fact sheet four
Biodiversity, Open Space and Buffers

This is the fourth in a series of fact sheets produced by the District Council of Mount Barker on Sustainable Residential Subdivision Design. Council's Development Plan identifies a number of areas within and adjacent to existing townships that are intended for residential development. A number of policies within the Development Plan require that residential development, including residential subdivisions, satisfy a range of sustainability objectives and principles.

This is one of five fact sheets, which cover the following topics:

- Site Analysis
- Energy Efficiency
- Water Sensitive Urban Design (WSUD)
- **Biodiversity, Open Space and Buffers**
- Sustainable Transport

Opportunities for biodiversity protection and enhancement

The townships within the District of Mount Barker are generally characterised by undulating land, mature trees and watercourses. Council's Development Plan requires that these and other features are preserved and enhanced where they exist on a particular development site. This will require a more site responsive approach to design, particularly with regard to retaining mature vegetation on the site (and not compromising the long term health of vegetation on adjoining sites) and integrating watercourses and stormwater management into a development concept.

This fact sheet needs to be read in conjunction with **Fact Sheet Five - Water Sensitive Urban Design (WSUD)**, particularly with regard to opportunities to integrate open space and stormwater management.

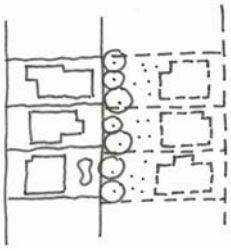
Retaining trees on site

Where a site includes trees that are to be retained, or trees are located on immediately adjacent sites and their canopies overhang or root zone projects into the subject land, then the design process needs to ensure their long term protection and health. The best way of ensuring this is to engage the services of an arborist to identify the Tree Protection Zone (TPZ) associated with a particular tree. Generally, the TPZ corresponds to the extent of the canopy (although at times it can be greater or less than this area, depending on the form and root structure of the tree).

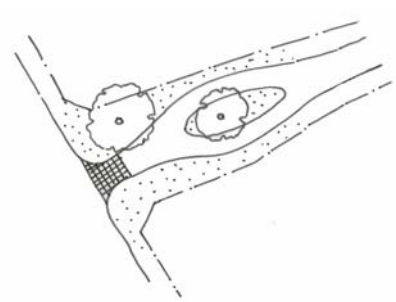
Defining the TPZ allows both the design and construction processes to take place in a manner which minimises damage to the tree. It also limits the types of activities that can occur within the TPZ (e.g. civil works, building footings, services trenching, the storage of materials or the parking of vehicles/machines) although some minimal encroachment of the TPZ is usually possible. Temporary fencing should also be installed around the TPZ during the construction phase.

Having defined the TPZ it is now possible to design the residential development adopting one or more of the following approaches:

- Locate the tree(s) within allotments ensuring that sufficient space is allowed on the allotment beyond the TPZ to accommodate a dwelling and ancillary facilities (e.g. outbuildings, vehicle access, covered pergolas, swimming pools)
- Locate the tree(s) within areas proposed as public open space (provided the location of the open space is also convenient and accessible to residents)
- Locate the tree(s) within the road reserve ensuring that civil works associated with the road construction will not compromise the health of the tree.



Create deeper/larger allotments to accommodate significant trees and dwellings



Accommodate significant trees within the road reserve

Accommodate significant trees within public open space

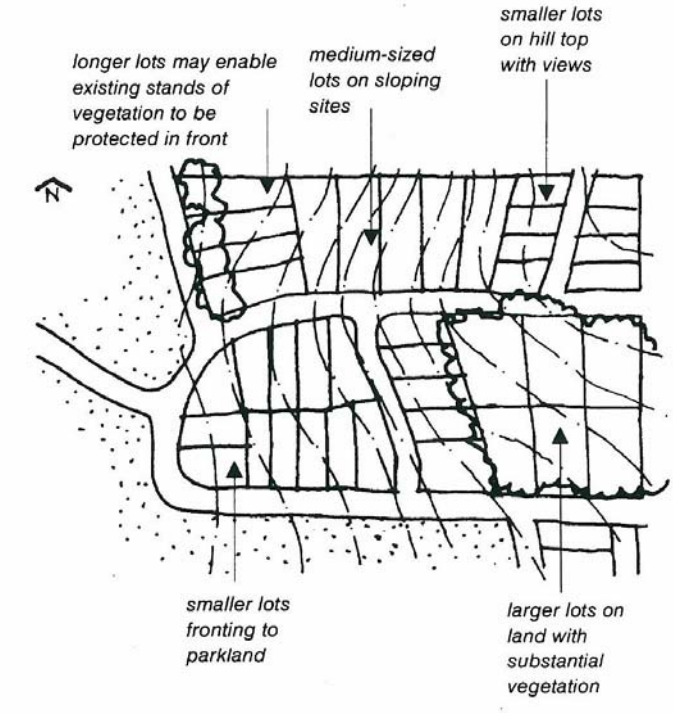
It is also desirable to retain as many trees and other types of native vegetation on the site. This is a requirement of the Development Plan and doing so will improve the amenity and marketability of residential development projects from the outset, as well as have biodiversity benefits.

Again, the best way of maximising tree retention is to either incorporate as many trees within suitably located areas of public open space or to locate the larger allotments on land with a significant number of trees, thereby ensuring that at least some of the trees will be retained and protected.

Public open space

Public open space provides opportunities for:

- Passive and active recreation
- Protection of natural features and cultural sites
- Improved amenity as a result of 'greening' of the development
- Stormwater management and buffers between incompatible land uses.



Lot size variation to suit site characteristics

Generally, when a land division proposal results in the creation of 20 allotments or more a public open space allocation of 12.5% of the site is required. Consideration of the context of the site and consultation with the Council will determine whether the full 12.5% should be provided or whether a lesser proportion and a monetary contribution would suffice.

Consideration will need to be given to:

- The size of the development and the existence and accessibility of open space in adjacent areas
- Opportunities for integration with existing areas of open space (e.g. the continuation of a linear reserve)
- Whether the retention and protection of natural assets such as trees and/or watercourses warrant the provision of public open space
- Stormwater management objectives and possible opportunities for integration.

Multiple use of drainage systems

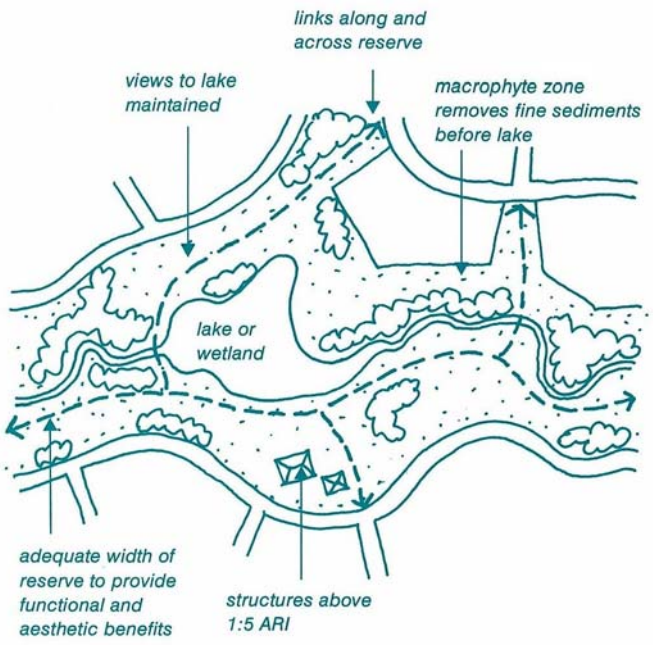
Watercourses within areas designated for urban development often support a wide diversity of habitats. Retaining and enhancing these habitats will have ecological as well as amenity benefits which, in turn, will improve the

marketability of a development project. Of course, watercourses also represent natural drainage lines and therefore will need to be considered as part of the stormwater management strategy for a development site.

The concept of multiple use of drainage systems recognises that there are benefits in considering water quality, maintenance, habitat retention and restoration, water conservation and a wider choice of recreational opportunities in an integrated fashion. Multiple use drainage systems are generally linear shaped spaces and therefore present a longer frontage to adjacent residential development than square or circular plan forms. This provides directly accessible open space to a greater number of people. Their linear nature also offer opportunities for integrating off-road pedestrian and cycle paths.

Stormwater management functions such as detention, infiltration, wetlands and Aquifer Storage and Recovery (ASR) are also able to be integrated into such systems, often without compromising their open space function. In fact, the presence of permanent water bodies, such as wetlands, can often improve the amenity and appeal of such areas.

Council's Development Plan stipulates that areas of land that are intended for the permanent retention of stormwater should not be considered as part of any open space contribution. Furthermore, where detention basins are proposed (i.e. basins that will only be inundated during peak storm events), careful consideration needs to be given to their design to ensure that they can still serve a recreational function for the majority of time and be easily maintained. This will require batters of suitable slope (i.e. generally 1 in 8 or less). Council will require a preliminary earthworks plan incorporating the required detention capacity at the development application stage.



It is important to provide sufficient space around permanent water bodies to maximise recreational opportunities

Linear reserves can serve both recreational and stormwater management functions without compromising the quality of either

Location and size of public open space

If public open space is to be provided within a development site then its location and size needs to be considered with regard to the following:

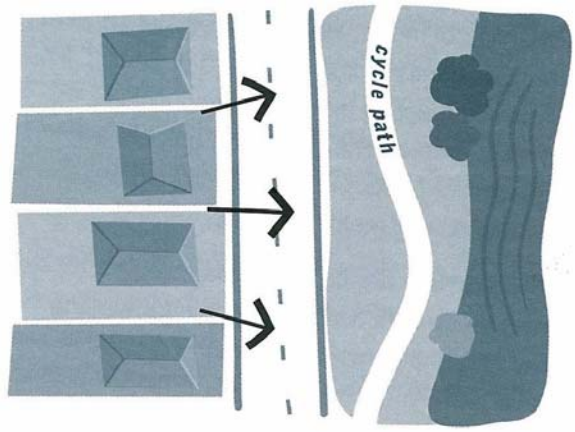
- **Accessibility** - the open space needs to be accessible to the maximum number of residents. This often means locating the open space centrally within a development area, rather than on the edges.
- **Useability** - the size, shape and slope of the open space needs to be appropriate to serve a variety of functions and recreational settings.
- **Connections** - opportunities to connect with adjoining public open space systems, such as linear reserves and off-road paths.
- **Integration** - opportunities to combine the functions of public open space with habitat retention (trees and watercourses) and stormwater management objectives.

Sometimes these can be conflicting considerations. For example, the preferred location for a detention basin may not correspond with the preferred location for public open space. Or, the existence of isolated significant trees on a development site may encourage designers to create a series of smaller 'pocket parks' encompassing the trees, which will limit their recreational value because of their small size and location. Generally preference should be given to accessibility and useability considerations referred to above. If in doubt, discuss the matter with Council officers.

Passive surveillance

The concept of passive surveillance is particularly relevant to public open space. It requires that public spaces are designed and located to be in full and direct view of residents and passing motorists. This engenders a sense of public ownership, allows for ongoing surveillance of public spaces and deters antisocial behaviour, which, in turn, encourages more use of public open space and further enhances perceptions of safety.

The simple implication for designing public open space is to maximise areas that are bound by public streets and fronted by houses, rather than being lined with side or rear fences. This not only improves the safety of public open space, it improves the value of the adjacent properties.



Locate public open space so that it is mostly bound by public streets that allow passive surveillance from houses and by passing motorists
(Source: Planning Guidelines for Walking and Cycling, New South Wales Government, 2004)

In the limited circumstances where allotments are to directly abut areas of public open space, then consideration should be given to locating two storey housing forms on such allotments (to allow some form of passive surveillance from the second storey) and special attention will be required to the design and materials of fencing.

Buffers

A number of residential development sites within the District abut non-residential areas such as Industry or Rural Zones. The Development Plan requires that in such circumstances the residential development needs to be designed and developed to minimise any potential adverse impacts. Importantly, this also means ensuring that the future residential development will not prejudice existing or future non-residential activities in adjoining zones.

There are a variety of ways of minimising potential impacts from adjoining areas. These include one or a combination of the following:

- Creating larger (deeper) allotments adjacent to the boundary of adjoining sites to enable a sufficient setback of the dwelling and private open space
- Locating a road between the proposed dwellings and the adjoining site
- Locating a suitably designed and dimensioned landscape buffer and/or berm/barrier between the dwellings and adjoining site
- Incorporating noise attenuation measures within the proposed dwellings (subject to noise being the only potential impact of concern)
- Orientating the dwellings and internal living spaces (particularly bedrooms) away from the adjoining site.

A specific requirement of the Development Plan is that, where allotments are proposed to abut boundaries of certain zones[1], allotments must be of sufficient dimensions to allow a minimum dwelling setback of 40 metres from the adjacent zone boundary.

The site analysis, the particular site characteristics and the nature of the adjoining development and potential impacts will determine the most appropriate method to adopt. It will also be necessary to refer to the Concept Plans for certain development sites contained within Council's Development Plan, which sometimes identify a preferred method for attenuation.

If a development site abuts rural areas that are used for intensive or dry land farming purposes then the range of potential impacts will include noise (machinery, bird scaring devices), dust, odours, spray drift and night time activity. It's also worth considering that, while incorporating noise attenuation measures within the dwelling (double or laminated glazing, acoustic seals, the use of ceiling, roofing and wall materials with appropriate acoustic qualities) may effectively address internal noise impacts, it will not address noise impacts on outdoor private open space.

Buffers in the form of vegetated berms combined with setbacks can still accommodate community infrastructure such as roads and pedestrian / bicycle paths

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[1] Industrial/Commercial Zone, Industry Zone, Industry (Kanmantoo) Zone, Landscape Zone, Rural Watershed Protection Zone, Rural (Mount Barker) Zone, or Rural (Kanmantoo and Kondoparinga) Zone.