
Appendix 3E
Passing and overtaking

Appendix 3E– Passing and overtaking

App3E.1

Introduction

Scope

This appendix supports Transit’s policy on passing and overtaking in section 3.4.3 of the PPM. This applies to two-lane state highways in *rural* and *peri-urban* areas until the point at which they are likely to be considered for four-laning. The policy and appendix should be read in conjunction with the following documents:

- National State Highway Strategy;
- Transit’s Passing and Overtaking Guidelines (and the Background Technical Report);
- Transit’s State Highway Forecast;
- If available, Regional State Highway Network Plans and Regional Passing and Overtaking Plans; and
- Regional and district planning documents (e.g. Regional Land Transport Strategies).

Terminology

Because of the technical nature of this Appendix, a number of key terms are explained below (refer also Appendix 1 – glossary):

Passing	The action of moving past slower vehicles using specific facilities provided to do so i.e. without crossing into the opposing traffic lane.*
Passing facility	A 2+1 lane, passing lane, crawler lane, slow vehicle bay, shoulder widening or crawler shoulder.
Passing lane (PL)	An additional lane provided to enable passing. A short passing lane is 600-800m plus tapers. Passing lanes are typically 1-1.5km in length plus tapers or more.
Slow vehicle bay (SVB)	Additional lane constructed to accommodate slow-moving vehicles and so enable other vehicles to pass. SVBs are generally up to 300 m long plus tapers. Further detail on geometric design is provided in the draft SHGDM.
Overtaking	The action of moving past slower vehicles by crossing into the opposing traffic lane.*
Overtaking/passing demand	The desire for following vehicles to pass or overtake slower moving vehicles, as indicated by the amount of traffic bunching and slower speeds for following vehicles.
Treatment	A project applied directly to the state highway infrastructure.
Measure	Other activities that seek to influence driver behaviour (e.g. education, enforcement of speed limit).
Road gradient	The typical gradient of a section of road, defined as: Flat 0-3% typical road gradient Rolling 3-6% typical road gradient Mountainous >6% typical road gradient
In series	Except for 2+1 lanes, passing facilities in series are those that are frequently and regularly spaced (e.g. every 5 or 10km) between the end of the merge taper for a facility to the start of the diverge taper of the next facility when travelling in one direction.

* Transit’s definition of passing and overtaking differs from Austroads.

Appendix 3E– Passing and overtaking

App3E.2 **Passing and overtaking strategy types**

Passing and overtaking strategy types

Transit has identified four passing and overtaking strategy types for addressing passing and overtaking demand that can be applied to different sections of state highway:

- overtaking;
- mainly overtaking;
- passing and overtaking; and
- passing.

Selection of strategy type

Selection of passing and overtaking strategy types for a particular section of state highway will generally depend on projected traffic flows and road gradient as follows:

Table App3E/1 – Summary of passing and overtaking strategy types

Strategy types	Summary of passing and overtaking treatments for each strategy type A range of supporting treatments and measures are also applied, depending on strategy type	Typical 25-30 year projected traffic flow where each strategy type applies (vpd)	
		Flat road gradient	Rolling or mountainous road gradient
Overtaking	<ul style="list-style-type: none"> • Sight distance improvements • Overtaking enhancements • Possibly, isolated short passing lanes, slow vehicle bays, shoulder widening or crawler shoulders. 	Less than 4,000	Less than 2,000
Mainly overtaking	<ul style="list-style-type: none"> • Sight distance improvements • Overtaking enhancements • Possibly some short “in series” (i.e. regular and frequent) passing lanes, slow vehicle bays, shoulder widening or crawler shoulders. 	4,000- 5,000	2,000- 4,000
Passing and overtaking	<ul style="list-style-type: none"> • In series passing lanes. • Overtaking enhancements. • Crawler lanes, where appropriate. 	5,000- 12,000	4,000- 10,000
Passing	<ul style="list-style-type: none"> • 2+1 lanes on flat/rolling road gradients (subject to comparison with four-lanes). • Passing lanes in series on mountainous road gradients. 	12,000- 25,000	10,000- 25,000

However, passing and overtaking demand will also influence choice of strategy type and this will in turn be affected by other factors including:

- proportion of HCVs and light towing vehicles;
- traffic bunching before that particular section of state highway;
- directional split of traffic flows;
- vehicle speed distribution;
- horizontal alignment of the state highway;
- available overtaking opportunities including sight distance; and
- existing passing facility lengths and frequency.

Appendix 3E– Passing and overtaking

App3E.3 Treatments and measures

Treatments and measures State highways in each strategy type will be considered for a range of treatments and measures to improve passing and overtaking opportunities. These fall into three main categories:

Table App3E/2 - Categories of treatment and measure

Category	Sub-category	Examples of treatments and measures
Overtaking treatments	Overtaking sight distance improvements	<ul style="list-style-type: none"> • Vegetation control • Batter relocation • Shape correction • Realignment
	Overtaking enhancements	<ul style="list-style-type: none"> • Seal widening • Overtaking in untreated direction at passing lane/slow vehicle bay (if adequate sight distance). • Passing lane/slow vehicle bay configuration
Passing treatments	Low volume treatments	<ul style="list-style-type: none"> • Shoulder widening • Crawler shoulders • Slow vehicle bays • Short passing lane
	Moderate volume treatments	<ul style="list-style-type: none"> • Wide shoulder (special use requirement) • Passing lanes in series • Crawler lanes • 2+1 lanes (subject to four-lane comparison)
Supporting treatments	Centreline treatments	<ul style="list-style-type: none"> • Single or double yellow line markings • Central wide profile markings • Gap separation • Central median cables
	Roadside/ edgeline treatments	<ul style="list-style-type: none"> • Clear zone and shoulder run-off • Signs and markings e.g chevrons • Wide profile markings • Local shoulder widening and/or chip seal • Cable or guard rails
	Intersection treatments	<ul style="list-style-type: none"> • Overtaking zones/passing lanes with respect to intersection • Provision for through traffic • Intersection rationalisation
Supporting measures (where appropriate in conjunction with other agencies)	Resource planning measures	<ul style="list-style-type: none"> • Control of direct access onto state highway • Submissions (planning documents, resource consent applications) • Encouraging alternative District networks • New alignments
	Education measures	<ul style="list-style-type: none"> • Target audience • General public
	Enforcement measures	<ul style="list-style-type: none"> • Problem locations • General public
	TDM measures	<ul style="list-style-type: none"> • Alternative hours, routes or modes
	ITS measures	<ul style="list-style-type: none"> • Variable message signs with/without web cameras • Speed cameras

Appendix 3E– Passing and overtaking

Treatments and measures

The following table sets out which types of treatment and measure are generally applicable for each strategy type.

Table App3E/3 - Integration of treatments & measures

Category of treatment or measure	Passing and overtaking strategy			
	Overtaking	Mainly overtaking	Passing and overtaking	Passing
Overtaking treatments				
OT sight distance impm'ts	C	C	C	-
OT enhancements	A	A	A	-
Passing treatments				
Low-volume treatments	A*	A*	-	-
Mod-volume treatments	-	-	A	A
Supporting treatments				
Centreline	A	A	A	A
Roadside and edgeline	A	A	A	A
Intersections	C	C	A	A
Supporting measures				
Resource Planning	C	C	A	A
Education	C	C	C	A
Enforcement	C	C	C	A
TDM	C	C	C	A
ITS	C	C	C	C
<p>Note: A means apply. C means consider if potential or actual problem. * means apply if overtaking is not viable.</p>				

App3E.4

Long term framework for passing and overtaking treatments

Passing and overtaking treatments

Passing and overtaking treatments form the centrepiece for each strategy type. Table App3E/4 below provides specifications for passing and overtaking treatments at different traffic volumes and road gradients over the next 30 years. Further detail is provided in Transit's Passing and Overtaking Guidelines.

Appendix 3E– Passing and overtaking

Table App3E/4 - Long-term framework for passing and overtaking treatments

Projected AADT (vpd)	Road Gradient		
	Flat	Rolling	Mountainous
0-2,000	Overtaking (OT) (OT sight distance improvements, OT enhancements, possible isolated shoulder widening/crawler shoulder/SVBs ¹ /short PLs.		
2,000-4,000	Overtaking (As above).	Mainly OT, as above but possibly some SVB¹ or short PLs @ 10 km.	
4,000-5,000 (General transition to PLs)	Mainly OT, as above but possibly some SVBs¹ or short PLs @ 10 km.	PLs @ 10km 1.2 km + tapers & OT enhancements.	PLs @ 5 km 1 km+tapers & possible OT enhancements.
5,000-7,000	PLs @ 5 or 10 km² 1.2 km + tapers & OT enhancements.		PLs @ 5 km 1.2 km+tapers & possible OT enhancements.
7,000-10000	PLs @ 5 or 10² km 1.5 km + tapers & OT enhancements.		
10,000-12,000 (General transition to 2+1 lanes) ³	PLs @ 5 km 1.5 km + tapers & possible OT enhancements	2+1 lanes (subject to four-lane comparison)	PLs @ 5 km 1.2-1.5 km + tapers.
12,000-20,000	2+1 lanes (subject to four-lane comparison).		
20,000-25,000 (General transition to 4 lanes)			

Key – strategy type	Overtaking	Mainly overtaking	Passing and overtaking	Passing
---------------------	------------	-------------------	------------------------	---------

- Notes:**
1. Where appropriate, a SVB is able to be easily altered to a short PL or PL at a later date.
 2. Along the same road section, a mixed layout with 5 km spacings in higher demand locations and 10 spacings in lower demand locations.
 3. For flat or rolling road gradient, the combination of passing lane length and spacing may not be sufficient to dissipate vehicle queues and a more frequent provision of passing opportunities would be required. Therefore, passing treatments, such as 2+1 lanes (subject to comparison with four-lanes), are likely to be required for state highways with a flat or rolling gradient and projected 10,000-25,000 vpd.
 4. 10,000-12,000 vpd represents a general upper limit for passing lanes in series with flat or rolling gradient. Above this threshold, treatments such as 2+1 lanes (subject to comparison with four-lanes), are likely to be required. Some locations may have a higher upper limit of about 14,000 vpd depending on other factors, such as proportion of directional flow and traffic composition.

There will be some flexibility in determining the level of infrastructure and supporting measures for specific sections of state highway. Passing/overtaking demand may vary due to other factors (e.g. available overtaking sight distance, the length of affected state highway section and the proportion of HCVs) and this will be taken into account in determining the appropriate treatment. The provisions within the National State Highway Strategy may also affect some locations.

Temporary passing lane closure

Passing and 2+1 lanes may restrict overall traffic flow at times of high demand (typically 1,200-1,400 vph one way, depending on passing facility length), compared to single lane carriageways, because of delays at merge points. Transit may temporarily close passing lanes where this is predicted to occur (e.g. during holiday peak periods).

Appendix 3E– Passing and overtaking

App3E.5

Selection of specific treatments and measures

Passing and overtaking treatments

Table App3E/3 above sets out when specific categories of treatments and measures should be applied or considered. The following table set out which particular treatments and measures are preferred or considered in each case:

Table App3E/5 – Toolkit of options

Treatments and measures		Passing and overtaking strategy type			
		Overtaking	Mainly overtaking	Passing and overtaking	Passing
Overtaking treatments	Overtaking sight improvements				
	Vegetation control, batter relocation	C	C	C	-
	Pavement rehabilitation, realignment	C	C	C	-
	Overtaking enhancements				
	Seal widening	P	P	C	-
	Overtake at PL or SVB, PL or SVB configuration	P ¹	P ¹	P ¹	-
Passing treatments	Low volume treatments ²				
	Shoulder widening or crawler shoulder	P ¹	C ¹	-	-
	SVB or short PL	C ¹	P ¹	-	-
	Moderate volume treatments ³				
	Wide shoulder (special use requirement)	-	-	C	-
	PLs in series	-	-	P	P ⁴
	Crawler lanes	-	-	C	C
	2+1 lanes (subject to four-lane comparison)	-	-	-	P ⁵
Supporting treatments	Centreline treatments				
	Line markings	P	P	P	C
	Gap separation	-	-	C	P
	Central median cables	-	-	C	P
	Roadside/edgeline treatments				
	Clear zone and shoulder run-off	P	P	P	P
	Increased signs and markings	P	P	P	P
	Wide profile markings	C	C	P	P
	Local shoulder widening and/or chip seal	C	C	P	P
	Cable or guard rails	C	C	C	C
	Intersection treatments				
	OT zones/PLs wrt intersection	P	P	P	P
	Provision for through traffic	C	C	P	P
Intersection rationalisation	-	-	P	P	
Supporting measures	Resource planning measures				
	Control of direct access onto SH	C	C	P	P
	Submissions (plan docs, RC applications)	C	C	P	P
	Encourage alternative District networks	C	C	C	C
	Education Measures				
	Target audience	C	C	C	P
	General public	C	C	C	C
	Enforcement Measures				
	Problem locations	C	C	C	P
	General public	C	C	C	C
	TDM measures				
	Alternative hours, routes or modes	C	C	C	P
	ITS measures				
	Variable message signs with/without web camera	C	C	C	C
	Speed cameras	C	C	C	C

NOTES: P = preferred option/s, C = consider if specific problem 1 = only if overtaking strategy is not viable. 2 = low volume is typically less than projected 5,000 vpd. 3 = moderate volume is typically projected 4,000-25,000 vpd. 4 = preferred on mountainous terrain. 5 = preferred on flat/rolling terrain, subject to comparison with four-lanes. Not an exclusive list, others may be added at a later date. If more than one preferred option for same treatment/measure, consider one or combination on a case-by-case basis.

App3E.6

Implementation

Regional Passing and Overtaking Plans

Implementation of Transit's policy and approach to passing and overtaking will be through the development of Transit regional passing and overtaking plans (RPOPs). These are long term (25-30 year) plans that set out the location and extent of proposed passing and overtaking treatments and the nature of other related treatments and measures for sections of state highway within each Transit Region.

RPOPs will form part of Transit regional state highway strategies, which set out state highway development proposals for a particular regional or sub-region over the same 25-30 year time period. Appendix 3D provides more detail on the scope and content of regional state highway strategies.

Guidance on developing RPOPs, including site selection, project evaluation, staging of work packages and project prioritisation is provided in Transit's Passing and Overtaking Guidelines.

Interim passing and overtaking programme

The SHF sets out Transit's programme of projects and activities for a 10 year period. Projects to improve passing and overtaking treatments identified within RPOPs will be reflected in the SHF and as such the SHF forms an interim passing and overtaking programme. The content of this interim programme will be reviewed as part of a rolling programme, in the case of overtaking, mainly overtaking and passing and overtaking strategy types every three years, in the case of passing strategy types every five years.

Previous passing and overtaking proposals - transition period

Transit regions have already developed lists of proposed passing lanes under the previous Passing Lanes Strategy. To allow for a smooth transition to the new Policy, high priority projects and routes under the previous Passing Lanes Strategy will normally be incorporated into the RPOP and delivered according to the previously planned timescale, unless there is a significant change to the project cost upwards or project benefits downwards (or a combination of both).

Projects scheduled for construction in the 2008/09 year and beyond will be prioritised under a revised prioritisation system.

Treatments proposed under separate Transit work schedules

Some of the treatments that form part of a passing and overtaking strategy for a particular section of state highway may already be planned under a separate Transit work schedule. For example, seal widening may be planned as part of the asset management programme, or central median barrier installation under the safety improvement programme. Transit will take account of these other scheduled works and ensure they are integrated into the RPOP and the interim passing and overtaking programme in the SHF.

App3E.7

Land use planning

Accessways

Transit places a high priority on seeking access arrangements for new developments and subdivisions that do not compromise the safety of current and future passing and overtaking facilities. For example:

- Transit will seek alternative locations for accessways at locations near passing lane tapers and 2+1 lane crossover points (transition zones);
- accessways on roads with central median barriers will have restricted movements; and
- accessways on passing lanes should be avoided if possible and any that are permitted will need to be designed to ensure the safety of accessway and other road users.

Further guidance on Transit's recommended approach to accessway location and design in relation to passing facilities and overtaking zones is provided in Transit's Passing and Overtaking Guidelines.

Transit seeks to influence accessway location and design by seeking appropriate provisions in land use planning documents and in its approach to individual development and access proposals.

Land use planning documents

Transit's policy and approach to engaging in the development of land use planning documents is set out in section 4.1 of the PPM. A key objective is to achieve recognition of Regional State Highway Strategies and therefore RPOPs, in planning documents such as district plans and RLTSs. Appendix 4B sets out suggested policies and rules for district plans relating to access onto the state highway.

Development and access proposals

Transit's policy and approach to dealing with development and access is set out in section 5.2 of the PPM. Provisions include:

- Transit seeks affected party status for all developments that seek direct access to a state highway.
 - Transit will assess the impact of development proposals that seek direct access onto a state highway on current and future provision of passing and overtaking facilities, as identified in RPOPs. Transit strongly encourages developments to access local roads rather than state highways, and generally requires this on LARs where reasonably practicable alternative legal access exists.
 - Where direct access to a state highway is permitted, Transit will seek to influence location to minimise adverse impacts on passing and overtaking facilities, particularly on LARs.
 - The accessway geometric design standards set out in Appendix 5B may need to be adapted for accessways adjacent or near to passing facilities. Where an accessway in such a location is permitted, it will be subject to specific design requirements assessed on a case by case basis.
-

Appendix 3E – Passing and overtaking

Development and access proposals (continued)

- Transit will reflect RPOP provisions in the prioritisation of new Limited Access Road declaration. LAR declaration may be appropriate along passing lanes particularly where segregation strips do not exist.
- Transit may seek mitigation options for developments that are approved that help improve passing and overtaking opportunities and improve safety (for example education of users as part of a travel plan).

Designations

Some of the passing and overtaking treatments specified above are likely to require new or amended designations. In particular designations may be required for:

- new state highway alignments;
- extra width on existing state highway alignments; and
- proposed upgrading of state highway intersections with high traffic volumes.

Transit's approach to designation is set out in section 3.6 and Appendix 3F of the PPM.
