

Figure 17  
**Watercourse park system**

Open space provision also has consequences in terms of maintenance costs - grassed areas which may require irrigation, regular mowing, bins to be emptied, and playgrounds needing regular safety checks. Given the cost of setting aside land which will not provide a direct financial return and the ongoing maintenance costs, it is important to ensure that the open space provided maximises accessibility and useability for all residents, and is designed to be multi-functional.

Open space in urban areas caters for many different cultural needs (including family barbecues, weddings, sports, meditation, etc.) and a range of open space types is needed to provide sufficient choice and diversity of experience to Gungahlin residents. Community needs include formal and informal recreation, celebration, performance, peace and quiet and communing with nature.

#### **6.6.4 Framework for Conserving Biodiversity**

An important aspect of sustainable development is biodiversity. The transition from rural to urban use in North Gungahlin is as revolutionary in its implications as was the introduction of burning techniques by the Aboriginal peoples, or of grazing by European settlers. The measure of a sustainable relationship with the natural environment is therefore relative to a prevailing ethos. Given that the task is to conserve and enhance biodiversity, the challenge is to find ways of making the maximum feasible gains.

In relationship to the challenges of urbanisation, the best way to achieve this is to not only conserve remnant habitats for both flora and fauna, but to also enhance the overall spectrum and variety of habitats by interlinking relatively large elements of restored open space.

The dispersed nature of the existing remnant vegetation and the variety of the topography on the site has led to the conclusion that a "web" of inter-linked ridge and valley elements will provide the best framework for maximising biodiversity in association with meeting urban development needs.

### **6.7 Cultural planning issues**

The cultural needs of the future Gungahlin community are an important consideration in the planning of the area. The identity of the Gungahlin community is still in its formative stages and will continue to develop as suburbs are fully built and residents move in. It is related to the emergence of Gungahlin as a new community, which has strong ties to the wider ACT community. In particular, existing Canberra residents, especially Belconnen, bring with them established social networks.

The area is rapidly transforming from rural paddocks to a landscape dominated by new homes. Unlike some parts of suburban Canberra, the Gungahlin district is relatively well endowed with Aboriginal and European heritage items and places. These represent a valuable cultural opportunity, particularly for newly developing communities, and will require conservation and interpretation.

The consultation process revealed that residents are aware of the social, employment and cultural diversity of the population, yet the housing form does not reflect this diversity.

There is a clear opportunity to develop projects which promote cultural diversity, such as a collaboration with agencies and people working with different groups in the community to initiate community cultural development projects which create and promote community interest and awareness of the diversity in the community.

## **6.8 Physical infrastructure**

The community's needs for physical infrastructure (water supply, sewerage, stormwater management, energy and telecommunications, and roads) are planned for well in advance of development. To ensure sufficient capacity, infrastructure planning tends to use conservative population and demand assumptions based on past practices.

### **6.8.1 Water supply**

Recent downward trends in household water use together with increasing installation of water-saving devices in gardens, kitchens, bathrooms and incentive schemes, suggest that water pricing and education have significantly affected the volume of water used by Canberra households. Expected continuing falls in demand for water combined with the application of sustainable urban water management principles allow for the currently planned water supply system to cater for the population increases estimated, and approach economic, social and environmental benefits for 'total water cycle' based design.

The proposed Structure Plan will have little long term impact on the current water supply strategy plan. There will need to be some adjustments to account for the relocation of group and local centres and schools.

### **6.8.2 Sewerage**

As household water intake has fallen, the volume of sewerage generated by households has also fallen. However there is considerable scope to further reduce sewerage volumes using various technologies to re-use and recycle "grey water" at the individual property, precinct or neighbourhood level. This would help to promote products which both reduce the volume of clean water used and make best use of the "grey water" produced. The currently planned sewerage system has the capacity to cater for the population increases estimated, using on-line package treatment plants in selected locations without augmentation.

Provision has been made in the Gungaharra and Horse Park catchments for reuse schemes such as ACTEW's CRANOS which treats effluent to provide "grey water" irrigation for parks within the catchment with storage in storm water quality ponds. The CRANOS system is one example of a treatment plant but given the very rapid advances in treatment technology it is expected that by the time the North Gungahlin catchment is big enough to install the treatment system, the plant technology will be much more advanced. These new systems will close the water cycle and cater for savings by eliminating the need to augment existing sewerage through Belconnen.

### **6.8.3 Stormwater**

In the past 10 years there has been a major shift in the perception of stormwater from a problem to be exported as quickly as possible, to a valuable resource. Canberra has an international reputation for best practice in this area, and further initiatives should foster water-sensitive design practices at both the future detailed planning and residential design stages.

The Structure Plan is in keeping with the principles of sustainable urban water management for the Gungaharra and Sullivans Creek catchments. In particular, the Structure Plan proposes to construct a series of smaller specialised ponds rather than a single large pond (as has been the practice in the past) with a more "natural" appearance for the low flow overland system. The proposed stormwater system has the capacity to cater for the population increases proposed.

In the case of Horse Park catchment, the requirement for Horse Park is for retardation. If wet retardation basins are built for urban reasons then care is required to maintain their water quality and levels. A small basin of this kind is required upstream of the Horse Park wetlands, with high flows being diverted clear of the wetland ecological area. A dry retardation basin is proposed on the site of the Amaroo District Playing Fields, capable of accommodating extreme flood events.

#### **6.8.4 Energy**

National energy market reforms are expected to influence residential energy prices in the long term. Demand for energy-efficient appliances is expected to continue to rise, but this is likely to be offset by continuing demand for an ever-growing range of energy-using appliances. The currently planned gas and electricity systems have the capacity to cater for the population increases estimated when development in Gungahlin is complete. In addition the ACT Government is applying the ACT House Energy Rating Scheme (ACTHERS) to inform the market about the energy efficiency of new and existing dwellings and the implications of this rating for household energy consumption and cost.

#### **6.8.5 Telecommunications**

Demand for telecommunications is expected to continue to grow, as telecommunications have become an intrinsic feature of the way people work and relax. The currently installed telecommunications system using optical fibre technology has the capacity to cater for major increases in demand and for the estimated population increases.

A separate process is being undertaken through the Gungahlin Telecommunications Master Plan, March 2000 (GTMP) to address the needs of mobile telephone users in the Gungahlin district while minimising their potential for visual impact, particularly with regard to the location of towers. Advancements in telecommunications technologies, particularly for mobile phones, increasing community concerns and the need to further refine a strategic approach to the provision of telecommunications in and around Gungahlin have led to a review of the GTMP to facilitate the delivery of adequate mobile phone coverage.

#### **6.8.6 Roads**

Travel patterns in the past 10-20 years have changed considerably from the days when many women stayed at home with children. As labour force participation rates have risen, demand for second cars and road space has increased. Many working couples work in different parts of the city, and time pressures have meant that people often prefer to drive because they need to stop at different places along the way to work and back (child care, schools, workplace, shops etc.). At the same time, retail planning changes have meant that local and group centres are more widely dispersed in newer urban areas, which results in greater travel distances.

Encouraging people to make more of their trips by public transport demands powerful incentives, including making public transport as easy and affordable to use as possible, designing routes and timetables to best serve the needs of users, and co-locating the various destination points so that a single trip by public transport can compete with the convenience of driving. Disincentives to use the private car for commuting include limits to the amount, and increases in the cost of parking. Recent policy changes by ACTION are intended to significantly improve access to public transport. However, a high level of commuting to workplaces outside Gungahlin plus the strong need for travel (especially on weekends and at night) to maintain social networks outside of Gungahlin are likely to mean continued strong demand for roads and driving.

### 6.8.7 Cycle paths

In recent years there has been an increasing awareness of the benefits of cycling for the well being of all Australians. Increased participation in cycling will improve transport access for many Australians, increase levels of individual health, and reduce green house emissions, pollution and congestion. Cyclists and non cyclists alike will benefit from lower health costs in the community, less traffic on our roads and cleaner air.<sup>8</sup>

Cyclists ride for varying but specific purposes, such as for shopping, travel to work, community (and recreation) facilities or to visit friends. Their routes are unpredictable but in general of a relatively short length, and occur along roads not subject to high levels of traffic. The skill level of cyclists varies greatly. Their needs include the provision of a comprehensive network of "low stress" routes and appropriate end of trip facilities, at various commercial and institutional destinations

The main users of bicycles and their requirements are:

- Primary School Children : Young children (Primary school age and younger) have little knowledge of roads and traffic laws and their cognitive skills are not fully developed.<sup>9</sup> Accordingly, primary school aged children can safely use off - road paths or quiet residential streets for cycling. Young children should only ride on or near roads under strict adult supervision.
- Secondary School Children: The skill of secondary school students varies greatly. For older students (14 and over), the majority of cycling takes place on-road. Off road facilities provided for this group are often under-utilised if the road system is more direct and faster.
- Recreational cyclists: The experience, age and skill of recreational cyclists can also vary greatly. They generally desire a pleasant recreational experience along off-road paths and quite local streets avoiding congested, heavily trafficked routes. Nevertheless, a large proportion of experienced recreational cyclists will prefer to use the road system for long journeys.
- Commuter cyclists - there are two types of commuters:
  - those who prefer paths or low stress roads and are willing to take longer to get to their destination. This type vary greatly with age, skill and fitness;
  - those who wish to get to their destination as quickly as possible regardless of traffic conditions. This type are usually highly skilled and are generally able to handle a variety of traffic conditions including the high stress levels experienced on busy arterial roads. Their primary requirements are space to operate (wide kerbside lane or an exclusive bicycle lane) and a smooth, even surface. These commuter cyclists are concerned with travel time and therefore prefer to use the most direct and convenient route. Only when arterial road conditions become unacceptably busy will these cyclists choose to use other slower routes.

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<sup>8</sup> Austroads, 1999-2004 - Australian Cycling - The National Strategy.; Austroads Inc. ; Sydney.

<sup>9</sup> Sandel S. 1974; Hoffman, Payne & Prescott, 1978. In Austroads and Standards Australia, 1999; Guide to Traffic Engineering Practice - Bicycles - Part 14; Austroads ; Sydney

**Relationship between users and trip destinations**

User Group	Trips within the Neighbourhood	Destination - Between Suburbs and/or Suburbs to Group Centre	Suburb to the Town Centre	Suburb to other Town Centres
Primary School, <sup>1,2</sup>	High	High	Medium/High	Low
Secondary School, <sup>1,3</sup>	Medium	High	High	Medium/High
Commuter	13%	27%	20%	40%
Recreation, <sup>1</sup>	Medium	Medium	Medium	Medium/High

<sup>1</sup> The relationship between user group and trip destination for primary school, secondary schools and recreation are assumptions based on Austroads definitions and recognition of the proposed urban structure;

<sup>2</sup> The catchment and accessibility assumptions for this group are as follows: primary school children travel at an average of 12 kilometres per hour (=1 kilometres/5 minutes). A maximum travel time of 10 minutes is acceptable. This equates to a catchment radius of 2 kilometres.

<sup>3</sup> The catchment and accessibility assumptions for this group are as follows: secondary school children travel at average speed of 20 kilometres per hour (=1 kilometre/3 minutes) and a maximum travel time of 10 minutes is acceptable. This equates to a catchment radius of approximately 3 kilometres.

An integrated system of cycling facilities will increase bicycle use. Bicycle networks should include a system of on and off road routes and provide the community with choices for transport and recreation.

## 7. COMMUNITY CONSULTATION

Community consultation is a central principle of the ACT Government's planning and decision making processes. It allows the community to work with the Government to make informed decisions about issues that affect its citizens. Consultation provides an opportunity to identify major differences, as well as areas of agreement which can be taken into account by Government in its decision making process.

### 7.1 Consultation with local members of the public and Traditional Owners

A number of consultation steps were undertaken, including;

#### 1998 - 2000

- Public consultations on Gungahlin Urban Structure Plan, including community briefings, public meetings and workshops with members of the public. (See **Appendix A & B**)
- Consultation with members of the Aboriginal community on the preparation of the "Gungahlin North ACT Cultural Heritage Survey", "Gungahlin Urban Structural Plan Cultural Heritage Component" and "Gungahlin Planning Project Heritage Sites Tabulation" Documents.
- Consultation with Aboriginal Representative Groups on conservation of Aboriginal Quarries within the Study Area.
- Consultation with Aboriginal Representative Groups on naming of Suburb of Bonner to honour Neville Bonner. Consultation on naming other places and areas within North Gungahlin to highlight the importance of Aboriginal Heritage was also undertaken.
- A series of articles in the Canberra Times, Gungahlin Chronicle and "Gunsmoke" (the Gungahlin local newsletter) were published to heighten community awareness of the processes for the Gungahlin Structure Plan Review.

#### 2001

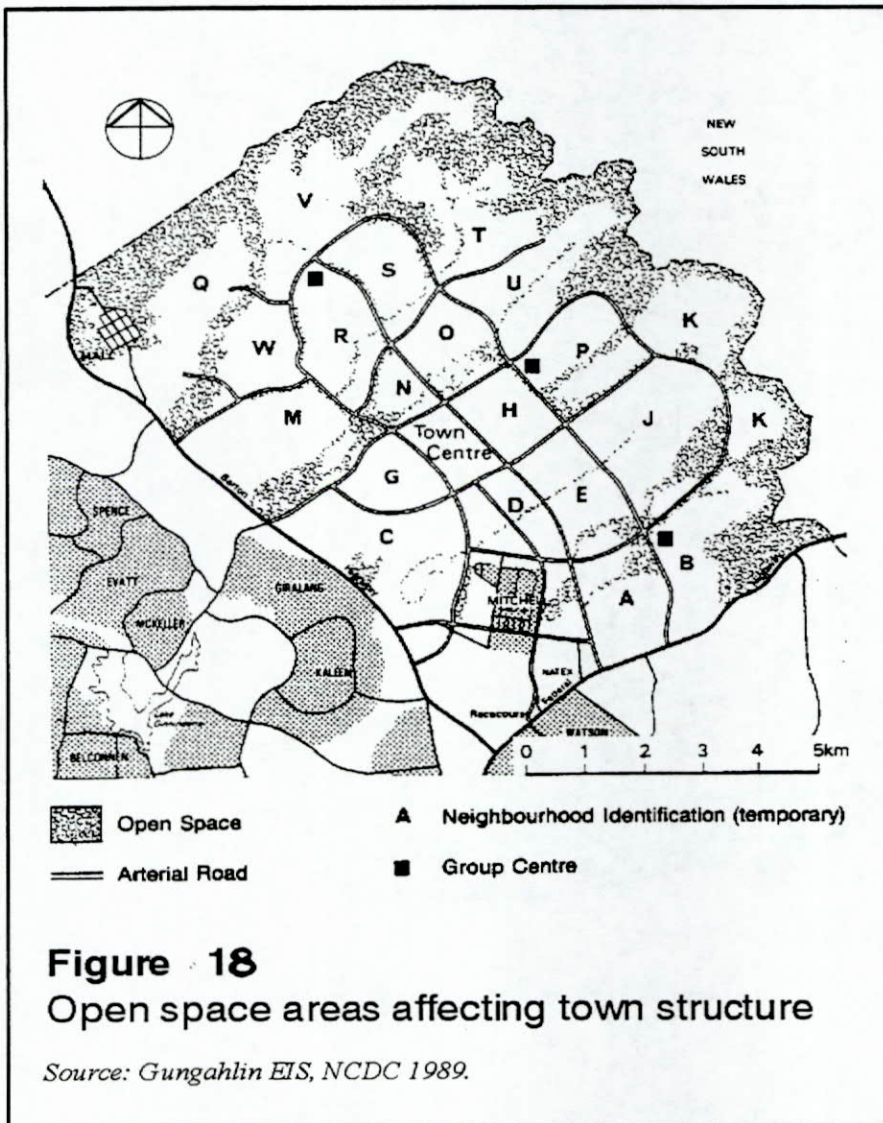
- As part of the consultation program on the Draft North Gungahlin Structure Plan, PALM released a brochure for community comment. This brochure provided an outline of the proposed changes to the North Gungahlin Study Area, the guiding principles of these changes, and the next steps in the planning process. The brochure was released for community comment on 3 September 2001 and for a three-month period until 7 December 2001.
- A series of four workshops, discussing such topics as *Environmental Values*, *Creating Communities*, *Effective Use of Resources* and *Sense of Place*, formed one component of the activities undertaken as part of the community consultation program by PALM during the community comment period. The workshops were attended by representatives of local action groups, ACT Government agencies, and representatives of the Aboriginal and Torres Strait Islanders Consultative Committee. The Report's summary and responses are to be found in **Appendix C**.
- A series of community information sessions, including manned shopping centre displays were also held.
- An on-site walk through the North Gungahlin area was undertaken, with key community representatives, members of PALM, and the Minister for Planning on 24 November 2001.

#### 2002

- Public consultation on the Preliminary Assessment and Draft Variation to the Territory Plan will be undertaken in accordance with Legislative requirements.

The extensive consultation for North Gungahlin, as indicated above, has raised a number of issues including, open space provision, employment opportunities, transport measures, and ecological, environmental and heritage considerations. All of the issues raised have been considered in the preparation of the continued planning for North Gungahlin.

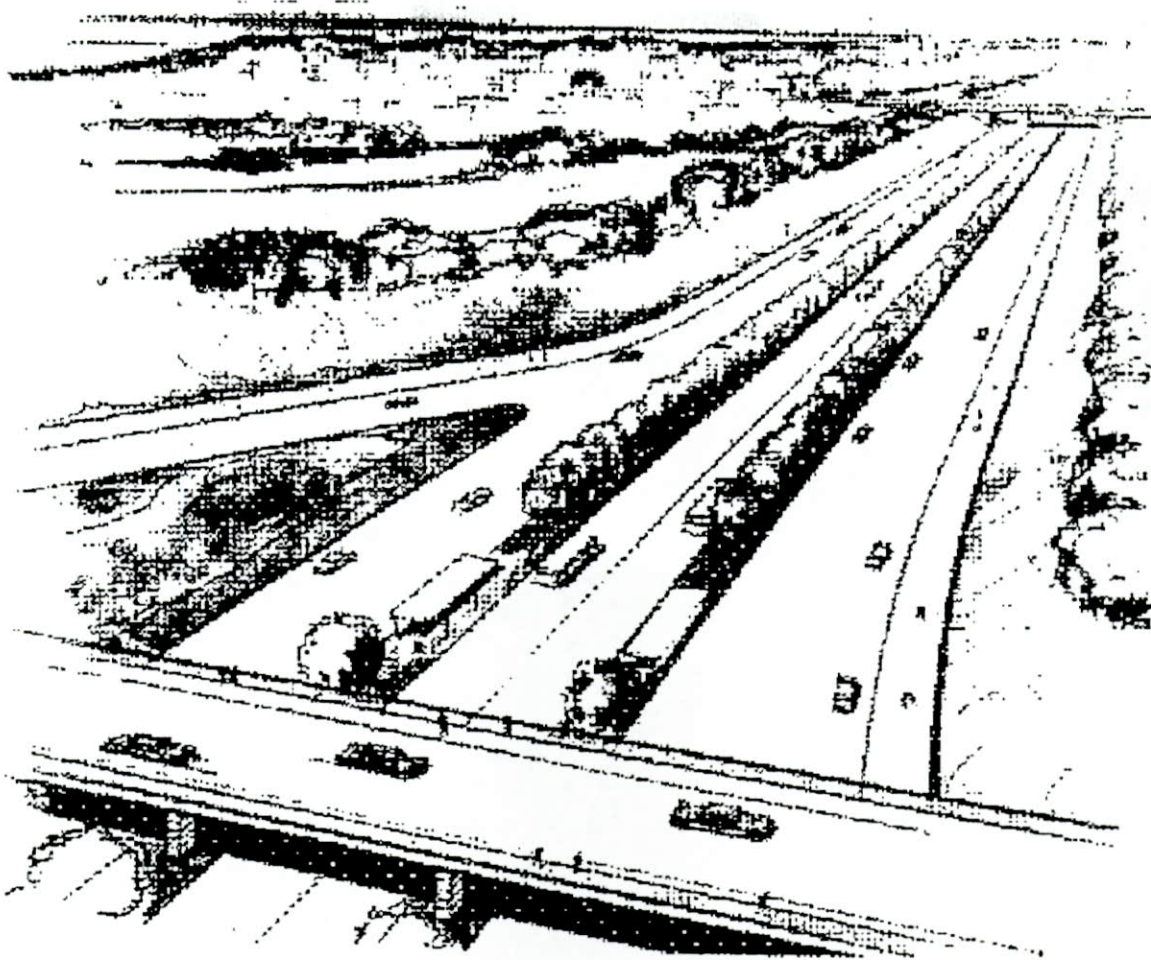
## 8. PLANNING PRINCIPLES



### 8.1 Original Gungahlin urban structure (to refer figs 18-27)

The original structure plan for Gungahlin (NCDC Gungahlin Policy Plan - 1989) proposed the suburb structure as the basic building block of the town structure. This is reflected in the existing Territory Plan principles and policies for Gungahlin. The major elements of the plan included twenty suburbs/neighbourhoods, an arterial road network, a hierarchy of centres including local shopping centres serving individual suburbs, three larger shopping centres serving groups of suburbs and a town centre acting as a focal point for the higher order retail and community facilities for the whole development. It also proposed objectives for the provision of a local road network and adequate public transport system including an inter-town public transport spine, linking the town centre to the city and other town centres.

The plan continued the earlier philosophies used in the planning of Belconnen, Woden and Tuggeranong of providing relatively free flowing, quick and unconstrained car access to all parts of the city, while protecting the amenity of residential areas.



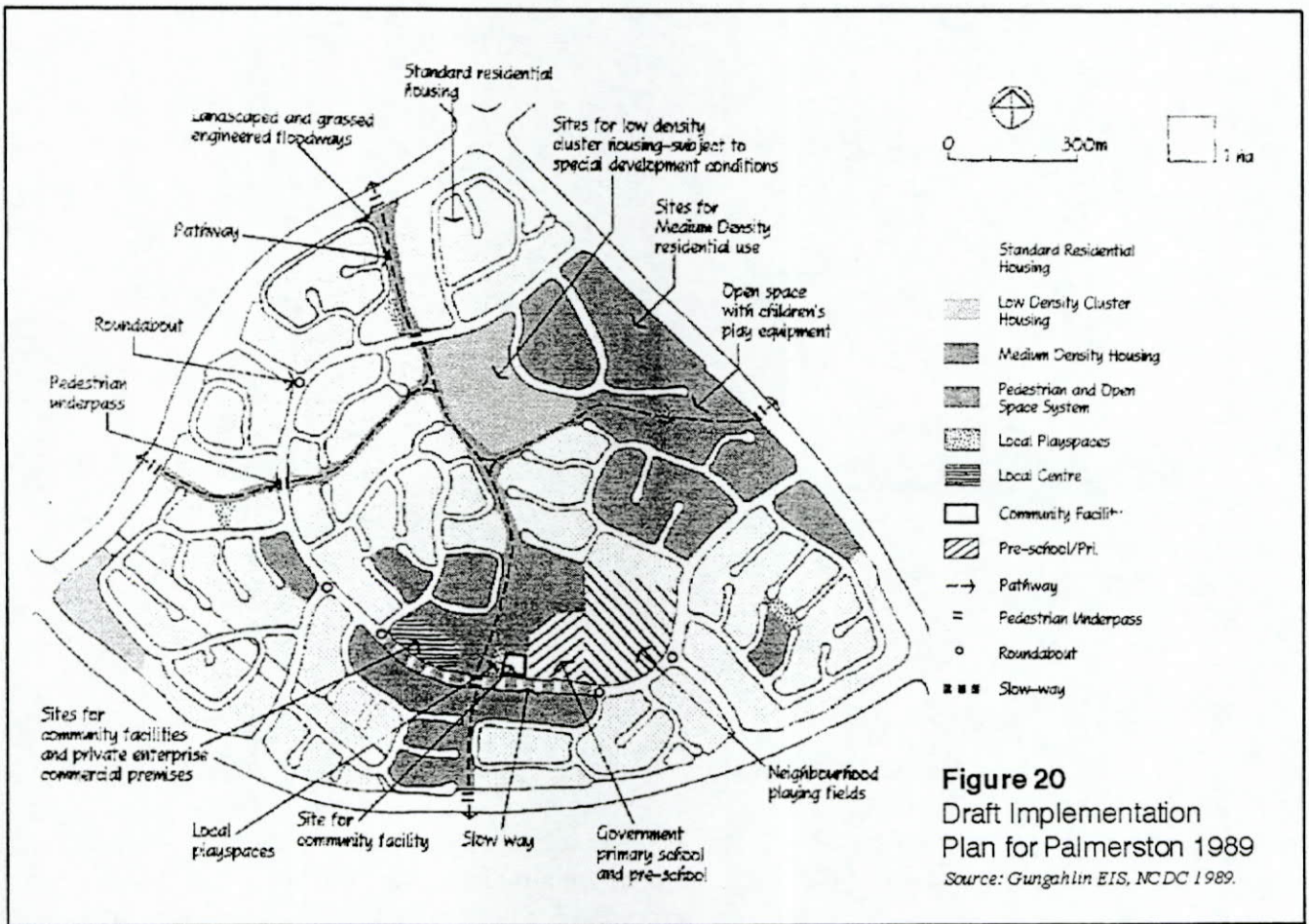
**Figure 19**  
View of an urban corridor adjoining  
a district centre

*Source: Gungahlin EIS, NCDC 1989.*

The optimum suburb size proposed in the original Gungahlin policy plan was based on the following criteria:

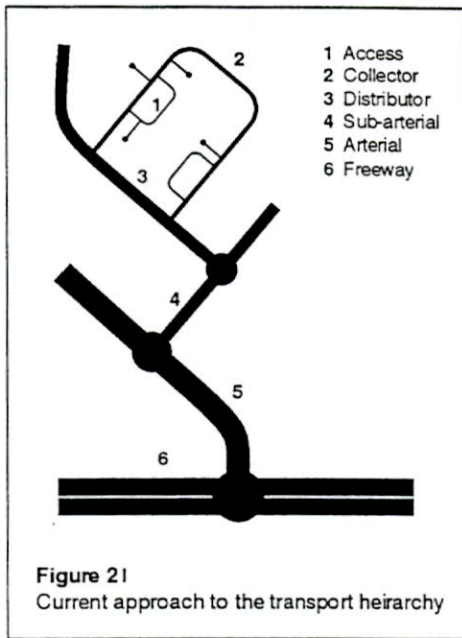
- four lane arterial roads at a grid of 1.4 to 1.9km to form the boundaries of suburbs;
- distributor roads which serve a maximum of 1500 dwellings or approximately 4000 vehicles per day (note: 1975 and 1997 travel surveys have recorded an average of approximately ten vehicle trips per dwelling each day);
- a maximum walking distance in the range of 1.0 to 1.5km ( about a 20 minute walk) to centrally located local facilities; and
- an adequate local retail centre which can be supported by the suburb.

The optimum size of the proposed suburbs was equivalent to approximately 1,600 residential blocks, with a preferable maximum of 1,800 blocks. Broader scale planning factors could dictate some smaller neighbourhoods, thus providing a range of neighbourhood populations in the order of 4,000 to 8,500 people.



The planning principles guiding the planning and development of suburbs included:

- a legible road hierarchy, including a curvilinear distributor system, collector roads and local access roads;
- regional traffic generators, if present, sited on the periphery of the suburb;
- an off-road movement system (influenced strongly by “Radburn” planning philosophies) to allow for the movement of pedestrians and cyclists, focussing on major planning elements such as the primary schools, local centre and playing fields;
- local facilities in a generally central location which could include a primary school, local shops and appropriate non-retail commercial and community facilities;
- a bus route operating on the distributor road system;
- road layout and block design which incorporate energy efficiency considerations where practicable; and
- an identifiable character for each suburb through distinctive landscape treatments.



## 8.2 Emerging issues

At the local level, as opposed to the metropolitan level, significant changes in thinking on sustainable urban settlements call into question a number of assumptions and factors influencing the preceding suburban design concepts. Challenges to the principles outlined above raise fundamental issues regarding the validity of the original urban structure for Gungahlin as proposed in the 1989 Policy Plan. Some of the critical changing circumstances that raise practical problems with suburban structure include:

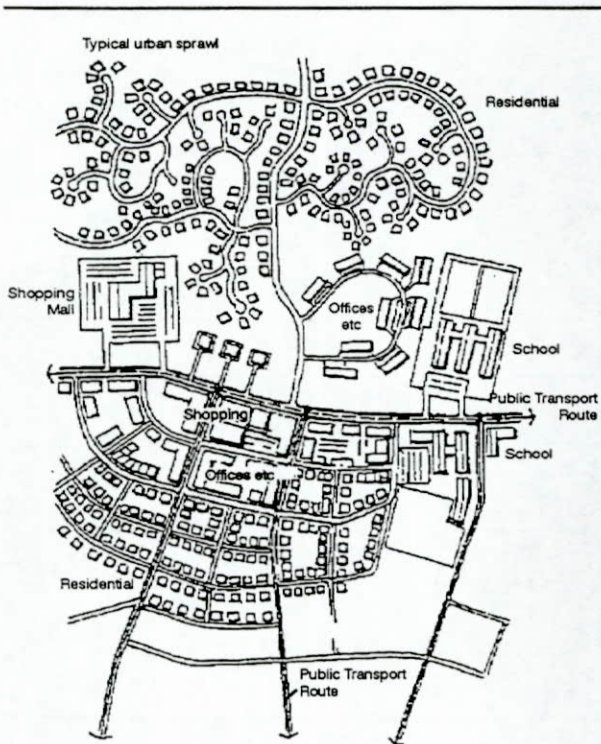
- the problems of long term viability of local centres internalised within suburbs where throughout Canberra a large number of local centres are in decline. They rely on external passing traffic for survival;
- it is very costly to run an efficient bus services on the internal curvilinear distributor road system which does not directly connect to other internal distributor road networks. It is also difficult to attract people on to public transport when buses run on indirect and disconnected networks at infrequent intervals; and
- primary schools internal to single suburbs have been vulnerable to closure due to the difficulty of sustaining adequate enrolments in the longer term.

Other changing circumstances which have affected the suburban structure include changes to stormwater management, open space provision and urban design quality.

Studies undertaken by the Victorian Government<sup>10</sup> analysing the energy use and greenhouse gas emissions associated with different types of urban fringe development concluded that conventional low density suburban development when compared to transit oriented development (“new urban” development) used substantially more annual energy per household (and therefore greater greenhouse emissions). Importantly the study found that urban design, street layout, housing densities and land use mix has a significant impact on household energy use. Savings of up to 57% of transport energy use were achievable by implementing “new urban”<sup>11</sup> development as opposed to conventional suburban development. Significant savings in dwelling energy used are also achieved by increased density through sharing of walls and through passive solar design.

<sup>10</sup> Commonwealth Department of Housing and Regional Development, Better Cities Program, 1995. Transit Supportive Development - Development Benefits possibilities.

<sup>11</sup> Conventional suburban development contrasts with new urban development by generally having segregated land uses, high car dependence, relatively disconnected street systems and low residential densities and very limited public transport and local employment.



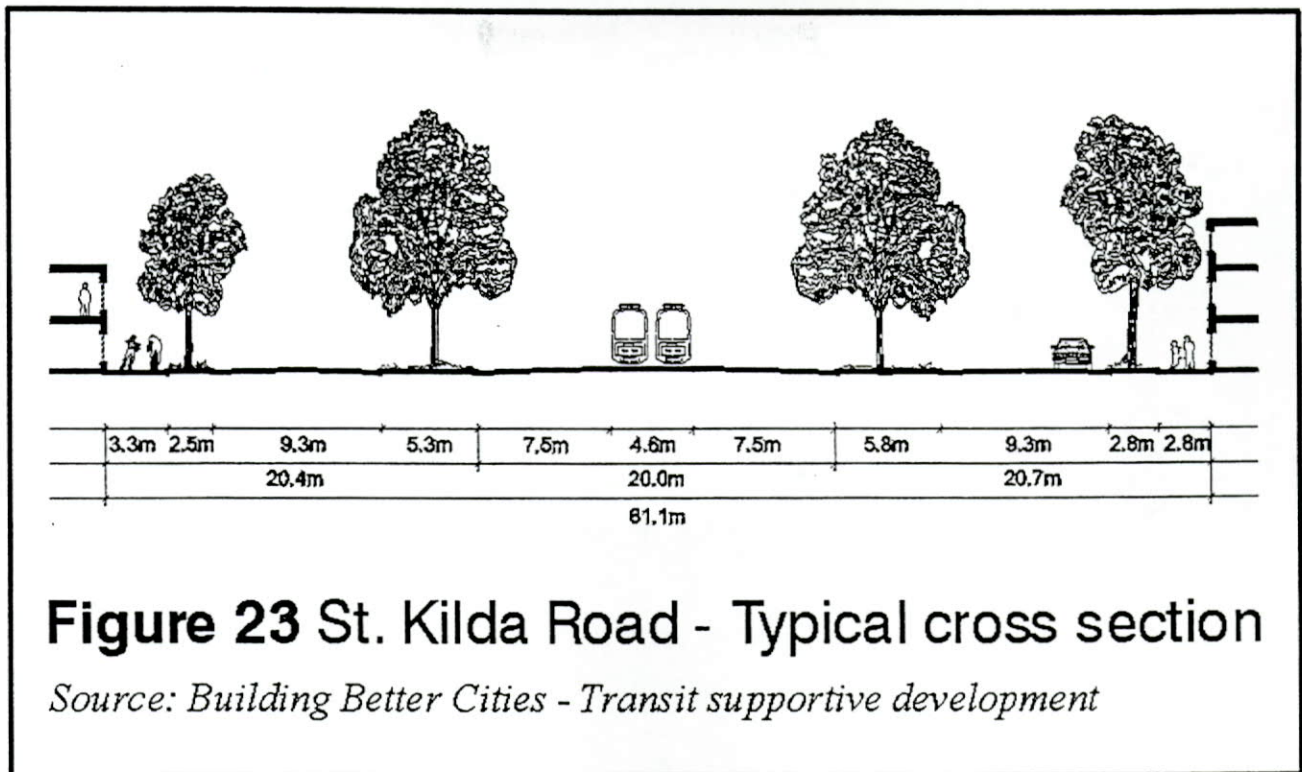
**Figure 22** Transit orientated development

*Source: Building Better Cities - Transit supportive development*

### 8.3 Sustainable city form

As the 21st century commences, sustainability has become the single most important and challenging urban planning issue. Sustainability embraces the need to preserve natural resources and protect the environment while also facilitating the development of economically viable and socially enriching urban environments.

There is a growing understanding and acceptance of the ways in which cities can become more sustainable. Urban growth and continuing car dependency lead to rising levels of traffic congestion, air and noise pollution and consumption of fossil fuels and greenhouse gas emissions. Transport, accessibility, density and urban form are key factors which influence the sustainability of a city. At the broader level of metropolitan structure approaches to transport, accessibility, density and urban form are advocated in AMCORD (the Australian Model Code for Residential Development). The major common theme outlined in these policies is the need to provide more transit supportive and sustainable urban form where there is an ability to maximise “exchange” (connectivity of the community to homes, jobs, recreation, open space, social activities etc) while minimising the necessary travel.

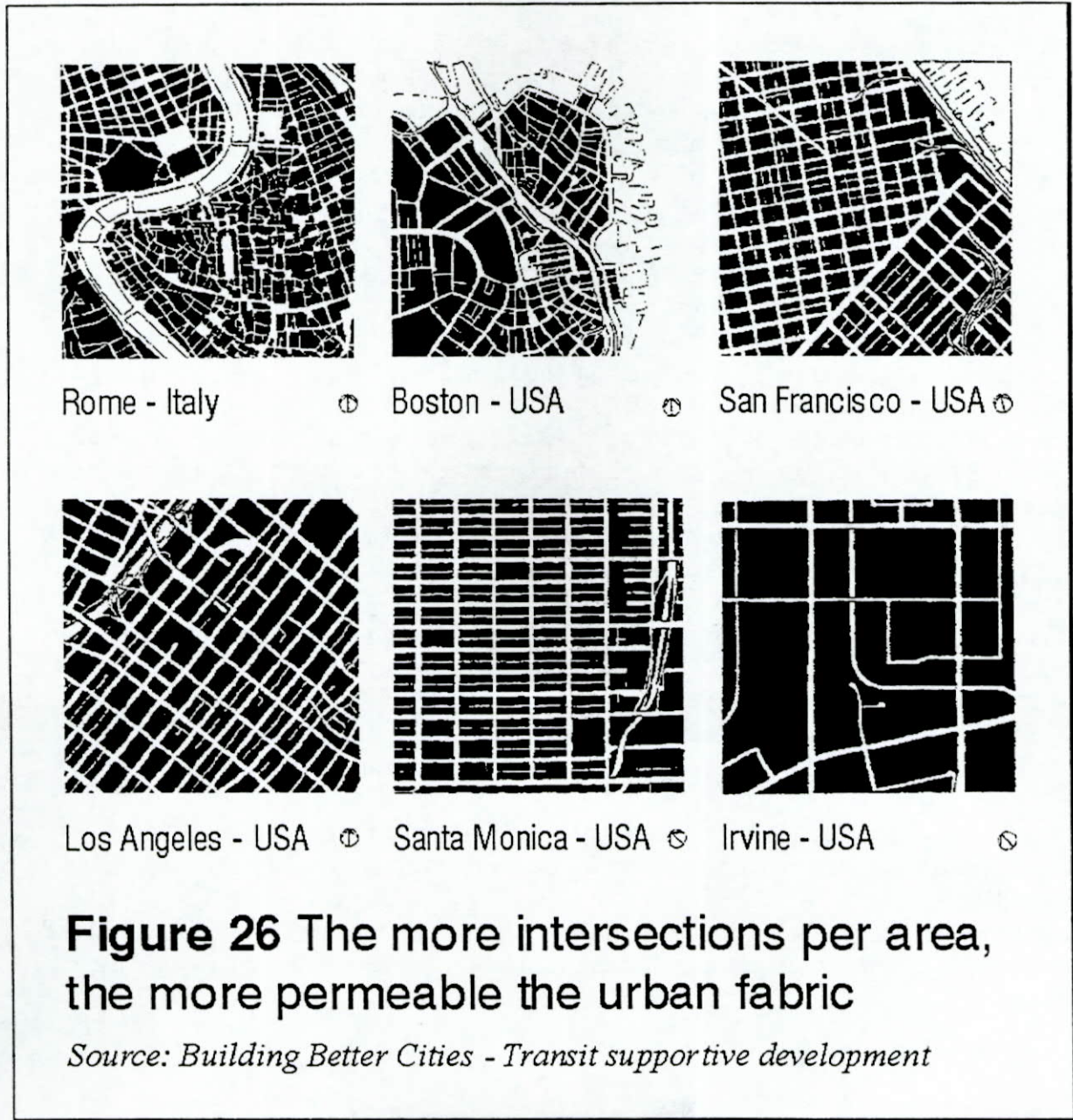
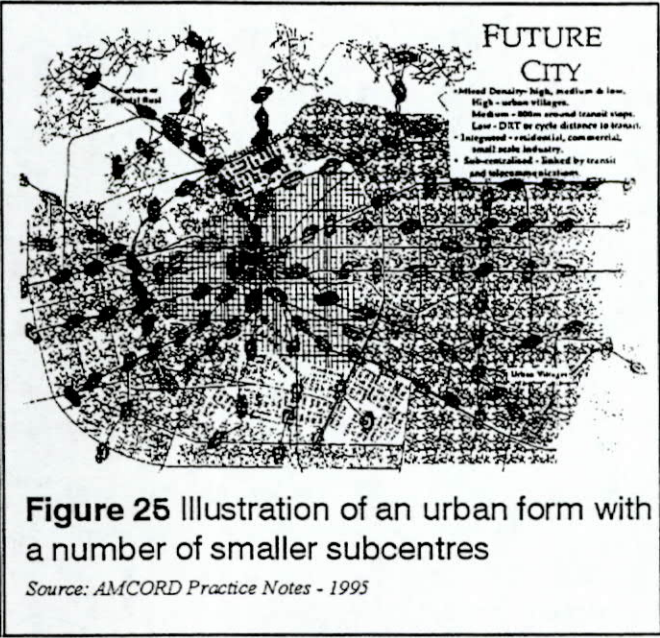
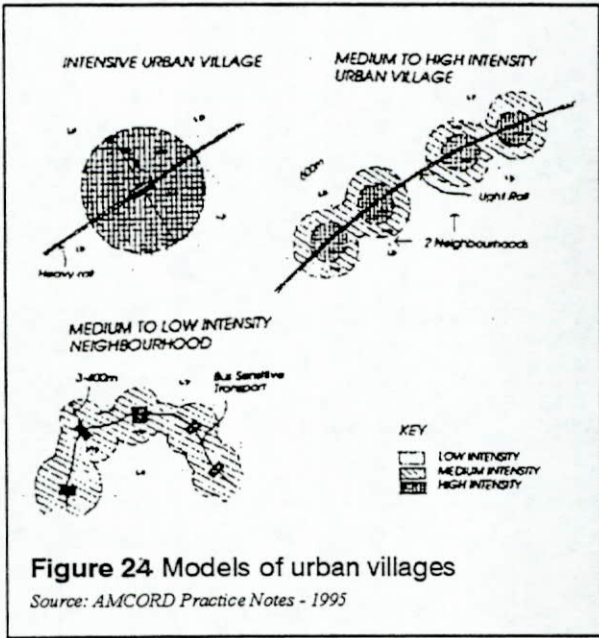


In summary, specific policies advocated are:

- creation of more compact cities with higher density nodes (urban villages, transit oriented development) along transit corridors;
- arranging cities in a linear or radial pattern developed along transport corridors;
- designing the urban fabric to support transit and facilitating personal choice to use transit;
- facilitating mixed use development within higher density nodes and enabling people to live and work at these nodes; and
- increasing cycling for transport and recreation to enhance the community's well-being is strongly advocated in The National Bicycle Strategy. The ACT strategy aims for an increase in the proportion of community trips by cycling from 3% in 1997 to 6% in 2007.

Such policies seek to produce a built environment which:

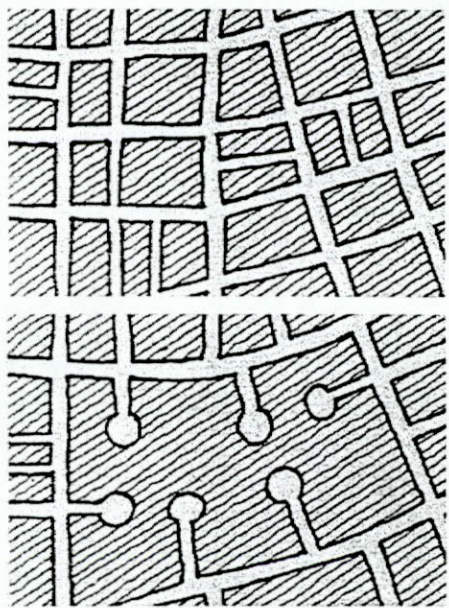
- is diverse in use and population;
- is scaled to the pedestrian;
- is capable of accommodating the car and transit;
- has a well defined public domain which is responsive to site features and ecology and supported by an architecture reflecting the climate and culture of the region;
- has fine grained and mixed use town, group and local centres;
- has higher residential and employment densities than conventional suburban development; and
- has a highly interconnected street system for traffic efficiency with traffic management to protect safety and amenity of residential and town centre areas.



## **8.4 Sustainable neighbourhoods**

New approaches to neighbourhood design are outlined in AMCORD (Practice Note PND 3), the ACT Code for Residential Development Sections 1 – 4 Discussion Paper 2001, and the ACT Government Publication – Designing for High Quality and Sustainability. The main elements of this approach are summarised below:

- integrated and holistic approach to neighbourhood design, ensuring no one element is considered in isolation;
- creation of defined self contained, sociable environments which reduce the need for private vehicles for day-to-day activities;
- compact neighbourhood units based on 400-600m comfortable walking distance of a central focal point (transit stop, primary school, convenience store, post office, child care centre, bank, park etc);
- increased densities and range of housing types (including affordable housing), as part of mixed use centres allied to transit stops. The form of building should allow greater flexibility; e.g. to include small scale business uses;
- an interconnected street network for shared use of pedestrians, cyclists and cars (where low traffic volumes and safe conditions are ensured) and where traffic is dispersed among a network of streets;
- a strong neighbourhood focal point which can consist of a transit stop and range of retail, service, civic and community facilities. This focus has high quality public domain and flexibility in design to allow community focus to develop as population grows;
- mixed use vertically and horizontally (eg shop top housing);
- employment of a range of urban design principles to achieve distinct identity, human scale and a high level of amenity. These include consideration of design elements - paths, nodes, landmarks, edges, legibility, permeability, flexibility (robustness) and variety;
- an emphasis on defining and achieving a high standard of design of the public domain including streets, open space and civic buildings;
- containment of the neighbourhood within well- defined edges (natural or constructed);
- a sequential arrangement of defined neighbourhoods in linear or nodal form (depending on the type of public transport to be provided);
- densities in the order of 20-30 dwellings per hectare should be considered in order to have a diversity of land use, justify the provision of services such as a transit stop and to minimise the need for private vehicle use on a daily basis;
- applying innovative technologies to reduce total energy and water use;
- applying innovative technologies, based on whole of life costings, to infrastructure provision and water management;
- maintain natural ecosystems in such a way that environmental processes and native flora and fauna are protected;
- develop a district which supports and promotes the community life of its residents and produces a built environment which meets the different needs of the community;
- provide a full range of community facilities and services in accordance with the needs of residents;
- locate centres, facilities and open space so as to maximise their accessibility and viability;
- facilitate and encourage a diversity of employment opportunities at local, group as well as town centre levels; and
- adopt sustainable urban water management design principles to secure economic, social and environmental benefits of integrated 'water in the landscape' and 'total water cycle' based designs.



**Figure 27**  
 Contrasting permeability in street systems  
 Source: *Building Better Cities - Transit supportive development*

## 8.5 Planning goals

The adoption of sustainable urban development has identified that intensive development should be clustered to support public transport. The challenge is to incorporate this principle into the planning of these new areas.

Planning goals, as outlined below, have been established incrementally from this platform to support this outcome. The sequence has been to work from definitions of sustainable development through to outcomes which need to be met in Gungahlin, and then to the consideration of alternative configurations for the Structure Plan itself.

### 8.5.1 Goal 1: Sustainable development

The concept of sustainable development embraces development which performs a delicate balancing of economic, environmental and social objectives. However, a key feature of sustainability approaches is the shift away from standard trend projection and conflict-driven conservation to a more pro-active planning philosophy which harnesses resources for long-term benefits. The ACT Government is a signatory to the Commonwealth Government's *National Strategy for Ecologically Sustainable Development 1992*.

The term sustainability has many definitions. The *Towards a Sustainable ACT: A Discussion Paper* released in June 2002 for comment proposes the following definition. "In the ACT, sustainability is about how we meet the needs of people today without compromising the ability of future generations to meet their needs. It is an approach to decision making that recognises that social, economic and environmental issues are interconnected and decisions must incorporate each of these aspects if they are to be good decisions in the longer term."

Part A of the Territory Plan aims to achieve the following outcome for sustainable development. "Continued development and change accommodating economic and population growth, but in a manner which upholds community values, conserves natural resources, safeguards ecological systems, achieves reductions in the level of Greenhouse gas emissions, and establishes the ACT as a model living environment for the 21<sup>st</sup> Century."

### ***The Goal is:***

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

### ***The Core Objectives are:***

- to enhance individual and community well-being and welfare by following a path of economic development that:
  - safeguards the welfare of future generations;
  - provides for equity within and between generations; and
  - protects biological diversity and maintain essential ecological processes and life-support systems.

### ***The Guiding Principles are:***

- decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations;
- where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the global dimension of environmental impacts of actions and policies should be recognised and considered;
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised;
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised;
- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms; and
- decisions and actions should provide for broad community involvement on issues which affect them.

These guiding principles and core objectives need to be considered as an integrated package. A balanced approach is required that takes into account all sustainability objectives and principles to pursue the goal of sustainable development.

## **8.5.2 Goal 2: Sustainable Urban Development**

Town planning can foster sustainable development by focussing on a number of specific aims. Urban design is concerned with the physical arrangement and functioning of urban activities, the physical appearance of the built environment and its relationship to the natural environment, the way in which people experience it, and the social and economical factors which influence its character. In order to achieve a high standard of urban design in the new area of Gungahlin, seven principles have been identified to guide the development of the Structure Plan and future development of the area. These are as follows:

### ***Development will endeavour to distribute benefits widely to the population***

The planning of the new development areas of Gungahlin will respond to the needs of less advantaged groups by ensuring that residential areas, facilities and services are safe, accessible and well connected to the rest of the city. Community safety principles will be adopted by designing residential areas, public places, movement systems, community facilities and centres in a way that provides opportunities for natural surveillance and that encourages a sense of community

ownership. Facilities and services will be provided in locations that maximise accessibility for all users. Their location will maintain and if possible increase the independence of residents with special needs and will preserve their dignity. Residential areas will be designed to provide for appropriate housing to suit a diverse range of needs and income capacities.

### ***The new areas of Gungahlin will produce environmental benefits***

The pattern of development in the new areas of Gungahlin will reflect land capability constraints resulting from topography, soils, geotechnical factors, drainage, natural hazards, micro-climate and flora and fauna habitats. The new areas will be planned to minimise the use of non renewable resources. Their design will support an integrated and flexible pedestrian, cycling and public transport system. For example, housing densities will support a viable, accessible, frequent and energy efficient public transport system and residential areas shall be walkable and compact.

Consequently, there will be opportunities to reduce car dependency, related energy use and airborne pollution. Energy use and airborne pollution will be further minimised by designing roads systems that are unlikely to become congested. Other forms of pollution will be minimised through designs which emphasise the use of effective passive systems to manage stormwater, waste water, sewerage and other systems.

The new areas will be designed to minimise the consumption of water and encourage the use of technologies which re-use and recycle within the home and neighbourhood. In addition, the use of passive and active solar systems, and of energy efficient building design and block and section design layout will be encouraged.

### ***The interests of the community will be defined and engaged***

The ongoing planning of the new areas of Gungahlin will be undertaken in collaboration with the Gungahlin community. Good planning often involves community involvement. By working with communities and developing the Gungahlin area thoughtfully and with care, we can provide Gungahlin residents with the opportunity to shape their own environments. Future planning in Gungahlin will provide all residents in Gungahlin with opportunities that maximise their capacity to participate in the everyday life of the community.

Residents will have opportunities to provide input into the planning and management of services and facilities and particularly in regard to identifying needs and establishing priorities to meet those needs.

### ***Development will respond to local features and needs***

Good planning is based on local characteristics. The shape and structure of the new development areas in Gungahlin will have a variety of characters derived from the natural and cultural features of the site and location relative to the town centre. New urban areas will respond to the need for imaginative urban design.

The provision of facilities and services will reflect the diverse needs of the population and of lifestyle choices. Public spaces will be provided to cater for a broad range of formal and informal uses and facilities and services will be flexible to cater for a range of community needs. A wide range of housing types will be provided to meet the changing needs of residents at different stages of their lives and according to different requirements for example, as a result of differing family size or a desire to work from home.

### ***Development will pay tribute to the past and present in creating the future***

Places become memorable and valuable because they manifest qualities that are associated with present and past events that have meaning to us. Development of the North Gungahlin area will respect and integrate items of Aboriginal and European cultural heritage value. It will give consideration to Walter Burley Griffin's design principles for Canberra, for example hills ridges and buffers will be conserved, land and water features will be used to add interest and variety and semi-formal streetscapes will be used for different road types.

Recognition and integration of the cultural heritage characteristics of the area will be enhanced by the continuing evolution of the cultural identity of the existing and future Gungahlin community.

The cultural identity of the Gungahlin community is still in its formative stages and will continue to develop as suburbs are fully built and residents move in. However, in the early stages of development, there is a significant opportunity to harness the variety of cultural characteristics within the area to develop and promote a sense of local culture and identity. In particular, land use, urban design and architecture will reflect the unique qualities of the community as a whole and of sub-communities within that. They will recognise that the community is dynamic and will provide opportunities to celebrate cultural diversity. Activity nodes, community places, parks and other key uses have the potential to provide a strong 'sense of place'.

### ***Design and development will offer the possibility for continuing adaptation and change***

It is frequently argued that the best and most beautiful places have evolved slowly over time. The Structure Plan for the design and development of North Gungahlin must be flexible in order to accommodate change over time, however it must also be robust. Fixed and flexible elements will be clearly defined. Gungahlin will be diverse in character with mixed and multiple use areas to be encouraged at all levels of the urban structure. This will also provide for a flexible range of uses in the short and long term.

The Gungahlin community, its culture and needs, will be encouraged to evolve wherever possible for example orientation of residences to the street and other houses will provide opportunities for informal neighbourhood interaction. ACT Code for Residential Development Sections 1 – 4 Discussion Paper 2001 contains a framework that will enable urban design to contribute to and facilitate the development and growth of the community.

Services and facilities planning will consider the long term needs of future residents as well as short term requirements. A variety of housing types and size as well as the shape and character of public spaces shall be provided to meet different needs, present and future.

### ***Design and development shall be of a high quality***

The new development area of Gungahlin shall display a high quality of urban design. The principles outlined above in combination with sensitive, thoughtful and creative design of the new aspects of the physical environment will ensure that the Gungahlin area achieves this objective and provides an urban structure that is simple, legible and flexible.

Suburban layouts shall be permeable and identifiable and shall also have high connectivity. Public spaces such as streets, centres, squares and parks shall be of high quality to provide a strong underlying structure to urban areas. A series of connected, overlapping residential areas will be provided around a series of landscaped areas, schools, community facilities and mixed use retail centres.

## 8.6 Structure Planning Principles

The major objectives of the Structure Plan are that:

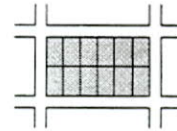
- development should encourage an environment that facilitates sustainability in terms of ecological, cultural, environmental, social and economic considerations.
- the landscape setting and values of the site should be recognised and enhanced. Existing significant landscape features will be retained, including significant trees where possible;
- the local neighbourhood should be based on a walkable radius of 400m, and focussed on an activity node such as a basic unit of open space (such as a park and potential community facility);
- residential areas should be based on a series of inter-connected suburbs (each containing 3 or 4 neighbourhoods) with their own local centre, typically adjoining a primary school site and open space corridor;
- mixed and multiple uses will be permitted at all levels of the urban structure;
- group centres serving larger populations should be well located on major roads in order to serve a cluster of suburbs to ensure the long term viability of the centre;
- an integrated cycling route network should be created within and between communities consistent with national standards;
- the open space system should form a continuous web of spaces that contains a sequence of destinations (eg. centres, schools, parks, community facilities, ovals, ponds, hilltop lookouts);
- the road hierarchy should be clearly legible and provide good and safe access to all users and encourage high levels of public transport usage;
- water sensitive urban design should be adopted as a means of implementing the principles of sustainable urban water management; and
- Aboriginal and historic heritage place will be recognised and significant sites conserved in public open space where appropriate.

The basic arrangement of elements which defines the structure of the area incorporates a blend of spatial and social ingredients. These can be conceived as a series of "building blocks" of graduated size and complexity that includes:

- the street – a public spatial unit which connects each individual block to the rest of the city;
- the section - typically a grouping of private blocks bounded by streets, the dimensions of which affect the siting of buildings;
- cluster - a grouping of about four sections based on a notional walking radius of 200m and a pocket park;
- a precinct - a spatial planning concept based on a notional walking distance of 400m, a central neighbourhood focus (park, bus stop, community facility, possibly a "corner shop" and other mixed uses);
- the suburb - focussed on a local centre and situated at the junction of a boulevard and/or collector road; and
- the group centre - a location with shops and services serving 10,000 or more people, surrounded by higher density housing and situated at the junction of major roads.

**SECTION AND STREET**

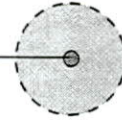
Basic residential element



**PRECINCT**

12-15 hectares  
150 dwellings  
380 people (approx)

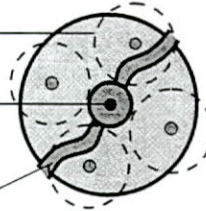
Pocket park (0.25ha approx)  
within 200m of all dwellings



**NEIGHBOURHOOD**

400m radius  
(5 min walk approx)  
50-60 hectares  
500-600 dwellings  
1500 people (approx)

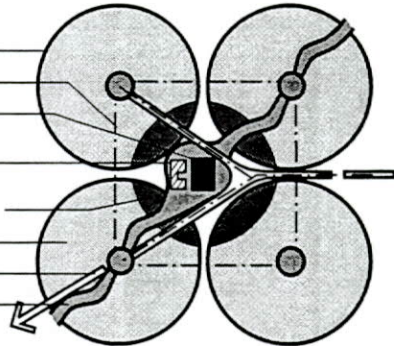
Precincts  
Neighbourhood park (1ha approx)  
Bus stop  
Possible corner shop  
Potential community facility site  
Linear open space



**SUBURB**

2-6 neighbourhoods  
100-300 hectares  
1000-3000 dwellings  
3000-5000 people (approx)

Neighbourhood  
Bus route  
Local centre  
Primary school  
Neighbourhood playing field  
Mixed use/higher residential density area  
Residential area  
Avenue  
Linear open space



**SUBURBS AND GROUP CENTRES**

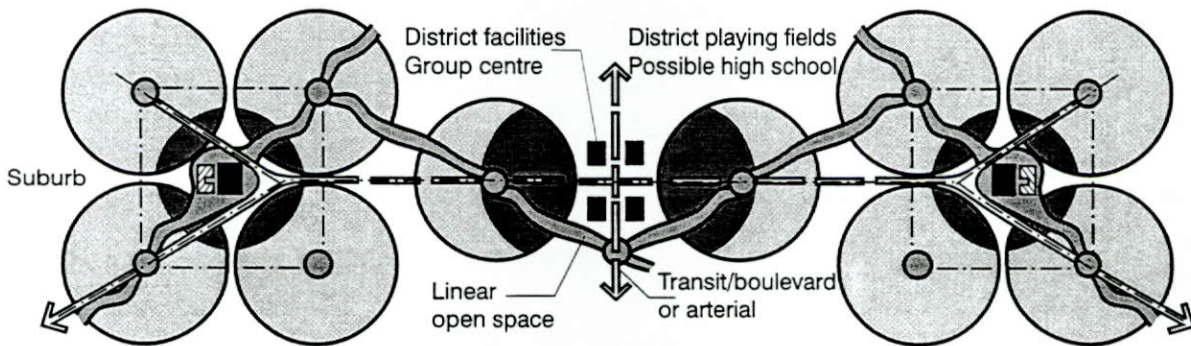


Figure 28  
**Urban structure principles**

## **9. STRUCTURE PLANNING OPTIONS**

### **9.1 Introduction**

The Structure Plan adopted the objectives outlined in the previous chapter and examined various options. These alternatives embraced three major variables:

- the extent of developable land (ie. the location of the urban/rural edge) and the conservation of woodland;
- the road network; and
- the number and distribution of schools, group and local centres.

It should be noted that each element of a Structure Plan is capable of being treated as a key variable, or determinant of an urban structure. In practice, some elements (such as the proposed open space system) were established relatively early in the process, whereas other elements require lengthy assessment based on the objectives. Broad assessment of the impacts was carried out as the Structure Plan developed.

### **9.2 Assessment of options**

Examination of the options was undertaken and their performance against clear criteria evaluated. The criteria adopted included:

- the protection of land of significant wetlands threatened communities;
- the protection of land with significant physical constraints and high visual value;
- the conservation of sites of cultural heritage significance;
- the preservation of significant landscape features;
- the integration of the transport network with the rest of Gungahlin and the metropolitan network with fewer congested road links;
- the ability to maximise exchange and to minimise necessary travel, leading to lower travel costs generally in Gungahlin;
- the accessibility of residents to public transport; its efficiency, and the robustness of the network in catering for future increases in patronage;
- the accessibility to Gungahlin Town Centre and other centres and schools and other community facilities;
- the compatibility of the road network with topographic constraints;
- the robustness of the structure to deal with alternative development sequences and the efficiency of infrastructure provision;
- the ability to ensure adequate long term enrolments for schools; and
- the urban design quality of the structure in terms of legibility, responsiveness to natural site characteristics, connectivity, integration of various natural and constructed elements into a coherent urban assembly (exploiting infrastructure investment so that functional and amenity objectives are both achieved - eg. providing boulevards instead of back fenced arterial roads, watercourse parks instead of floodways).

#### **9.2.1 Extent of developable land**

Section 3 outlines the physical characteristics which in various ways act as either opportunities or constraints on future use of the land.

The most significant physical constraints are:

- hydrological properties (creek lines, seepage and springs on down slopes, intermittent watercourses, wetlands and flood plains);

- remnant native vegetation including Mulligans Flat;
- threatened species and ecological communities (eg. grasslands, woodlands, birds) for which Action Plans have been prepared;
- slopes steeper than 20% and ridge lines;
- Horse Park Drive as constructed (near Ngunnawal);
- the water supply limit (720m AHD); and
- existing schools, centres and suburbs.

The proposed extent of urbanisation closely corresponds with the current boundary on the Territory Plan, except that:

- the urban area of Casey and Forde is reduced to protect areas of yellow box – red gum grassy woodland;
- the urban area of Taylor is slightly reduced in one portion to avoid steeper land outside walking distance of the local centre; and
- the urban area is slightly increased in Jacka and Bonner along the same ridge, and slightly reduced in other places to achieve a smoother urban boundary to improve ecological management of reserve areas. (See **Figure 29**)

Overall, these areas are similar to the current Territory Plan area.

### **9.2.2 The road network**

The road network was modelled to determine traffic behaviour and performance of the network in terms of the range of transport planning criteria and general criteria. The results indicated a radial ring performed well as:

- it has superior accessibility to Gungahlin Town Centre and other centres;
- group centres are located downstream of the catchments at important intersections and local centres are located on key intersections within the suburb;
- it provides a more even distribution of traffic throughout the network;
- it provides flexibility for a variety of efficient bus routing options while providing a potential bus stop within 500m of 95% of dwellings;
- it is compatible with site topographical constraints (it has a good environmental fit) enabling roads to be constructed efficiently; and
- it provides the opportunity to integrate Horse Park Drive into the urban fabric as an urban boulevard with development frontage and high pedestrian amenity.

### **9.2.3 School distribution**

The distribution and phasing of government primary and high schools (as a major community facility) have also been carefully reviewed, leading to various locational recommendations in order to maximise accessibility, facilitate co-location and allow for different phasing sequences. Consideration of schools distribution has included investigation of the spatial planning consequences of co-locating primary schools and high schools, or government and non-government schools, compared to a more dispersed approach.

Government primary schools are currently planned to accommodate a peak enrolment of 750 students and a long term enrolment of 400-460 students. Schools are designed to accommodate the long term enrolment of 460 students and portable buildings are used to accommodate the peak enrolment period. On current household structure, this means that a primary school will serve between 1,700 and 2,200 households, the number changing as a suburb and its population ages. To ensure the long term viability of schools the aim is to locate schools so that the catchment can change or increase in area as new urban development occurs. This enables enrolments to be kept stable over time.

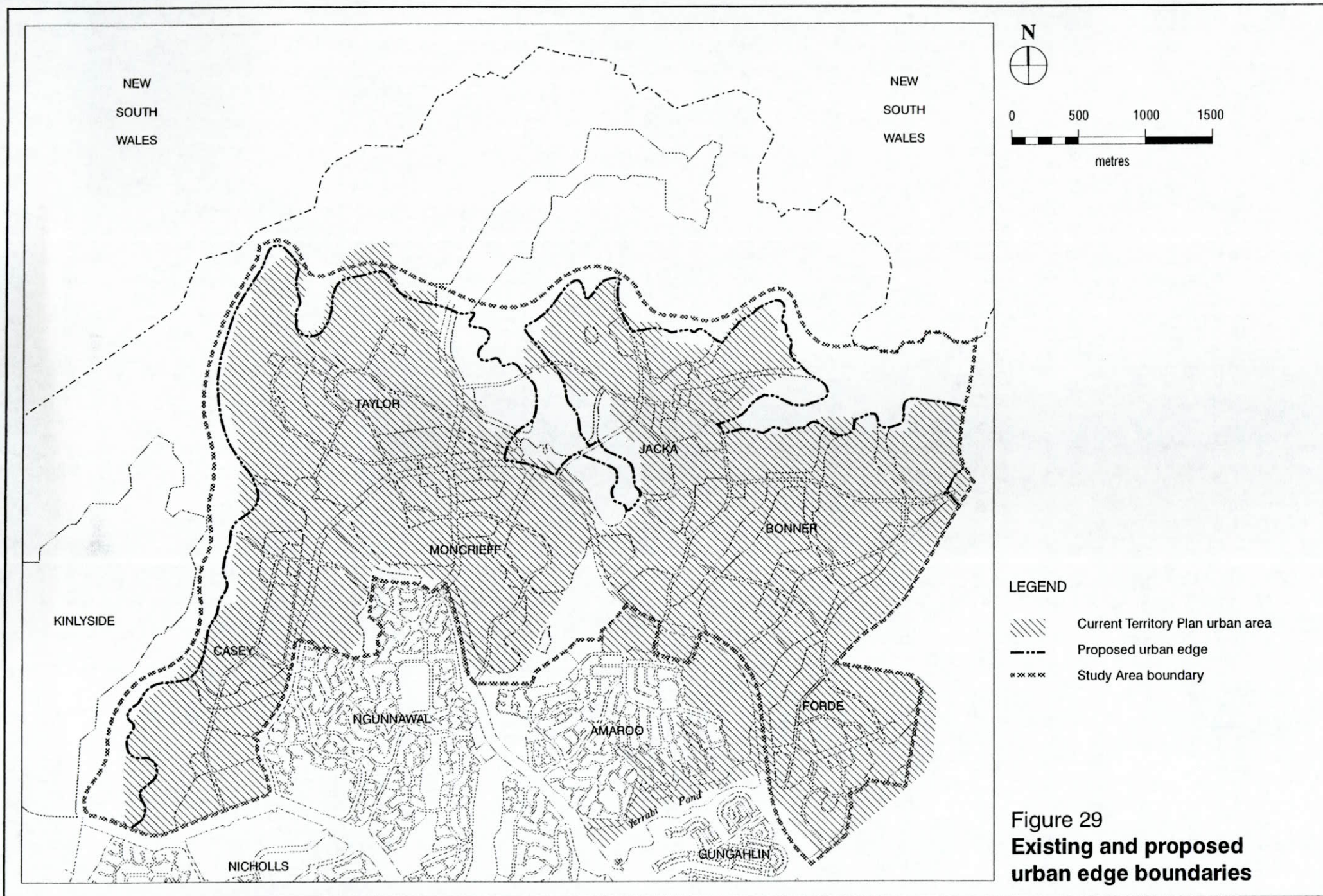


Figure 29  
**Existing and proposed urban edge boundaries**