

Temporary Traffic Management Guidance Handbook



January 2014



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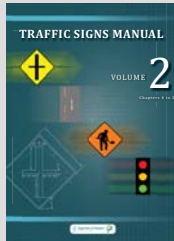
GLOSSARY OF TERMS

CSCS	C onstruction S kills C ertification S cheme
DTTAS	D epartment of T ransport, T ourism, and S port
GCMTRW	G uidance for the C ontrol and M anagement of T raffic at R oad W orks
GSJ	G rade- S eparated J unction
HSA	H ealth and S afety A uthority
IPV	I mpact P rotection V ehicle
km/h	K ilometres P er H our
LMCC	L orry M ounted C rash C ushion
NRA	N ational R oads A uthority
PSCS	P roject S upervisor C onstruction S tage
PSDP	P roject S upervisor D esign P rocess
Roadworks	Meaning repairs, maintenance, alterations, improvements, installations, or any works to, above or under a public road
SSWP	S afe S ystems of W ork P lan
TM	T raffic M anagement
TTM	T emporary T raffic M anagement
TTMGH	T emporary T raffic M anagement G uidance H andbook
TSM	T raffic S igns M anual
veh/h	V ehicles P er H our
VMS	V ariable M essage S ign
vpd	V ehicles P er D ay

1 INTRODUCTION

1.1 PURPOSE

This guidance handbook is designed to serve as a quick and easy-to-use reference document for the planning and implementation of temporary traffic management (TTM) measures for routine operations relating to traffic sign maintenance. These operations range in duration from a few minutes up to one day, but are never more than one day's work.



The Traffic Signs Manual (TSM) and the Guidance for Control and Management of Traffic at Road Works (GCMTRW)

This handbook takes a practical approach to TTM arrangements, giving due consideration to the safety of road users and workers. It intends to complement existing standards and guidance. It also considers the practical issues and risks associated with setting up a TTM layout, which may take significantly longer than carrying out the works themselves, works which are relatively low risk routine operations.

It is intended to be used as a 'dashboard' handbook, and to become a commonplace reference document which will encourage a greater level of consistency in TTM measures for routine operations, such as:

- Road traffic signs installation / repair / replacement / cleaning / removal
- Junction definition post installation / repair / replacement
- Vegetation control (e.g. hedge trimming)

1.2 DEVELOPMENT

This handbook is based on:

- The principles and guidance of Chapter 8 of the Traffic Signs Manual (TSM) and the Guidance for the Control and Management of Traffic at Road Works (GCMTRW)
- Consultation with the HSA, Local Authorities, TM service providers, and the traffic signing industry
- NRA experience in implementing and managing road maintenance contracts

1.3 APPROPRIATE TYPES OF TTM

The appropriate TTM for routine traffic sign maintenance varies depending on duration, location and the nature of the work being carried out. In addition, some activities involve continuously moving or short stop operations.

Therefore the most appropriate TTM setup for such works may not fall neatly into the standard roadwork types as set out in the TSM Ch. 8 (i.e. Static Types A, B, C, Semi Static, and Mobile).

As such, the layouts included in this handbook, where necessary, combine elements from the various roadwork types in order to arrive at what is considered to be the most suitable TTM arrangement.

1.4 FURTHER ASSESSMENT

While the guidance contained here will provide some consistency in TTM measures used for routine operations, no 'one' set of TTM layouts can cover all sites and conditions. Therefore, at each site, a risk assessment is required, and further development of layouts may be necessary prior to TTM setup. Where further development is required, reference shall always be made to Chapter 8 of the TSM. For the purposes of this handbook:

- **Shall** or **must** indicates that a particular requirement is mandatory,
- **Should** indicates a recommendation and
- **May** indicates an option.

1.5 SITE SPECIFIC RISK ASSESSMENTS

It is important for TTM auditors and installers to note that the layouts in this guidance handbook cover typical scenarios only. There are many instances where they may not suit the particular operation or location. The Contractor's TTM designer may need to develop new layouts or amend the typical layouts shown here, in order to meet their particular site conditions.

It is therefore a requirement that a Site Specific Risk Assessment be carried out by the TTM installer on any layout used in this handbook, prior to implementing it on site.

Section 8 contains a standard Site Specific Risk Assessment pro forma which should be used. Alternatively refer to the GCMTRW document for further guidance on risk assessments.

**NO COMPROMISE SHALL BE
MADE ON THE SAFETY OF ROAD
USERS OR WORKERS**

2 GENERAL PRINCIPLES OF HANDBOOK

Complement other TTM guidance



This handbook intends to complement existing standards and guidance, and apply it to specific routine operations.

Use of best practice and experience



While based on the principles of TSM Chapter 8 and the GCMTRW documents, this handbook is informed by years of experience in routine road maintenance operations.

TTM types

Static
Semi Static
Mobile

In order to achieve the most practical setup, elements of different types of TTM have been blended or combined.

Take account of works duration



Consider if safe and reasonably practicable to spend extended durations setting up TTM for short duration works. Longer exposure to traffic increases risk.

Incident response



TTM setup should be capable of being removed quickly in the event of an incident or emergency.

Risk assess for routine operations



Is putting out the TTM more hazardous for operatives and road users than the routine operation itself?

Consistency



There are different interpretations of the current standards, which gives rise to inconsistencies and potential commercial advantages. The layouts provided here aim to remove ambiguity for routine operations.

Standardising PPE and works vehicles



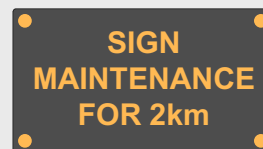
A benchmark for PPE and vehicle conspicuity will help give a consistent message to road users.

Maximising visibility for operatives



If an operative can see what's coming, he has at least some chance of escape or preparing himself.

Continuously Moving Works



Routine operations which move continuously with very short stops for single carriageways. Use of advance signage and repeaters.

Stop/Go Operative



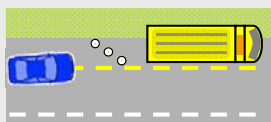
This vulnerable operative must be protected, while ensuring he has good visibility and is conspicuous.

Using Spotters



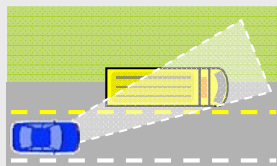
Where operatives are working at high risk locations and are engaged in an activity, dedicated spotters are used as a second set of eyes to protect the operative. All spotters should carry whistles and flags.

Advance lines of cones to alert drivers



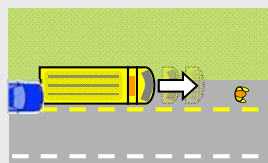
Cones used in advance of works to alert errant drivers before they reach the works area, and to give them time to recover.

Works vehicles as shields



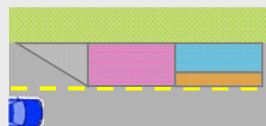
Use works vehicle(s) to protect workers from errant vehicles, allowing for potential shunting etc.

Mitigate against vehicle shunting



A shunting distance should be provided to mitigate against the risk of a shunted works vehicle impacting the works area.

Safety Zones



Longitudinal and lateral safety zones and tapers implemented to protect the works area.

Carry TM equipment to maximise visibility



Always carry signs and cones on side away from traffic, to maximise operative and traffic visibility.

Impact Protection Vehicle (IPV)



IPV's are used to set up the TTM, therefore where possible should also be used during the works to protect operatives.

3 THE CONCEPT OF ROUTINE OPERATIONS

3.1 GENERAL CONCEPT

Routine operations are considered to be those of short duration (less than one working day). Where works are greater than one working day, the standard static layouts of TSM Chapter 8 apply.

3.2 ANTICIPATED DURATIONS

Increased use of Static Signage	< 5 minutes	A series of short-hop maintenance operations along a route where each stop is limited to 5 minutes or less (Typical operations include: pole caps, patching, sign washing, hedge maintenance).
	< 30 minutes	Short duration stops for minor maintenance operations where the works zone is generally limited to 2km in length. (Typical operations include: single post installations, sign face replacement, minor removals, hedge clearance, landscaping).
	> 30 minutes	Medium duration stops for maintenance operations. (Typical operations include: sign installations, sign removals, tree clearance).
	> 3 hours	Longer duration maintenance operations. Always less than one day.
	> 1 working day	Long term works at fixed sites. Considered to be outside the scope of this handbook. Refer to TSM Ch. 8.
Increased use of Mobile Protection Measures		

3.3 PARTICULAR REQUIREMENTS FOR ROUTINE OPERATIONS

- Careful consideration must always be given to site specific conditions and further risk assessment must be carried out if deviations from the outlined durations are required (refer also to Section 1.5).
- The emphasis must always be on the safety of the work force, and road users being safely able to pass the works.
- Existing pedestrian and/or cyclist facilities shall be maintained where reasonably possible, otherwise they shall be safely guided through the site, or a safe temporary route past the works shall be provided.
- Particular precautions must be taken during adverse weather conditions. The Contractor must consider what further measures are appropriate, up to and including pulling off site. Weather conditions such as, but not limited to, low-lying sun, fog, frost/ice/snow, heavy rainfall, wet/slippery roads.
- Where TTM is set up to encompass multiple works areas within close proximity, these areas may be considered as separate sites for the purposes of duration, only if further risk assessment has determined that the cumulative duration is not excessive. Additional TTM measures are required if this cannot be clearly demonstrated, or if other additional risks result.
- It should be noted that the TTM layouts in this handbook are considered to be appropriate for daylight hours only. Further assessment is required for the use of TTM for works outside of this period.

4 EQUIPMENT

4.1 VARIABLE MESSAGE SIGNS

Principles of Use

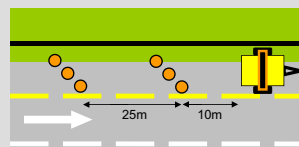
Variable Message Signs (VMS) are considered a requirement in the following circumstances:

- Single Carriageways –
 - Recommended for use as part of continuously moving operations (<5 mins), up to a max distance of 10km in advance of the works vehicles.
 - Generally not required otherwise unless the works zone is of an extended length (>2km), or operatives working on the live carriageway.
 - Can be used in other particular situations if risk assessment deems them necessary.
- Dual Carriageways & Motorways –
 - Required for all works >30 mins duration. Typically located in close proximity to the works, in line with the advance signs.
 - Required for all works <30 mins duration, except for One-Off Isolated Works*. Located up to a max distance of 3km in advance of the works.
 - Required for all works <5 mins duration, except for One-Off Isolated Works*. Located up to a max distance of 10km in advance of the works.
 - Also recommended for the following scenarios on Dual Carriageways & Motorways –
 - as part of continuously moving operations, up to a max distance of 10km in advance of the works.
 - where works are on the live carriageway.
 - where the works zone is of an extended length (>2km).

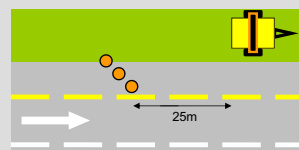
One-Off Isolated Works refer to scenarios that are isolated to one works area (one site), no closer than 10km from the next site. They are restricted to <30 mins operations, and are **not considered to be linear or extensive in nature.*

VMS Protection & Positioning

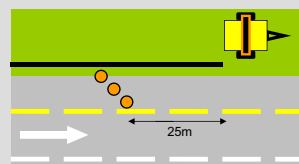
VMS should be regarded as a fixed object (hazard) in accordance with NRA DMRB TD 19. They should be located behind existing safety barriers where possible. The following diagrams give the various scenarios that are considered acceptable for protecting the VMS.



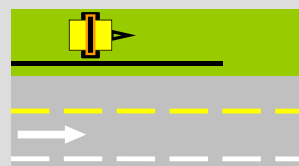
Short Duration Only
(Limited verge access with no barrier protection – cones in hard shoulder)



Short Duration Only
(Verge access with no barrier protection – cones in hard shoulder)



Better Scenario
(Verge access with limited barrier protection – cones in hard shoulder)



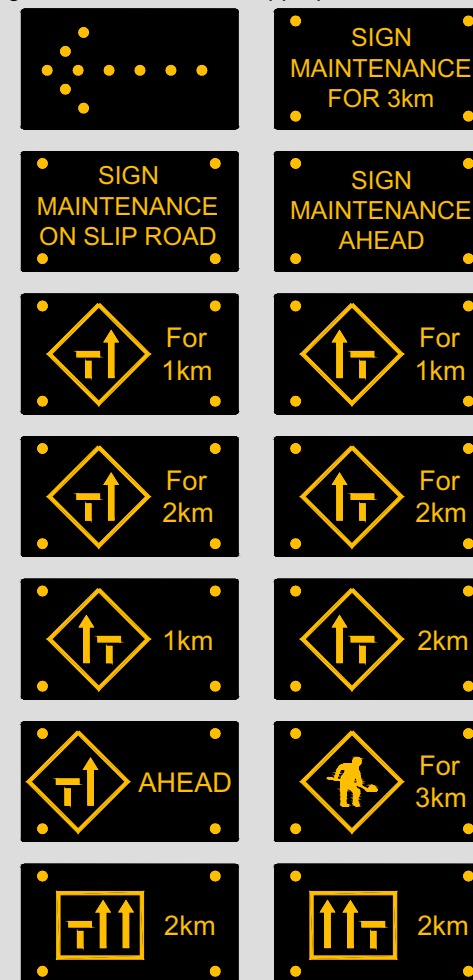
Ideal Scenario
(Barrier protection)

The requirements in relation to the positioning of VMS are similar to those for static signs. Lateral clearance, clear visibility, and road geometry are to be considered when positioning VMS, and when in position the VMS should be free of obstructions such as vegetation.

VMS Message Sets

The messages displayed on VMS should be clear and concise. Preferably only one message should be displayed, as alternating messages are often illegible to passing traffic.

For Traffic Sign operations one of the following typical messages should be used as appropriate:



VMS sizes and specifications are to be in accordance with EN12966 and the NRA Guidelines For The Use Of Variable Message Signs On National Roads (www.nra.ie).

4.2 WORKS / WARNING VEHICLE RECOMMENDATIONS

Front Markings (All vehicles)

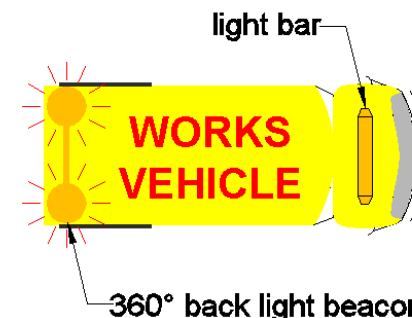
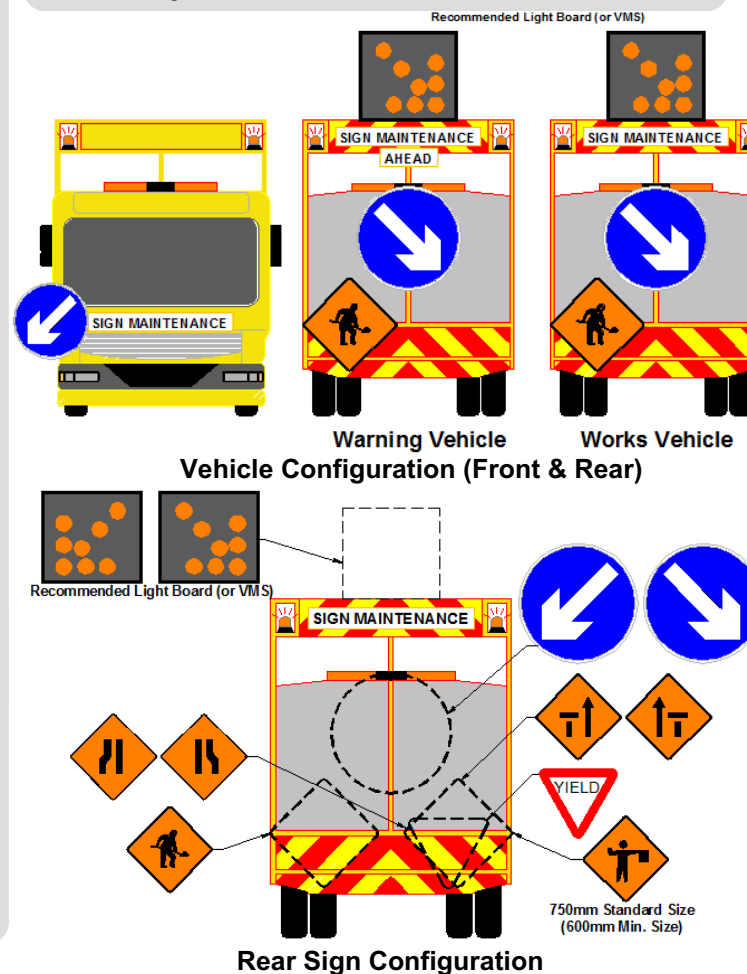
- Main body of vehicle painted in a conspicuous yellow.
- Optional conspicuity markings may be added to the front of the vehicle in an alternative colour to the main body. Ensure reflective markings do not 'dazzle' approaching drivers.
- Front markings must be Class RA1 retro-reflective material only.

Rear Markings (All Vehicles)

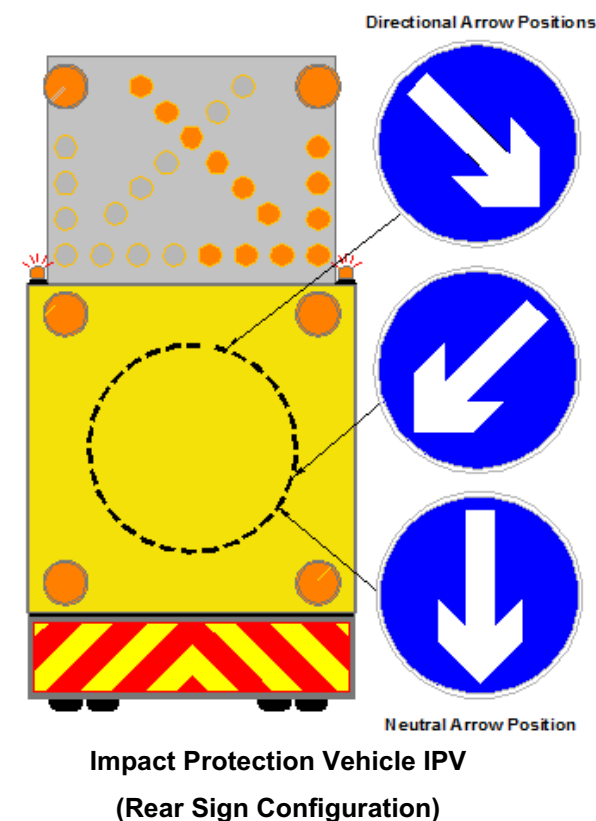
- The rear of the vehicle should be covered in markings as much as possible. Chevron markings to be used, comprising alternate strips of fluorescent orange-red Class RA2 retro-reflective material and fluorescent yellow non-retroreflective material, of not less than 150mm width each, inclined at 45-60° to the horizontal and pointing upwards.
- The rear of the vehicle must be kept as clean as possible to maximise conspicuity and maintain its retro-reflective properties.
- Visibility through the rear of the vehicles should be maintained as much as possible.
- All signs on the rear of vehicles must be removed/covered once operations are complete (or work is finished for the day).
- If trailers or other equipment is towed to the works site, it must not block the vehicle mounted signage during operations. All equipment must be detached prior to operations commencing, or if not, the vehicle signage must be replicated on the back.

If non-standard vehicles (e.g. concrete trucks) are used as part of short term operations, where they may be potentially exposed to oncoming traffic, they must be made highly conspicuous with appropriate markings and signage, as per the requirements for other works and warning vehicles.

There is to be no working from the rear of any vehicle, unless it is suitably protected from oncoming traffic in that direction.



Light Bar and Beacon Configuration

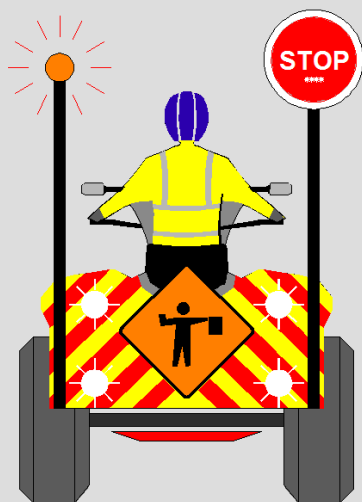


4.3 OTHER VEHICLES

Any vehicle stopping on the road for works purposes or inspections should be conspicuously marked in the same manner as the work vehicles (described on previous page).

Vehicles must be equipped with either a roof-mounted flashing amber warning light bar or independent roof-mounted flashing amber warning beacons, visible through 360°. For vehicles with bodies, the rear window chevrons should be semi-transparent to allow a clear view out the back of the vehicle where possible.

Where quad vehicles are used as part of traffic control operations, they must be road worthy, and fitted with wing mirrors, LED's and high-level lights. Operatives must wear protective helmets at all times. The Stop/Go batten must be positioned on the right hand side of the vehicle.



Quad Vehicle



Works Pick-Up



Works Van

Requirements for Vehicle Mounted Beacons

- Must comply with the requirements of the Road Vehicle Lighting Regulations and should also comply with the United Nations Economic Commission for Europe (UNECE) Regulation 65 on Special Warning Lamps.
- Where obscured by others parts of the vehicle or any equipment carried on the vehicle, additional beacons should be fitted where they will remain visible.

- They shall be in use when entering, leaving or moving within the site, when travelling in traffic at less than the general traffic speed, when working through junctions and roundabouts, and when stationary on the hard shoulder.
- When stationary within the confines of a fully installed traffic management layout, the roof-mounted beacons shall be switched off, unless they form part of the guarding of the works, e.g. works on minor roads, or are required for mobile works.
- Vehicles should carry spare beacons to ensure the vehicle has at least one lamp working, should a bulb blow.
- Beacons must be kept clean and serviceable at all times, and be inspected as part of the normal vehicle inspection regime.

4.4 COMMUNICATION SYSTEM

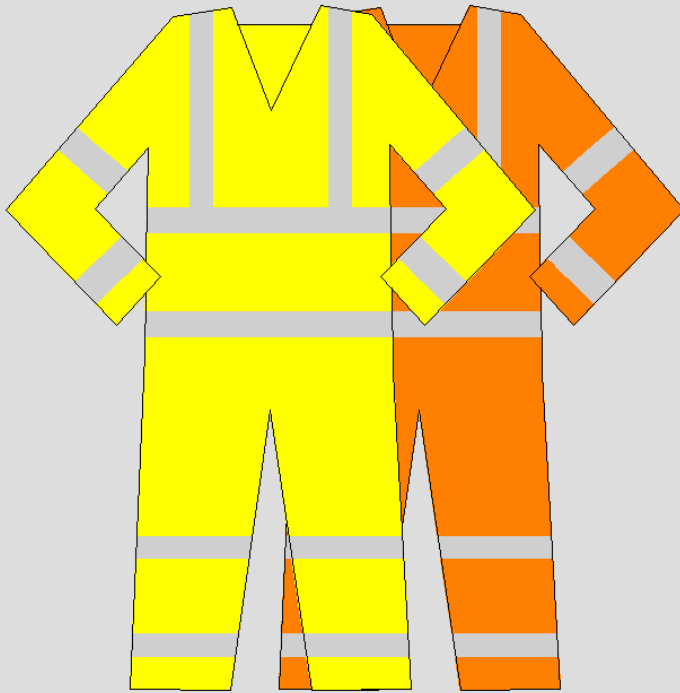
A reliable communication system should be provided between all vehicles. This is considered particularly important where there is no clear line of sight between vehicles and operatives.

It is also recommended that a communication system be provided for operatives on the ground, acting in traffic control and spotter roles (e.g. Stop/Go man) at all times.

All operatives with communication devices should be interconnectable.

4.5 RECOMMENDED PPE

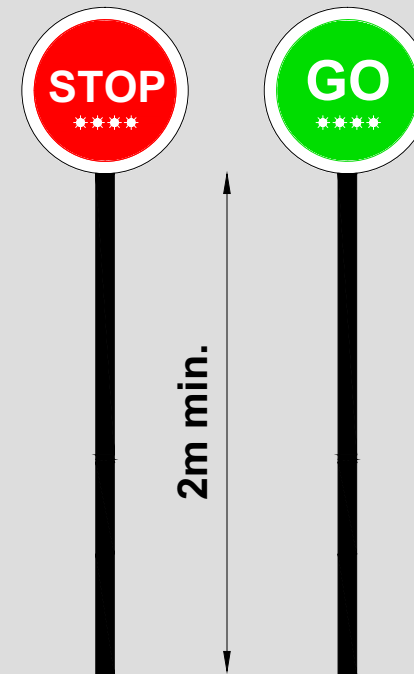
- Long sleeve high-vis vest (or jacket) and trousers to be worn by all operatives at all times.
- Steel toe cap boots to be worn at all times.
- Hard hats, gloves, eye and ear protection, etc. to be worn as required, depending on the operation.



Recommended for all Operatives

4.6 STOP / GO DISCS

- Where Stop/Go discs are used, they must be visible to oncoming traffic at all times (particularly on bends and crests of hills).
- They must be a minimum height of 2m, but may need to be higher in certain circumstances, to maintain visibility.
- Typically they should include LED's on both faces, to improve conspicuity.



5 TEMPORARY TRAFFIC MANAGEMENT CHECKLISTS

Pre Setup – Consultation and Approvals

- ☐ Develop TTM layouts
- ☐ Agree Programme for the Works & Working Hours
- ☐ Notify An Garda Síochána (incl. Traffic Corps)
- ☐ Notify Emergency Services (if required)
- ☐ Obtain Road Opening Licence / Road Closure Order (if required)
- ☐ NRA's Road Space Booking System – request consent through the Motorway Traffic Control Centre (where applicable)
- ☐ Submit AF2 Forms to the Health and Safety Authority (HSA)
- ☐ Client to appoint PSCS (to be accepted by the Contractor)
- ☐ Appoint Temporary Traffic Operations Supervisor
- ☐ Inform Bus Operators (where applicable)

Pre Setup – H&S Requirements

- ☐ PSDP to be notified
- ☐ Site Specific Risk Assessment – to be carried out and recorded for each separate works site location.
- ☐ Modifications to TTM Layouts – where required under risk assessment, modifications to layouts must be recorded prior to implementation on site.
- ☐ Communicate to TTM Installer – the Temporary Traffic Operations Supervisor (or PSCS) must adequately communicate any particular changes or requirements of the specific TTM layouts to the TTM Installer prior to set-up.
- ☐ Hazard Identification – identification of utilities and other hazards must be carried out prior to TTM set-up.

Pre Setup – H&S Documentation

The following documentation is to be held in the works vehicle at all times.

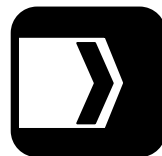
- ☐ Site Specific TTM Layouts
- ☐ PSCS's Construction Stage Safety & Health Plan
- ☐ Signing, Lighting & Guarding at Roadworks CSCS card (for Temporary Traffic Operations Supervisor only)
- ☐ Safe Pass cards
- ☐ Machine Operator CSCS cards
- ☐ IPV Driver Qualifications (where applicable)

During Works – General Requirements

- ☐ **3 minute traffic counts** must be carried out and recorded prior to TTM setup where required. Repeat at intervals to ensure that traffic flows are not exceeded for the selected layout.
- ☐ **Queue lengths** to be checked regularly. If excessive build up is observed, Contractor to consider pulling off site and returning when traffic volumes adequately reduce.
- ☐ **Weather conditions**, such as heavy rain, fog, snow, low lying sun, etc. which can reduce visibility, should be considered when implementing TTM.
- ☐ **Permanent signs** should be covered or taken down if in contradiction with the TTM layout.
- ☐ **Removing TTM** may be required to deal with high traffic volumes, adverse weather conditions, and emergency access.
- ☐ **TTM equipment**, cones, signs, barriers, PPE, etc. should be cleaned and checked regularly for displacement or damage, and replaced where needed.
- ☐ For short duration or moving works, **varying degrees of TTM** will be required at different stages as site conditions change. At all stages, the TTM must be capable of properly managing road users and protecting operatives, particularly when transitioning between different TTM scenarios.
- ☐ All **TTM must be removed once the works are completed**. Any permanent signs covered/removed for the duration of the works must now be reinstated.
- ☐ Care must be taken not to cause **detrimental damage to verges, filter drains, and landscaped areas**, when manoeuvring the works vehicles.
- ☐ **TTM Installers must face oncoming traffic** (and be visible to oncoming traffic) when placing and removing signs and cones.

6 TTM LAYOUT DIAGRAMS - TRAFFIC SIGNS

Temporary Traffic Management Layout Diagrams For



TRAFFIC SIGNS

LAYOUT INDEX

TYPICAL OPERATIONS

ACTIVITY

DURATION

Minor Maintenance (Continuously Moving)

- Pole Caps
- Patching
- Sign Washing
- Hedge Maintenance

<5 mins

Standard Maintenance / Minor Works

- Single Post Installations
- Sign Face Replacement
- Minor Removals
- Hedge Clearance
- Landscaping

<30 mins

Standard Works

- Sign Installations
- Sign Removals
- Tree Clearance

>30 mins

WORKS LOCATION / SITE CHARACTERISTICS

LAYOUT REFERENCE

SINGLE CW

SINGLE CW	Mainline Verge	With H/S
		No H/S - Good Sight Lines
		No H/S - Poor Sight Lines (Single Bend)
		No H/S - Poor Sight Lines (Double Bend)
	Junction Verge	With H/S
		No H/S - Good Sight Lines
		No H/S - Poor Sight Lines (Single Bend)
		No H/S - Poor Sight Lines (Double Bend)
	Roundabout - All Works Areas	
	Roundabout - Isolated Works Area	Entry Verge
		Traffic Island
		Central Island
	Roundabout - Multiple Works Areas	Entry Verge
		Traffic Island
		Central Island

TS 01	TS 23	TS 42
TS 02	TS 24	TS 43
TS 03	(TS44)	TS 44
TS 04	(TS44)	(TS44)
TS 05	TS 25	TS 45
TS 06	TS 26	TS 46
TS 07	(TS46)	(TS46)
TS 08	(TS46)	(TS46)
TS 09	TS 27	-
-	-	TS 47
-	-	TS 48
-	-	TS 49
-	-	TS 50
-	-	TS 51
-	-	TS 52

TS69 and TS70 are examples of typical scenarios for works in highly urban areas (Main Street locations)

DURATION

<5 mins

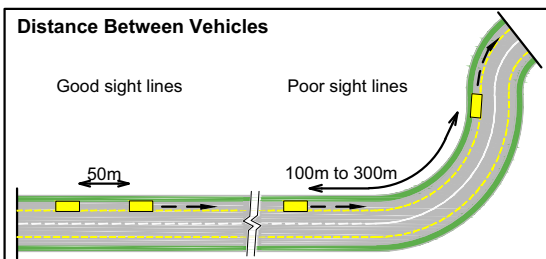
<30 mins

>30 mins

WORKS LOCATION / SITE CHARACTERISTICS

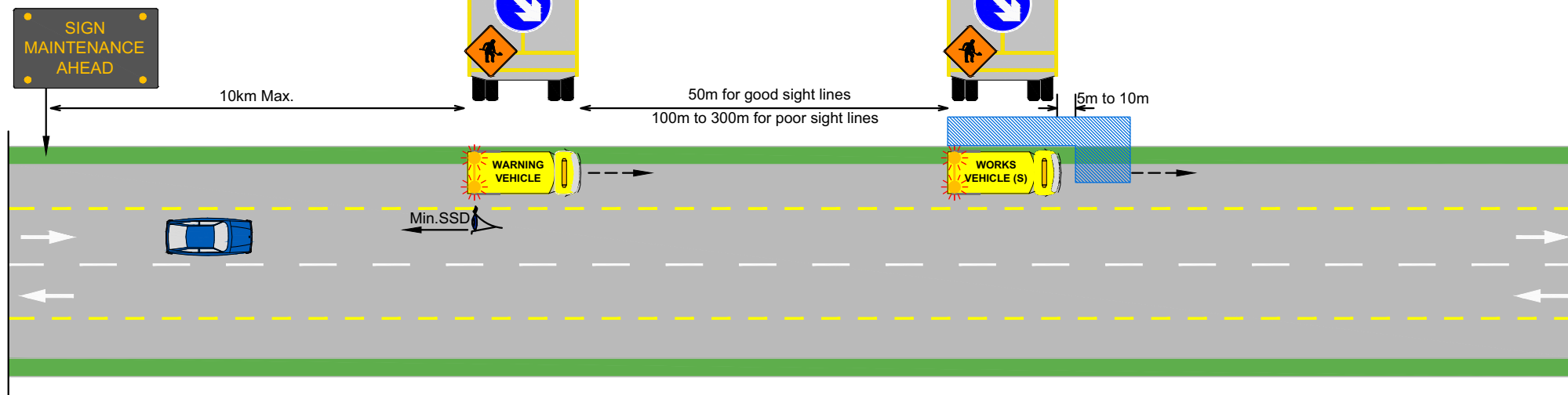
LAYOUT REFERENCE

URBAN DUAL C/W (2/3 Lane)	Mainline Verge	With H/S (or Bus Lane)	TS 10	TS 28	TS 53
		No H/S	TS 11	TS 29	TS 54
	Mainline Median		TS 12	TS 30	TS 55
DUAL C/W & MOTORWAY (2/3 Lane)	Mainline Verge	With H/S	TS 13	TS 31	TS 56
		With H/S - Diverge Taper	(TS13)	TS 32	TS 57
		No H/S	TS 14	TS 33	TS 58
	Mainline Lane 1	Standard	(TS14)	(TS33)	(TS58)
		Diverge Taper	(TS14)	(TS33)	TS 59
	Mainline Lane 2/3 or Median		(TS60)	(TS60)	TS 60
	Grade-Separated Junction (Full GSJ)	Exit Nose	TS 15	TS 34	TS 61
		Off-Ramp - LHS	TS 16	TS 35	TS 62
		Off-Ramp - RHS	TS 17	TS 36	TS 63
		Start of On-Ramp	TS 18	TS 37	TS 64
		End of On-Ramp - LHS	TS 19	TS 38	TS 65
		End of On-Ramp - RHS	TS 20	TS 39	TS 66
	Compact Grade-Separated Junction (Compact GSJ)	Exit Nose & Traffic Island	TS 21	TS 40	TS 67
		Slip-Road	TS 22	TS 41	TS 68



**Reliable
communication
system
recommended**

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

1. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
2. For isolated one-off stops, refer alternatively to TS23.

Legend	
	Minimum Stopping Sight Distance (SSD)
	Works Area

January 2014

Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

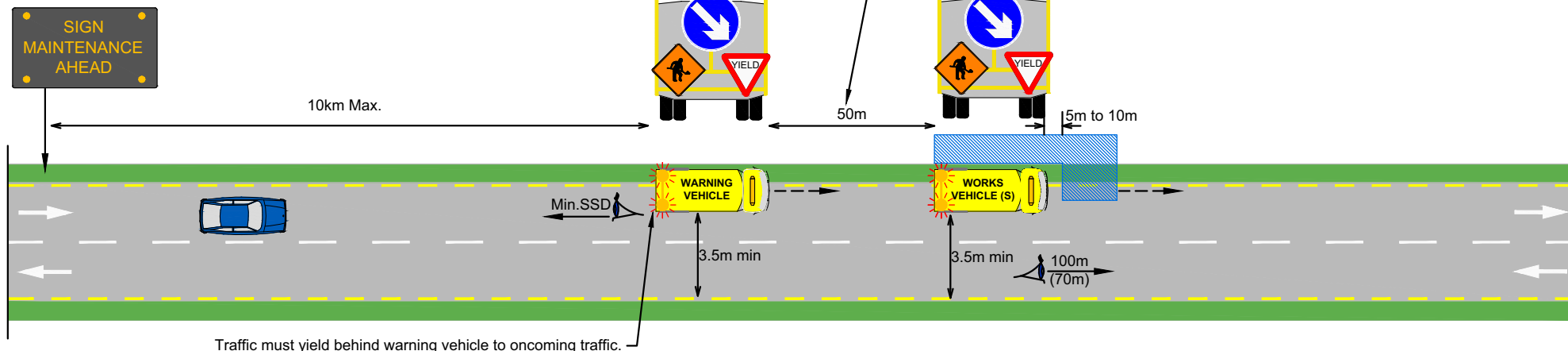
< 5
mins

Single C/W
Mainline Verge - With H/S

TS 01



VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

1. Where traffic volumes are > 20 veh / 3 mins (400 veh/h), refer to TS43. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Where sight lines are poor refer to TS03 or TS04 as appropriate.
3. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
4. For isolated one-off stops, refer alternatively to TS24.
5. Vehicles to have minimal encroachment on the running lanes where possible.
6. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
7. Should not be used in poor weather conditions.

Legend	
	Forward Clear Visibility 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Works Area

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

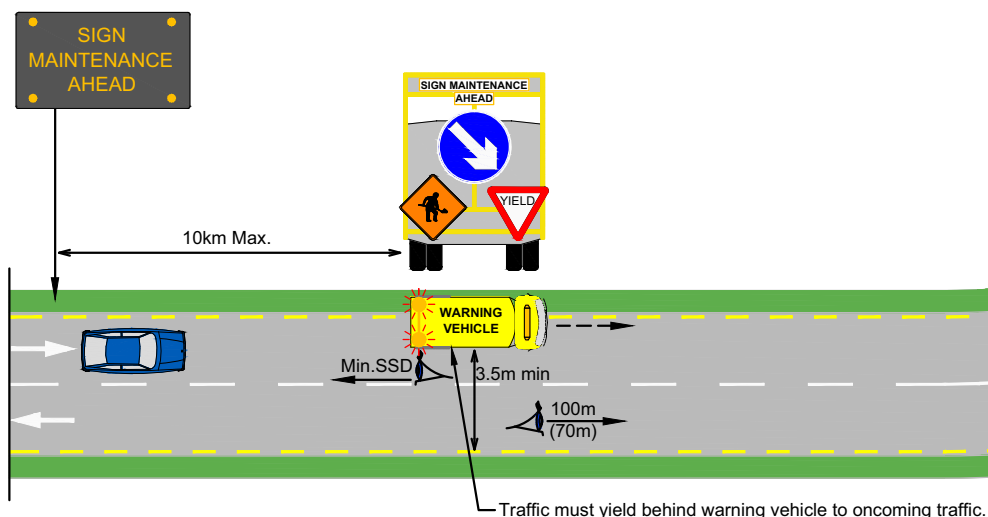
Single C/W

Mainline Verge - No H/S - Good Sight Lines

TS 02



VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

EXAMPLE ONLY - NOT TO SCALE

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

1. To be used for a single bend i.e. where good sight lines are achievable after the Works Vehicle.
2. For multiple bends refer to TS44. Further risk assessment and additional TM development may also be required.
3. Where traffic volumes are > 20 veh / 3mins (400 veh/h), refer to TS44. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
4. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
5. For isolated one-off stops, refer alternatively to TS44.
6. Vehicles to have minimal encroachment on the running lanes where possible.
7. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
8. Should not be used in poor weather conditions.

Legend	
	Forward Clear Visibility
100m (70m)	80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Works Area

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

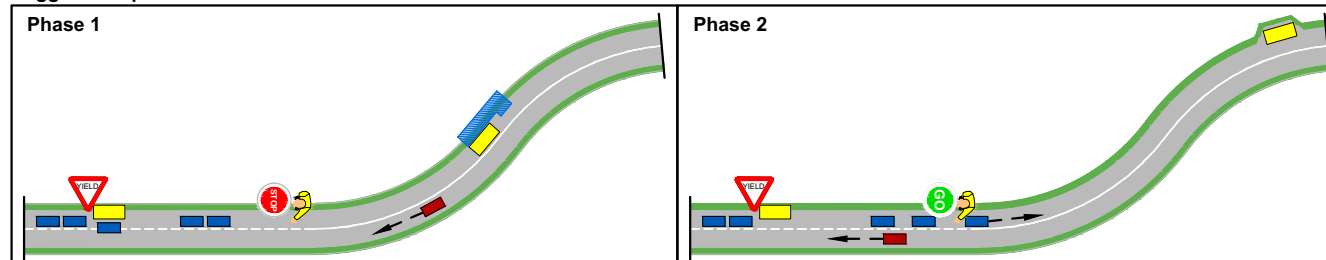
< 5
mins

Single C/W

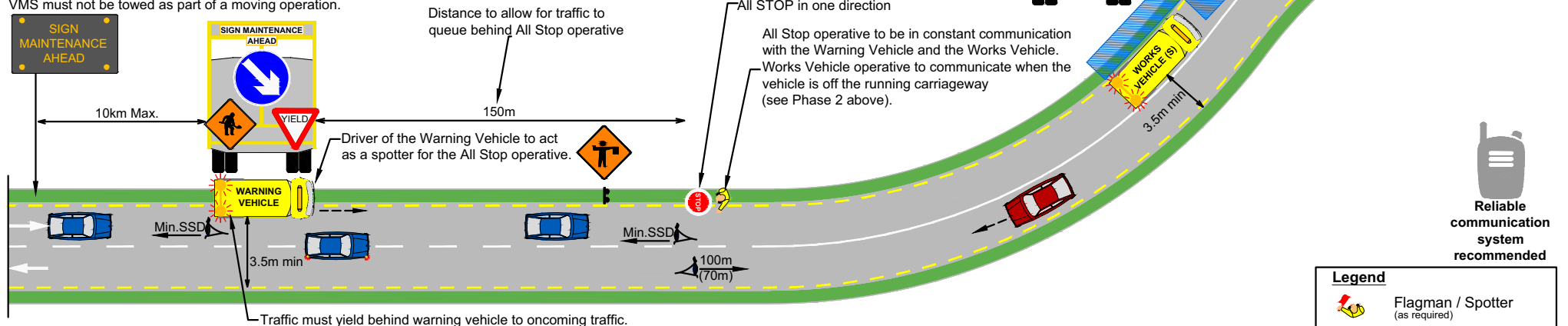
Mainline Verge - No H/S - Poor Sight Lines (Single Bend)

TS 03

Suggested Operation



VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Notes

- To be used for a double bend i.e. where good sight lines are not achievable after the Works Vehicle.
- For multiple bends refer to TS44. Further risk assessment and additional TM development may also be required.
- Where traffic volumes are > 15 veh / 3mins (300 veh/h), refer to TS44. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
- Where the flagman observes excessive queuing, he must communicate to the works vehicle to pull off the running lane and allow traffic to pass.
- For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
- For isolated one-off stops, refer alternatively to TS44.
- Vehicles to have minimal encroachment on the running lanes where possible.
- Care must be taken not to damage verges or cause debris when maneuvering vehicles.
- Should not be used in poor weather conditions.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Legend	
	Flagman / Spotter (as required)
	Forward Clear Visibility 100m / 70m 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Stop / Go & Operative
	Works Area

Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

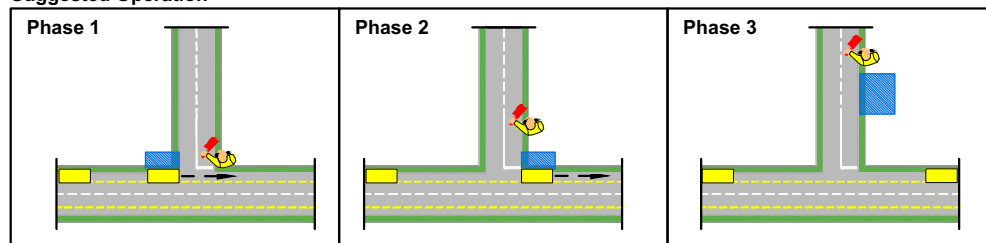
< 5 mins

Single C/W
Mainline Verge - No H/S - Poor Sight Lines (Double Bend)

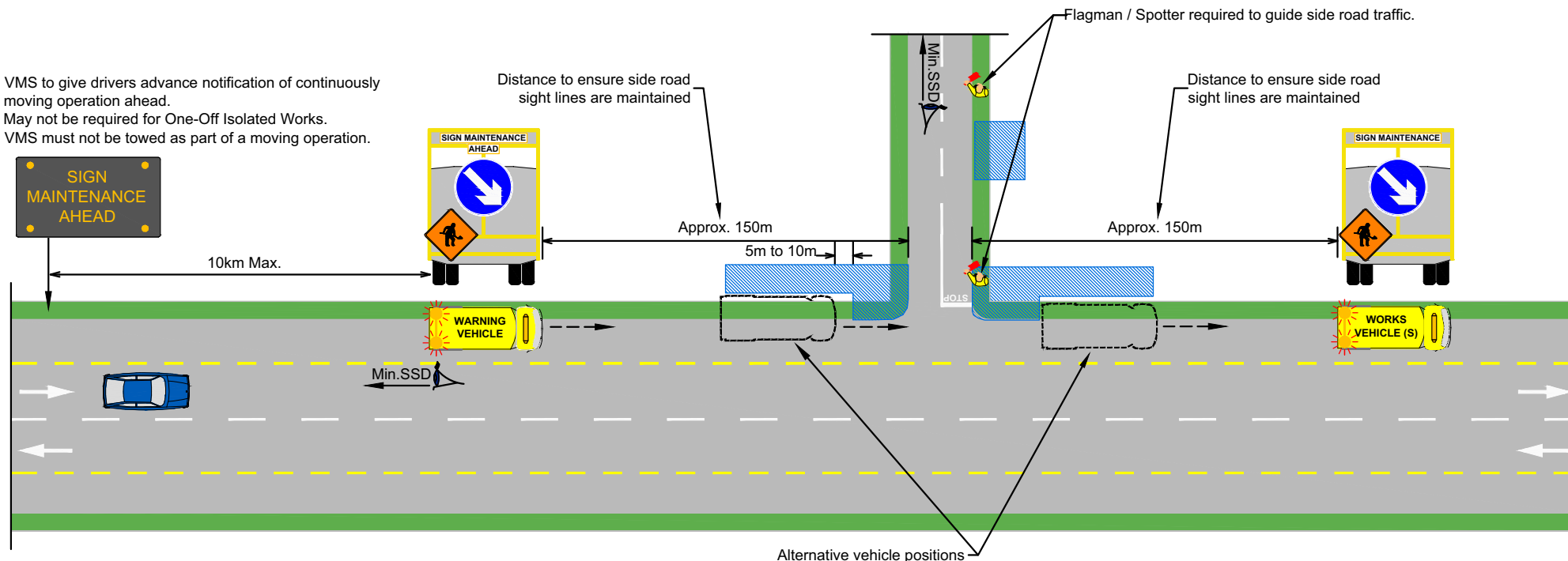
TS 04

January 2014

Suggested Operation



VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

- Where side road traffic volumes are > 20 veh / 3 mins (400 veh/h), implement TS01 or TS02 for works on side road as appropriate.
- For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
- For isolated one-off stops, refer alternatively to TS25.

Legend	
	Flagman / Spotter (as required)
	Minimum Stopping Sight Distance (SSD)
	Works Area

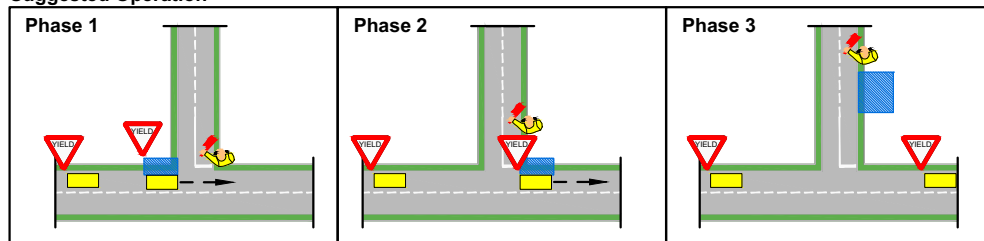
Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

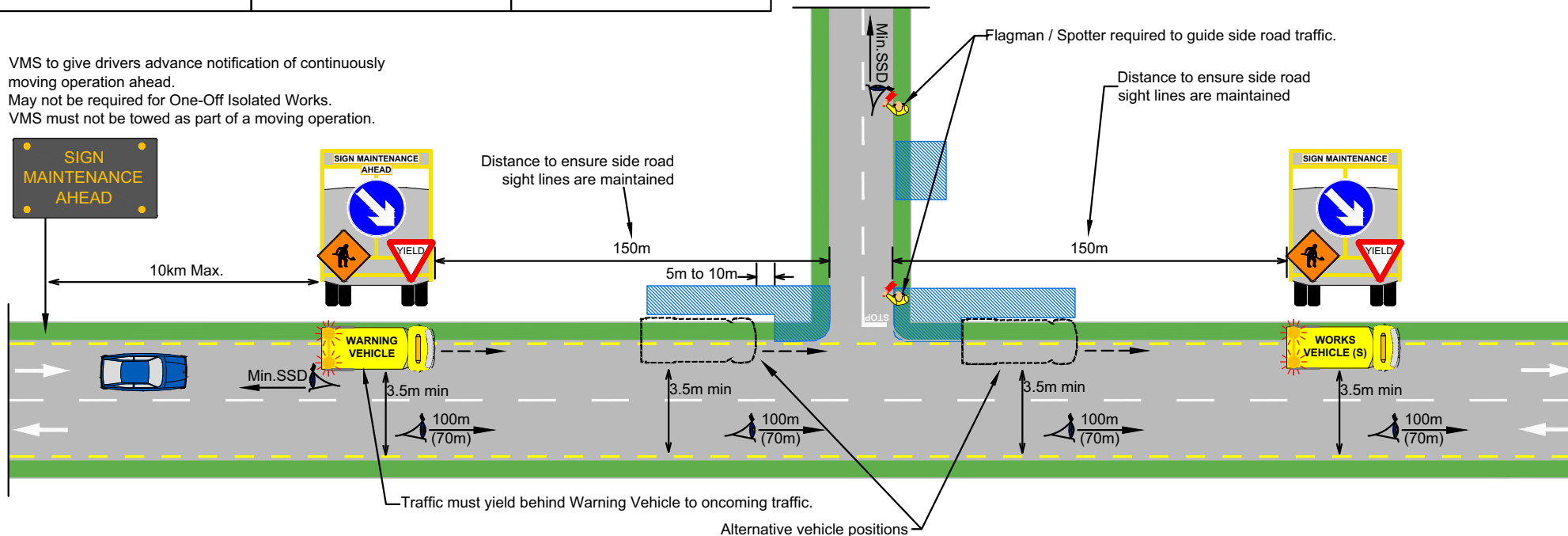
Single C/W
Junction Verge - With H/S

TS 05

Suggested Operation



VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

- Where mainline and side road traffic volumes are > 20 veh / 3 mins (400 veh/h), refer to TS46. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
- Where sight lines are poor refer to TS07 or TS08 as appropriate.
- For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
- For isolated one-off stops, refer alternatively to TS26.
- Vehicles to have minimal encroachment on the running lanes where possible.
- Care must be taken not to damage verges or cause debris when maneuvering vehicles.
- Should not be used in poor weather conditions.

Legend	
	Flagman / Spotter (as required)
	Forward Clear Visibility 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Works Area

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

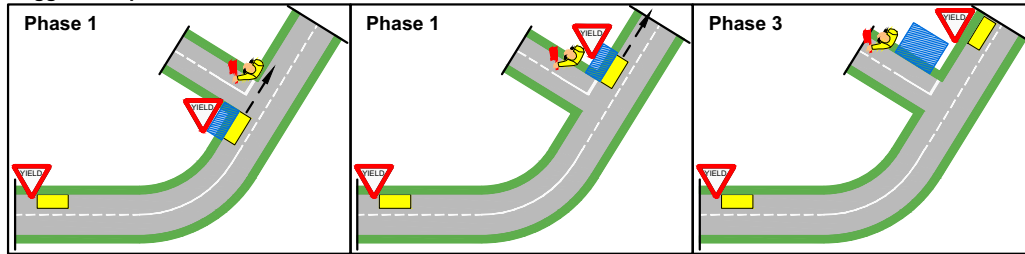
< 5
mins

Single C/W

Junction Verge - No H/S - Good Sight Lines

TS 06

Suggested Operation

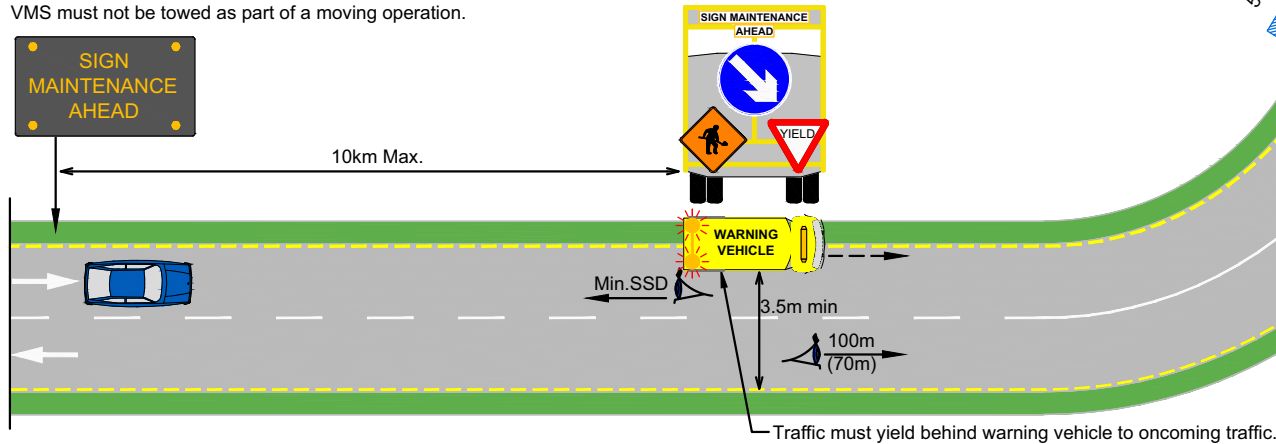


SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

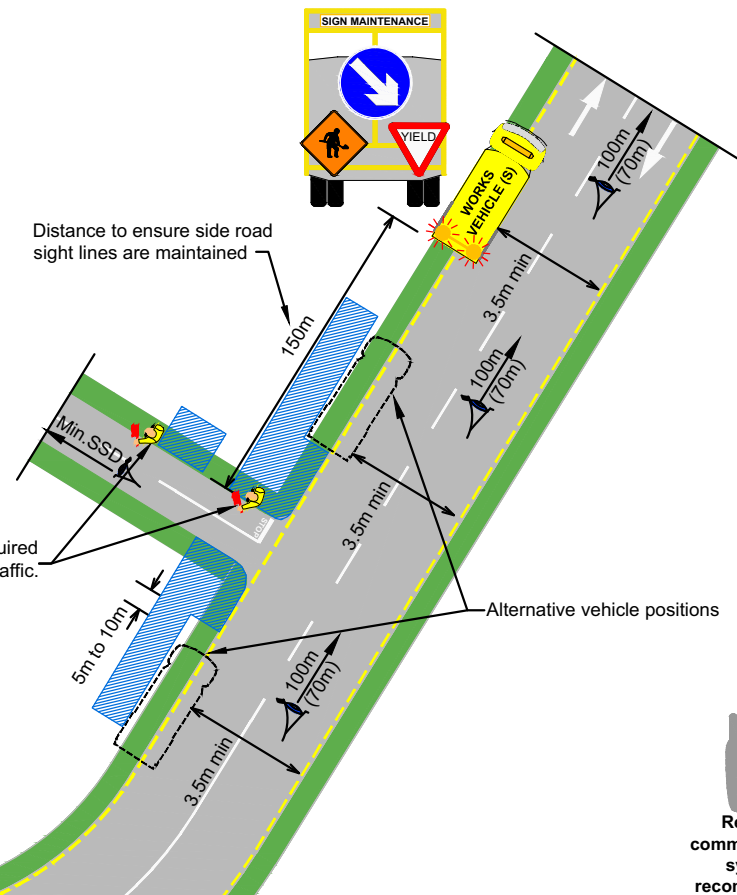
1. To be used for a single bend i.e. where good sight lines are achievable after the Works Vehicle.
2. Where mainline and side road traffic volumes are > 20 veh / 3mins (400 veh/h), refer to TS46. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
4. For isolated one-off stops, refer alternatively to TS46.
5. Vehicles to have minimal encroachment on the running lanes where possible.
6. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
7. Should not be used in poor weather conditions.

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS

EXAMPLE ONLY - NOT TO SCALE



Reliable communication system recommended

Legend	
	Flagman / Spotter (as required)
	Forward Clear Visibility 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Works Area

Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

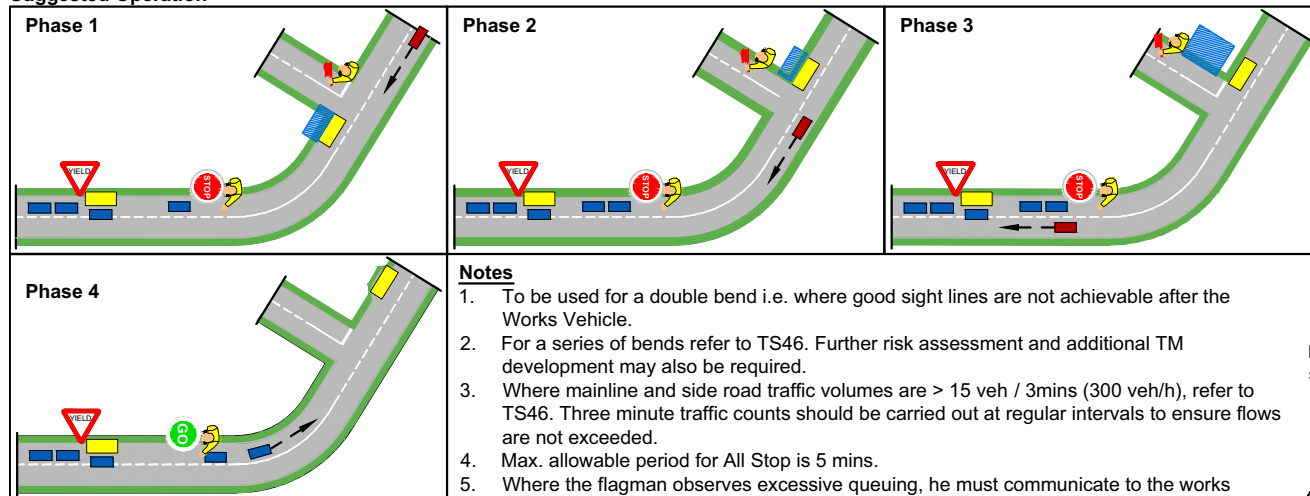
< 5 mins

Single C/W
Junction Verge - No H/S - Poor Sight Lines (Single Bend)

TS 07

January 2014

Suggested Operation



Notes

1. To be used for a double bend i.e. where good sight lines are not achievable after the Works Vehicle.
2. For a series of bends refer to TS46. Further risk assessment and additional TM development may also be required.
3. Where mainline and side road traffic volumes are $> 15 \text{ veh} / 3\text{mins}$ (300 veh/h), refer to TS46. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
4. Max. allowable period for All Stop is 5 mins.
5. Where the flagman observes excessive queuing, he must communicate to the works vehicle to pull off the running lane and allow traffic to pass.
6. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
7. For isolated one-off stops, refer alternatively to TS46.
8. Vehicles to have minimal encroachment on the running lanes where possible.
9. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
10. Should not be used in poor weather conditions.

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.

☐ Traffic must yield behind Warning Vehicle to oncoming traffic.

- Driver of the Warning Vehicle to act as a spotter for the All Stop operative.

All Stop operative to be in constant communication with the Warning Vehicle and the Works Vehicle. Works Vehicle operative to communicate when the vehicle is off the running carriageway (see Phase 4 above).

ALL STOP

$$\frac{100\text{m}}{(70\text{m})}$$






Flagman / Spotter required
to guide side road traffic.

Distance to ensure side road
sight lines are maintained

—Alternative vehicle positions

**Reliable
communication
system
recommended**

Legend

- | | |
|---|---|
|  | <p>Flagman / Spotter
(as required)</p> |
|  | <p>Forward Clear Visibility
80 / 100 km/h
30 / 50 / 60 km/h</p> |
|  | <p>Minimum Stopping
Sight Distance (SSD)</p> |
|  | <p>Stop / Go & Operative</p> |
|  | <p>Works Area</p> |

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

Single C/W

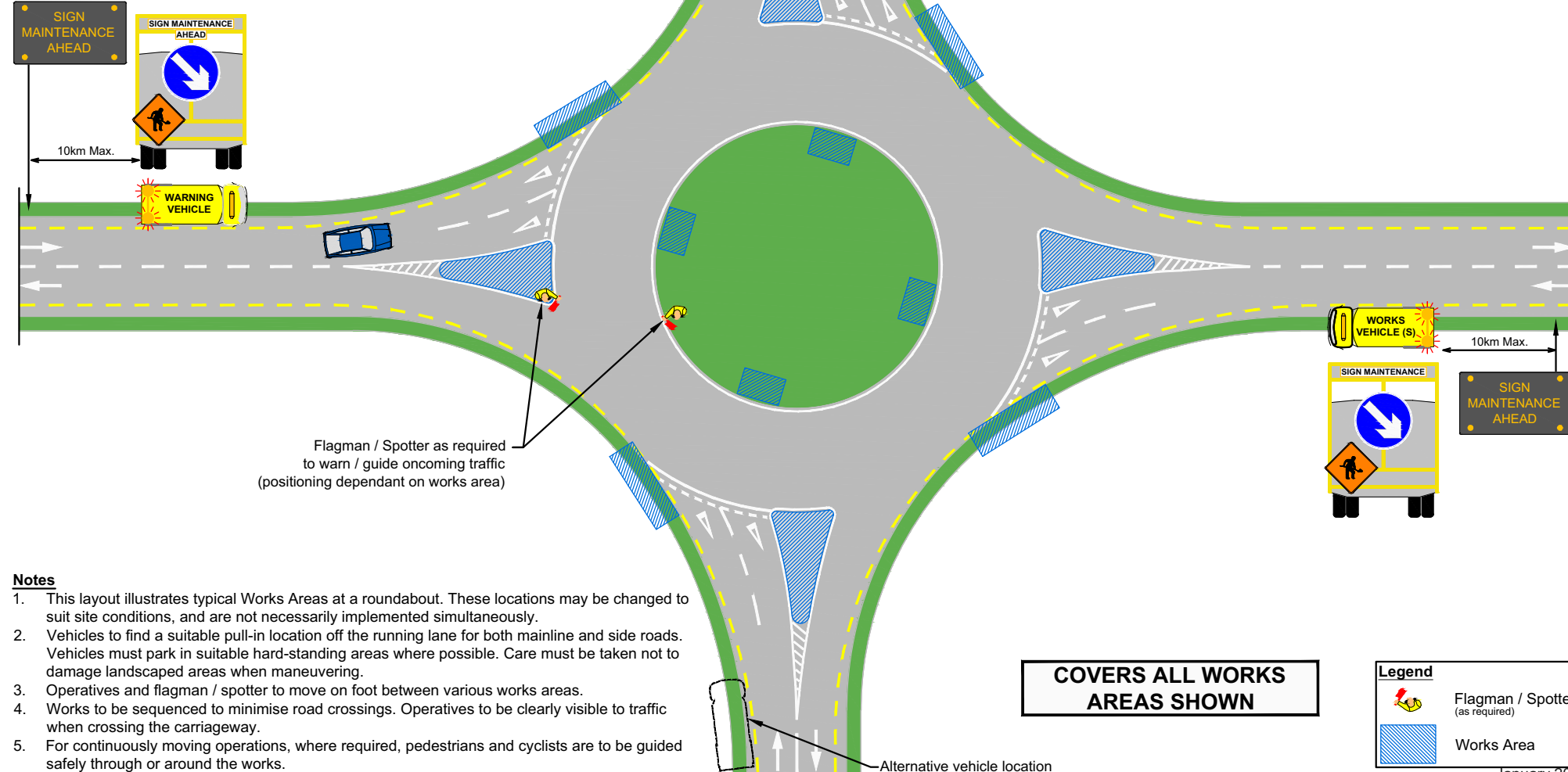
Junction Verge - No H/S - Poor Sight Lines (Double Bend)

TS 08

VMS to give drivers advance notification of continuously moving operation ahead.

May not be required for One-Off Isolated Works.

VMS must not be towed as part of a moving operation.



Notes

1. This layout illustrates typical Works Areas at a roundabout. These locations may be changed to suit site conditions, and are not necessarily implemented simultaneously.
2. Vehicles to find a suitable pull-in location off the running lane for both mainline and side roads. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
3. Operatives and flagman / spotter to move on foot between various works areas.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.

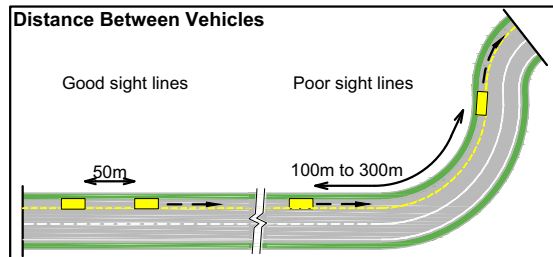
Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

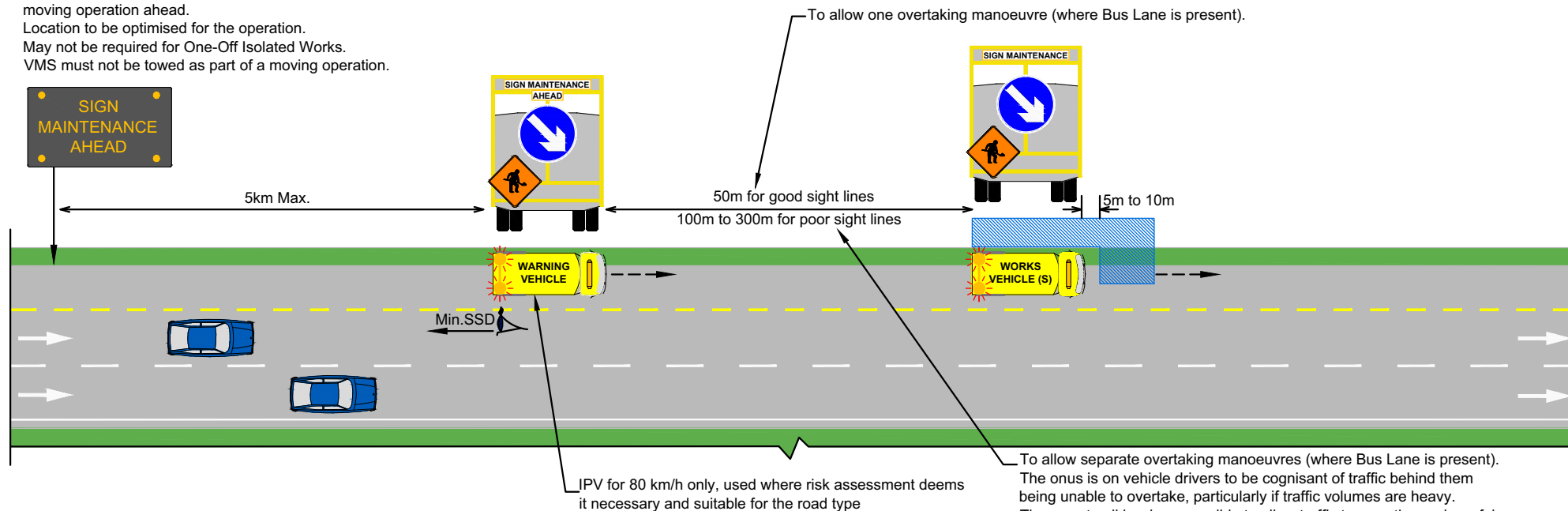
Single C/W
Roundabout - All Works Areas

TS 09

January 2014



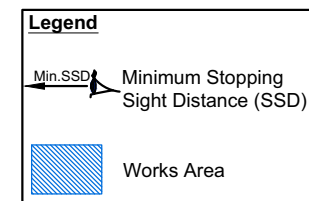
VMS to give drivers advance notification of continuously moving operation ahead.
Location to be optimised for the operation.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Notes

1. Layout not suitable for use during peak hours, particularly where a Bus Lane is present. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
2. Where numerous side accesses or high traffic volumes are encountered, the distance between the warning vehicle and works vehicles should be carefully considered. A flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
3. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
4. For isolated one-off stops, refer alternatively to TS28.
5. Vehicles to have minimal encroachment on the running lanes where possible (where Bus Lane is present).
6. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
7. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160

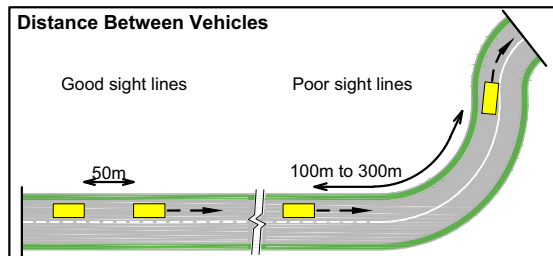


Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

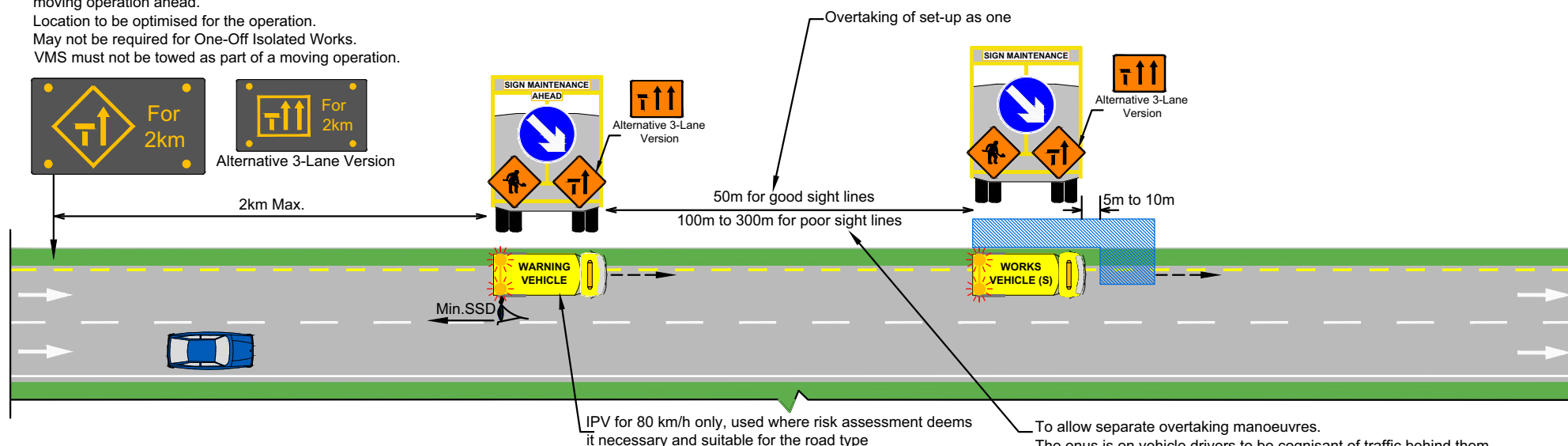
< 5 mins

Urban Dual C/W - 2/3 Lane ($\leq 80\text{km/h}$)
Mainline Verge - With H/S (or Bus Lane)

TS 10



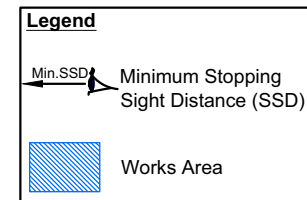
VMS to give drivers advance notification of continuously moving operation ahead.
Location to be optimised for the operation.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Notes

1. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
3. Where numerous side accesses or high traffic volumes are encountered, the distance between the warning vehicle and works vehicles should be carefully considered. A flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
4. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
5. For isolated one-off stops, refer alternatively to TS29.
6. Vehicles to have minimal encroachment on the running lanes where possible.
7. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
8. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160



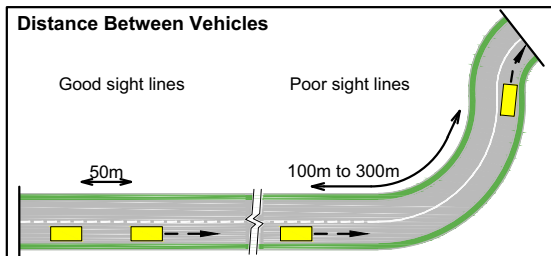
Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5 mins

Urban Dual C/W - 2/3 Lane ($\leq 80\text{km/h}$)
Mainline Verge - No H/S

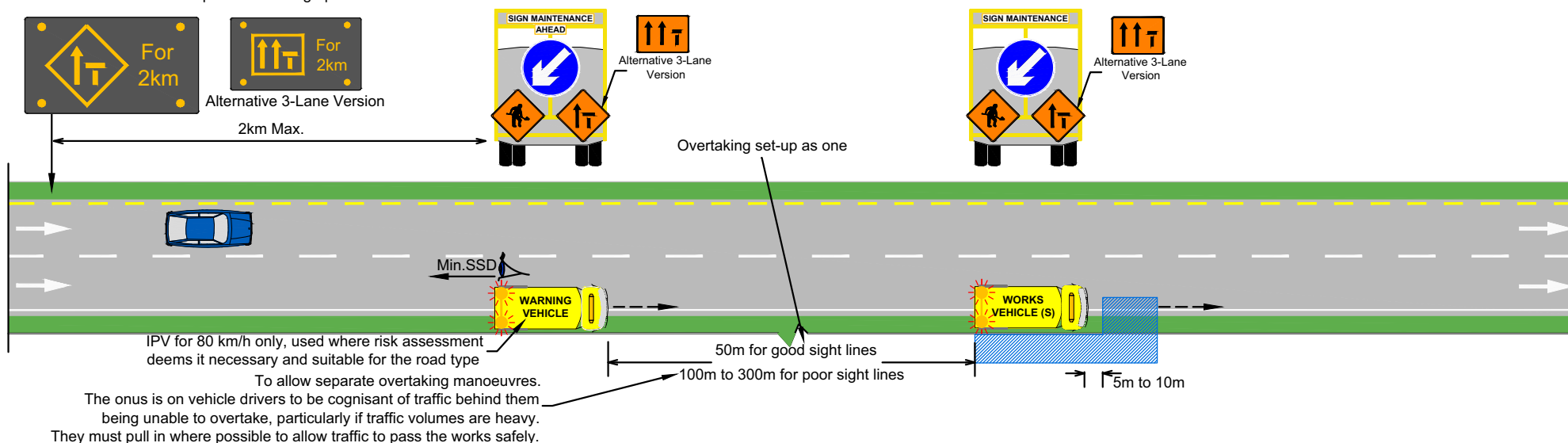
TS 11

January 2014



VMS to give drivers advance notification of continuously moving operation ahead.
Location to be optimised for the operation.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.

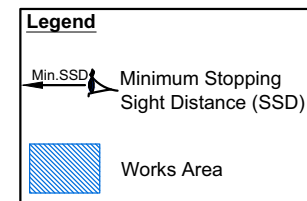
**Reliable
communication
system
recommended**



Notes

1. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout not suitable for use during peak hours. Queues to be monitored and queues kept to a minimum. Operatives to be observant of queuing through junctions.
3. Where numerous side accesses or high traffic volumes are encountered, the distance between the warning vehicle and works vehicles should be carefully considered. A flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
4. For continuously moving operations, where required, pedestrians and cyclists are to be guided safely through or around the works.
5. For isolated one-off stops, refer alternatively to TS30.
6. Vehicles to have minimal encroachment on the running lanes where possible.
7. Care must be taken not to damage verges or cause debris when maneuvering vehicles.
8. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160



Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

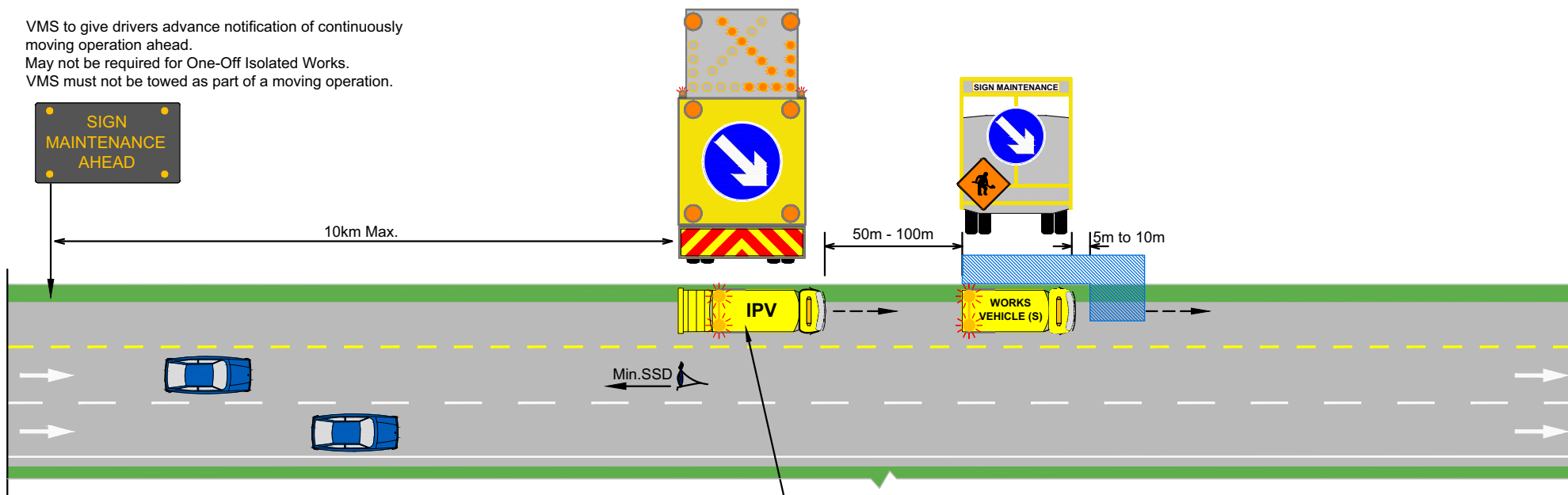
**< 5
mins**

Urban Dual C/W - 2/3 Lane (≤80km/h)
Mainline Median

TS 12

January 2014

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.

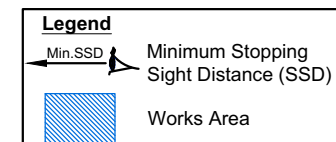


IPV to be used for all dual c/w and motorway works >80km/h.
The IPV may only be substituted with a Warning Vehicle in limited circumstances,
for one-off isolated works of <5 mins only, where risk assessment has deemed it appropriate.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. This layout may be suitable for use at Start of Diverge Taper locations.



Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

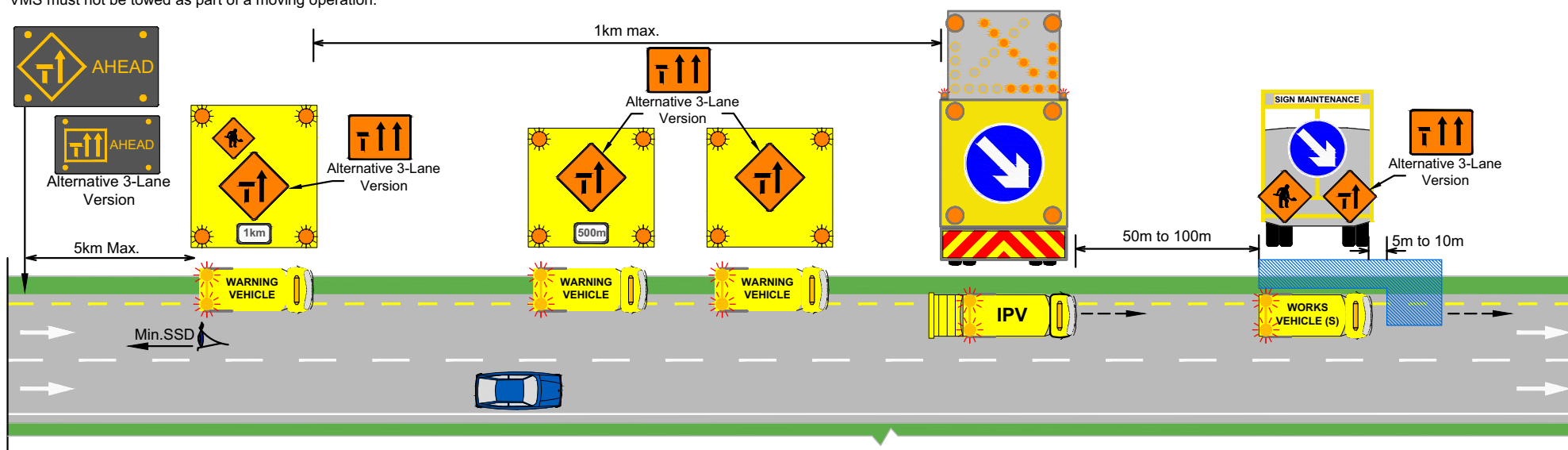
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Mainline Verge - With H/S

TS 13

January 2014

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum
3. Warning Vehicles must pull in where possible, to ensure minimal encroachment on the running lane.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Minimum Stopping Sight Distance (SSD)
	Works Area

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

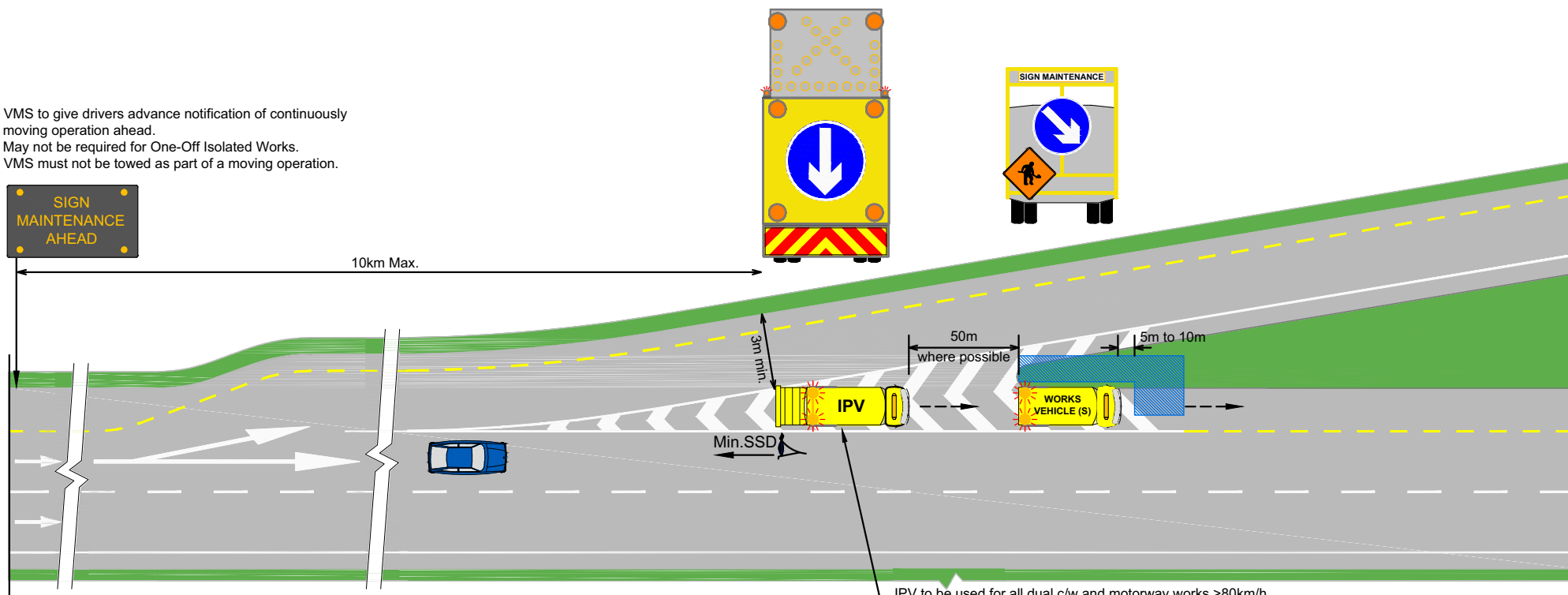
< 5
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Mainline Verge - No H/S (& Mainline Lane 1)

TS 14

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



IPV to be used for all dual c/w and motorway works >80km/h.
The IPV may only be substituted with a Warning Vehicle in limited circumstances,
for one-off isolated works of <5 mins only, where risk assessment has deemed it appropriate.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

- Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Minimum Stopping Sight Distance (SSD)
	Works Area

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

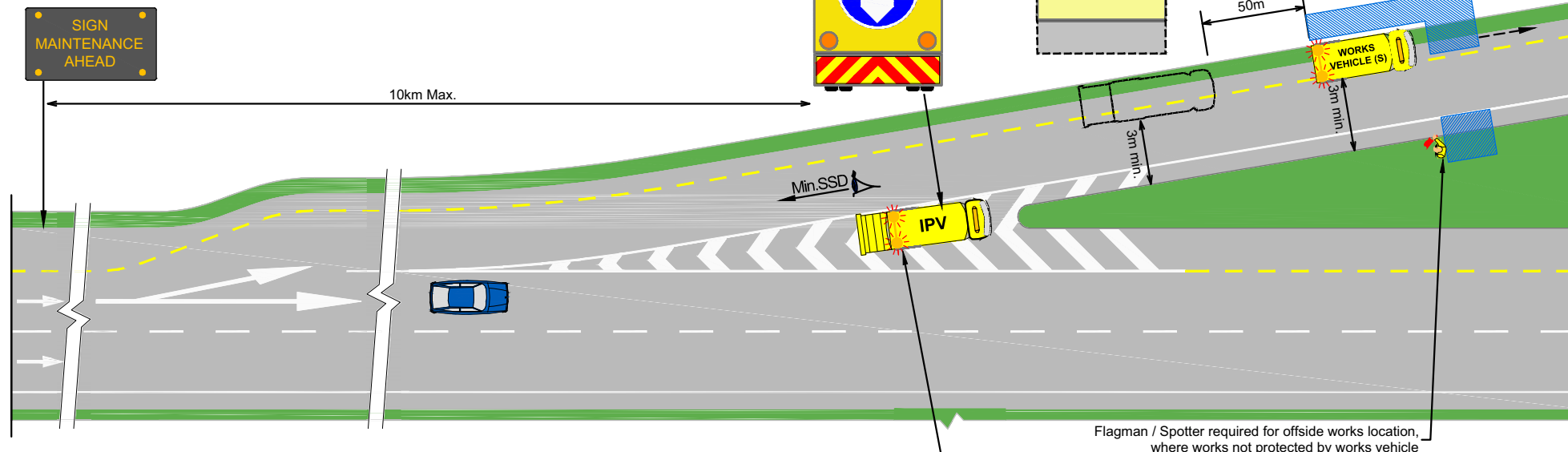
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Exit Nose

TS 15

January 2014

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



IPV to be used for all dual c/w and motorway works >80km/h.
The IPV may only be substituted with a Warning Vehicle in limited circumstances,
for one-off isolated works of <5 mins only, where risk assessment has deemed it appropriate.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Flagman / Spotter (as required)
	Minimum Stopping Sight Distance (SSD)
	Works Area

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

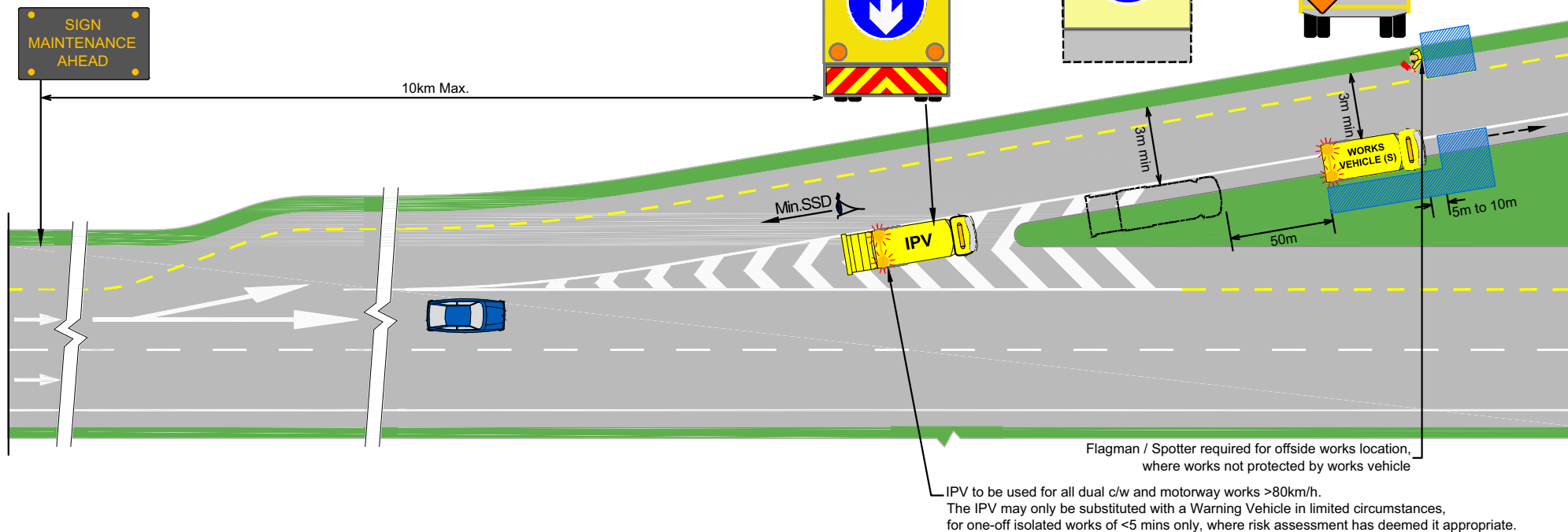
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Off-Ramp - LHS

TS 16

January 2014

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Flagman / Spotter (as required)
	Minimum Stopping Sight Distance (SSD)
	Works Area

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

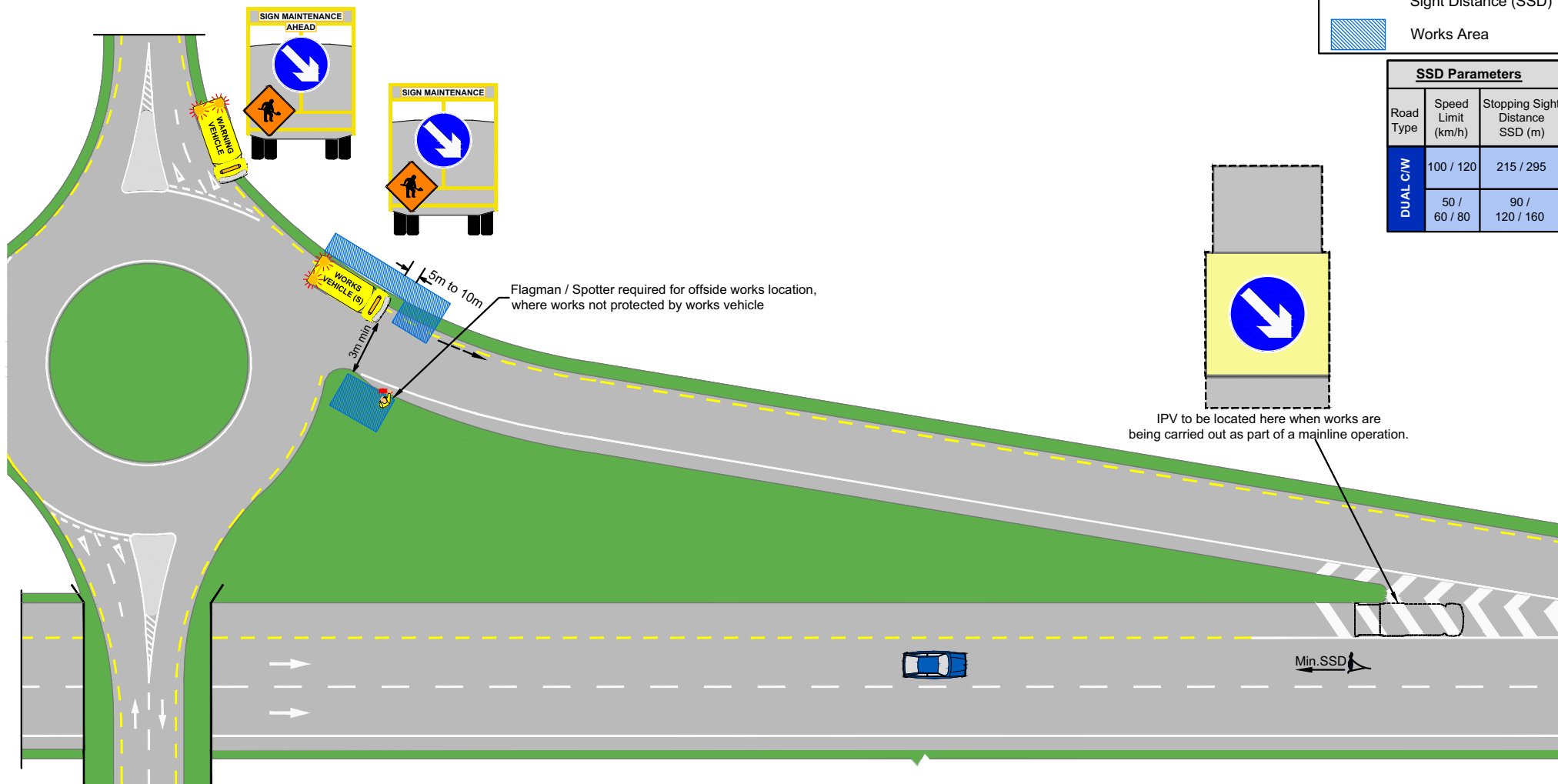
Full GSJ - Off-Ramp - RHS

TS 17

January 2014

Notes

1. Works relating to signs at the tops of interchanges and associated approaches are treated as standard single carriageway and/or roundabout works. Refer to TS01 to TS09 as appropriate.
2. It may be appropriate to use TS09 for such scenarios, where the vehicles find a suitable pull-in location, and operatives travel on foot.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

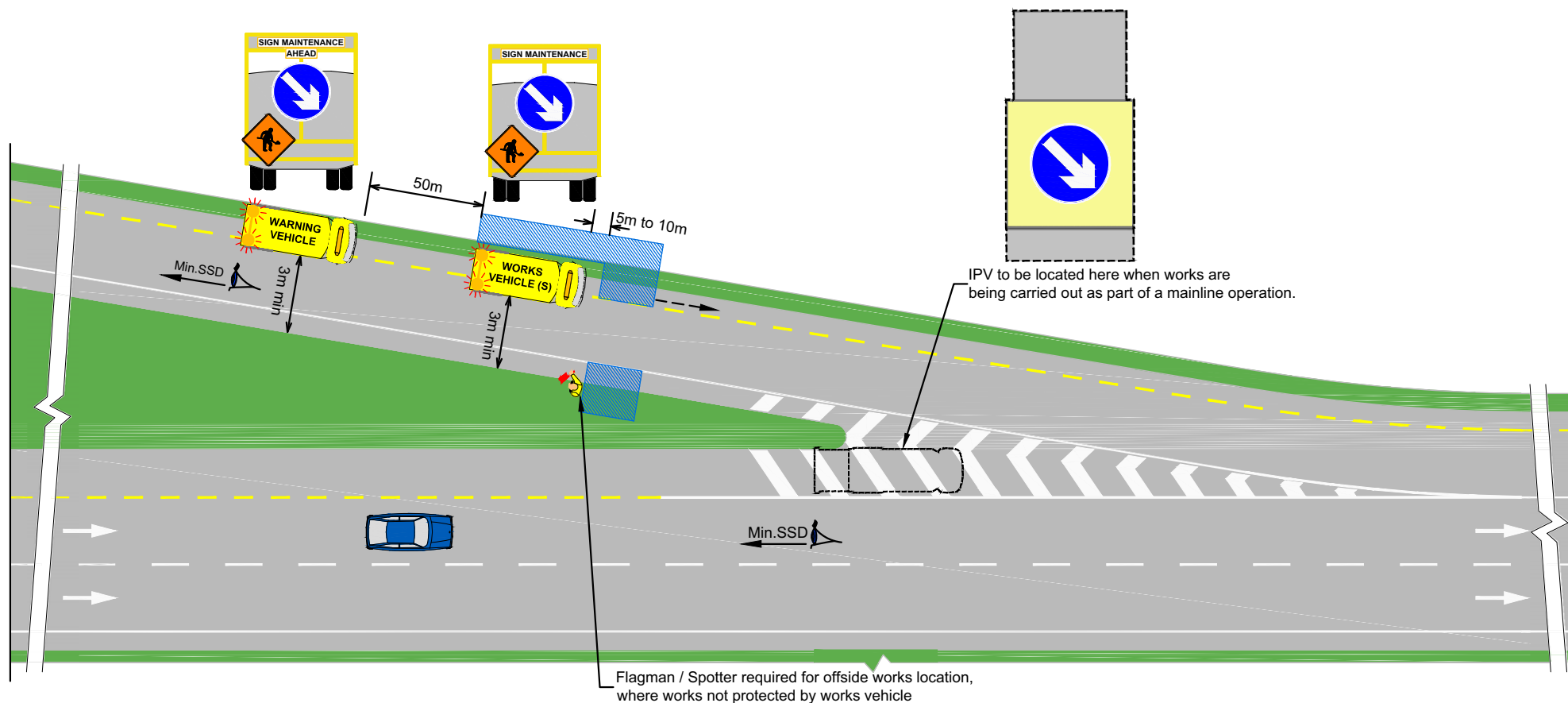
< 5
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Start of On-Ramp

TS 18

January 2014



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL CW	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160

Notes

1. Vehicles to have minimal encroachment on the running lanes where possible.
2. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend

- Flagman / Spotter (as required)
- Min.SSD
- Minimum Stopping Sight Distance (SSD)
- Works Area

January 2014

Minor Maintenance (Continuously Moving)

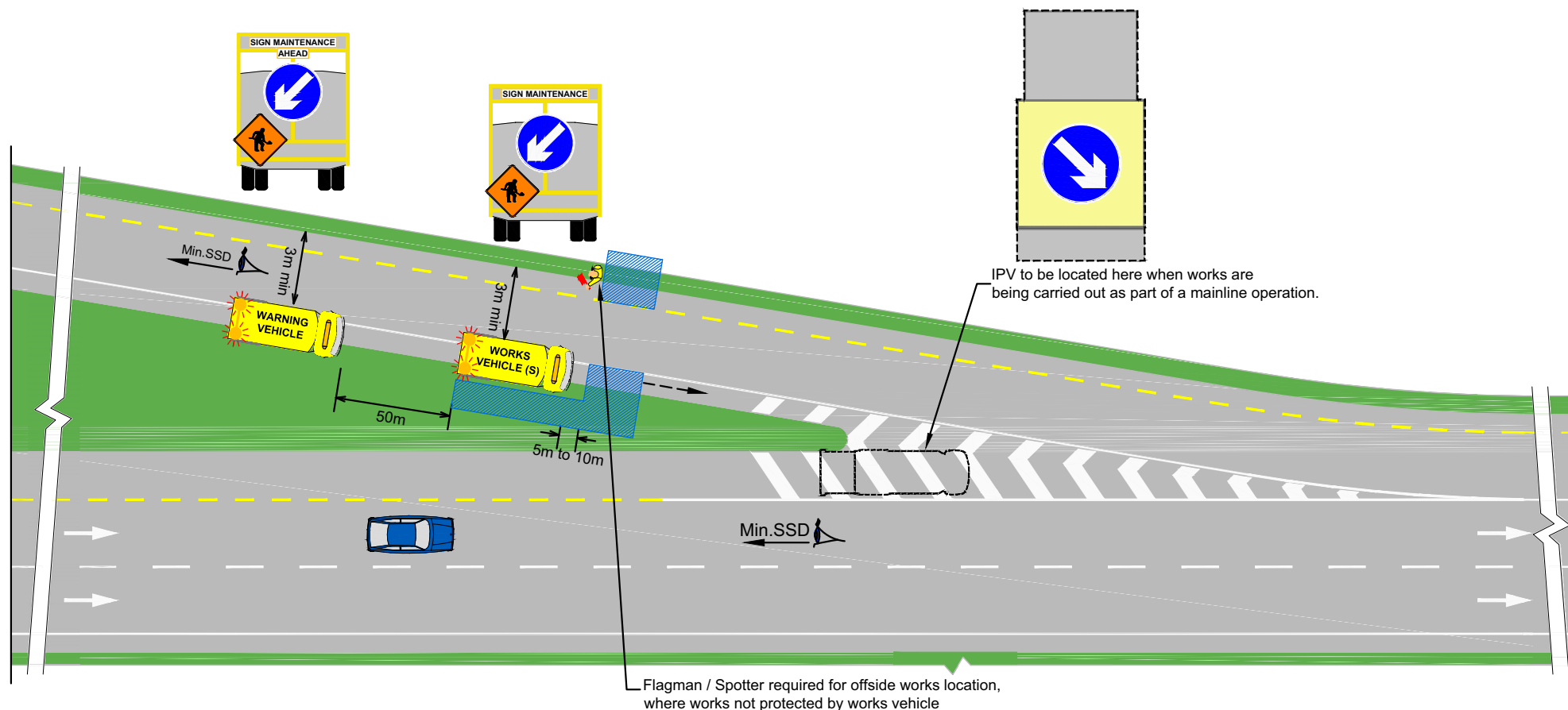
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - LHS

TS 19






SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL CW	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160

Notes

1. Vehicles to have minimal encroachment on the running lanes where possible.
2. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend

-  Flagman / Spotter
(as required)
-  Min. SSD
Minimum Stopping
Sight Distance (SSD)
-  Works Area

January 2014

Minor Maintenance (Continuously Moving)

Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - RHS

TS 20

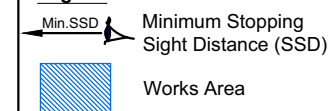
Notes

1. Vehicles to have minimal encroachment on the running lanes where possible.
2. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

EXAMPLE ONLY - NOT TO SCALE

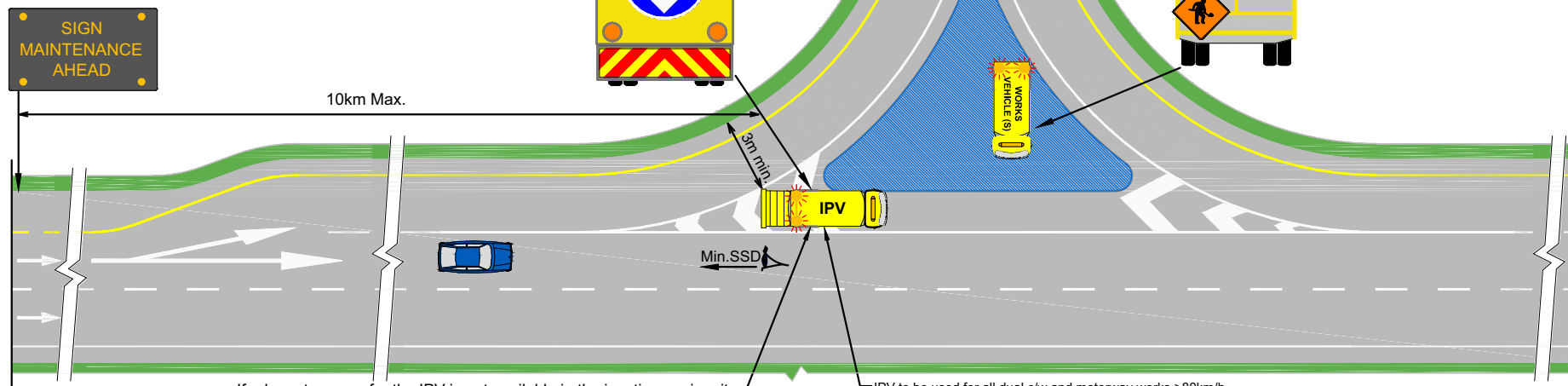
Legend



SSD Parameters

Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



If adequate space for the IPV is not available in the junction nosing, it should be located at the start of diverge taper.
In such instances a flagman / spotter is required, subject to risk assessment, in the verge opposite the traffic island (behind safety barrier or other safe location) to warn approaching traffic of the works.

IPV to be used for all dual c/w and motorway works >80km/h.
The IPV may only be substituted with a Warning Vehicle in limited circumstances, for one-off isolated works of <5 mins only, where risk assessment has deemed it appropriate.

Minor Maintenance (Continuously Moving)
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5
mins

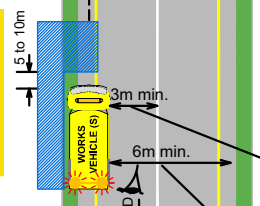
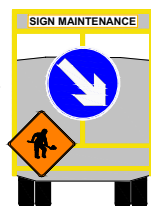
Dual C/W & Motorway - 2/3 Lane (>80km/h)
Compact GSJ - Exit Nose & Traffic Island

TS 21

January 2014

Notes

1. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
2. Traffic volumes are restricted to 20 veh / 3 mins (400 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded. Otherwise refer to TS68.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



If minimum passing width is not available to maintain 2-way traffic, due to the presence of centre line bollards, refer to TS68. In such instances, a section of bollards may need to be temporarily removed to facilitate traffic passing the works.

If centre line bollards are not present, cones are to be used to delineate a temporary centre line, to maintain 2-way traffic. In such instances 6m min. width is required adjacent to the works. Otherwise refer to TS68.

RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS

EXAMPLE ONLY - NOT TO SCALE

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160



Reliable communication system recommended

VMS to give drivers advance notification of continuously moving operation ahead.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



10km Max.

Flagman / Spotter required in the verge (behind safety barrier or other safe location), to warn approaching traffic of works ahead and possible queues on the slip road.

Min.SSD

Min.SSD

3m min.



If adequate space for the IPV is not available in the junction nosing, it should be located at the start of diverge taper. The use of the flagman / spotter is particularly important in such instances to warn approaching traffic.

IPV to be used for all dual c/w and motorway works >80km/h. The IPV may only be substituted with a Warning Vehicle in limited circumstances, for one-off isolated works of <5 mins only, where risk assessment has deemed it appropriate.

Legend

- Flagman / Spotter (as required)
- Forward Clear Visibility 30 / 50 / 60 km/h
- Minimum Stopping Sight Distance (SSD)
- Works Area

January 2014

Minor Maintenance (Continuously Moving)

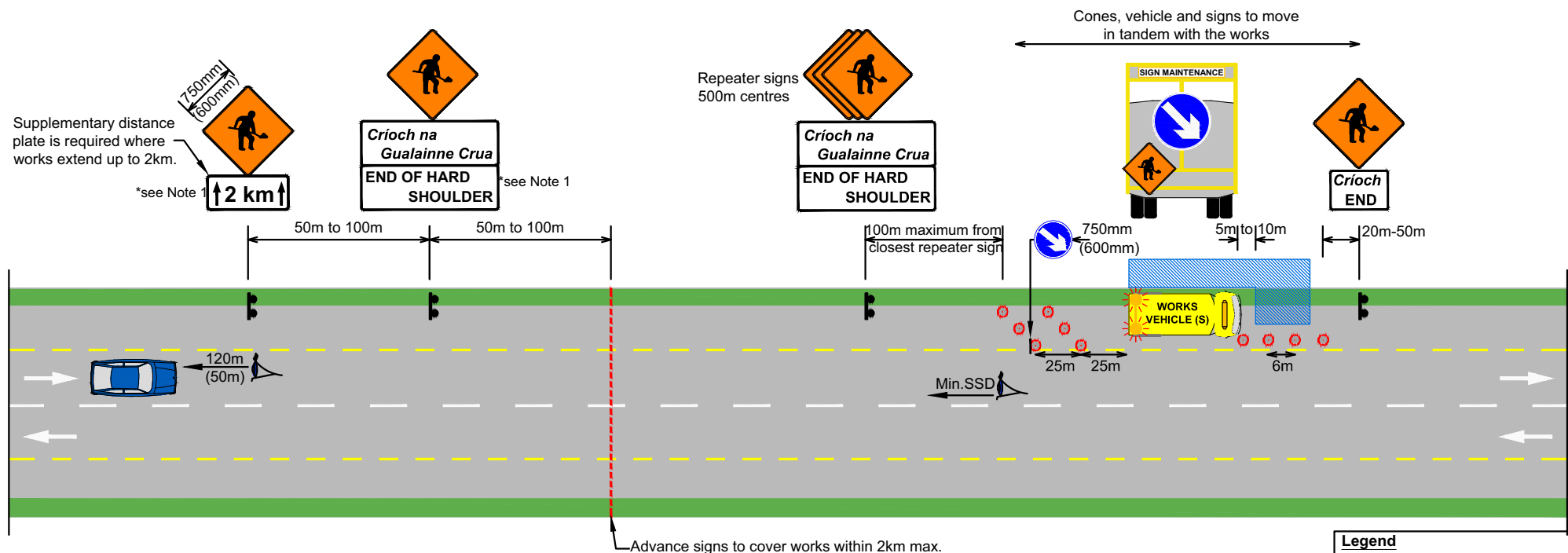
Pole Caps / Patching / Sign Washing / Hedge Maintenance

< 5 mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Compact GSJ - Slip Road

TS 22








<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE CW	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. For works at a side road junction refer to TS25.
3. For works directly opposite a junction (e.g. header sign), this layout may not be suitable if the hard shoulder is reduced to accommodate right turning movements. In such instances TS43 or TS44 should be used, with traffic control required on the side road also.
4. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
5. Where required, pedestrians and cyclists are to be guided safely through or around the works.

Legend

	Cones (0.75m min)
	Visibility to Sign 80 / 100 km/h 30 / 50 / 60 km/h
	Min. SSD Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

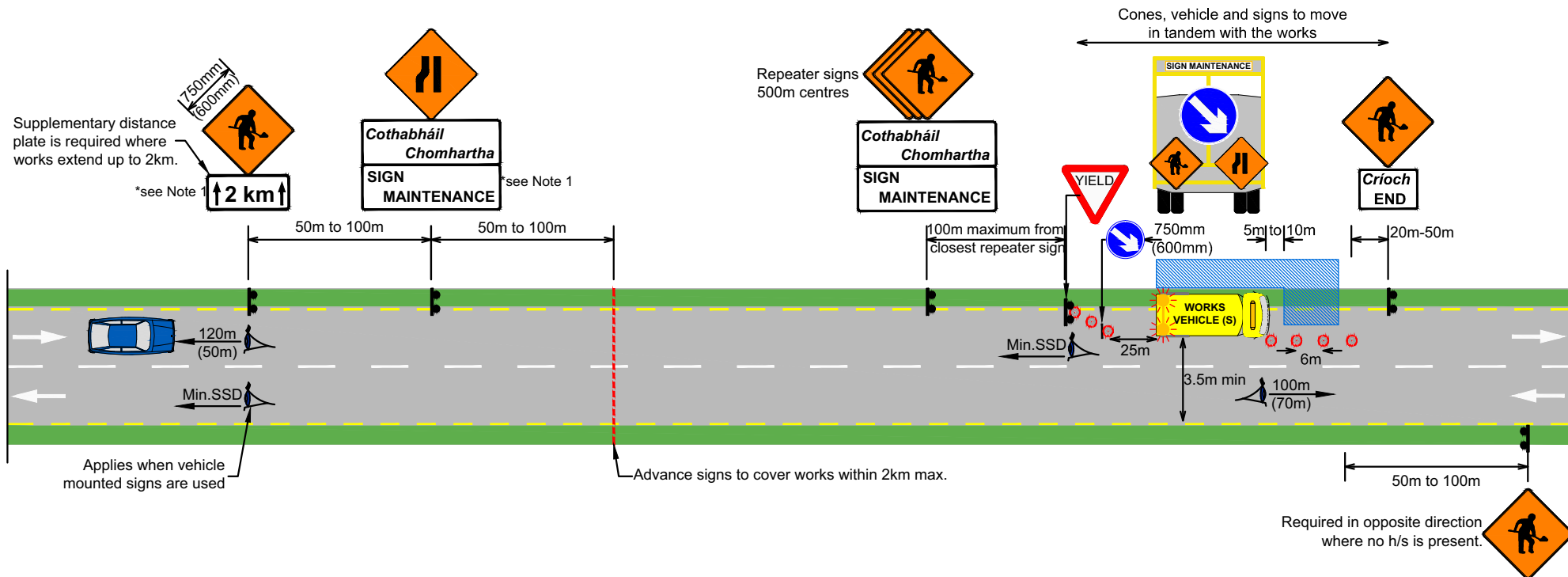
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Single C/W

Mainline Verge - With H/S

TS 23



Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways
2. Where traffic volumes are > 20 veh / 3 mins (400 veh/h), refer to TS43. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. For works directly opposite a junction (e.g. header sign), this layout may not be suitable if it impacts the space required to maintain traffic freeflow around right turning vehicles. In such instances TS43 or TS44 should be used, with traffic control required on the side road also.
4. For works at a side road junction refer to TS26.
5. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
6. Where sight lines are poor refer to TS44.
7. Where required, pedestrians and cyclists are to be guided safely through or around the works.
8. Vehicles to have minimal encroachment on the running lanes where possible.
9. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Legend	
	Cones (0.75m min)
	Forward Clear Visibility
	80 / 100 km/h
	30 / 50 / 60 km/h
	Visibility to Sign
	80 / 100 km/h
	30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

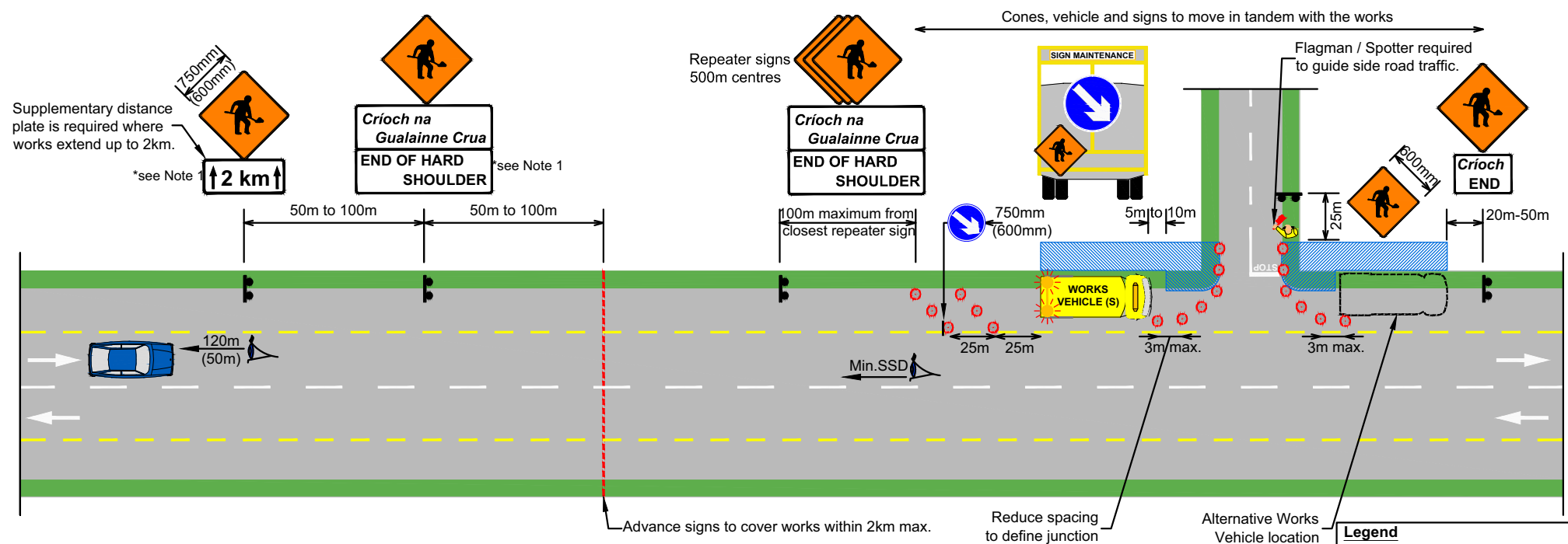
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Single C/W

Mainline Verge - No H/S - Good Sight Lines

TS 24



<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
3. Where required, pedestrians and cyclists are to be guided safely through or around the works.
4. When the side road cross section and traffic volumes are similar to the mainline, TM as per the mainline is to be implemented on the side road.

Legend

-
- Diagram illustrating the layout for a traffic sign installation project on a road:
- Cones (0.75m min):** Indicated by a red cone icon.
 - Visibility to Sign:** 80 / 100 km/h and 30 / 50 / 60 km/h.
 - 120m (50m):** Distance markers on the road.
 - Min. SSD:** Minimum Stopping Sight Distance (SSD).
 - Traffic Sign:** Indicated by a sign icon.
 - Works Area:** Indicated by a blue hatched rectangle.

January 2014

Standard Maintenance / Minor Works

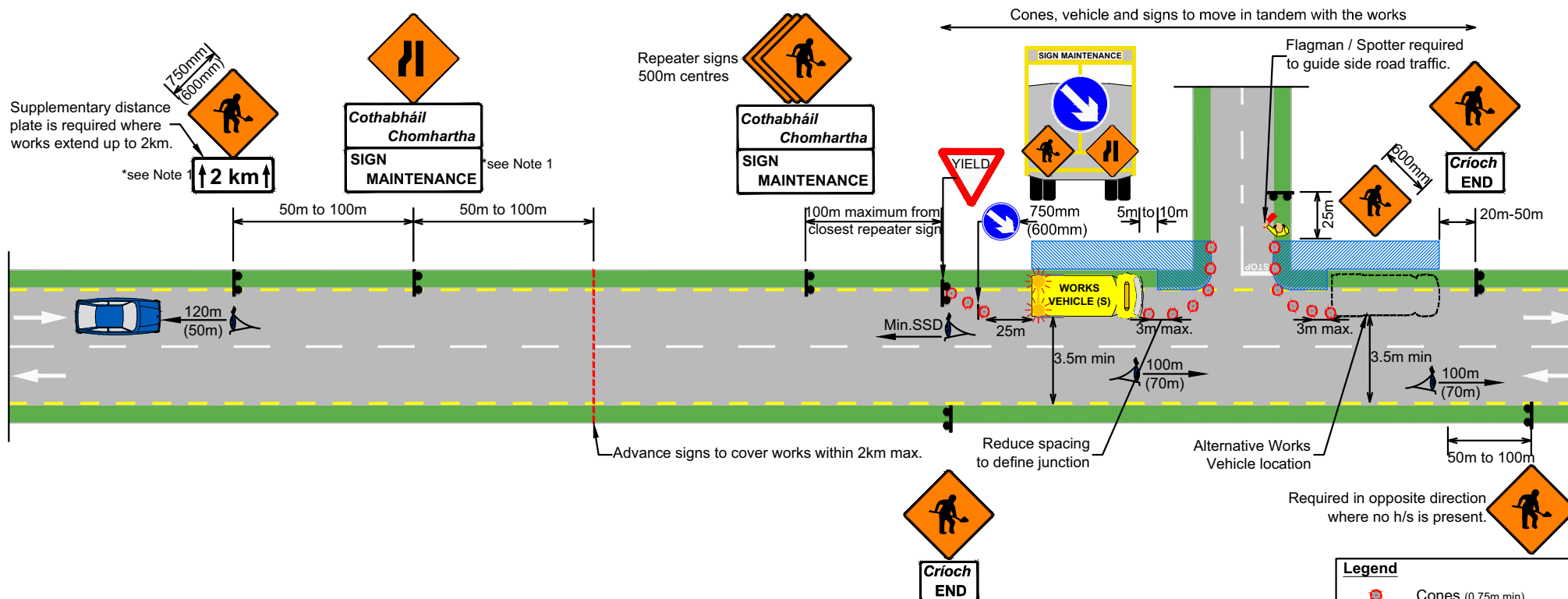
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Single C/W

Junction Verge - With H/S

TS 25



Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. Where traffic volumes are > 20 veh / 3 mins (400 veh/h), refer to TS46. Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. Where sight lines are poor refer to TS46.
4. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
5. Where required, pedestrians and cyclists are to be guided safely through or around the works.
6. When the side road cross section and traffic volumes are similar to the mainline, TM as per the mainline is to be implemented on the side road.
7. Vehicles to have minimal encroachment on the running lanes where possible.
8. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Legend	
	Cones (0.75m min)
	Forward Clear Visibility 80 / 100 km/h 30 / 50 / 60 km/h
	Visibility to Sign 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

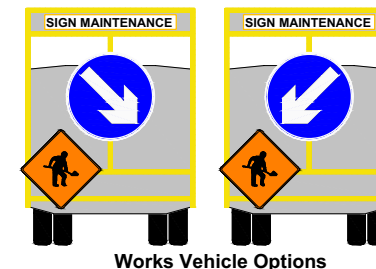
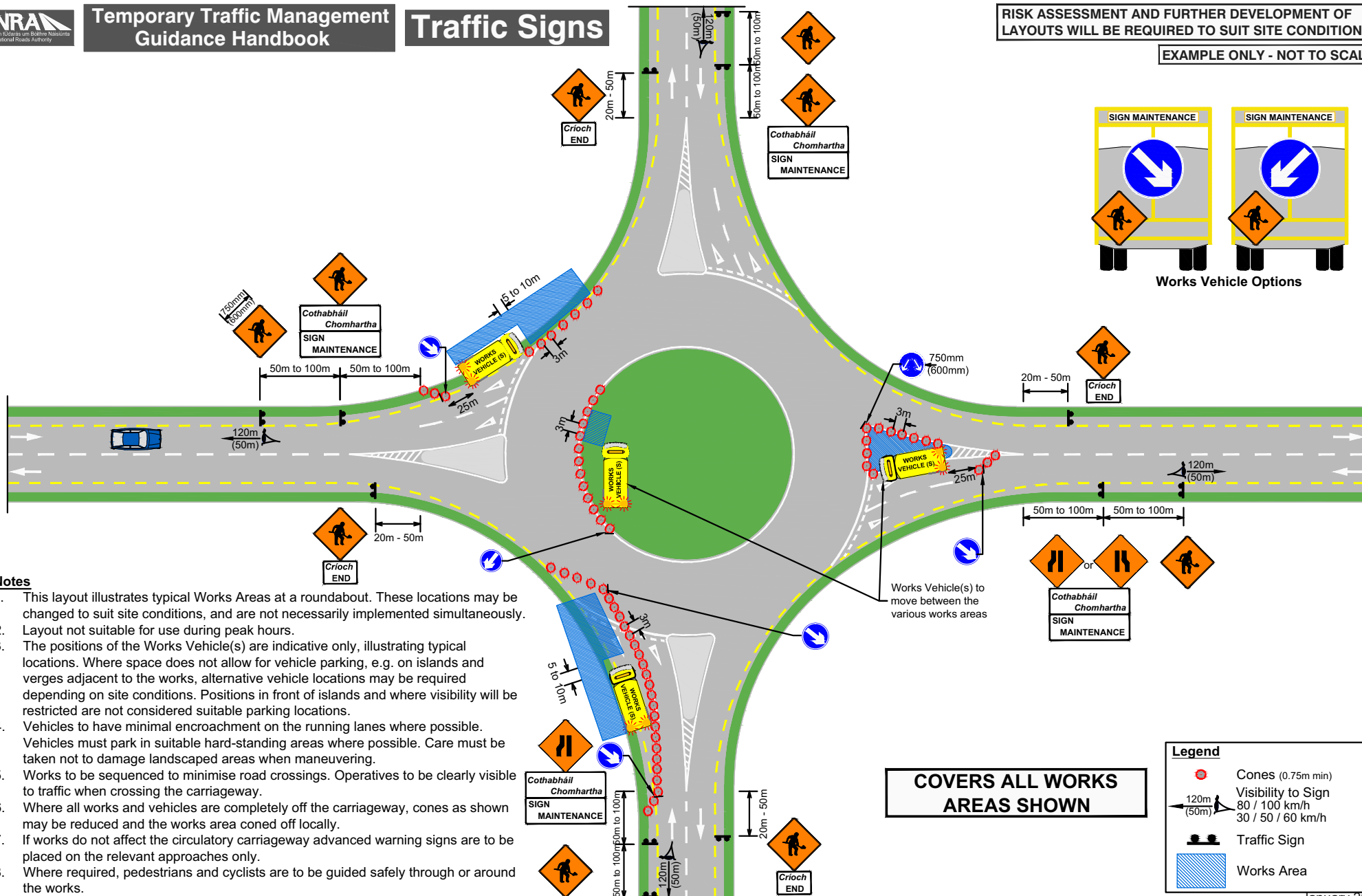
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Single C/W

Junction Verge - No H/S - Good Sight Lines

TS 26



Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

**< 30
mins**

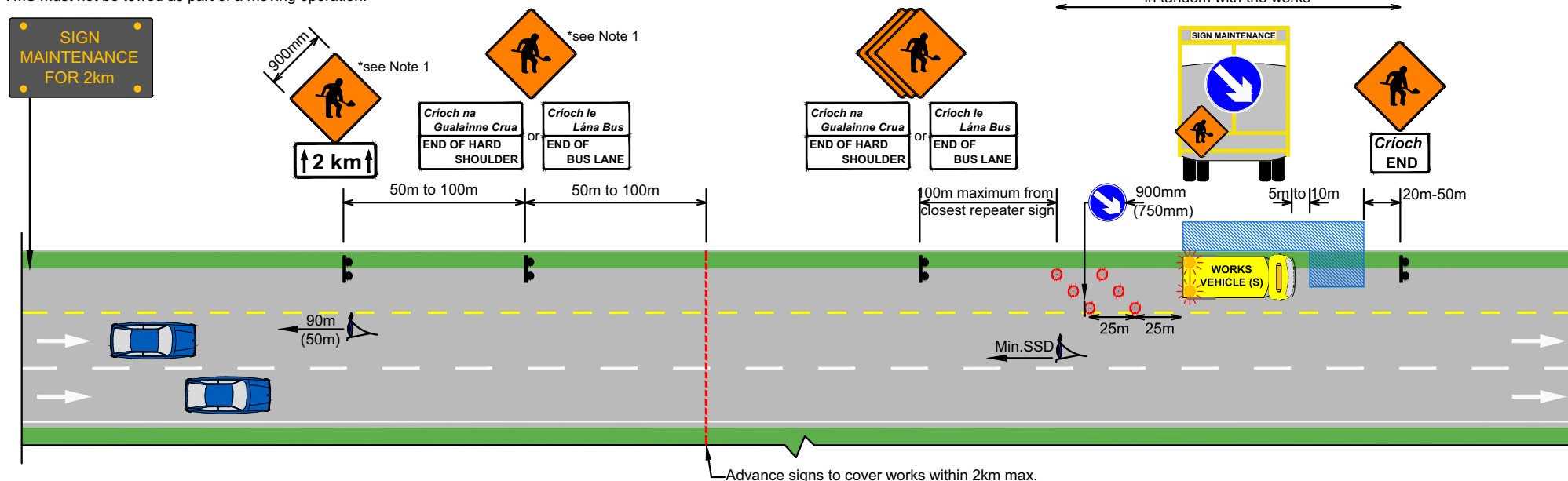
Single C/W

Roundabout - All Works Areas

TS 27

January 2014

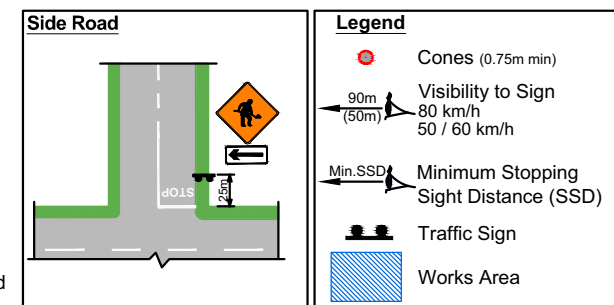
VMS to give drivers advance notification of the operation ahead.
 Location to be optimised for the operation.
 Can be located up to a max. of 2km in advance of the works.
 May not be required for One-Off Isolated Works.
 VMS must not be towed as part of a moving operation.



Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. Layout not suitable for use during peak hours, particularly where a Bus Lane is present. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
3. Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
4. IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
5. Where required, pedestrians and cyclists are to be guided safely through or around the works.
6. Vehicles to have minimal encroachment on the running lanes where possible (where Bus Lane is present).
7. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160



Legend	
	Cones (0.75m min)
	Visibility to Sign 80 km/h 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

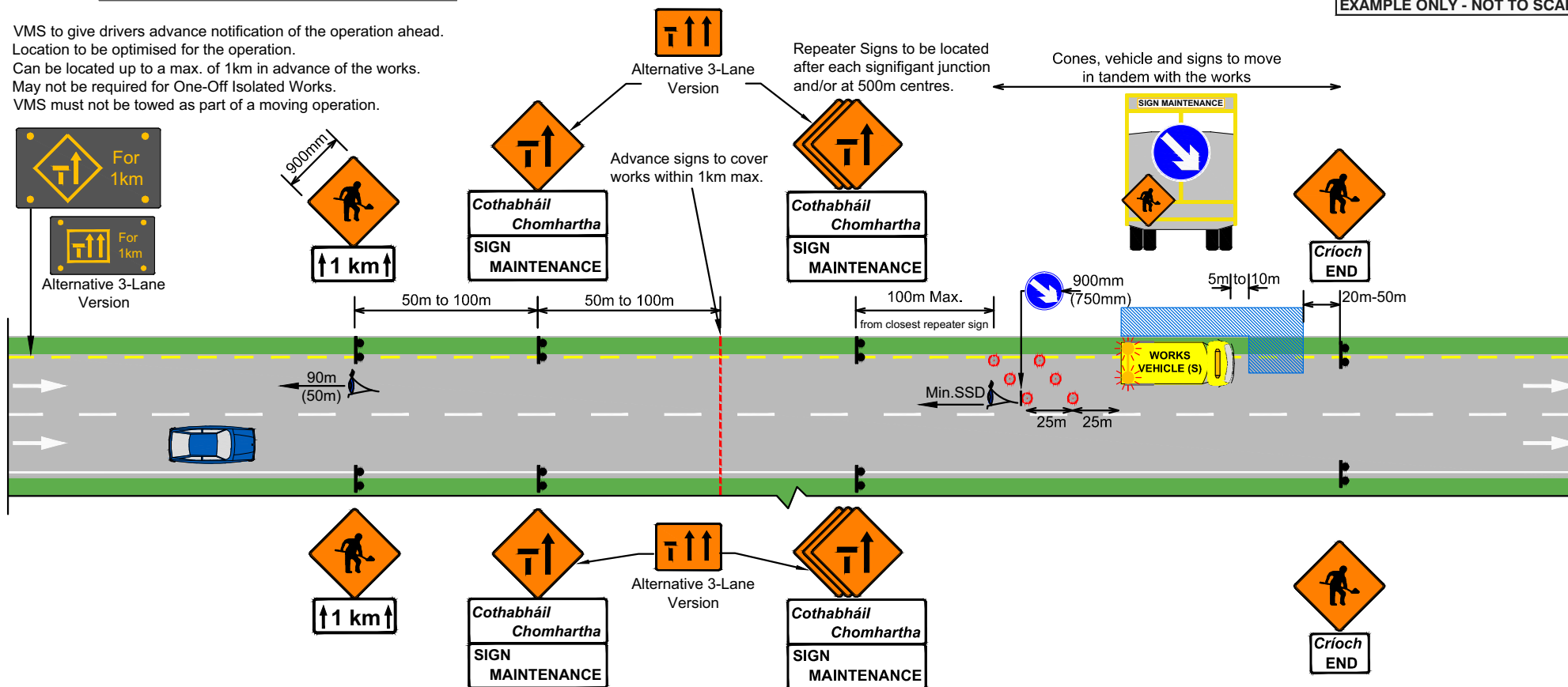
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Urban Dual C/W - 2/3 Lane (≤80km/h)
 Mainline Verge - With H/S (or Bus Lane)

TS 28

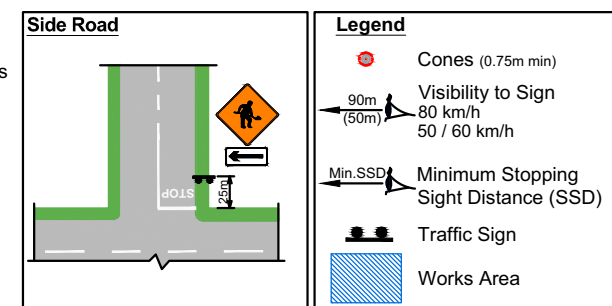
VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 1km in advance of the works.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
3. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
4. Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
5. IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
6. Where required, pedestrians and cyclists are to be guided safely through or around the works.
7. Vehicles to have minimal encroachment on the running lanes where possible.
8. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.
9. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL CW	50 / 60	90 / 120
	80	160



January 2014

Standard Maintenance / Minor Works

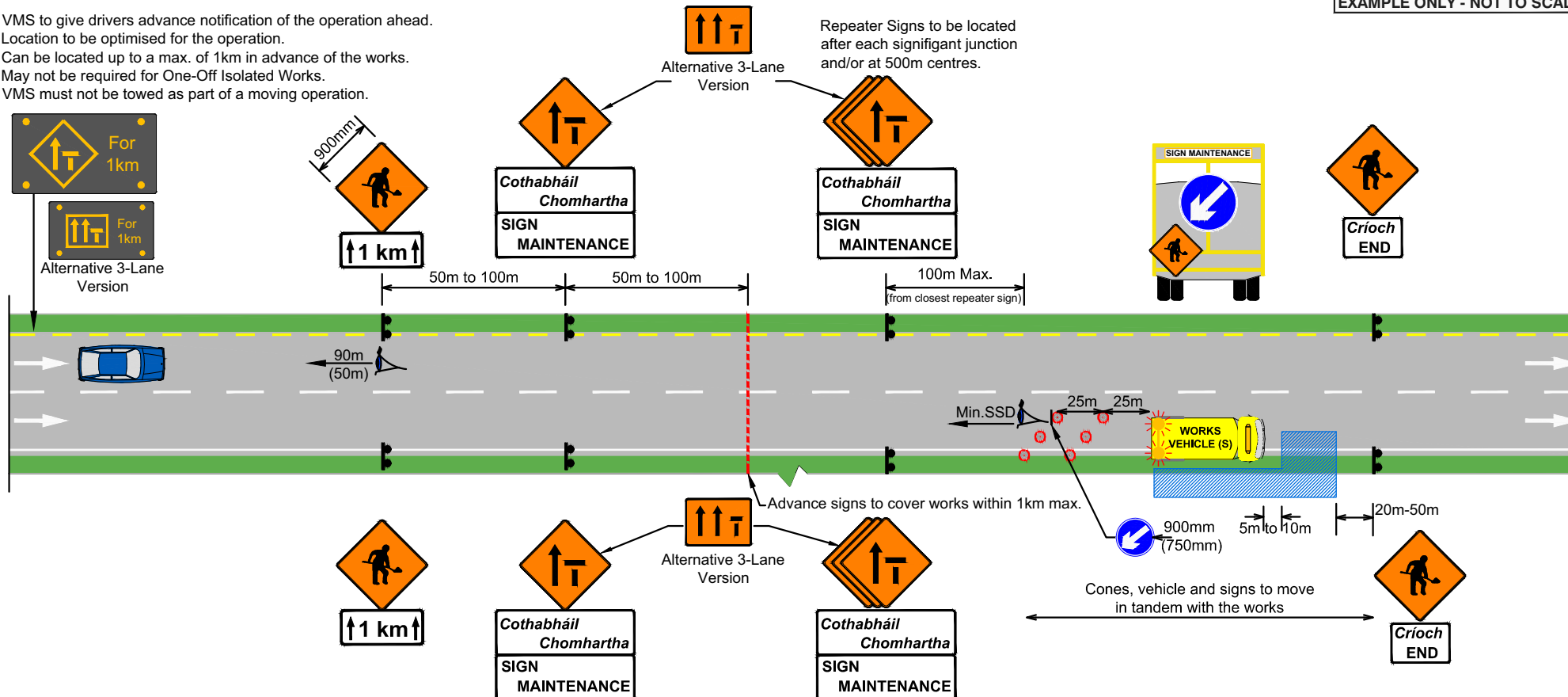
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Urban Dual C/W - 2/3 Lane ($\leq 80\text{km/h}$)

TS 29

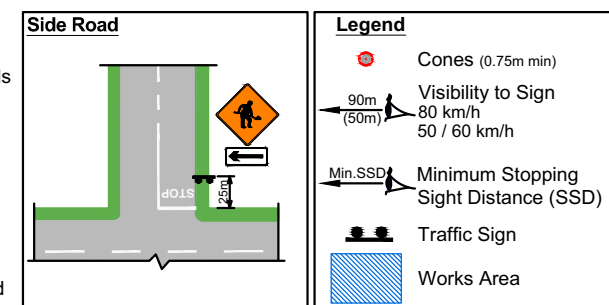
VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 1km in advance of the works.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Notes

1. Signs may be vehicle mounted. Vehicles should park clear of the running lane in the verge or entrance ways.
2. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
3. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
4. Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
5. IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
6. Where required, pedestrians and cyclists are to be guided safely through or around the works.
7. Vehicles to have minimal encroachment on the running lanes where possible.
8. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.
9. Further development of this layout may be required to suit site conditions, where risk assessment deems it necessary for the road type.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160



January 2014

Standard Maintenance / Minor Works

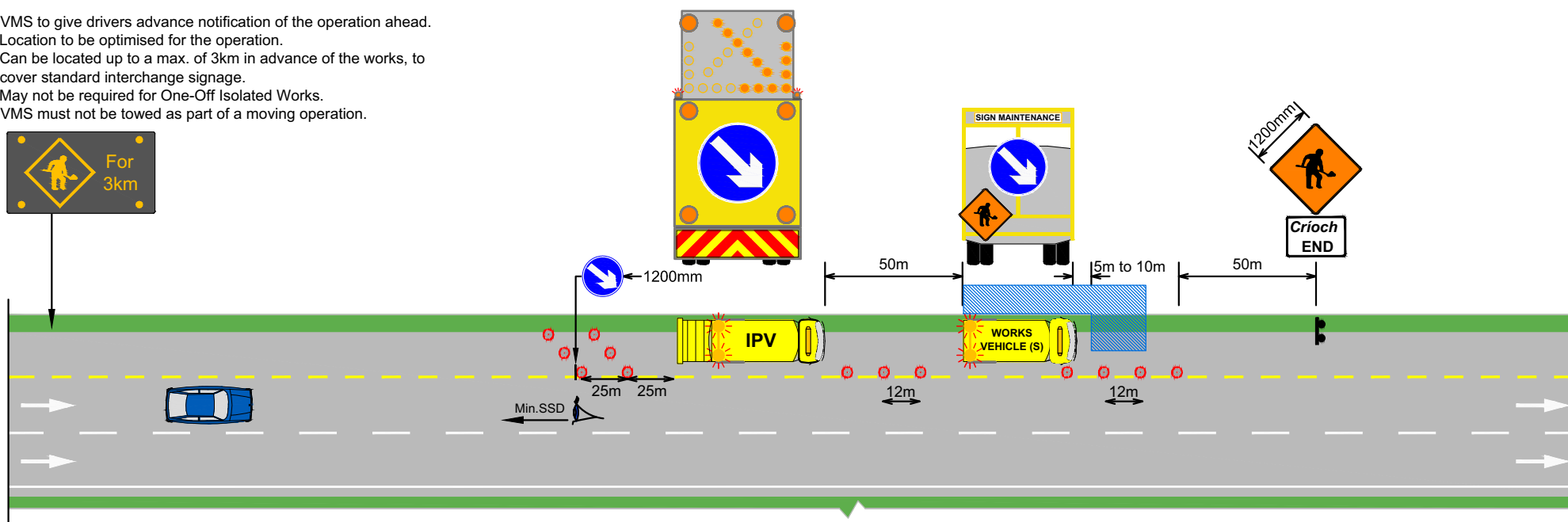
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Urban Dual C/W - 2/3 Lane (≤80km/h)
Mainline Median



TS 30

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Legend

-  Cones (1.0m min)
-  Minimum Stopping Sight Distance (SSD)
-  Traffic Sign
-  Works Area

January 2014

Standard Maintenance / Minor Works

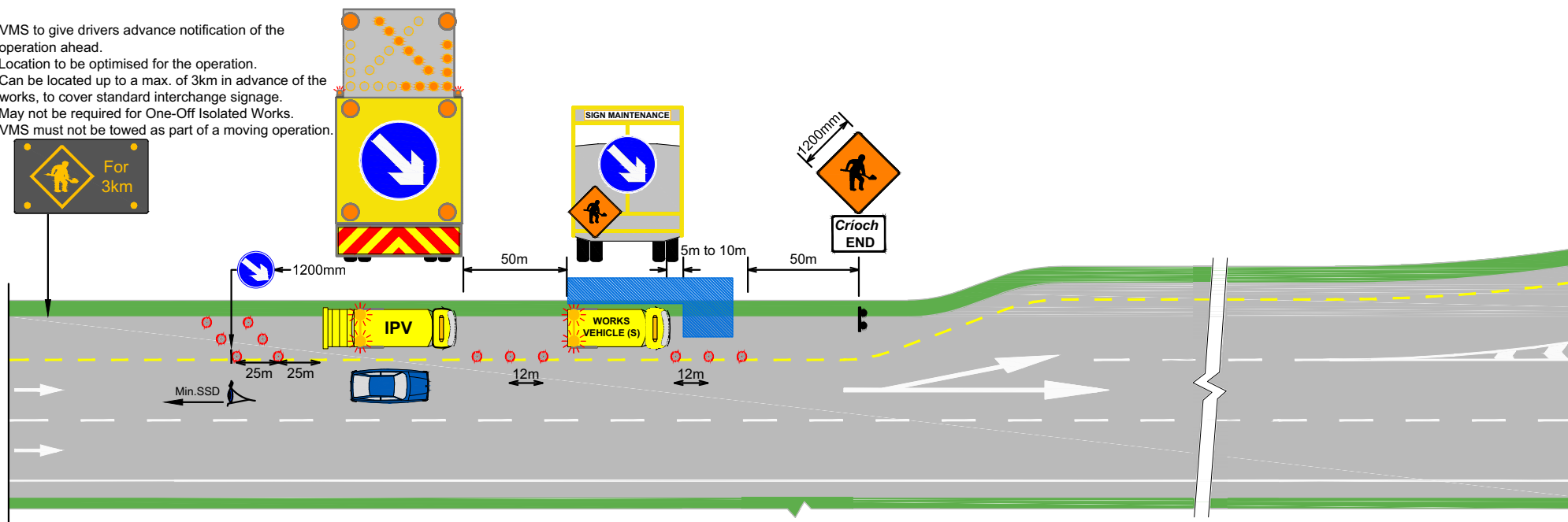
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

TS 31

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Legend	
	Cones (1.0m min)
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

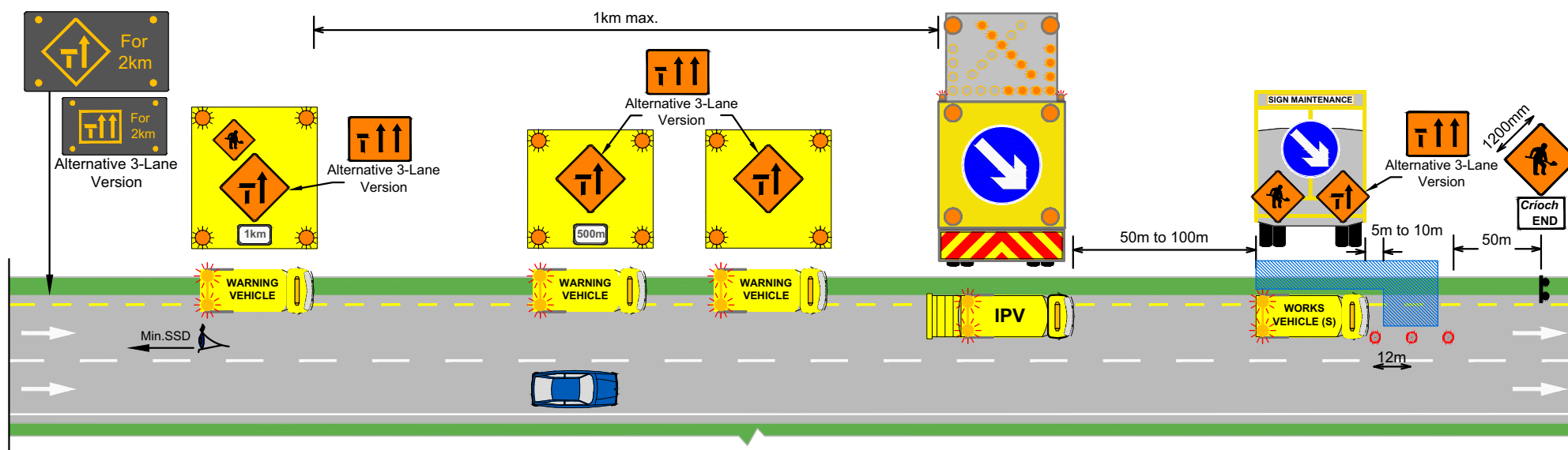
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Mainline Verge - With H/S - Diverge Taper

TS 32

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 2km in advance of the works.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.







<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum
3. Warning vehicles must pull in where possible, to ensure minimal encroachment on the running lane.
4. Where there is limited pull-in space for the advance warning vehicles, a flagman / spotter may be required in advance, to warn approaching traffic, subject to risk assessment. In such instances, he must always be positioned at a safe location behind a safety barrier.
5. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend

-  Cones (1.0m min)
-  Minimum Stopping Sight Distance (SSD)
-  Traffic Sign
-  Works Area

January 2014

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

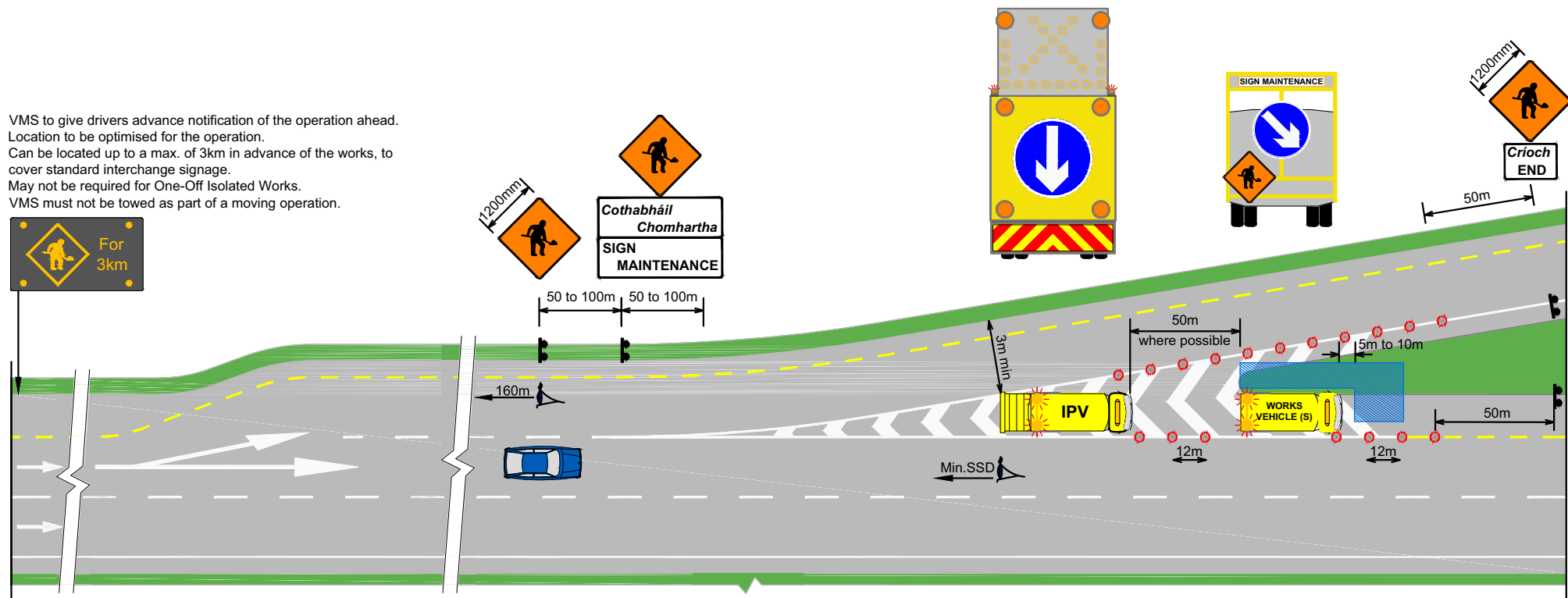
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Mainline Verge - No H/S (& Mainline Lane 1)

TS 33

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to
cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

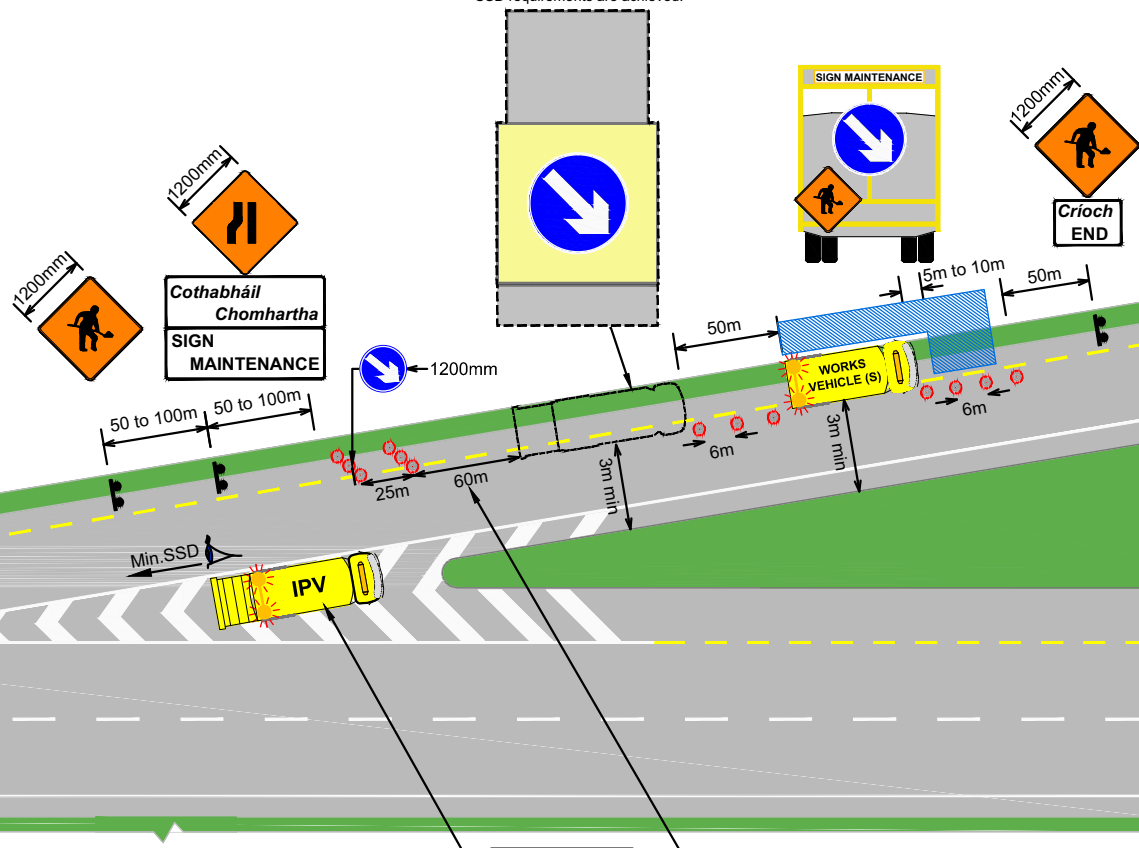
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Exit Nose

TS 34

VMS to give drivers advance notification of the operation ahead.
 Location to be optimised for the operation.
 Can be located up to a max. of 3km in advance of the works, to
 cover standard interchange signage.
 May not be required for One-Off Isolated Works.
 VMS must not be towed as part of a moving operation.



Alternative IPV location.
 Only if space permits and minimum
 SSD requirements are achieved.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

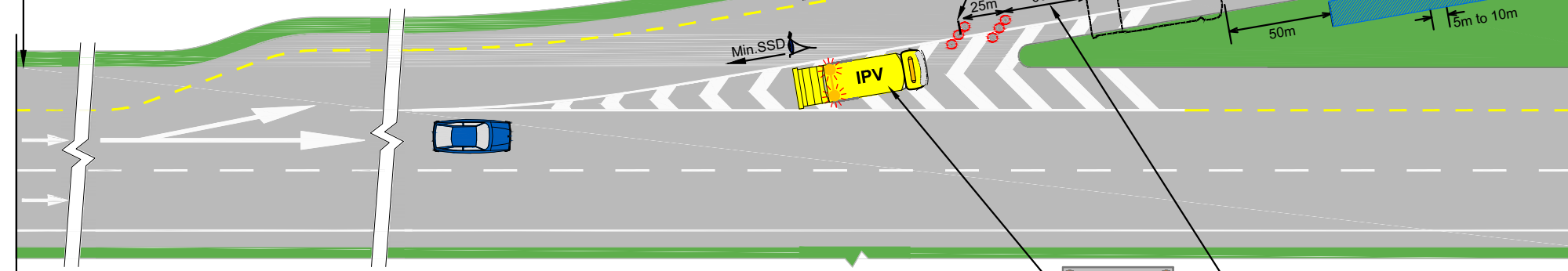
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Off-Ramp - LHS

TS 35

January 2014

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to
cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Alternative IPV location.
Only if space permits and minimum
SSD requirements are achieved.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

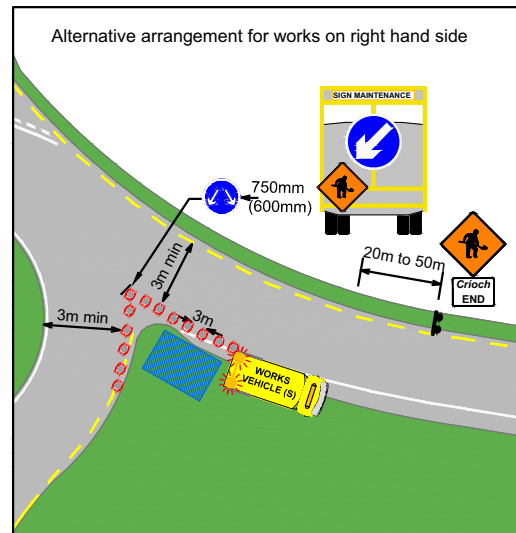
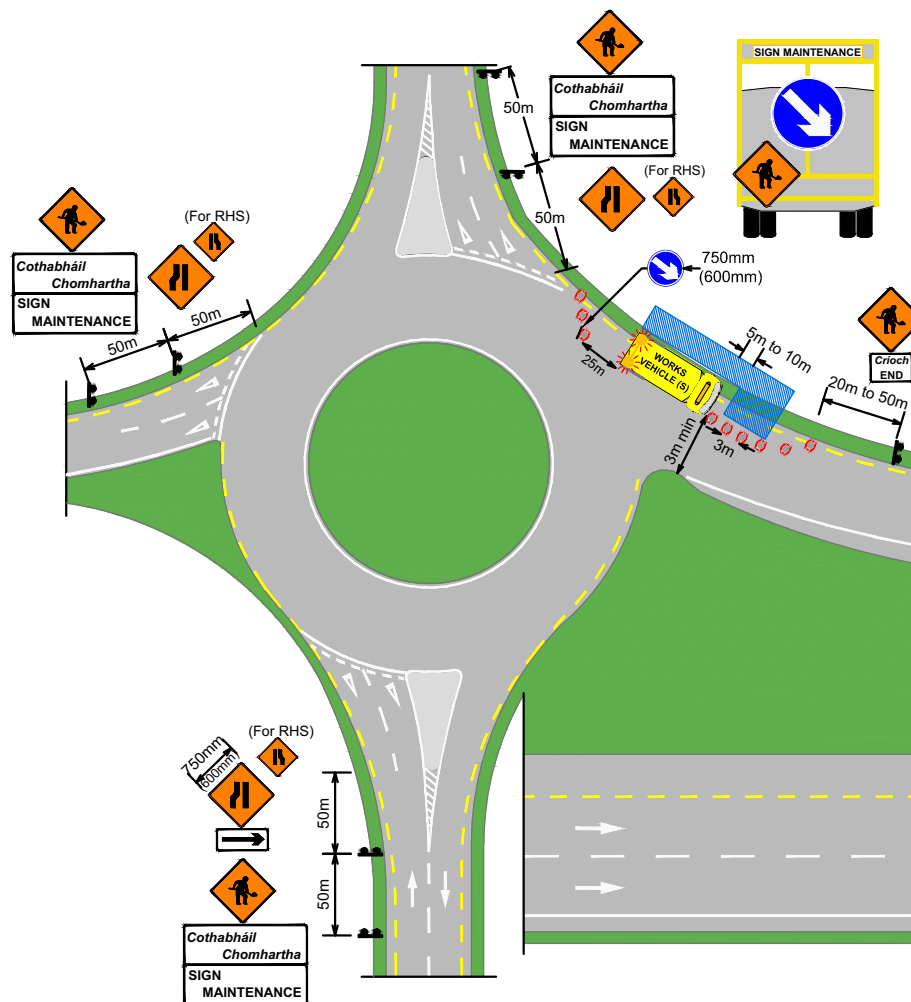
Full GSJ - Off-Ramp - RHS

TS 36

January 2014

Notes

1. Works relating to signs at the tops of interchanges and associated approaches are treated as standard single carriageway and/or roundabout works. Refer to TS23 to TS27 as appropriate.
2. Vehicles to have minimal encroachment on the running lanes where possible.
3. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
 LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

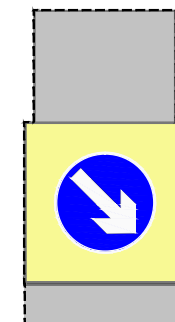
EXAMPLE ONLY - NOT TO SCALE

Legend

- Cones (1.0m min)
- 50m Visibility to Sign
- Min.SSD Minimum Stopping Sight Distance (SSD)
- Traffic Sign
- Works Area

SSD Parameters

Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL CW	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160



IPV to be located here when works are being carried out as part of a mainline operation.

Min.SSD

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

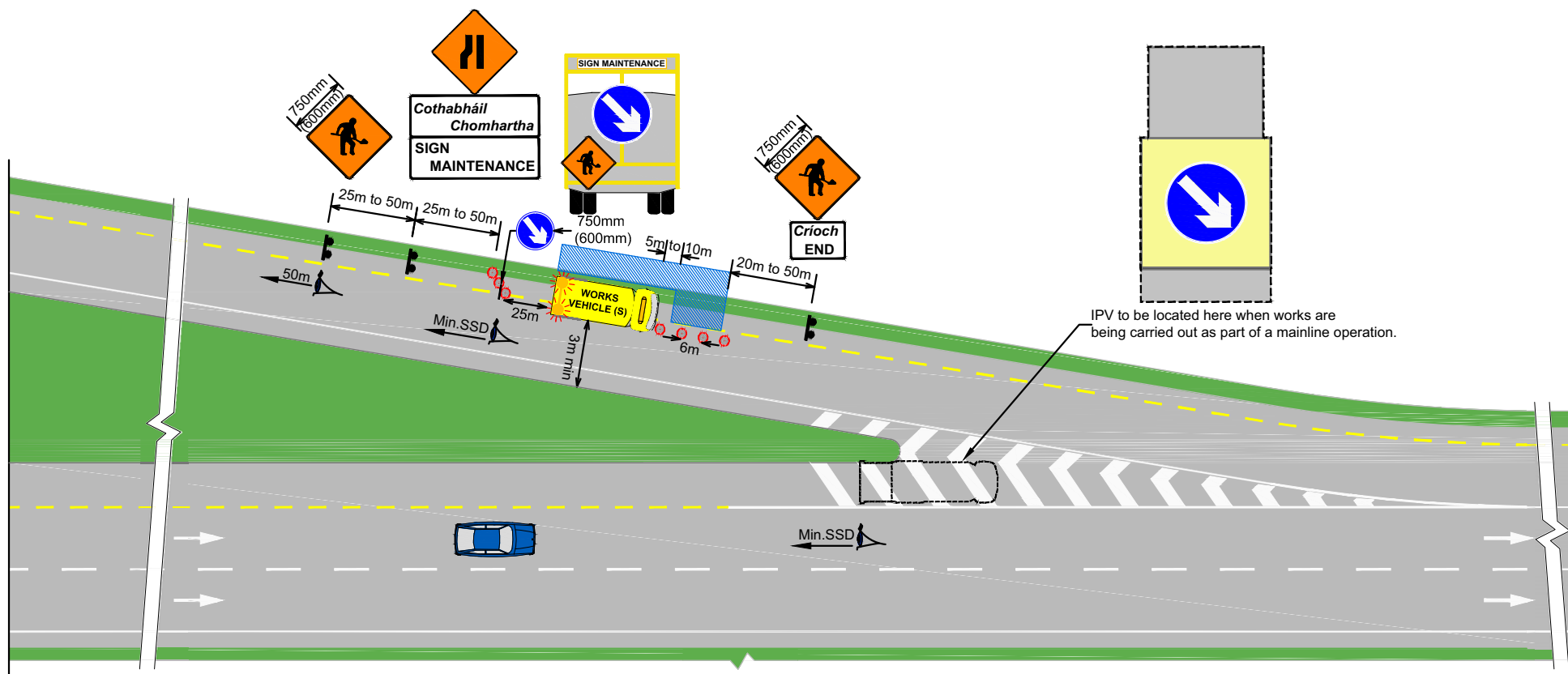
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Start of On-Ramp

TS 37

January 2014



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160

Notes

1. Vehicles to have minimal encroachment on the running lanes where possible.
2. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Cones (1.0m min)
	50m Visibility to Sign
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

January 2014

Standard Maintenance / Minor Works

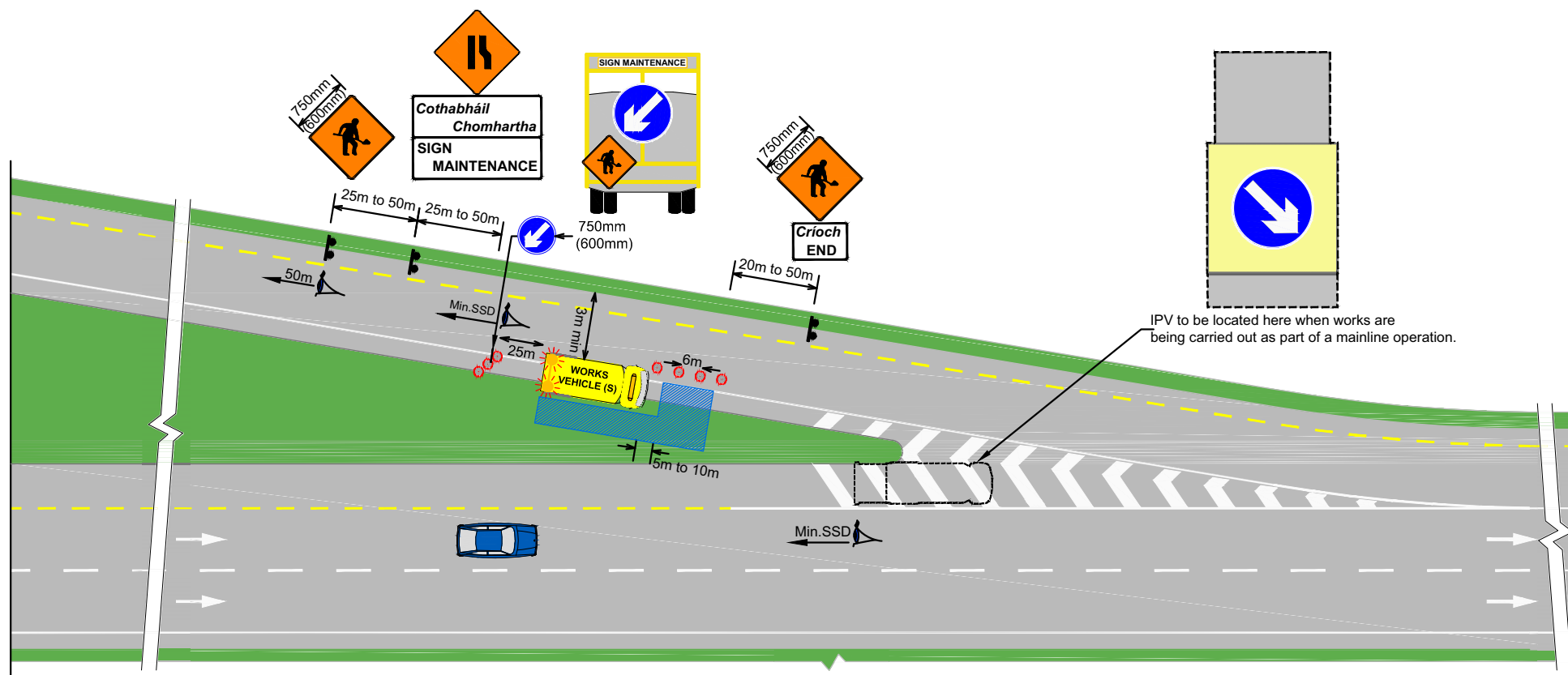
Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - LHS

TS 38



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL CW	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160

Notes

1. Vehicles to have minimal encroachment on the running lanes where possible.
2. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend

- Cones (1.0m min)
- Visibility to Sign
- Minimum Stopping Sight Distance (SSD)
- Traffic Sign
- Works Area

January 2014

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

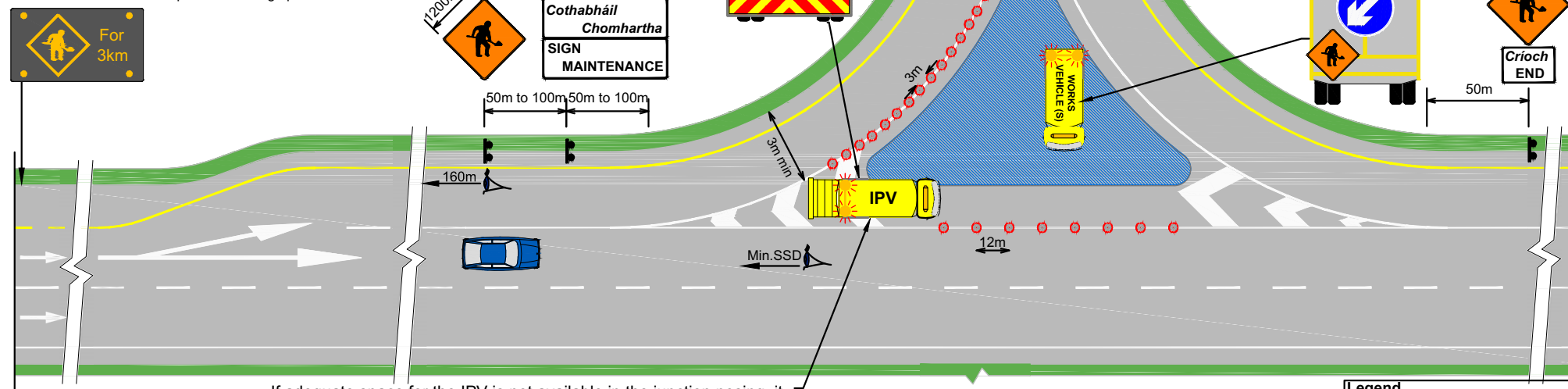
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - RHS

TS 39

VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



If adequate space for the IPV is not available in the junction nosing, it should be located at the start of diverge taper.

In such instances a flagman / spotter is required, subject to risk assessment, in the verge opposite the traffic island (behind safety barrier or other safe location) to warn approaching traffic of the works.

<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Coning around the works area may be optimised if permanent bollards are in place, subject to on site risk assessment.

Legend

-

January 2014

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Compact GSJ - Exit Nose & Traffic Island

TS 40

Notes

1. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
2. Traffic volumes are restricted to 20 veh / 3 mins (400 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

EXAMPLE ONLY - NOT TO SCALE

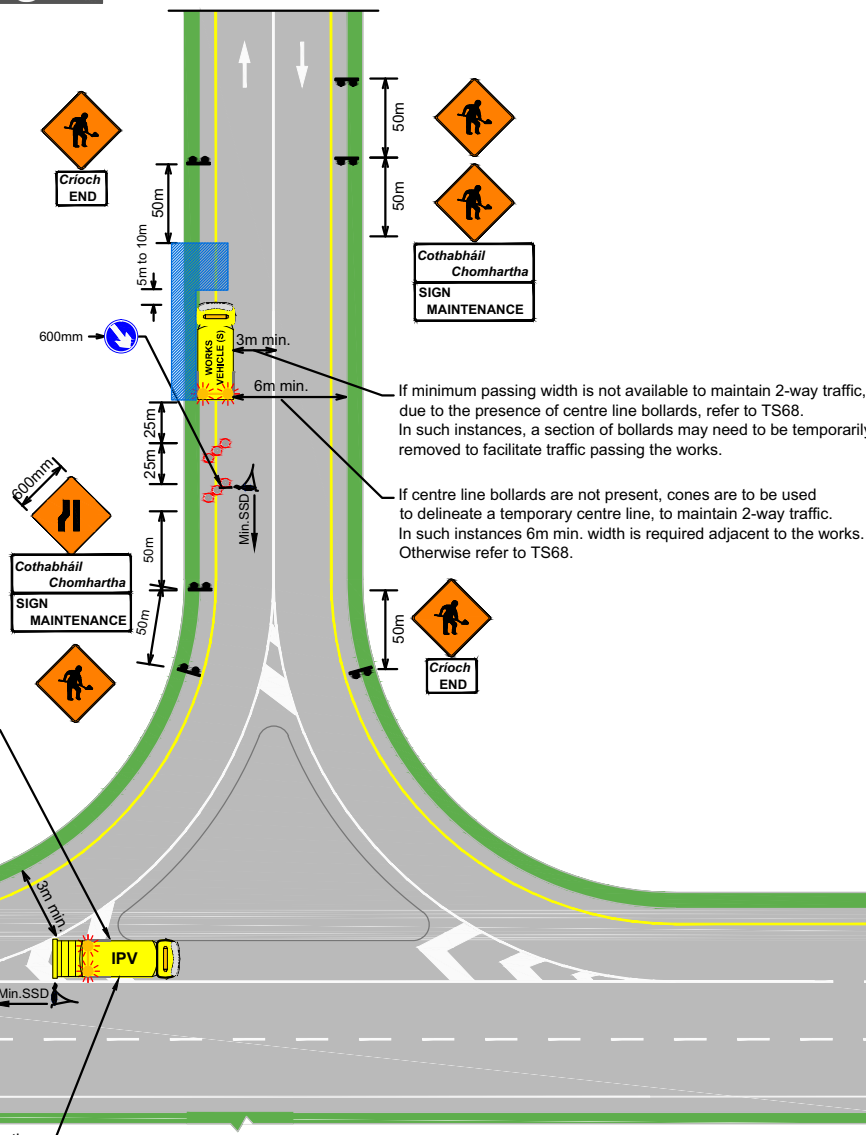
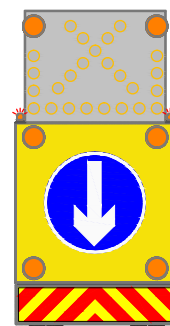
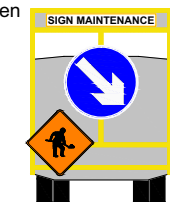
SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295
	50 / 60 / 80	90 / 120 / 160



VMS to give drivers advance notification of the operation ahead.
Location to be optimised for the operation.
Can be located up to a max. of 3km in advance of the works, to cover standard interchange signage.
May not be required for One-Off Isolated Works.
VMS must not be towed as part of a moving operation.



Flagman / Spotter required in the verge (behind safety barrier or other safe location), to warn approaching traffic of possible queues and works on the slip road.



If adequate space for the IPV is not available in the junction nosing, it should be located at the start of diverge taper.
The use of the flagman / spotter is particularly important in such instances to warn approaching traffic.

Legend	
	Cones (1.0m min)
	Flagman / Spotter (as required)
	Forward Clear Visibility 30 / 50 / 60 km/h
	Visibility to Sign
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Works Area

Standard Maintenance / Minor Works

Single Post Installations / Sign Face Replacement / Minor Removals / Hedge Clearance / Landscaping

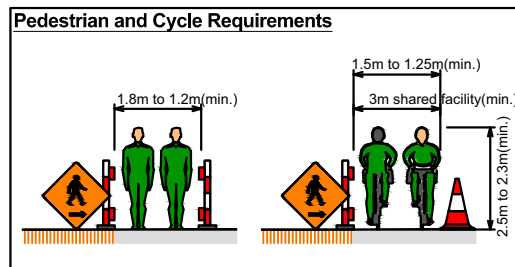
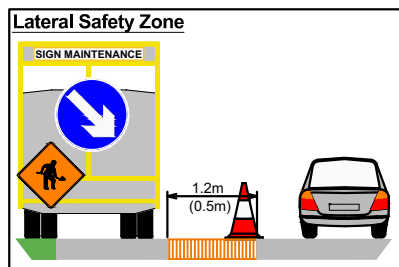
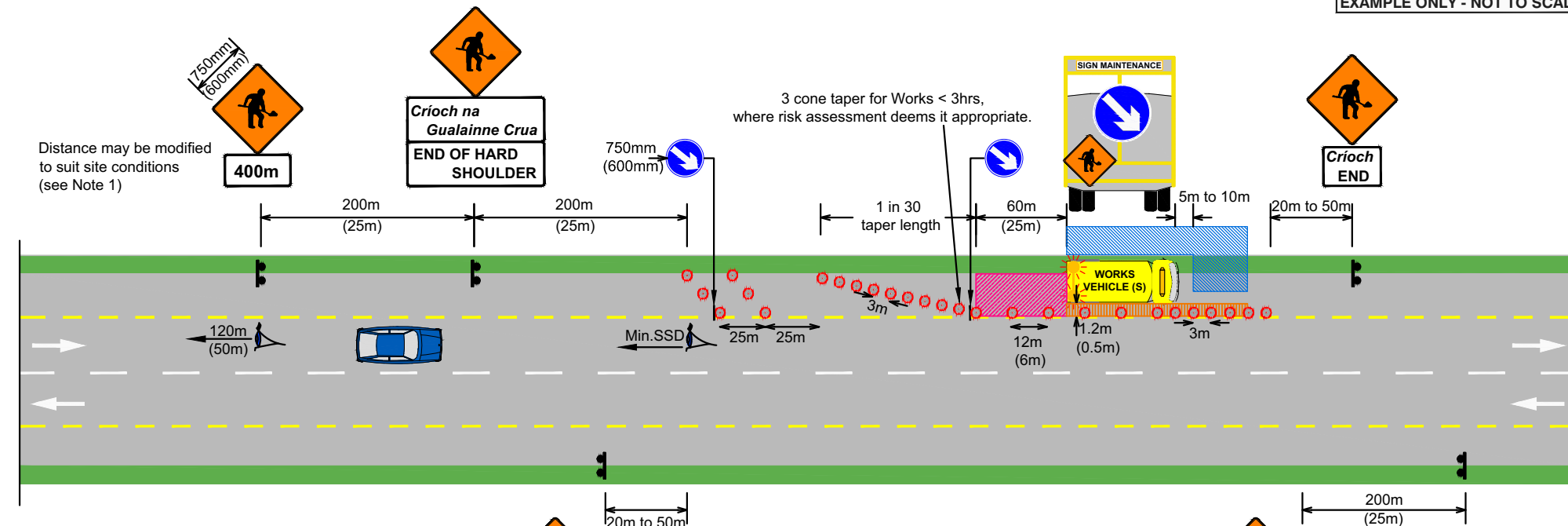
< 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Compact GSJ - Slip Road

TS 41

January 2014

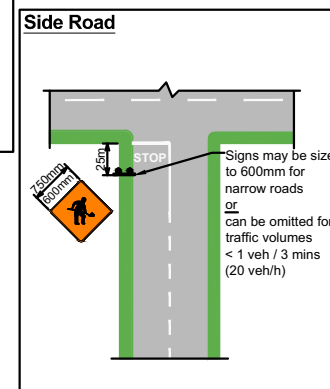


This sign must always be located after junctions in the direction of travel. Distance may be reduced to ensure sign is always on works side of any junction.

Notes

1. For roads < 80 km/h, distance plate should be 50m.
2. For works at a side road junction refer to TS45.
3. For works directly opposite a junction (e.g. header sign), this layout may not be suitable if the hard shoulder is reduced to accommodate right turning movements. In such instances TS43 or TS44 should be used, with traffic control required on the side road also.
4. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
5. The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If encroachment on the running lane is unavoidable, refer to TS43.
6. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215



Legend	
	Cones (0.75m min)
	Visibility to Sign 80 / 100 km/h 30 / 50 / 60 km/h
	Min.SSD
	Other Dimensions 80 / 100 km/h 30 / 50 / 60 km/h
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

Standard Works

Sign Installations / Sign Removals / Tree Clearance

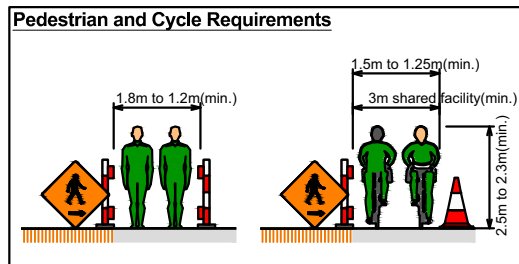
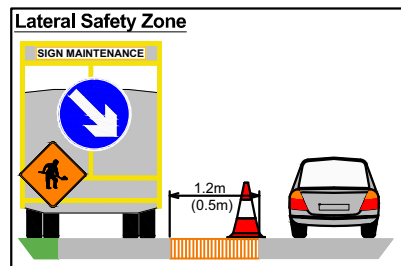
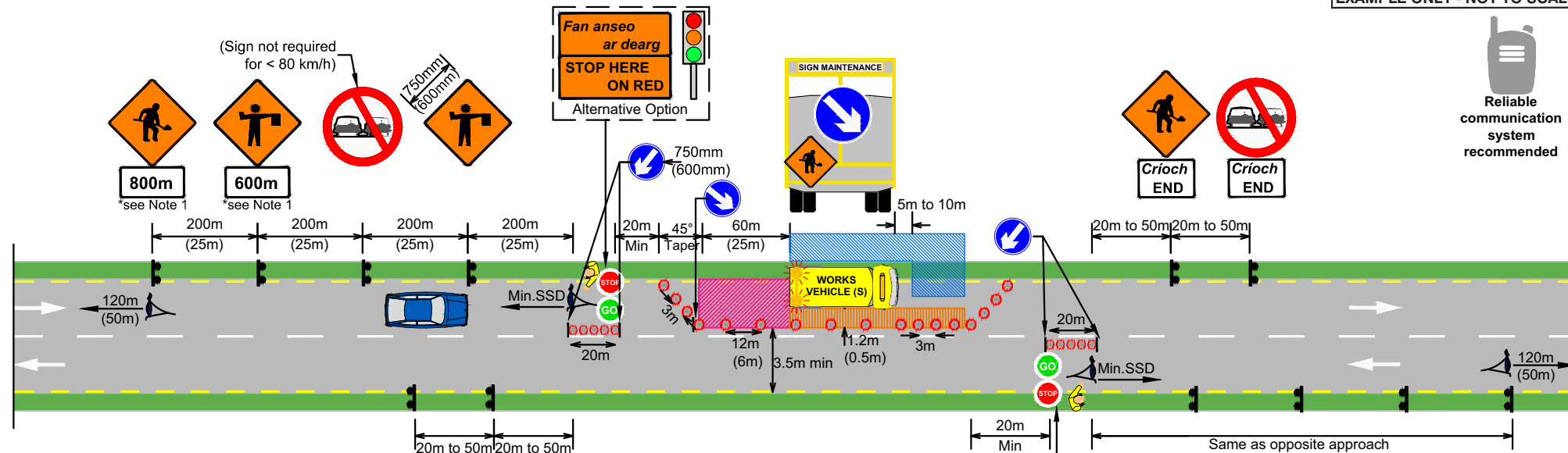
> 30
mins

Single C/W

Mainline Verge - With H/S

TS 42

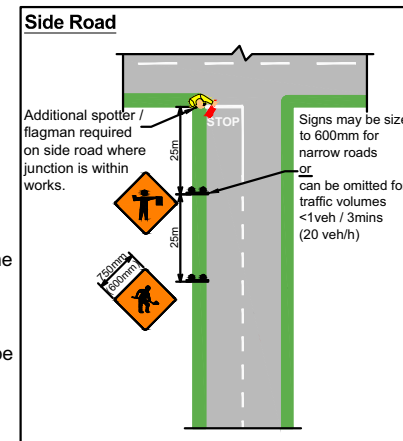
January 2014



Notes

1. For roads < 80 km/h, distance plates should be 100m and 75m.
2. For works at a side road junction refer to TS46.
3. If this layout is used for works directly opposite a junction (header sign), full traffic control (Stop/Go) is required on the side road.
4. Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
5. Where the works and TM can be contained completely off the running carriageway in the verge, consideration can be given to using a layout similar to TS42, but only where risk assessment deems it suitable and appropriate based on site conditions.
6. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215



Legend	
	Cones (0.75m min)
	Flagman / Spotter (as required)
	Visibility to Sign 80 / 100 km/h 30 / 50 / 60 km/h
	Minimum Stopping Sight Distance (SSD)
	Other Dimensions 80 / 100 km/h 30 / 50 / 60 km/h
	Traffic Sign
	Stop / Go & Operative
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

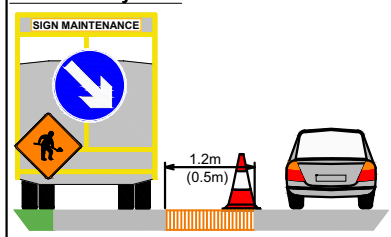
Single C/W

Mainline Verge - No H/S - Good Sight Lines

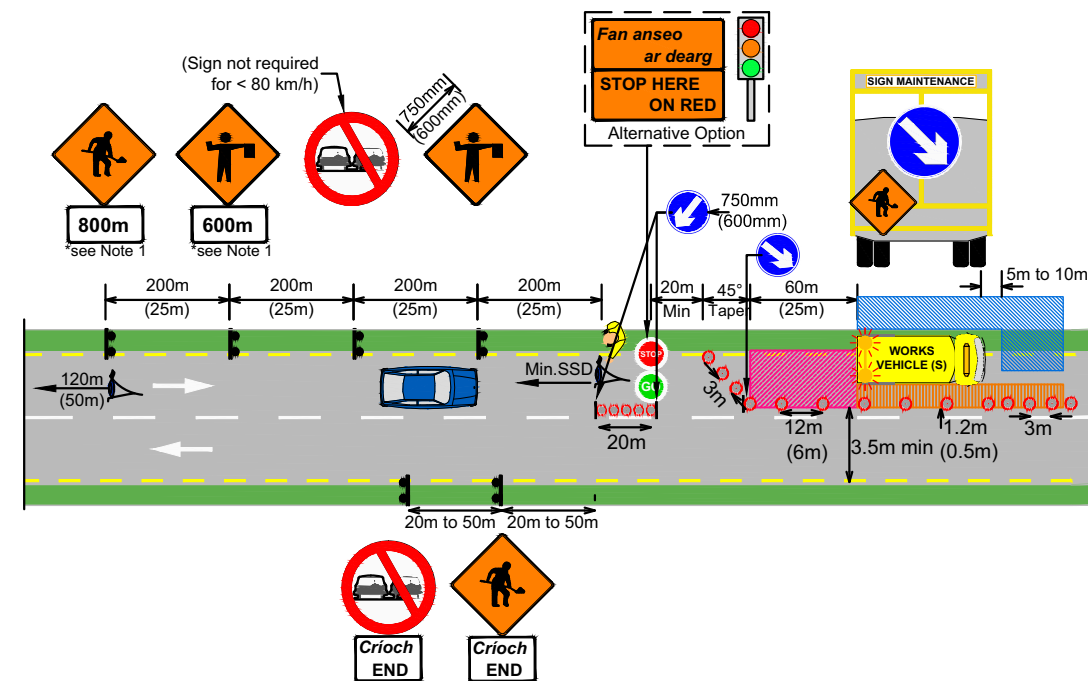
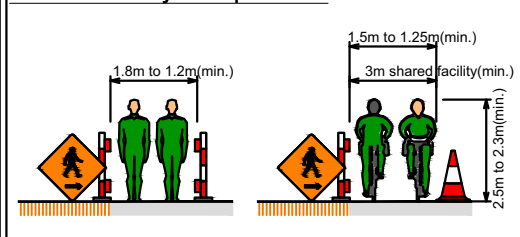
TS 43



Lateral Safety Zone



Pedestrian and Cycle Requirements

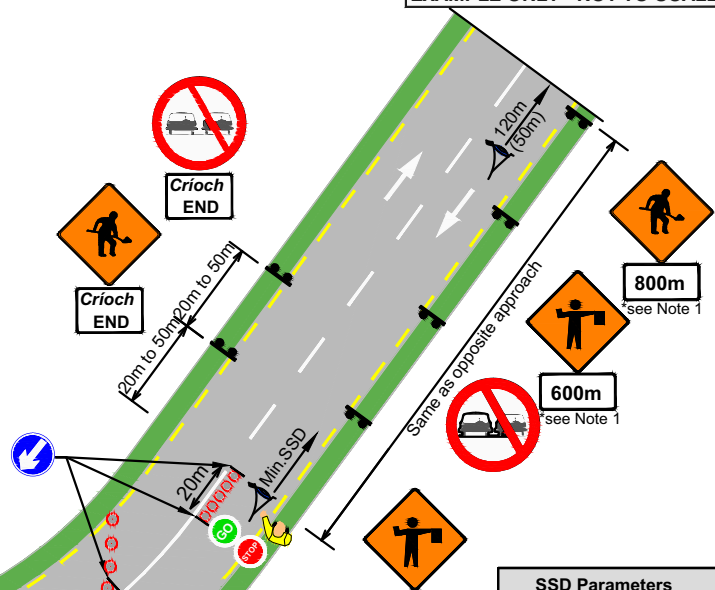


Notes

- For roads < 80 km/h, distance plates should be 100m and 75m.
- This plan can also be used for multiple bends, provided minimum SSD is achievable to the Stop/Go operatives in both directions. Further risk assessment and additional TM development may be required to suit site conditions.
- For works at a side road junction refer to TS46.
- If this layout is used for works directly opposite a junction (header sign), full traffic control (Stop/Go) is required on the side road.
- Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
- Where the works and TM can be contained completely off the running carriageway in the verge, consideration can be given to the use TS42, but only where risk assessment deems it suitable and appropriate based on site conditions.
- Existing pedestrian and/or cycle facilities to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

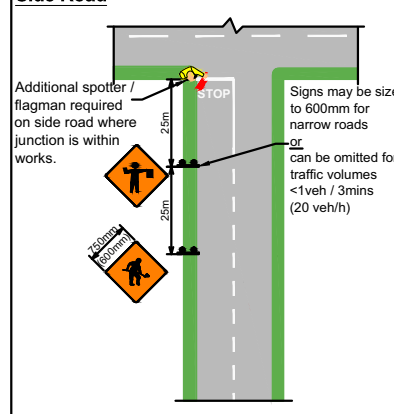
RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS

EXAMPLE ONLY - NOT TO SCALE



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Side Road



Legend

- Cones (0.75m min)
- Flagman / Spotter (as required)
- Visibility to Sign 120m (50m)
- Minimum Stopping Sight Distance (SSD) Min.SSD
- Other Dimensions 200m (25m)
- Traffic Sign
- Stop / Go & Operative
- Longitudinal Safety Zone
- Lateral Safety Zone
- Works Area

January 2014

Standard Works

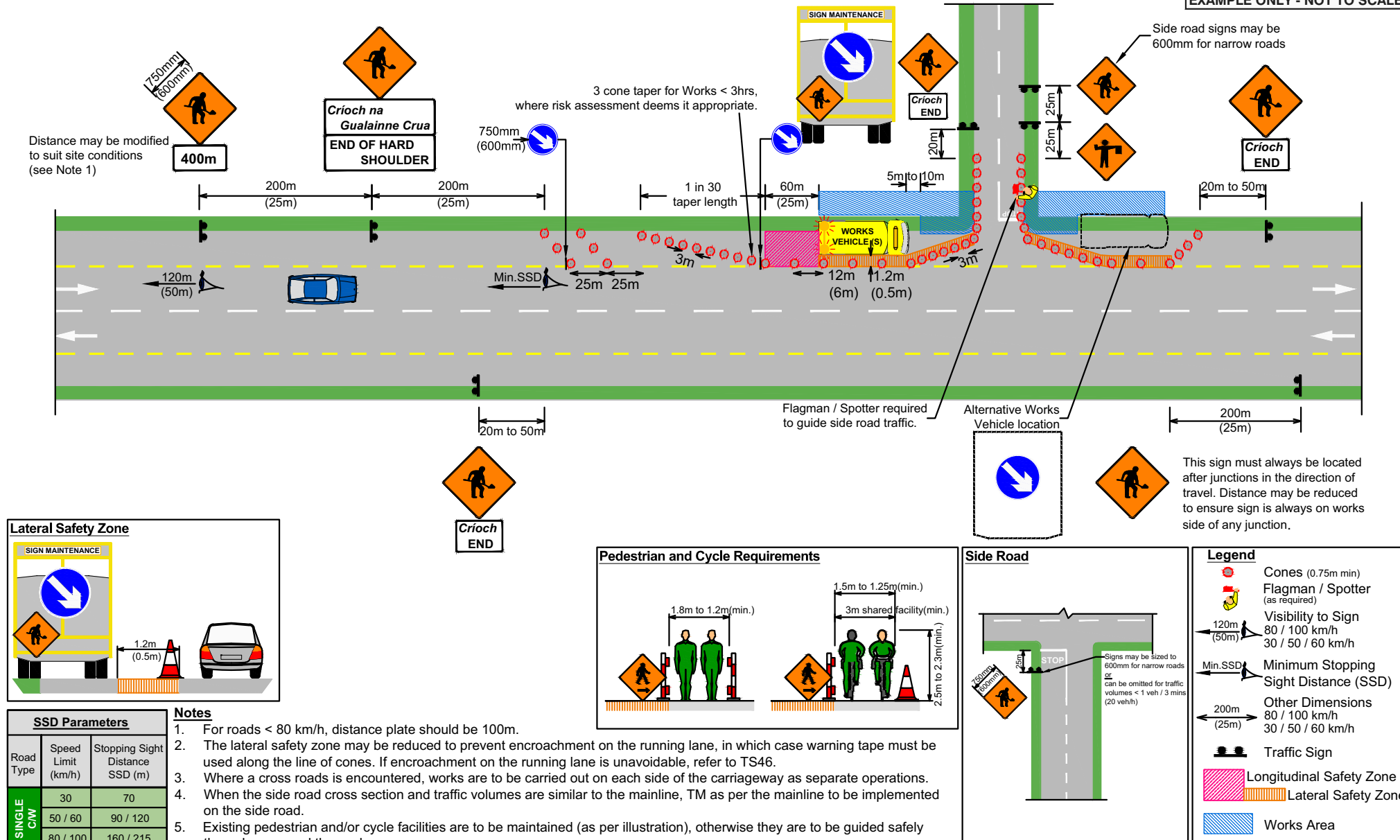
Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Single C/W

Mainline Verge - No H/S Single Bend

TS 44



Standard Works

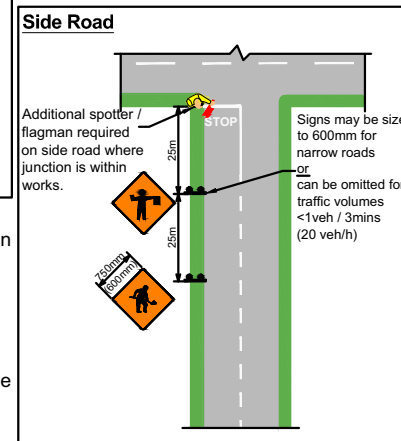
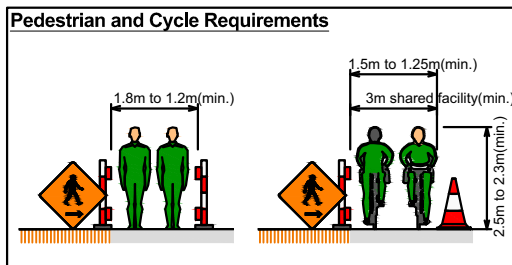
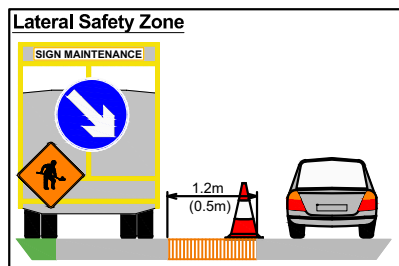
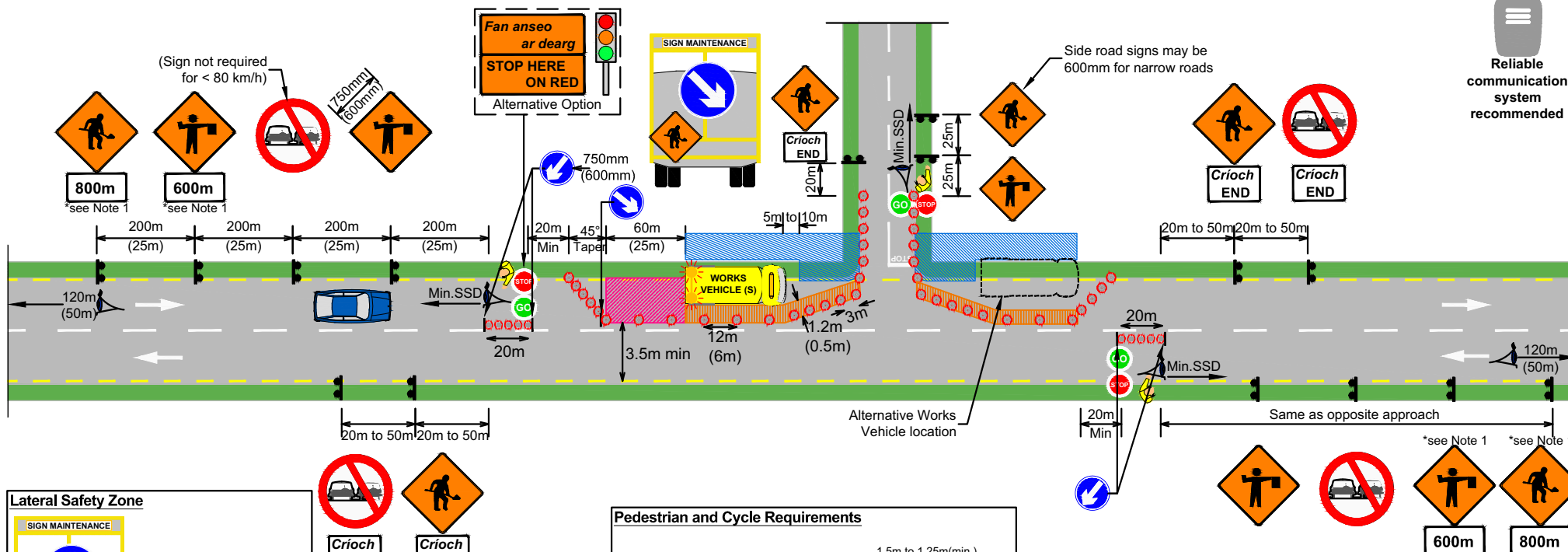
Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Single C/W

Junction Verge - With H/S

TS 45



Legend

- Cones (0.75m min)
- Flagman / Spotter (as required)
- Visibility to Sign
 - 120m (50m)
 - 30 / 50 / 60 km/h
- Min.SSD
- Minimum Stopping Sight Distance (SSD)
- Other Dimensions
 - 80 / 100 km/h
 - 30 / 50 / 60 km/h
- Traffic Sign
- STOP / GO
- Stop / Go & Operative
- Longitudinal Safety Zone
- Lateral Safety Zone
- Works Area

Notes

- For roads < 80 km/h, distance plates should be 100m and 75m.
- This plan can also be used for junctions on bends, provided minimum SSD is achievable to the Stop/Go operatives in both directions. Further risk assessment and additional TM development may be required to suit site conditions.
- When the side road cross section and traffic volumes are similar to the mainline, TM as per the mainline to be implemented on the side road.
- Where a cross roads is encountered, works are to be carried out on each side of the carriageway as separate operations.
- Where the works and TM can be contained completely off the running carriageway in the verge, consideration can be given to the use TS45, but only where risk assessment deems it suitable and appropriate based on site conditions.
- Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
SINGLE C/W	30	70
	50 / 60	90 / 120
	80 / 100	160 / 215

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

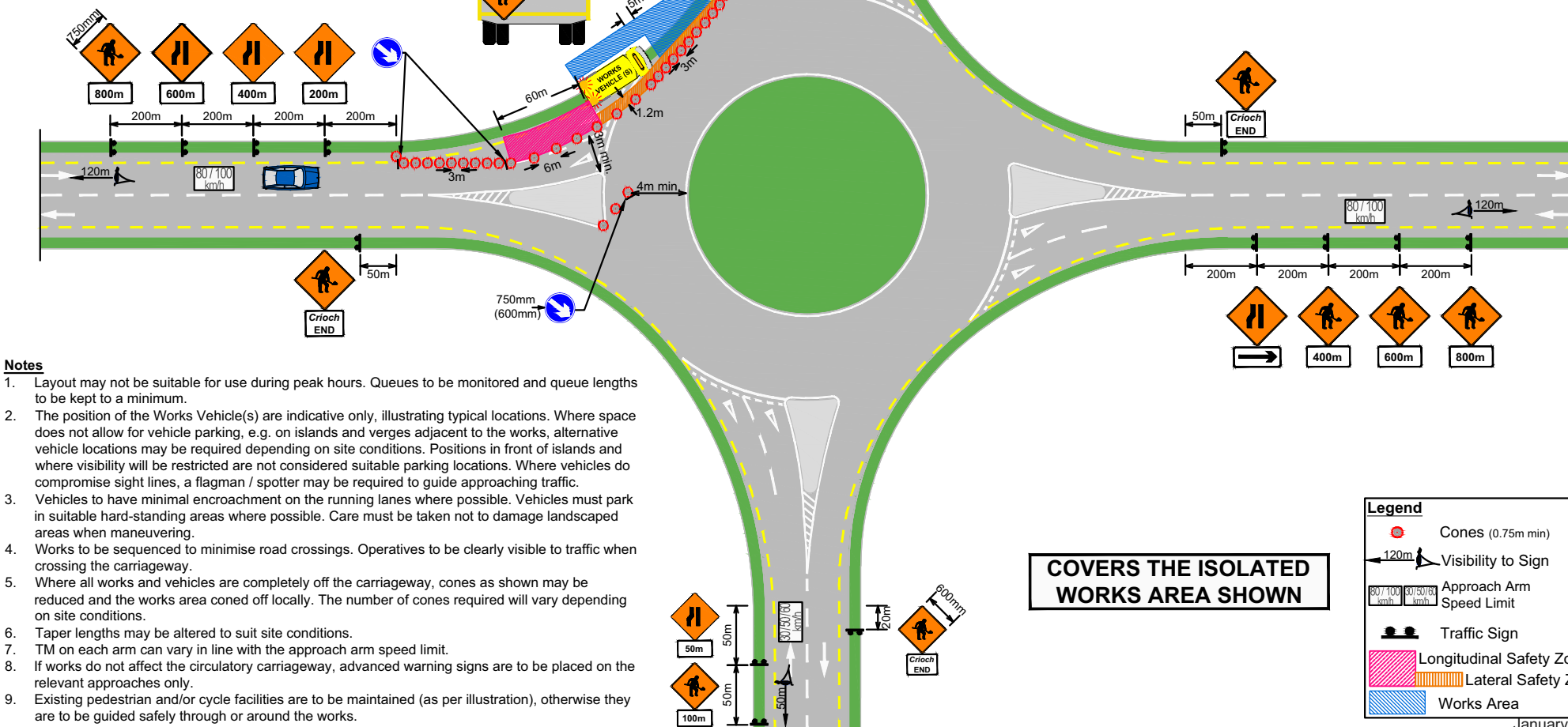
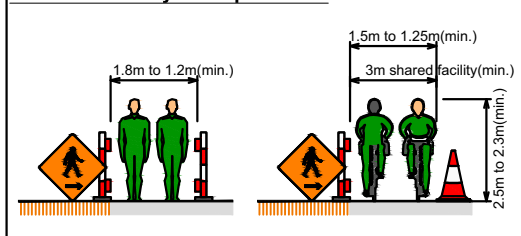
Single C/W

Junction Verge - No H/V

TS 46

January 2014

Pedestrian and Cycle Requirements



Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

**COVERS THE ISOLATED
WORKS AREA SHOWN**

Legend	
	Cones (0.75m min)
	Visibility to Sign
	Approach Arm Speed Limit
	Speed Limit
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

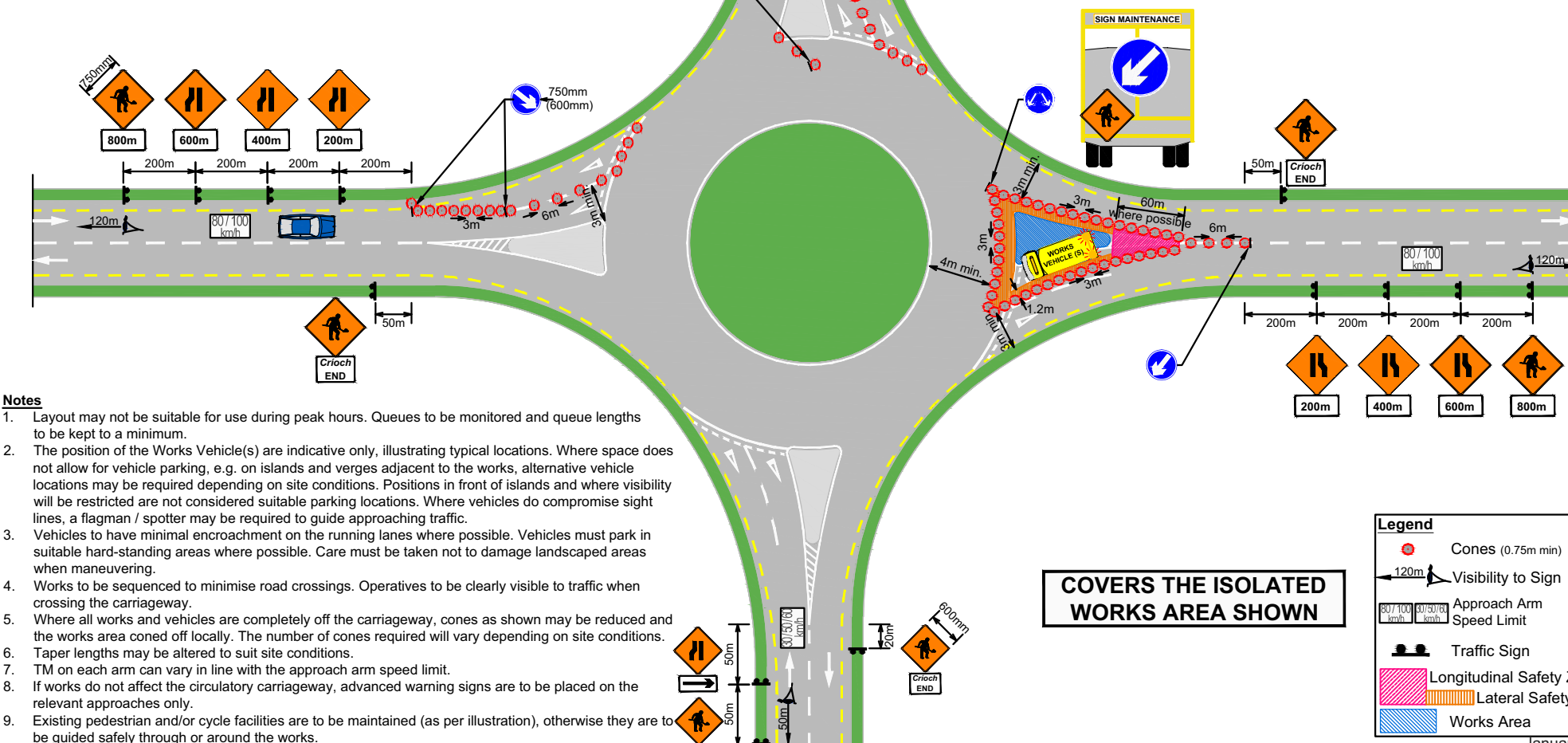
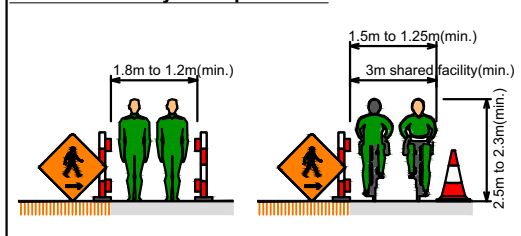
> 30
mins

Single C/W

Roundabout - Isolated Works Area - Entry Verge

TS 47

Pedestrian and Cycle Requirements



Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

**COVERS THE ISOLATED
WORKS AREA SHOWN**

Legend	
	Cones (0.75m min)
	Visibility to Sign
	Approach Arm Speed Limit
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

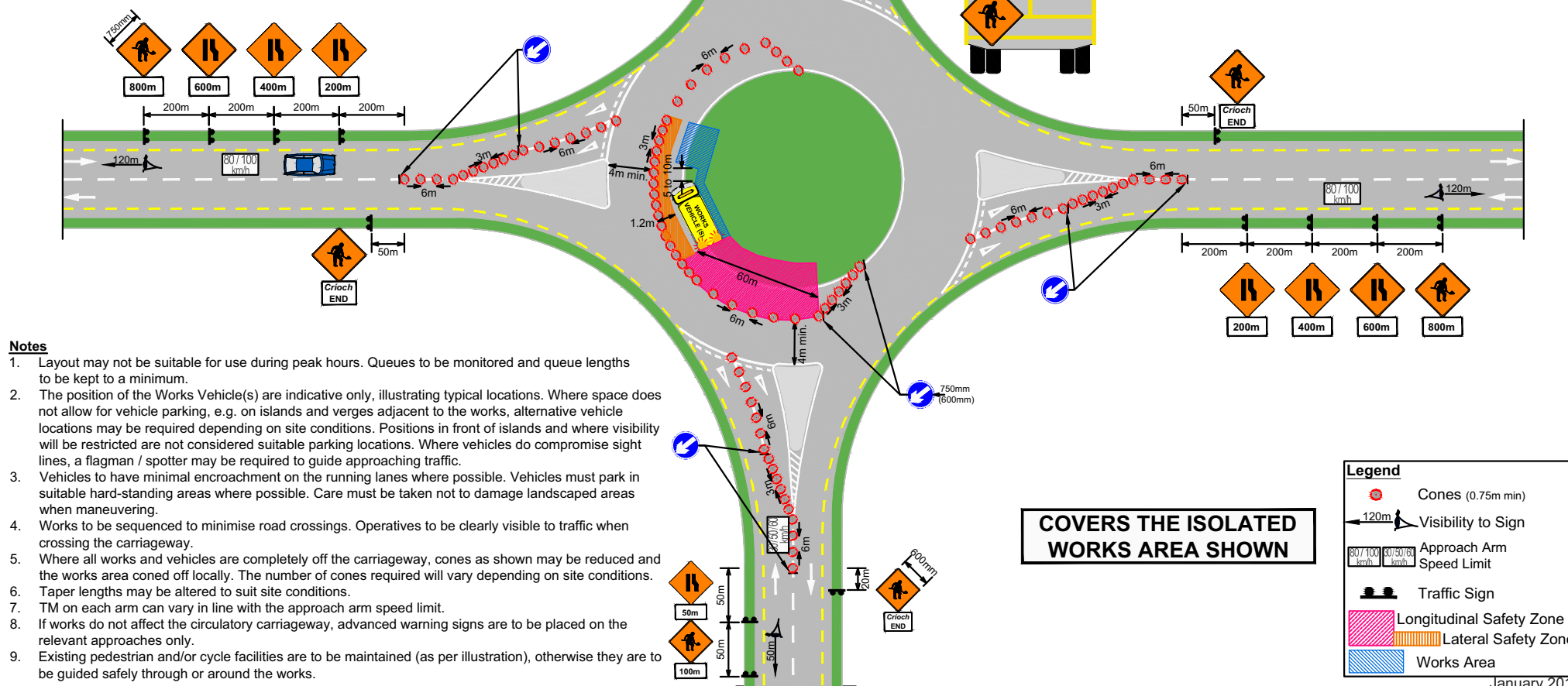
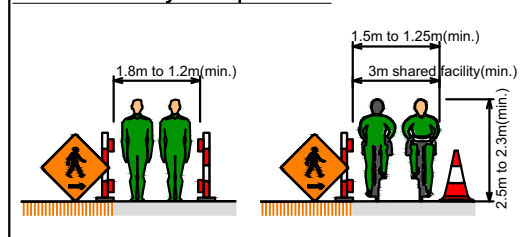
> 30
mins

Single C/W

Roundabout - Isolated Works Area - Traffic Island

TS 48

Pedestrian and Cycle Requirements



Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

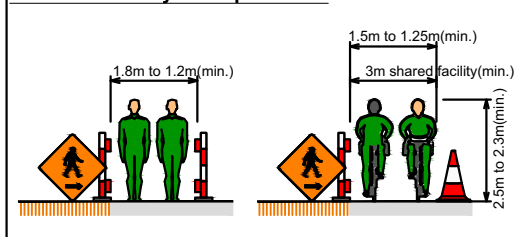
Single C/W

Roundabout - Isolated Works Area - Central Island

TS 49

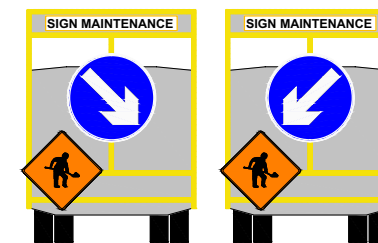
January 2014

Pedestrian and Cycle Requirements

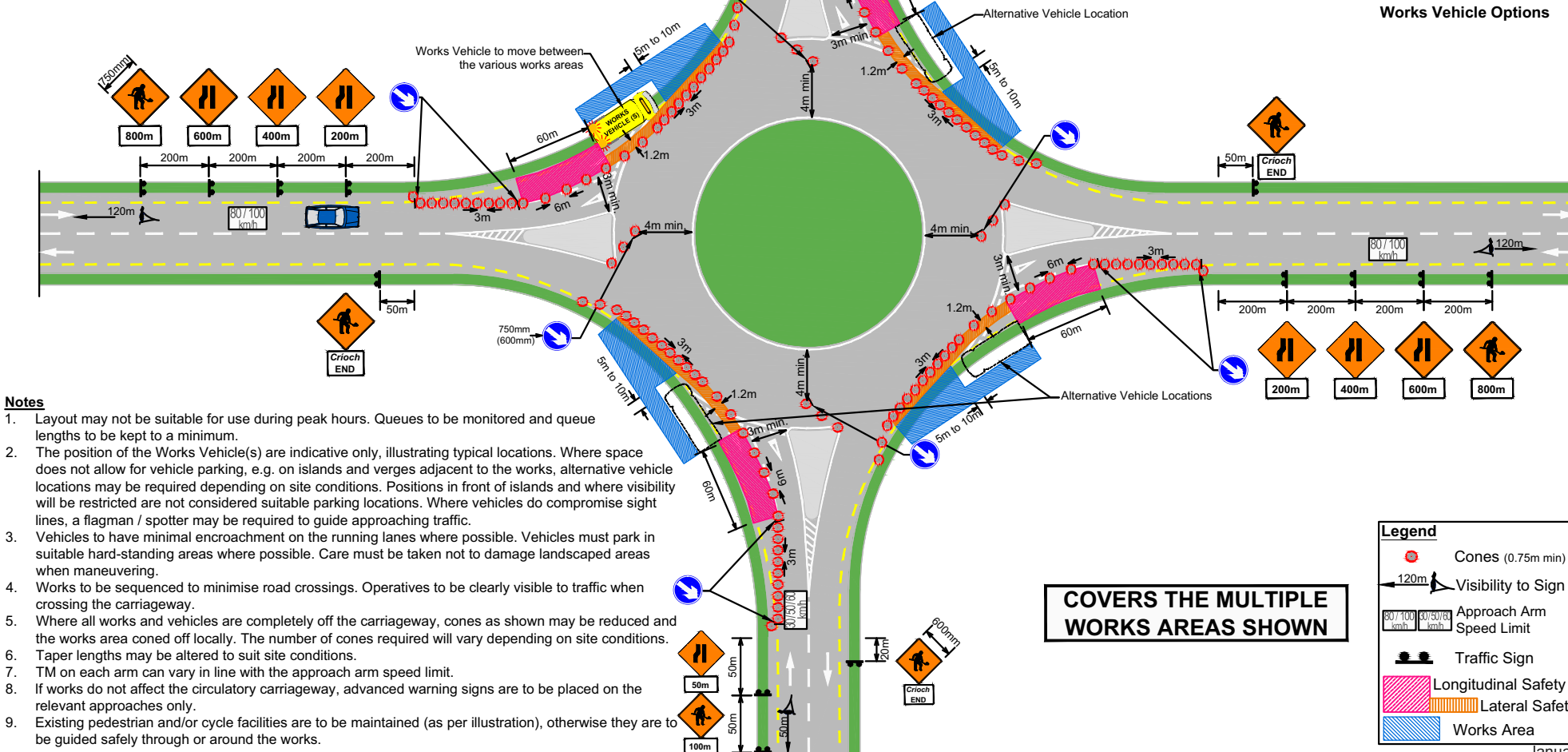


**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

EXAMPLE ONLY - NOT TO SCALE



Works Vehicle Options



Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

Legend	
	Cones (0.75m min)
	Visibility to Sign
	Approach Arm Speed Limit
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

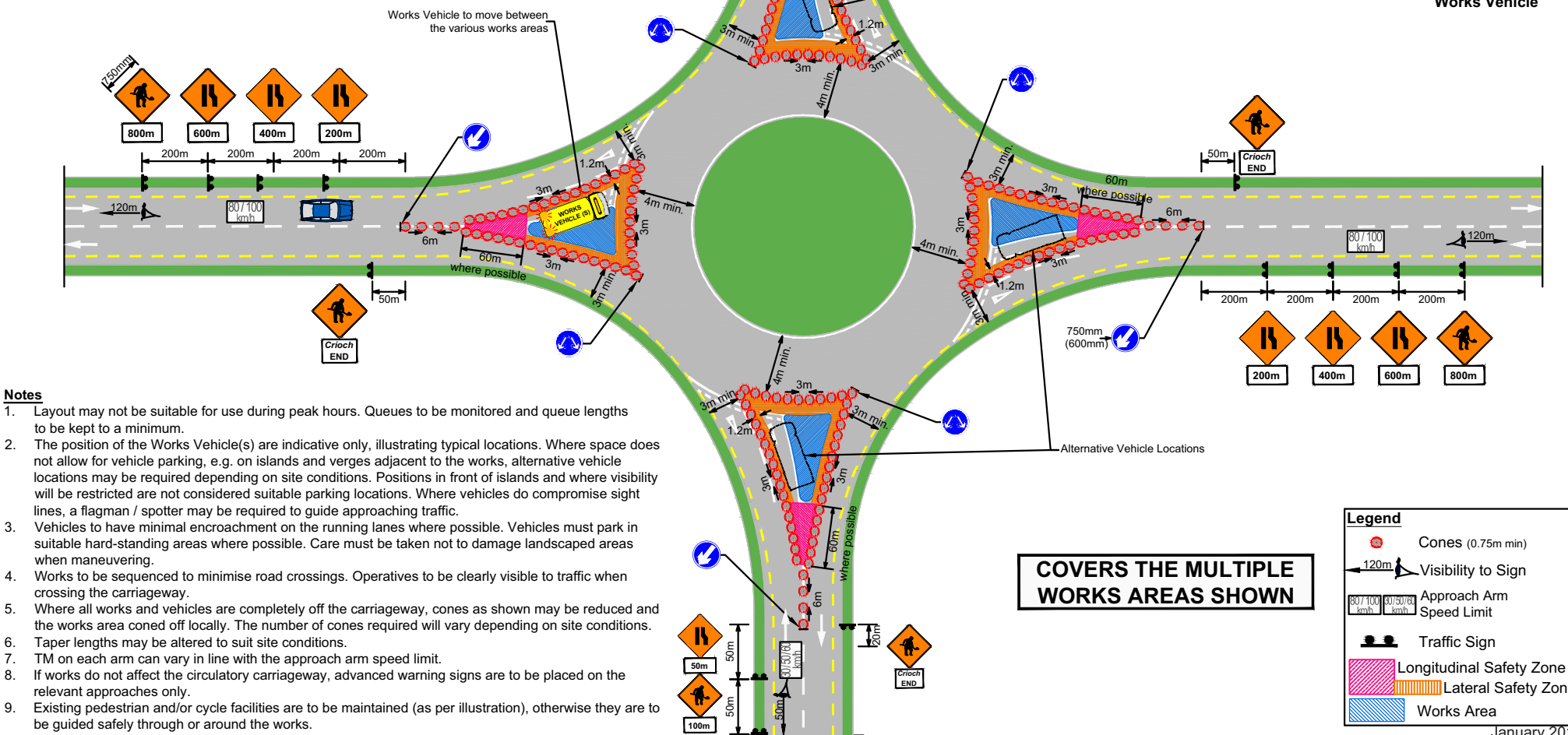
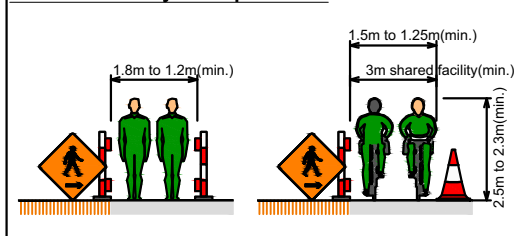
> 30
mins

Single C/W

Roundabout - Multiple Works Areas - Entry Verge

TS 50

Pedestrian and Cycle Requirements

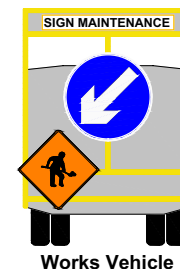


Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS

EXAMPLE ONLY - NOT TO SCALE



Works Vehicle

Legend	
	Cones (0.75m min)
	Visibility to Sign
	Approach Arm Speed Limit
	Traffic Sign
	Longitudinal Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

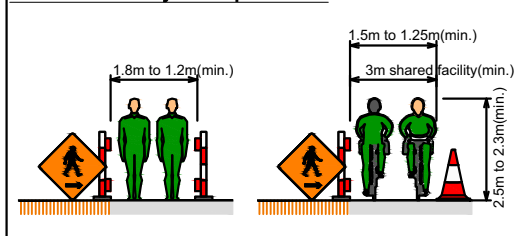
> 30
mins

Single C/W

Roundabout - Multiple Works Area - Traffic Island

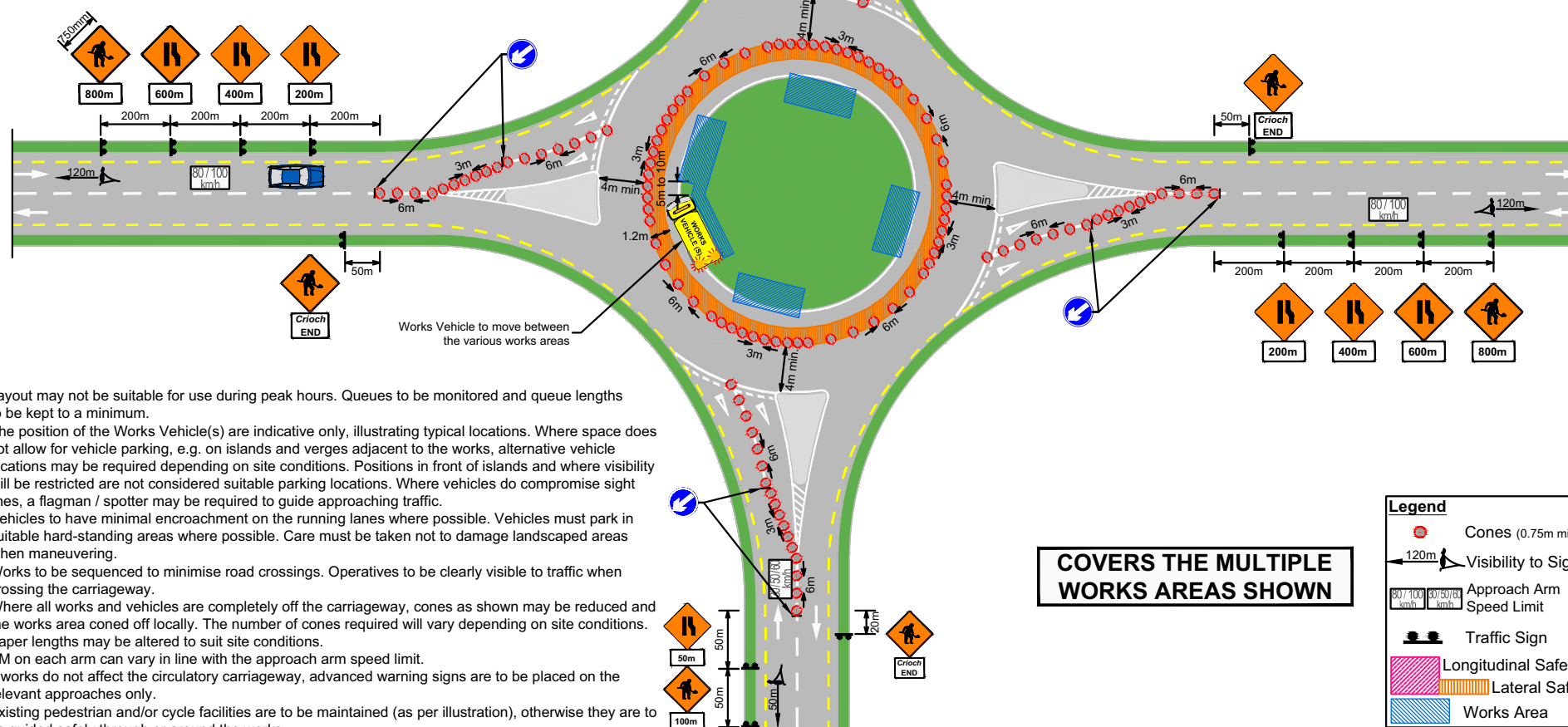
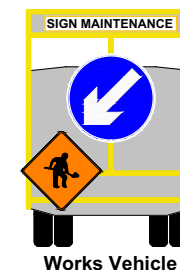
TS 51

Pedestrian and Cycle Requirements



**RISK ASSESSMENT AND FURTHER DEVELOPMENT OF
LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS**

EXAMPLE ONLY - NOT TO SCALE



Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
2. The position of the Works Vehicle(s) are indicative only, illustrating typical locations. Where space does not allow for vehicle parking, e.g. on islands and verges adjacent to the works, alternative vehicle locations may be required depending on site conditions. Positions in front of islands and where visibility will be restricted are not considered suitable parking locations. Where vehicles do compromise sight lines, a flagman / spotter may be required to guide approaching traffic.
3. Vehicles to have minimal encroachment on the running lanes where possible. Vehicles must park in suitable hard-standing areas where possible. Care must be taken not to damage landscaped areas when maneuvering.
4. Works to be sequenced to minimise road crossings. Operatives to be clearly visible to traffic when crossing the carriageway.
5. Where all works and vehicles are completely off the carriageway, cones as shown may be reduced and the works area coned off locally. The number of cones required will vary depending on site conditions.
6. Taper lengths may be altered to suit site conditions.
7. TM on each arm can vary in line with the approach arm speed limit.
8. If works do not affect the circulatory carriageway, advanced warning signs are to be placed on the relevant approaches only.
9. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.

**COVERS THE MULTIPLE
WORKS AREAS SHOWN**

Legend	
	Cones (0.75m min)
	Visibility to Sign
	Approach Arm Speed Limit
	Traffic Sign
	Longitudinal Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

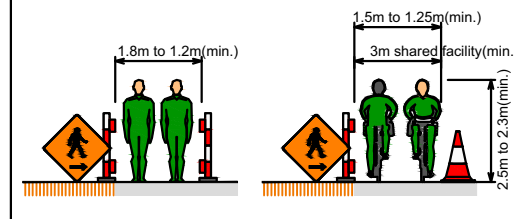
> 30
mins

Single C/W

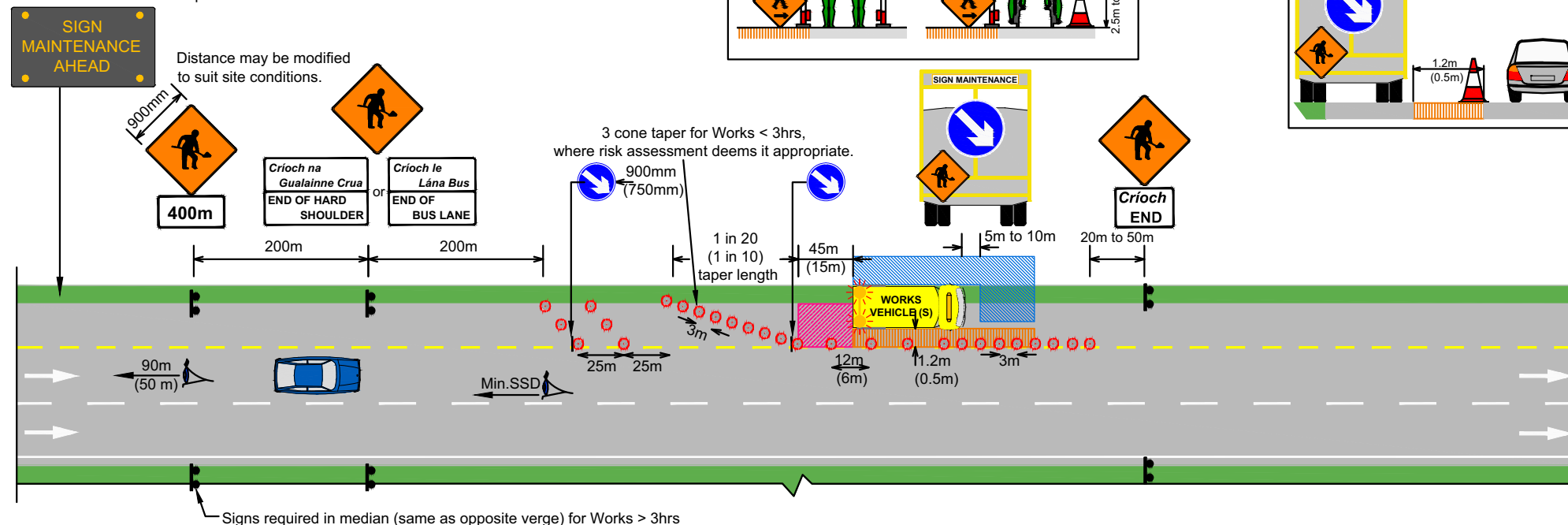
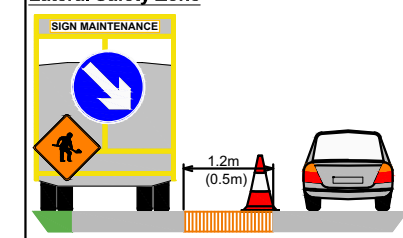
Roundabout - Multiple Works Areas - Central Island

TS 52

VMS to be located 1km in advance of the Works.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Lateral Safety Zone

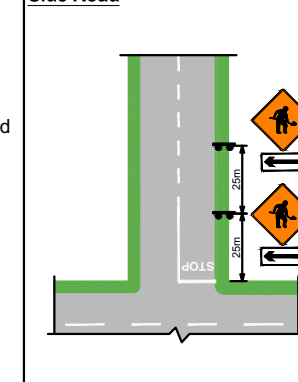


Notes

1. If a Bus Lane is present, additional advance warning signage may be required, in line with TSM Ch.8 Table 8.3.4, subject to on site risk assessment.
2. Layout may not be suitable for use during peak hours, particularly where a Bus Lanes is present. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
3. The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If this is unavoidable refer to TS54.
4. Cone taper lengths may need to be modified to suit site conditions, where risk assessment deems it appropriate.
5. Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
6. IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
7. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.
8. Vehicles to have minimal encroachment on the running lanes where possible (where Bus Lane is present).

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160

Side Road



Legend

- Cones (0.75m min)
- Visibility to Sign
90m / 100 km/h
(50m) 30 / 50 / 60 km/h
- Min.SSD Minimum Stopping Sight Distance (SSD)
- Other Dimensions
45m / 80 km/h
(15m) 50 / 60 km/h
- Traffic Sign
- Longitudinal Safety Zone
- Lateral Safety Zone
- Works Area

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

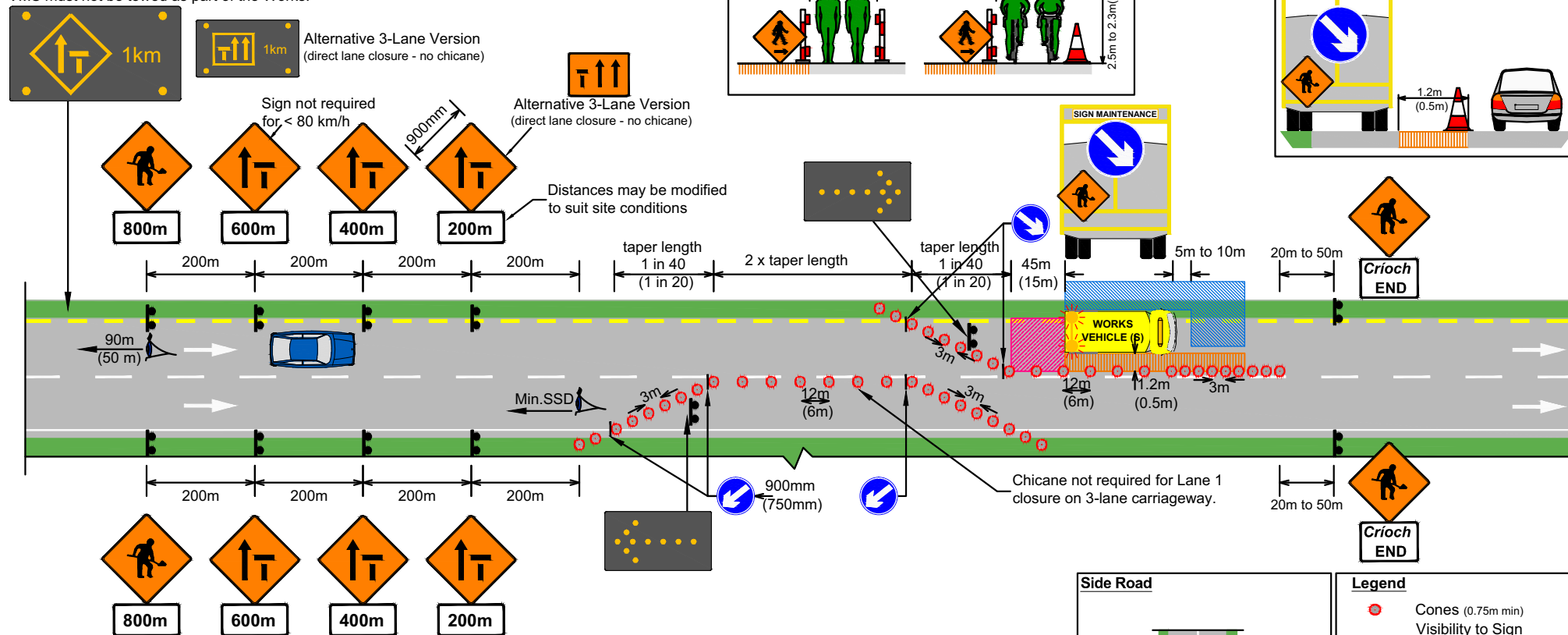
Urban Dual C/W - 2/3 Lane (≤ 80 km/h)

Mainline Verge - With H/S (or Bus Lane)

TS 53

January 2014

VMS to be located 1km in advance of the Works.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Notes

- Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
- Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
- Where works area is in close proximity after a junction, the chicane must be in advance of the junction.
- Cone taper lengths may need to be modified to suit site conditions, where risk assessment deems it appropriate.
- Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
- IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
- Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.
- Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (m)
DUAL C/W	50 / 60	90 / 120
	80	160

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

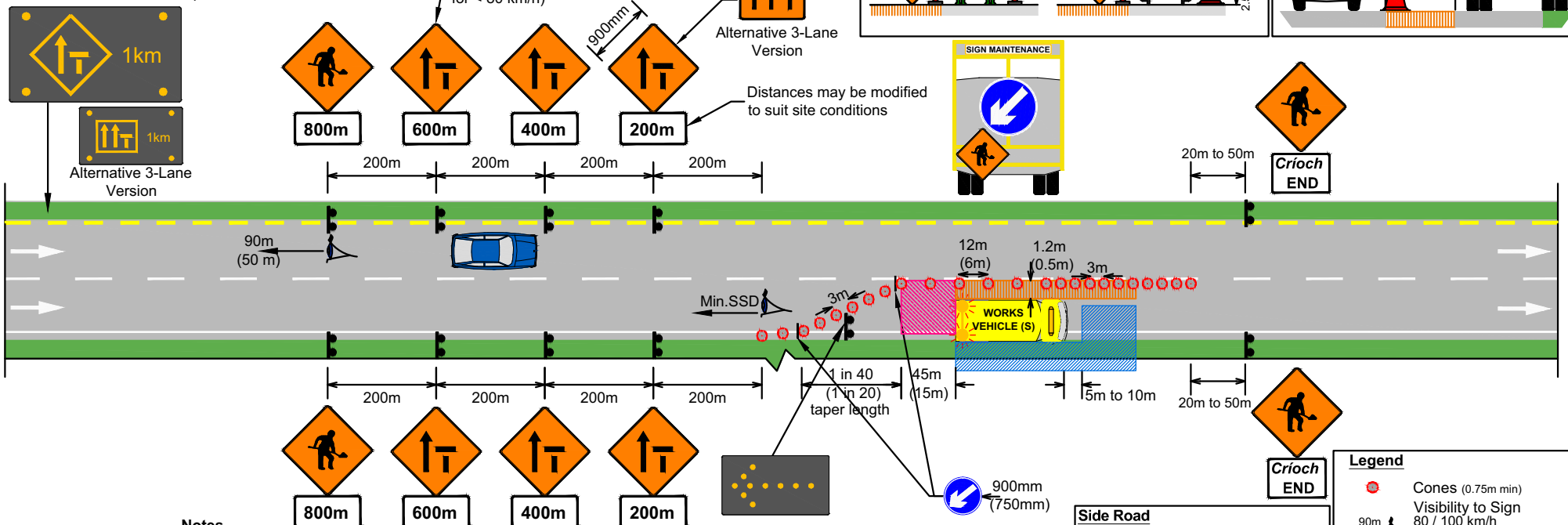
Urban Dual C/W - 2/3 Lane (≤ 80 km/h)

Mainline Verge - No H/S

TS 54

January 2014

VMS to be located 1km in advance of the Works.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Notes

1. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum. Operatives to be particularly observant of queuing through junctions.
2. Traffic volumes are restricted to 60 veh / 3 mins (1200 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. Where works area is in close proximity after a junction, mainline traffic must be diverted into Lane 1 in advance of the junction.
4. Cone taper lengths may need to be modified to suit site conditions, where risk assessment deems it appropriate.
5. Where numerous side accesses or high traffic volumes are encountered, a flagman / spotter may be required to guide / warn approaching traffic, subject to risk assessment.
6. IPV may be used in advance of the works vehicle for 80 km/h only, or where a risk assessment deems it necessary and suitable for the road type.
7. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.
8. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	50 / 60	90 / 120
	80	160

Standard Works

Sign Installations / Sign Removals / Tree Clearance

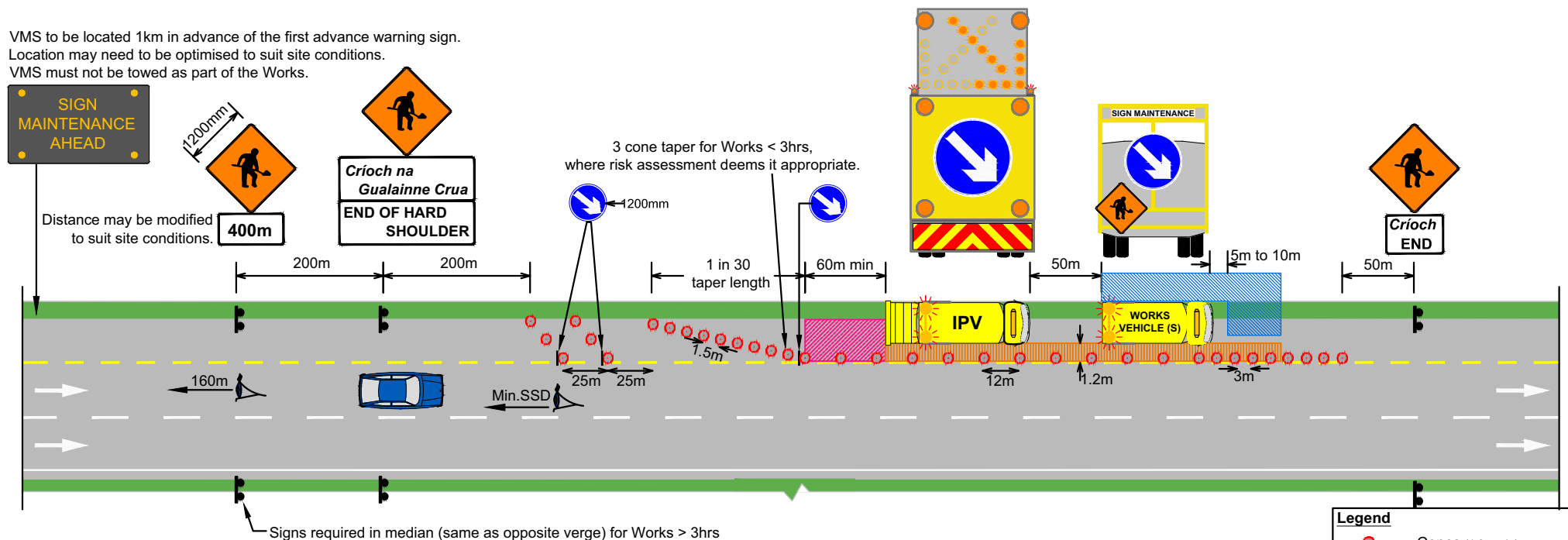
> 30
mins

Urban Dual C/W - 2/3 Lane (≤80km/h)
Mainline Median

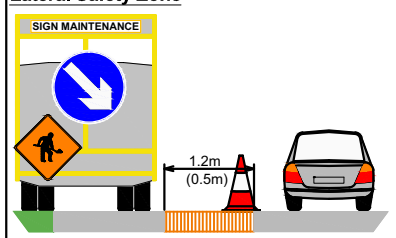
TS 55

<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Lateral Safety Zone



Notes

1. The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If this is unavoidable refer to TS58.

Legend

-
- Diagram illustrating the layout of a road section for a traffic sign placement study. The diagram shows a road with a traffic sign (a red octagon with a white 'X') and a 'Cone' (a red and white striped cone) placed 160m from the sign. A car is shown at a distance of 100/120 km/h from the sign. The diagram also shows a 'Min. SSD' (Minimum Stopping Sight Distance) and a 'Traffic Sign' (a red octagon with a white 'X'). The road is divided into a 'Longitudinal Safety Zone' (a pink hatched area) and a 'Lateral Safety Zone' (a blue hatched area). A 'Works Area' (a blue hatched area) is also shown.

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

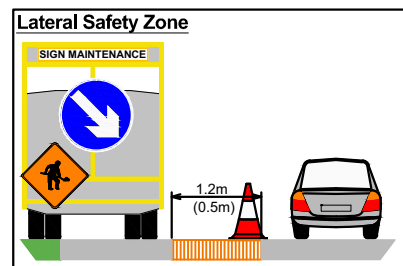
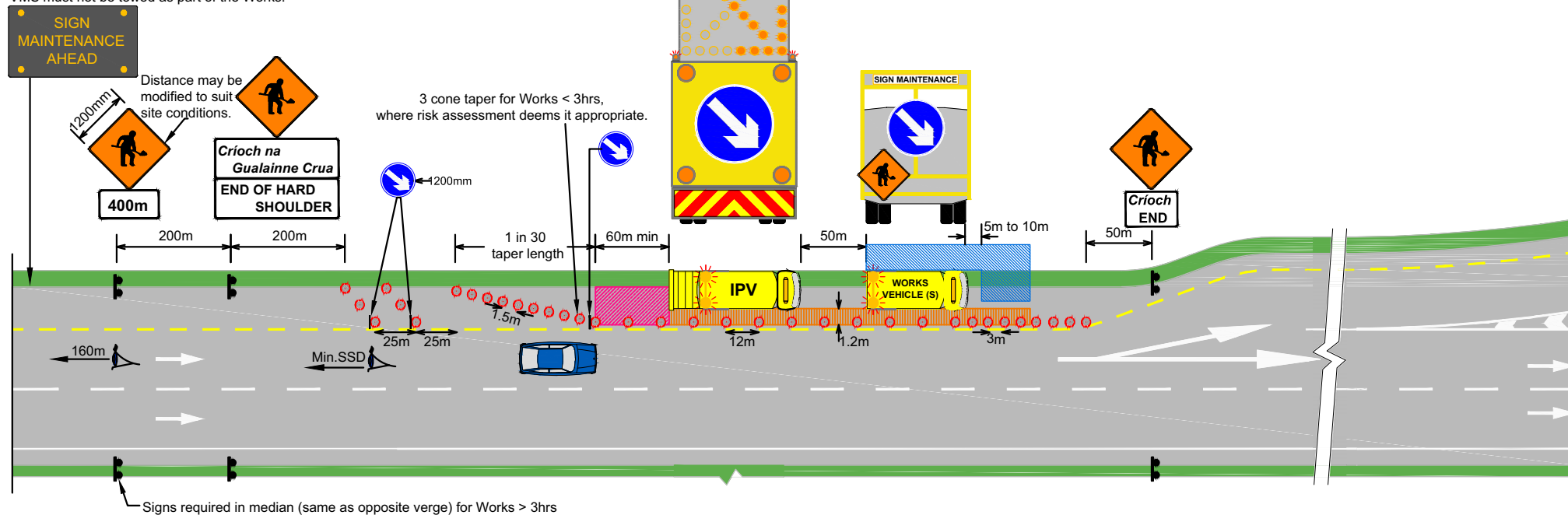
Mainline Verge - With H/S

TS 56

EXAMPLE ONLY - NOT TO SCALE

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Notes

- The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If this is unavoidable refer to TS59.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

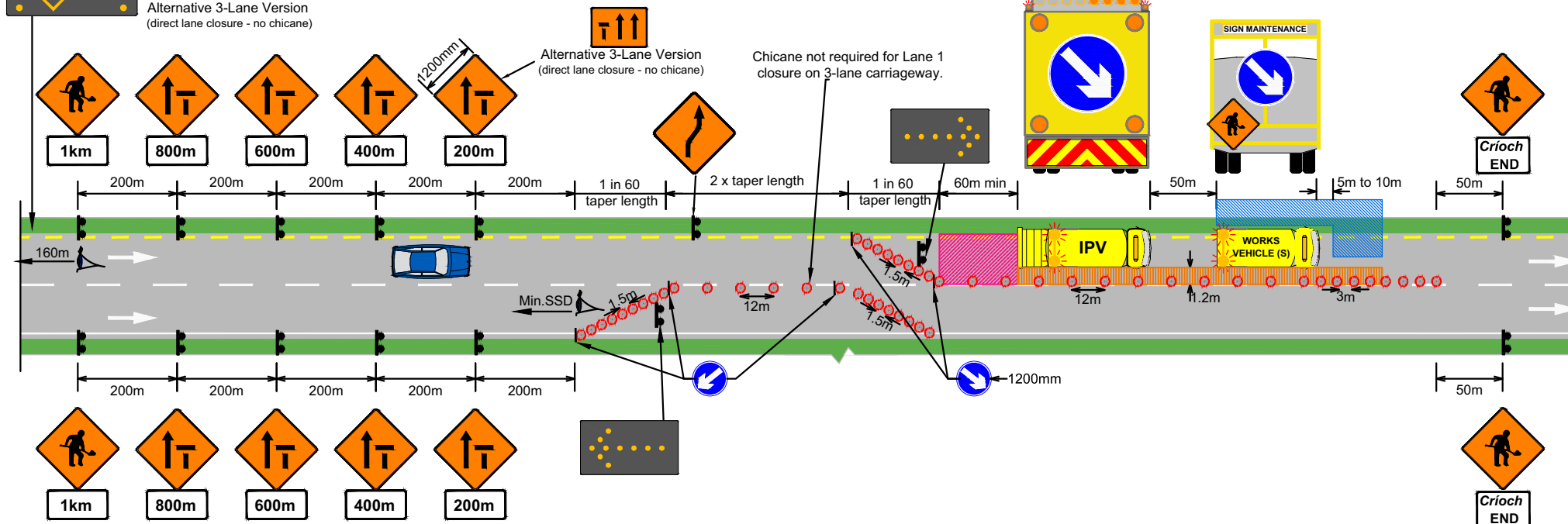
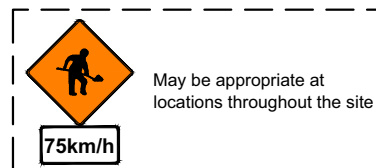
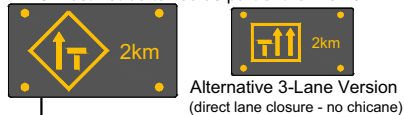
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Mainline Verge - With H/S - Diverge Taper

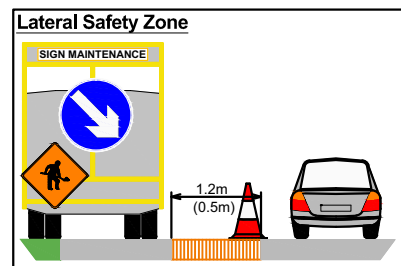
TS 57

EXAMPLE ONLY - NOT TO SCALE

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295



Notes

1. Traffic volumes are restricted to 60 veh / 3 mins per lane (1200 veh/h/lane). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

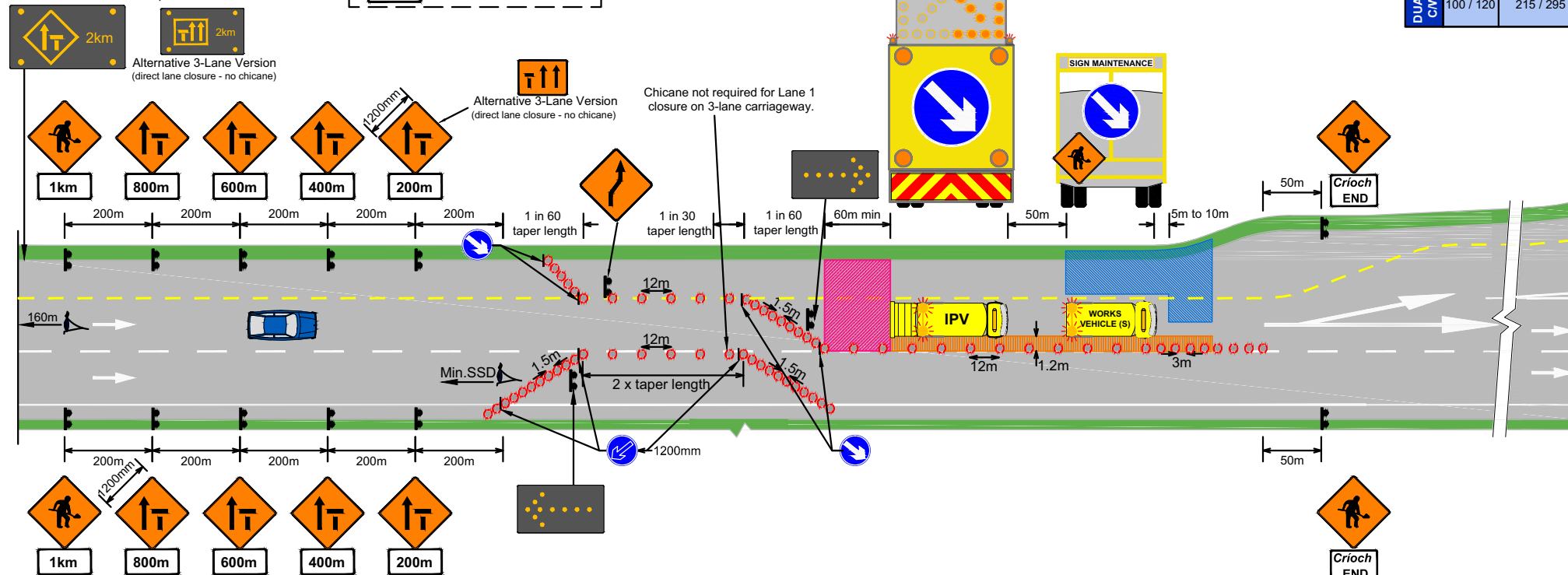
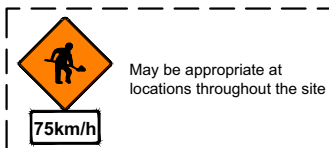
Dual C/W & Motorway - 2/3 Lane (>80km/h)
Mainline Verge - No H/S (& Mainline Lane 1)

TS 58

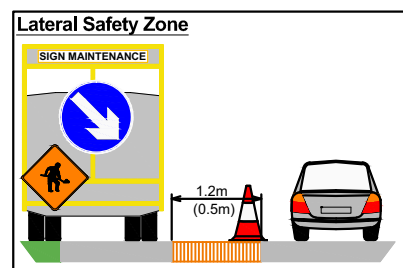
January 2014

EXAMPLE ONLY - NOT TO SCALE

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295



Notes

1. Traffic volumes are restricted to 60 veh / 3 mins per lane (1200 veh/h/lane). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

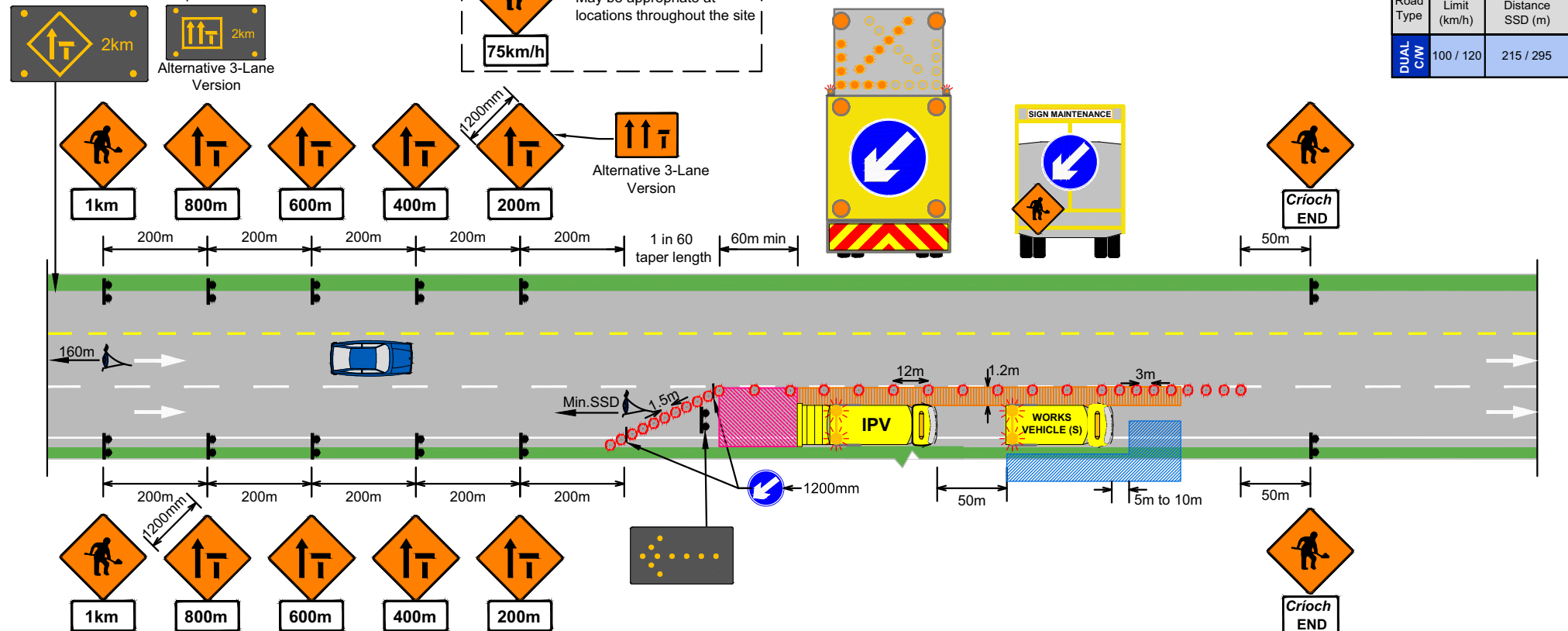
Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)
Mainline Lane 1 - Diverge Taper

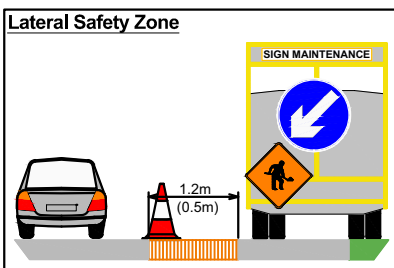
TS 59

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



EXAMPLE ONLY - NOT TO SCALE

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295



Notes

1. Traffic volumes are restricted to 60 veh / 3 mins per lane (1200 veh/h/lane). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Operatives to be clearly visible to, and be facing oncoming traffic when crossing the carriageway.

Legend

- Cones (1.0m min)
- Visibility to Sign 160m
- Minimum Stopping Sight Distance (SSD)
- Traffic Sign
- Longitudinal Safety Zone
- Lateral Safety Zone
- Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

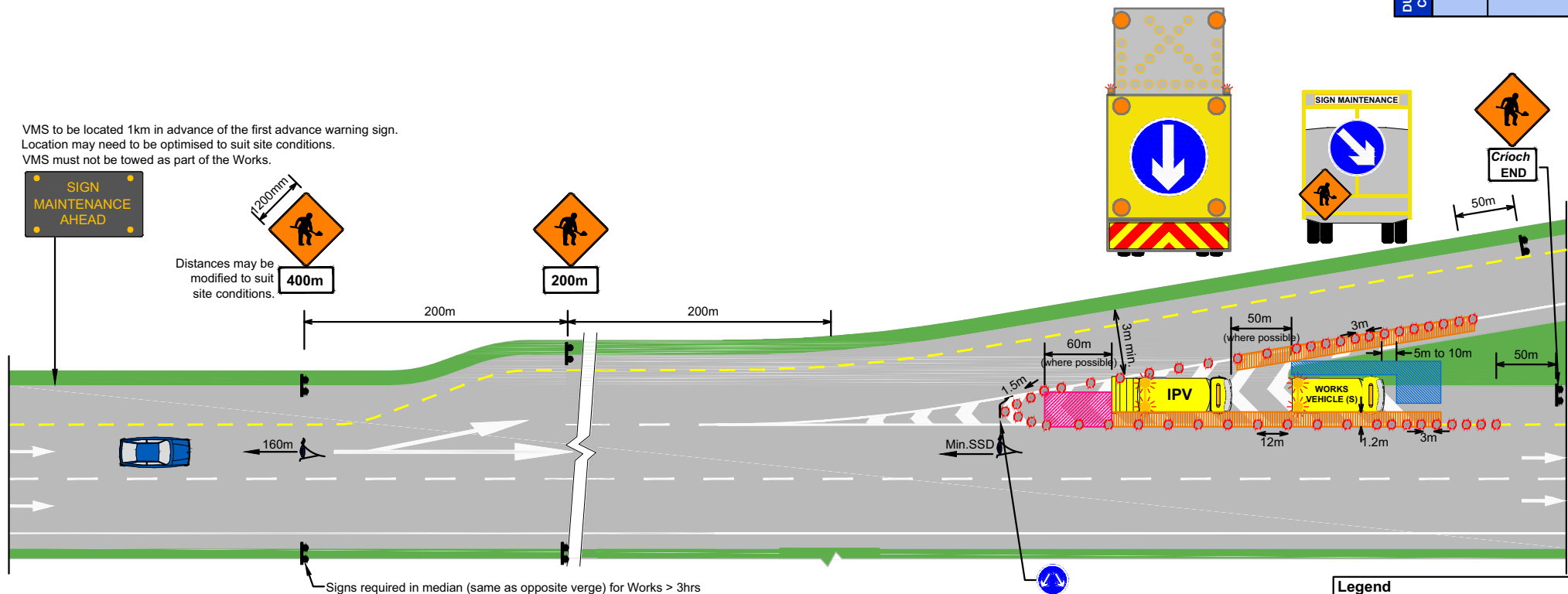
Dual C/W & Motorway - 2/3 Lane (>80km/h)
Mainline Lane 2/3 or Median

TS 60

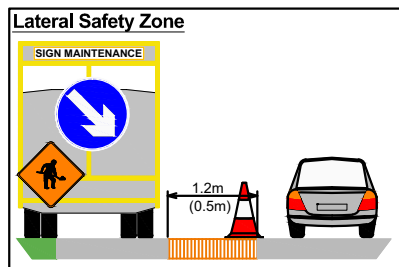
EXAMPLE ONLY - NOT TO SCALE

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance (SSD) (m)
DUAL C/W	100 / 120	215 / 295

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



Signs required in median (same as opposite verge) for Works > 3hrs



Notes

1. The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If this is unavoidable refer to TS58.

Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

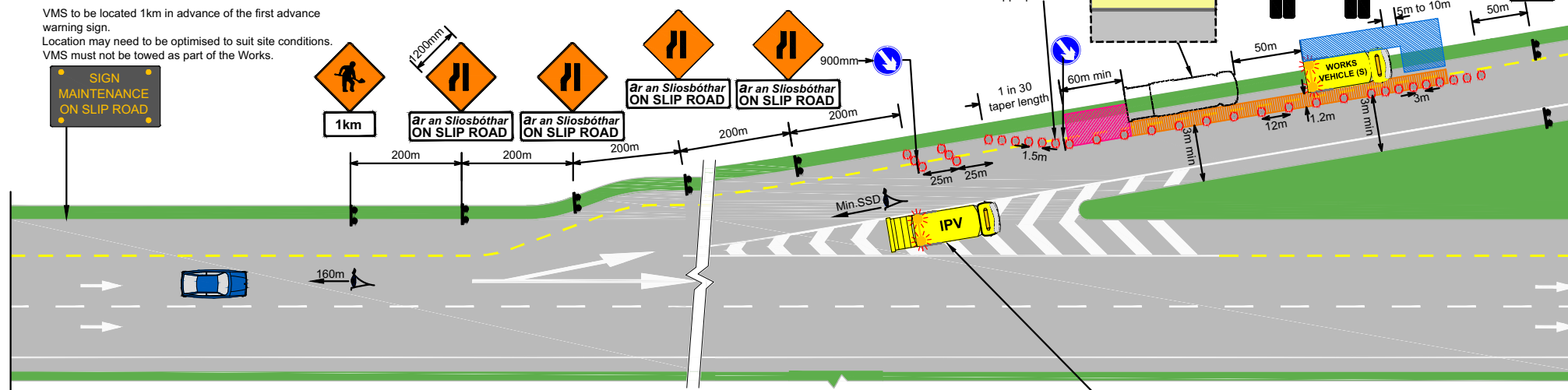
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Exit Nose

TS 61

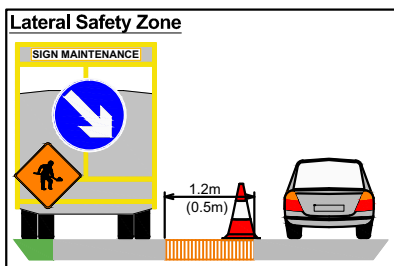
<u>SSD Parameters</u>		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



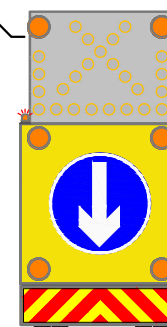
Alternative IPV location.
Only if space permits and minimum SSD requirements are achieved.

EXAMPLE ONLY - NOT TO SCALE



Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



Legend

-

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

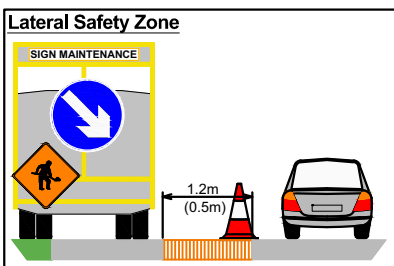
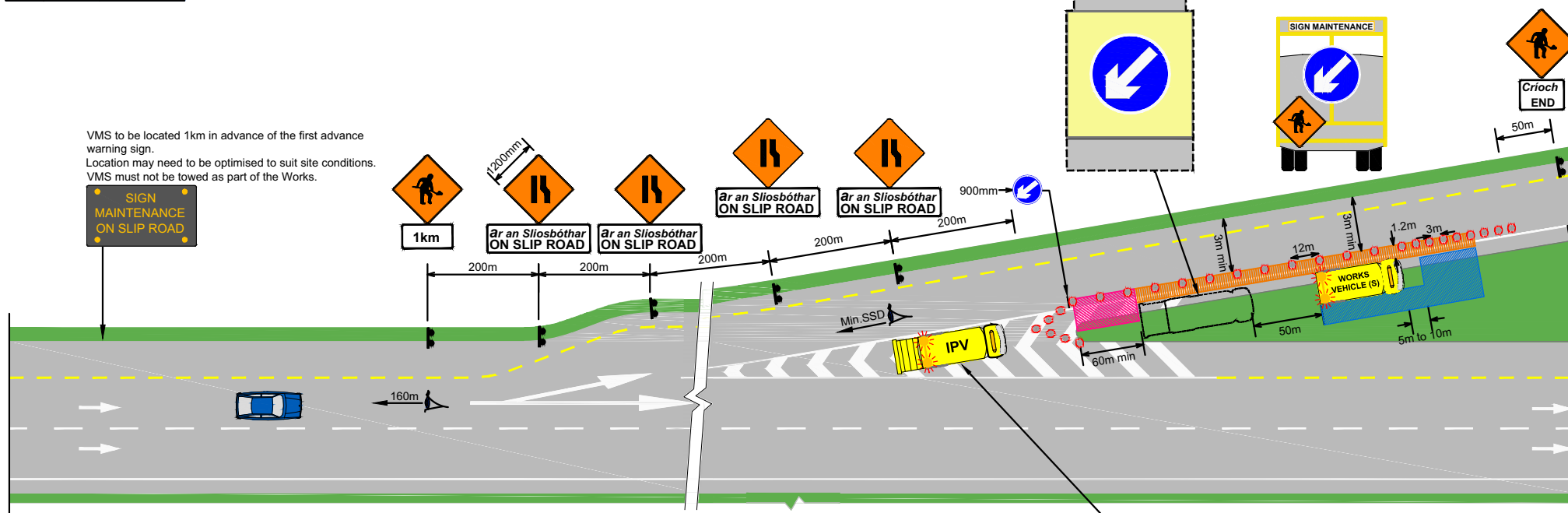
> 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Off-Ramp - LHS

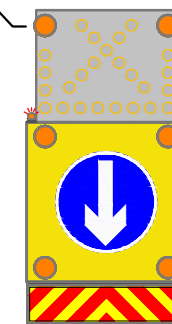
TS 62

SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295



Notes

1. Traffic volumes are restricted to 25 veh / 3 mins (500 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
3. Vehicles to have minimal encroachment on the running lanes where possible.
4. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



Legend	
	Cones (1.0m min)
	Visibility to Sign 100 / 120 km/h
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

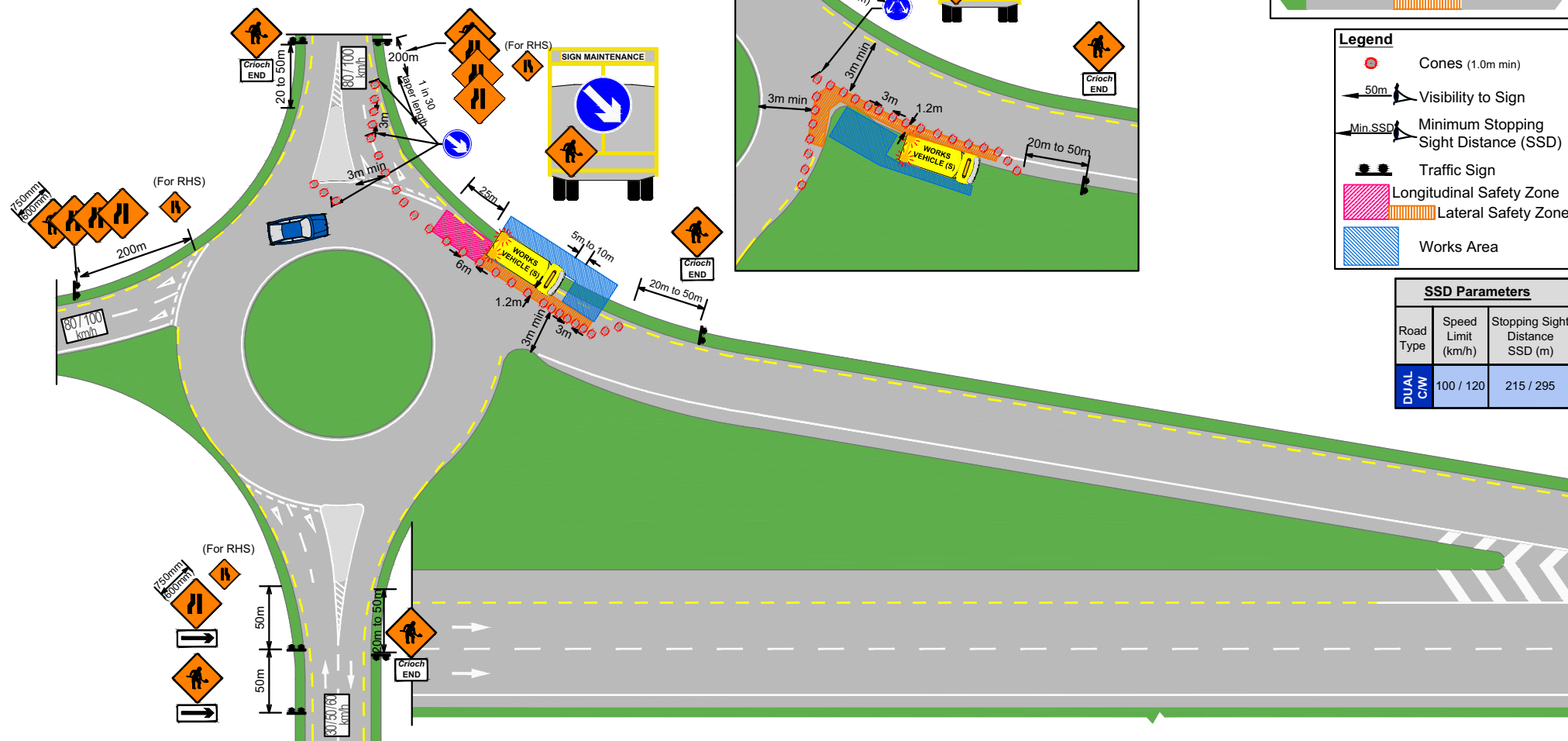
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Off-Ramp - RHS

TS 63

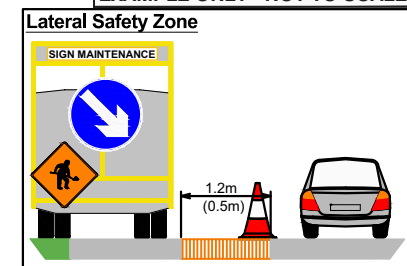
Notes

1. Works relating to signs at the tops of interchanges and associated approaches are treated as standard single carriageway and/or roundabout works. Refer to TS42 to TS52 as appropriate.
2. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths to be kept to a minimum.
3. Taper lengths may be altered to suit site conditions.
4. TM on each arm can vary in line with the approach arm speed limit.
5. Existing pedestrian and/or cycle facilities are to be maintained (as per illustration), otherwise they are to be guided safely through or around the works.
6. Vehicles to have minimal encroachment on the running lanes where possible.
7. Care must be taken not to damage verges or cause debris when maneuvering vehicles.



RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS

EXAMPLE ONLY - NOT TO SCALE



Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

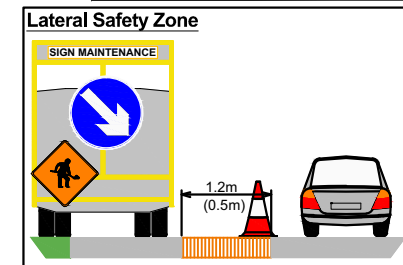
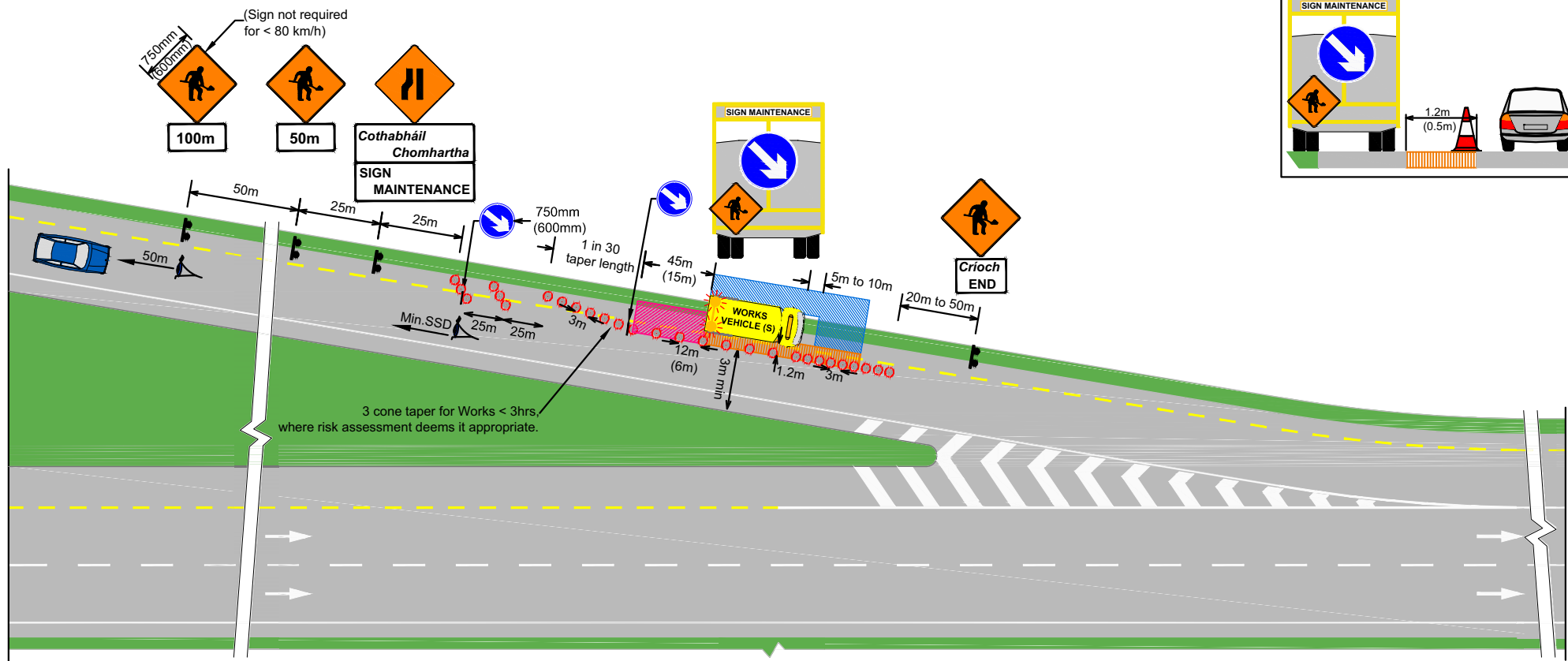
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - Start of On-Ramp

TS 64

January 2014

EXAMPLE ONLY - NOT TO SCALE



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
2. Vehicles to have minimal encroachment on the running lanes where possible.
3. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Cones (1.0m min)
	50m Visibility to Sign
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

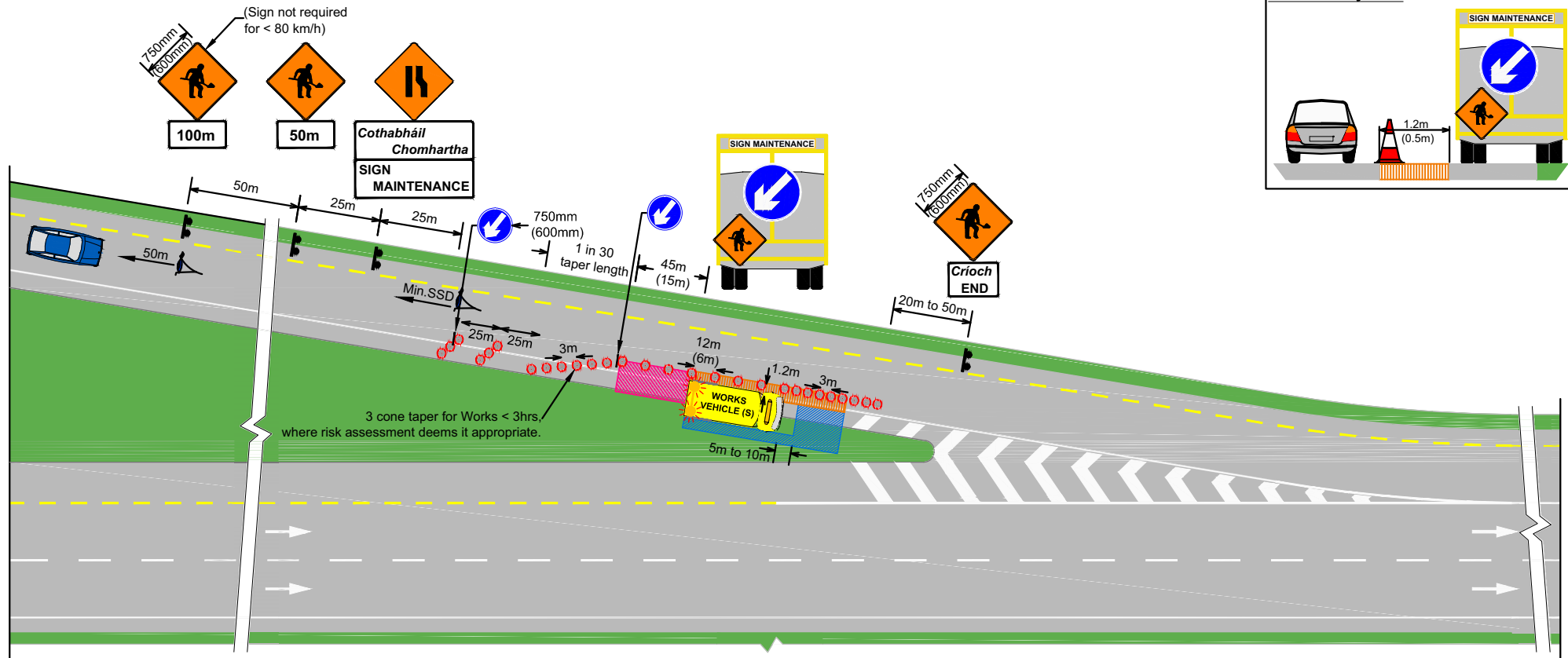
Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - LHS

TS 65



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

1. Layout may not be suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
2. Vehicles to have minimal encroachment on the running lanes where possible.
3. Care must be taken not to damage verges or cause debris when maneuvering vehicles.

Legend	
	Cones (1.0m min)
	50m Visibility to Sign
	Minimum Stopping Sight Distance (SSD)
	Traffic Sign
	Longitudinal Safety Zone
	Lateral Safety Zone
	Works Area

January 2014

Standard Works

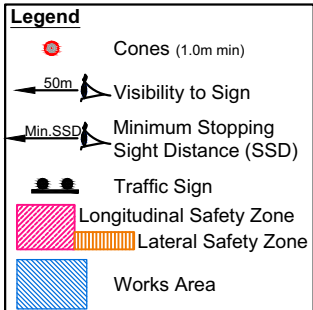
Sign Installations / Sign Removals / Tree Clearance

> 30
mins

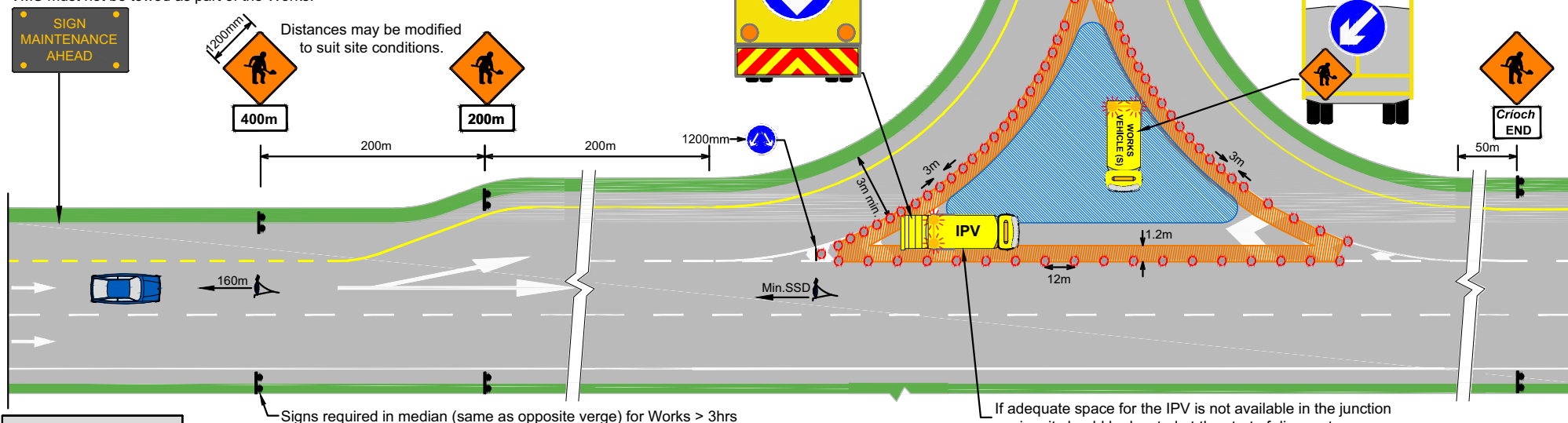
Dual C/W & Motorway - 2/3 Lane (>80km/h)

Full GSJ - End of On-Ramp - RHS

TS 66



VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

Notes

- The lateral safety zone may be reduced to prevent encroachment on the running lane, in which case warning tape must be used along the line of cones. If this is unavoidable refer to TS58.
- Coning around the works area may be optimised if permanent bollards are in place, subject to on site risk assessment.

If adequate space for the IPV is not available in the junction nosing, it should be located at the start of diverge taper. In such instances a flagman / spotter is required, subject to risk assessment, in the verge opposite the traffic island (behind safety barrier or other safe location) to warn approaching traffic of the works.

Standard Works

Sign Installations / Sign Removals / Tree Clearance

> 30
mins

Dual C/W & Motorway - 2/3 Lane (>80km/h)
Compact GSJ - Exit Nose & Traffic Island

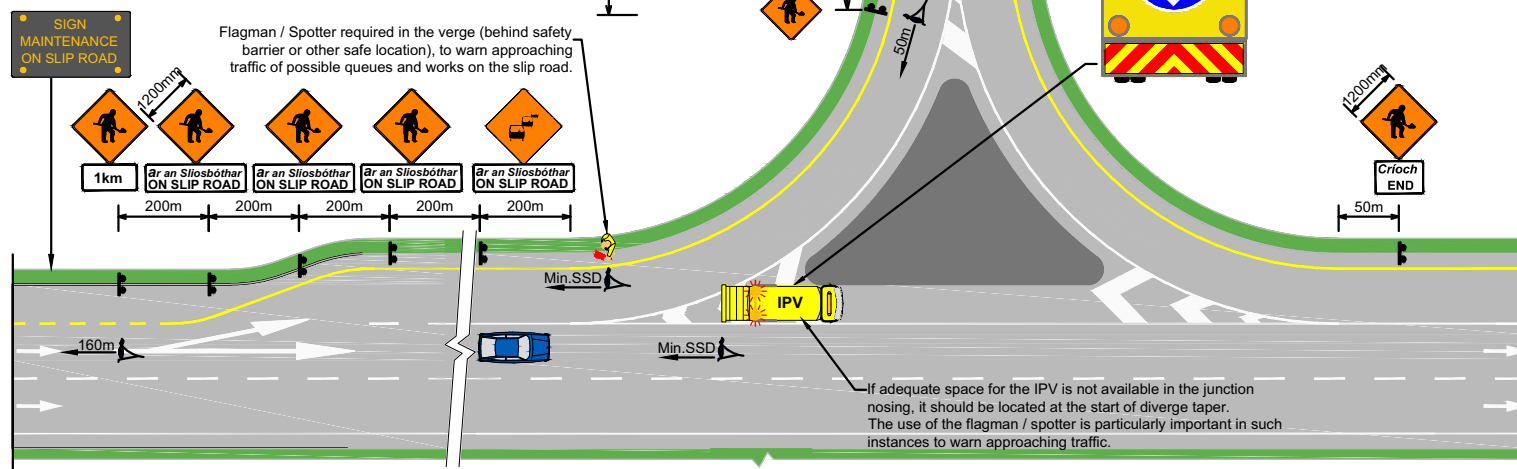
TS 67

Notes

1. Layout not suitable for use during peak hours. Queues to be monitored and queue lengths kept to a minimum.
2. Traffic volumes are restricted to 20 veh / 3 mins (400 veh/h). Three minute traffic counts should be carried out at regular intervals to ensure flows are not exceeded.
3. A section of centre line bollards may need to be temporarily removed adjacent to the works to facilitate traffic passing as part of the Stop/Go operation
4. If 2-way traffic can be maintained without the need to remove bollards, the Stop/Go operation is not required..
5. Vehicles to have minimal encroachment on the running lanes where possible.

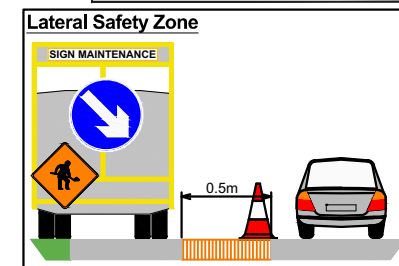
Where the entire works zone (including advanced signs and likely traffic queues) can be confined to after the slip-road speed limit change point, mainline warning signs may not be required, subject to risk assessment. In such instances refer to TS43 for works on the slip road.

VMS to be located 1km in advance of the first advance warning sign.
Location may need to be optimised to suit site conditions.
VMS must not be towed as part of the Works.



RISK ASSESSMENT AND FURTHER DEVELOPMENT OF LAYOUTS WILL BE REQUIRED TO SUIT SITE CONDITIONS


EXAMPLE ONLY - NOT TO SCALE



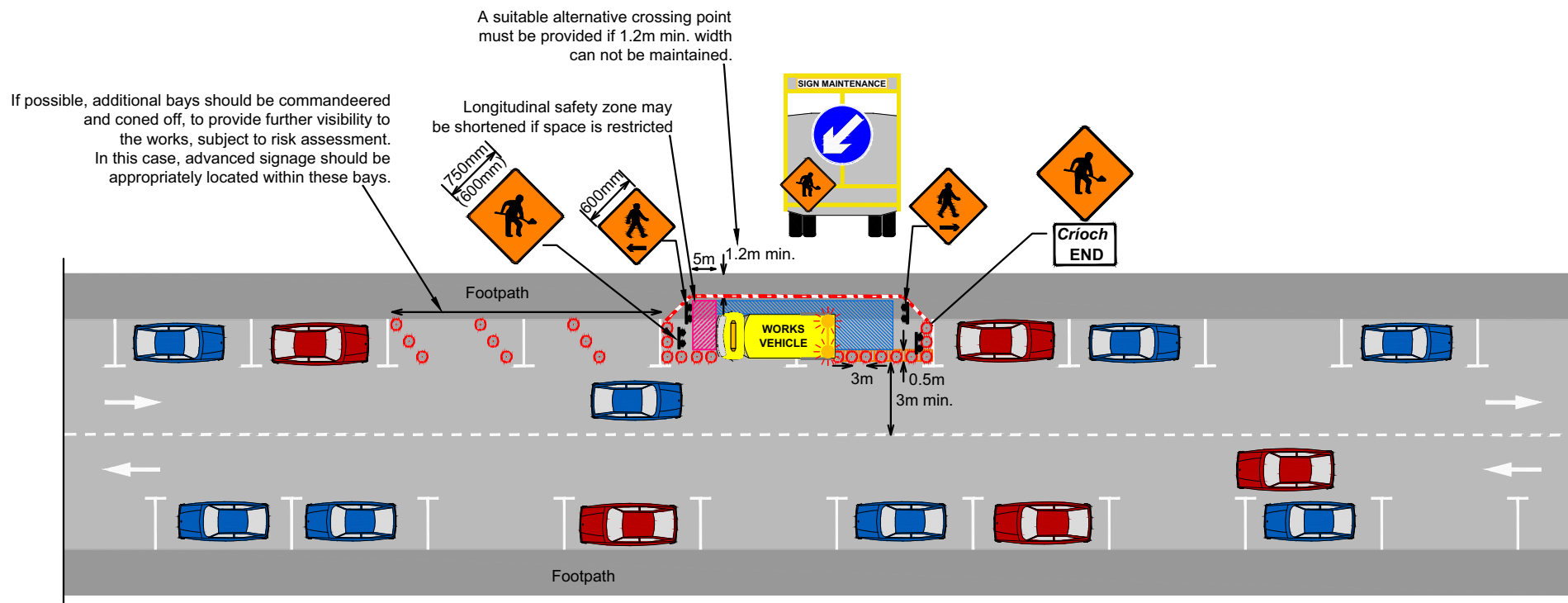
SSD Parameters		
Road Type	Speed Limit (km/h)	Stopping Sight Distance SSD (m)
DUAL C/W	100 / 120	215 / 295

**Reliable
communication
system
recommended**

Legend

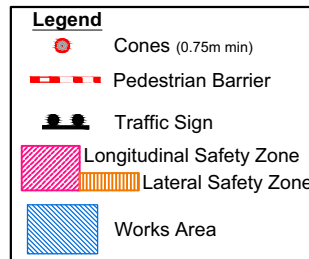
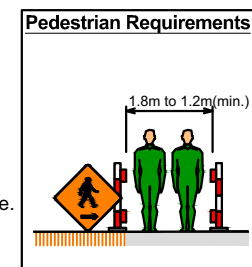
- 
- The diagram illustrates various traffic control elements used in road construction or maintenance. It includes:
- Cones** (1.0m min): Represented by a red cone icon.
 - Flagman / Spotter** (as required): Represented by a yellow flag icon.
 - Visibility to Sign**: Indicated by a distance of 160m (50m) and a sign icon.
 - Minimum Stopping Sight Distance (SSD)**: Indicated by a distance of 160m (50m) and a sign icon.
 - Traffic Sign**: Represented by a black and white sign icon.
 - Stop / Go & Operative**: Represented by red 'STOP' and green 'GO' signs, with a yellow flag icon pointing to the 'GO' sign.
 - Longitudinal Safety Zone**: Represented by a pink hatched rectangular area.
 - Lateral Safety Zone**: Represented by an orange hatched rectangular area.
 - Works Area**: Represented by a blue hatched rectangular area.

January 2014



Notes

1. This layout is intended for use in highly urban situations (Main Street locations) where it is ineffective and inappropriate to install full TM, due to lack of space, potential to obstruct, and limited driver awareness. Its use is restricted to speed limits of 60km/h max.
2. The use of a highly conspicuous and well lit works vehicle is essential to provide warning to drivers and pedestrians alike.
3. In this scenario the works are to be completely contained within the available parking bays and the adjacent footpath. The works must be scheduled for a suitable time when parking is likely to be available.
4. It is only appropriate for use when traffic flow can be maintained adjacent to the works. Where this is not achievable, refer to TS42 to TS46 as appropriate.
5. Where it is not possible to maintain the minimum footpath width adjacent to the works, it may be necessary to provide (and sign) a suitable alternative pedestrian crossing point, subject to risk assessment. Alternatively, pedestrians may be safely guided safely through the work zone, if a risk assessment deems it appropriate.
6. Consultation in advance with the Local Authority is essential in relation to urban works, particularly regarding the temporary acquisition of parking bays, and restrictions on pedestrian and cyclist movements.
7. This layout is not suitable for use during peak hours.



January 2014

Standard Works

Sign Installation / Sign Removal

< 3
hours

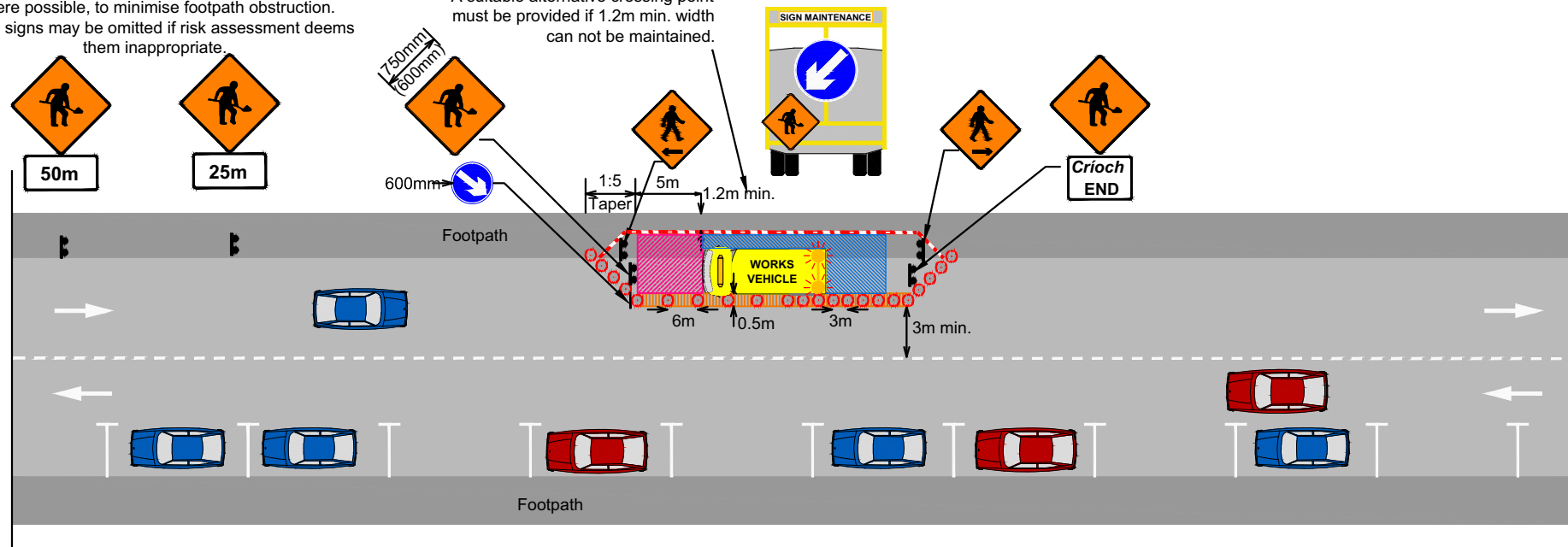
Single C/W - Urban

Main Street Locations - Parking Bays Available

TS 69

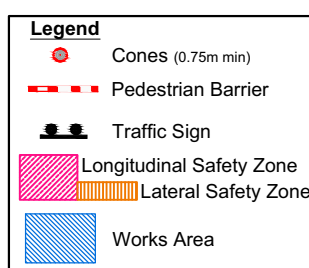
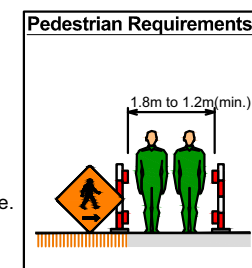
Advance signs to be located in build-outs where possible, to minimise footpath obstruction. These signs may be omitted if risk assessment deems them inappropriate.

A suitable alternative crossing point must be provided if 1.2m min. width can not be maintained.



Notes

1. This layout is intended for use in highly urban situations (Main Street locations) where it is ineffective and inappropriate to install full TM, due to lack of space, potential to obstruct, and limited driver awareness. Its use is restricted to speed limits of 60km/h max.
2. The use of a highly conspicuous and well lit works vehicle is essential to provide warning to drivers and pedestrians alike.
3. It is only appropriate for use when traffic flow can be maintained adjacent to the works. Where this is not achievable, refer to TS42 to TS46 as appropriate.
4. Where it is not possible to maintain the minimum footpath width adjacent to the works, it may be necessary to provide (and sign) a suitable alternative pedestrian crossing point, subject to risk assessment. Alternatively, pedestrians may be safely guided safely through the work zone, if a risk assessment deems it appropriate.
5. Consultation in advance with the Local Authority is essential in relation to urban works, particularly regarding the temporary acquisition of parking bays, and restrictions on pedestrian and cyclist movements.
6. This layout is not suitable for use during peak hours.



January 2014

Standard Works

Sign Installation / Sign Removal

< 3
hours

Single C/W - Urban

Main Street Locations - No Parking Available

TS 70

7 IN THE EVENT OF AN EMERGENCY

CALL EMERGENCY SERVICES (999 or 112)

KNOW YOUR EXACT LOCATION

In the case of a Serious Incident

- Call Emergency Services.
- Stop work, making sure that all vehicles and site equipment are safe.
- Stop traffic if necessary – do not move injured person.
- Assist injured person with First Aid, if appropriate, at the instruction of emergency services phone operator.
- Call Site Supervisor by phone/radio - do not leave injured person alone.
- Arrange for easy access and egress for Emergency Services.
- Wait for Emergency Services, and provide access through the works where required.
- Assist Gardaí with Traffic Control if required.
- Maintain safe traffic flow around injured person if applicable.

In the case of a Minor Accident

- Assist injured person with First Aid.
- Stop work if necessary.
- Report injury to the Site Supervisor.
- Log accident.

Reporting Accidents and Incidents

- All site accidents and incidents must be immediately reported to the Site Supervisor who in turn will report to the appointed Safety Officer.
- All personnel must fully assist in any investigation resulting from an accident.
- Contact the Employer's Representative, if any of the following take place:
 - A fatality
 - Any injury to the public requiring medical attention.
 - All notifiable accidents to employees.
 - Road traffic accidents due to or near the works where no injury has been sustained.
 - Any dangerous occurrence or incident.
- Contact the Health and Safety Authority (HSA) for all notifiable accidents.

8

Temporary Traffic Management Plan - Risk Assessment Pro Forma

Reference No.

General Information

Client:	
PSDP:	
PSCS:	
TTM Installer:	
General Location: (e.g. Route, Town/Village/Townland)	
Time of Day:	

Works Description

Activity/Operation:	
Planned Duration: (at Particular Site Location)	
Layout Used as Basis for TTM:	TS
Alternative TTM Layout: (If Applicable - Reference and Attach)	

Traffic Counts (3 mins)

Count No.	Time	Count

Site Conditions

Surrounding Land Use: (e.g. Urban, Rural, Sub-Urban, etc.)	
Speed Limit:	
Carriageway Type: (e.g. Single, Dual, Motorway, etc.)	
Carriageway Width:	
Hard Shoulder Width: (If Present)	
Pedestrian Facilities: (List any Facilities in Place)	
Other Conditions/Hazards: (e.g. Schools, Hospitals, Special Care Facilities, etc.)	

Site Specific Risks

Is Minimum Stopping Sight Distance (SSD) Maintained to the Works?	
Are Pedestrian Facilities Provided? (Describe Where Applicable)	
Weather Conditions: (List as Appropriate)	
Other Risk Items: (List as Appropriate)	

Modifications to Layout (List/Sketch as Appropriate)

Signed: _____

Date: _____

Notes: Risk Assessment of the TTM plan must be carried out by the TTM installer prior to the installation of the TTM.

This pro forma is available from the NRA in stand alone PDF format upon request.

9 REFERENCES AND ACKNOWLEDGEMENTS

These guidelines are based on the standards and guidance published in the following documents:

- Chapter 8 of the Traffic Signs Manual 2010 (DTTAS).
- Guidance for the Control and Management of Traffic at Road Works (DTTAS, HSA, NRA, LGMSB).
- Roads Act 2007.
- Road Traffic Act 2011.
- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work (Construction) Regulations 2013.
- Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2012.
- Guidelines for Working on Roads - Guide to the Safety, Health and Welfare at Work (Construction) Regulations 2008 (HSA).
- Guidelines on the Procurement, Design and Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations 2006 (HSA).
- Road Safety Markings Association (RSMA) Best Practice Guide, UK.
- Guidelines for the use of Variable Message Signs on National Roads (NRA).
- EN 12966 Vertical Road Signs: Variable Message Signs

The National Roads Authority gratefully acknowledges the technical assistance of RPS Group in the preparation of this handbook. It would also like to acknowledge the significant collaboration with those who participated directly in the development of this document, including the following:

- The City & County Managers Association
- Local Authority Engineering and Health & Safety Personnel
- National Road Offices, with specialist industry knowledge
- Traffic Signing Industry, in association with the Construction Industry Federation (CIF)
- Traffic Management Service Providers
- The Health & Safety Authority (HSA)

The National Roads Authority also wishes to acknowledge the comments and contributions of the many persons and organisations who reviewed the draft versions of the handbook.

