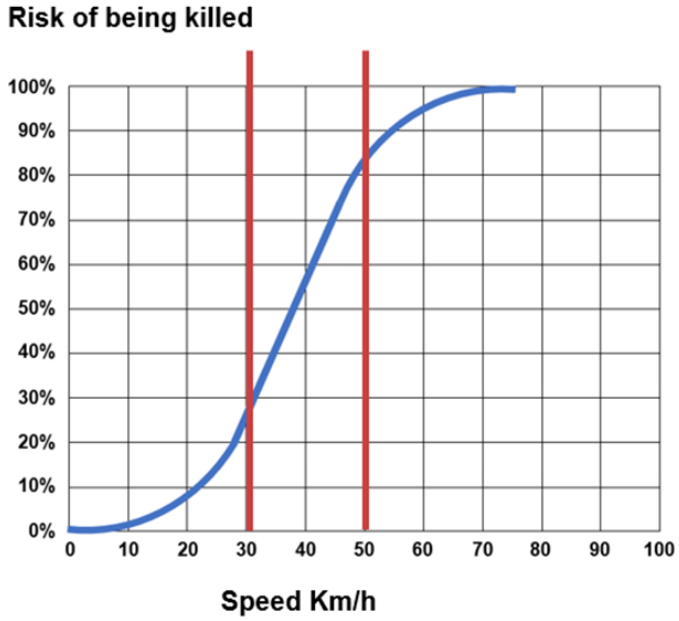
A TSL must be 80km/h or less, have a drop in speed from the permanent speed limit of 10km/h and be appropriate to the condition of the road. TSLs are authorised by the RCA by approval of the TMP.

The TMP includes the TSL that has been authorised, an estimated length of TSL, where the signs are likely to be placed and on which streets. It also includes the times and dates that the TSL can be in force and the diagram number associated with the TSL.

When the TSL is placed, the On-site record records where the signs are actually placed and the actual length of TSL. If a driver contests a speeding ticket the NZ Police need the On-site record to prove the that the TSL was installed.

TSLs need to be realistic for the conditions at the worksite. If TSL is not realistic, drivers will often ignore it. This can lead to reduced compliance with all TSLs.

Human survivability



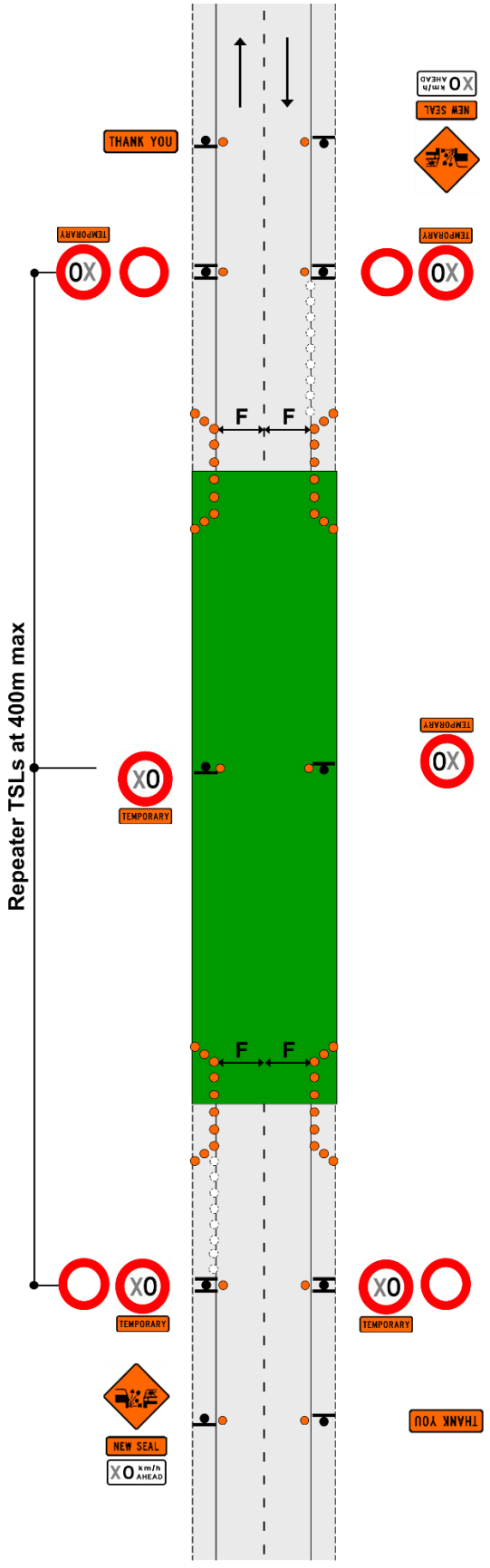
Speed	Risk of being killed
20km/h	10%
30km/h	27%
50km/h	85%
70km/h	100%

Positive traffic management

Speed signs alone will not slow traffic down. If you have a TSL you will need to use other options to squeeze speed out of drivers. Here are some of the options available:

- T144 sign (speed advisory sign)
- Narrowing lanes (side friction)
- Cone offset delineation
- Gradually reducing the space between delineation devices
- Placing cones from the TSL to the taper
- Using temporary speed humps
- Using flashing beacons, flares, or illuminated signs.

Sign location



Gated TSL signs

Gate speed signs at every change in speed (TSL or return to permanent speed limit).

Gated speed signs are not required on roads with an AADT of less than 500 vehicles.

Repeater signs

On long worksites TSL signs must be repeated at intervals no greater than 400m, as a reminder to road users of the maximum speed they may travel past, or through, the worksite.

On two-way two-lane roads these repeater signs need to be installed at 400m intervals on the left-hand side of road users travelling through the worksite.

On multi-lane roads, all repeater signs must be gated to ensure that vehicles in the right hand or centre lanes can see a TSL sign.

Excessive or inappropriate use of TSLs (eg leaving in place once works have been removed or finished) will result in instant non-conformance regardless of overall site condition rating.

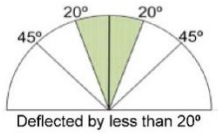
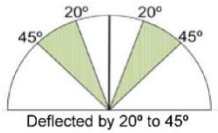
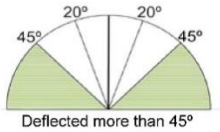
If a range of TSLs have been authorised for the worksite, the STMS needs to decide which TSL to use. The TSL Decision Matrix is used to help the STMS make this decision.

TEMPORARY SPEED LIMIT (TSL) DECISION MATRIX WORKSHEET

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.

Appendix B

Possible Temporary Speed Limit

	EXCELLENT (110, 100, 90)	AVERAGE (80, 70)	BELOW AVERAGE (60, 50)	POOR (40, 30, 20)
1. Minimum Lane Width	3.5m	3.25m	3.00m	2.75m
2. Pavement / Surface Condition	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) **70km/h** where new seal has been swept but not marked	Defects and / or loose material on the lane (eg unattended reseals) **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)
3. Visibility and Alignment	There is greater than 140m visibility to the first cone in taper, **and** the worksite has not imposed a change in alignment	There is less than 140m visibility to the first cone in taper, **or** vehicles are deflected by 20 degrees or less from the original direction of travel  Deflected by less than 20°	There is less than 60m visibility to the first cone in taper, **or** vehicles are deflected by 20-45 degrees from the original direction of travel  Deflected by 20° to 45°	There is less than 30m visibility to the first cone in taper, **or** vehicles are deflected by more than 45 degrees from the original direction of travel  Deflected more than 45°
4. Site Clutter	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 though the site. Some queues of road users	Has numerous driver distractions including construction traffic. Cycle lanes or footpaths are closed. **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)

Is the lowest speed 80km/h or less and at least 10km/h below the permanent speed?

Yes → **Use this Temporary Speed Limit**

No → **No Temporary Speed Limit Required**

UNATTENDED, NIGHT-TIME ACTIVITIES AND MACHINERY

Redundant TTM equipment

Remove TTM equipment not in current use (or place it in a safe secure location).

Redundant TTM equipment may be stored on site provided that:

- It does not remain on-site and unused for more than 48 hours
- It is stored:
  - At least 5m from the edge line (where no footpath exists), or
  - In the back berm area between footpath and boundary.

Courtesy tow of vehicle

RCAs have different policies and procedures for courtesy towing of a vehicle. Contact the RCA to confirm local policies and procedures.

Notification to the vehicle owner of the courtesy tow requirement, in advance of the installation of TTM, may be required.

Night-time activities

Issues to be aware of:

- Traffic density will be less and hence traffic speed may increase
- Visibility is reduced
- Road user's awareness may be reduced
- Positive TTM may be different (eg illuminated signs)
- Lighting that directs light downward is required.
  Note: Light sources that produce glare that could dazzle road users are not permitted
- Use of illuminated wands is optional and may only be used when overhead lighting for MTCs is provided.

Unattended worksites

Check TMP for unattended worksite instructions and TMD.

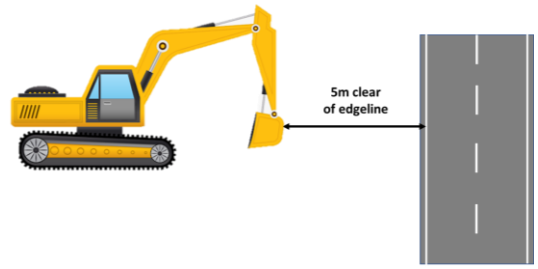
STMS to consider the following:

- Can working space be reduced?
- Can cones be extended towards oncoming traffic (eg closure on corner or over a hill)?
- Can TSL be raised or removed?
- Do temporary pedestrian paths need to be illuminated?
- Will the temporary surface deteriorate?
- How often will the site need checking?

Vehicles, plant and materials - Unattended Sites

No vehicles, plant or materials are to be left:

- **In any of the safety zones** including the taper
- **On curves** or any similar place where they may be struck by an out-of-control vehicle.

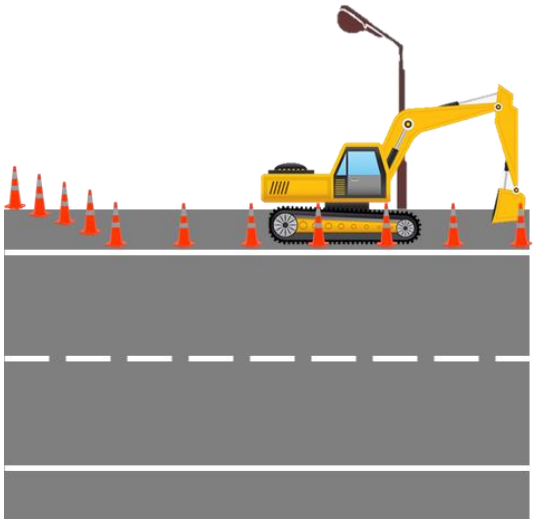


Over 65 km/h

- All plant **must be** parked at least 5m outside the edgeline and on the same side of the road as the working space.

Under 65km/h

- Plant **where possible must be** parked at least 5m outside the edgeline and on the same side of the road as the worksite.



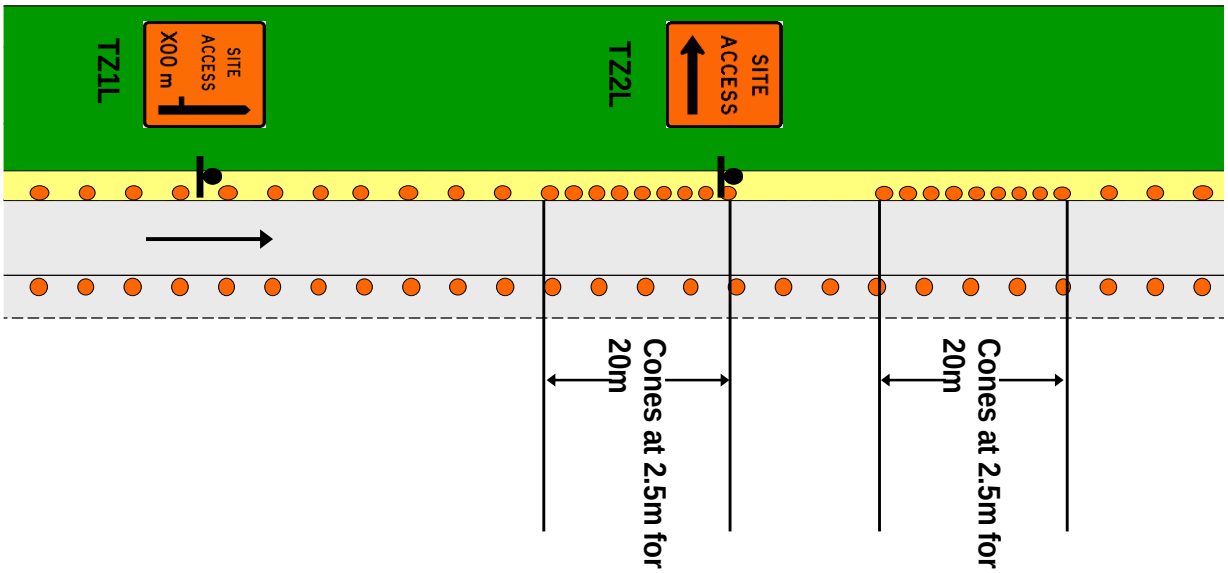
It may remain in a normal parking area providing:

- The vehicle/plant is registered for on road use
- Parked on same side of the road as worksite
- The plant is not parked on a central median
- It has Clear Sight Distance (eg 3 x the posted speed limit in metres)
- The plant is parked within an RCA approved shoulder closure as detailed in the signed TMP____ AND ____ Where possible parked under street lighting.

Delineation of site access

Access point must be signed and delineated with additional cones at 2.5m centres for:

Level of road and speed	Delineation either side of the opening
Over 65km/h	20m
Under 65km/h	10m



MAINTENANCE STANDARDS

Condition	Daytime	Nighttime	Requirements
Acceptable Marginal Unacceptable			When installed, all signs must be in ACCEPTABLE condition. Advance warning, MTC and TSL signs must remain in acceptable condition at all times. Any other signs in marginal condition must be replaced **within 12 hours.** Signs in unacceptable condition must be replaced **immediately.**
Acceptable Marginal Unacceptable			When installed, all delineators must be in ACCEPTABLE condition. Delineators in tapers must be in acceptable condition at all times. Once more than 25% of delineators are in marginal condition they must be cleaned to acceptable condition or replaced within 12 hours. Delineators in unacceptable condition must be replaced immediately.
Acceptable Marginal Unacceptable			High visibility garments must be in acceptable condition at all times.

ELECTRONIC VMS BOARDS

Approval is required from the RCA to use any VMS sign

AWVMS

AWVMS is the tail pilot vehicle for level 2/3 roads and may also be used on level 1 roads

Mobile variable message sign (VMS)

Maximum of three lines per sign.

Only use messages that have been approved in the TMP.

Avoid positioning VMS on a corner where it can be a distraction and where an out of control vehicle could hit it.

Regional VMS

Mounted on a fixed support structure beside high volume urban or rural roads.

Used for:

- Incident management, diversions, delays, closures
- Adverse road or driving conditions.

Advanced Traffic Management System (ATMS)

- Mounted on overhead gantries above motorways.
- Used for similar applications to the regional VMS.

CRITICAL POINTS FOR ME

Add critical points here:

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