Discussion Paper

Review of

Queensland Streets and Complete Streets

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21 August 2016
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1. Introduction

1.1. Purpose

This discussion paper has been prepared for the Institute of Public Works Engineering Australia, Queensland Division (IPWEAQ).

The paper provides a review of the IPWEAQ documents, *Queensland Streets* and *Complete Streets* in response to comments and criticisms from the local government industry and engineering profession about their suitability for contemporary use. It provides recommendations on a way forward that addresses current concerns about those documents.

The opinions expressed in this discussion paper are based on the experience of the author, who has undertaken this work pro bono. They do not represent the opinions of the IPWEAQ or any IPWEAQ representatives.

1.2. Background

During the 1980’s, members of the South-East Queensland Local Government Engineers and Overseers Association (including the author) were involved on a voluntary basis in the preparation of documents for the standardisation of road design, stormwater drainage design and standard drawings for use by local governments throughout South East Queensland. This organisation had an informal link to the then Local Government Engineers Association of Queensland (LGEAQ), subsequently the Institute of Municipal Engineering Australia (IMEAQ), Queensland Division and now the Institute of Public Works Engineering Australia, Queensland Division Inc. (IPWEAQ).

Funding was then obtained for the completion of these projects. The road and stormwater design projects were undertaken by consulting engineers under the guidance of steering committees. This led to the publication of the first editions of *Queensland Streets* in 1993 and the *Queensland Urban Drainage Manual* in 1992. The author, on a voluntary basis, also lead the production of first edition of the LGEAQ Standard Drawings in the late 1980’s.

The first edition of *AMCORD* (*Australian Model Code for Residential Development*) was published in 1989 followed by a second edition in 1990. This was a resource document whose aim was to encourage a wider choice in housing and greater cost-effectiveness in residential subdivision. It established a development control system that was soundly based on research. It also introduced a relatively new approach to code development, being a single comprehensive set of objectives, performance criteria and prescriptive (deemed-to-comply) standards to cover residential development up to two storeys in height. *AMCORD* led to a major shift in the approach to residential development.

*AMCORD* addressed 12 elements of residential design, one of which was Street Design. The broad coverage of the Street Design element had insufficient detail for the finalisation of the subdivision layouts and the preparation of detailed development design.

The reasons for producing *Queensland Streets* were:
to produce a standard design manual of practical use to designers that would gain acceptance throughout Queensland; and
• to provide the necessary additional technical support to AMCORD in the area of Street Design, that incorporated “state of the art” principles and techniques.

At the time of its publication, Queensland Streets was possibly Australia’s leading-edge guideline on the design of streets in residential developments.

Although originally intended primarily for the design of street layouts and detailed design for lower-density residential developments in greenfield areas, the principles within Queensland Streets could be applied to brownfield development and existing streets in lower-density residential areas. Those principles were subsequently extended to develop guidelines for street design in rural residential areas, multi-unit residential developments and industrial areas.

Although Queensland Streets is a guideline document, it is written in the form that it can be adopted as a development code for subdivision design.

What Queensland Streets does not cover in detail is street design for areas other than residential-only and industrial-only precincts.

It appears that one of the motivations for the development of Complete Streets, which was published in 2010, is that Queensland Streets did not address the design of streets in other types of precincts, such as mixed-use precincts, urban villages and town centres. Some professionals also had a different view on the planning and design of residential streets. A further motivation was the emergence of a number of different philosophies with respect to land use planning.

Some urban planning philosophies and approaches to development that have gained acceptance by some in the planning professions over the past few decades include:

• New Urbanism;
• Transit-oriented Development (TOD);
• Transit-supportive Communities/Development (TSC/TSD);
• Urban Villages;
• Traditional Neighbourhood Development (TND);
• Neo-traditionalism.

There is now concern that Complete Streets does not adequately meet the needs of designers, particularly with respect to its suitability as a development code and design code. There are also concerns that some of its provisions are not evidence based, and that they are inconsistent with Queensland Streets.

1.3. Survey Feedback

A survey of practitioners undertaken by IPWEAQ yielded a range of views about the suitability of Queensland Streets and Complete Streets.

It is clear from the survey answers that there is an overall sentiment that Complete Streets does not address the needs of designers and development assessment authorities. The general view is that, even though it provides an interesting perspective on street planning and design, it is of little practical use to designers and development assessors.
Queensland Streets is still regarded as being technically sound, but requires some updating. There is some limited support for supplementing Queensland Streets with additional material. Its continued use as a design manual and development code seems to be generally supported.

The following are the comments (quoted in italics) received to the question, “Is there anything else you would like incorporated into Queensland Streets or Complete Streets?“:

- Rural road issues.
- We need a combination of the 2 documents. The contemporary and well accepted planning philosophy of Complete Streets and technical engineering detail of Queensland Streets meeting a contemporary standard.
- Queensland Streets could incorporate additional information for small lot and rear access development.
- I believe it cannot be resuscitated, it should be scrapped and replaced with an updated version of Qld Streets.
- The layout and technical content should be similar to Queensland Streets. As a technical document Complete Streets provides limited guidance.

The following are the additional comments (quoted in italics) made in the survey responses:

- Complete Streets referenced in Engineering Design guidelines and used to generate road hierarchy cross sections. Engineering drawings would be used to supplement IPWEAQ std drawings plus Council own standard drawings.
- Just need to supplement Complete Streets to fill gap to Austroads. Complete Streets is called up in Planning Scheme and a supplement under banner of Complete Streets would not require amendment to Planning Scheme.
- Typical intersections layouts showing recommended distances from and between property accesses, commercial accesses etc. would be helpful. Recommended street layouts would be the reason I use the material the most.
- C.S. is called up in most planning schemes I am required to comply with but they have all developed individual design guides with some relying on AustRoads Standards to varying degrees. More than Engineering drawings are required in C.S. to provide the necessary shortage of technical information to convert it into a complete street design code. My preference is that Q.S. is made a contemporary street design guide supporting the CS design philosophy. For the IPWEAQ standards to be once again adopted statewide (to make massive savings to the development industry and to Councils) they need to be a fully integrated code i.e., the planning guidance of CS with a modernised self-contained Street design guide in a revised Q.S. Austroads stds do don’t focus on non-car transport as a priority nor do they support urban amenity or residential quality. The Western Australian Government’s Liveable Neighbourhood is the nearest to a complete street (not road!!) design code in Aust. Queensland badly needs an equivalent design guide again.
and massive industry saving would result. It would also be massively popular!!! I am happy to provide support towards the formation of an updated Queensland Street design code.

- We have a copy in our Design Library but I rarely use it. I generally use Austroads/TRA planning scheme/TMR Standards/IPWEA Standard Drawings. If the standard drawings were relevant to and referred by TRA planning scheme I would use them. I don’t know why Qld streets is not referenced in TRA planning scheme.

- We reference both Complete Streets and Qld Streets in the Regional Development Manual (covers 10 LG’s + Cape Indigenous councils). We tried to use only complete streets but more details specifications were missing which are in Qld Streets so we have to reference them both.

- When reviewing reconfiguration applications for new developments. Standard details are very valuable in assessing proposals. Information from Complete Streets and Queensland streets are included in design standards and planning scheme policies.

- Queensland Streets was useful in providing design information that wasn’t available in other manuals (eg. cul-de-sac information). Complete Streets, although useful as a guide to assist with design culture, does not provide useful information to use in design. Therefore, after reading it once, you tend not to refer to it again.

- For the engineering designer, Queensland Streets is a vastly superior publication with the level of detail provided.

- As a sole operator (effectively), I work with other larger organisations or clients on project management or delivery. As such I don’t tend to utilise either document with maybe the occasional reference when reviewing the work of a designer. Inclusion of Standard Drawings may slightly increase usage.

- Planning schemes are moving to technical documents for road design. QLD Streets needs to be able to offer advice/direction that is not in these documents. This is the case for road hierarchy; all councils seem to call road types by different names, different road widths and verges, road requirements and configurations. Parking rates are another point of variation. Consistency across councils is an important outcome that maybe achieved through Qld streets.

- Complete Streets is of no use as a design manual and in no way is an adequate replacement for Queensland Streets. Queensland Streets is still relevant and with minor revision could be a useful tool for the foreseeable future.

- As a practical and usable Engineering reference document, Council’s needs an authoritative and prescriptive document that can be relied upon. In this manner a good Engineer can get the same answer (or solution) as another good engineer when talking about the same problem, this helps to eliminate conflict when designing and or assessing
designs carried out by others. As a general rule, all Council Engineers share the same low opinion of this document and never refer to it.

- See above comments. Complete streets needs to be more technically focussed and prescriptive to be used to guide appropriate outcomes. it has been suggested that the format should be revised to be similar to Queensland Street with revisions to ‘old’ information as appropriate.

- The SCC planning scheme references both documents.

- I use complete streets when looking at streets adjacent to mixed land uses and where I am looking at better integrating pedestrians and cyclists into the street environment. The Austroads design guides are the technical design standards that should be applied however they typically do not cater well for the lower speed street environments and can also be difficult to interpret. It may be as simple as having Austroads review and endorse or update the current figures and tables within Queensland Streets so that they can be considered a contemporary standard.

- Capricorn Municipal Development Guidelines documents still reference Qld Streets. References were not changed to Complete Streets due to resource constraints but also considering how the new Complete Streets philosophy affected the rest of the documentation. Changed road hierarchy was one example.

- Complete Streets is a higher order document that contains too many variables. We need specific outcomes (acceptable solutions) like that contained in Queensland Streets. Queensland Streets remains the document referenced in our Planning Scheme.

- Extract from the BRC 2015 planning scheme:
  SC6.3.3.3 Geometric design
  Council has adopted the Complete Streets (IPWEAQ 2010) as the primary guide for its road layout (refer to standard drawings for the road cross sections). However, Complete Streets does not preclude cul-de-sacs and T-intersections in the mix of road and intersection layouts. Accordingly, it will be necessary, in some cases, to control vehicle speeds in residential streets through tight horizontal alignments - by providing curved alignment and limiting the road leg length?. The Design Criteria tables in this manual provide minimum values where speed controls are required. Therefore, Queensland Streets (IPWEAQ 1995) may be used to obtain values outside the minima.

- As part of development assessment, I consider the proposed layout and use concepts in both publications but I only really refer to them when there needs to be a negotiation.

- Uncertain about last question. I have only ever referred to Queensland Streets about 2 times during my career, to find information regarding proposed cycle routes. After looking at the latest TRUM manual, I would prefer to not have supplements in a standard. It is just my opinion but it is so much easier for me to refer to information within one document with chapters etc. I don't like supplements. Drawings are always
helpful. Standard drawings are a good idea, assuming that qld streets are referenced in grc stds.

- The complete streets direction seems to be more towards the pedestrian traffic being the hierarchy over vehicle traffic. This is not conducive to the small towns actual traffic movements. The final resource should have components to address the actual direction that the road authority is working towards. Urban street design in complete streets is adequate for more high occupancy residential areas but does not address the patterns of smaller populations bases and communities that have ample street spaces to cater for all traffic. There are more smaller communities within Queensland than highly populated urban areas. For smaller rural communities the complete streets manual is not financial feasible to follow which is why I think is not followed as a resource.

- The planning scheme of this Council refers to both. There is a sentiment to have reference to Complete Streets removed as a reference as unhelpful in resolving issues when it comes to development assessment. For a decision under the Sustainable Planning Act to be a good decision it must be based upon a clear set of reasons. Sound reasoning requires reference to credible standards that possess the characteristics of being: sufficiently definitive as to be pragmatically useful, widely accepted by professionals in the field and clearly superseding and advancing upon previous approaches. Queensland Streets does provide a sound basis for publicly defendable decision making, generally providing a credible and defendable standard for wide application. Provision of alternative solutions under contemporary planning practice is also important. For alternative solutions to be sufficient it is necessary that they be based upon the established principles of engineering as opposed to mere opinion. Complete Streets has not adequately addressed this need. Rather it has not advanced upon previous approaches; instead it offers guidance without being definitive, raising issues without necessarily resolving them within a best practice framework. Complete Streets may be a product of its time. Possibly it sought to recognise contemporary trends in land use planning; however, it was caught up in a milieu of limited involvement in the details of project delivery. Complete Streets should now be retired from service. Queensland Streets continues to provide a sound basis for the planning, assessment and delivery of municipal-scale road infrastructure. The publication date and the layout of Queensland Streets might lead some to presume that the document is out of date. Queensland Streets remains a fundamentally sound document. It is in need of a publication refresh and an update amendment to contemporary practices. It is strongly recommended that Queensland Streets be updated and reissued as the preeminent municipal road infrastructure manual.
2. Document Introductions and Approaches

2.1. Document Purposes and Scopes

The purpose of *Queensland Streets* is stated at the beginning of that document, it being:

- “To provide the basis for a uniform standard of residential streetworks design, incorporating “state-of-the-art” principles and techniques, for use throughout Queensland.
- As a technical support to AMCORD, to provide more detailed design criteria necessary for the design of streetworks for residential developments in accordance with AMCORD principles.”

Its scope and application are also described in the Introduction Chapter. Although relatively well defined, some practitioners seem to be unaware of the limited scope of *Queensland Streets*. The Introduction Commentary (p10.) states that the recommended applications for *Queensland Streets* to be:

- “Conventional” Detached Residential, 600 to 1,200 m² (albeit no longer conventional);
- Large Lot Detached Residential, 1,200 to 2,000 m²;
- Rural Residential, over 2,000 m²;
- Small Lot Residential, 250 to 600 m²; and
- Multi-unit Residential (generally greater than 1 unit per 150 m²).

For the purposes of this discussion paper, all the above residential types will be referred to as lower-density residential. They are also limited to dwellings having maximum two-storey construction, similar to that provided for under *AMCORD*.

Also, for the purpose of this discussion paper, the term lower-order residential-only precincts is intended to refer to those precincts that are essentially residential, but may or may not include within community facilities, schools, shops, etc., that can be accessed without the need to access an external major road system.

It is felt that the purpose, scope and application sections of *Queensland Streets* should be revised to emphasise the limitations in scope as outlined in the Introduction Commentary.

On the other hand, the purpose of *Complete Streets* (in Section 1.2 of that document) is not specific. It states that it “provides a uniform standard”, but it is arguable that it does not do so, it is quite the opposite.

Although *Complete Streets* also states that it is a guideline document, it could be more correctly classified as a resource document rather than a guideline document.

*Complete Streets* does not include a scope or application. The Introduction Chapter is not succinct and gives the impression that it applies to streets in all precinct types. That may have been the intention of the document, but as outlined throughout this paper, it does not adequately perform that role for residential-only precincts.

The purpose and scope are not clearly defined in *Complete Streets*. Its format and style also reflects a purpose that is not well-defined. This may partly explain why it has not gained adequate acceptance amongst practitioners.
Importantly, *Queensland Streets* and *Complete Streets* are not just design documents. They are also planning documents for not just streets, but also street networks within precincts. The planning aspect of these documents is just as important, if not more important, than the detailed design standards.

The planning of the street networks is inextricably linked with the land-use planning of the precincts that they serve. Accordingly, it is important that this be unambiguously stated in the Introduction chapter of future documents.

It is also important that if Council planning schemes are to recognise these documents as codes, they be called up as precinct planning codes as well as detailed design codes.

In summary, it is critical that documents of this nature definitively state their purpose, scope and limitations at the very beginning. The introductory chapters of both documents should be revised accordingly. The names of any updated documents should also reflect their intended role.

2.2. Document Goals and Primary Objectives

*Queensland Streets* aims to achieve, for residents, street users and the community generally, the following goals/primary objectives:

- Safety;
- Amenity;
- Convenience; and
- Economy.

*Queensland Streets* also lists subordinate criteria/objectives under each these goals.

*Complete Streets* defines a set of primary objectives and some of the means by which they are to be achieved. The primary objectives are:

- Improving safety and security;
- Increasing vitality and interaction;
- Reducing private motor vehicle dependence;
- Improving development efficiency;
- Providing valuable community space; and
- Retaining economic activity in communities.

It could be concluded from close examination that the objectives of both documents are very similar. *Complete Streets* does not address economy in the same manner as *Queensland Streets*, which refers to capital costs, maintenance and user costs, whereas *Complete Streets* refers to perhaps a narrower economic goal, development efficiency.

*Complete Streets* places an emphasis on pedestrian activity and is written in a way that implies that *Queensland Streets* does not place sufficient emphasis on this aspect. Although *Queensland Streets* also addresses this in a less detailed manner in the goals/objectives section, the primacy of pedestrian and cyclist use of streets is the main theme throughout *Queensland Streets*. The difference in emphasis could relate to the primary purpose of *Queensland Streets* being for lower-density residential-only precincts, whereas *Complete Streets* is intended for a broader range of precincts.
2.3. Document Approaches

Although the stated goals, objectives and principles that underpin both *Queensland Streets* and *Complete Streets* are similar, there is a significant difference in approach.

Throughout *Queensland Streets*, each performance criterion and acceptable solution is tested for compliance with each of its four goals and their supporting objectives. Its approach involves proposing evidence-based technical solutions that satisfy each goal and objective. The specific testing of each aspect of street design against the stated goals and objectives is a major strength of *Queensland Streets*.

*Complete Streets* does not adopt this type of approach. It discusses various aspects of street design without specifically referring back to the overarching goals and objectives, or testing the appropriateness of its proposals against the goals and objectives.

Section 1.6, Strategies and Innovations in *Complete Streets* lists four key strategies that are employed throughout the document to achieve its listed objectives. None of these strategies could be regarded as innovations from a contemporary perspective.

Some of these strategies, while appropriate in some situations, are inappropriate for adoption for all streets. For example, the strategy that states that streets should be classified by “the type of place they form part of, not their (motor vehicle) traffic function”, is an inappropriate methodology. In order to achieve the design objective, streets should be classified under both categories.

This section also incorrectly states that: “These strategies represent a significant departure from the philosophy of earlier editions of *Queensland Streets* - - “. This misrepresentation of the philosophy underpinning *Queensland Streets* requires correction.

Although the authors of *Complete Streets* may argue otherwise, the way *Complete Streets* is written places an emphasis on heavily urbanised streets in mixed-use and town centre precincts. Apart from industrial streets, *Queensland Streets* is limited essentially to what would now be regarded as lower-density residential-only precincts.

Although the focus in *Complete Streets* on pedestrian movement and activity is appropriate, the emphasis on place-making in *Complete Streets* tends to skew the understanding of the role of streets. Street design is far more complex than a focus on place-making.

2.4. Document Layouts

The order of the Chapters in *Queensland Streets* is a reflection of the limited funds that were available at the time of its original production and subsequent editions, as well as the additional Commentaries and Chapters that were added in the later editions. The format and chapter arrangement warrant changes to make the document more orderly. There may also be merit in separating the industrial street chapter from the remaining document which focusses on streets in various forms of lower-density residential-only precincts.

The format of *Complete Streets* is reasonable for a resource reference but is totally unsuitable as a planning and design guideline. If the document is to be used for the former purpose, few changes to the format seem necessary. However, as discussed later in this paper, significant changes are considered warranted to the content.
3. Approaches to Planning and Design of Streets

3.1. New Urbanism

Some of the underlying principles in Complete Streets are those of New Urbanism. New Urbanism is a planning philosophy that has gained increasing interest over recent decades.

New Urbanism focusses on place-making and the creation of vibrant mixed-use communities that are walkable and compact. It aims to produce diverse communities that are self-contained with respect to the civic facilities needed for people’s daily lives, in a way that promotes walkability between those facilities. It also promotes public transport in preference to use of the motor car.

Some of the principles of New Urbanism are:

1. Walkability - most things within a 10-minute walk; a high-quality pedestrian network.

2. Connectivity - an interconnected grid network; a hierarchy of boulevards, narrow streets and lanes.

3. Mixed Use - diversity of uses within neighbourhoods and buildings; diversity of demographics.

4. Mixed housing - with respect to types and sizes.

5. Quality architecture and quality public realm - emphasis on aesthetics; human scale architecture; well-located public places.

6. Traditional neighbourhood structure - discernible centre and edges; public space at the centre; highest densities in the town centre.

7. Increased density - whether small towns or large cities.


9. Sustainability - eco-friendly technologies; respect for natural systems; energy efficiency; more local production; more walking less driving.

10. Quality of life - resulting from the combination of the abovementioned factors.

Many of the principles of Transit-oriented Development (TOD) align with New Urbanism.

There is little disagreement amongst planning professionals with the overarching intents and principles of New Urbanism and TOD. However there has been on-going debate about how some aspects should be implemented.

There are also views that the focus on mixed-use communities ignores the reality that mixed-use communities cannot exist everywhere and residential-only communities are needed to accommodate populations.
Nevertheless, some, but not all, of the New Urbanist principles can be applied to residential-only neighbourhoods that also include the facilities needed by those communities. The goals of *Queensland Streets* in relation to residential-only neighbourhoods are similar to the New Urbanist philosophies. *Queensland Streets* also proposes that the lower-density residential-only precincts also be self-contained with respect to internal accessibility to neighbourhood facilities that support that residential area.

Some professionals argue that, because *Queensland Streets* doesn't produce grid-pattern fully-connected streets for motor vehicles, this represents a failure of *Queensland Streets*.

One of the problems with the implementation of New Urbanism, and similar planning philosophies, to urban development and redevelopment, has been the process. There has been a failure to separate the goals from the solutions. The optimum outcomes can only be achieved as a result of a rigorous analysis of the goal and objective setting that leads to the development of the performance outcomes, and in turn the most appropriate design solution.

For example, after detailed analysis of all the relevant factors, including such aspects as natural features, topography, stormwater flows, etc., a grid pattern street network may, or may not, turn out to be the appropriate solution for achieving fine-grained walkable neighbourhoods. However, the pedestrian movement network need not be the same as the motor vehicle network. If a grid network is found to be appropriate for pedestrians after a full analysis of all factors relevant to that location, a fully-connected grid network may not be appropriate for motor vehicle traffic. On the other hand, it may also be that a different network than grid pattern, albeit fine-grained and highly connected, is appropriate for the pedestrian network because of the constraints and opportunities that exist at the particular area under consideration. Again, that pedestrian network is not necessarily the appropriate network for motor vehicles.

It is therefore important that proper analysis is not blinded by pre-conceived solutions as to the appropriate street pattern.

3.2. “Cities for Tomorrow” Guideline and Resource Documents

Excellent guideline and reference material for people involved in urban planning and design are the following two publications, which were commissioned and published by Austroads:


and


The author of these documents was the renowned Hans Westerman, who has an excellent reputation in this field. He was Professor Emeritus of Town Planning at the University of NSW and has worked extensively in the areas of land use - transport interaction and integration. He led the AMCORD process prior to being commissioned by Austroads to produce these documents.
It is a pity that more use is not made of these documents. They are comprehensive documents that could be highly useful for practitioners involved in land use and transport planning at the regional and local levels. The principles and processes in these documents are relevant to all urban planning circumstances and their associated street networks.

Both documents are structured around corporate outcomes for the whole of government in three areas of application:

- Regions
- Local
- Corridors

A hierarchical separation of regional factors from local factors is recognised. The third factor is the notion of corridors which goes beyond the confines of the land dedicated for transport purposes (e.g., the road reserve, rail reserve, etc.), but includes the associated land use and urban environment. A holistic approach is adopted in its approach to urban planning.

The Resource Document provides an overview which forms the basis for the approach and ideas in the Better Practice Guide.

The following diagram describes the structure of the Resource Document.

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Structure of the Resource Document

The Better Practice Guide is intended to assist practitioners with processes and tools for achieving the desired integration outcomes. It goes beyond the integration of land use, transport and the urban environment, by addressing the need for integration of the following aspects in order to realise appropriate outcomes:

- integration in the use of physical, human, economic and financial resources;
- integration between the public and private sectors;
- integration between different levels of government;
- integration between institutions and agencies;
- integration between government and the community; and
- integration between different professional disciplines.

It recognised that the breaking down of institutional silos is essential in order to achieve the appropriate desired outcomes. The establishment of the appropriate institutional framework is a key contributor.

The tools in the Guide represent planning principles, approaches and techniques used to achieve the goals and desired outcomes.
“Tools are related to the integration between

- land and transport, such as ‘The right activity in the right location’;
- networks, modes and the utilisation of the road space, such as ‘The right transport task in the right mode’; and
- transport and the (urban) environment, such as ‘Traffic calming’.” (p13)

Some of the outcomes from the integrated approach include:

- “Getting the right activity in the right place;
- The right transport task, right mode and route;
- From housing to living areas;
- From car places to people places;
- From transport routes to integrated corridors; and
- Reducing greenhouse emissions”. (p26-27)

The Better Practice Guide comprises four main parts:

A. An Overview;
B. Steps and Applications – A seven step process to be applied to the Regional, Local and Corridor contexts, and combinations of these;
C. Planning for desired outcomes – providing details and tools to be used in practice and applied to the Regional, Local and Corridor contexts, and combinations of these; and
D. Processes – planning processes and community involvement.

The Guide categorises Corridors into two overall types – Type 1 and Type 2:

Type 1 Corridors are “primary transport routes and their environments where the through-transport function is dominant and adjoining areas are planned, designed and managed to reduce or eliminate friction and impact.”

Type 2 Corridors are “secondary transport routes and their environments, where both the transport function and the frontage function are important.” (p vi)

Further sub-categories of Type 2 Corridors are illustrated and include their design parameters.

Some Type 2 Corridors are closely related to the higher-order streets relevant to the design of urban centres and main streets. There is also a range of lower order streets that apply within precincts in the Local context which do not fall within the Type 2 corridor category.

Flexibility of designs and making provision for future generations in a way that the urban environment and its associated infrastructure readily responds to the changing needs of the future must be an essential element of the planning and design processes. The Guide includes a tool that:

“addresses the ever-present factor of uncertainty in a planned environment, and the need to protect the interests of future generations. Its purpose is to ensure that the land-use and transport infrastructure evolves in a manner which does not foreclose options for future generations.

Integrating transport, land-use and environmental planning is - - - about creating such conditions for future generations. This goes to the heart of what sustainable development should aim to achieve.
Keeping options open is not only an argument for environmental probity, it is also a matter of ‘inter-generational equity’, efficiency and cost-effectiveness.

**Integrated approaches** -- should aim to create options because:

- needs, values and perceptions will change;
- they are difficult to predict; and
- decisions on land use and transport made now can either restrict or keep choices open for the future.” (p169)

The relationship between the street and the abutting built environment is a continuous theme throughout these documents. Throughout Chapters L-1 to L-15 in Part C of the Guide, tools in the form of principles, approaches and techniques are provided for the planning of Local precincts. This is the area of particular relevance to street planning and design.

In this regard, there is an excellent chapter on residential precincts (Chapter L-10) which provides tools for the creation or adaption of precincts that “are safe, convenient, have a high level of amenity and facilitate the use of non-car-based transport modes.” (p223).

The principles in Chapter L-10 align with those of AMCORD and Queensland Streets. Tools for establishing an acceptable relationship between the motor vehicle and the Local environment are provided. These adopt the same approach as in AMCORD and the objectives and performance standards of Queensland Streets. Tools for the design of cycling and pedestrian networks are also provided.

Importantly, the Cities for Tomorrow documents are based on research. Being evidence-based, they provide practitioners with sufficient information to proceed with confidence.

The documents can contribute towards increased understanding and lead to better practice in land-use planning generally. They are highly relevant resources and high-order guideline documents for street planning and design.

### 3.3. The Street Network Planning Process

Good conceptual design results from, not only a sound understanding of the overarching planning principles, but also a sound understanding of design detail. The planning and design of street layouts is no different. Lack of adequate understanding, of either the planning principles or detailed design considerations, will inevitably lead to inappropriate solutions.

In order to achieve the desired objectives, the planning of street layouts is a complex process where “one size does not fit all”. A major failing in the planning process for street layout designs is that a multi-disciplinary approach is required but is rarely used. There are a number of technical engineering issues that should be addressed at the planning stage, as well as the appropriate interaction between the street and the adjacent built-environment.

There is a tendency not to involve the engineering profession at the early planning stage. Failure to address the important engineering matters at that stage means that costly retrofitting solutions must be found at a later detailed design stage.

An example of an aspect of prime importance when determining the appropriateness of the street layout pattern, is the need for the street network to accommodate stormwater overland
flow paths (the major drainage system). This important aspect is not addressed in *Queensland Streets* or *Complete Streets*.

Preliminary calculations to prove the street system has the necessary major drainage capacity should be undertaken at the time of deciding on the street pattern. Getting this right at an early stage, not only saves significant construction costs but also, has the desirable outcome of generally establishing most or all properties above the adjacent road level. This improves street aesthetics and is highly desired by purchasers, producing higher returns for the developer.

Another aspect of extreme importance in the planning of street networks is the determination of the appropriate accessibility to public transport. Provision of efficient bus routes within a reasonable walking distance of most potential patrons is a vexed question. Current street network planning requirements are often inconsistent with the ability to provide an efficient bus service, or a bus service capable of servicing the majority of residences in a precinct. The risk in specifying an unachievable standard with respect to the provision of bus services may result in less accessibility to public transport than if a lower standard of accessibility were specified for street network planning. More research is required into the economics of bus services in order to determine the appropriate standards to apply in the planning of street networks.

*Queensland Streets* provides sound technical guidelines for achieving a desirable street pattern for lower-density residential precincts and streets in industrial precincts. In order to achieve the goals and objectives sought by the street design, those involved in determining the street layout must have a sound understanding of the application of the provisions of *Queensland Streets*.

It is far more difficult to satisfactorily apply the provisions of *Complete Streets* in order to determine the appropriate street layout, or detailed design of streets, for lower-density residential precincts and streets in industrial precincts.

*Queensland Streets* does not have guidelines for streets in multi-use precincts, urban villages and town centres. Although *Complete Streets* provides some guidance by way of principles for the design of streets in precincts, it lacks sufficient technical guidance for practitioners.

*Complete Streets* was intended to serve the purpose of providing practitioners with the principles and tools for the planning and design of streets that integrated with adjacent land uses. Despite it providing much useful information, it falls short of the mark in terms of tools; is not sufficiently comprehensive and; lacks evidence-based research to support expressed opinions.

A better approach, that addresses all these shortfalls is that provided in the Austroads, “Cities for Tomorrow” documents. These are described elsewhere in this discussion paper.

The major difficulty with developing specific codes for precincts such as multi-use areas, urban villages and town centres, as well as main street environments, is that there are a wide variety of circumstances that apply.

Many mixed-use and town centre precincts develop or redevelop with existing street patterns already in place. The goal for these streets is usually upgrading and/or redesign to provide a vibrant quality public realm to complement and revitalise the adjacent land uses.

The development of greenfield areas, and the major redevelopment of brownfield areas, as mixed-use, town centres or urban villages are usually controlled by master plans. These master plans should have already been through a rigorous process to set the pattern for development.
Nevertheless, even in the master plan development phase, some guidance is desirable in the determination of the appropriate street layouts and geometrics, as well as in the later design development phases.

Because of the variety of circumstances associated with mixed-use precincts, town centres and urban villages, the production of guidelines suitable for practitioners as codes for development is likely to be a wasted exercise. It may also prove to be counter-productive.

Nevertheless, there would appear to be a gap in available information on appropriate street treatments for specific circumstances. For example, typical cross sections, together with suggested circumstances appropriate for their use could be very helpful for the planning of mixed-use streets, streets in town centres and urban villages, and main streets.

3.4. Connectivity, Permeability and Legibility

Many planning guidelines stress the importance of permeability and legibility in street networks. A major criticism of the Queensland Streets approach is the lack of legibility and permeability of street networks based on its approach. Yet, one of the four goals of Queensland Streets is Convenience. Under this heading, permeability and legibility is addressed in detail in Queensland Streets. The criticism appears to stem from the form of street layouts that result from the application of Queensland Streets to street planning, which are usually not grid-pattern.

There is a view amongst some professionals that grid-pattern layouts best achieve the objectives of legibility and permeability. Proponents of New Urbanism generally have this opinion.

The Commentary Section 1.8 in Queensland Streets provides a summary of some alternative planning philosophies and the difference between the street design concepts proposed under these philosophies and the Queensland Streets design concepts. It explains in some detail why the Queensland Streets approach is better able to produce outcomes that meet the desired goals. This commentary is essential reading for those wishing to understand the merits of different approaches.

The Introduction Comments in Queensland Streets (p10.C) summarise the key factors for lower-density residential development as follows:

“For Residential Streets it is considered that the “fully branching, hierarchical” street system as recommended in the Guideline is superior in Safety, Amenity and Economy and therefore more appropriate than the Grid-Iron system. However, to alleviate or minimise the potential for reduced Convenience the following points (which are detailed in the text) should be carefully addressed:-

• Pedestrian and Cyclist connectivity of a high order should be provided.
• Legibility of street layout should be considered, and augmented if necessary by intersection design.
• Internal Connectivity within the Neighbourhood (“Urban Village” or whatever) should be designed such that Community facilities, schools, shops, transit facilities etc. can be readily accessed without the need to use the external Major Road
system. This will enhance the notion of “community”, and the sense of integration of the neighbourhood.

- **External Connections** to the Major road system should be located with regard to the major external traffic attractions, to maximise total travel time.
- **Bus Routes** should be carefully considered and provided for as appropriate.
- **Future Street Link Options** should be provided for where appropriate. A means of achieving this may be by dedication of street reserves, presently left as open space, but with provision for future street construction if required.”

The *Cities for Tomorrow Better Practice Guide* also provides commentary on the New Urbanism approach to the design of precinct layouts (p225). It states that advocates for the grid pattern approach “believe that this form of development reduces trip length for vehicle trips, but there is no evidence yet that it does (see Resource Document Chapter 11). There is a probability that the space for streets and the costs of construction and maintenance are increased, compared with those proposed in AMCORD, but may be justified in areas of higher densities. - - - Research in Canberra has shown that grid patterns increase the potential for vehicle accidents.”

An obvious question is, although permeability is important for pedestrian movement, why is it necessary for vehicular movement, particularly in residential-only precincts? Also, is legibility important for residential-only neighbourhoods, given that existing residents can readily find their way throughout their neighbourhood?

The choice of the street network pattern should be the outcome of a complex process that involves a rigorous analysis of the desired goals and objectives of the precinct. It should not be an input into that process.

For example, an important input into the street planning process should be the provision for overland stormwater drainage paths (the major drainage system). Another may include the desirability, for a range of reasons, not to have properties developed below street level. The location and spacing of public transport servicing the precinct is another important determinant of the street network.

In the case of residential-only precincts, there has been a tendency to provide culs de sac without adequate, or any, pedestrian/cyclist linkages from the cul de sac head. This was often because many Council subdivision standards either do not require any connection, or only require narrow connections (e.g., 4.0 or 6.0 metre widths).

Major reasons for these requirements were to maximise development yield through maximising the number of lots; reducing construction costs; and to increase property sale prices in culs de sac because of purchaser preference. For these reasons, land developers have generally supported this approach.

Narrow connections from cul de sac heads have been regarded in the past to be sufficient for the functional needs of pedestrian and cyclist movement. There has been little regard to the undesirability of narrow links from the amenity perspective, particularly with respect to their impact on the liveability of adjacent residents. Where this has been a matter of concern, closed culs de sac have been adopted without any pedestrian/cyclist connections. They were also considered to be safer from a crime prevention perspective because there is no excuse for people other than residents to be walking in the street. There is probably not sound evidence for this view.
There are legitimate traffic safety reasons why motor vehicles should not have highly permeable and grid-pattern networks. Uncontrolled four-way junctions, the outcome of grid-pattern networks, are undisputedly unsafe forms of intersections and should be avoided wherever possible. Where they cannot be avoided in a residential-only neighbourhood, the most appropriate form of treatment is usually a roundabout.

There is no evidence that, by not providing maximum permeability for motor vehicles, there will be significant increases in total vehicle kilometres travelled. The inconvenience to residents in motor vehicles having less connectivity than pedestrians and cyclists to facilities within and adjacent to their precinct, may encourage a proportionally greater use of those latter modes.

In a lower-density residential-only precinct, permeability for motor vehicles does not meet any of the goals of the best practice precinct planning and design. Reducing connectivity for motor vehicles does not mean that high quality connectivity should be denied to pedestrians and cyclists. This is needed to satisfy one of the main goals of good practice.

The need for convenient connectivity for pedestrians and cyclists is a fundamental under both Queensland Streets and Complete Streets. Queensland Streets states, “pedestrian and cyclist connectivity of a high order should be provided” (Commentary p10.C). Although culs de sac are consistent with the Queensland Streets fully branching, hierarchical street system, the provision of good pedestrian and cyclist links at the heads of culs de sac should be a requirement for designs complying with Queensland Streets principles.

The pedestrian/cyclist connections between streets should desirably be approximately 15 metres width and no less than 10 metres width. These widths are needed to afford greater amenity for adjacent residents; provide greater attention to crime prevention; and provide better landscaping treatment.

At low points of inter-street connections, including downhill culs de sac, overland flow drainage paths can also be more satisfactorily accommodated with wider links.

Where the cyclist/pedestrian path meets a motor vehicle carriageway, it is important to provide a physical barrier at the end of the path, so that the crossing point is not directly opposite the main path route. This is essential in order to prevent cyclists, skateboarders, people on scooters, etc. travelling directly into motor vehicle paths without stopping or slowing down to assess the safety of the situation.

It is unfortunate that the adoption of narrow links from cul de sac heads, and other inter-street pedestrian connections, has resulted from Council subdivision standards and/or a focus on only the functional needs of pedestrians and cyclists. This has resulted in some legitimate criticism of non-grid pattern subdivision patterns. It is these legitimate concerns about the lack of pedestrian connectivity that have resulted in criticism of the Queensland Streets design standards. However, it is not the fault of Queensland Streets which requires high levels of pedestrian/cyclist connectivity. The fault lies with the Council subdivision standards and/or the application thereof.

Legibility would appear to be more of an issue for areas that are frequented by visitors. In town centres and mixed-use areas, legibility will be more important than for residential-only neighbourhoods, because these areas are frequented more by visitors unfamiliar with the area. Therefore, in town centres and mixed-use areas, legibility of the street network will often be an
important consideration. In doing so, it must be recognised that a legible street network does not necessarily have to be a grid pattern.

Legibility is considered to be of minor importance for residential-only neighbourhoods, because those residents would be familiar with their street pattern. Way-finding may be inconvenient for those visitors who are unfamiliar with the area if a fully branching, hierarchical street system existed. However, the other advantages of this type of layout over a grid-pattern layout far outweigh the legibility disadvantages.
4. Proposed Changes to the IPWEAQ Documents

4.1. Queensland Streets

IPWEAQ should continue to support *Queensland Streets* as the leading guideline for the planning and design of streets and street networks for lower-density residential precincts and for industrial precincts. It should also be promoted as a suitable development assessment code for precinct planning, street network planning and detailed street design.

The following overall changes are considered warranted for *Queensland Streets*:

1. Consider renaming of the document update to reflect its actual purpose.

2. Include reference to the methodology and resource material in the Austroads *Cities for Tomorrow Best Practice Guideline* and resource material in the Austroads *Cities for Tomorrow Resource Document*.

3. Make amendments that reflect contemporary best practice in the planning and design of street networks and streets in lower-density residential-only precincts.

4. Make amendments that reflect contemporary best practice in the planning and design of street networks and streets in industrial precincts.

5. Add a further chapter for the planning and design of street networks and streets in business park precincts.

6. Review the content throughout the main text and the commentary pages in terms of the appropriateness of being main text or commentary with the view to including of relevant main text in the commentary pages in the main document and vice versa.

7. Undertake a major review of the Introduction Chapter with the view to a complete rewrite of the chapter.

8. Change the order of the chapters.

9. Change the format and set-out of the chapters to make the document more user-friendly from the perspectives of subdivision planner, designer and development assessor.

10. Undertake the detailed changes to any proposed new or updated IPWEAQ street planning and design guidelines and resource documents, as outlined throughout the body of this Discussion Paper.

11. Give consideration to producing two separate documents, one for lower-density residential-only areas and the other for industrial-only plus business park areas.
4.2. Complete Streets

If *Complete Streets* is to be continued to be promoted by IPWEAQ, it should only be promoted as a resource document and not as a design guideline or development code. In addition, the following overall changes are considered warranted:

- Chapter 1 Introduction: Complete rewrite, including addressing matters raised in this discussion paper.
- Chapter 2: Delete or a more comprehensive rewrite.
- Chapter 3: Review for content and appropriateness of emphasis. Also compare with, and cross-reference to, the Austroads Guides on design for pedestrians.
- Chapter 4: Review for content and appropriateness of emphasis. Also compare with, and cross-reference to, the Austroads Guides on design for cyclists. Correct and update the information on roundabouts.
- Chapter 5: Review and amend as appropriate.
- Chapter 6: Complete rewrite having regard to the information in *Queensland Streets* and *Cities for Tomorrow* documents.
- Chapter 7: Complete review. Also compare with, and cross-reference to, the Austroads Guides and Australian Standards.
- Chapter 8: Complete review, particularly having regard to the planning and design for stormwater major drainage.
- Chapter 9: Review and update.
- Chapter 10: Review.
- Chapter 11: Substantially more information required.
- Chapter 12: Substantially more information required.
- Chapter 13: Major rewrite, removing information that is not evidence-based and with appropriate cross-references to other recognised guideline documents.
- Chapters 14: Review for compatibility with *Cities for Tomorrow*. Cross-reference to other guides where appropriate.
- Chapter 15: Review for compatibility with *Cities for Tomorrow*. Cross-reference to other guides where appropriate.
- Chapter 16: Delete as it is in conflict with *Queensland Streets*.
- Chapter 17: Delete as it is in conflict with *Queensland Streets*.
- Chapter 18: Review for compatibility with *Cities for Tomorrow*. Cross-reference to other guides where appropriate.
- Chapter 19: Delete as it is in conflict with *Queensland Streets*.
- Chapter 20: Update.
- Chapter 21: Update.
Chapter 22: Update and expand.

Appendix A: Delete because it is unsuitable.

Appendix B: Delete because it is unsuitable.

Appendix C: Delete because it is unsuitable.

It can be seen that the required review of Complete Streets is a major exercise. Given that there is already a significant amount reference material that is already available, the updating of this document as a reference resource may be considered to be unwarranted.

If it is to be updated, it should be a far more comprehensive document that includes more material that is based on research or other evidence, and with appropriate cross-reference to other recognised guides. It should not repeat the contents of those guides, but simply provide the cross-reference.

An alternative could be the preparation of a small document useful for the planning and design of streets and street networks for multi-use precincts, town centres, urban villages and main street environments. That document should defer to the methodology and resource material in the Austroads Cities for Tomorrow Best Practice Guideline and resource material in the Austroads Cities for Tomorrow Resource Document and other suitable references.

This document could be supplemented by a set of typical cross sections, together with suggested circumstances appropriate for their use. This could be very helpful for the planning of mixed-use streets, streets in town centres and urban villages, and main streets.
5. Matters requiring more attention

5.1. General

There are a number of important matters that it is considered should be added to the body of knowledge for planners and designers, that are not covered adequately in *Queensland Streets* or *Complete Streets*. Descriptions of these matters are outlined in the following sections of this chapter. These descriptions are only summaries of some aspects that desirably should be covered in contemporary street planning and design guidelines or associated resource/reference documents.

5.2. The Role of the Street

Neither *Queensland Streets* or *Complete Streets* adequately define and address all the functions that must be performed by streets. It is inconceivable that a comprehensive and integrated approach to the planning and design of street can be achieved without stating up-front what all the functions of a particular street are, even if obvious to many.

Street planning and design guidelines need to unequivocally state that streets are places for some, or all, of the following:

- Community interaction;
- Commercial interaction;
- Seating;
- Street dining;
- Exercise;
- Street entertainment;
- Play;
- Pedestrian access to premises;
- Vehicular access to premises;
- Pedestrian traffic;
- Vehicular traffic (unless specific modes are excluded);
- Public transport;
- Vehicular parking;
- Overland stormwater conveyance (the major drainage system);
- Stormwater capture and conveyance (the minor drainage system);
- Stormwater quality treatment;
- Lighting;
- Utility services;
- Awnings/protection for pedestrians from the elements;
- Public transport shelters;
- Streetscape treatment;
- Landscaping;
- Street art;
- Signage; and
- Other street furniture (serving the above functions).
All relevant roles should be treated as important. Depending on the location, there may be greater emphasis on some functions over others. Some may not be relevant to a particular street type, e.g., street dining. None of the required functions should be ignored in street design.

It is the appropriate inter-relationship and integration of those functions that determines the success of a street. Place-making is important, but it is not the only consideration in street planning and design.

In the determination of that inter-relationship, it is also important that the roles of streets are not seen to be remaining fixed over time. Changes such as the uses in precincts, demographics, technology, etc., will mean that the roles, or their importance, may change and street elements may need to be redesigned in response. Such changes, often unpredictable, may be organic over time, or may occur more quickly. The important consideration should be that there is sufficient flexibility that the street can readily respond.

In some cases, guidelines are required for the design of some of the abovementioned street elements. These may be in the form of documents such as Queensland Streets, Austroads Guides or Australian Standards. For some elements, design guidelines are not necessary. However, reference to resource documents may assist designers.

5.3. What is traffic?

The premise underpinning both Queensland Streets and Complete Streets is that in the past there has been an inappropriate emphasis on designing streets for private motor vehicles, whereas the emphasis should be on calming motor vehicle traffic.

Unfortunately, the term “traffic” is used throughout many publications (including Queensland Streets and Complete Streets) when referring to motor vehicle traffic, and specifically private passenger vehicle traffic. The outcome of just using the term “traffic” for motor vehicle traffic is that it fails to acknowledge the importance of non-motorised traffic such as cyclist traffic and pedestrian traffic.

For avoidance of doubt, pedestrian traffic should be treated as including skate-boarders, people using scooters, roller-bladers, prams, and mobility scooters (the latter, although motorised, is regarded as a pedestrian under the Australian Road Rules if capable of not more than 10 km/h).

If the planning and design emphasis is to be away from motor vehicles, the language should reflect it. There is a need for any future guidelines/manuals to be more specific with respect to the mode of traffic. The term, motorised traffic (rather than the abbreviated version, traffic), should be specifically used in all instances when referring to that mode of traffic.

5.4. Stormwater Drainage in Street Planning

Stormwater drainage should be an essential input to the planning of street networks. This is often not the case, resulting in the need to costly retrofit, sometimes inadequate, stormwater drainage solutions in the derailed design phase. This aspect is particularly important in Queensland which experiences much higher rainfall intensities than many other areas of Australia.
Although the methodology for stormwater drainage design is covered in detail in the *Queensland Urban Drainage Manual* (QUDM), the need for the street network to have sufficient capacity for stormwater overland drainage paths (the major drainage system in QUDM terms) should be addressed in all street (and road) planning and design guidelines and manuals. It is not mentioned in either *Queensland Streets* or *Complete Streets*.

Preliminary calculations to assess the capacity of all streets to cater for major drainage should be carried out at the layout planning stage. Unfortunately, this is rarely done. This will continue to be the case until it is emphasised as being an essential part of the street network planning process in documents such as *Queensland Streets* and *Complete Streets*.

It is relevant that this process usually leads to allotments on both sides of the street being higher than the street carriageway. This eliminates the potential for stormwater to overtop the carriageway and verge, flowing through allotments on the lower side of the street. It also produces lots that have a better street aspect and improves the overall streetscape. Properties that are higher than the street are preferred by purchasers, resulting in potentially higher returns for developers.

### 5.5. Planning for Stormwater Quality Infrastructure

Water sensitive urban design (WSUD) practice was at the early stages of development at the time of publishing *Queensland Streets*. It is not addressed in that document. *Complete Streets* includes a brief summary of WSUD practices in its Section 7.4.

If it is proposed to use the street for WSUD treatment systems, a comprehensive understanding of WSUD detailed design and maintenance considerations needs to be applied at the street layout planning stage. Failure to do this can result in good intentions going awry.

The provision of WSUD treatment systems in streets often come at the expense of other important street functions. They can be land-hungry, as well as having other design constraints. Maintenance arrangements also need to be addressed at an early stage.

All options for stormwater quality treatment should be considered at the precinct planning stage in order to determine the optimum overall solution.

Where it is decided that stormwater quality treatment should be undertaken within the street, this is likely to have a significant impact on the street cross section, levels, maintenance considerations and the overall streetscape.

### 5.6. Public Transport in Street Planning

One aspect of extreme importance in the planning of street networks is the determination of the appropriate accessibility to public transport. *Queensland Streets* provides some guidance on accessibility to bus routes in the design of street networks for lower-density residential-only precincts. *Complete Streets* also provides some guidance on some additional aspects of design for public transport.

There is a need for further evidence-based information on the planning and design for public transport.
Provision of efficient bus routes within a reasonable walking distance of most potential patrons is a vexed question. As stated in *Queensland Streets*, it is often specified that all residences be within 500 metres walking distance to bus stops, which in turn could be converted to 90% of residences being within 400 metres straight-line distance of a potential bus route.

These street network planning requirements are often inconsistent with the ability to provide an efficient bus service, or a bus service capable of servicing the majority of residences in a precinct. The risk in specifying an unachievable standard with respect to the provision of bus services may result in less accessibility to public transport than if a lower standard of accessibility were specified for street network planning. For example, a more suitable standard may be the requirement for 600 metres walking distance to a bus route from 80% of residences. Such a standard may result in more public transport patronage than the standard stated in *Queensland Streets*.

More research is required into the economics of bus services to lower-density residential-only precincts, and other precinct types, in order to determine the appropriate planning standards for particular circumstances.

Because this is such an important issue, more evidence-based guidance is needed for practitioners.

### 5.7. Design for People with Disabilities

Approximately one-fifth of the population consists of people with a disability. There are also other people without a disability who also benefit from facilities designed for people with disabilities.

The disability discrimination legislation and relevant standards need to be referenced. Where relevant, the principles underpinning the legislation need to be included in a way that this aspect is front and centre of the planning and design process. It should not be treated as a secondary consideration or for retrofitting towards the end of the planning and design process.

The range of disabilities varies markedly. There is also a range in the degree of particular disabilities. It is important that designers recognise these factors and acknowledge the need for design responses to accommodate these issues.

To illustrate the types of issues that must be considered, the following are a few examples of circumstances that should be addressed in street design:

- Eyesight disabilities do not include just reduction or loss in the overall level of vision, but also other forms such as loss of peripheral vision.

- Each item of street furniture or public utility service should be assessed for its potential to become an obstacle. In this regard, obstacles should be avoided adjacent to building wall frontages that may be used for way-finding by people with eyesight disabilities.

- Footpath crossfalls, and path gradients where practical, should comply with accepted standards for people with disabilities.
• Trip hazards should be avoided. Consideration must be given to paving surfaces that are easy to maintain. Ramps into building entrances become problematic where streets have medium to steep gradients.

• Care is needed in the use of segmental paving surfaces that are uncomfortable for people in wheelchairs.

• Poles, planting and street furniture should be avoided adjacent to the middle of parking bays in order not to restrict access to and from parked vehicles.

• Sufficient clearance should be provided at parking spaces for people with disabilities for the operation of wheelchair lifts at the rear of vehicles.

• Kerb ramps may suit wheelchairs but are unsuitable for people who cannot handle the steepness of the ramp. This applies to some people with walking sticks and wheelie-walkers, as well as others who prefer to step down or up a vertical kerb. Therefore, a section of vertical kerb is needed at crossing locations.

• Providing raised platforms at street crossing locations to assist people with disabilities is in many cases undesirable from a traffic safety perspective. If the preferred crossing location not marked as a zebra crossing, some pedestrians will tend to subconsciously believe that a raised platform crossing has a greater degree of safety than one that requires the negotiating across a kerb. The physical action of stepping off a kerb or using a kerb ramp, adds a degree of additional caution and delay that increases the pedestrian’s awareness that he/she is entering a potential unsafe environment. (This design aspect may also be important for marked pedestrian crossings. Even though the pedestrian has right of way over motorised traffic, care and awareness is still required by the pedestrian. Traffic crashes are low probability events and there is no forgiving aspect about a motorist unintentionally not seeing a pedestrian at a crossing.)

• Kerb ramps often need to be located where the kerb is turning around a corner. The Australian Standard (AS 1428 series) kerb ramp design, which is designed for a straight section of kerb at right angles to the direction of travel, must therefore be adjusted to align the ramp in the direction of travel in a way that still complies with the design intent for the kerb ramp. Solutions that satisfy the needs of people with disabilities are not straight-forward. In this regard, there is merit in standard drawings being developed for those circumstances.

5.8. Off-street Parking

The location of off-street parking areas is critical to achieving a well-functioning street system. Some considerations include:

• Locating them mid-block and not on corners;

• Sleeving the parking area behind buildings that front the street;
• Producing a layout that suits multi-level or basement parking in the future;
• Minimising the number of parking access locations;
• Using joint-use easements for private car parks on different titles to minimise the number of accesses;
• Locating vehicular accesses where there is minimal potential conflict between vehicles and pedestrians;
• Ensuring adequate visibility between drivers and pedestrians, including building truncations where appropriate;
• Where centre medians are provided in front of vehicle accesses, ensure U-turns can be accommodated at the adjacent intersections.

5.9. On-street Parking

On-street parking can benefit street activity in retail and commercial areas. Time limits should be set and controlled in order to optimise nearby retail turnover.

There is no universal answer on the type of on-street parking that should be provided – parallel, angle, front-in, rear-in. Front-in parking has the advantages of getting the vehicle off the through-carriageway quicker and of vehicles being able to park more accurately within the parking bay. Rear-in parking affords better visibility for drivers leaving the parking bay and is safer for people putting items in the vehicle boot. In main street environments, rear-in parking is usually considered safer, whereas in off-street locations, front-in parking is usually considered more appropriate.

5.10. Modular Design for Verges

In retail and commercial areas, there are benefits in setting up a modular arrangement for verge treatments based on the parking module. This enables poles, planting and street furniture to be located so that they do not obstruct access to and from parked vehicles. For example, a 6.5 metre module is appropriate for locations with parallel parking.

Where build-outs in lieu of parking may be desired for activities such as footpath dining, their location should also be based on the verge/parking module. This will give flexibility for changes that might be required in the future to the parking or built-out without requiring major relocation of infrastructure.

5.11. Active Frontages

An important factor in achieving vibrant streets is the provision of active frontages to abutting development. Active frontages are achieved through adjacent land uses consisting of small
incidental tenancies, and the provision of frequent pedestrian accesses along the street to those tenancies.

Larger and “big-box” uses, and any activity that does not promote frequency of pedestrian access to the street, should desirably be sleeved behind the smaller tenancies, but with their street access prominent to the street. This includes uses such as supermarkets, cinemas, gymnasiums and off-street carparks.

Uses that do not have frequent pedestrian movement from the street and/or do not operate outside normal business hours, such as some commercial premises, should not be located on the ground floor.

By ensuring active frontages are provided where they maximise vitality in the right street locations, this contributes to the important objective of having “the right activity in the right location”. The planning scheme should ensure that this occurs in terms of specifying the nature of the built-form frontage.

In some cases, time-limit parking controls can also play an important part in ensuring activity occurs in the right street location. The appropriate time limits, and active management thereof, can also assist further activation of the street where active frontages are also proposed.

The desirability of buildings being built to the street can produce design constraints requiring careful consideration with respect to the footpath levels. Stormwater must be prevented from entering premises from the street, but footpath crossfalls and levels must comply with the needs of people with disabilities and avoid trip hazards at entrances.

5.12. Built-form Flexibility

Flexibility for the future should be a key aspect of not just the street design, but also the adjacent built form. If activity in a town centre or urban centre is anticipated to grow over time, whereby more uses will establish, there is a need to ensure that the right uses are always in the right location, commensurate with the stage of development of the centre. This is less likely to occur if the built form is not conducive to future changes in use.

New buildings should be built in a way that their frontages can readily respond to the desired changes in use. If the desired level of active use is not economically possible at an early stage of development of a centre, it is highly desirable for the building frontages to be so constructed that they can be readily converted in the future to more active frontages. Higher levels of activity with active frontages can then occur over time as the economics improve, if the building frontages can be readily converted. For example, if a fitness centre with a single entry and large frontage is established on a street frontage at an early stage, it should be a requirement that the front wall of the building can be readily converted at a future stage into a number of entrances corresponding to the conversion of the fitness centre to a number of small incidental tenancies such as small shops or cafes.

The debate with respect to the appropriate carparking provision in centres can become a “chicken and egg” argument, particularly with the development of centres into transit centres. There is a view that carpark numbers should be restricted in TODs in order to promote greater use of public transport. This applies to carparking provision for residential and commercial uses.
in the centre, as well as commuter carparks. This approach is not supported by available evidence on carpark demand in TODs.

Nevertheless, there is the possibility that the overall carpark demand may reduce over time with public transport improvements and other changes, although the extent of the change may be difficult to predict. Multi-storey carparks could be constructed to satisfy the short to medium term parking demands, but incorporate design flexibility for future reductions in parking demand, or changes in the desired location of the parking facility. One way of designing in flexibility for the future is to design multi-storey carparks so that they can readily be converted in the future, partly or fully, into other uses such as residential or commercial.

5.13. Streetscapes in Residential-only Precincts

Streetscapes of residential-only precincts can be improved by attention to detail with certain streetscape elements. Some of these are often not given sufficient attention, particularly at the residential precinct planning stage. They include:

- Improving the streetscape scale, amenity and economics by having tighter distances between the housing through small street reserves and reduced housing setbacks;
- Having allotments built above the street level, but not so high that driveways look too steep;
- Improving the aesthetic appeal of dwellings by setting garage frontages slightly further back from the street than the front of the dwelling (this can also assist with driveway gradients when dwellings are built closer to the street);
- Preventing add-on carports from being built in front of houses at a later date, by implementing specific Council regulatory controls;
- Giving consideration to where caravans and boats can park so that they are not visually obtrusive; and
- Attention to the levels of building platforms and driveways at the street design stage, particularly in the case of streets with medium and steep gradients and zero-lot-line housing.

5.14. Streetscapes in Mixed-use and Town Centre Precincts

The relationship between the street and the adjacent built form is critical to the success in achieving the goals of mixed-use precincts, centre precincts and main street environments.

Goakes, 1987 p12-23, lists eleven principles of aesthetics of townscapes:

1. Creation of unity;
2. Use simple means to achieve the objective;
3. Sound organisation of space;
4. Hide the ugly and incongruous and highlight those aspects which are pleasant and in harmony;
5. Order and variety;
6. Use deception if necessary;
7. Maintain balance;
8. Create accents where appropriate;
9. Maintain proportion and scale;
10. Repetition, rhythm and sequence; and
11. Common sense and good taste.

He then states that the composition of townscape elements “is the placing together of the objects of the townscape in a way that they seem united into a pleasing, balanced and harmonious whole”.

Scale plays an important role in this regard. The minimum practical street width between the built form usually produces the best streetscape, having regard to the multitude of roles that the street must accommodate within that space. Those roles place increasing and competing demand for street width. Success is achieved through attention to appropriate integration of the streetscape elements.

Pedestrian scale is important, but wide street reserves can be counter-productive. Goakes, 1987, p66 discusses this aspect (where $D$ is the distance between buildings and $H$ is the height of adjacent buildings):

“(A $D/H$ ratio) of 1 to 3 is probably more appropriate to business districts and inner city urban areas where land prices are a premium and a measure of intimacy and crowding is considered a desirable feature.

Ratios of 3 and 4 are more appropriate for suburban situations. If over 4, one tends to lose a sense of enclosure, which is a general expectation of a street. The mutual interaction between the buildings begins to dissipate.

Where the $D/H$ ratio tends to be large, the ratio may be reduced to a more effective figure by planting of appropriately-sized trees. Care needs to be taken to ensure that the trees are of the correct size and colour so that they are neither over-dominant, nor ineffective.

Rather than recommend a standard ratio for all situations it is best that planners appreciate the implications of the ratios when considering control measures. One would consider that in any particular city, variety rather than standardisation should be sought. This is referring to deliberately planned variety in the width of streets and the heights of facades of buildings.”

Where it is not possible to achieve these ratios by way of two or three storey construction, the use of higher building facades and tree planting can assist in improving the street proportionality.

Goakes, 1987, p64/65 also discusses the role of awnings in the streetscape:

“In streets where streams of people move, and in those parts of the world where heat and heavy rain are not uncommon, awnings over footpaths become a very logical requirement for a building. Of course, these awnings tend to dominate the streetscape. In fact as an element of unity and repetition and rhythm, these awnings can be a very important feature. Consideration should be given to having awnings designed independently of individual buildings, and carrying them across pedestrian crossings of streets also.”

“- - - great care should be taken that when a designer considers that a building, because of its function, requires an awning, that it is designed into the streetscape.”

From an engineering perspective, an understanding of these aspects is important in order to ensure the various functions of the street can be integrated in a way that the aesthetics of the
streetscape are not affected by inappropriate design details, and streets that are too wide because of poor integration of the component elements.

The quality of the public realm is an important driver for increasing the vibrancy of streets. The quality of the streetscape design plays an important role in this regard. It is not just the positive impact achieved by the initial construction, it is important that durability is designed in. A streetscape that degrades quickly and is costly to maintain detracts from the quality of the public realm. This can only be prevented through significant attention to construction details during the design phase, with maintainability being a primary consideration.

5.15. Rear-Lane and Park-Frontage Development

Rear-lane housing has gained some recent acceptance as an alternative form of housing. The aim of this form of housing is to remove driveways and garages from the frontage of the street faced by the dwelling, improving the aesthetics of that street. The vehicle garage is accessed from the rear lane, often setback by 6 metres in order to accommodate tandem parking. There are some aspects of rear lane housing that need to be addressed if this form of housing is proposed. They include the following matters:

- In order to address Crime Prevention through Environmental Design (CPTED) issues, it is highly desirable for habitable rooms at first storey level overlook the lane.
- Refuse services are preferred from the rear lane.
- Lane reserve widths are usually approximately 7.5 metres with 5.5 metre carriageways, leaving 1.0 metre verges to accommodate utility service facilities and refuse bins on collection days.
- Driveway profiles need to be addressed at the planning stage because of the constraints imposed by the narrow carriageway widths. The driveway levels must take account of a range of matters, including vehicle clearances, overland flow paths and the housing floor levels.
- Driveway design level constraints often limit the suitability of rear-lane housing to relatively flat topography.

A variation to rear-lane housing is a form of housing that fronts parkland. Pedestrian access to the front of the building is obtained via a path located between the parkland and the residential lot. Utility services to the properties are normally located within that narrow path reserve in a similar way that they would normally be located in a street verge. However, utility services could also be located in the rear lane.

With this form of housing, consideration needs to be given where visitors to those residences will park. This is often provided in the nearest adjacent street which also fronts the parkland. Such parking could also be jointly used by park visitors.

5.16. Intersections

Complete Streets provides a short commentary on some aspects of intersection design. It includes some misconceptions with respect to intersection design.
The location, type and design of intersections is a critical aspect of street design. Certain principles need to be understood if appropriate solutions are to be found for the planning and design of street layouts. Although traffic safety must be a paramount consideration, amenity and personal safety for street users and occupants of nearby premises are also important factors.

Although each situation should be treated on its own merits, some general principles of intersection design include the following:

- Uncontrolled four-way junctions are undesirable from a traffic safety perspective.
- Priority-controlled four-way junctions, albeit safer than uncontrolled four-way junctions, are generally undesirable from a traffic safety perspective.
- Signalised four-way junctions do not control speeds of vehicles that have a green signal.
- Signalised four-way junctions can have delays that are considered unacceptable by both motor vehicles and pedestrians unless the motor vehicle and/or pedestrian volumes are high. Accordingly, they are often unsuitable for most mixed-use and town centre street intersections.
- Compared to alternative four-way junction treatments, properly designed single-lane roundabouts generally have significantly lower overall crash frequencies; significantly lower overall crash severities; lower delays to motorists and pedestrians; and are as safe for pedestrians and cyclists.
- Compared to alternative four-way junction treatments, properly designed double-lane roundabouts generally have significantly lower overall crash frequencies; significantly lower overall crash severities; lower delays to motorists and pedestrians; but may be less safe for pedestrians and cyclists unless specific provision is made for those users.
- Single-lane and double-lane roundabouts can be designed to control pedestrians and cyclists in a manner that significantly improves their traffic safety.
- Signalised four-way junctions often require a greater loss of kerbside car parks than roundabouts.
- Signalised four-way junctions have a lower standard of amenity than roundabouts from traffic noise, air-pollution; and aesthetic perspectives;
- Properly designed roundabouts are usually the most appropriate treatment for four-way street junctions.

The unsuitability of roundabouts for street intersections, such as espoused in Complete Streets, is becoming an urban myth that is unsupported by evidence from properly conducted research evidence. The existence of some poorly designed roundabouts has also given this form of intersection a bad name amongst some members of the public and some professionals.

Roundabouts can be, and should be, designed in a manner that properly addresses their perceived short-comings with respect to pedestrians and cyclists. Pavement marking and other physical treatments can be provided where cyclist and motor vehicle volumes justify such treatments. Pedestrians must be guided away from the intersection proper by physical barriers (which can be in the form of planting) in order to cross the street at a safer location. The perceived inconvenience caused to pedestrians by having to cross a street slightly away from the intersection proper is in reality not an inconvenience in terms of overall pedestrian delays at the intersection.
5.17. Rural Towns

A survey response pointed out the need for more guidance in the design of streets for small towns.

There are a large number of rural towns throughout Queensland and they are located in every local government area other than Brisbane City.

Many rural towns are built up around a main street. The main streets of rural towns have a different emphasis on the combination of the roles performed by the street than is the case for main streets in more urbanised areas. The function of the main street is particularly constrained where the street has an important role as a through-traffic route for motor vehicles. Often there is a relatively high proportion of trucks in the through-traffic adding an additional complexity to the desirability to calm the motor vehicle traffic.

The needs and functions required of main streets in rural towns can vary markedly from town to town. Stakeholders often have competing expectations. However, there are principles and processes that can be applied to determine the most appropriate solution for upgrading the main street. Complete Streets is of limited use in this regard. However, the Austroads Cities for Tomorrow Resource Document and Better Practice Guide provides a comprehensive approach to the principles and processes in this regard. There are also other useful references in the Bibliography chapter of this discussion paper, in particular:

Roads and Traffic Authority NSW and Westerman H L 2000, Sharing the Main Street – A Practitioners’ Guide to managing the road environment and traffic routes through commercial centres, 2nd Ed.

For new residential-only and industrial developments in small towns, Queensland Streets could be used.

The question is whether there is a suitable document that can be universally used as a complete guideline document for the design of the other streets in rural towns. The nature of the existing street network in many rural towns controls sometimes constrains their design or redesign. These streets often consist of wide reserves and often service relatively large allotments, not all of which have a residential-only use.

Although the principles and details in Queensland Streets may useful for the redesign of some of these streets, other documents such as Austroads, Guide to Traffic Management Part 8: Local Area Traffic Management may also provide suitable guidance.

Further investigations are possibly required to determine whether there is a need for a further guideline for the redesign of existing streets in rural towns, other than the main street.

5.18. Industrial Streets

Both Queensland Streets and Complete Streets have chapters on the industrial streets. The chapter in Queensland Streets is comprehensive and its provisions are still relevant. On the other hand, the chapter in Complete Streets does little to add to the body of knowledge.

There is some merit in removing the chapter on Industrial Streets from Complete Streets.
5.19. Streets in Business Parks

There is merit in producing standards for streets in business parks.

A combined manual for street planning and design for industrial precincts and business park precincts may be warranted. It would be separate from the manual for lower-density residential precincts.

5.20. Further Reading

*Queensland Streets* includes a very limited list of references in its Acknowledgements page at the beginning of that document. The “References and further reading” chapter in *Complete Streets* is not sufficiently comprehensive.

There are a number of Australian and international documents that would assist practitioners involved in the planning and design of streets. Some additional references are included in the Bibliography in this paper. However, this is not a comprehensive list. Fellow professionals could assist by adding suitable references to that list.

Some of these documents may not be readily available because they were published some years ago. This does not mean that they are no longer useful. If not readily available, it should be possible for IPWEAQ to obtain permission from the author and/or publisher to produce pdf versions of the documents.

There is merit in IPWEAQ producing a library of such references which are to be made available to practitioners.
6. Overall Conclusions

1. It should be promoted that *Queensland Streets* and *Complete Streets* are not just detailed design documents. They are also planning documents for not just streets, but also street networks within precincts. The planning aspect of these documents is just as important, if not more important, than the detailed design standards. The planning of the street networks is inextricably linked with the land-use planning of the precincts that they serve. Accordingly, it is important that this be unambiguously stated in the Introduction chapter of any future updates of these documents. It is also important that if Council planning schemes are to recognise these documents as codes, they be called up as precinct planning codes as well as detailed design codes.

2. *Complete Streets* implies that the approach adopted by *Queensland Streets* is no longer relevant, but there is nothing in *Complete Streets* that demonstrates why that is the case. To the contrary, the over-arching goals and objectives of both documents are essentially the same. Although *Queensland Streets* has been in use for over 25 years, the principles and design responses in that document continue to be relevant and are defendable.

3. Critics of the approach adopted by *Queensland Streets* have either misunderstood its purpose or misunderstood the overarching goals and objectives that have led to its evidence-based performance criteria and acceptable solutions. It is possible that many of those critics have never used *Queensland Streets* for the planning and design of residential subdivision streets.

4. Criticism that *Queensland Streets* focusses on design for the motor vehicle is incorrect. *Complete Streets* also incorrectly implies this. The overarching philosophies of *Queensland Streets* include taming the speed of motor vehicles in residential streets, and limiting motor vehicle volumes, in order to make the streets safer, as well as benefit other street users and the lifestyles of residents.

5. *Queensland Streets* remains a suitable guideline document for the planning and design of streets in lower-density residential-only precincts where housing in the main is limited to two storeys.

6. The chapter in *Queensland Streets* on streets in industrial precincts is also a suitable planning and design guideline document.

7. There is merit in having chapter for streets in business parks.

8. *Queensland Streets* is not intended to be used for the planning and design of streets in multi-use precincts, urban villages, town centres or main streets. Some of the information in *Queensland Streets* may be useful, but the design methodology in *Queensland Streets* is not relevant for those environments.

9. The format of *Queensland Streets* enables it to be readily adopted as a development code for the planning and design of street networks and streets in lower-density residential-only precincts, and the planning and design of streets in industrial precincts.
10. There may be merit in those aspects containing industrial and business park precincts being in a document that is separate to the lower-density residential-only document.

11. Desired changes to *Queensland Streets* include:

   i. Inclusion of the Austroads *Cities for Tomorrow* documents as the over-arching references for the planning and design of local precincts and their associated street networks.
   
   ii. Changing the order of the chapters to incorporate the added-on chapters on multi-unit residential streets, rural residential streets and industrial streets.
   
   iii. Inclusion of certain relevant sections in the commentary pages into the main document and vice versa.

   iv. Rewriting the Introduction Chapter 1, particularly with respect to the Purpose, Scope and Limitations.

   v. Greater emphasis on how pedestrian/cyclist only permeability should be achieved between streets such as at cul de sac heads.

   vi. More emphasis on layouts that facilitate efficient bus route operations and access to potential bus routes;

   vii. Including the need to consider stormwater major drainage/overland flow paths as an essential input into the street system planning process.

   viii. Further editing of the overall document to remove unnecessary repetition and discussion that may be no longer relevant.

   ix. A complete update of the format to make it more user-friendly.

   x. Cross-reference to other relevant standards, such as Austroads Guides, rather than reproduce that information.

12. There could be more attention given in *Queensland Streets* to the interrelationship between the residential street and adjacent land use. Matters that could be included are reduced frontage setbacks and rear-lane housing, together with the associated design aspects that need to be addressed, e.g., attention to driveway gradients.

13. Further investigations are possibly required to determine whether there should be a further guideline for the redesign of streets in rural towns or whether combinations of *Queensland Streets* and Austroads, *Guide to Traffic Management Part 8: Local Area Traffic Management* is sufficient.

14. Practical approaches to main streets in towns, including in rural towns, can be found in a number of documents that practitioners would find useful for their town. These include: Austroads “*Cities for Tomorrow*” documents; the RTA of NSW publication, “*Sharing the Main Street*”; and Queensland Transport’s “*Shaping Up*”.

15. *Complete Streets* consists of three parts:

   1) Part 1 is an introduction chapter which sets out the purpose, objectives, philosophies and strategies that underpin the document.

   2) Part 2 consists of a number of chapters which include the key principles that apply to the planning and design of streets (*Complete Streets* states it applies to all streets);
3) Part 3 consists of chapters for different street types but, like Part 2, it is essentially limited to principles for the design of those street types.

16. *Complete Streets* is not suitable as a planning and design guideline.

17. *Complete Streets* is essentially a resource document, but is not a comprehensive reference.

18. Apart from being possibly suitable as a resource document after some modification, *Complete Streets* lacks sufficient detail for use as a technical planning and design guideline document. One of the responses to the IPWEAQ survey represented the views of many by summarising the suitability of *Complete Streets* as follows:

   “-- - Complete Streets, although useful as a guide to assist with design culture, does not provide useful information to use in design. Therefore, after reading it once, you tend not to refer to it again.”

19. Some of the principles within the *Complete Streets* document may not be able to be supported by evidence and therefore it could be subject to challenge.

20. In the case of streets in lower-density residential-only precincts, *Complete Streets* does not provide sufficient practical solutions, and does not adequately represent those precinct types.

21. *Complete Streets* supports a form of layout, generally a permeable grid pattern layout, that differs from the fully branching, hierarchical street system proposed in *Queensland Streets*.

22. Permeability for pedestrians and cyclists is promoted, and is readily achievable, under the *Queensland Streets* design philosophy. There is substantial evidence that grid patterns for motor vehicles have many disadvantages and are in the main inappropriate for streets in lower-density residential-only precincts.

23. It is unfortunate that the adoption of narrow links or no links, rather than wide links, from cul de sac heads, and other inter-street pedestrian connections, has continued to occur. Council subdivision standards have too often supported this approach. This has resulted in some legitimate criticism of non-grid pattern subdivision patterns. It is these concerns about the lack of pedestrian connectivity that directed criticism towards the *Queensland Streets* design standards. However, it is not the fault of *Queensland Streets* which requires high levels of pedestrian/cyclist connectivity. The fault lies with the Council subdivision standards and/or the application thereof.

24. *Complete Streets* is also not written in a form that is suitable for use as a development code.

25. *Complete Streets* could benefit from removing repetition, but requires more material if it is to be used as a comprehensive reference document.

26. *Complete Streets* could also gain greater acceptance if it were edited to remove contentious material that is not evidence based. This would possibly make both more readable and be
more useful to readers who need a better understanding of the principles of street planning and design.

27. What is missing from both *Queensland Streets* and *Complete Streets* is more detail on the planning and design of streets in locations such as multi-use precincts, urban villages, town centres and main streets. The question is what form it should take.

28. The major difficulty with developing a code for such precincts is that there are a wide variety of circumstances that apply.

29. Many mixed-use and town centre precincts develop or redevelop with existing street patterns already in place, with the streets requiring upgrading and/or redesign to provide a vibrant quality public realm to complement and revitalise the adjacent land uses.

30. The exception is the development of larger greenfield or brownfield areas as mixed-use, town centres or urban villages. These developments are usually controlled by master plans that have already been through a rigorous process to set the pattern for development. Nevertheless, even in the master plan development phase, some guidance is desirable in the determination of the appropriate street layouts and geometrics, as well as in the later design development phases.

31. Because of the variety of circumstances associated with mixed-use precincts, town centres and urban villages, the production of detailed guidelines suitable for practitioners as codes for development is likely to be a wasted exercise. It may also prove to be counter-productive.

32. Nevertheless, there would appear to be a gap in available information on appropriate street treatments for specific circumstances. For example, typical cross sections, together with suggested circumstances appropriate for their use could be very helpful for the planning of mixed-use streets, streets in town centres and urban villages, and main streets.

33. The optional typical cross sections with associated commentaries could be referenced in master plans and local government codes and design standards.

34. Rather than prepare a new detailed guideline for street planning and design in mixed-use precincts, town centres, urban villages, and main streets, excellent documents are already available in the Austroads, “Cities for Tomorrow - Better Practice Guide” and “Cities for Tomorrow - Resource Document”. These should be the over-arching guidelines used by all professionals involved in the planning and design of these urban communities and centres.

35. There could be merit in IPWEAQ having a very small document that provides some direction for the planning and design of streets and street networks for multi-use precincts, town centres, urban villages and main street environments. That document should defer to the methodology in the Austroads Cities for Tomorrow Best Practice Guideline and resource material in the Austroads Cities for Tomorrow Resource Document, as well as other suitable references.
7. Recommendations

1. Adopt the Austroads *Cities for Tomorrow - Best Practice Guide* (Westerman 1998a) and the associated *Resource Document* (Westerman 1998b) as the overarching guideline and resource documents for the planning and design of street systems and their associated precincts.

2. Update *Queensland Streets* for contemporary use for the planning and design of street networks in lower-density residential-only precincts.

3. Update *Queensland Streets* for contemporary use for the planning and design of street networks in industrial-only precincts, and add further chapters for the design of streets in business parks.

4. Give consideration to the separation of the lower-density residential-only material from the industrial-only/business park material into two documents and rename them to reflect their true nature.

5. Promote those documents as guidelines for the planning and design of street networks and streets for their specific precinct types, and as development codes for their specific precinct types.

6. Cease promoting *Complete Streets* as a street planning and design guideline.

7. If *Complete Streets* is to continue to be promoted by IPWEAQ, undertake significant amendments to the document and promote it as a resource reference only.

8. Do not prepare a detailed planning and design guideline for streets in multi-use precincts, town centres, urban villages and main street environments, but promote the Austroads *Cities for Tomorrow* as the guideline and resource documents for the process of planning and designing streets in those locations.

9. Give consideration to the preparation of a very small document that provides a broad direction for the planning and design of streets and street networks for multi-use precincts, town centres, urban villages and main street environments. That document should defer to the methodology and resource material in the Austroads *Cities for Tomorrow Best Practice Guideline* and resource material in the Austroads *Cities for Tomorrow Resource Document* and other suitable references.

10. Prepare a set of typical cross sections, together with suggested circumstances appropriate for their use, could be referenced for the planning of mixed-use streets, streets in town centres and urban villages, and main streets.

11. Undertake the detailed changes to any proposed new or updated IPWEAQ street planning and design guidelines and resource documents, as outlined throughout the body of this Discussion Paper.
8. Bibliography

This bibliography includes some articles of interest that are not referenced in *Queensland Streets* (in its Acknowledgement page) and *Complete Streets* (in its Chapter 22, References and further reading).

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