Planning Guidelines for Emergency Vehicle Access and Minimum Water Supplies within the Metropolitan Fire District

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1. PURPOSE

The purpose of this guideline is to identify the minimum access requirements for emergency vehicles (fire and ambulance) for new road networks, road network upgrades as well as property developments that incorporate streets and common access ways.

This document is a self-assessment guideline that provides assistance to property developers, design engineers, municipalities and planning authorities who are involved in preparing and evaluating applications pertaining to the subdivision or development of land within the Metropolitan District.

2. SCOPE

This guideline applies to the whole of the Metropolitan Fire District in regard to road network upgrades, subdivision applications and property developments that incorporate streets and common access ways.

The scope of this guideline encompasses:

- The provision of fire hydrants and fire plugs to enable fire fighters to undertake firefighting operations
- The formulation of objectives for vehicular access;
- The formulation of vehicular access requirements for the following development types will be considered:
  - Commercial;
  - High Density Housing (4 or more floors)
  - Medium Density Housing;
  - Subdivisions (low density housing); and
  - Arterial Road Access and Movement.
- The establishment of an independent certification process by appropriately qualified design engineers;
- The establishment of an alternative design approval process by the Chief Officer of the Metropolitan Fire and Emergency Services Board.

This guideline does not apply to:

- buildings and developments within a designated bushfire prone area as determined by the Victorian Building Regulations 2006; and
- an allotment subject to a Wildfire Management Overlay under the Planning and Environment Act 1987.

Please consult the Victorian Department of Transport, Planning and Local Infrastructure website for further guidance on this matter.

3. DEFINITIONS

The following definitions apply for the purpose of this guideline.

"BCA" means Building Code of Australia 2013 and includes any amendment or replacement of the Building Code of Australia.

"Chief Officer" means the Chief Officer of the Metropolitan Fire and Emergency Services.
“Emergency vehicle access road” is a road surrounding a large building with increased volume and area and includes the access road to the site. Any reference to a ‘perimeter vehicular access road’ within this guideline is deemed to be a reference to an emergency vehicle access road.

“Flashover” is the transition point in fire behaviour within a compartment where the fire escalates from burning of an individual item, or items, to ignition of every combustible item when temperatures reach approximately 600°C in the upper layer and/or the incident radiant heat flux reaches approximately 20kWm².

“Hard stand” refers to an area to be occupied by fire brigade appliances while engaged in combating an emergency incident. The area of hard stand needs to be of sufficient size, and have sufficient capacity, to accommodate any fire brigade appliance.

“MFB” means the Metropolitan Fire and Emergency Services.

“Metropolitan Fire District” (MFD) has the same meaning as Section 4 of the Metropolitan Fire Brigades Act 1958.

“NPER” means the National Engineering Registration Board.

“Private Roads” are roads that do not have public highway status or are not declared roads within the meaning of the Transport Act 1983 or are not under the care and management of a Council or public authority.

“Public Highway” has the same meaning as Section 3 of the Local Government Act 1989.

“Road” has the same meaning as Section 3 of the Local Government Act 1989. The definition of a road in the Local Government Act 1989 includes:

(a) a street;
(b) a right of way;
(c) any land reserved or proclaimed as a street or road under the Crown Land (Reserves) Act 1978 or the Land Act 1958;
(d) a passage;
(e) a cul de sac;
(f) a by-pass;
(g) a bridge;
(h) a footpath, bicycle path or nature strip; and
(i) any culvert or kerbing or other land or works forming part of the road.

“VPP” means the Victorian Planning Provisions.
4. LEGISLATIVE BACKGROUND AND CORPORATE POLICIES

4.1 Metropolitan Fire Brigades Act 1958

The duties and powers of Councils and Public Authorities in relation to fire are contained within Section 5 (1) of the Metropolitan Fire Brigades Act 1958 (MFB Act), which provides that:

“In the metropolitan district it is the duty of every municipal council and public authority to take all practicable steps (including burning) to prevent the occurrence of fires on, and minimise the danger of the spread of fires on and from—

(a) any land vested in it or under its control or management; and

(b) any road under its care and management.”

In addition to the those duties and powers that are conferred to Councils and Public Authorities in relation to fire, the Chief Officer of the Metropolitan Fire and Emergency Services is tasked with the prevention of fire and the protection of life and property by all practical means within the Metropolitan District pursuant to Section 32 (d) of the MFB Act. Section 6 of the Metropolitan Fire and Emergency Services Board Policy No. B 6000/14 also states that:

“...the MFESB aims to minimise injuries, loss of life and the cost of property and environmental damage caused by fire and other emergencies, at an acceptable community cost. An MFESB corporate objective is to contain fires to the room of origin in 90% of cases.”

4.2 Planning and Environment Act 1987 & Subdivision Act 1988

The Chief Officer of the MFB is not a formal referral authority within the various planning schemes that exist within the Metropolitan Fire District. The MFB is however, by definition, a “public authority” within the meaning of both the Planning and Environment Act 1987 and Subdivision Act 1998. Municipal Councils and planning authorities are therefore encouraged under Section 52 (1)(d) to give notice of a planning permit application to the Chief Officer.

4.3 Victoria Planning Provisions

The provisions pertaining to the provision of street type fire hydrants are currently contained within Clause 56.09-3 of the Victoria Planning Provisions (VPP), which is replicated below

“56.09-3 Fire hydrants objective
To provide fire hydrants and fire plugs in positions that enable fire fighters to access water safely, effectively and efficiently.

Standard C29
Fire hydrants should be provided:

- A maximum distance of 120 metres from the rear of the each lot.
- No more than 200 metres apart.”
5. OBJECTIVES FOR ACCESS

The importance of reaching a fire or medical emergency quickly is somewhat obvious with consideration of the risk to human life and property damage. Prompt and efficient access to a property is particularly critical given that the nature and consequence of a fire significantly changes if the fire is allowed to spread and develop allowing ‘flashover’ to occur.

Currently the MFB’s commitment to the Victorian government is to attend 90% of all fires within 7.7 mins from the receipt of a call to kerb side. In order for the MFB and Metropolitan Ambulance Service to provide a successful service to the community, these agencies need to:

- Gain access to properties in an efficient manner; and
- Have sufficient room to manoeuvre and operate appliances and emergency vehicles within the proximity of the emergency.

Gaining access to a property is however a function of a number of elements which include:

- Road Design;
- Traffic Conditions (incl. volume and speed); and
- Distance to the emergency site.

The traffic conditions and distance to a site is not something that can be controlled by the relevant authorities, however the road design and ability to gain close access to a property can and should be influenced during design and planning stages of developments to allow adequate access for emergency vehicles.

While ambulance vehicles are smaller than fire appliances the tests applied here are for the access and accommodation of fire appliances (the larger of the two vehicle types) rather than ambulances per say. This does not lead to an unnecessary onerous design criteria since whenever a medical emergency may occur there could also be a fire, and secondly, modern practice is such that in many medical call-outs, a fire appliance attends in the first instance. Accordingly, the technical content in this guideline concerns itself with the geometric characteristics and requirements for fire appliances only.
6. VEHICULAR ACCESS REQUIREMENTS FOR BUILDINGS

6.1 Preface

The task of devising access requirements for fire brigade appliances to a fire incident is a multi-dimensional task needing to account for a number of characteristics including the size of the building, the contents and use of the building, the likely severity of a fire on a given site and the location of a fire hydrant system to that building.

In this regard the MFB have various levels of alarm which, depending on the level and intensity of a fire incident, will effectively deploy more manpower and resources.

Residential developments will generally require a lower alarm than a commercial building however the requirements of a commercial building will vary according to the contents and size of the building.

The access requirements specified within this document are based generally on a 1st alarm structure fire response [12] however these do not begin to take into account for the size of the building and the contents of the building which may require further alarm calls. It is therefore recommended that in the planning stages for buildings, advice should be sought from the MFB as to the most probable fire alarm call for the proposed building type.

6.2 Provision of Street Hydrants

The objectives and prescriptive standards pertaining to the provision of street fire hydrants and fire plugs within the MFD are generally outlined within Clause 56.09-3 of the VPP.

Whilst Standard C29 of the VPP currently provides that (public infrastructure) street fire hydrants and fire plugs are to be provided at a maximum distance of 120 metres from the rear of each allotment and no more than 200 metres apart, the Chief Officer of the MFB recognises that it maybe difficult for absolute compliance with Standard C29.

Sections 6.2.1 and 6.2.2 of this guideline outline an acceptable alternative to Standard C29 of the VPP, which can be relied on to satisfy the fire fighting objectives of Clause 56.09-3 of the VPP.

6.2.1 Fire Hydrants within Residential Streets and Access Ways

Subject to section 6.3.1, above or below ground fire hydrants should be provided at not more than 120 metre intervals along residential streets and at each intersection. Above ground fire hydrants may be single outlets.

6.2.2 Provision of Fire Hydrants within Commercial & Industrial Streets and Access Ways

Within streets serving commercial properties such as factories, warehouses and offices, above or below ground fire hydrants should be provided at not more than 90 metre intervals and at each street intersection. Above ground fire hydrants should have dual valved outlets.
6.3 Residential Buildings

6.3.1 Two Stories or Less - 2 storeys or less (Ground and First Floor)

Residential buildings of 2 storeys or less (Ground and First Floor) and less than 9 metres in height will generally be found within residential subdivisions. These buildings typically only require the primary services of standard pumper appliances as the fires will primarily be fought from the outside of the building. Ladders are provided on these emergency vehicles, which are of sufficient length to access these size buildings.

Roads that typically serve these types of residential dwellings however provide a combined function of parking and traffic movements whilst also maintaining suitable amenity and safety for residents, which is often produced through the implementation of traffic calming measures. Management of these issues needs to be carefully considered to ensure that access to sites by emergency services is not compromised.

Should a residential building within a subdivision be greater than 2 storeys or has an effective height greater than 9 meters, then the access objectives of this Section and Section 6.5 of this document shall apply.

The following outlines the access requirements for residential developments, where buildings are less than 2 storeys or less than 9 metres in effective height.

Standard Lot Access - 2 storeys or less than 9 metres effective height

Access to a standard residential lot within a subdivision shall be gained from the road network with no specific requirements for access required, on the proviso that the road network is sufficiently designed in accordance with Section 7 of this document.

Narrow Road Access to a Dwelling - 2 storeys or less than 9 metres effective height

It takes time for fire hoses to be set up from a hydrant to a fire appliance and subsequently from the fire appliance to the fire. However if sufficiently close access to the fire can be gained, the high pressure hose reel on the emergency vehicle can be effectively used as the first source of water to the fire.

It is therefore strongly recommended that any access road less than 3.5 metres in width, within a subdivision be classed as a secondary access roadway to the property with primary access provided via a roadway commensurate with Section 7.3.1, which is greater than or equal to 3.5 metres.

Should however sole access to a property be provided along a roadway less than 3.5 metres, which does not permit the safe passage of the emergency vehicle, then the following shall apply:

- The length of the narrow road should not be any greater than 70 metres to the centroid of the furthest allotment with a fire hydrant provided within 20 metres of the start of the narrow road.
The rationale behind this distance is provided as follows:

- The effective length of hose between the fire appliance and the hydrant is considered to be 20 metres. This length pertains to a theoretical 10 metre obstruction and the fact that 10 metres is generally a safe working distance for a fire brigade appliance to work from;
- The standard length of hose from the fire appliance is 30 metres of which 2 hose lengths can be used; and
- An effective water stream length is regarded as 10 metres.

A typical example of this set up is shown in Figure 6.1.

![Figure 6.1: Hose Setup](source: Australian Standard Fire Hydrant Installations AS2419.1-2005)

**Access to Long Lots - 2 storeys or less than 9 metres effective height**

Where a lot is sufficiently long that the allotment centroid is located greater than 70 metres from the road frontage, then access to the property must be gained in order to have access to a fire. For sufficient water provisions, a street fire hydrant must also be located within 20 metres of where the fire appliance will park.

In total, this situation requires a hydrant to be provided within 90 metres of the allotment centroid and access for fire appliances to within 70 metres of the allotment centroid.

To provide sufficient access, an all weather access way must be provided that will be of a standard and strength to permit access without vertical encumbrances with following dimensions:

- An all weather access way must be at least 3.5 metres wide, with a vertical clearance free from encumbrances of 4.2 metres; and
  
  **Note:** In this circumstance, a safe working area clear of encumbrances must be provided and be at least 5.4 metres wide and 10 metres long.

- All access ways will be capable of carrying an emergency vehicle of 17 tonnes; and
- The maximum grade must not exceed 1 in 8 (12.5%) except where topography makes it impractical to keep below this grade, and then an absolute maximum of 1 in 5 (20%) will be possible for up to 50 metres in distance.
The rationale behind these requirements are similar to ‘Narrow Road Access to a Dwelling’ with 20 metres of hose length being the maximum distance between the hydrant and fire appliance and a further 60 metres of hose length with a 10 metre water spray distance from the fire appliance to the point of fire.

Similarly should a 3.5 metre wide access way be provided to within close proximity of the building, then the opportunity to get water onto the fire faster is increased with the ability to use the high pressure hose reel from the emergency vehicle.

6.4 Commercial Buildings

The access requirements for commercial buildings are somewhat varied depending on the size, contents and type of building.

The access requirements for commercial buildings is set out in a similar manner to that in Section 6.3 however consideration will also be given to ‘Large Isolated Buildings’.

It is recognised that the contents of commercial buildings will vary and may contain materials or equipment that will significantly increase the risk of fire to a building or the severity of damage should a fire occur within a building.

In this instance it is recommended that advice be sought from the MFB’s ‘Structural Fire Safety Department’ for more specific access requirements to allow efficient and effective access to the development in the event of a fire, for buildings containing materials which increase the risk or severity of a fire.

6.4.1 Commercial Buildings - 2 storeys or less than 9 metres effective height

Commercial buildings of 2 storeys or less (Ground and First Floor) than 9 metres in height are required to provide typical access for a standard pumper appliance to the development.

In order to provide access for standard pumper appliances a minimum unobstructed road width of 3.5 metres is required to give access, to within 70 metres of the allotment centroid and 90 metres to the nearest fire hydrant.

Ladders are provided on these emergency vehicles which are of sufficient length to access these size buildings.

Should a building of this height however be classed as a ‘Large Isolated Building’ then the access arrangements of Section 6.4.2 shall apply.

Further consideration should be given to the access requirements of the building should materials be contained within a building, which would increase the risk of fire or the severity of damage likely to be caused by a fire.
6.4.2 Commercial Buildings - Large Isolated Buildings

Should any of the above commercial buildings fall into the category of a ‘Large Isolated Building’ (see below) then the access requirements for a commercial building detailed in Sections 6.4.1 and 6.5 will be overridden by those below.

The definition of a ‘Large Isolated Building’ is set out within the BCA. Reference should be made to the BCA to determine whether a building as a large isolated building. The criteria to determine this is summarised as follows:

*Should the size of a fire compartment or atrium in a Class 5, 6, 7, 8 or 9 building exceed the relevant maximum floor area or the relevant maximum volume set out in Table C2.2 (reproduced in Table 6.1) and Clause C2.5 of the BCA, then the building is deemed to be a ‘Large Isolated Building’.*

In all cases, the details of the BCA should be addressed to establish applicability.

### TABLE 6.1: BUILDING CODE OF AUSTRALIA TABLE C2.2

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type of Construction of Building</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type A</td>
</tr>
<tr>
<td>5, 9b or 9c aged care building</td>
<td>max floor area</td>
</tr>
<tr>
<td></td>
<td>max volume</td>
</tr>
<tr>
<td>6, 7, 8 or 9a (except for patient care areas)</td>
<td>max floor area</td>
</tr>
<tr>
<td></td>
<td>max volume</td>
</tr>
</tbody>
</table>

Note: See C2.5 for maximum size of compartments in patient care areas in Class 9a health care buildings.

In the instance of a ‘Large Isolated Building’ the following access requirements may apply:

(i) Must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and

(ii) Must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and

(iii) Must provide reasonable pedestrian access from the vehicular access to the building; and

(iv) Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and

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1 Source: Building Code of Australia 2006
(v) Must be wholly within the allotment except that a public road complying with (i), (ii), (iii) and (iv) may serve as the vehicular access or part thereof.

(vi) An unobstructed height clearance of 4.2 metres should be provided along the road, with a further lateral clearance of 2 metres from any overhead obstruction where a ladder type appliance is to be operated (Refer to Figure 6.2);

(vii) The access road must provide a weight bearing capacity suitable to cater for the operation of emergency vehicles;

(viii) The grading of any roadways or ramps within a site required to provide access for emergency vehicles should be designed in accordance with the Australian Standard, Parking Facilities Part 2: Off-street commercial vehicles facilities AS2890.2-2002; and

(ix) Should the surrounding road network meet the above requirements then the public road can be classed as being part of the vehicular access for the site.

Figure 6.2: Required Unobstructed Clearances

The rationale behind these access requirements has been guided by the BCA.

6.5 General Requirements

6.5.1 Buildings Greater than Two Stories and Less than 20 metres Effective Height

Buildings less than 20 metres in height but greater than two stories may be required to be fought from the outside of the building due to the unpredictability or lack of fire resistance and fire services provided within the given building. For that reason the standard fire appliance used in this type of building is significantly different to that for a two storey or less dwelling.
The minimum vehicular requirements for a fire occurrence within a building of this nature include a pumper tanker appliance as well as a ladder platform appliance.

A ladder platform appliance requires additional working width on a stable and sufficiently designed surface to cater for stabilising legs or jacks, with each of these jacks having a width of 1.45 metres. The ladder appliance is 2.5 meters wide and a further lateral clearance of 2 metres is required to any overhead obstructions prior to the use of a ladder platform appliance.

As the ladder platform appliance can also utilise the road network adjacent to the building allotments, road access to developments within this category should always be provided via an access road of 3.5 metres minimum width with an additional 2.9 metres available for the use of stabilising legs on a ladder platform type emergency vehicle.

In addition to the above, to enable a ladder platform appliance to get close enough to the building to gain sufficient ladder access, the building itself should not be set back by a distance greater than 16 metres from a hard stand surface suitable for use by a the ladder platform appliance.

If the building is set back by a distance greater than 16 metres from a hard stand surface provided as part of the adjacent road network, then a hardstand surface should be provided on site within 16 metres of the building however not closer than 10 metres.

The grading of any roadways or ramps within a site required to provide access for emergency vehicles should be designed in accordance with the Australian Standard, Parking Facilities Part 2: Off-street commercial vehicles facilities AS2890.2-2002.

Any on-site hardstand surface needs to be suitable to cater for a ladder platform appliance as described above.

6.5.2 Buildings Greater than 20 metres but Less than 25 metres Effective Height

The method of fighting fires at or within buildings matching this criteria often require the use of both a ladder platform and a standard pumper appliance. Whilst it is not uncommon for buildings of this size to be afforded sprinkler protection or a second fire isolated stair case, buildings of this size generally can be expected to include measures to restrict fire spread through the implementation of passive fire protection measures (e.g. fire rated walls, floors and spandrels etc.) and effective fire brigade intervention measures. Regardless, fire fighting may be required to undertaken external from the building.

As discussed in previous Sections of this guideline, a ladder platform appliance requires additional working width on a stable and sufficiently designed surface to cater for stabilising legs or jacks, with each of these jacks having a width of 1.45 metres. As the ladder appliance is 2.5 meters wide, a further lateral clearance of 2 metres is required to be established from any overhead obstructions prior to the use of a ladder platform appliance.

The ladder platform appliance must utilise the road network adjacent to the building allotment, therefore road access networks to buildings within this category should be of 3.5 metres minimum width with an additional 2.9 metres available for the use of stabilising legs on a ladder platform type vehicle.
In addition to the above, to enable a ladder platform appliance to get close enough to the building to gain sufficient ladder access, the building should not be set back more than 10 metres from a hard stand surface suitable for use by a the ladder platform appliance.

If the building is set back by a distance greater than 10 metres from a hard stand surface provided as part of the adjacent road network, then a hardstand surface should be provided on-site within 10 metres of the building.

The grading of any roadways or ramps within a site required to provide access for emergency vehicles should be designed in accordance with the Australian Standard, Parking Facilities Part 2: Off-street commercial vehicles facilities AS 2890.2-2002.

Any on-site hardstand surface needs to be suitable to cater for a ladder platform appliance as described above.

### 6.5.3 Buildings Greater than 25 metres Effective Height

The method of fighting fires again changes for buildings with an effective height greater than 25m. Generally, buildings of this effective height will incorporate an automatic fire sprinkler system which may enable fires to be fought from an internal position.

As a result, the requirements for emergency vehicles are reduced with ladder platform type vehicles typically no longer required. Standard pumper type appliances will be typically required to attend fires at such sites. Therefore access to these types of buildings must provide a minimum road width of 3.5m to allow sufficient access for standard pumper vehicles.

However, it must be recognised that the internal conditions may exceed the limitations for safe or effective fire fighting, and therefore, the fire must be fought externally. It is often very difficult for buildings with an effective height greater than 20–25 metres to be fought effectively from the outside.

This is the case for the following reasons:

- The appliance set up area is often affected by the width of the footpath and nature strip and a car potentially parked in front of the building;
- On this basis, if a 16 metre wide obstruction has been placed in front of a building (which may consist of footpath and nature strip, parked vehicle, 2 metres lateral clearance and any set back of a building from the site frontage) then the effective length of a 30 metre ladder is reduced to 25 metres;
- Furthermore if a wind speed within a particular area is significant, the safe working height of the ladder platform must be reduced, therefore a factor of safety (20%) should also be included;
- The above reduces the effective fire fighting height of a building to approximately 20 metres.

The above considerations only further demonstrate the importance of a professional assessment of the likely fire conditions upon arrival at a fire incident and must be specific to the particular building. Fire fighters must be given a reasonable period of time to enter a building, to conduct occupant search and rescue activities, carry out containment and extinguishment operations, before the conditions within the building are likely to threaten their safety and prior to the collapse of the building (mitigation of unexpected catastrophic failure). Any assessment should be undertaken in accordance with the International Fire
7. ROAD NETWORK DESIGN

7.1.1 Objectives for Access

The road network is a key component in providing access to a site of an emergency for fire and ambulance vehicles. The method of access for emergency vehicles to a site is designed upon first travelling as far as possible using the highest order roads gradually using lower order roads as the emergency vehicle gets closer to the site.

The order of roads as typically used for access is summarised as follows:

- Primary Arterial Road;
- Secondary Arterial Road;
- Collector Roads;
- Access Streets; and
- Laneways.

The design and management of these roads plays a large role in the response time of emergency services to a site of emergency. In particular the design of arterial roads is critical given that these are the preferred road types for emergency vehicles to travel along for as long as possible through their journey.

7.1.2 Arterial Road Access and Management

The response time of an emergency vehicle to a site is most efficient where travel paths are predominantly via arterial road networks. The following recommendations are provided in the interest of maximising efficient travel via arterial road networks:

- It is recognised that where a centre median is not provided along an arterial road, emergency vehicles have the ability even when congested to divide the traffic lanes to make their way through the traffic, however this is significantly reduced once traffic lanes are bounded by solid kerbing or barriers preventing the traffic from moving out of the way of emergency vehicles;
- The centre median of an arterial road should not obstruct the ability for emergency vehicles to cross and travel along the opposite side of the road. In this regard, bollards or trees should be sufficiently spaced (or not used) to allow easy access for emergency vehicles to cross the centre median to travel along the opposite carriageway;
- The centre median should also provide the opportunity for emergency vehicles to straddle the median and carriageway to enable travel along a congested road. The centre median is therefore required to be sufficiently low and unobstructed;
- Where only a single lane is provided along a road or car parking occupies the left hand lane, provision should be provided to allow for emergency vehicles to travel along the opposite side of the road.
• In the instance of a centre median being provided along an arterial road where no provision is made for emergency vehicles to cross to the opposite side or it is not considered to be appropriate, then an emergency vehicle lane or similar should be provided along the left hand edge of the carriageway.

• Tram stops located opposite each other can form a significant barrier for emergency vehicles when travelling along arterial roads. As a result it is recommended that tram stops be staggered along arterial roads to ensure that these stationary vehicles do not block the entire carriageway and therefore restrict the movements of emergency vehicles;

• Should trams utilise rails within the centre median of a carriageway for their operation (but without a trafficable pavement), this area should be made accessible and available for use by emergency vehicles as this provides an effective and efficient travel location for emergency vehicles and avoid other cars. In addition, a trafficable passing area for emergency vehicles should be provided at intervals along the tramline to allow emergency vehicles to pass trams when using this route; and

• Arterial roads should provide a minimum height clearance of 4.2 metres to allow for the passage of emergency vehicles.

7.2 Local Road Design

7.2.1 Carriageway Design

7.2.2 Carriageway Widths and Parking

The following dimensions are recommended as minimum carriageway widths, to allow emergency vehicles to safely travel along local roads and maintain adequate clearance from parked vehicles.

Road designs must take into consideration the size of the emergency vehicles as well as the regular vehicles parked along the side of the road. Emergency vehicles generally do not exceed a width of 2.5 metres (excluding mirrors) however adequate clearance to stationary vehicles and human error also need to be accounted for within any road designs i.e. ability of regular vehicle drivers to successfully park against the kerb and also the ability of drivers of emergency vehicles.

The minimum carriageway widths have been determined in Table 7.1 based on the level of parking which is to be expected along the carriageway. It is noted that all carriageways are required to provide a minimum height clearance to overhead obstructions of 4.2 metres.
### Table 7.1: Carriageway Widths Based on On-Street Parking Requirement

<table>
<thead>
<tr>
<th>PARKING TYPE</th>
<th>PREFERRED CARRIAGEWAY WIDTH</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Sides of carriageway</td>
<td>8.1m</td>
<td>This carriageway width provides for a 2.3m wide parking lane on each side of the carriageway and provides a 3.5m wide centre lane for emergency vehicle movements.</td>
</tr>
<tr>
<td>One side of carriageway</td>
<td>5.8m</td>
<td>This carriageway width provides for a 2.3m wide parking lane on one side of the carriageway and provides a 3.5m wide lane for emergency vehicle movements.</td>
</tr>
<tr>
<td>No Parking along carriageway</td>
<td>3.5m</td>
<td>It is strongly recommended that any access road within a subdivision of a size any less than 3.5m be a secondary access to property with primary access provided via a roadway greater than or equal to 3.5m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the event that sole access to a property be provided along a roadway less than 3.5m which does not permit the access of a fire appliance, then the length of the laneway should not be any greater than 70m to the allotment centroid with a fire hydrant provided within 20m of the start of the narrow road.</td>
</tr>
</tbody>
</table>

Translating the above carriageway width requirements to the residential road hierarchy stipulated within Standard C25 Table C6 of Clause 56.07-4 of the Victorian Planning Schemes, Table C6 has been reproduced in Table 7.2 to show the recommended carriageway widths to cater for emergency vehicles.
TABLE 7.2: AMENDED TABLE C6 FROM CLAUSE 56.07-4

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Lane</td>
<td>3 or 3.5 – 8m [2]</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Access Place</td>
<td>3.5m [3] or 5m</td>
<td>Any car parking should be indented</td>
<td>Total width 7m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For services 3.5m, on one side, 2.5m on the other</td>
</tr>
<tr>
<td>Access Street</td>
<td>5 – 5m</td>
<td>Indented to leave a minimum 3.5 clear carriageway Carriageway</td>
<td>4m minimum each side</td>
</tr>
<tr>
<td></td>
<td>5.8m or 8.1m [4]</td>
<td></td>
<td>4.5m minimum each side</td>
</tr>
<tr>
<td>Collector Street</td>
<td>6 – 6.5m</td>
<td>Indented to leave 6m minimum clear carriageway Carriageway</td>
<td>4.5m minimum each side with adequate road reserve width for widening for future bus route if required.</td>
</tr>
<tr>
<td></td>
<td>8.1m</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At bus stops avoid vehicles overtaking a bus when passengers are alighting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trunk Collector Street</td>
<td>2 x 3.5m</td>
<td>Parking not permitted on minimum width carriageways If required parking should be provided on a 5.5m carriageway in parking locations that allow cars to exit in a forward direction and includes parallel parking</td>
<td>6m minimum each side</td>
</tr>
<tr>
<td></td>
<td>2 x 5.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dual carriageway plus median. Bus bays to be indented</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1] The maximum width within the range should be used when bus use is anticipated or when upright kerbs are used.
Width is measured from kerb invert to invert. Widening may be required at bends to allow for wider vehicle paths (using Australian Standard AS2890.5-1993, Parking Facilities: On-street parking and Australian Standard AS2890.2-2002, Parking Facilities: Off-street parking – Commercial vehicle facilities), but should not negate the function of bends serving as slow points.

[2] Width will be determined by requirements for access to off street parking. If this lane provides sole access to a lot then a minimum width of 3.5m should apply.
Edge of Carriageway Kerbing Design

To provide emergency vehicles with the ability to mount the kerbing along the edge of a carriageway, it is recommended that semi mountable kerbing is incorporated within the design of the local road network. The use of this type of kerbing permits emergency vehicles to mount the kerb and utilise the nature strip as an extension to the road width if vehicle parking or other obstructions are present. This measure should increase the ability for emergency vehicles to effectively navigate the local street network and gain efficient and effective access to properties.

The typical semi mountable kerb is shown below in Figure 7.1.

![Semi Mountable Kerb](image)

**FIGURE 7.1: TYPICAL SEMI MOUNTABLE KERB**

Road Grades

It is recommended that road grades on local streets are designed in accordance with the current version of VicRoads, Road Design Guidelines, with the longitudinal gradient of local streets not exceeding a grade of 9% (1:11).

Should the topography of an area be constrained such that the above grades recommended by VicRoads can not be met, then a grade of up to 20% can be adopted.
along access streets and 15% on all other streets in accordance with Clause 56.07-3 of the Planning Scheme.

Under no circumstances should road grades exceed that stipulated within the Planning Scheme.

**Turning Bays**

Cul de Sacs must provide sufficient treatment at their end to cater for the turning movements of an emergency vehicle and the allowance for all vehicles to exit the roadway in a forwards direction.

Turning treatments may consist typically of a court bowl or hammerhead treatment and these should be designed to meet the turning needs of a standard pumper type appliance, which has the maximum dimensions of:

- Height – 3.26 metres;
- Length – 8.75 metres;
- Width – 2.5 metres; and
- Turning Circle (kerb to kerb) – 19.80 metres

It is noted that an emergency vehicle may utilise the nature strip and / or lot driveways to sufficiently manoeuvre around a stationary vehicle to exit in a forward direction. However should the nature strip be intended to be used by all turning vehicles, a suitable mountable kerbing must be provided.

The design of a typical court bowl and hammerhead treatment is provided in Appendix C.

**Road Treatments and Traffic Control Devices**

Traffic control devices and road treatments can take a number of forms. Some examples of these treatments include:

- Roundabouts;
- Slow Points;
- Road (Speed) Humps;
- Modified T-Intersections;
- Threshold Treatments; and
- Splitter Islands.

These typical types of treatments are shown in Figures 7.2 – 7.6.
FIGURE 7.2: TYPICAL ROUNDBOUT TREATMENT

FIGURE 7.3: TYPICAL SLOW POINT
FIGURE 7.4: TYPICAL SLOW POINT

FIGURE 7.5: TYPICAL SPEED HUMP
In the design of traffic management devices, it is recognised that these are often used to decrease traffic speeds along local roads and increase the safety and traffic flow along these roads. However, traffic management devices often slow and impede the ability of emergency vehicles to reach their destination resulting in increased response times.

To reduce the impact on emergency vehicle response times, the following recommendations are made for the design of traffic management devices:

- All road treatments, traffic management devices and intersection treatments within a residential subdivision should be designed to allow for the movement of Standard Pumper Tanker type appliance through the device. This emergency vehicle type has the following dimensions with further information contained within reference [3]:
  - Height – 3.26 metres;
  - Length – 8.75 metres;
  - Width – 2.5 metres; and
  - Turning Circle (kerb to kerb) – 19.80 metres

- A mountable kerbing should be provided to allow for mounting of the device by the emergency vehicle where adequate carriageway width is not available to allow for the movements of emergency vehicles. Mountable kerbing should be designed with the following characteristics to ensure the ability to mount a device is maintained for emergency vehicles:
  - A mountable kerbing should be used with a 30 – 40mm bull nose when it is likely that an emergency vehicle will have to mount a traffic control device. The bull nose of 30 – 40mm should be sufficient to keep general motorists off the device. A typical mountable kerb on a traffic device is shown in Figure 7.7.
Planning Guidelines for Emergency Vehicle Access and Minimum Water Supplies within the Metropolitan Fire District

- A sufficient clear, hardstand area on the traffic device must also be provided to allow for the movement of emergency vehicles over the device without its path being impeded by signage or trees.

- It is noted that emergency vehicles may traverse to the opposite side of the road to which the vehicle is travelling to navigate a traffic management device. This can be considered in the design of traffic management devices where sufficient carriageway width is not available.

Figures 7.2, 7.3 and 7.4 provide some good examples of traffic management treatments. The design is considerate of mountable areas for emergency vehicle movement and also maintains a treatment which will discourage the mounting of the treatment by general motorists.

![Mountable Kerb on Traffic Device](image.png)

**FIGURE 7.7: TYPICAL MOUNTABLE KERB ON TRAFFIC DEVICE**

The use of speed humps from a traffic engineering design perspective should be limited to access streets or other roads lower within the road hierarchy, which will ensure that emergency vehicles can only meet these devices in the final stages of their journey to a site.

The use of speed humps as traffic management devices is however strongly discouraged from an emergency services perspective for the following reasons:

- Speeds humps cause damage to the suspension systems of emergency vehicles; and
- Speed humps are undesirable for ambulance travel particularly if carrying a patient with back or spinal injuries.

Local Area Traffic Management treatment should be avoided. All other possible options should be considered to treat the issue.
8. ALTERNATIVE DESIGNS AND PRESCRIPTIVE COMPLIANCE

If any of the conditions referred to in this guideline cannot be met, alternative design proposals must be referred to and approved by the Chief Officer of the Metropolitan Fire and Emergency Services.

Where designs have been assessed and demonstrate compliance with the prescriptive criteria of this guideline, a written statement of compliance must be obtained. An accredited independent civil engineer who has a National Engineering Registration Board registration, must be engaged to provide the statement of compliance and must also indicate that the road network and fire hydrant spacing design has been assessed and complies with the prescriptive criteria of GL-27. A sample statement of compliance is contained within Section 12 – Appendix B.

Note: For the purpose of this guideline, a reference to an independent civil engineer is deemed to be a reference to a civil engineer who neither designed the road network nor the public fire hydrant infrastructure.

9. ACKNOWLEDGEMENTS

The Fire Safety Directorate of the Metropolitan Fire and Emergency Services wish to acknowledge the contribution of GTA Consultants in the compilation of this guideline.

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Email: gta@gta.com.au
10. REFERENCES

In preparing this guideline, reference has been made to a number of background documents, including:


[2] City of Darebin Planning Scheme;


[8] The Victorian Building Regulation 2006;

[9] Various technical data as referenced in this report;


[12] Planning and Environment Act 1913;


Appendix A – Court Bowl and Hammerhead Road Treatments
FIGURE A1: TYPICAL COURT BOWL TREATMENT
Appendix B – Statement of Compliance

STATEMENT OF COMPLIANCE

To
Planning Manager
Relevant Municipality
Postal address & Post code

Copy To
Commander
Structural Fire Safety
Metropolitan Fire and Emergency Services Board
450 Burnley Street
RICHMOND VIC 3121

From
Name of Engineer
NPER Registration Number:
Area of Practice: CIVIL
Postal address & Post code

Property Details
Number
Lot/s
Folio
Parish

Street/road
LP/PS
Crown allotment
County

City/suburb/town
Volume
Section
Municipal District

Compliance
The part of the design described as:

<INSERT RELEVANT DESCRIPTION>

complies with the following provisions of the Metropolitan Fire and Emergency Services Board guideline GL-27 ‘Planning Guidelines for Emergency Vehicle Access and Minimum Water Supplies within the Metropolitan Fire District’.

(a) Provision of Street Hydrants*
(b) Road Network Design*
*Delete whichever is not applicable

**Design documents**
Drawing Numbers:
Prepared by:
Date:

**Signature**
NPER Registration Number:
Signed:
Date: