ACT Government

TRAFFIC CONTROL DEVICES

MUNICIPAL INFRASTRUCTURE STANDARDS 13

City and Environment Directorate

JUNE 2026

Machinery of Government changes: On 1 July 2025, administrative arrangements were made to establish the City and Environment Directorate (CED). As of the date of publication of this document, the transition from Transport and Canberra City Services (TCCS) to CED, including updates to internal organisational structure, are yet to be finalised. References in this document to the organisation TCCS are to mean CED.

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Revision Register

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1/0	–	First release	Ken Marshall	April 2019
1/1	N/A	Acknowledgement of Country added	Shelly Fraser	September 2021
	1.1.2.2	WHS Act added		
	1.1.2.3	Reference to Attachment B and drafting standard removed		
	1.1.3.1	*AS 4049*, *AS 1158* and *AS 60598* added Austroads references consolidated.		

Edition/ Revision Number	Clause Number	Description of Revision	Authorised By	Date
	1.2.2.1	Requirements for Works Approval added		
	2.5.2.1	Arrows for lane discipline removed		
	2.5.2.2	Flush medians changed to chevrons at islands and medians and gores changed to traffic islands		
	2.7.1	Priority path network and type of path noted as main determinant in crossing type		
	2.7.2	Reference to the *GRSTMAS* removed		
	2.9	Reference to *MIS 13* removed and AS references specified		
	3.1	Duplicate reference to *AS 1742.2* removed		
	3.2	Special sign code to be assigned by TMS added		
	3.3.1, 3.3.2, 3.3.3, 3.3.4	Document restructured with these sections becoming 3.4, 3.5, 3.6 and 3.7		
1/2	All	Minor amendments to align with structure and layout of Municipal Infrastructure Standards documents, that are non-technical in nature	Tim Rampton	June 2026
	1.1.3	Referenced documents, including standards and guidelines, updated		
	1.1.5, 2.6.6, 2.7.1	Minor updates to abbreviations and references		
	2.6.5	Update to criteria for Keep clear zones to align with *AS 1742.2*		
	2.9	Update to standard drawing references and light requirements		

Edition/ Revision Number	Clause Number	Description of Revision	Authorised By	Date
	2.9.1	New section added which contains design guidance on selection criteria and suitability of different types of vertical deflection devices		
	2.9.2	Amended to provide additional design requirements and design considerations for raised pavement platforms and road humps		
	2.9.2.1	Amended to provide additional design requirements and design considerations for concrete raised pavement platforms		
	2.9.2.2	Amended to provide additional design requirements and design considerations for asphaltic concrete road humps		
	2.9.3	New section added which outlines design requirements and design considerations for asphaltic concrete road cushions		
	2.9.4	New section added which outlines design requirements and design considerations for asphaltic concrete car park humps		
	2.9.5	New section added which outlines pavement design requirements for vertical deflection devices		

ACKNOWLEDGEMENT OF COUNTRY

City and Environment Directorate (CED) acknowledges that Aboriginal people are the Traditional Owners of Australia. We acknowledge and pay respect to the Ngunnawal people as the custodians of the land and waters that we live and thrive on today and recognise any other people or families with connection to the lands of the ACT and region.

CED acknowledges that Canberra's cultural and natural heritage was maintained by the Traditional Custodians for many generations before colonial settlement on Australian soil. Aboriginal people's management of the land preserved the natural balance of local plants and animals. This knowledge of the environment in which we live is critical to the protection and restoration of our land today.

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1.1 General

1.1.1 Responsibilities

1.1.1.1 Objectives

General: Provide Traffic Control Devices (TCD) for regulatory and warning signposting road marking and traffic signals to ACT Australian Road Rules and the appropriate Australian Standards.

1.1.1.2 Precedence

Requirement: Where any document except legislation or the *Territory Plan* issued referenced in this Design Standard includes technical requirements that conflict with this Design Standard, consult with the service authority and TCCS for clarification.

1.1.2 Cross references

1.1.2.1 Commonwealth Legislation

The following Commonwealth legislation is relevant to this Standard:

Disability Discrimination Act (Cth)

1.1.2.2 ACT Legislation

The following ACT legislation is relevant to this Standard:

Road Transport (Safety and Traffic Management) Act (ACT)

Road Transport (General) Act (ACT)

Territory Plan (ACT)

Work Health and Safety Act (ACT)

1.1.2.3 Design Standards

This Design Standard references the following component standards:

MIS 05 Active Travel Facilities Design

MIS 08 Stormwater

MIS 09 Bridges and Related Structures

MIS 12 Guide Signs

MIS 14 Public Lighting

1.1.2.4 TCCS Reference Documents

Reference document 6 Requirements for Design Acceptance Submissions

Reference document 11 Drafting Requirements for Summary Drawings

1.1.2.5 Policy and guidelines

Requirement: All Traffic Control Devices in the ACT must be consistent with and not contradict in any way the intent or requirements of the:

Australian Road Rules, Road Transport (Safety and Traffic Management) Regulation

1.1.3 Referenced documents[1]

General: The following documents are incorporated into this Design Standard by reference:

1.1.3.1 Australian Standards

AS 1158	Lighting for roads and public spaces (Set)
AS/NZS 1428	Design for access and mobility (Set)
AS 1742	Manual of uniform traffic control devices (Set)
AS 1743	Road signs – Specifications
AS 1744	Standard alphabets for road signs
AS/NZS 1906	Retroreflective materials and devices for road traffic control purposes (Set)
AS 2144	Traffic signal lanterns
AS/NZS 2276.1	Cables for traffic signal installations: Part 1: Multicore power cables
AS/NZS 2276.2	Cables for traffic signal installations: Part 2: Feeder cable for vehicle detectors
AS/NZS 2276.3	Cables for traffic signal installations: Part 3: Loop cable for vehicle detectors
AS 2339	Traffic signal posts, mast arms and attachments
AS 2353	Pedestrian push-button assemblies
AS 2578	Traffic signal controllers
AS 2703	Vehicle detector systems
AS 2890	Parking facilities (Set)
AS 2979	Traffic signal mast arms
AS 4049.1	Paints and related materials – Pavement marking materials: Part 1: Solvent-borne paint – For use with surface applied glass beads
AS 4113.2	Traffic signal lamps: Part 2: Lamps for a.c. operation at extra-low voltage
AS 4852.1	Variable message signs: Part 1: Fixed signs
AS 60598	Luminaires (Set)

Austroads

AGRD	Austroads Guide to Road Design (Set)
AGTM	Austroads Guide to Traffic Management (Parts 1–13)
AP-R642-20	Austroads Research Report 'Effectiveness and Implementation of Raised Safety Platforms'

Other publications

Design Guide for Roadside Signs, Queensland Department of Transport and Main Roads
(now incorporated into *Traffic and Road Use Management: Volume 3 – Signing and Pavement Marking: Part 5: Design Guide for Roadside Signs*)

GRSTMAS	ACT Guidelines for Road Safety and Traffic Management around Schools
RMS TSD	RMS Traffic signal design RMS Publication 08-092
RDN 03-07	Vicroads Road Design Note 'Raised Safety Platforms (RSPs)'

[1] Not all the documents are specifically referenced in the body of this Standard. However, they may be relied upon depending on the nature of the Works.

1.1.4 Standards

1.1.4.1 General

Design: *AS 1742 (Set)*. In order of precedence *ACTSD, ACT GRSTMAS, AGTM06, AGTM08, AGTM10*.

Proprietary products: To *TCCS Products previously considered for use list*.

1.1.5 Interpretation

1.1.5.1 Abbreviations

ACTSD	ACT Standard Drawings
CED	City and Environment Directorate
CPM	Ceramic Pavement Marker
LLM	Long Life Material
RMS	Roads and Maritime Service (now referred to as Transport for New South Wales)
RRPM	Retroreflective Raised Pavement Marker
TCCS	Transport Canberra and City Services Directorate, ACT Government and its successors (including City and Environment Directorate)
TfNSW	Transport for New South Wales
TTM	Temporary Traffic Management

1.2 Pre-design planning

1.2.1 Planning

1.2.1.1 Standard Details

General: The ACTSD provide guidance to designers through typical details. Typical details are a guide only and designers must modify details as appropriate with appropriate engineering judgement to suit individual requirements.

1.2.1.2 Material selection and performance

General: A structurally sound sign is considered to have reached the end of its useful life when it is illegible at night. For road markings the prime factor is the maintenance of appropriate surface friction and reflectivity, particularly during wet and dark conditions.

Requirement: Materials that provide minimum whole of life cost are to be used wherever possible. The prime factor in determining appropriate materials is the visibility and legibility provided by the material in all lighting conditions.

1.2.2 Consultation

1.2.2.1 TCCS and other Authorities

General: Consult with TCCS and other relevant Authorities during the preparation of the design of Traffic Control Devices. For work in the National Land (National Triangle) and Designated Land (major corridor entries to the ACT such as Barton Highway or Federal Highway) a Works Approval is required by the National Capital Authority (NCA).

1.2.2.2 Safety in Design

Requirement: Implement safety in design processes in accordance with the *Work Health and Safety Act*.

2 ROAD PAVEMENT MARKINGS AND RETROREFLECTIVE MARKERS

2.1 Lines

General: To *AS 1428.2, AS 1742.9, AS 1742.10, AS 1742.11, AS 1742.13* and *AS 4049.1*.

Requirements: Line types for use in the ACT are to conform with *ACTSD-3501* and in various arrangements on roads as detailed in the relevant ACTSD as referred in this Design Standard.

2.2 Retroreflective raised pavement markers (RRPMs)

Design: RRPMs are used to supplement linemarking for delineation on roads at night, in fog and other inclement weather conditions. RRPMs are to be installed in conjunction with linemarking for the line types as shown on *ACTSD-3501* and in various arrangements on roads as detailed in the relevant ACTSD as referred in this Design Standard.

Requirements:

> RRPMs are to be uni-directional or bi-directional and of appropriate colour for the line type or purpose as detailed on *ACTSD-3501*.

> RRPMs are also used to mark services and provide delineation of islands, flush medians and crossings, and are to be arranged as shown on the ACTSD. RRPM colour will vary depending on the side of use of the adjacent traffic lane. RRPM colours and positioning for various applications are detailed as follows:

- Flush median islands and gores – refer to *ACTSD-3502*.
- Traffic islands – refer to *ACTSD-3503*.

> RRPMs may be used in some instances to guide traffic or encourage lane conformance in configurations not shown on the ACTSD. This may include installation of RRPMs adjacent to edge lines on curves at intersections to discourage vehicles from cutting into a marked shoulder or bicycle lane. Use of RRPMs in arrangements not shown on the ACTSD can only be implemented with the approval of the Road Authority.

2.3 Ceramic pavement markers (CPMs)

Requirement: CPMs are no longer used in the ACT and are not to be replaced. Use of the appropriate linemarking as shown on *ACTSD-3501* is to be implemented to replace existing CPMs whenever maintenance or new work is undertaken.

2.4 Linemarking in carparks

General: Parking lines are generally white except yellow is used to facilitate identification of special zones and may be used in off street carparks with a light background e.g. light grey concrete, refer to **Special zones** for details.

Requirement: Linemarking for on and off-street parking is to be in accordance with *AS 2890 (Set)* with line types as shown on *ACTSD-3501.*

2.5 Pavement messages

2.5.1 Messages

Design: Pavement message words and arrangements are to be in accordance with *AS 1742.2, ACTSD-3520* to *ACTSD-3521* and *ACTSD-3523.*

Requirements:

> For messages installed on roads with speed zone of 80km/h or less, markings are to be 3,000mm high unless approved by the Road Authority or otherwise detailed.

> The following pavement messages may be used in the ACT in addition to those in *AS 1742.2.* With the exception of the FORM ONE LANE message the messages should only be used in special circumstances e.g. poor sight distance and may only be used with approval by the Road Authority:

- END
- FORM ONE LANE (refer to *ACTSD-3521* for details and arrangements)
- GIVE WAY
- KEEP CLEAR
- LANE
- ONLY
- PED X
- SCHOOL
- SCHOOL X
- SLOW
- STOP.

2.5.2 Symbols

2.5.2.1 Arrows

Design: Arrows are to be installed for guidance on the pavement at intersections or trapped lanes and in advance of lane changes. Marking of arrows is not required when vehicle movements are permitted by regulations. Arrows are also installed on the pavement in association with cycle facilities.

Requirements:

> Arrows in advance of intersections are to be in accordance with those shown on *ACTSD-3520* and positioned as follows:

- Traffic signals – refer to *ACTSD-3540.*
- Roundabouts – refer to *ACTSD-3541*.

> Arrows in advance of lane change or trapped lanes are to be installed in accordance with those shown on *ACTSD-3520.*

2.5.2.2 Walking and cycling facilities arrows and symbols

Design: Walking and cycling symbols for use on roads and paths are to be in accordance with those shown on *ACTSD-3522* to *ACTSD-3524.*

Requirements: Refer to *MIS 05 Active Travel Facilities Design* and ACTSD-0500 series for detail on the use of walking and cycling arrows and symbols on roads and paths.

A new suite of design components for active travel associated with the principal community cycling routes (CBR routes) has been developed and details for signposting of these routes are provided in *ACTSD-0575*.

Design: Diagonal markings and chevrons are applied to areas of pavement which are not generally intended for use by moving vehicles. Diagonal markings are used where all traffic must pass to one side (normally the left) of the marking and chevrons are used where traffic may pass to either side of the marking travelling in the same direction.

Requirements:

> Chevrons at islands and medians – refer to *ACTSD-3502* for details.
> Traffic islands – refer to *ACTSD-3503* for details.
> Refuge islands – refer to *ACTSD-3504* for details.

2.5.3 White gore paint

Design: White gore paint (waterborne paint with glass beads) is to be applied to all island noses facing approaching traffic and pedestrian islands under certain circumstances.

Requirements:

> White gore paint is to be applied on the radius between tangent points of all traffic and pedestrian island noses facing traffic. Refer to *ACTSD-3502* for details.
> For triangular traffic islands with kerb lengths less than 5.0m in length the full length of kerbs are to have white gore paint applied.
> For pedestrian islands and refuges with kerb lengths less than 10m in length the full length of kerbs are to have white gore paint applied.

2.6 Special zones

2.6.1 Bus stops

Design: Bus stops are to be marked with message and lines as detailed on *ACTSD-3510.*

Requirements:

> The marked bus stop length is dependent on the required bus storage and likelihood of vehicles regularly parking on the approach to the bus stop. If vehicles are likely to be regularly parked on the approach to the bus stop, then the obstructed approach dimension should be used. Refer to *ACTSD-3510* for design details.
> Bus stops are to be marked within the road pavement or through construction of laybys (preferably concrete) in consultation with the Road Authority.
> Bus stops are to be staggered when installed on the road pavement with the stagger arrangement dependant on the road type and width, taper length, sightlines and location of intersections, paths, driveways and other street furniture. Due to sight distance at pedestrians crossing facilities, bus stops should not be placed immediately downstream of the adjacent bus stop unless the stopped bus fully prevents cars from passing e.g. when adjacent to a refuge island.
> The requirement for a layby, shelter and seating and the types to be provided are to be agreed with the Road Authority. The layby detailed on *ACTSD-3510* is suitable for use on roads with speed limits of 60km/h. Laybys on higher speed roads are to be designed in accordance with *AGRD03*. Ensure that buses entering and exiting any layby type do not cross the road dividing line.
> Due to sight distance requirements bus stops should not be placed immediately upstream of pedestrian crossing facilities unless the stopped bus fully prevents cars from passing e.g. when adjacent to a refuge island. The refuge island shall be of sufficient length that it is clearly visible to oncoming motorists and will discourage drivers from passing to the right of the island.

2.6.2 Accessible parking zones

Design: Accessible parking zones for users with a disability are to be marked with symbols and lines as detailed on *ACTSD-3511*. Refer to *AS 2890 (Set)* for kerb ramp requirements.

Requirements:

> Angle accessible parking shall be avoided unless absolutely necessary and shall be designed to the approval of the Road Authority.

2.6.3 Loading zones

Design: Loading zones are to be marked with message and lines as detailed on *ACTSD-3511*.

Requirements:

> The width of loading zones should allow for the most common goods vehicle likely at the particular location, they should generally be a minimum of 2.5m wide, 3.0m desirable.
> Linemarkings are to be yellow LLM (long life material).

2.6.4 Taxi ranks

Design: Taxi ranks are to be marked with message and lines as detailed on *ACTSD-3511*.

Requirements:

> The width of taxi ranks should provide for taxis to position as close to the kerb as possible, they should generally be 2.3m wide.
> Linemarkings are to be yellow LLM.

2.6.5 Keep clear

Design: Keep clear zones are marked within traffic lanes at intersections and shall only be used at locations permitted in *AS 1742.2, Clause 5.8.5* or as agreed by the Road Authority. Keep clear zones to be marked with message and lines as detailed on *ACTSD-3520.*

Requirements:

> Length to be as agreed with the Road Authority and is to allow continued use of intersections that may be obstructed by queuing traffic.
> Linemarkings are to be yellow LLM.

2.6.6 School zones

Design: There are generally no pavement markings associated with school zones. Measures such as dragon teeth or 40 speed zone pavement patches may be installed in response to particular issues in retrofit at specific school sites only with the approval of the Road Authority.

Requirements:

> Any pavement markings approved by the Road Authority for installation in retrofit at specific school sites are to be marked in accordance with relevant TfNSW standards, technical directions and specifications.

2.7 Crossings

2.7.1 Pedestrian crossings

Design: Pedestrian crossings (zebra) are to be marked and signage installed as detailed on *ACTSD-3530.* For pedestrian crossings on raised platforms (wombat crossings) refer to *ACTSD-3532.* The warrant for installing a pedestrian crossing (zebra) is to be in accordance with *ACTSD-3530* unless the crossing is associated with a school then the warrant is to be assessed with reference to *GRSTMAS*.

Requirements:

- In retrofit where raised platforms are on a pedestrian desire line a pedestrian crossing may be installed without reference to a warrant. Alternatively, if the platform is not installed on an obvious pedestrian desire line, landscaping or other measures to prevent pedestrian access shall be installed. The priority path network and type of path is a main determent of the type of crossing (refer to ACTSD 0500 series)
- In estate development, it is preferred that raised platforms that are to be marked as pedestrian crossings are designed to allow pedestrians to cross on an even gradient without traversing a gutter tray. Refer to **Raised pavement platforms and road humps** for further details regarding the design considerations for provision or omission of side slopes.
- Zigzag linemarking may be installed on approaches to pedestrian crossings with poor sight lines such as on a curved road alignment. This treatment can only be installed with the approval of the Road Authority. The approved zigzag is to be marked in accordance with the relevant TfNSW standards, technical directions and specifications.

2.7.2 Children's crossings

Design: Children's crossings, where warranted, are generally to be located within school zones in the ACT. Refer to *ACTSD-3530* for linemarking and signage details.

2.8 Special markings

2.8.1 Kerb mounted house numbering

General: Where required house numbers are to be marked on the kerb near the driveway using road marking materials.

Requirement:

- Numbers are to be at least 75mm high, white or yellow in colour and applied using a stencil onto a black background that is at least 120mm square.
- The number is to be positioned at least 25mm from the top of the kerb and within 1 m of the driveway on the side which most clearly indicates the numbered property.

Alternatives: Other methods of application for numbers may be submitted for approval by the Road Authority. Use of any mechanical fixings such as screws or rivets is not permitted.

2.8.2 Hydrant marking

General: To assist emergency services to locate fire hydrants, bi-directional blue reflective pavement markers are to be placed adjacent to the centreline of the road and level with the hydrant in accordance with the Water Authority requirements as outlined below.

Requirement:

- The marker should be offset from the centreline towards the side of the road on which the hydrant is located.
- If there is no marked centreline at the marker location, a single bi-directional white marker can be placed on the centreline adjacent to the blue marker.

2.9 Vertical deflection devices

General: Vertical deflection devices may be required when the existing road geometry does not sufficiently calm traffic to a safe speed. Devices shall be located clear of driveways to ensure bottoming of vehicles does not occur.

Requirements: Refer to *ACTSD-3531* to *ACTSD-3535*.

Lighting requirements: Devices shall be lit in accordance with *MIS 14 Public Lighting* and to Australian Standard lighting requirements (*AS 1158 (Set)* and *AS 60598 (Set)*).

2.9.1 Device selection criteria and suitability

General: There are multiple types of vertical deflection devices. Raised pavement platforms and road humps span the full width of the roadway, whereas road cushions do not span the full width of the roadway. Typically, multiple road cushions are employed across the roadway. Refer to *AGTM08* for further guidance.

Selection of type of device: At locations which are on a current bus route or known future bus route for streets with high commercial traffic, or where it is critical that access by emergency vehicles is not to be adversely affected, road cushions are to be adopted unless a wombat crossing is to be provided. Concrete raised pavement platforms should be used in estate development where enhanced pedestrian crossing safety or speed reduction is required. In retrofit scenarios, asphaltic concrete road humps are generally preferred over concrete raised platforms due to the shorter construction timeframes and reduced impacts to traffic during construction. Where longer construction timeframes and greater impacts to traffic during construction are considered to be low risk, then either raised concrete platforms or asphaltic concrete road humps can be adopted for wombat crossings in retrofit scenarios. Refer to **Table 13-1** which outlines the preferred type of vertical deflection device for various scenarios.

Car parks: At off street car parking facilities with low traffic speeds, the asphaltic concrete car park hump is to be adopted.

Table 13-1 Preferred type of vertical deflection device for various scenarios

	Bus route[5]		Not a bus route[5]	
	New estate development	Retrofit	New estate development	Retrofit
Wombat crossing	Raised concrete platform	Asphaltic concrete road hump[1]	Raised concrete platform	Asphaltic concrete road hump[1]
Not a wombat crossing	Asphaltic concrete road cushions[2]	Asphaltic concrete road cushions[1]	Raised concrete platform[4]	Asphaltic concrete road hump[4] or Single wide asphaltic concrete road cushion[3]

[1] In retrofit scenarios, asphaltic concrete road humps are generally preferred over raised concrete platforms for wombat crossings due to the shorter construction timeframes and reduced impacts to traffic during construction. Where longer construction timeframes and greater impacts to traffic during construction are considered to be low risk, then either raised concrete platforms or asphaltic concrete road humps can be adopted for wombat crossings in retrofit scenarios.

[2] Consider alternative design measures to manage speeds in new estate development projects, such as adopting appropriate traffic lane widths, blister island treatments, etc.

[3] A single wide asphaltic concrete road cushion will partially span the full width of the roadway but with a 1m gap from each edge of cushion to face of kerb.

[4] Raised concrete platforms and asphaltic concrete road humps which are not a wombat crossing shall not be installed at pedestrian desire lines.

[5] It shall be considered whether the street is a current bus route or a known future bus route.

2.9.2 Raised pavement platforms and road humps

Design considerations: Consideration shall be given to the impact of the platform/hump on overland flow drainage paths.

Pedestrian desire lines: Raised platforms and road humps shall not be installed at a location where there is an existing pedestrian desire line across the street or at a location where a pedestrian may confuse the device for a zebra crossing, unless they are provided with a pedestrian (zebra) crossing – refer to **Pedestrian crossings**.

Piano key pavement marking: Raised pavement platforms and road humps shall be provided with reflective piano key pavement markings in accordance with *ACTSD-3532*.

Side slopes: In accordance with *ACTSD-3532*, a raised pavement platform or road hump can either have two side slopes, no side slopes or one side slope. Where a side slope is not provided, the platform is flush with the connecting path on the verge/median so that pedestrians can cross the platform on an even gradient. The following shall be considered when choosing to provide sides slopes or no side slopes:

- Accessibility: A pedestrian (zebra) crossing facility on a raised concrete platform or road hump with no side slopes will result in improved accessibility for pedestrians.
- Drainage: A raised concrete platform or road hump with no side slopes or one side slope will require the construction of appropriate kerbside stormwater sumps to manage surface flows in the roadway. Drainage requirements are outlined in *ACTSD-3532*.

- Speed management for cyclists: For a pedestrian (zebra) crossing facility on a raised concrete platform or road hump that is part of a main community route or principal community route, the side slopes should generally be provided if the connecting path enables a cyclist to approach at high speed. This is because the side slopes and connecting kerb ramps can act as a speed limiting treatment.
- Erroneous use by pedestrians: For a raised concrete platform or road hump that is not a pedestrian (zebra) crossing facility, side slopes should generally be provided unless landscaping or other measures are adopted in the verge/median to deter pedestrians from erroneously using the device as a pedestrian crossing.
- Restriction of vehicular access: For a raised concrete platform or road hump without side slope(s), consideration shall be given to the provision of vehicle access restriction devices, such as bollards, to prevent unauthorised entry of vehicles onto the verge/median.
- Traffic calming for small vehicles and motorcycles: Where side slopes are provided, drivers of smaller vehicles and motorcyclists may attempt to track close to the kerb in an effort to avoid the raised top portion of the platform/hump to maintain a higher speed across the device. A platform/hump with one or no side slopes will prevent such occurrences and help to improve the traffic calming effects of the device.

Roads with steep grades: Raised pavement platforms and road humps should generally not be adopted on roads with a gradient exceeding 3% due to the difficulty of heavy vehicles and buses traversing a raised pavement platform or road hump on steep uphill grades. Refer to *AGTM08, Section 9.6* for further guidance. Where the longitudinal gradient of the existing road exceeds 3%, seek approval from the Road Authority or consider alternative measures to reduce traffic speeds.

Raised Safety Platforms: Subject to Road Authority approval, Raised Safety Platforms may be permitted on higher speed roads and for raised intersections. Consideration shall be given to Austroads research report *AP-R642-20 Effectiveness and Implementation of Raised Safety Platforms* and *Vic Roads Road Design Note 03-07* regarding the suitability and design of Raised Safety Platforms.

2.9.2.1 Concrete raised pavement platforms

Requirements: Additional requirements for concrete raised pavement platforms are detailed on *ACTSD-3531* and *ACTSD-3532*.

Preferred surface colour treatment: Unless otherwise agreed with the Road Authority, concrete raised platforms shall have a batch mixed ‘brick red’ colour oxide additive added to the concrete mix to contrast with adjacent pavements and any zebra crossing pavement markings.

Selection of alternative surface colour treatments: The most important consideration is ensuring sufficient luminance contrast and colour contrast of the concrete substrate colour against the surrounding road pavement, typically asphalt, and any white zebra crossing pavement markings. This is to ensure the platform is easily detectable, and to ensure that the white zebra crossing pavement markings are easily detectable. ‘Brick red’ oxide colour treatment is considered to provide the greatest contrast with adjacent road pavement and any white zebra crossing pavement markings. For the selection of alternative surface colour treatment, consideration shall be given to the luminance contrast and colour contrast of the concrete substrate colour against the surrounding road pavement and any white zebra crossing pavement markings, and is subject to approval by the Road Authority.

2.9.2.2 Asphaltic concrete road humps

Requirements: Additional requirements for asphaltic concrete road humps are detailed on *ACTSD-3533* and *ACTSD-3532*.

Existing roads with uneven crossfalls: Some existing roads have a large difference in crossfall from edge of pavement to the centre of the traffic lane or road centreline. For such roads, the cross section profile of the road surface is highly non-linear. In such cases, where there is a large difference in crossfall between the edge of the pavement and the centre of the traffic lane or road centreline, the extent of pavement replacement shall be extended upstream and downstream of the road hump to transition the cross section profile of the road surface from non-linear to linear at the location of the road hump. The benefit of this transition is to achieve a more consistent crossfall, and linear profile, for the raised top component of the road hump. Transitions from uneven to consistent crossfall shall meet the superelevation rate of rotation requirements for a design speed of 30km/h.

2.9.3 Asphaltic concrete road cushions

General: Asphaltic concrete road cushions are the preferred form of road cushion due to reduced maintenance requirements and improved whole-of-life costs. Road cushions constructed from other materials, including rubber or concrete, are not to be adopted unless approved by the Road Authority.

Requirements: Asphaltic concrete road cushions shall be provided with reflective piano keys. Additional requirements for asphaltic concrete road cushions are detailed on *ACTSD-3534a* and *ACTSD-3534b*.

Road cushion layout: Refer to *ACTSD-3534b* for road cushion arrangement options. The designer shall prepare a detailed design layout for road cushions that suit local conditions as appropriate and obtain approval from the Road Authority. This includes consideration of Traffic Control Devices such as medians, refuge islands, blister islands, pavement markings and linemarking.

Gap widths: The gap widths between road cushions and from the nominal kerb line to the edge of road cushion are governed primarily by the total width of the road carriageway and the layout of the road cushions. The following are the primary considerations when assigning gap widths:

- Provide sufficient gap width to enable on-road cyclists to safely bypass the cushion hump.
- Ensure gap widths are not too large to enable a small vehicle to bypass the cushion hump.
- Deter drivers of vehicles from deviating away from the traffic lane to avoid cushion hump (large gap widths may encourage drivers to attempt to deviate away from the traffic lane to bypass the cushion hump).

Acceptable gap widths: Refer to **Table 13-2** for absolute minimum, desirable minimum and maximum gap widths.

Table 13-2 Absolute minimum, desirable minimum and maximum gap widths for road cushion layouts

Dimension	Gap width		
	Absolute minimum	Desirable minimum	Maximum
Edge of cushion to nominal kerb line	0.75m[1]	1.0m	1.1m
Between two road cushions	0.4m[1]	0.5m	1.0m

[1] The designer shall seek approval from the Road Authority to adopt gap widths which are less than the desirable minimum and greater than or equal to the absolute minimum. Consider alternative layout options presented in *ACTSD-3534b* to accommodate desirable gap widths, or consider installing the road cushions at a location where the road carriageway width can accommodate desirable gap widths.

Roads with steep grades: Road cushions should generally not be adopted on roads with a gradient exceeding 3% due to the difficulty of heavy vehicles and buses traversing a road cushion on steep uphill grades. Refer to *AGTM08, Section 9.6* for further guidance. Where the longitudinal gradient of the existing road exceeds 3%, seek approval from the Road Authority or consider alternative measures to reduce traffic speeds.

Other design considerations: The following shall also be considered as part of detailed design layout for road cushions:

- Proximity to driveways: Where possible, road cushions shall be placed in locations that consider and avoid turning movements for vehicles entering and exiting driveways.
- Proximity to on-street parallel parking: Where on-street parallel parking is permitted, it is desirable that the edge of road cushions be placed in line with the parking bay linemarking.
- Proximity to road shoulders and on-road cycle lanes: Preferably the linemarking for the shoulder or on-road cycle lane will be outside the edge of the road cushion or align with the edge of the road cushion. Where this cannot be accommodated, the designer shall develop alternative solutions to enable a cyclist in the road shoulder or on-road cycle lane to safely bypass the road cushion.

2.9.4 Asphaltic concrete car park humps

Requirements: Asphaltic concrete car park humps shall be provided with reflective pavement markings. Additional requirements for asphaltic car park humps are detailed on *ACTSD-3534a* and *ACTSD-3534b*.

Height of hump: The designer shall select the height of the hump based on the design speed of the car park and the speed reduction that is desired to be induced by the car park hump. For maximum speed reduction effects, adopt a car park hump height of between 70mm and 75mm. For a less severe speed reduction effect, adopt a car park hump height of between 50mm and 55mm. The height of the car park hump shall be no greater than 75mm.

2.9.5 Pavement design

Design: Unless otherwise agreed by the Road Authority, the pavement for a minimum of 2m beyond the vertical deflection device, including both the approach and departure ends of the device, shall not be a flexible granular pavement and shall have a minimum thickness of asphalt of 130mm.

Requirements: Refer to pavement details and specification requirements in *ACTSD-3531*, *ACTSD-3533*, *ACTSD-3534a* and *ACTSD-3535*.

3 SIGNS

3.1 Regulatory and warning signs

Design: To *AS 1742.1, AS 1742.2, AS 1742.4, AS 1742.9, AS 1742.10, AS 1742.11, AS 1742.13, AS 1743, AS 1744, AS 1906.1*.

Design guidance: *AGTM06* and *AGTM10*.

Requirements:

- Signage vertical and lateral positioning is to conform to *ACTSD-3601.*
- Support assemblies are to be as detailed on *ACTSD-3602.*
- Post sizes and footings are to be in accordance with details on *ACTSD-3630.*

3.2 ACT parking signs

General: **Appendix A** details all the sign identifiers and messages currently approved for use in the ACT together with the identifiers used on previous approved sign lists. These signs are pictorially depicted on *ACTSD-3701* to *ACTSD-3714* and a list of signs in numerical order is available on the Road Authority website.

Size: To simplify maintenance, signs are to be 300mm wide by 450mm deep wherever possible. Signs with longer messages may be enlarged to 600mm deep.

Requirement:

- Superseded signs are not permitted for use in new installations. Superseded signs may be used for maintenance when the required replacement of signs is minimal only with the approval of the Road Authority.
- The use of signs bearing different messages may be approved in special circumstances. These signs must be identified as 'special' on the Traffic Control Device drawings for the project and a pictorial representation of the sign will be required on the drawings submitted for approval. Justification must be supplied for the use of special messages. The unique code will be assigned by TCCS – Traffic Management and Safety (TMS).

3.3 School speed zone sign assembly

Design: School zones in the ACT operate continuously between 8am and 4pm and details of the sign assembly (Sign No. R4-8(ACT)) required to define a school zone is shown on *ACTSD-3610.*

Requirement: Refer to *GRSTMAS* for guidance in appropriately locating the ACT school zone sign assembly and the appropriate use of A and B size signs.

3.4 Street name plates

Design: Street name signs are guide signs. Refer to *MIS 12 Guide Signs* for design details.

Requirements: Street name plate assemblies are detailed on *ACTSD-3620*.

3.5 Guide signs

Design: Refer to *MIS 12 Guide Signs*.

3.6 Ticket parking, three for free, park and ride signs

Design: For the purposes of sign colour, signs advising motorists of the operational aspects of ticket parking areas are considered to be service signs. These signs should include those which delimit the ticket parking area. The signs for use in the ACT are shown on *ACTSD-3720* to *ACTSD-3735* and *ACTSD-3750.*

Requirement:

- Colours: Signs including Park and Ride and Three for Free signs included within a ticket parking area are to have white lettering on a blue background.
- Signs are to indicate the location of ticket machines and list the costs and conditions of parking.

Exception: Park and Ride signs with regulatory effect in areas other than ticket parking areas are to be red on white.

3.7 Temporary traffic management signage

Design: *AS 1742.3*.

General: The preparation and approval of Temporary Traffic Management (TTM) is the responsibility of the Contractor undertaking the Works. For projects where the management of traffic is considered critical to the safe movement of traffic and public around or through the construction site, then TTM concept plan should be prepared for the guidance only of tenderers. The Contractor is to use the TTM concept plan in preparation of the plans submitted to the Road Authority for approval. All TTMs should be endorsed by the Authorised Person prior to submission for approval by the Road Authority.

4 TRAFFIC SIGNALS

Design: To *AS/NZS 1428.4.1, AS 1742.14, AS 4113.2, AS 2144, AS/NZS 2276.1 to AS/NZS 2276.3, AS 2339, AS 2353, AS 2578, AS 2703, AS 2979* and *RMS TSD*.

Design guidance: *AGRD4A*, *AGTM06*, *AGTM09*, *AGTM10* and linemarking and signage to be installed in accordance with *ACTSD-3540*.

Requirements:

- Cable and loop layout, including numbering, to be installed in accordance with *ACTSD-3901*, with modifications to suit local site conditions as approved by the Road Authority.
- Hardware is to be installed in accordance with *ACTSD-3902*, with the layout and numbering of signal pedestals, signal groups, pedestrian signal groups and detector loops as detailed.
- Installation of loop detectors is to be in accordance with *ACTSD-3911*.
- Pedestals and push button details and locations are to comply with *ACTSD-3912.*
- The traffic controller housing footing, including conduit alignments and locations, are to comply with *ACTSD-3913.*
- Positioning and details of jointing boxes and layout of conduits between pedestals and jointing boxes are to comply with *ACTSD-3914.*
- Outreach joint use columns including footings are to comply with *ACTSD-3915.*

5 INTELLIGENT TRAFFIC SYSTEMS (ITS)

5.1 Variable speed zone signage

Design: Variable speed zone signs shall be located in conjunction with the Road Authority with guidance from *RMS Technical Direction TDT 2014/006.*

Requirements:

- Specific requirements to be provided by the Road Authority to address the location and purpose of the installation.
- Signs are to be of the type and installed to comply with *RITS006.*

5.2 Variable message boards (fixed)

Design: To *AS 4852.1* with guidance on signage design, location and placement from *RMS Technical Direction TDT 2005/02b.*

Requirements:

- Specific requirements to be provided by the Road Authority to address the location and purpose of the installation.
- Signs are to be of the type and installed to comply with *RITS001.*
- Road functionality including width of traffic and bicycle lanes must not be altered or compromised during the installation of variable message boards.

6 MATERIALS

6.1 Sign blades

6.1.1 Regulatory signs

Design: Regulatory signs are to be fabricated using reflective materials.

Requirements:

> Refer *MITS 14 Road Signs*

6.1.2 Parking and information signs

Design: Class 100 sheeting is permitted for use on parking signs.

6.2 Sign supports

Design: Where the risk of damage to signage from traffic is high or the sign is in a paved surface (e.g. concrete, asphalt, segmental pavers) sign supports that allow rapid and economic replacement of a sign and/or support (e.g. aluminium sign socket system) are to be used. The protection and temporary traffic management that may be required to safely replace damaged signs and/or supports is to be considered in the selection of an appropriate signage stem for each location.

Timber supports for signs are not permitted. Timber can deteriorate rapidly in the ground leading to unexpected collapse with a potential to cause injury and property damage.

Requirements:

> All sign supports exposed to risk of damage from traffic are to be designed to be frangible or located behind appropriate safety barriers or outside the clear zone.
> Frangible post systems are to be in accordance with the *Design Guide for Roadside Signs, Queensland Department of Transport and Main Roads* (now incorporated into *Traffic and Road Use Management: Volume 3 – Signing and Pavement Marking: Part 5: Design Guide for Roadside Signs*) or other approved proprietary post systems e.g. Signfix fluted aluminium poles.
> Sign poles and footings are to be designed with use of standard pole types as detailed on *ACTSD-3630.*

6.3 Road pavement markings

6.3.1 Longitudinal markings

Acceptable materials:

> Waterborne pavement marking paint with glass beads.
> Thermoplastic with glass beads.
> Two component cold applied material with glass beads and anti-skid material.
> Retroreflective raised pavement markers (RRPMs).

Requirements:

> Thermoplastic when used longitudinally adjacent to on-road cycling facilities shall be specified with a thickness less than 4mm to prevent cyclist falls caused by ‘tram lining’.
> Retroreflective raised pavement markers should not be placed in front of driveways or pedestrian desire lines whenever possible.

6.3.2 Transverse lines and other markings

Acceptable materials:

- Waterborne pavement marking paint with glass beads and anti-skid material.
- Thermoplastic with glass beads and anti-skid material.
- Two component cold applied material with glass beads and anti-skid material.
- Waterborne paint with glass beads (white gore) to mark island noses and kerbs facing traffic as specified in this Design Standard.
- Retroreflective raised pavement markers (RRPMs).

7 DOCUMENTATION

Requirements:

All Traffic Control Device drawings shall be submitted for approval through the ProjectWise Portal.