



Knox City Council

Traffic Engineering Guidelines

**For Residential, Commercial, Industrial and
Broad-Acre Subdivision Developments**

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Introduction

- 1.1 This is a guide for town planning applicants considering traffic and transport provisions. There may be circumstances when more or less rigorous requirements may be appropriate.
- 1.2 Although the guide provides a summary of the requirements under the Australian Standards, Building Code of Australia and the Knox Planning Scheme, the applicant should read this guide in conjunction with the above noted documents.
- 1.3 The following Council reference documents are to be referred to in line with these guidelines:
 - Civil Works Guidelines
 - Stormwater Drainage Guidelines
 - Waste Management in Multi-Unit Developments Policy and Procedures
 - Council standards
 - Integrated Transport Plan 2015
 - Knox Bicycle Plan Review 2008
 - Pedestrian Plan 2005
 - Road Management Plan 2015
 - Liveable Streets Plan 2012-2022

VicRoads Requirements

- 2.1 Where the proposed development is situated adjacent to or has an effect on an arterial road that falls under VicRoads jurisdiction, development plans must be provided to VicRoads as the relevant referral authority. Refer also to the Knox Planning Scheme clause 52.29.
- 2.2 Where any pedestrian crossing is proposed to be added or altered for the development, approval from VicRoads must be obtained in the form of a Memorandum of Authorisation (MOA).
- 2.3 Where any speed limit is proposed to be added, altered or associated with a development, approval from VicRoads must be obtained in the form of a Memorandum of Authorisation (MOA).
- 2.4 Where any shared zone (both pedestrians and vehicles are using the same space) is proposed to be added or altered for a development, approval from VicRoads must be obtained in the form of a Memorandum of Authorisation (MOA).

Public Transport Victoria Requirements

- 3.1 Where a development type is listed under clause 52.36-1 of the Knox Planning Scheme which includes:
- A residential development/building/village comprising 60 or more lodging rooms/dwellings or lots.
 - A new retail premises of 4000m² or more of leasable floor area
 - An increase of more than 1000m² to the leasable floor area of an existing retail premises which is 4000m² or more of leasable floor area
 - An office development of 10,000m² or more of leasable floor area
 - A place of assembly comprising 400 or more seats or 600m² or more of gross floor area
 - An education centre
 - A major sports and recreation facility
 - Any alteration or development of public transport infrastructure or stops
- The application must be referred to Public Transport Victoria (PTV) for approval. Alternatively, the applicant must present sufficient support from PTV for the development.
- 3.2 If there is a bus stop within 10m of the approach or 15m on the departure side of a proposed crossover, consultation and approval is required from Public Transport Victoria.
- 3.3 Alterations, including relocation, of a bus stop must be referred and receive approval from Public Transport Victoria, the appropriate bus company and Council.

Driveways and Crossovers

All Developments

- 4.1.1 Where a driveway/accessway leads to four or more car parking spaces and is from land in a Road Zone (arterial roads managed by VicRoads and Council link roads as specified in the Knox Planning Scheme maps and clause 52.06-9), access to the car spaces must be at least 6m from the road carriageway.
- 4.1.2 Redundant crossovers must be removed and the kerb and channel and naturestrip reinstated to Council standards.
- 4.1.3 Wherever possible, crossovers should be kept separate from neighbouring crossovers. Where a crossover is located within 2.4m of a neighbouring crossover, the design may require the adjacent crossover to form a partial or full double crossover. Approval for a crossover within 2.4m of a neighbouring crossover must be sought from Council's Asset Preservation team.

Residential Developments

4.2.1 The Knox Planning Scheme, clause 52.06-9, and Knox Council requirements indicate accessways must:

- Ensure vehicles can exit a development in a forwards direction if the accessway serves four or more car spaces or connects to a road in a Road Zone
- Be at least 3m wide
- Have an internal radius of at least 4m at changes of direction or be at least 4.2m wide
- Provide a passing area within the property (at the entrance) 5m wide and 7m long where one or more of the following occur:
 - a) there are 10 or more car spaces
 - b) the driveway is over 50m long
 - c) the property connects to a road in a Road Zone
 - d) traffic volumes of the adjacent road are in excess of 6000 vehicles per day
 - e) the driveway is curved or sight distance along the driveway is restricted
- Provide at least a 2.1m clearance beneath overhead obstructions in a car parking space.

4.2.2 The location of crossovers should maximise the retention of on-street car parking space (Knox Planning Scheme clause 55.03-9).

4.2.3 Crossovers must be kept 1m clear of all assets including, but not limited to, power poles, telecommunications facilities, drainage pits and related structures.

4.2.4 Drainage pits and lids must be either fully clear of or fully within the crossover area. Drainage pits located within the crossover area must be modified with a heavy duty trafficable lid to Knox City Council standards and approved by Council's Asset Preservation team.

4.2.5 The relocation or alteration of utilities (such as power poles or communication pits) must be referred to and approved by the service provider.

4.2.6 Vegetation within the naturestrip must be considered as a site constraint. Permission from Council must be sought prior to the removal of the vegetation.

- 4.2.7 Crossovers must be located 3m clear of street trees. Significant trees with a high amenity or ecological value must be protected and crossovers located clear of trees to the satisfaction of Council's Arborist and Parks Services team. Plans showing vegetation (including street trees) on the naturestrip, located within 3m of a crossover, will be referred to the Parks Services and Assets Preservation teams for evaluation. Where approval is granted to remove the vegetation, the cost (including amenity value) to remove and replace a tree clear of the crossover must be met by the developer.
- 4.2.8 Crossovers and driveways must not be located within 10m of an intersection (from the kerb line).
- 4.2.9 Driveways are to be located where there is unobstructed sight distance, safe access into and out of the site and designed at right angles with the road.
- 4.2.10 Any vehicle space to the rear of a front/existing dwelling must include a vehicle turning bay to enable vehicles to enter and exit in a forward direction.
- 4.2.11 Turning templates for an 85th percentile vehicle must be used as per Australian Standards 2890.1 (2004) Appendix B.
- 4.2.12 In accordance with the Country Fire Authority (CFA) subdivision requirements, access for emergency vehicles must be considered within multi unit developments. Fire trucks require 3.5m wide x 4.0m high clearance. Approval for any subdivision access requirements must be sought from the CFA.
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- 4.2.13 The Planning Scheme Clause 55.03-9, requires access for service and delivery vehicles to be considered within multi unit developments. Small service/delivery vehicles require 2.3m wide x 3.5m high clearance.
- 4.2.14 Connections onto declared main roads are referred to and approved by VicRoads and may require a wider crossover, a left turn deceleration lane or a right turn storage lane to improve access to some sites.
- 4.2.15 All driveway grades must comply with clause 52.06-9 of the Knox Planning Scheme. Any driveway gradients not specified in the Knox Planning Scheme must meet the relevant Australian Standards AS2890.1 clause 2.5.3, clause 2.6 and clause 3.3 and Knox City Council standards.
- 4.2.16 Driveways that rise to the exit must provide adequate sight distance to pedestrians and motorists as per the Knox Planning Scheme clause 52.06-9.
- 4.2.17 For developments with more than three dwellings, accessway grades must not be steeper than 1:10 (10 percent) within 5m of the frontage to ensure safety for pedestrians and vehicles.

Industrial Developments

- 4.3.1 Driveways must meet the minimum widths as stated in Australian Standard 2890.2 to ensure two way road widths for commercial vehicles. Justification is required using turning movement templates, as per Australian Standard 2890.2, to show that crossover widths are sufficient. A wider crossover splay may be required on declared main roads in accordance with VicRoads Standards.
- 4.3.2 Driveways must be designed so that all vehicles likely to access the site can enter and exit without the need to prohibit on-street parking, i.e. turning circles for articulated vehicles must be considered.
- 4.3.3 It is considered unsafe for commercial vehicles to reverse into roads experiencing 2,000 or more vehicles per day. Frequency of movements, road classification, road width and visibility may also be factors. Consideration must be given for trucks to enter and exit the site in a forward position.

Car Parking

All Developments

- 5.1.1 Car parking bay and aisle dimensions must comply with the Knox Planning Scheme under Clause 52.06-9. The minimum 90 degree car parking space envelope is 2.6m x 4.9m. Where the front or rear of a parking space is located adjacent to a vertical obstruction such as a garage door, wall or overhang, a 500mm clearance between the allocated car space and the obstruction is required. Where parking spaces are provided in tandem (one space behind the other) an additional 500mm in length must be provided between each space for clearance.
- 5.1.2 In accordance with diagram 1 of the Knox Planning Scheme Clause 52.06-9 and Australian Standard 2890.1 clause 2.4.2 (d), where the side of a vehicle space is against a vertical obstruction, a manoeuvring clearance of 300mm must be provided alongside the 2.6m wide parking space.
- 5.1.3 Car spaces in garages, carports or otherwise constrained by walls (including a garage door) should be at least 6m long and 3.5m wide for a single space and 5.5m wide for a double space measured inside the garage or carport.

- 5.1.4 Car parking must be provided at the rates outlined in the Knox Planning Scheme clause 52.06.

If car parking reduction is requested, a Car Parking Demand Assessment (undertaken by a qualified traffic engineering consultant) must be provided justifying the reduced parking requirement and comparing the car parking rates observed at other similar developments in the Knox or neighbouring area. The car parking demand assessment must provide information as stated under Knox Planning Scheme clause 52.06-6 or as required by Council.

The report may include a travel plan (or travel map fixed on site) indicating how the developer will encourage alternative transport to the site, particularly those employed on the site.

- 5.1.5 A Car Stacker Management Plan is required whenever mechanical parking or use of car stackers is proposed.
- Mechanical parking must not be used for visitor car parking unless used in a valet parking manner.
 - Mechanical parking bays must be 5.4m long to accommodate vehicles and have a 1.8m height clearance or designed to the satisfaction of Council.

- 5.1.6 Car parking within major developments must be well lit and clearly signed.

- 5.1.7 Visitor/customer car parking must be signed and/or line marked.

Residential Developments

- 5.2.1 Where a dwelling has two (2) bedrooms, one car parking space must be provided.
- 5.2.2 Where a dwelling has three or more bedrooms, two car parking spaces must be provided.
- 5.2.3 Where 2 or more car parking spaces are provided for a dwelling, at least one space must be under cover.
- 5.2.4 1 visitor space per every 5 dwellings must be provided within the site.

Industrial/Commercial Developments

- 5.3.1 The design of car parks must maximise natural surveillance and pedestrian visibility from adjacent buildings

- 5.3.2 Developments must provide appropriate turning movements within the site for all vehicles used to ensure all vehicles exit and enter the site in a forward direction.
- 5.3.3 Excessive numbers of crossovers (generally more than 2) into a site is not encouraged as this reduces the amount of on-street parking available.
- 5.3.4 Give way line marking should be installed at locations where there is the possibility for conflict between parking aisles or access roads within the site.
- 5.3.5 Developments must provide accessible car parking in accordance with Knox Planning Scheme clause 52.06-5, car parking requirements under the Building Code of Australia and Australian Standards 2890.6.

Traffic Generation

Residential Developments and Broad-Acre Subdivisions

- 6.1.1 A Traffic Engineering Impact Assessment will be required for developments with 50 or more car spaces.
- 6.1.2 Where a significant increase in traffic is attributed to a development a Traffic Engineering Impact Assessment is to be supplied to Council to outline how the increased traffic might be managed.
- 6.1.3 Where it is considered a development may create additional traffic in a street that may exceed the capacity of the street or adjacent roads, a Traffic Engineering Impact Study must be provided to demonstrate how the traffic can be managed.
- 6.1.4 A Construction Management Plan is required for Multi Unit Developments and other properties abutting an arterial road or roads with limited parking where construction vehicles would impede through traffic. The construction management plan must be submitted and approved by Council's Asset Preservation and Traffic and Transport Teams.

New Roads

All Developments

- 7.1.1 The design of streets and roads should comply with the Knox Planning Scheme (clause 56.06 and 55.03), Knox City Council Standard Drawings, Australian Standards (AS2890), Austroads Guidelines and Country Road Authority Requirements.

- 7.1.2 Access road widths shall be sufficient to allow any necessary turning and reversing manoeuvres and providing access for waste vehicles where necessary. Turning templates should be applied. Some localised widening may be required to facilitate all turning manoeuvres.
- 7.1.3 Turn around facilities must be provided at the end of no through roads.
- 7.1.4 Access ways in excess of 60m or serving 16 or more dwellings must provide roads in accordance with the Knox Planning Scheme Clause 56.06-8 Table C1 including kerb and channel, footpaths and other associated subdivisional requirements.
- 7.1.5 Sufficient stopping distance must be provided on the vertical alignment. Sight distance at all intersections must meet VicRoads standards. Safe Intersection Sight Distance should be met (refer to Table 3.2 Austroads Road Design Part 4A: Unsignalised and Signalised Intersections).
- 7.1.6 Right angle bends may require pavement widening, painted centre lines and raised reflective pavement markers to the satisfaction of Council. Some may also require traffic islands at either end.
- 7.1.7 Stop/Give way signs and associated line marking must be installed at intersections with major roads, collector roads and modified 'T' intersections but not at minor roads.
- 7.1.8 Collector roads must have painted centre lines and raised reflective pavement markers to the satisfaction of Knox Council.
- 7.1.10 Access onto arterial roads must be designed to the satisfaction of VicRoads and Knox Council.

Street Lighting

All Developments

- 8.1.1 It is required that internal street lighting is provided consistent with the Knox Planning Scheme Clause 55.03-7 and Australian Standard 1158 to the satisfaction of Council and the relevant service authority. Areas of particular concern include internal intersections, turnaround facilities and where pedestrian travel paths may be undefined. Councils Civil Works Guidelines must be consulted.

Garbage Collection

Residential Developments

- 9.1.1 Waste collection, storage and management must comply with the Council policy and procedure for Waste Management in Multi-Unit Developments, unless a specific exemption is granted by the Waste Management Team for reasons of practicality, safety or efficiency.
- 9.1.2 For developments with kerbside collections, the following lengths are required along the road reserve to cater for each set of waste and recycling/green waste bins and clearance between bins.
- individual bins, a length of 1.7m per unit
 - communal bins, a length of 1.8m per unit
- 9.1.3 The placement of bins along the road reserve for greater than 10m is not acceptable as it may create sight distance issues.
- 9.1.4 For developments with 6 or more dwellings, waste bin (i.e. green waste, recycling and garbage) storage and collection must be accommodated within the site. Hard Rubbish must be accommodated within the site for 15 or more dwellings. A Waste Management Plan must be provided to the satisfaction of Council's Waste Management team.
- 9.1.5 A turnaround area must be provided if collection is within the site as vehicles are not permitted to reverse into or from the site.
- 9.1.6 The safe and legal parking of a waste collection vehicle, whilst performing collection, must be considered.

Industrial/Commercial Developments

- 9.2.1 Provisions for garbage collection and storage, including bin location points, must be shown on a plan for approval.

Sustainable Transport

All developments

- 10.1.1 Clause 21.02-1 of the Knox Planning Scheme encourages major developments to better respond to the needs of pedestrians and cyclists and move away from a car based urban form.
- 10.1.2 Developments must provide a connecting accessible path for cyclists, mobility aid users or pedestrians from the public space to the entrance of the building. A connecting path must be constructed to the satisfaction of Council.
- 10.1.2 The installation or upgrade of a bus stop and/or footpath access is to be considered for large developments (with 50 or more car spaces) or where a development will have a significant impact on the amenity of the area.
- 10.1.3 Where a development is required to provide 50 or more car spaces, a travel plan must be provided for the site. Travel plans for other developments may be required where there is a significant impact on the amenity of the area.

Industrial/Commercial Developments

- 10.2.1 Pedestrian routes through car parking areas to building entrances and other attractors must be clearly marked and separated from traffic in high activity parking areas.

Broad-Acre Subdivisions

- 10.3.1 Development plans must comply with the Knox Planning Scheme Clause 56.06.

Footpaths

All Developments

- 11.1.1 Path widths vary from 1.4m footpaths to 3.0m shared paths (new paths are a minimum 1.5m) depending on the path hierarchy identified as part of the Knox Road Management Plan (2015) and the Pedestrian Plan (2005). Where there is no existing footpath along the public road frontage of the site, construction of a sealed footpath, in accordance with Council requirements, should be provided to the nearest existing public footpath or bus stop. Footpaths within the development must be linked to the nearest existing public footpath.
- 11.1.2 Where 90 degree car parking spaces allow vehicles to overhang a footpath within the development, a clear 1.2m width must be available for pedestrians. In this instance, footpaths on the back of kerb must be wide enough to accommodate both pedestrians and vehicle overhang in accordance with Australian Standard 2890.1 clause 2.4.5.2.
- 11.1.3 All footpaths and pram crossings must comply with the Disability Discrimination Act (DDA). This includes, but is not limited to, minimum footpath widths, a continuous path of travel, kerb ramps and Tactile Ground Surface Indicators (TGSI), where appropriate.
- 11.1.4 Footpaths and shared paths must comply with the Knox Planning Scheme clause 56.06-5. All footpaths and shared paths must be constructed to Council standards.
- 11.1.5 Walking and cycling networks should be designed to include safe road crossings including the provision of traffic controls where required as per clause 56.06-2 of the Knox Planning Scheme.

Residential Developments

- 11.2.1 Internal footpaths are encouraged wherever possible. Council supports pedestrian accessible subdivisions and developments that have multiple access points to enable pedestrians to walk a more direct route.

Bicycle Facilities

All developments

- 12.1.1 Bicycle facilities are required for all developments as outlined in the Knox Planning Scheme clause 52.34 which includes:
- a) The appropriate number of bicycle parking spaces (refer to table 1 of clause 52.34-3)
 - b) a bicycle space for an employee or resident either in a bicycle locker or at a bicycle rail in a lockable compound. For visitors, bicycle rails must be provided
 - c) Bicycle rails, compound and lockers to comply with requirements in clause 52.34-4
 - d) Appropriate bicycle signage as per clause 52.34-5
 - e) a bicycle access path to allow cyclists to ride to within 30m of the bicycle parking space
- 12.1.2 The dimensions of a bicycle is on average 1.7m in length, 1.2m in height and 0.7m in width at the handlebars. Sufficient space must be provided at all bicycle parking spaces.
- 12.1.3 Bicycle parking arrangements must adhere to the Australian Standards (AS 2890.3 Parking Facilities) or Knox Planning Scheme clause 52.34.
- 12.1.4 Where a footpath along the public road frontage is classified as a shared path under the Principal Bicycle Network or the Knox Council Bike Plan, a 3.0m wide path must be constructed to Council standards.
- 12.1.5 Cycling infrastructure (on-road bicycle lanes or off-road bicycle paths) should be planned to encourage the separation of cyclists from other road users as per state requirements under clause 18.02-2 of the Knox Planning Scheme.
- 12.1.6 Bicycle facilities in the form of a shared path should be provided through a subdivision to connect to existing or future networks in line with the intent of the Knox Bicycle Plan and Knox Bike Map.

Commercial Developments

- 12.2.1 Provisions of bicycle end-of-trip facilities in commercial buildings must be provided as per clause 18.02-2 in the Knox Planning Scheme.

Other

All Developments

- 13.1.1 All signage and line marking shall be in accordance with Australian Standard 1742.2 and installed and maintained to Council standards.
- 13.1.2 Road Safety Audits and satisfactory responses to the audits may be required for larger developments where extensive road works are proposed, particularly along main roads.
- 13.1.3 A Road Opening Permit will be required for any works in the road reserve.
- 13.1.4 'No Road' signs and/or bollards must be installed at new road terminations to prevent vehicle access to and from undeveloped land or vacant road reserves.

Residential Developments

- 13.2.2 All structures (including letter boxes, meter boxes and fences) and vegetation adjacent to driveways must be less than 900mm in height or relocated clear of a splayed area in accordance with the Knox Planning Scheme clause 52.06 and Australian Standard 2890.1 clause 3.2.4 to ensure adequate sight distance.
- 13.2.3 Units must have sealed road connections both within the development and onto the exiting sealed road network. E.g. where a development obtains access from an unsealed service road, a sealed connection must be provided onto the main road.

Industrial/Commercial Developments

- 13.3.1 All signage must be designed and located so that sight distance is not obstructed, there is overhead clearance from footpaths etc and the supports are frangible or outside the clear zone for the particular road.