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ROAD NETWORK PLANNING & FUNCTIONAL ROAD HIERARCHIES

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ROAD NETWORK PLANNING & FUNCTIONAL ROAD HIERARCHIES

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Abstract

Road Network Planning in the Department of Main Roads is important to manage the road network to achieve desirable outcomes. Local Governments and Main Roads have responsibilities to manage their existing road networks and effectively plan for new urban and rural roads. Main Roads planning documents provide the strategies for successful results. Functional road hierarchies are effective classification systems that can be used to describe and classify roads by function for planning purposes. Links to Local Governments and implications of legislation are examined. The need for all Local Governments to adopt and implement a functional road hierarchy is advocated.

Key Words: road network planning, functional road hierarchies, Roads Alliance, Main Roads.

Purpose

This paper identifies key issues associated with road network planning and discusses the use of functional road hierarchies to address them. It introduces the road network planning regime of the Department of Main Roads and considers several road hierarchy tools that have been developed to assist local governments and the Department of Main Roads to manage their diverse road networks.

Background

The department of Main Roads has a presence across all of Queensland. There are 14 district offices that are responsible for communicating and liaising with 125 local governments on their road networks.

Main Roads Mission

There are four key outcomes for the Queensland road system, which contribute to the government's priorities for the State:

- Safer roads to support safer communities
- Efficient and effective transport to support industry competitiveness and growth
- Fair access and amenity to support liveable communities
- Environmental management to support environmental conservation.

The keys to making these outcomes a reality are partnerships and working relationships with communities, federal and state government agencies, local government, industry and the private sector.

The mission of the Department of Main Roads is to plan, deliver and manage a road system that improves the liveability of communities, affords safe travel conditions for all road users, supports economic development in a cost effective way, reduces transport costs for industry and promotes environmentally sustainable transport solutions.

Extent of responsibilities

Queensland has approximately 180,000 kilometres of public roads. Local Governments, including Aboriginal and Islander Community Councils manage 146,000 kilometres of roads while Main Roads controls 34,000 kilometres, including over 4000 kilometres of national highways. Private companies operate toll ways. The Department of Main Roads is responsible for the provision, maintenance and management of the State-controlled road network. This comprises the major traffic carrying arterials and linking roads throughout the State. Main Roads has a strategic interest in the remainder of the road system. This interest has become more demonstrated in recent times with the establishment of the Roads Alliance with local government.

Strategic Planning Through to Outcome Delivery

Roads Connecting Queenslanders

A strategic long-term direction for the Queensland road system and Main Roads.

To manage the road network effectively Main Roads undertakes strategic planning. *Roads Connecting Queenslanders* outlines the role of roads in linking Queensland communities now and into the future. Its long-term 10 –20 year focus outlines how this physical network of roads contributes to the State's economic prosperity and Queenslanders quality of life. Main Roads has a total road system focus, with a stewardship role of the State's roads in efficiently delivering road projects and managing road operations.

Challenges facing Main Roads include the need to anticipate and respond to the changing transport needs and expectations of many stakeholders within a constrained funding environment. As needs and expectations will exceed resources, Main Roads will require a greater focus on priority setting and efficiency. In these circumstances, investment must be targeted. A key way of targeting investment is through establishment of a road hierarchy.

Asset Management Framework

Main Roads' Strategic Framework for Road System Asset Management represents the total process involved in stewardship of the State-controlled road system. The framework incorporates the full spectrum of asset management activities from strategic direction setting, development of policy and strategy, program development, delivery and operations to performance feedback and review.

The framework consists of seven phases:

Phase 1: Outcomes for Transport System This phase defines the desired outcomes for the transport system to achieve broader government objectives and community outcomes.

Phase 2: Network Priorities < 15 years Phase 2 sets out investment priorities at the network level that will help achieve the transport system outcomes under Phase 1.

Phase 3: Corridor Planning & Investment Strategies <15 years Phase 3 provides a vision of the future function of a transport corridor and desired performance, for example, up to 15 years.

Phase 4: Program Development < 7 years Phase 4 condenses the Phase 3 corridor visions and investment strategies to a shorter term investment program.

Phase 5 is the program delivery phase.

Phase 6 is the project audit phase that addresses "did we deliver what we said we would deliver".

Phase 7 Review at system level to see if phase 1 outcomes were achieved.

Each of these phases requires separate tools for implementation however the establishment of a road hierarchy is essential for each step.

Road System Choices

Road system choices take a longer-term national and state-wide view of the factors that influence the development, use and management of the total road network and the wider transport system and land use. Factors include whole-of-government outcomes, stakeholder preferences, making better use of existing infrastructure and funding availability, achieving a road network that provides users with a seamless integration between State-controlled and local government roads. Choices made at the road system level drive other choices made and activities undertaken at the road corridor, road operation and road project level.

Investment Guide for Queensland's State-controlled roads

The document provides a broad picture of how the State-controlled road network should develop over the medium term that is beyond the five-year horizon of the *Roads Implementation Program.* The guide is based on a fitness-for-purpose approach.

The *Investment Guide for Queensland's State-controlled roads* sits under *Roads Connecting Queenslanders* and provides a starting point for a more detailed link and project planning.

At the road link level, Link Strategies are the "blue print" for developing specific road corridors. They show the likely timing and staging of the works needed to achieve twenty-year visions. They also outline strategies for managing road operations. Strategies for road development include rural areas, urban areas and a staged development approach as well as a funding outlook.

The Investment Guide assists with road investment decision-making. The road visions have been useful for preparing Statements of Intent for particular road links. Main Roads is using these statements as an input to new planning schemes prepared by local governments under the *Integrated Planning Act 1997.*They also provide a starting point for more detailed roads planning as well as input on State-controlled roads of other departments, local governments and industry.

Industry studies provide an understanding of past and future trends in road use.

Appendix A Investment Guide and Planning Process graphically represents the above process.

Roads Alliance

To ensure investment is being targeted to community priorities, a major initiative in road network planning in Queensland is the Main Roads/Local Government Alliance, commonly known as the Roads Alliance. The Alliances provide a basis for improved planning and management of State-controlled roads and local government roads serving a like function. The common understanding in the Roads Alliance is that both parties have the desire to produce better road outcomes within existing budget allocations and also to develop better business cases for a greater share of federal dollars for Queensland.

The Roads Alliance will increase the effectiveness of road planning by enabling Main Roads and local governments to better target road works

in high priority areas. The Regional Road Groups will agree on priority works based on community and regional road network requirements as well as on network condition. That common understanding has already produced an agreed road hierarchy. The Road Functional Classifications parallel the nine NAASRA Classes. **Class 1** include National Highways and other state highways that form the principal avenue of communication between, through major regions. **Class 2** are State Strategic roads or main roads the convey the movement of through traffic. **Class 3** includes rural arterials, mainly regional roads and major local government roads that are not Class 1 or 2 and are an avenue of movement between important centres and/or key towns. **Class 4** are known as Rural Collectors that consists of mainly district roads and local government collector roads that move local traffic from local areas to the wider road network including access to abutting properties. **Class 5** are roads that connect to Class 1, 2, 3 or 4 roads. These are access roads to residences, properties or specific facilities that carry local traffic. Classes 6, 7, 8 and 9 are urban roads. **Class 6** are known as Urban Arterials. They are the principal arteries for through traffic and freight movements across urban areas that are the extensions into urban areas of Class 2 or Class 3 roads. **Class 7** are Major Urban Collectors. These consist mainly regional roads that are significant local government road links in urban areas and convey through traffic. **Class 8** are Minor Urban Collectors. They move local traffic on local government collectors and trunk collectors. **Class 9** are known as Urban Access that have access to special facilities and consist of access streets and cul de sacs the carry local traffic.

Roads Implementation Program 2002-03 to 2006-07

Consultation with industry, the community and other levels of government was an essential step in this year's $5.6 billion *Roads Implementation Plan (RIP).* The RIP takes into account policy objectives of government and reflects all government commitments and the business direction set out in Main Roads' Strategic Plan.

Projects likely to be implemented over the next five years are usually detailed in the current *Roads Implementation Program*, which is a rolling five-year program of detailed planning, design, construction, operation and maintenance works. The first two years of the *Roads Implementation Program* indicate a firm project commitment. The last three years of the *Roads Implementation Program* are indicative and only for planning purposes. The *Roads Implementation Program* is distributed to a wide range of stakeholders including local governments.

Guidelines for Assessment of Road Impacts of Development Proposals

These guidelines assist developers to assess the impact of developments on State-controlled roads. This means that proponents and Main Roads can identify the likely impacts to the operation and physical characteristics of the infrastructure to accommodate traffic generated from a specific development and reduce the risk to the development. Requirements differ across different road classifications.

Legislation

The *Transport Infrastructure Act 1994* establishes powers that provide for local government to obtain Main Roads

approval for among other things certain developments that would have a significant impact on State-controlled roads.

The purpose of the *Integrated Planning Act 1997* (IPA) is to seek to achieve ecological sustainability by – coordinating and integrating planning at the local, regional and State levels; managing the process by which development occurs and managing the effects of development on the environment (including managing the use of premises). Local Governments are developing Planning Schemes that are a guide to the management of development within their local government area. To comply with IPA, assessable and self-assessable development is identified as well as identifying outcomes sought to be achieved in the local government area as the context for assessing development. Road hierarchies are a useful tool for coordinating land use and transport planning.

Functional Road Hierarchies

A road hierarchy is the classification of roads into major and minor routes. These are used for planning purposes to safely and efficiently manage the movement of people and goods while maintaining the liveability of urban and rural areas.

A functional road hierarchy is consistent, easily understood and usable. Main Roads and local government currently use different terminology. A common understanding of the terms and usage of a road hierarchy is a desirable step forward.

Individual Road Hierarchy Classifications

In the past, several attempts have been made to standardise terminology and understanding of corridor planning nomenclature.

Cairns Hierarchy – Draft – March 1998 (prepared by Eppel Olsen & Partners)

This was a document developed in joint collaboration between Cairns City Council and the Department of Main Roads.

It highlights benefits of having an established Road Hierarchy as:

- ensuring activities most closely related to frontage development (for example, social interaction and parking) can be given more space when environmental and access functions are allowed to predominate;

- allowing activities which are incompatible with traffic flow to be restricted on designated routes where traffic movement should predominate;

- restricting the overall environmental impact of traffic flow to be restricted on designated routes where traffic movement should predominate;

- ensuring orderly grouping of streets/roads in a framework around which state and local governments can plan and implement various construction, maintenance, environmental schemes and projects;

- providing a sound basis for traffic management, transport and land use management planning;

- assisting local governments to consider the effect of their decisions on surrounding areas and streets within the established road hierarchy;

- assisting state and local governments with the adoption of suitable standards of construction of traffic routes and Local Area Traffic Management for various roads/streets;

- allowing orderly planning heavy goods vehicle routes including dangerous goods;

- assisting in the identification of through connections for public transport;

- ensuring amenity benefits by indicating suitable treatments, for example, designation of traffic carrying roads indicate that treatments such as buffers, barriers, mounds, siting consideration can occur to preserve amenity. It also allows the identification of environmental cells/neighbourhood where through traffic is discouraged;

- ensuring control over design and access provides safety benefits.

It is indicated in the Cairns area that some sub arterial roads contain residential frontages. 60kph speeds may create potentially hazardous situations due to this mix of access and traffic carrying functions.

Transport Plan for Brisbane 2002 – 2016 – Brisbane City Council

This document outlines a plan for a sustainable future and the cost of unsustainable travel choices. A desired outcome is that people and goods can move safely on the road network by the most efficient modes and routes, and the impact of traffic on neighbourhoods and the environment is minimised.

The future road network has been planned to:

- align with Council's Road Hierarchy, the Centres Policy and preferred land use outcomes defined in City Plan

- ensure upgrades support the most efficient movement of people and goods

- reallocate freed-up general traffic lanes on the radial road network for bus priority, bike lanes and local amenity improvements

- increase safety and reduce "rat-running" on local streets

Council's Road Hierarchy ensures that roads are appropriately designed to serve particular functions in the movement of people and goods, including pedestrian, bike and public transport modes to maximise their efficient use and preserve the amenity of the local environment. The Road Hierarchy is also an important element in supporting preferred land use and urban form throughout the city. The hierarchy includes motorways, arterial routes, suburban routes, district accesses, neighbourhood and local accesses.

While the main function of streets is access to residences, local streets also have an open space function that residents use for other activities like walking, cycling or simply speaking with neighbours. Council recognises that residents closely relate their local street with where they live and their sense of place.

The document also recommends that the efficient use of the existing road network will reduce the need to continuously upgrade or add new facilities. Intelligent transport systems will assist users in their choice of route at peak times. Clearways will be extended, use of innovative line marking will be undertaken as well as the carrying out of minor capital works at intersections to improve road capacity and safety.

Main Roads' recommendation under IPA

Two tables that Main Roads have recommended that Councils include in their planning schemes are included in Appendix B Urban Roads – Road Hierarchy Desirable Performance Criteria

and Appendix C Rural Roads – Road Hierarchy Desirable Performance Criteria – Rural Areas. Main Roads is not prescriptive in this matter however would expect road hierarchies to include all road functions from highways/motorways through to access places.

These two tables display the complexity of the classification of roads. The most important aspects of road classification are the implications of legal responsibility including *duty of care* issues and construction standards as well as efficient and effective land use management planning.

Road classification acknowledges that not all roads are the same. For example, national highway route users expect roads that enable them to drive fast without the friction of property access, intersections or turning vehicles impeding their trips, commonly called the traffic function. Alternatively, residents desire access roads that give priority to their social and recreational needs rather than through traffic, commonly called the access function.

Road Characteristics

Classifying roads enables the identification of the needed characteristics of the road and traffic it carries so that suitable planning and design standards such as width, geometry, degree of access permitted and junction priority can be chosen to satisfy construction standards.

A road hierarchy also assists in relating the type of traffic each road is expected to carry to the environmental needs of the surrounding community. Most of our roads have a balance. It is important to get this balance right. Main Roads is conscious of the impact of local trips on the regional function of the higher order State-controlled roads. Peak hour traffic often accentuates the impacts of local traffic. Similarly, the communities in urban areas normally do not appreciate regional, state and national traffic on local streets.

The separate functions of each type of road have implications for access to higher order roads. Two predominant functions of roads in urban areas are those that carry traffic – the arterials and distributors and those that give access to adjacent property – the access roads.

Appendix D Function versus Classification Graph describes the way the traffic function and land service function are often inversely proportional to each other.

Benefits of a Functional Road Hierarchy

A functional road hierarchy provides transparency and assists efficient and effective communication between developers, local governments, Main Roads and others. A common hierarchy would be advantageous to Main Roads when discussing construction and maintenance needs with local governments and developers. Similar policies for on street parking, pedestrians and direct property access could be applied to both Main Roads and local government roads where the function is similar.

A common functional road hierarchy also has implications for land use management planning including corridor planning, corridor protection and the tools needed to protect land for future State-controlled roads.

Over the years, there has been at least three different classification systems used in Queensland and it needs to be acknowledged that there have been difficulties and consequently a shift in thinking towards a "standard gauge". This joint and agreed hierarchy will provide a key benefit particularly with respect to access to road issues. Investment decisions will be more efficient.

Expectations about road noise will be more predictable. Land use management planning issues will be easier to resolve and management of the network will be more efficient if everyone knows the anticipated outcomes. The first step will be to get an agreed road hierarchy between State and local governments.

Links to Local Governments

Main Roads interests are being recognised in local government planning schemes. A road hierarchy is a good starting point for addressing access issues and identifying road issues associated with development proposals. It is expected that through Main Roads further involvement in land use planning, that land use applications consistent with the local government planning scheme will also be more consistent with Main Roads' plans for future road works.

Implications of Integrated Planning Act (IPA) 1997 and Integrated Planning and Other Legislation Amendments (IPOLA) 2003

IPA recognises the policies of local government and State Agencies and is a process to try to ensure that the Planning Schemes outcomes are adhered to. Main Roads has the opportunity to be involved in the preparation of planning schemes that provide early identification, discussion and resolution of opportunities for integration, including strategic planning matters and future infrastructure planning.

In the future priority infrastructure plans will form part of the planning schemes that are identified within the priority infrastructure areas. These areas represent cost effective areas of extension of services to be contained in the next 15 years of development growth. If any future road works needed, because of the development, can be completed within the timing of planned road works by Main Roads then the development will be regarded as having no significant adverse impact on the State-controlled road network. In this situation, no conditions with respect to the road works are likely to be attached to the development application by Main Roads. However, if the development is outside the priority infrastructure area then conditions will be necessary to mitigate road impacts of the development.

Conclusion

Transparency and a common understanding between local governments, state agencies and the private sector on what land use is suitable on particular roads is needed. In addition, as growth continues the relationship between transport, land use and the environment will become more pressured.

These hierarchy principles provide a means of classifying a road according to its function, role and management. Past decisions have resulted in current constraints that mean that corridor planning is very difficult. However, if a functional road hierarchy can be implemented in each local government there can be better outcomes for road users.

References

Brisbane City Council, "Transport Plan for Brisbane 2002 – 2016".

Eppell Olsen & Partners (1998), "Cairns Hierarchy Draft".

Integrated Planning Act (1997).

Queensland Government, Department of Main Roads, "*Roads Implementation Program 2002-03 to 2006-07".*

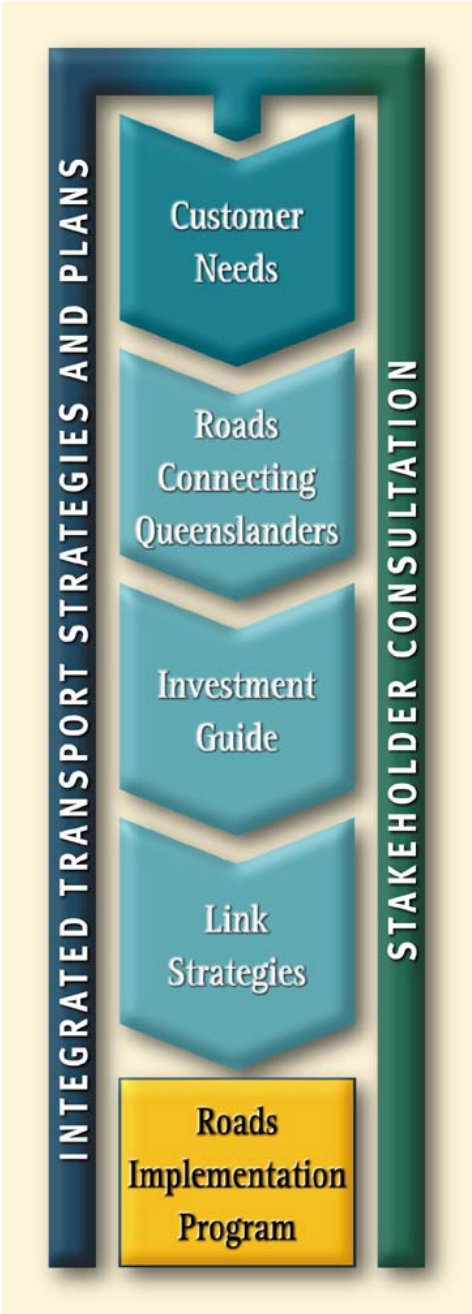
Queensland Government, Department of Main Roads, "Investment Guide for Queensland's state-controlled roads".

Queensland Government, Department of Main Roads, "Roads Connecting Queenslanders".

Queensland Government, Department of Main Roads, "Guidelines for Assessment of Road Impacts of Development Proposals".

Transport Infrastructure Act (1994).

Appendix A – Investment Guide and Planning Process



Appendix B – Road Hierarchy Desirable Performance Criteria

Criterion	Arterial Road			Sub Arterial Road			Collector Street		Local Street	
	Highway	**Arterial**	**Arterial Main Street**	**Traffic Distributor**	**Controlled Distributor**	**Sub Arterial Main Street**	**Major Collector**	**Minor Collector**	**Access Street**	**Access Place**
					Functional Characteristics					
Dominant Function	National/State/ Regional	Metropolitan	Metropolitan/sites	District	District	District /sites	Neighbourhood	Neighbourhood	Sites	Sites
NAASRA Classification	1	2	3 and 6A	6B	6C	6C	7	8	9	9
Traffic carrying function	Volumes not restricted	Volumes not restricted	<20,000vpd	Volumes not restricted	<10,000vpd	<10,000vpd	<6,000vpd	<3,000vpd	<750vpd	<300vpd
Residential access function	Nil	Nil	Nil	Nil desirable, accept consolidated	Nil desirable, accept consolidated	Site specific	Consolidated	Individual	Individual	Individual
Commercial access function	Nil	Nil	Site specific*	Consolidated	Consolidated	Site specific	Direct possible for large sites	Individual	Individual	Individual
Industrial access function	Nil	Nil	Nil	Nil	Nil	Nil	Direct possible for large sites	Individual	Individual	Individual
Traffic speed environment	≥100km/h	70-80km/h	40-50km/h	60-80km/h	May be controlled to 50-70km/h	40-50km/h	60km/h	50km/h	≤ 50km/h	≤ 50km/h
Heavy vehicle movement	Primary freight routes	Primary/secondary freight routes	Should bypass except for access	Secondary routes	Should bypass except for access	Should bypass except for access	Access only	Access only	Access only	Access only
Dangerous goods movement	Primary routes	Nominated routes only	Inappropriate except for access	Nominated routes only	Nominated routes only	Inappropriate except for access	Inappropriate except for access	Inappropriate except for access	Inappropriate except for access	Inappropriate except for access

Public transport facilities	Line haul, priority treatments	Line haul, priority treatments	Bus route	Bus route	Bus route	Bus route	Bus route	Bus route	Nil	Nil
Cycle facilities	Nil	Trunk Routes, off carriageway*	Trunk/District routes, cycle lanes on road	Trunk/District routes cycle lanes on road	Trunk/District routes cycle lanes on road	Trunk/District routes cycle lanes on road	District/Neighbourhood routes, cycle lanes on road	District/Neighbourhood routes. Marked lanes not req'd	Neighbourhood routes, shared road space with cars	Neighbourhood routes. Shared road space with cars
Pedestrian movement facilities	Only where linkage required, separate from road*	Only where linkage required, pathways*	Pathways both side	Only where linkage required, pathways*	Pathways both sides	Pathways both sides	Pathways both sides	Pathways one or both sides	Depends on network planning	Depends on network planning
					Functional Characteristics					
Access control	No access	No access	Selective access control	Selective access control	Selective access control	Selective access control	Combined site access	Individual sites	Individual sites	Individual sites
Parking provision	Nil	Nil	Keep clear of through lanes	Nil	Keep clear of through lanes	Keep clear of through lanes	Nil	Kerbside	No specific provision	No specific provision
Bus stopping provision	None on road	Indented bays where appropriate	Indented bays where appropriate	Indented bays where appropriate	Indented bays where appropriate	Indented bays where appropriate	Indented bays where appropriate	Kerbside	No provision	No provision
Pedestrian crossings	Grade separated	Signalised	Controlled points	Controlled points	Controlled points	Controlled points	Some points controlled	Some controlled points	No specific provision	No specific provision
Intersection spacing	1-2km highway ≥2km motorway	500-1000m	Site specific	300m	300m	Site specific	100m	60m	40m	Nil
Intersection treatments	Grade separated	Grade separated /signal/roundabout	Signal/ roundabout	Signal/roundabout /priority T	Signal/roundabout /priority T	Signal/roundabout /priority T	Roundabout/priority	Roundabout/ priority	Priority	Priority
Cross section	Volume driven, divided	Volume driven, could be divided	4 or 2 lanes, could be divided	Volume driven, could be divided	4 or 2 lanes, could be divided	4 lanes	4 lanes, could be divided	2 lanes	2 lanes	1 or 2 lanes

* Where no viable alternative solution exists

Appendix C – Rural Roads – Road Hierarchy Desirable Performance Criteria – Rural Areas

Criterion	Highway	Arterial	Traffic Distributor	Major Collector	Minor Collector	Access Street	Access Place
Functional Characteristics							
Dominant Function	National/State/Regional	Intra regional	District	District	Neighbourhood	Sites	Sites
NAASRA Classification	1	2	3	4A and B	5A	5B	5C
Traffic carrying	Volumes not restricted	Volumes not restricted	Volumes not restricted	<6,000vpd	<3,000vpd	<1,000vpd	<500vpd
Residential access	Nil	Nil	Nil	May be individual	Individual	Individual	Individual
Commercial access	Nil	Nil	Consolidated	Consolidated	Individual	Individual	Individual
Industrial access	Nil	Nil	Nil	May be individual	Individual	Individual	Individual
Traffic speed environment	≥100km/h	80-100km/h	80-100km/h	60-80km/h	50-70km/h	50-60km/h	≤ 50km/h
Heavy traffic movement	Primary freight routes	Primary/secondary freight routes	Secondary routes	Access only	Access only	Access only	Access only
Dangerous goods movement	Primary routes	Nominated routes only	Nominated routes only	Inappropriate except for access	Inappropriate except for access	Inappropriate except for access	Inappropriate except for access
Public transport facilities	Line haul, priority treatments	Line haul, priority treatments	Bus route	Bus route	Bus route	Bus route	Nil

Frictional Characteristics							
Cycle facilities	Regional, off carriageway	Regional, generally, off carriageway	Regional/local, cycle lanes on road	No specific provision	No specific provision	No specific provision	No specific provision
Pedestrian movement facilities	Only where linkage required, separate from road*	Only were linkage required, pathways*	Only where linkage required, pathways*	No specific provision	No specific provision	No specific provision	No specific provision
Preferred access control	No access	No access	Selective access control	Combined site access	Individual sites	Individual sites	Individual sites
Parking provision	Nil	Nil	Nil	No specific provision	No specific provision	No specific provision	No specific provision
Bus stopping provision	None on road	Indented bays where appropriate	Indented bays where appropriate	Kerbside	Kerbside	Kerbside	Nil
Pedestrian crossings	Grade separated	Signalised/ Controlled point	Controlled points	May require controlled points	May require controlled points	No specific provision	No specific provision
Intersection spacing	4-8km (maximum 12km)	>1000m	>300m	>100m	>100m	>100m	Nil
Intersection treatments	Grade separated/ Priority	Roundabout/ priority	Roundabout/priority	Roundabout/priority	Roundabout/priority	Priority	Priority
Cross section	Volume driven, could be divided	Volume driven, could be divided	Volume driven, could be divided	2 lanes, could be divided	2 lanes	2 lanes	1 or 2 lanes

Appendix D – Function versus Classification Graph

Insert attached appendix D here.

Author Biography

Insert attached photo here.

Valerie Dripps has worked in mining, organisational development and training. As a consultant, she was a built environmental scientist before joining the Department of Main Roads in 2000. In Main Roads Valerie has worked in the Environmental Management, Organisational Capability and Road Network Management branches. Currently, Valerie is focused on corridor planning and its relationship with land use.

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