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1. Introduction

1.1 General

All road agencies across Australia are working towards greater consistency between States/Territories in how road networks are managed. In order to achieve this, the Austroads Guide to Traffic Management and Australian Standards relating to traffic management have been adopted to assist in providing that level of consistency and harmonisation across all jurisdictions. This agreement means that these Austroads Guides and the Australian Standards are the primary technical references.

Austroads Guide to Traffic Management Part 9: Traffic Operations (AGTM Part 9) is a nationally agreed guideline document outlining the use of traffic control devices on the road network and has been adopted by all jurisdictions, including VicRoads.

All jurisdictions will be developing their own supplement to clearly identify where its practices currently differ and to provide additional guidance to that contained within AGTM Part 9. This document is the VicRoads supplement and shall be read in conjunction with AGTM Part 9.

1.2 How to Use this Supplement

There are two key parts to this document:

- **Classification of Supplement Information**: this table classifies supplement information as a Departure, Additional Information or both. This information assists with identifying its hierarchy in relation to the Austroads Guide to Traffic Management.

- **Details of Supplement Information**: this section provides the details of the supplement information.

  - **Departures**: where VicRoads practices differ from the guidance in the Austroads Guide to Traffic Management. Where this occurs, these differences or ‘Departures’ will be highlighted in a box. The information inside the box takes precedence over the Austroads Guide to Traffic Management section. The Austroads Guide to Traffic Management section is not applicable in these instances.

  - **Additional Information**: all information not identified as a departure provides further guidance to the Austroads Guide to Traffic Management and is read and applied in conjunction with the Austroads Guide to Traffic Management section.

Where a section does not appear in the body of this supplement, the Austroads Guide to Traffic Management requirements are followed.
2. Classification of Supplement Information

The classification of each section as a Departure, Additional Information or both is shown in the table below.

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<th>Section</th>
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Austroads Guide to Traffic Management requirements are followed for sections not shown in this table.
3. Details of Changes

Section 6.2 – Planned and Special Event Management

In order to hold an event on a road in Victoria, the organiser is required to obtain permission from VicRoads, the relevant municipal council or other responsible road authority (e.g. a toll road operator). On-road events include fun runs, festivals, parades, races, bicycle events, motorsport events and filming on roads.

VicRoads is responsible for the management of all arterial roads and freeways (except tollways). Regardless of the types of the road on which the event is held, VicRoads’ permission will be necessary if the event requires exemptions from the Road Rules or other laws. For example:

- Parades often require an exemption to allow adult passengers to travel without seat belts, or in the cargo area of a vehicle.
- Any type of motor vehicle race on a road and any use of modified or specialist vehicles for filming also require VicRoads permission.

VicRoads applies the same criteria to each event, but the organiser of a major event may be required to provide additional documentation such as a communication plan for the major event (e.g. ANZAC day, Easter Marches and community festivals etc). If the event is a race with more than 30 participants, VicRoads requires a ‘Victoria Police Highway Events Permit’ before VicRoads issues a permit (under Section 99B (1) of the Road Safety Act 1986). Guidelines on when to obtain a permit for walking/cycling events can be found in Attachment A of this Supplement.

Generally, a pre-qualified contractor is required to carry out traffic management for on-road events.


To contact VicRoads regarding an event in Metropolitan Melbourne, email vicroadsmetroevents@roads.vic.gov.au or for an event in Regional Victoria, call 13 11 71 and ask for the events officer in the relevant VicRoads Regional office. VicRoads Regional offices are listed on the Events Application.

Section 7.3.2 – Phase Intervals

In Victoria, the pedestrian walk time is calculated using a walking speed of 1.2 m/s. Further details on calculating the walk time can be found in Appendix H.5 of this Supplement.

The overall pedestrian clearance interval is calculated using the allowable higher 1.5 m/s walking speed. Whilst there are some instances where the clearance interval is permitted to overlap into the vehicle intergreen period, this is only when there is no potential for conflict between pedestrians and vehicles (i.e. where there are no left or right filter turns). Where this occurs, the above walking speed should still be used, so as to encourage pedestrians to complete their crossing in an efficient manner.

Section 7.3.3 – Phasing Design

a) Basic fundamentals of right turn signal phasing

In general, right turn vehicle movements can be controlled using either of three techniques. These techniques are defined as follows:

Filter right turn

A right turn movement which operates in the same phase as conflicting vehicle (generally through and left turn vehicles from the opposite direction) and/or pedestrian movements. The right turn is therefore required to find safe gaps in that conflicting traffic before being able to turn.
**Partially controlled right turn**

A right turn movement which operates in two phases:

- in a phase in which it is controlled by a green right turn arrow, and so has priority over conflicting vehicle and/or pedestrian traffic movements.
- in a phase in which it can operate as a filter right turn (refer definition above).

With this type of control, the right turn movement is controlled with either two-aspect (Yellow/Green) right turn arrow displays or three-aspect (Red/Yellow/Green) right turn arrow displays. Generally these types of lanterns are also associated with normal three-aspect (Red/Yellow/Green) circular displays. The operation with each of the displays is described below.

**i) Partially controlled turn - two-aspect right turn arrow displays**

When controlled by two-aspect right turn displays, the operation is as follows:

- During the right turn phase, the right turn movement is controlled by the green arrow.
- At the end of the right turn phase, the right turn movement goes through the yellow arrow.
- After the yellow arrow has terminated, the right turn movement is controlled by the adjacent normal three-aspect circular display. Generally, that display will be green and so vehicles can conduct a filter right turn (refer definition above).
- The termination of the right turn movement is controlled by the normal three-aspect circular displays.

**ii) Partially controlled turn - three-aspect right turn arrow displays – “red arrow drop out”**

When controlled by three-aspect right turn displays, the operation is as follows:

- During the right turn phase, the right turn movement is controlled by the green arrow.
- At the end of the right turn phase, the right turn movement goes through the yellow arrow.
- After the yellow arrow has terminated, the right turn movement is then controlled by the red arrow. The red arrow will be held on for the following periods:
  - all Red interval of the right turn phase, plus
  - a period of time in the next phase (i.e. 2 seconds, or the Walk Time of the conflicting pedestrian movement if it exists).
- After the red period, the right turn red arrow goes off (to blank) and the right turn movement is controlled by the adjacent normal three-aspect circular display. Generally, that display will be green and so vehicles can conduct a filter right turn (refer definition above).
- The termination of the right turn movement is controlled by the normal three-aspect circular displays, except that the red right turn arrow is activated during the All Red interval of the circular displays.

Static signs displaying Stop Here On Red Arrow (R6-14) may be placed at the stop line pedestal (adjacent to the applicable right-turn lane) as a measure to assist motorists who do not understand or are not familiar with the operation.

The lantern display sequences for the two cases described above are shown in Section 8.3 of the Austroads Guide to Traffic Management Part 10.

The key difference between the two types of operation is that the “Red Arrow Drop Out” operation provides a red period during which conflicting vehicle and/or pedestrian movements can be established before the filter right turn movement commences. Within Victoria, the “Red Arrow Drop Out” operation is now the preferred form of partially controlled turn to be adopted. However, it should only be used where the right turn movement is from an exclusive right turn lane.

**Fully controlled right turn**

A fully controlled right turn is a right turn movement which only operates in a phase in which it is controlled by a green right turn arrow, and so has priority over conflicting vehicle and/or pedestrian traffic movements. However, unlike a partially controlled turn, it is unable to filter during any other phase. At the end of its own phase, the right turn is terminated and held on a red arrow display (until it operates in the following traffic signal cycle or possibly in a repeat right turn phase).
b) Alternative right turn treatments

As congestion increases across the road network, VicRoads is implementing more innovative operations to optimise capacity - and road safety – and to prioritise critical movements (which include sustainable transport modes).

This has included alternative treatments for the control of right turn movements; however these treatments are based on one of the three techniques described above.

Whilst time based bans on right turn movements have been used for a long period of time, a relatively recent operation that has been implemented is to operate a fully controlled right-turn phase every second cycle (or every third, etc. cycle – i.e. not every cycle).

Whilst this operation can have significant capacity benefits for the opposing critical though movement (as well as the general intersection operation), it should be implemented appropriately.

The warrants for consideration of the alternative right turn treatments are discussed below.

**Every second cycle**

Operating a fully controlled right turn every second cycle can be considered where:

- The intersection and/or the opposing through movement are/is at or above capacity.
- The right-turn volume is low (e.g. < ~100 vph/lane).
- The volume of a right turn movement can be accommodated in a relatively short phase.
- The queue length can be accommodated within the available turn lane.

Prior to implementation, traffic analysis (e.g. first principles, SIDRA etc.) shall be completed to confirm the operational benefits.

If the traffic analysis indicates potential over-queuing from the right-turn lane into the adjacent through lane, is it possible to install a queue detector near the taper of the right-turn lane, whereby the queue detector can be used to dynamically disable the skipping of the right-turn phase for the cycle(s).

Signage is required at the intersection to inform drivers of the change to normal operation. At the majority of intersections, the required signage states "RIGHT TURN MAY OPERATE EVERY 2ND CYCLE". At intersections with Red Light Cameras, the sign shall also include supplementary information identifying the days and time periods in which it operates. Refer to Clause 6.1 in the VicRoads Supplement to AS 1742.14:2014 for further details.

**Banned movements**

Time-based bans on right turning movements can be considered where:

- The intersection and/or the opposing through movement are/is at or above capacity.
- The volume of a right turn movement is minor.
- There are suitable alternative routes for right turn vehicles to reach the desired destination.

Signage is required at the intersection to inform drivers of the change to normal operation. A ‘No Right Turn’ (R2-6) sign is required with a supplementary sign to identify the time periods in which the turn ban operates. Refer to Clause 6.1.2 (a) in AS 1742.14:2014 for further details.

For advance turn ban signs, refer to Clause 2.8.5 in the VicRoads Supplement to AS 1742.2:2009

**c) Determining the method of right turn control**

The selection process of the method of control for right turns is typically influenced by the crash history, carriageway configuration, traffic volumes and the potential for right turn vehicles to filter across opposing traffic, and the ability for turn lanes to accommodate queues.

As a guide, the following criteria can be used to aid the selection process. It is noted that the control that is most appropriate has the majority of its criteria met.
Filter control
A filter turn can be considered if there is:
• one turning lane
• three opposing lanes or less
• low-medium right-turn volumes
• low-medium opposing through volumes
• low-medium pedestrian volumes
• a speed limit of 70 km/h or less.

Partially controlled
A partially controlled turn can be considered if there is:
• one turning lane
• three opposing lanes or less
• medium-high right-turn volumes
• low-high opposing through volumes
• low-high pedestrian volumes
• a speed limit of 70 km/h or less.

Partially controlled (with ‘red arrow drop-out operation’)
A partially controlled turn with Red Arrow Drop Out can be considered if the site is in an urban location and there is:
• one exclusive right turning lane
• three opposing lanes or less
• medium-high right turn volumes
• low-high opposing through volumes
• low-high pedestrian volumes
• a speed limit of 70 km/h or less
• a requirement to control the right-turn and opposing through traffic/pedestrian conflict, while still maintaining the capacity of the right-turn movement by enabling filtering.

Fully controlled
A fully controlled turn can be considered if there is:
• three opposing lanes or more
• medium-high right-turn volumes
• medium-high opposing through volumes
• high pedestrian volumes
• a speed limit of 80 km/h or more.
• two or more right-turn lanes.
• two or more opposing right-turn lanes.
• road safety issues (e.g. poor sight distance).
• a relevant crash trend (e.g. a significant amount of recorded casualty crashes that would be solved by this method of control, which have occurred over the latest five-year period)
• a tram right-of-way.
• linking/capacity benefits, (e.g. where the phasing implemented includes a lagging right-turn conflict)
When considering the method of right-turn control(s) for a site, the following shall also be noted:

- The criteria shall be used in conjunction with sound engineering experience and judgement.
- The operational safety of the phasing is the primary factor, followed by efficiency and other factors.
- For new sites, a site investigation shall be conducted to observe local issues (e.g. horizontal and vertical geometry, sight distances, surrounding area development, etc.), as well as consideration of any relevant data (e.g. traffic volumes, crash statistics, etc.).
- In general, partially controlled right-turns (with ‘red arrow drop-out operation’) are replacing the traditional partially controlled right-turns at existing and new sites.
- The potential type of right-turn control shall be chosen via the criteria above, and then subsequently confirmed via a traffic analysis (e.g. SIDRA, etc.).

d) Operation of pedestrian movements

Late Introduction

If there are no conflicting vehicular traffic movements with a pedestrian movement (e.g. the left turn movement has a slip lane and the right turn movement is fully controlled), then the pedestrian movement may be permitted to have a late introduction.

Late introduction permits the pedestrian movement to introduce anytime within an adjacent leading right-turn phase, and/or anytime within the adjacent through phase up to the required clearance time (implemented within SCATS). Typically, a late introduction within an adjacent through phase is only permitted when the pedestrian movement runs in the primary through phase. This is to prevent the pedestrian movement from unnecessarily extending a minor phase.

If there are vehicular traffic movements that conflict with a pedestrian movement (e.g. there is no left turn slip lane and/or the right turn is not fully controlled), late introduction of a pedestrian movement is typically not permitted. Otherwise, there may be an increased likelihood of a pedestrian-vehicle conflict if a pedestrian movement starts unexpectedly during a phase. However, if late introduction is expected to be highly beneficial under this circumstance, then the following should be considered in the assessment:

- the volume and type of pedestrians
- if the pedestrian crossing is within a Pedestrian Priority Area (as per the Road Use Hierarchy under SmartRoads)
- the volume and design speed of opposing vehicular traffic
- whether the pedestrian movement is part of a combined pedestrian/bicycle path, and if so, the expected volume of cyclists.

If late introduction is not permitted, the pedestrian movement must run at the beginning of the adjacent through movement, whether that is at the start of the adjacent leading right turn phase, or the start of the adjacent through phase (if the adjacent leading right turn phase does not run). Otherwise, it must wait until the following cycle. While this would noticeably increase delays for pedestrians, it would make the operation of the intersection safer.

Late introduction should be permitted whenever it is safe to do so, on a risk management basis as described above, in order to encourage sustainable transport modes and to reduce the potential for pedestrians to cross against the steady red Don’t Walk display. However, where late introduction is not permitted, the operational design (Controller Operation Specification) and controller personality (EPROM) should be designed so that if the site is resting in the primary through phase (e.g. late night/early morning) and there is a demand for a pedestrian movement that runs in the primary through phase, then the controller should demand a side road phase, subsequently returning to the pivot phase in order to service the pedestrian movement. This avoids left and right turning traffic being caught unawares of a pedestrian movement suddenly changing to green whilst in the motion of turning.

Automatic introduction

An automatic introduction of the pedestrian movement may be considered where there is a high volume of vulnerable pedestrians (e.g. school children, the elderly, etc.) and/or within areas of significant pedestrian activity during peak pedestrian times. However, automatic introduction should typically be implemented outside commuter peak periods. The impact of the automatic introduction of pedestrian movements on other modes should also be considered to ensure compliance with SmartRoads.
The automatic introduction of pedestrian movements should not be implemented ad-hoc, as it may reduce the effectiveness of the pedestrian lantern and how motorists use it as an indication of the presence of pedestrians at the crosswalk.

Section 8.5.1 – Lane Use Management Systems

Lane control signals are overhead signals which permit or prohibit the use of specific lanes of a road. These systems are rarely used, but when they are, it is typically to support:

- ‘Tidal flow’ with a greater number of lanes allocated to travel in one direction at the expense of the number of lanes in the opposite direction.
- Part time bus priority schemes, which may change direction or not occur at all at different times during a day.
- They may also be used to control contra-flow lanes on freeways or other divided roads, although they have not been used for this purpose in Victoria to date.

These schemes are referred to as ‘reversible lane’ control (refer to Section 8.5.2 in this Supplement). Other terms often used for ‘reversible lane’ control are ‘tidal flow’, ‘off-centre’ operation or ‘contra-flow’. Permitted use of a lane is indicated by a downward pointing arrow and prohibited use of a lane is indicated by a red cross (refer to Table 3.3 of AS 1742.14:2014). The downward pointing arrow shall be white, as green may be mistaken for an intersection signal.

Lane Use Management Signs on freeways

Information regarding Lane Use Management Signs on Freeways can be found on the VicRoads website at http://www.vicroads.vic.gov.au/Home/Moreinfoandservices/RoadManagementAndDesign/DesignStandardsManualsNotes/ManagedFreewayManuals/. Alternatively, this information can be found by searching for 'Managed Freeway Manuals' on the VicRoads website at www.vicroads.vic.gov.au. The following documents shall be referred to:

- Managed Freeway Guidelines (April 2014)
- Managed Freeways - Freeway Ramp Signals Handbook (July 2013)
- Managed Freeways - Handbook for:
  - Lane Use Management
  - Variable Speed Limits
  - Traveller Information (July 2013)
- Managed Freeways – VicRoads Policy

Other overhead lane control

Overhead lane control can also be used to allocate lanes for different combinations of through and turning traffic from the same direction approaching and at an intersection. In this case, the arrows are pointing up and the displays are referred to as Variable Use Lane Signs. The intention is that these displays look like signs which give directional information. Guidelines for Variable Use Lane Signs are discussed in Clause 4.12 of AS 1742.2:2009

Section 8.5.2 – Reversible Lanes

Rule 152 of the Road Safety Road Rules 2009 sets out the obligations of drivers in relation to overhead lane control devices.

Reversible lane controls are typically applied to arterial roads of limited width, which experience a heavy flow of vehicles in one direction during peak hours. The existing number of lanes may be retained or increased as part of the scheme. Two schemes in Melbourne (Queens Road and Johnston Street) have succeeded because each road was wide enough to permit it to be marked as five lanes, rather than the pre-existing four lanes.

There is nothing in principle to prevent use of reversible lane controls on tram routes. However, the cost of providing multiple tracks and the difficulties with providing safe tram stops will typically preclude such schemes.
Similarly on divided roads, the strong visual cue created by the median is likely to prevent a reversible lane control scheme from operating safely, unless it is reinforced with temporary bollards or similar devices. Banning the use of right turn lanes is also likely to be needed. The high cost of managing such a system will limit its application to situations where the benefits are very high and the disbenefits can be safely managed.

The following applications are intended for undivided roads without trams.

Any scheme for reversible lane control signals will need to include:

- part time or full time clearways on both sides of the road
- a plan to manage right turns. Isolated right turns can seriously disrupt a through traffic lane and negate the potential improvements a reversible lane control scheme achieves for capacity. Right turns will need to be banned or catered for (e.g. possible use of a ‘median turning lane’ for turns from opposing directions).

The use of lane control signals to achieve reversible lane operation may be considered in relation to an arterial road where all of the following apply:

- Peak period traffic volume in the peak direction is currently equivalent to at least 1200 vph/lane.
- Peak period traffic volume in the counter direction is less than one third of the flow in the peak direction (for a four or five lane road).
- Peak period traffic in the peak direction is encountering substantial delays.
- Clearway restrictions have been implemented on both sides of the road during the applicable periods through the day.
- Other traffic management measures aimed at alleviating the problem (e.g. right turn restrictions, improved or coordinated traffic signal timings, relocation of bus stops, etc.) have been investigated and either implemented or rejected as being inappropriate.

Municipal councils considering the possibility of installing lane control signals are required to contact VicRoads with a brief outline of the proposal, having regard to the points mentioned above. If there is prima facie justification for lane control signals, VicRoads will assist the municipal council with the collection and analysis of data required to make a thorough assessment of the proposal.

Following in-principle agreement for the installation of lane control signals, detailed plans and specifications will need to be prepared and these will be referred to the municipal council (and other authorities, as appropriate) for comment.

Table 3.3 of AS 1742.14:2014 sets out the requirements for reversible lane control schemes and plans for the installation of lane control signals shall follow that Standard.

The plans and specifications for any reversible lane control scheme shall include all signs and linemarking associated with the scheme. All such signs and road marking form an integral part of the overall design and shall not be removed or varied without consultation with VicRoads. After completion of the plans and specifications, arrangements for their installation will require VicRoads’ involvement.

As ‘overhead lane control signals’ come within the definition of ‘traffic signals’ in the Road Safety (Traffic Management) Regulations 2009, they are Major Traffic Control Devices, requiring VicRoads written consent to erect, modify or remove

Where the lane control signal system requires new or modified clearway restrictions on arterial and municipal roads, it is the responsibility of VicRoads to approve these changes in consultation with the municipal council and in accordance with the Road Management Act 2004 – ‘Code of Practice for Clearways on Declared Arterial Roads (2004)’. On arterial roads, VicRoads is responsible for the supply and installation of clearway signs.
Appendix H.4 – Vehicle Settings

The determination of signal controller settings is broadly discussed in Section 7.5.12 of the AGTM Part 9 and discussed in detail in Appendix H.4.

The following sections provide supplementary material and clarification of Appendix H.4.

Late start setting

In addition to the example late start setting given in the AGTM Part 9, Appendix H.4.1, a late start time (or delay time) can be applied to the start of a pedestrian movement, where the pedestrian crossing is significantly offset (greater than 6 m to 8 m) from the parallel vehicle movement that commences in the same phase.

Generally, the reason for applying this late start is to allow a reduction in all red time between phases where that time is dictated by a conflict between a vehicle movement and an offset pedestrian movement.

When calculating the all red interval for a particular phase, the length of the vehicle path distance from the stop line to the conflict point with a pedestrian and/or vehicle movement which is starting up in the next phase is required to be used. When a pedestrian crossing is set well back from the intersection, the vehicle path to that movement is longer and so a longer all red time is required.

However, if a late start is applied to the start of the pedestrian movement in the next phase, the all red of the phase can be calculated based on the vehicle path distance to the conflicting vehicle. The late start to the pedestrian movement is then calculated as the difference between the time to travel to the vehicle/pedestrian conflict and the time to travel to the vehicle/vehicle conflict.

The late start period should not exceed 1.0 seconds if a filtering left turn or right turn starts in the next phase, to avoid drivers being surprised by the sudden introduction of the pedestrian movement.

The benefits of providing a late start to a pedestrian movement are:

- the all red time between critical vehicle movements is reduced in all traffic signal cycles, resulting in less “lost time”, and therefore an increased intersection capacity
- reduced frustration for drivers waiting to start in the following phase (i.e. drivers will not be waiting at the stop line unnecessarily)
- reduced temptation for drivers clearing the intersection to “run the red”. This can become an issue over time as drivers realise there is always an extended period before conflicting vehicles start up.

A late start time for a vehicle movement can also be used to benefit pedestrians and/or cyclists at a signalised intersection (refer to AGTM Part 9, Table 7.6 and Table 7.7). This treatment may be used in a location such as a high pedestrian activity area.

Yellow time

The calculation of yellow time values is detailed in Appendix H4.6, Table H2 of the AGTM Part 9. The following interpretation notes shall also be considered:

- Yellow time values can be considered as any design speed +/- 5 km/h of the design speed in the table. For example, yellow time values for a design speed of 60 km/h can be used for any design speed between 55 km/h and 65 km/h.
- A design speed of 45 km/h shall be adopted for turning vehicles, rather than the posted speed limit. This design speed is generally reflective of intersection geometries. As per the note above, yellow time values of 40 km/h or 50 km/h could be adopted for turning vehicles, although VicRoads generally adopts the lower of these (i.e. 40 km/h values).
- ‘Level’ yellow time values from Table H2 can be considered as any grade up to 5% downhill or up to 5% uphill.
- Given yellow times for an intersection on a grade should be the same for opposite traffic streams, the highest of values determined using Table H2 should be used.
- As a guide, approach grades should be considered for the approach distance detailed below:
### Table 1: Approach grade distances

<table>
<thead>
<tr>
<th>Design Speed (km/h)</th>
<th>Approach Distance (m)*</th>
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<td>90</td>
<td>140</td>
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*Based on approximate distance derived from (design speed x yellow time values for level approach)

- For exclusive tram phases, a yellow time of 3.0 seconds shall be used. When trams operate in the same phase as the parallel vehicle movement, the calculated yellow time for those parallel vehicle movements shall be used.
- For exclusive bicycle phases, a yellow time of 3.0 seconds should be used. When bicycles operate in the same phase as the parallel vehicle movement (i.e. at the majority of sites where specific bicycle lanterns are not provided), the calculated yellow time for those parallel vehicle movements should be used.
- VicRoads adopts a reaction speed ($t_r$) of 1.0 seconds, unless there are exceptional circumstances.
- As an added safety check in the design process, VicRoads reviews the adopted yellow time when initially designing the controlled time settings for a new signalised intersection and subsequently when reviewing the operation of existing intersections. During this process, VicRoads considers the appropriateness of the intergreen times for site specific conditions and can increase the yellow times in exceptional circumstances (e.g. larger proportion of heavy vehicles due to the lower deceleration rate, etc.).

### All red time

All red time values are calculated from equation A3 in the AGTM Part 9, with the following additional notes to be considered:

- The clearance distance ($L_c$) is measured as follows:
  - from the centre of the traffic lane of the movement for which the all red time is being determined
  - from the vehicle stop line to the far side of the kerbside lane of the conflict vehicle movement, or the far side of the pedestrian crossing of the conflict pedestrian movement
  - for multiple through lanes, use the longest turning path
  - for a single right turn lane, use the centre of the turning lane
  - for double or triple right turn lanes, use the centre of the outside right turn lane or the longest turning path
- Typical examples of determining clearance distances are shown in Figures 1 to 4.
Figure 1: Through movement, measure from stop line to far side of pedestrian crossing

Figure 2: Right turn movement, measure from stop line to far side of pedestrian crossing
Figure 3: Through movement, where conflicting pedestrian movement has a late start and is offset by at least 8 m, measure from stop line to far side of kerbside lane.

Figure 4: Through movement, where no conflicting pedestrian movement exists, measure from the stop line to far side of kerbside lane.

- For through movements, the all red time shall be based on the posted speed limit.
- For right turn movements, a design speed ($v_D$) of 45 km/h shall be used.
- For exclusive tram phases, a design speed of 45 km/h shall be used for through tram movements. When trams operate in the same phase as the parallel vehicle movement, the posted speed limit shall be used.
• If turning trams are involved, it is recommended that an on-site estimation be made and/or Yarra Trams provide comments or data to establish the appropriate design speed.
• For exclusive bicycle phases, a design speed of 20 km/h shall be used. When bicycles operate in the same phase as the vehicle movement (i.e. at the majority of sites where specific bicycle lanterns are not provided), the vehicle design speed limit shall be used. This is because cyclists can stop more quickly than vehicles (due to their lower speeds) and should be able to come to a complete stop within the yellow time period (i.e. the all red time should not be required).
• All red times are set for each phase rather than each signal group. In the instance when movements that are closing down in the same phase have different calculated all red times, the higher all red time shall be used for the phase.
• For situations where the starting traffic must cover a significant distance to reach the conflict point, the time taken to cover this distance at the posted speed limit can be subtracted from the all red time.
• At pedestrian operated signals, an all red time of 2.0 seconds shall be provided at the end of the vehicle movements, and 3.0 seconds at the end of the pedestrian movement.
• For ease of use, as an alternative to Figure H5 of the AGTM Part 9, all red times can be determined from Table 2.

Table 2: All-red times for different design speeds

<table>
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<th>All Red</th>
<th>40</th>
<th>45</th>
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<th>60</th>
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<td>47-51</td>
<td>52-58</td>
<td>58-64</td>
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<td>97-100</td>
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Appendix H.5 – Pedestrian Settings

Pedestrian walk time

In addition to the guidance provided in AGTM Part 9, the following additional guidance for pedestrian walk time settings applies in Victoria.

The Walk Time is intended to ensure that the pedestrian, once started, will continue crossing the carriageway, rather than return to the starting point (i.e. the pedestrian should be “committed” to completing the crossing). In the case of a divided carriageway with a median of sufficient width, the Walk Time is intended to enable a pedestrian to be able to reach a point 1 m past the median, and so be able to complete their crossing within the clearance interval.
When applying the Walk Time formula, the following interpretation notes shall also be considered:

The Walk Time is calculated in two different ways, depending on the carriageway layout. These methods have been adopted to ensure uniformity across Victoria:

- **Layout Type A** includes:
  - single carriageways (one-way or two-way)
  - divided carriageways with a median that is not wide enough to store pedestrians (i.e. less than 2.5 m between face of kerbs), or if there is no push button on the median
  - staggered pedestrian crossings on divided carriageway (i.e. each stage of the crossing is treated as a separate crossing)

- **Layout Type B** consists of a divided carriageway with a median that is wide enough to store pedestrians (i.e. greater than 2.5 m between face of kerbs)

The Walk Time is determined as follows:

- **Layout Type A**
  - using a walk speed of 1.2 m/s (refer to Figure H 6 in AGTM Part 9)
  - the crossing distance is measured from kerb line to kerb line
  - a minimum time of 4 seconds
  - a maximum time of 8 seconds, except in special circumstances as defined below.

- **Layout Type B**
  - using a walk speed of 1.2 m/s (refer to Figure H 6 in AGTM Part 9)
  - the crossing distance is defined as the distance across the widest carriageway plus the median width plus one metre past the median
  - a maximum Walk Time of 15 seconds is generally applied.

A maximum Walk Time setting is employed to reduce the impact on the capacity of critical intersections during peak periods (e.g. reduce the impact of long Walk Times associated with minor vehicle movements). Long Walk Times can also significantly affect the capacity of an intersection in off peak periods where shorter cycle times may be desirable.

At school crossing sites where a crossing supervisor is in attendance, the supervisor is obliged to wait until he or she considers it safe, step onto the carriageway, and blow a whistle to start the children onto the carriageway. To cater for this “starting delay”, the Walk Time may be increased by 2 seconds, or in some cases, by 4 seconds.

**Pedestrian clearance time**

The overall pedestrian clearance interval is calculated using the allowable higher 1.5 m/s walking speed (refer to Section 7.3.2 of this Supplement).

Whilst there are some instances where the clearance interval is permitted to overlap into the vehicle intergreen period, this is only when there is no potential for conflict between pedestrians and vehicles (i.e. where there are no left or right filter turns). Where this occurs, the above walking speed should still be used, so as to encourage pedestrians to complete their crossing in an efficient manner.

When applying the Pedestrian Clearance Time formula from the AGTM, the following interpretation notes shall also be considered:

The pedestrian crossing distance is taken as follows:

- single Carriageway – the kerb line to kerb line crossing distance
- divided Carriageways (median less than 2.5 m) – where the median is not wide enough to store pedestrians, or if there is no push button on the median, then the crossing distance shall be that of the total kerb line to kerb line carriageway width plus median
- divided Carriageways (median greater than 2.5 m) – the kerb line to kerb line width of the widest carriageway.
At locations where there are a high proportion of disabled or elderly pedestrians, (i.e. outside hospitals or elderly citizens clubs) it may be considered appropriate to provide an additional 2 seconds clearance time, or to recalculate the clearance time with a lower walking speed (1.2 - 1.0 m/s).

The total pedestrian clearance time \( t_{pc} \), calculated by the formula in Appendix H5.3, can be split into Clearance 1 \( t_{c1} \) and Clearance 2 \( t_{c2} \).

\[
t_{pc} = t_{c1} + t_{c2}
\]

Clearance 2 \( t_{c2} \) is generally calculated as follows:

- Where right and/or left turners can filter across the pedestrian movement during the intergreen period, Clearance 2 is set to zero and the clearance does not run into the intergreen.

\[
t_{c2} = 0
\]

- Where this conflict does not exist (e.g. the right turn is fully controlled), Clearance 2 can operate within the intergreen interval, provided there is a period of steady Don't Walk Time \( t_{sw} \) prior to commencement of the next conflicting green movement. The minimum steady Don't Walk Time should desirably be 4 seconds, but 3 seconds can be considered.

\[
t_{c2} = I - t_{sw}
\]

- Where an Early Cut Off (ECO) interval is used, and right turners can filter across the pedestrian movement during the ECO interval, Clearance 2 is set to zero.

\[
t_{c2} = 0
\]

- Where an ECO interval is used, and conflict does not exist during the intergreen or ECO periods (e.g. the right turn is fully controlled), Clearance 2 can operate within the intergreen interval, provided there is a period of steady Don't Walk \( t_{sw} \) prior to commencement of the next conflicting green movement. The minimum steady Don't Walk Time should desirably be 4 seconds, but 3 seconds can be considered.

\[
t_{c2} = ECO + I - t_{sw}
\]

Clearance 1 can then be calculated as follows:

\[
t_{c1} = t_{pc} - t_{c2}
\]

The above calculations ensure that the potential for conflict between pedestrians and vehicles filtering during through the intergreen is minimised. The pedestrian clearance phase can only overlap into the vehicle intergreen when there is no potential for vehicle / pedestrian conflict.
ATTACHMENT A – Do You Need A Permit?

VicRoads supports the use of Victoria's roads for walking, running and cycling events, where it is safe and appropriate to do so. If a walking, running or cycling event can be conducted safely and without significant interference with normal road use, you may not need a permit or other approval.

Note: this information does not apply to events involving motor vehicles, other than registered vehicles operating as shadow or support vehicles.

Complying with the Road Rules

It is more likely that your event will not significantly interfere with normal road use if participants will comply with the Road Safety Road Rules 2009 ("Road Rules"). You should not simply assume that your event will comply with all Road Rules. Please familiarise yourself with the relevant Road Rules, in particular:

- For a pedestrian event: Rules for pedestrians (rules 228-239), especially rule 238 (pedestrians on a road or road shoulder).
- For a cycling event: Keeping left (rules 129-132), speed limits (rule 20), overtaking (rules 140-141), riding alongside another rider (rule 151), and additional rules for bicycle riders (Part 15). See also rule 19, which indicates that "driver" generally includes a bicycle rider.

When is a permit required?

You are likely to need an event permit for a pedestrian or cycling event on a road if one of the following applies:

- Your event is a race.
- Your event involves more than 30 participants.
- Participants may not be able to comply with all Road Rules.
- You are planning to conduct some of your event on a tollway or a freeway.
- Your event is organised or intended for the purpose of raising money for or awareness of a charity or other cause.
- Participation in your event is open to the general public.
- It is a pedestrian event and pedestrians will be travelling, not on a footpath or shared path, in the same direction as traffic passing within 3 metres of them in a high speed zone (speed limit of 80 km/h or higher).
- You will be using a support or shadow vehicle, which will be travelling in a traffic lane more than 20 km/h below the speed limit,
- You will be using a support or shadow vehicle with flashing lights, or other non-standard signage which might distract other road users,
- Your event requires road closure and/or the use of traffic management and traffic control devices.
- Your event involves more than 4 people and will be conducted on a winding two lane road, such as the Great Ocean Road, Great Alpine Road, Mt Dandenong Tourist Road, or a mountain resort access road.

If any of these criteria apply, please determine whether your event route is on municipal roads (council responsibility) or arterial roads and freeways (VicRoads’ responsibility). There is a 'Map of Declared Roads' on the VicRoads website that will assist (http://maps.vicroads.vic.gov.au). As a general guide, VicRoads is responsible for roads coloured green, black or red in a Melway Greater Melbourne Street Directory or a VicRoads Country Street Directory. If arterial roads and freeways will be impacted, you will need to complete an Event Application and submit it to VicRoads. Otherwise, you should contact the relevant municipal council. If your event will be conducted on a tollway, you must contact the operator of that tollway.

If none of these criteria apply, you may proceed without a permit. You are welcome to print this page and carry it with you, in case you are asked to produce a permit.
Conducting the event

Before the event starts, you should check to ensure that there are no road works or emergency measures in place that may impact it. VicRoads' website and the VicEmergency website may contain relevant information. You should not conduct an event in an area of road works, or on a day of Extreme or Code Red fire danger.

For safety, VicRoads strongly recommends that any pedestrian or cycling event only take place during daylight hours, and that pedestrian events comply with the following:

- Pedestrians must not travel within freeway reserves, except on a footpath.
- Pedestrians must not travel in a traffic lane on a road.
- On sections of road where pedestrians cannot maintain 1.0 m clearance from passing traffic in the nearest traffic lane, they must be transported by vehicle to the next point where this clearance is satisfied.
- When travelling on a road shoulder, pedestrians must travel no more than two abreast.

Responsibility for event

Please note that VicRoads does not accept any responsibility for accidents, damage or injury to property, participants or third parties as a result of any pedestrian or cycling event. The event organiser is responsible to ensure the safety of participants, and to prevent loss or damage to members of the public.

Contacts

To contact VicRoads about an event in Metropolitan Melbourne, email vicroadsmetroevents@roads.vic.gov.au.

To contact VicRoads about an event in Regional Victoria, call 13 11 71 and ask for the events officer in the relevant VicRoads Regional office. VicRoads Regional offices are listed on the Events Application.
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Department: Network Standards

Directorate: Policy and Programs

Approved by: Jeremy Burdan
Manager – Network Standards

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Previous versions of this document are available on request by contacting the VicRoads – Network Standards team.

For enquiries regarding this supplement, please contact the VicRoads – Network Standards team via tem@roads.vic.gov.au or 9854 2417.