

**Planning Policy  
Manual**

**TRANSIT**  
NEW ZEALAND  
ARARAU AOTEAROA



INTERNATIONAL  
CONSULTANTS

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# Planning Policy Manual

SP/M001

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## PLANNING POLICY MANUAL

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# Planning Policy Manual Supplement

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# Planning Policy Manual Record of Amendments

Amendment No	Date of Effect	Description
1	27 October 2000	Amendments to Access Policies and Guidelines and other minor changes.
2?		re-issue cum. (in Amd 1) to Ch. 3.
2-	1 Sep. 2002	Date of issue 28 May 2004 - P17-10A
3	1 Sept. 2005	Supplement to 3 <sup>rd</sup> App. Appendix 4

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### **3. EFFECTS OF ADJACENT ACTIVITIES ON STATE HIGHWAYS**

#### **3.1. Introduction**

The State highway system can provide a range of significant opportunities and benefits to adjacent communities including access to rural and residential developments, to retail and commercial activities, and as a feeder into a district's road network. Such opportunities and benefits can assist the overall community's social and economic well being.

Given the importance of the State highway system, it is essential that the adverse effects on the network arising from adjacent activities are avoided, remedied or mitigated.

The most significant direct effect from adjacent activities on the safety and efficiency of the State highways is that of turning traffic associated with accesses and side roads. Other effects arise from advertising signs (driver distraction and amenity effects), lighting and glare (driver safety), and vegetation (shading and icing of road surfaces and reduction in visibility).

This section explains Transit's policies and methods for addressing these adverse effects.



### 3.2. Issues

The main general issues in relation to adjacent activities are set out below;

- Several aspects of adjacent land use activities have the potential to adversely affect the State highways, including access, advertising signs, lighting/glare and vegetation.
- It is important that developers and councils consult with Transit early in the consent process so that the potential adverse effects can be identified and addressed in development proposals at an early stage.
- It is important that developers and councils are aware of the Limited Access Roads (LAR) status of some sections of State highway, as this will assist in the LAR and resource consent/subdivision processes.
- The main statutory methods to achieve suitable controls on property access are through the Transit Act and the RMA.
- Transit will continue to declare sections of State highway as LAR, generally in the rural and urban fringe areas where further development and pressures for property access are greatest.
- Transit will process applications for crossings and subdivisions of land adjacent to LAR's in the best interests of maintaining safety and efficiency of the highway. Transit will also inform the territorial authority and the applicant of the authorisations required under the Transit Act, and will advise them of its views in relation to any resource consent application affecting a LAR.
- Transit will have an input into the preparation and ongoing development of district plans to ensure that suitable provisions are in place to protect the safety and efficiency of the State highway system.
- Transit will participate, as an affected party, in the assessment of resource consent where applications will potentially affect the State highway system.

### 3.3. General Policies

#### 3.3.1. General Policies for Effects of Adjacent Activities

Transit's General Policies for Effects of Adjacent Activities on State Highways are:

##### **Consultation**

- (i) To encourage developers of land adjacent to State highways to consult Transit early in any development proposal to enable full consideration of effects on the State highway.

##### **Land Use Development**

- (i) To have an input into the preparation of district plans and plan changes to identify the potential effects of adjacent land zoning on the safe and efficient operation of the State highway.
- (ii) To encourage local authorities to identify and consider any adverse effects of activities on State highways when preparing plans and processing consents and to identify methods to avoid, remedy, or mitigate these adverse effects.
- (iii) To use the provisions of the RMA and Transit Act to ensure adverse effects of development proposals are avoided, remedied, or mitigated.
- (iv) To ensure developers and local authorities are aware of Transit's expectations under the Transit Act, for resource consent applications affecting State highways that are LAR.

#### 3.3.2. General Methods

Methods for achieving these policies include:

- Publicise and educate council staff, potential developers, landowners and the wider public about Transit's role in State highways to ensure Transit is consulted on any matter affecting the State highway.
- Seek inclusion of provisions in district plans such as roading hierarchies, and rules on access, advertising signs, vegetation control and glare.
- Declare new sections of LAR, and process applications for crossing places and subdivisions in accordance with the Transit Act.
- Participate in the RMA processes where resource consents will potentially affect the State highway system, as appropriate.

## 3.4. Access

### 3.4.1. Introduction

State highways make a significant contribution to the nation and the community's social and economic well being by providing access for a wide range of activities including residential, farming, and commercial/retail businesses. Businesses and industries often locate adjacent to State highways to attract customers.

While providing for access, the principal role of the State highway system is to provide a "through road" function so that there is connectivity between regions for transportation of people and goods. The safe and efficient operation of the State highway can be affected as access demands increase, and the type and frequency of movements on and off the State highway change.

Of the issues addressed in this chapter of the manual, access has the greatest actual and potential effect on the safe and efficient operation of State highways. Research indicates that there is a strong correlation between the frequency and use of accesses and accident rates. As the density and use of accesses along a State highway increases, the ability for that road to operate efficiently (i.e. with minimal "side friction") diminishes. In order to avoid the proliferation of access points ("ribbon development") it is appropriate to develop new side roads or encourage shared use of accesses where these are appropriately located.

This section describes policies and methods to address the access issues. The nature of the access issues will depend on State highway traffic volumes and characteristics, the nature and extent of adjoining development and demands for further development.

### 3.4.2. Issues

- Balancing the safe and efficient movement of through traffic with the needs of the existing and future communities to access the State highway.
- Access to and from the State highways often has a significant adverse effect on the safe and efficient operation of the State highway system, by creating additional conflict points and reducing the safe operating speed of traffic.
- Subdivision and development of land adjacent to State highways can increase the demand for access.
- Urban areas have lower operating speeds, however the urban State highways generally carry higher traffic volumes. Traffic safety is therefore still a very important consideration, for example accident rates are highest at urban intersections. Urban areas also have much more development and the greater demands for access have to be taken into account in the management of State highways. Encouraging developments to gain access to a side road where it is practically available will however assist in protecting the arterial function of urban State highways.
- Rural areas have lower traffic volumes, but operating generally at higher speeds. There are two distinct environments, the lower volume, more remote rural State highways, and the higher volume rural/urban fringe State highways.

The lower volume roads are nevertheless important strategic routes, and it is essential to maintain traffic safety and efficiency. This can generally be achieved by district plan controls on access spacings, access design and construction etc. The higher volume rural highways may be subject to greater development pressures and additional measures, including LAR controls, may be necessary.

- Safe sight lines for motorists can be adversely affected by vegetation and poorly located signs on private land near intersections and accesses to State highways.

### 3.4.3. Policies for Access

Transit's policies for Access are:

- (i) To have all local road intersections and property accesses adjoining State highways located and designed to comply as far as practical with Transit standards.
- (ii) To declare additional "at risk" sections of State highway as Limited Access Roads (LAR) in terms of the LAR prioritisation model.
- (iii) To use the provisions of the RMA to protect State highways from inappropriately located developments, and to ensure the adverse effects of adjacent developments are remedied or mitigated.
- (iv) To participate in the RMA submission process for a subdivision or land use application adjoining a State highway that has been declared LAR, but not to lodge an appeal on the resource consent decision.
- (v) To use the limited access road provisions of the Transit Act to deal with property access requirements involving a limited access road, following a council decision on a subdivision or landuse application.
- (vi) To use segregation strips to prevent direct property access to and from the highway where other methods may not be effective, e.g. on expressways.

### 3.4.4. Methods

Methods for achieving these policies include:

- Promote understanding among council staff, potential developers, landowners and the wider public of:
  - The status of State highways in their region; and
  - The need to manage access now and in the future to maintain and enhance the safe and efficient operation of the State highway.
- Ensure desired access management approaches are included in all individual State highway strategy studies which local authorities are consulted on.
- Locate intersections with a minimum separation distance of 360 metres in urban areas (less than 70 km/hr) and 800 metres in rural areas (70km/hr and above).
- Establish Corridor Management Agreements (refer to Appendix 1 for definition) with local authorities

- Expand the LAR network, based on Transit's LAR prioritisation methodology, which includes factors such as traffic volumes, traffic speed, road geometry, accident record, and adjacent development pressures.
- Submit on access requirements to councils to promote Transit's interest in subdivision and landuse consents for land adjoining, or with access to, a State highway.
- Only lodge an appeal on a resource consent decision where the application is for land adjoining, or with access to, a State highway that has **not** been declared LAR.
- Write a letter to applicants of subdivision or landuse consents for land adjoining, or with access to, a State highway that has been declared LAR stating:

"Transit will participate in the RMA submission process but will not appeal the resource consent decision, however applicants are required to obtain a section 93 approval under the Transit Act once they have a resource consent. Pursuant to an assessment of the access requirements, Transit may or may not grant a section 93 approval."

- Process applications under the Transit Act for access and subdivision on land adjoining LAR sections of State highways. Participate in RMA processes in resource consent applications and, where appropriate.
- Promote inclusion in subdivision consents of:
  - Covenants and voluntary agreements relating to access, and
  - The use of segregation strips where appropriate.
- Enter into side agreements with developers for works or cash payments for the mitigation of effects on State highways where district plans do not provide for a council to hold or require the payment of financial contributions.
- Promote the adoption of a roading hierarchy into district plans (refer to Appendix 4 for suggested road hierarchy model)
- Promote inclusion of the following access rules, or similar, into district plans:

#### ***ACCESS RULES***

##### ***Permitted activities – Access to State Highways***

*An access to a State highway shall be a permitted activity subject to:*

- *No legal access is available from another road.*
- *The traffic generated through the access to the State highway is less than 100 ecm/d.*
- *Compliance with the performance criteria given in Table 1 (refer to Appendix 4 in this manual) regarding sight distance, clearance from intersections, and minimum access spacing.*
- *For an access with less than 30 ecm/d, the vehicle crossing is to be designed and formed in accordance with Diagram C (refer to Appendix 4 in this Manual).*
- *For an access with between 30 and 100 ecm/d, the vehicle crossing and localised road widening is to be designed and formed in*

accordance with Diagram D (refer to Appendix 4).

- Provision for manoeuvring on site, so that reverse manoeuvring onto the State highway is not required.

### *Restricted Discretionary Activities – Access to State Highways*

*Any access to a state highway unable to meet the performance criteria above shall be a restricted discretionary activity. The Council's discretion is restricted to matters of access.*

### *Assessment Matters – Access to State Highways*

*When considering a resource consent application for access to a State highway as a restricted discretionary activity, Council shall include assessment of the following matters:*

- Whether the crossing is sufficiently removed from an intersection having regard to traffic volumes on the roads, and any other factors that will prevent conflict and confusion between vehicles turning at the crossing or at the intersection;*
- The adequacy of available sight distances having regard to the 85th percentile speed of vehicles on the road;*
- Whether there is a need to separate entry and exit in order to reduce potential traffic confusion and conflict;*
- Whether the physical form of the road will minimise the adverse effects of access (e.g. whether the road offers good visibility; whether a solid median barrier will stop unsafe right hand turns or a flush median will assist right hand turns etc);*
- Whether particular mitigation measures such as a deceleration or turning lane are required due to speed or volume of vehicles on the road;*
- The design of the crossing to enable traffic exiting the site to safely enter the traffic stream;*
- The location and design of the crossing in relation to pedestrian and cycle safety;*
- Whether there is adequate queuing and parking space on site so that vehicles do not queue over vehicle crossings or on the State highway;*
- Any potential cumulative effects of extra access points on the function of the State highway;*
- Any relevant accident history of the State highway in the vicinity of the site; and*
- The particular traffic characteristics of an existing or proposed activity, including expected traffic generation, types of vehicles etc.*

### 3.4.5. Rationale for Access Rules

The Access Rules suggested for inclusion in district plans have several components. The rationale for each of these is set out below:

#### **Access to an alternative road:**

The requirement that sites with frontage to a State highway should take access from a side road where it is available is consistent with the principles of the Rooding Hierarchy. This will reduce the potential number of access points to the State highway and therefore maintain its ability to act as an arterial route with minimum "side friction". The reduction of access points will also reduce the potential for accidents to occur (refer to explanation of spacing between successive access).

#### **Traffic generation threshold:**

The rule contains an upper threshold of 100 ecm/d, below which accesses onto a State highway may be treated as permitted activities provided all other performance criteria are met.

It is considered that activities generating more than 100 ecm/d are relatively high traffic generators and specific site-by-site assessment is required before access is permitted to the State highway. In many cases the access will need to be specifically designed so that it will function safely given the particular traffic environment.

For guidance on how traffic generations relate to types of land use activity, refer to Appendix 4 which contains a list of activities and typical traffic generation rates.

#### **Sight distance:**

Based on Austroads research and guides -  
NAASRA. 1988. *Guides to Traffic Engineering Practice*

#### **Location of access relative to intersection:**

Based on Austroads research and guides -  
NAASRA. 1988. *Guides to Traffic Engineering Practice*

#### **Spacing between successive accesses:**

There shall be no more than 5 individual accesses along any 1 km section of State highway (on both sides), measured 500m either side of a proposed access. Rationale relates to the cumulative effects of access as outlined in Brindle R. Feb 1998. *Relationship between accidents and access conditions*. ARRB Transport Research, Melbourne.

#### **Access design standards:**

Access diagrams contained in Appendix 4 are based on Austroads Guide Part 5 Intersection at Grade, p40. Diagram D allows for 2.5m shoulders which are type A widening as per standard design RD 486 (widening on the downstream side for left turning traffic was deleted as being dangerous due to attempts by traffic to use the shoulder as an additional lane).

P42 Figure 5.23a of the Austroads Guide gives warrants for turning bays. Turning volumes as far as 10 cars per hour may generate the need for a turning bay, some activities eg schools, nursing homes can generate high peak hour volumes for a modest daily flow.

Diagram E in Appendix 4 is designed for low volume access which are used by heavy vehicles and require some modification to ensure the safe operation of the access and adjoining State highway. Shoulder sealing of 2m allows for 1m / 1sec lateral displacement which would enable another vehicle to pass a heavy vehicle turning into an access at 60km / h.

**On-site manoeuvring:**

The reversing of vehicles out into the traffic flow on State highways has potential safety ramifications. On-site turning is to be encouraged by providing for manoeuvring areas.



## 3.5. Signs

### 3.5.1. Introduction

Signs are an important mechanism to convey messages. In relation to State highways, there are three broad types of signs:

- official signs
- advertising signs and devices
- community signs.

The definitions of these signs are provided in Appendix 1.

Signs can assist drivers by conveying information that is fundamental to the driving task, such as regulatory speed limits, warning signs, destination signs, and relevant property information.

For that reason, it is appropriate that “official signs” are provided by Transit on the State highway reserve. Some signage on private property is also considered necessary to advise drivers of the key information of a business or other activity on that site, and the location of the property access.

However, signs in some circumstances will cause driver distraction. The potential for driver distraction to result in accidents is greatest when signs are inappropriately located near intersections, are obscuring traffic signs or signals, are not legible or contain too much information to be readily absorbed by drivers.

This section describes policies and methods to address the signs issues.

### 3.5.2. Issues

- Signs can provide essential information for the motorist, and therefore official signs and relevant on-site signage directed at State highway motorists are considered to be appropriate.
- Community signs are acceptable on State highway reserves in situations where traffic safety is not compromised.
- Advertising signs can distract the attention of drivers and cause unexpected driver behaviour such as sudden braking.
- In urban areas with less than 70 km/h speed restrictions, the distractive effects of advertising signs are considered less significant, and therefore fewer controls are advocated. However signs should not be placed in locations where they will compete with official signs or traffic signals for driver attention as this can adversely affect, or confuse the interpretation of essential driver information, with consequences for all motorists.
- On motorways and rural State highways which have higher speeds and often higher traffic volumes, the distractive effects of signs has a greater potential to result in accidents. It is therefore important that any advertising directed at drivers is kept to a minimum in those areas

# Appendix 1: Definitions and Abbreviations

## Definitions

### Access / crossing place

Access, or crossing place, is defined as the ability to enter or leave the State highway from adjoining property. The crossing place is the point on the property boundary where vehicles are permitted to enter and leave the State highway.

### Activities

*Activities* includes all undertakings on the State highway associated with construction, maintenance and improvements. Activities also include all undertakings and pursuits on properties removed from the State highway and as defined in district plans.

### Adjacent

Adjacent means lying near or adjoining (The Concise Oxford Dictionary). In terms of signs or glare, adjacent facilities are those considered to have an effect on State highway users.

### Adjoining

Adjoining means next to or joined with (The Concise Oxford Dictionary). Adjoining properties about the State highway and usually have direct access to the State highway.

### Advance Warning Signs

These are off-site signs which give advanced or early warning of a site or accessway ahead. This prior warning enables a driver to plan ahead and commence any driving manoeuvres such as slowing down well in advance of the actual site.

### Advertising Signs and Devices

Includes all advertising signs and devices which are visible to or are intended to be seen by road users whether they are motorists, cyclists or pedestrians. It includes advertising that is:

- located within the road boundaries
- located on property near a road
- permanent or fixed in nature
- temporary or moveable in nature
- vehicle-mounted advertising or other advertising on vehicles

Advertising includes any name, figure, character, outline, display, notice, placard, delineation, poster, handbill, advertising advice or appliance such as a balloon, or any other thing of a similar nature to attract attention. Including all parts, portions, units, materials, frame, background, structure and support or anchorage and also any of the foregoing things when displayed on parked vehicles and/or trailers. Letterboxes and property numbering systems are generally excluded from the roadside advertising and devices definition.

### Amenity Values

Amenity values mean those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes (Resource Management Act 1991).

### **Assessment of Environmental Effects (AEE)**

An assessment of any actual or potential effects that the activity may have on the environment, and the ways in which any adverse effects may be avoided, remedied, or mitigated as required for any resource consent or designation application under the Resource Management Act 1991.

### **Community Signs**

Signs which provide information for or about the community. Community signs, both permanent and temporary, may be erected within the State highway reserve where approved by Transit. Signs may be erected adjacent to State highways in accordance with the provisions of relevant District Plans and/or bylaws.

Permanent community signs include:

- (i) Community service signs such as those used for fire warnings; and
- (ii) Community information such as "Welcome to..." type signs, signs associated with community road safety campaigns and white crosses.

Temporary community signs include:

- (i) Community events such as school reunions, other event banners, and road safety signs which may be erected 28 days before and must be removed within 7 days after the event; and
- (ii) Electioneering signs – may be erected for a maximum period of 3 months and then removed the day prior to the election.

### **Corridor Management Agreements**

Corridor Management Agreements are agreements between Transit and territorial authorities for the provision and protection of road amenities, road services and certain carriageway features on State highways with the relevant district. The Corridor Management Agreements do not replace or remove any of the existing statutory obligations, legal rights, or obligations of Transit and the territorial authority, and the other agencies e.g. utilities and other network, which occupy the corridor under their respective legislation.

### **Effects**

Refers to those effects that are greater than minor.

### **Equivalent Car Movement Per Day (ecm/d)**

Equivalent car movement per day (averaged over a year) is defined as follows:

1 car to and from the property = 2 equivalent car movements

1 truck to and from property = 6 equivalent car movements

1 truck and trailer to and from property = 10 equivalent car movements

This is based on the assumption that a single residential dwelling is deemed to generate 8 equivalent car movements per day (ecm/d). Surveys undertaken by Transit and overseas support this assumption. An indication of typical traffic generation levels for a variety of different activities is provided in Appendix 4.

### **Expressway**

An expressway is a non-statutory term used to describe a highway which, in relation to access control, lies between a motorway and a limited access road. Direct property access to an expressway is prohibited through the use of segregation strips (see definition below). Expressways are generally high speed roads with well spaced at grade intersections.

### **Frangible**

Able to be broken and absorb enough impact energy to reduce the severity of a vehicle collision e.g. trees or shrubs having slender stems which break or bend (refer to *Guidelines for Planting for Road Safety*, August 1991, Transit New Zealand & Land Transport Safety Division of the Ministry of Transport ISBN 0-478-04109-8, Appendix C). For Signs refer to Appendix 5 and reference to Manual of Traffic Signs and Marking (MOTSAM) for criteria.

### **Heavy Vehicle Mix**

The percentage of heavy vehicles in the overall traffic mix where heavy vehicles are defined as weighing over 3.5 tonnes gross.

### **Limited Access Road (LAR)**

Limited Access Roads (LARs) are declared under the Transit New Zealand Act or created under the Public Works Act as a means of controlling access between roads and properties. Each parcel of land adjoining a State highway which is limited access road that does not have a reasonable legal alternative access to some other road is entitled to at least one crossing place where vehicles are permitted to enter and leave the road. Limited Access Roads are not roads for the purpose of subdivision unless the Minister of Transport agrees upon a recommendation from Transit that it can be used as such.

### **Motorist Service Centres**

A one-stop facility intending to serve the travelling public outside of urban areas. Facilities may include, for example, vehicles refueling, service station, carwash, and fast-food restaurants.

### **Official Traffic Signs**

All signs in the traffic regulations and in the Manual of Traffic Signs and Marking (MOTSAM) approved by the LTSA and that are considered necessary by Transit for the safe and efficient operation of the State highway system. These signs include:

- regulatory signs
- warning signs
- guide signs
- motorist service signs
- tourist signs
- general information signs

They are part of the normal road operations and traffic guidance and are made of standard design, colour, shape etc and convey instructions of warning or advice on road conditions, destinations, traffic control, and tourist and motorist services.

### **Sight Distance**

Sight distance (or vehicle intervisibility distance) to and from an access to enable safe vehicle turning manoeuvres. Refer to Diagram A in Appendix 4 for method to determine sight distance at a property access.

### **Segregation Strips**

Segregation strips are a means of controlling road access. Segregation strips are essentially small strips of land along the frontage of properties (even just a few centimetres wide) created under the Public Works Act (or by councils under the Local Government Act) during property negotiations. The strips are held in public ownership and are not classed as being

road. Properties separated from a road by a segregation strip lose their direct access to the road adjoining the segregation strip but are generally provided with alternative road access.

### **State Highway Reserve**

The State highway reserve includes the total area between private property boundaries/ or other types of reserve that is used currently (or may be in the future) for State highway roading purposes. The land in the reserve is managed by Transit and is owned by the Crown. This includes the actual road carriageway, footpaths, any land over which a right of way has been granted and any land taken for roading under the provisions of the Transit Act or Public Works Act 1981.

### **Sustainable Management**

As defined in Section 5 of the Resource Management Act 1991:

*"managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well being and for their health and safety while –*

- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

### **Trigger Levels**

The trigger levels indicate when intervention is required. If an activity on a property adjoining a State highway generates access movements above the indicated trigger level for its particular circumstances, then mitigation works would be required to safeguard the safety and efficiency of the highway.

### **Unofficial Signs**

Are all signs that are **not** contained in Manual of Traffic Signs and Marking (MOTSAM) including advertising signs / devices and community signs.

### **Works**

Works includes construction and improvement projects.

### **Abbreviations**

LAR	Limited Access Road
LTSA	Land Transport Safety Authority
MOTSAM	Manual of Traffic Signs and Marking
OSH	Occupational Safety and Health in Employment Act 1992
RMA	Resource Management Act 1991
Transit	Transit New Zealand
Transit Act	Transit New Zealand Act 1989

## **Appendix 3: Land Transport Safety Authority and Austroads Guidelines**

The following Land Transport Safety Authority (LTSA) guidelines may be used for guidance by council, business and individual property owners. However, it should be noted that Transit has NOT adopted all sections of LTSA's guidelines. The listing of these adopted guidelines is intended as a reference only. Anyone wishing to change the land or develop property adjoining a State highway should contact Transit before undertaking any planning or construction associated with the internal site layout or access provision.

### **Guidelines for establishing Rural Selling Places RTS 3, August 1992**

These Guidelines address the following issues:

- (a) Definition and types of "Rural Selling Place".
- (b) Section 4.3/4.4 - Sales area design guides (sales area set back, driveways, sight distance, advertising).
- (c) Appendix 2: Draft Performance Standard for Rural Selling Places (Definitions, Consents, Performance Criteria)  
[Note: Sight lines criteria differ from Transit's Access Standards and Guidelines as contained in Appendix 4 of this manual]

### **Guidelines for Visibility at Driveways RTS 6, May 1993**

These Guidelines address the following issues:

- (a) Section 2.1 - Sight Distances Table
- (b) Section 2.2 - Visibility Measurements
- (c) Section 3.0 - Design Principles for Visibility at Driveways
- (d) Section 4.2 - Distance from Intersections and between Driveways  
[Note: Some distances differ from Transit's Access Standards and Guidelines as contained in Appendix 4 of this manual]
- (e) Section 4.3 - Driveway Width
- (f) Section 4.4 - Pedestrian Safety

## **Road Safety Guidelines for Service Stations RTS 13, March 1996**

These Guidelines address the following issues:

- (a) Table 3.2 - Safety Issues and Recommended Traffic Management Techniques for Service Stations in Urban Speed Environments (based on roading hierarchy)
- (b) Section 4.0 - Safety Issues and Recommended Traffic Management Techniques in Rural Speed Environment
- (c) Section 5.0 - General Safety Considerations (visibility, pedestrians, signs, driveway angle and width)
- (d) Appendix IV: Driveway Distance Formula - the formulae used to calculate the minimum distance a driveway should be from an intersection.
- (e) Appendix VI: Visibility - RTS 6 - Guidelines for Visibility at Driveways (Sight Distance, Lines of Clear Site).  
[Note: Sight lines criteria differ from Transit's Access Standards and Guidelines as contained in Appendix 4 of this manual]

## **Guidelines for Planting for Road Safety, August 1991**

Transit New Zealand & Land Transport Safety Division of the Ministry of Transport  
ISBN 0 478-04109-8

These guidelines cover:

- General principles for planting and maintenance of vegetation
- Urban and rural techniques
- Sight distance lines in various situations
- Clearance to obstacles
- Frangible plant species

## **Austroads Guides**

Transit has adopted the following Austroads Guides:

AUSTROADS. 1988. *Guide to Traffic Engineering Practice, Part 5: Intersections at Grade. With Transit New Zealand. 1991 Roading Design Guidelines RD\_1 Intersections at Grade.*

## Appendix 4: Access Standards and Guidelines for Inclusion in District Plans

*The following Transit access standards and guidelines are for inclusion in District Plans:*

**Property access performance criteria where traffic generation is less than 100 equivalent car movements per day (ecm/d).**

**Table A4-1:**

Posted (Legal) Speed Limit (km/h)	Required Sight Distances (m)  See Diagram A	Location of Property Access Relative to Intersection.		Minimum Spacing Between Adjacent Property Accesses  Distance N on Diagram B (m)
		See Diagram B		
		Minimum Distance K (m)	Minimum Side Road Distance M (m)	
50	140	30	20	-
60	175	50	30	-
70	210	100	45	40
80	250	120	60	100
100	330	200	60	200*

\* there shall be no more than 5 individual accesses along any 1 km section of State highway (on both sides), measured 500m either side of a proposed access.

***NOTE (not for inclusion in District Plans)***

Approval must be must be sought from Transit before any work is carried out within the State highway reserve in relation to access construction.

Applicants unable to meet the required sight distances in Table A4-1 can consult Transit for further consideration. In cases where the operating speed is lower than the posted speed limit Transit may approve shorter required sight distances.

The following table (not for inclusion in District Plans) shows the derivation of the sight distance requirements in Table A4-1:

Posted Speed Limit	Operating Speed Range	Required Sight Distance (m)
50	50-70	140
60	60-80	175
70	70-90	210
80	80-100	250
100	100-120	330

*Adapted from Austroads "Guide to Traffic Engineering Practice – Part 5: Intersections at Grade". The required sight distances are based on the upper end of the operating speed range.*



- I **NB:** Operating Speed is “the speed at which a driver can safely travel on a given section of road under the prevailing traffic conditions and is defined as the speed at or below which 85 percent of vehicles travel”.

### **Access Design for Rural State highways**

*All accesses directly to a rural State highway require design appropriate to the highway they are connecting to in order to avoid, remedy, or mitigate the adverse effects. Diagrams C and D provide appropriate standard designs for accesses up to 30 and 100 equivalent car movements per day respectively.*

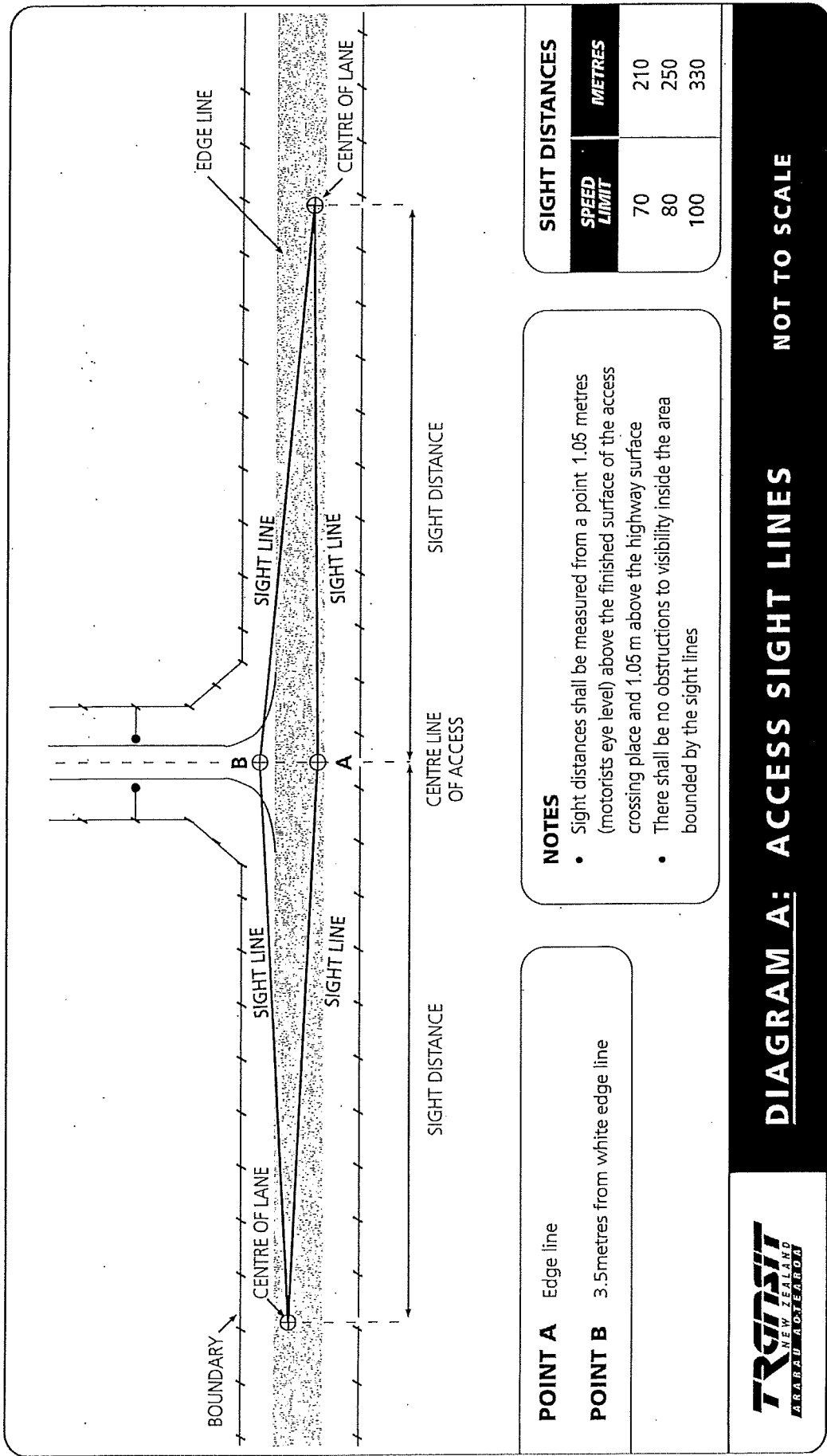
#### ***Note (not for inclusion in District Plans)***

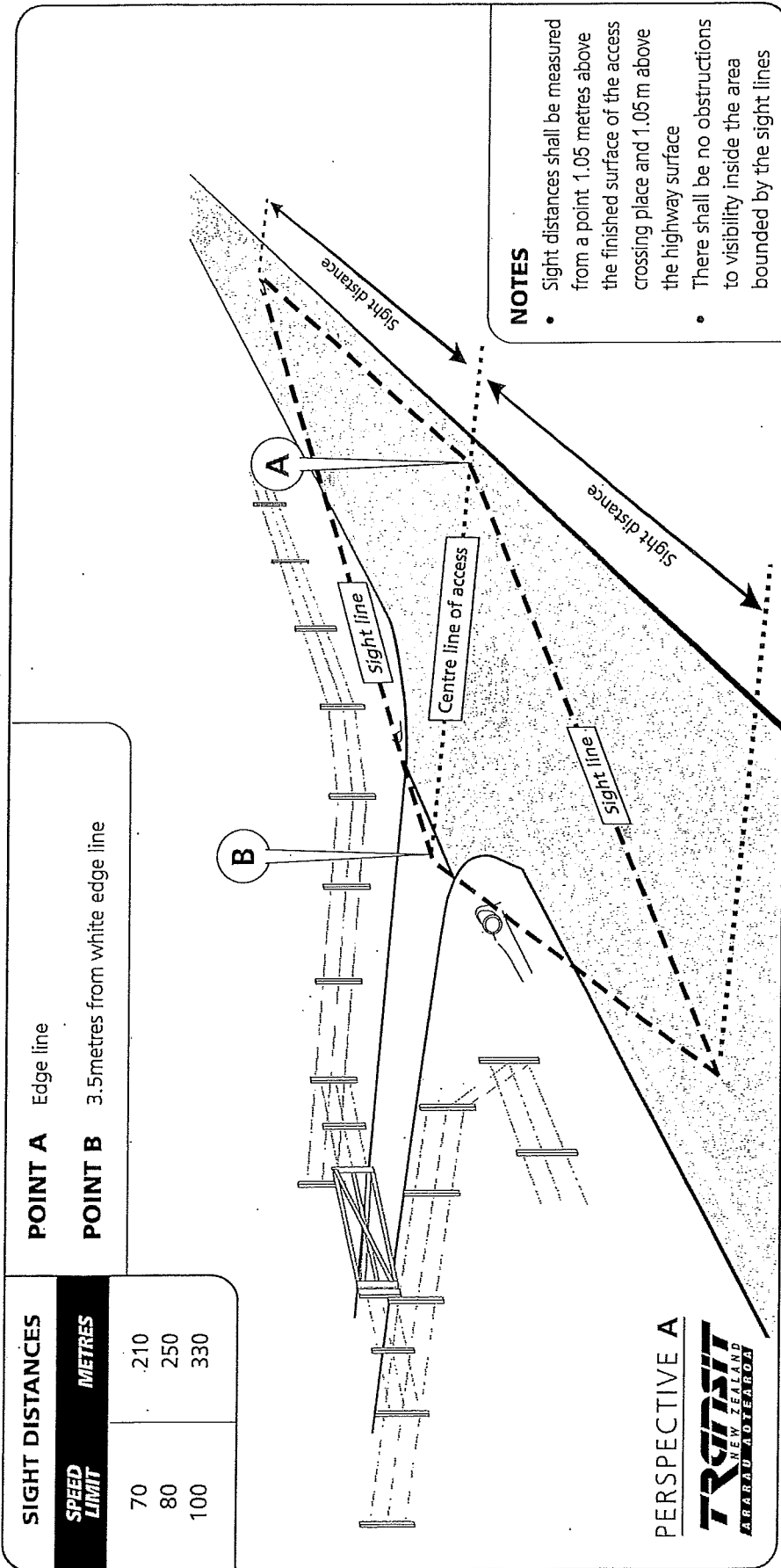
The length of seal distances (*d*) provided in the table in Diagram D are based on a sideways diverging/merging vehicle movement of approximately 1.0 m/sec using the following formula:

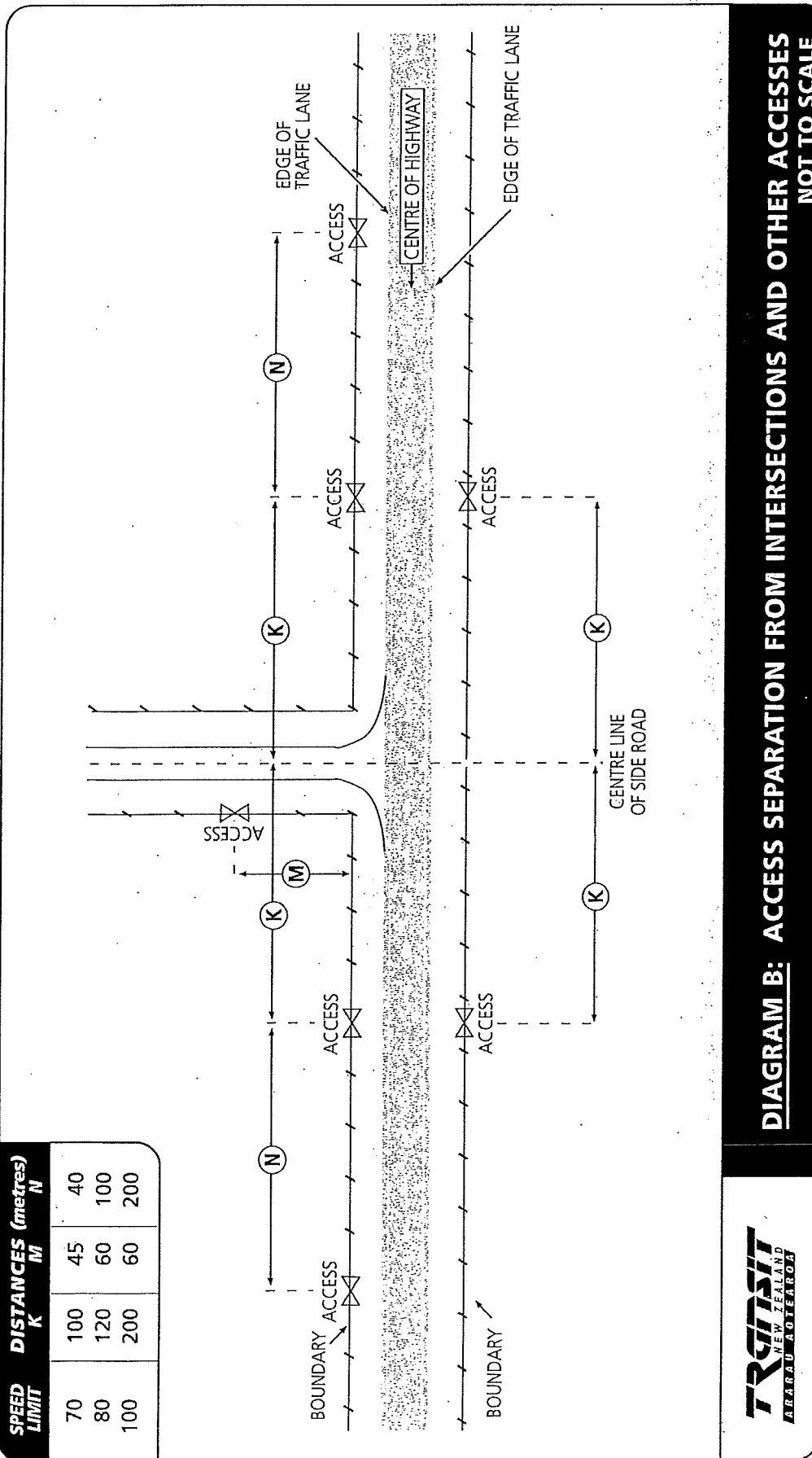
$$L = VW/3$$

Where: **L** = seal length (m)  
**V** = speed (km/h)  
**W** = width of shoulder (m)

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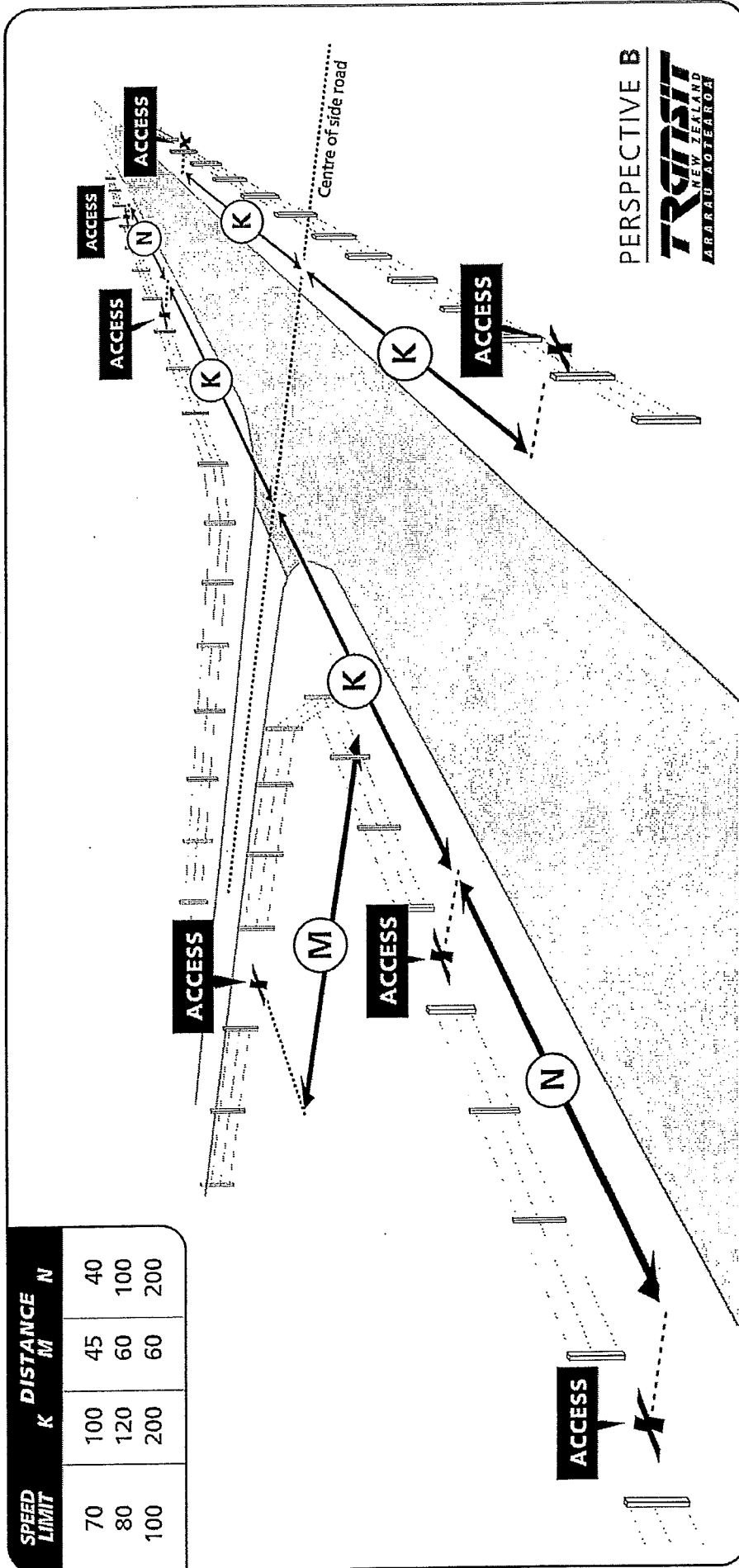






**DIAGRAM B: ACCESS SEPARATION FROM INTERSECTIONS AND OTHER ACCESSES**  
 NOT TO SCALE

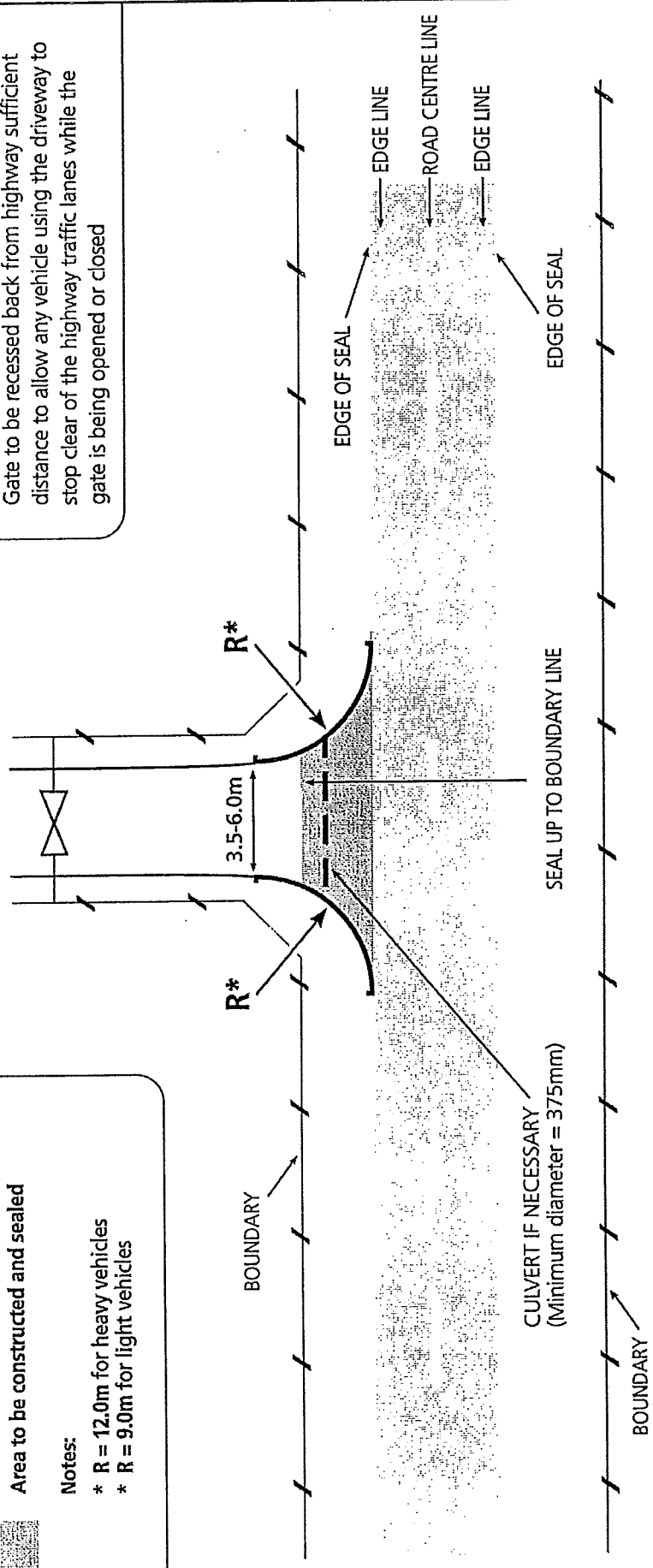




Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed

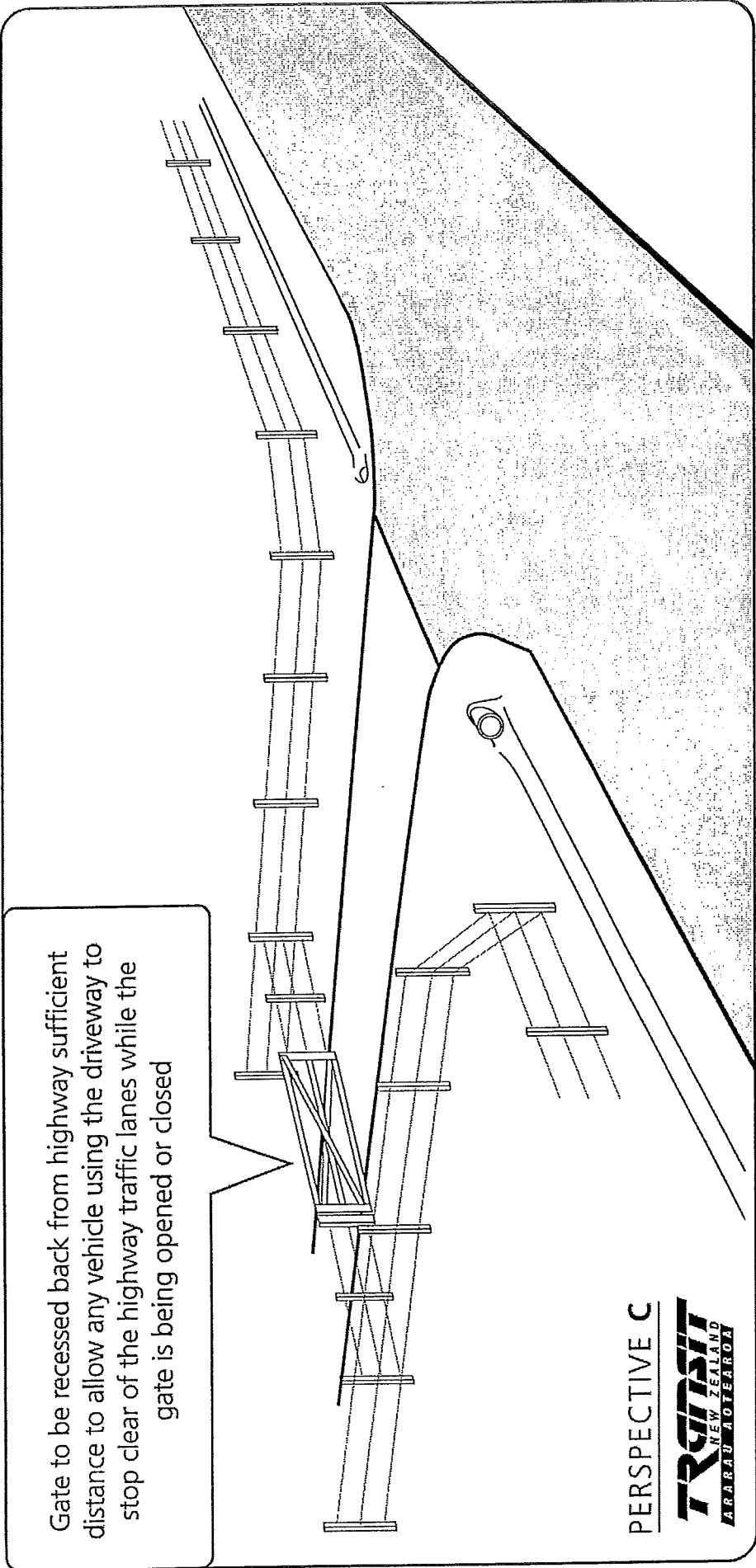
Area to be constructed and sealed

- Notes:
- \* R = 12.0m for heavy vehicles
  - \* R = 9.0m for light vehicles



**DIAGRAM C: LOW USE ACCESS STANDARD (1-30 ecm/day)**

NOT TO SCALE



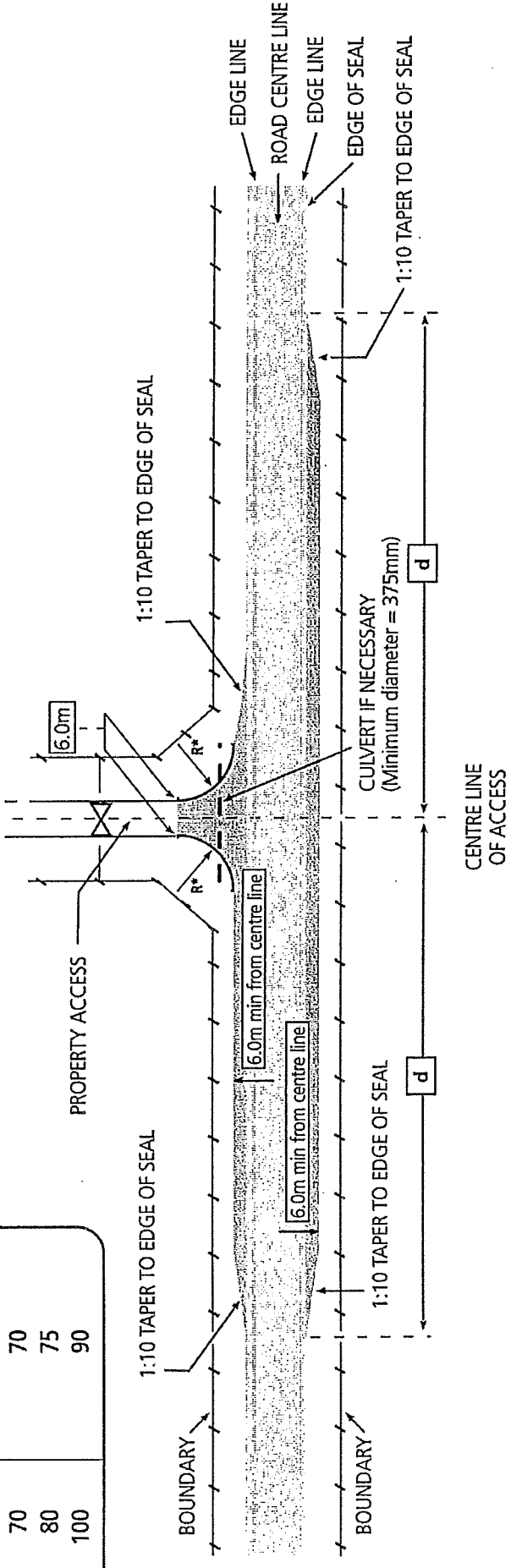


**POSTED LIMIT (km/h)**

70	70
80	75
100	90

**Length of seal (d) required from centre line of access (including taper) (metres)**

70	70
80	75
100	90



**Bellmouth Radii (R)**

- R = 9.0m Light vehicle use (eg road side stalls)
- R = 15.0m Heavy vehicle use (eg tourist attractions and heavy vehicle land uses)

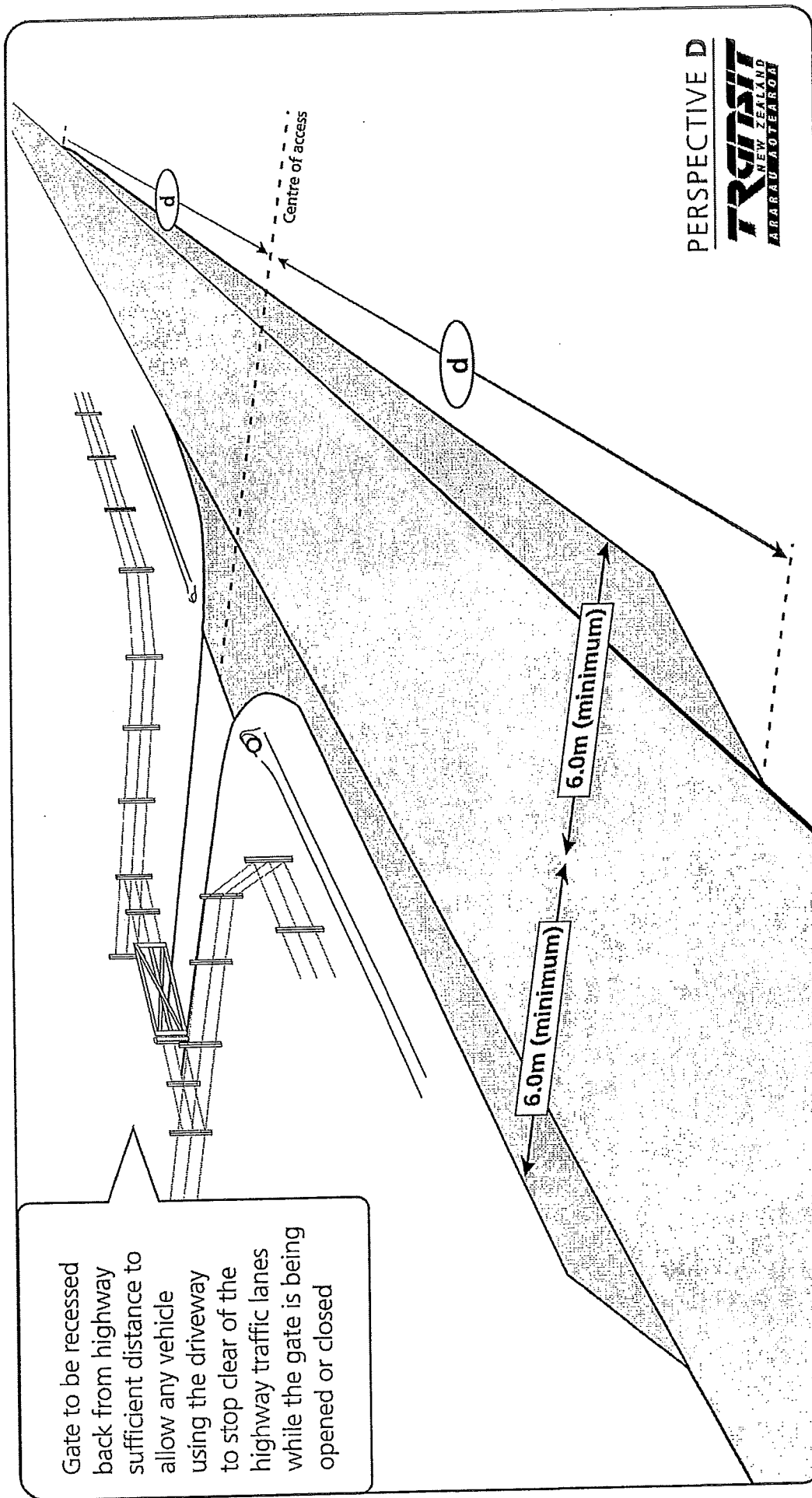


Area to be constructed and sealed

Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed



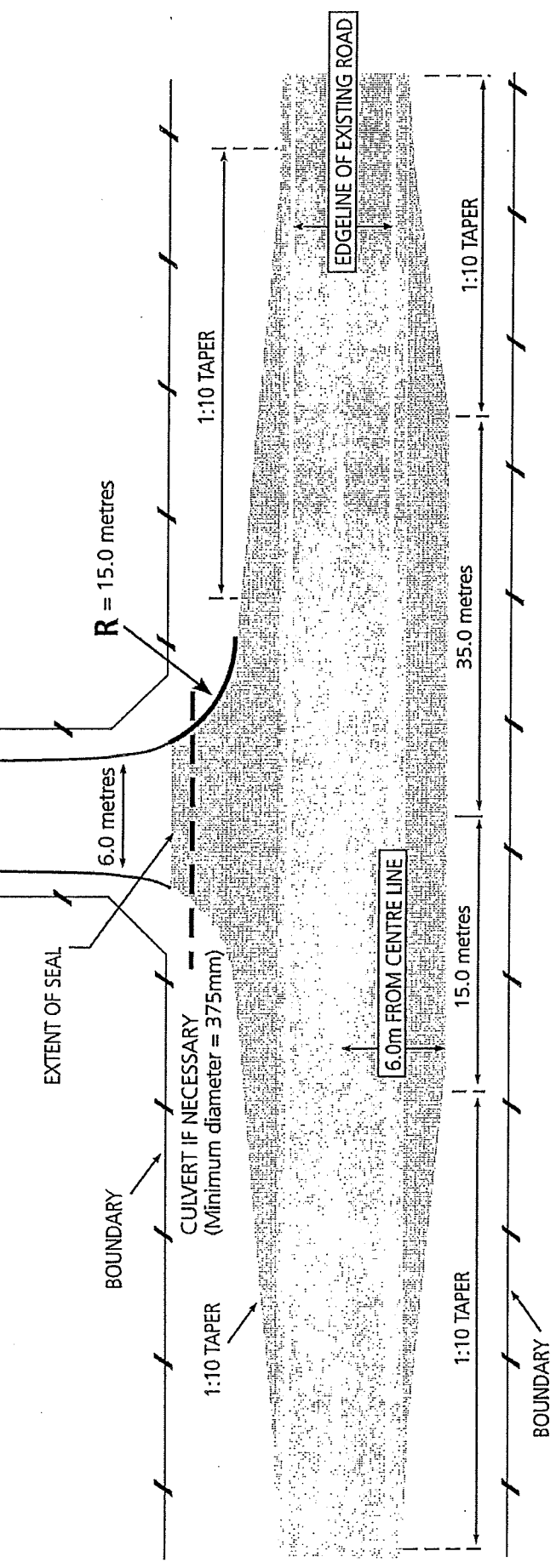
**DIAGRAM D: MODERATE USE ACCESS STANDARD (31-100 ecm/day) NOT TO SCALE**



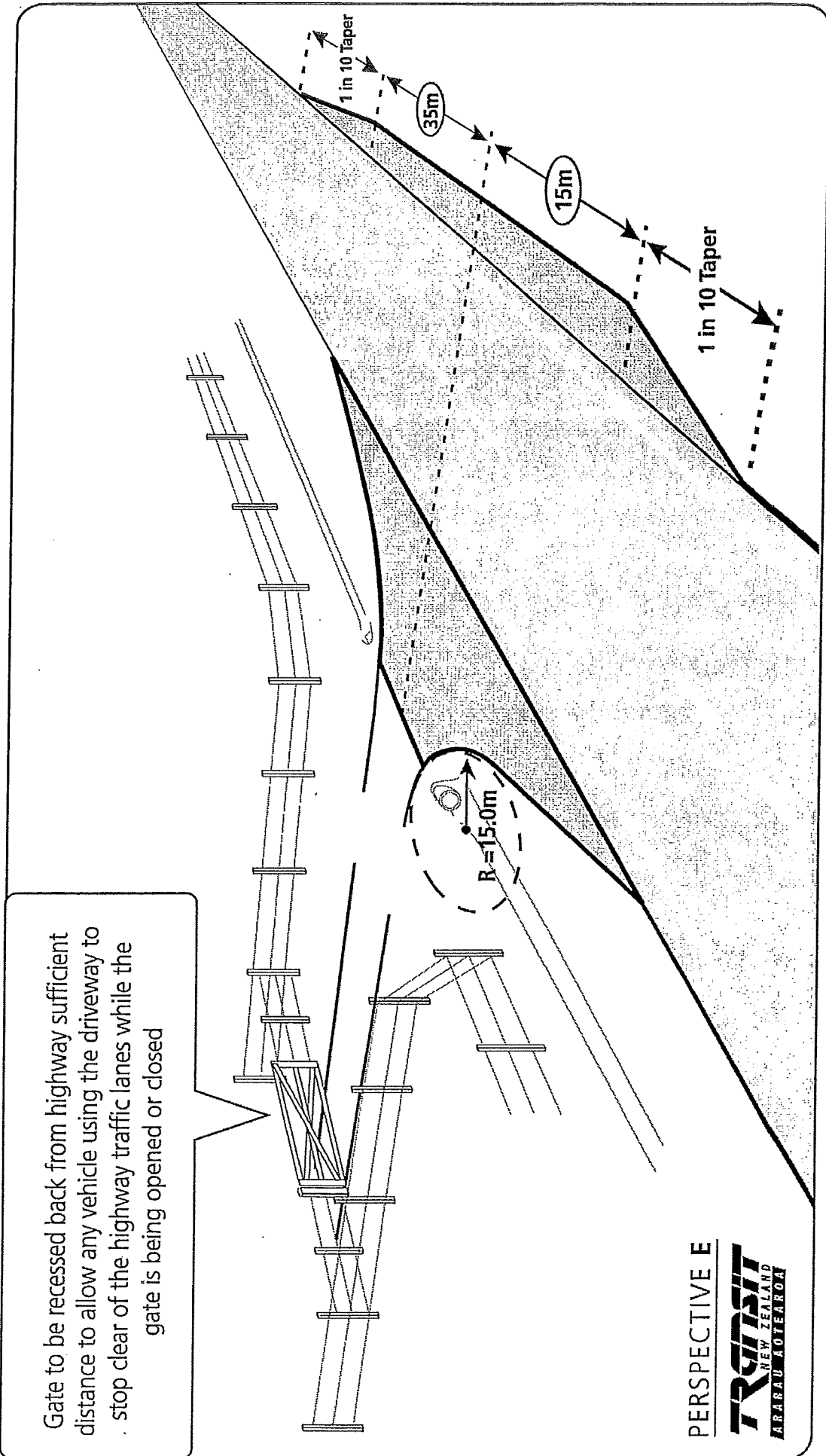
Seal widening and access sealing



Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed



**DIAGRAM E: PRIVATE ACCESS Regular use by Heavy Vehicles (eg dairy tankers)**  
NOT TO SCALE



Gate to be recessed back from highway sufficient distance to allow any vehicle using the driveway to stop clear of the highway traffic lanes while the gate is being opened or closed

PERSPECTIVE E  
**TRIT**  
 NEW ZEALAND  
 ARARAU KOTEAAROA

## Suggested Provisions for Inclusions in District Plans – Roading Hierarchy

### **ROADING HIERARCHY**

*The roads within the District/City are classified according to a hierarchical system, based on the function of each road, and the need for that road's capacities and capabilities to efficiently fulfil that function. The classification of roads determines their management in regard to land use and subdivision. The 'higher' the classification, the greater the management emphasis placed on enhancing the movement of through traffic; the 'lower' the classification, the greater the emphasis on access, and on pedestrian, parking and servicing needs.*

*The roading classification system applied to roads in the District/City is as follows:*

*Strategic Arterials: These routes form part of the network of nationally or regionally important arterial roads. Nationally important routes are managed by Transit New Zealand as State highways, whereas other strategic roads may be managed by territorial authorities. These routes predominantly carry through traffic, and carry the major traffic movements in and out of the District/City.*

*Other possible classifications:*

*District Arterials: These roads cater for traffic movement between the major areas of the District/City. Again traffic management of these roads seeks to facilitate traffic movement.*

*Collector Roads: These roads collect and distribute traffic to and from the arterial road network, and often act as links between two arterials. These roads also act as local main roads supplementing the district arterials. Through-traffic generally makes up a high proportion of the traffic flow.*

*Local Roads: These roads provide direct access to adjoining properties. Many local roads, except cul-de-sacs, also collect and distribute traffic to and from local roads within the District/City. Traffic flows are usually low, and it is desirable to minimise through or extraneous traffic because of the effects on the adjoining environment and amenities, and the limited physical capabilities of such roads.*

*Note: There may be other types of road that do not come within the overall hierarchy. These may include service lanes, which provide side or rear access to any site from side roads in business areas, to minor no-exit access routes in rural areas. In addition, there are a number of unformed roads which have no active role in the roading network. Over the long term it is envisaged that the pattern of unformed roads will be rationalised, retaining those which perform, or have the potential to perform, some active public access function, and gradually eliminate those which have no potential for access.*

## Background Material Supporting Access Management

Extract from Source: Brindle, R. *Relationship between accidents and access conditions. Research Report ARR 320. ARRB Transport Research Ltd, Victoria, Australia,*

TABLE A4-2

### SUMMARY OF ACCIDENT EFFECTS OF ACCESS POINTS ON RURAL ROADS

<p>General statements</p>	<p><i>A common rule of thumb is that each extra access point increases the accident rate by 10 accidents per 100mvkm, not including major intersection accidents.</i></p> <p>Removal of access restrictions (say, a ten-fold increase in access density) can increase the accident rate <sup>(a)</sup> 2 - 3 times or more. Typically, the comparative accident rates for no access control: partial control: high level of control will be roughly in the ratios 100:60:40.</p> <p>Permitting minor intersections and a few private entrances (partial control) has been found to increase the rate 40 - 60%. One source estimates an increase of up to 15% for each new access.</p> <p>Removal of controls on a partially-controlled highway (permitting frequent private entrances) can increase the accident rate a further 60 - 75%, or up to 10% for each new access.</p> <p>The effect of access controls is much greater at lower traffic volumes. Adding 10 access points per kilometre can increase the accident rate by a multiple of 4 at 2000 veh/day.</p> <p>The increase in accident rate is greater on 4-lane undivided roads than on 2-lane or divided roads. 4-lane undivided sections have higher accident rates than 2-lane sections with the same level of access.</p>
<p>Effects of minor junctions</p>	<p><i>Each minor junction adds about 35 accs/100mvkm(a) to the accident rate on 2- lane highways, and about 25 accs/ 1 00mvkm on 4-lane highways.</i></p> <p>(Thus, on a typical base of 150 accs/100mvkm on 2-lane roads and 100 accs/ 100mvkm for 4-lane roads, going from zero to one junction per km could add about 25% to the rate, and from one to two would add a further 20%.)</p> <p>These effects are affected by alignment. A 2-lane road with average curvature of 7 degrees will have 20-25% higher accident rate than a road with average curvature of 3 degrees, at closely-settled rural access spacings.</p>

Effects of non-commercial access points	<p><i>Each residential access point adds 1-1.5% to the accident rate on low-access 2-lane rural roads.</i></p> <p>On 4-lane rural roads, each private access adds 2-3% to the accident rate at low degrees of curvature.</p> <p>The effect of each entrance on the accident rate could be as high as 15% with higher average degrees of curvature. Medians reduce this effect.</p>
Effects of commercial access points	<p><i>Each commercial access point per kilometre can add 5-10% to the accident rate at low access frequencies (additional 10-15 acc/100mvkm for each access point).</i></p> <p>The effect is speed-related. The accident rate could be held roughly constant after adding an average of one business access per kilometre, if speed is reduce by 10km/h (e.g. from 90 to 80 km/h)</p>
Effects of medians	<p><i>Each access point on a 4-lane rural highway is found to be up to 10 times more hazardous without a median than with one; adding a median to a 4-lane rural road can reduce total accidents by 30-40%.</i></p>

Note: (a) Accidents per 100 million vehicle kilometres

TABLE A4-3

SUMMARY OF ACCIDENT EFFECTS OF ACCESS POINTS ON URBAN ROADS

<p>General statements</p>	<p><i>Removal of access limitations can increase the accident rate by up to 4 times (US data).</i></p> <p>Australian data suggests that allowing direct access and frequent minor junctions on urban arterials can increase the <i>casualty</i> accident rate by 30% on divided roads and 70% on undivided roads, compared with roads with widely-spaced junctions and few property access points. (Total rates probably increase by bigger margins).</p>
<p>Effects of minor junctions (assumed to include two-way service road entries and pairs of one-way service road connections)</p>	<p><i>Each junction can add 5 - 10 acc/100mvkm on 4-lane roads (one source estimates about 20 acc/100mvkm), and about 30 acc/mvkm on 2-lane urban roads.</i></p> <p>Increasing from 2 to 6 junctions per km leads to a 20 - 100% increase in accident rate on 4-lane roads, and 50 - 100% increase on 2-lane roads. Adoption of values towards the bottom end of this range seems advisable. Reported total rates for roads with 6 junctions/km (average) range from 150 to 375 acc/100mvkm</p>
<p>Effects of non-commercial access points</p>	<p><i>Each minor access point adds 1 - 2% to the accident rate on low-access 4-lane roads, and 2 - 3% on 2-lane roads. The increase in accident rate is greater as the access density increases.</i></p>
<p>Effects of commercial access Points</p>	<p><i>On 2-lane roads, each access point adds about 15 acc/100mvkm. (Increasing from 0 to 10 per km adds about 80% to the accident rate, and from 0 to 20 per km increases the rate 2 - 3 times.)</i></p> <p>On 4-lane roads, commercial access points add 5 - 10 acc/100mvkm each at low access densities, and about 15 - 20 acc/100mvkm above 10 access points per km.</p>
<p>Effects of medians</p>	<p><i>US data suggest that medians result in 40 - 60% reduction in crashes, and 40 - 50% reduction in pedestrian collisions.</i></p> <p>Australian data varies. In Melbourne, undivided sections were found to have a 30 - 40% higher rate than divided sections for the same level of access. The effect is less at higher levels of access limitation (i.e. fewer turns). In WA, multi-lane arterials without medians are reported to have rates 3.5 times higher than those with medians.</p>



Extract from source: RTA, December 1993. Guide to Traffic Generating Developments; Section 3 Land Use Traffic Generation pp 3-22 - 3-24

**Table A4-4**  
**SUMMARY TABLE OF LAND USE TRAFFIC GENERATION RATES**

Land Use	Traffic Generation Rates	
	Daily Vehicle Trips	Peak Hour Vehicle Trips
<b>Residential</b>		
Dwelling houses	9.0 / dwelling	0.85 per dwelling
Medium density residential flat building	4-5 / dwelling	0.4-0.5 / dwelling (Up to 2 bedrooms)
	5-6.5 / dwelling	0.5-0.65 / dwelling (3 bedrooms or more)
High density residential flat building	-	0.24 / unit (metropolitan regional centres)
	-	0.29 / unit (metropolitan sub-regional centre) sub-regional centre)
Housing for aged and disabled persons	1-2 / dwelling	0.1-0.2 / dwelling
<b>Casual Accommodation</b>		
Motels	3 / unit	0.4 / unit
Hotels - traditional	see section 3.4.2	-
Hotels - tourist	see section 3.4.3	-
<b>Office and Commercial</b>		
Commercial premises	10 / 100m <sup>2</sup> GFA	2 / 100m <sup>2</sup> GFA
<b>Retail</b>		
Shopping centres	-	-
Service stations and convenience stores	-	-
Motor showrooms	-	0.7 / 100m <sup>2</sup> Site Area
Car tyre retail outlets	10 / 100m <sup>2</sup> Site Area	1 / 100m <sup>2</sup> Site Area
Road side stalls	-	-
Drive-in liquor stores	-	-
Markets	18 / stall	4 / stall
Bulky goods retail stores	-	-
Video stores	-	-

Land Use	Traffic Generation Rates	
	Daily Vehicle Trips	Peak Hour Vehicle Trips
<b>Land Use Refreshment</b>		
Drive-in take-away food outlets	-	-
Restaurants	60 / 100 m <sup>2</sup> GFA	5 / 100 m <sup>2</sup> G
Clubs	-	-
<b>Recreation Facilities</b>		
<i>Recreation facilities:</i>		
Squash courts	-	3 / court
Tennis courts	45 / court	4 / court
Bowling greens	-	-
Gymnasiums- metropolitan regional centre	20 / 100m <sup>2</sup> GFA	3 / 100 m <sup>2</sup> GFA
Gymnasiums- metropolitan sub-regional areas	45 / 100m <sup>2</sup> GFA	9 / 100m <sup>2</sup> GFA
<b>Tourist Facilities:</b>		
Caravan parks	-	-
Marinas	-	-
<b>Road Transport Facilities</b>		
Road transport terminals	5 / 100m <sup>2</sup> GFA	1 / 100m <sup>2</sup> GFA
Container depots	-	-
Truck stops	-	-
<b>Industry</b>		
Factories	5 / 100m <sup>2</sup> GFA	1 / 100m <sup>2</sup> GFA
Warehouses	4 / 100m <sup>2</sup> GFA	0.5 / 100m <sup>2</sup> GFA
<b>Health and Community Services</b>		
Professional consulting rooms	-	-
Extended hours medical centres	-	-
Child care centres	-	-
<b>Public Car Parks</b>		
Public car parks	-	-

GFA = Gross Floor Area

**Note:**

Currently a research project is being undertaken with funding from Transfund New Zealand to investigate typical traffic generation rates for activities in New Zealand. When the results of this research becomes available Transit will update these figures with ones from a New Zealand context.

**Extract From:** Auckland Uniservices (1997) Draft Research Report - *Investigation of Factors Affecting Crash Rates on State highways at Rural Accesses*. Auckland

**Table A4-5 Analysis by Highway AADT (Broad Categories) (p16)**

Variable	70 km/h Speed Limit		100 km/h 80 km/h &LSZ	
	Statistics	Comments	Statistics	Comments
State highway AADT >2,500 vpd vs <2,500 vpd	OR = 7.11 95% cl = 2.37,21.3 p = 0.04% power= 46%	Quite strong evidence that crashes are more likely to occur (7.11x) at accesses where the adjacent State highway AADT is > 2,500 vpd. Evidence against independence of the variables is extremely strong but power is quite low.	OR = 8.06 95% cl = 5.40, 12.0 p = 0.00% power= 99%	Strong evidence that crashes are more likely to occur (8.06x) at accesses where the adjacent State highway AADT is > 2,500 vpd. Evidence against independence of the variables is extremely strong.
State highway AADT >10,000 vpd vs <10,000 vpd	OR = 2.18 95% cl = 1.21,3.94 p = 1.0% power= 63%	Quite strong evidence that crashes are more likely to occur (2.18x) at accesses where the adjacent State highway AADT is > 10,000 vpd. Evidence against independence of the variables is strong.	OR = 3.63 95% cl = 2.24, 5.88 p = 0.00% power= 76%	Strong evidence that crashes are more likely to occur (3.63x) at accesses where the adjacent State highway AADT is > 10,000 vpd. Evidence against independence of the variables is extremely strong.
State highway AADT 2,501 - 10,000vpd vs 0-2,500 vpd	OR = 5.89 95% cl = 1.91,18.1 p = 0.20% power= 38%	Quite strong evidence that crashes are more likely to occur (5.89x) at accesses where the adjacent State highway AADT is 2,501 - 10,000 vpd compared with < 2,500 vpd. Evidence against independence of the variables is extremely strong but power is low.	OR = 7.10 95% cl = 4.72, 10.7 p = 0.00% power= 98%	Strong evidence that crashes are more likely to occur (7.10x) at accesses where the adjacent State highway AADT is 2,501 - 10,000 vpd compared with < 2,500 vpd. Evidence against independence of the variables is extremely strong.
State highway AADT 10,000 vpd vs 2,501 - 10,000vpd	OR = 1.59 95% cl = 0.86,2.95 p = 14.0% power= 60%	A suggestion that crashes are more likely to occur (1.59x) at accesses where the adjacent State highway AADT is >10,000 vpd compared with 2,501-10,000 vpd. P value is not low enough to suggest a strong dependence between variables.	OR = 1.96 95% cl = 1.19, 3.22 p = 0.84% power= 79%	Quite strong evidence that crashes are more likely to occur (1.96x) at accesses where the adjacent State highway AADT is 10,000 vpd compared with < 2,501 - 10,000 vpd. Evidence against independence of the variables is strong.

**Notes:**

OR = Odds Ratio or the relative risk. A value greater than 1.0 indicates an increased risk  
 CL = Confidence Level. CL of 95% given of the OR falling between the two figures shown.  
 p = test of independence result – a p close to 0% indicates there is strong evidence against independence of the two variables.  
 Power indicates the strength of the relationship.

**Background Information – Access Management Techniques**  
**Source: ARRB Transport Research Ltd**

This section has been included to provide some additional methods and techniques that might be considered for managing access. Background information is given on the appropriate context for the different techniques as well as a comparison of the costs of different frontage treatments.

**Table A4-6 Techniques of access management**

Access controls	<ul style="list-style-type: none"> <li>• Vehicular access to alternative boundary, with or without “plantation reserve”.</li> <li>• Physical or legal barrier on abuttal boundary.</li> <li>• Access via adjacent property driveway.</li> <li>• Frontage roads: Service road (within reserve); Contiguous subdivisional road.</li> <li>• Local street pattern.</li> <li>• Building orientation.</li> <li>• Amenity controls (nose protection, landscaping, land use zoning).</li> </ul>
Driveway controls	<ul style="list-style-type: none"> <li>• Location, spacing and number of driveways.</li> <li>• Clearance from intersections.</li> <li>• Common driveway for adjacent or consolidated properties.</li> <li>• Specify traffic volume limit at driveway.</li> <li>• Design, including width, speed of entry, internal conditions affecting entering and departing traffic.</li> <li>• One-way or two-way operation.</li> <li>• Conditions on crossing of foot- and bicycle paths.</li> <li>• Sight line controls/requirements at exists.</li> <li>• Incorporation of driveway into signalised intersection or roundabout.</li> </ul>
Local widenings	<ul style="list-style-type: none"> <li>• Protected turns for right-turning vehicles (through median or by local deflection of through lane(s)).</li> <li>• Deceleration/acceleration and turning lanes for left-turning vehicles.</li> <li>• Manoeuvring lane for local movements (continuous left-turn lane).</li> <li>• Widened let lane.</li> <li>• Provision for parking off the through lanes: kerb indents or building setbacks.</li> </ul>
Intersection (location, spacing and control)	<ul style="list-style-type: none"> <li>• Sight line considerations in intersection location.</li> <li>• Minimum spacings of minor junctions.</li> <li>• Prohibition of minor cross-intersections on arterial.</li> <li>• Spacing of controlled (signalised) intersections.</li> <li>• Design (splays, splitters etc).</li> <li>• Signalisation requirements at driveway(s).</li> </ul> <p>(continued on next page)</p>

**Table A4-6 Techniques of access management (continued)**

Turn controls	<ul style="list-style-type: none"> <li>• Left in, left out only (median and/or channelisation).</li> <li>• One-way entries, exists.</li> <li>• U-turn bans/permission.</li> </ul>
Medians and median openings	<ul style="list-style-type: none"> <li>• Raised median.</li> <li>• Minimum median break spacing.</li> <li>• Design of median break to limit turns.</li> <li>• Insertion of median barrier to limit turns.</li> <li>• Right-turn deceleration lane.</li> <li>• Acceleration lane for merging right-turn (egress) traffic.</li> <li>• Median storage for right-turn egress vehicles.</li> <li>• Painted median to permit all turns (opposed right lane turn).</li> </ul>
Traffic control /parking controls	<ul style="list-style-type: none"> <li>• Clearways, parking bans.</li> <li>• Parking clearances from driveways.</li> <li>• Local speed environment.</li> <li>• Other traffic control items at entrances/exists.</li> </ul>

**Table A4-7 Generalised costs and benefits of access management techniques**

Access Management Technique	Items Contributing to Benefits	Items Contributing to Costs
FRONTAGE CONTROLS:		
Access control (plantation strips and similar)	Improved traffic flow, reduced fuel consumption for a given task, reduced road space needs, decrease in accidents, improved visual environment (if planting adequate) in suburban context, potentially lower noise exposure for adjacent buildings, uninterrupted bicycle movement, pedestrians at less risk from traffic across driveways and minor streets, clear neighbourhood boundaries.	Loss of land (corresponding to width of plantation or "access restriction" strip); (unverified) costs associated with non-supervised pedestrian spaces if buildings turn away from the road; maintenance costs for landscaped area.  (continued on next page)

**Table A4-7 Generalised costs and benefits of access management techniques (continued)**

Access Management Technique	Items Contributing to Benefits	Items Contributing to Costs
Service (frontage) roads	Separation of access from through traffic means some reduction in accidents and traffic interruption, parking provided for clear of carriageway, opportunities for commercial frontages to be accessible to passing traffic, allows flexible land uses, keeps non-residential traffic on the arterial.	Loss of land, inefficient use of road space and roadway; construction costs; potentially difficult intersections at entries to and exists from service road; greater noise exposure for adjacent buildings; frontages not necessarily "overseen" because of fences and commercial uses.
Internal roads brought to arterial boundary	Most advantages of service roads without traffic impedance on through lanes; provides residential exposure to arterial if that is desired; lower construction costs than for conventional frontage road; avoids entrance/exist problem.	Not suitable for non-residential uses, therefore less flexible future land uses; indirect access to sites fronting arterial.
Direct to carriageway	Least cost; usually possible within existing road reserve; maximum commercial access.	Higher impedance to through traffic, even with deceleration and turning lanes; frontages not necessarily "overseen" because of fences and commercial uses.
DRIVEWAY CONTROLS	Limits interruptions to through traffic; increased safety and traffic efficiency	Site implications; commercial consequences.
LOCAL WIDENINGS	Limits interruptions to through traffic; increased safety and traffic efficiency.	Construction costs (usually paid by developer).
INTERSECTION CONTROLS	Management of turning conflicts	Installation costs (usually paid by developer); some impedance to through traffic.
TURN CONTROLS	Reduction in turning conflicts	Increased travel distances
MEDIANS AND OPENINGS	Reduction in turning conflicts.	Increased travel distances
TRAFFIC (INCLUDING PARKING) MANAGEMENT	Reduction in impedance to through traffic; more uniform travel speed; speeds appropriate to conditions.	Loss of frontage parking.

