

**Mirvac Fini: Burswood Lakes
Children's Guidelines Working Paper**



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ABN 91 093 334 028

Working Paper 6:
*Guidelines for Children
in the Outdoor
Residential Environment*

Mirvac Fini
Burswood Lakes

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6 January 2003

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1.0 INTRODUCTION

*"Children are the future being shaped in the present."
(David Engwicht, 1999:37)*

*"We do not inherit the Earth from our parents; we borrow it from our children."
(Native American saying as quoted by the *New Internationalist*)*

*"Youth comprise nearly 30 percent of the world's population. The involvement of today's youth in environment and development decision-making and in the implementation of programmes is critical to the long-term success of Agenda 21."
(United Nations, 1992)*

This *Working Paper* provides a set of guidelines for the design of the outdoor environments at Burswood Lakes to accommodate the needs of children in the 'middle childhood' age range (ages five to twelve) they have been designed to assist Mirvac Fini and its consultants in the preparation of the landscape Master Plan for this site.

Children will be the adults and leaders of tomorrow. They have to get involved in discussions and future planning as authentic participants. Chapter 25 of the Agenda 21 endorsed at the Earth Summit in Rio de Janeiro in 1992, reminds us that:

The relationship between children and the natural and built environment is a reciprocal one. As a communicating medium, the natural and built environment plays an important role in encouraging children's understanding of social values. In communities where their voices are listened to and valued, children are empowered to become significant contributors and participants in shaping the environments which in turn shape them.

The diversity of the city or urban environment can be used as a learning ground for children in relation to ecological values. As we create environments which are sustainable and which communicate that sustainability is important, we educate children (and adults) to value sustainability. Valuing sustainability, including the principle of intergenerational equity, also communicates to children that we value them and their futures. Because the whole Burswood Lakes site is designed as a model of sustainability, it is important that the ecological merits of the site be clearly communicated to its younger users.

Play has been called "the work of childhood". It is a significant shaper of adult intelligence, values and self-sufficiency. Play is children's way of discovering their social and natural environments and a world beyond their families. They learn that they are able to function on their own, which helps them to build up feelings of self-confidence and self-esteem. The experience, with its social and natural diversity, teaches children to respect and accept difference. They learn to perceive, use and value the environment and these activities can encourage and support their development as individuals and responsible citizens within the community.

All residential environments need to be designed with the needs of playing children in mind. In higher and medium-density housing developments such as Burswood Lakes, where dwellings and yards are smaller, the pressure on the outdoor public realm is increased. Play opportunities are often restricted in yards or courtyards and some dwellings may only have small balconies. Therefore, play opportunities close to small dwellings for children must be very carefully designed and appropriately furnished. Some families will have access to only one car and some may choose to have no car to take advantage of the transit features of Burswood Lakes. For those households, access to play opportunities close to home is likely to have even more importance.

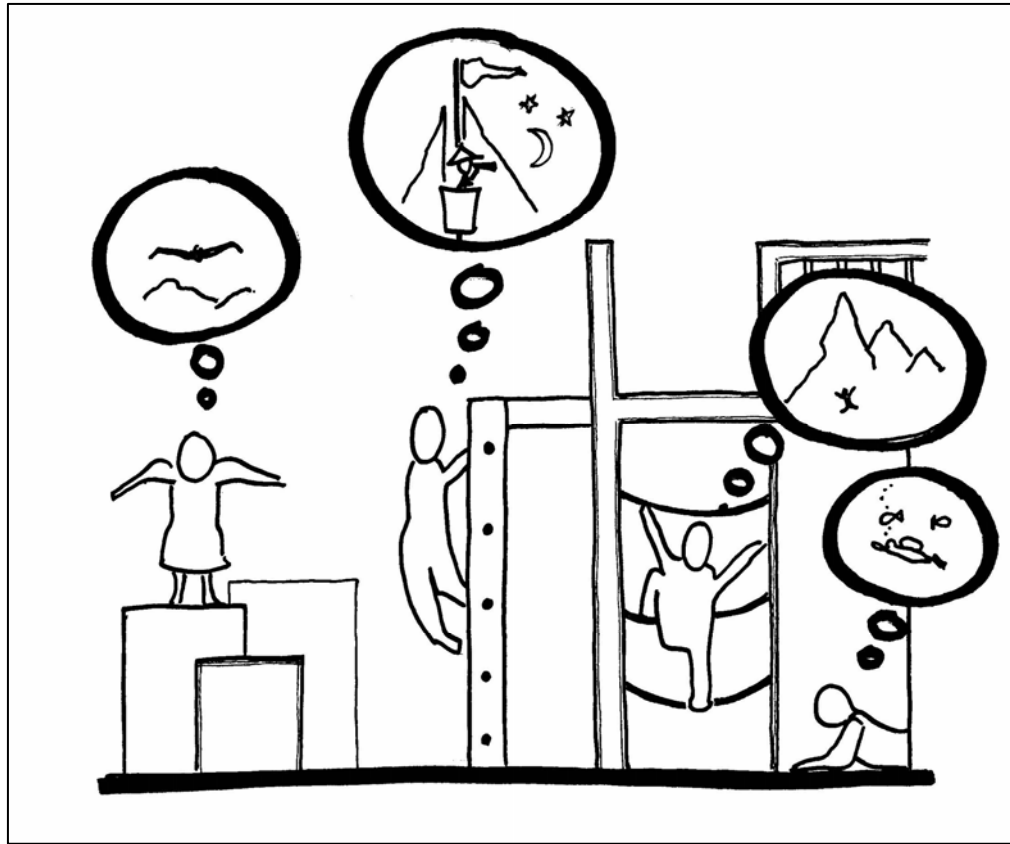


Figure 1: Play has been called “the work of childhood”

2.0 OBJECTIVES OF OUTDOOR ENVIRONMENTS FOR CHILDREN

While children enjoy playing in a variety of spaces in the public realm, their learning and development can be significantly enhanced if attention is paid to their particular needs in the design of the public realm. The following general objectives should be considered:

FUNCTION

- responds to the physical, social, cognitive, creative and individualistic aspects of play of all users (see Figure 2);
- safe; and
- self-motivating; it should not depend on paid supervision to function effectively.

QUALITY

- varied and diverse, offering a combination of soft and hard areas and natural and built elements for the user to explore, discover and manipulate.

ORGANISATION

- organised to provide non-conflicting areas for the physical, social, cognitive, creative, and individualistic aspects of play; and
- stresses self-choice rather than compulsion in the use of facilities.

ACCESS

- conveniently accessible from adjacent interior and exterior areas;
- accessible to all children, within walking distance at the neighbourhood scale;
- accessible for year-round activity; and
- accessible for emergency access and use of maintenance equipment.

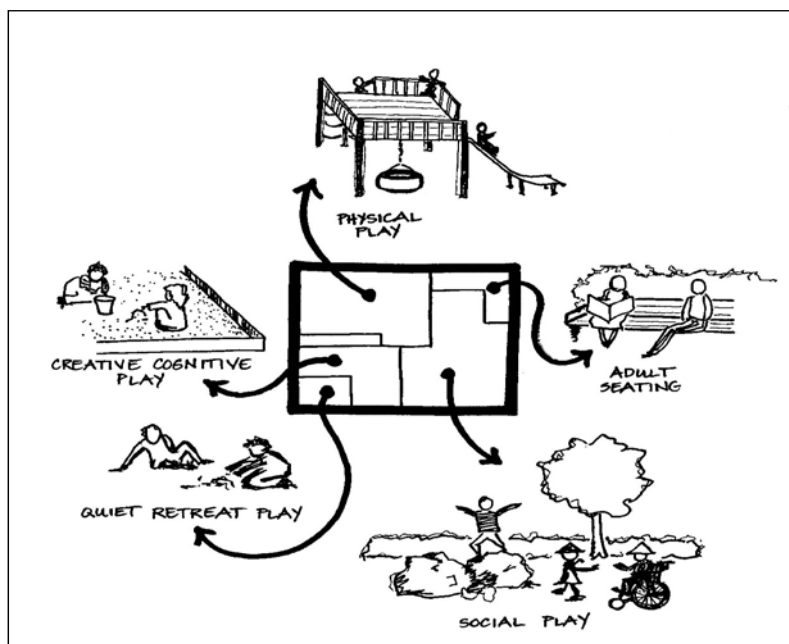


Figure 2: Play serves many functions in child development

3.0 SPACES TO PLAY

3.1 ATTRACTIVE PLAY SPACES

It is important to provide attractive, safe landscaped areas which are more interesting for play than surrounding roads or parking areas. Therefore:

- Ensure that communal landscaped areas are:
 - Easily accessible from dwellings and associated private yards;
 - Within sight and calling distance of kitchens or other focal activity areas within dwellings;
 - Provided with a variety of play equipment appropriate to the ages of resident children;
 - Provided with wide, hard-surfaced paths; and
 - Located on direct routes to schools and other off-site facilities;
- Ensure that spaces are large enough to minimise conflict between groups of children or between children and adults.

3.2 COMFORTABLE SPACE DIMENSIONS

Landscaped spaces of comfortable dimensions will be more likely to be used (and not abused) by children, as well as adults. Therefore:

- Where smaller open spaces are provided, try to make them square or nearly square;
- Avoid large courtyards; rather provide intimate sub-spaces (ideal dimensions of open space: 30-60 metres on each side);
- Work with a ratio of building height to open space of 1:3 or 1:5; as tight as 1:2 with careful landscaping;
- Use landscaping to increase the feeling of privacy (but avoid creating security problems);
- Consider providing a series of connected, medium-sized open spaces, rather than one large or several identical spaces.

3.3 DIVERSITY OF PLAY SPACES

As children greatly value interesting places full of surprises, ensure that the outdoor environment provides that excitement, while still being safe for children and others. Therefore:

- Provide a variety of play environments at different and appropriate locations, including informal and natural play areas. No one location is sufficient;
- Provide multiple levels of activities, from passive games to active sports, including:
 - a multi-level activity maze;
 - activities that provide sensory stimulation;
 - textures and tactile play;

- play involving body movement —swinging, rocking, climbing, sliding, crawling and jumping;
- balancing and walking activities;
- water play;
- sand play;
- passive play and interesting rest areas;
- grassy areas and nature areas; and
- modified group sports and other group activities;



Figure 3: The value of water cannot be overemphasised

- Provide a variety of spaces, surfaces, levels and plant materials;
- Provide mounding for views and rolling down slopes; and
- Ensure that the most interesting areas (e.g., hilltops and waterfronts) are kept for public use and designed to encourage safe use by children.

3.4 NATURAL PLAY

Ensure that opportunities are provided not only for the well-known types of play but also for more creative play: natural play environments where children can play with nature and build and develop and learn through doing are important. Therefore:

- Consider providing wooded areas, and watercourses for exploratory and fantasy play;
- Encourage these areas to grow as wild as possible to support animal and bird habitats and provide habitat links;
- Consider planting native plant 'communities', including indigenous bushes and wild flowers to create a maintenance-free overgrown area; and

- The value of **water** for children's play cannot be over-emphasised. Wherever possible, incorporate waterways into recreation areas. They can serve as natural drainage measures as well as excellent play areas for children. Care will need to be taken to deal sensitively with adult concerns that they are a hazard to children (See Figure 3).



Figure 4: "Trees become entire environments for children" (Clare Cooper Marcus, 2001:99)

3.5 ECOLOGICAL LEARNING

The provision of ecological play space is necessary for re-educating humanity about human-environment relationships. Figure 5 illustrates these ecological learning principles. To create opportunities and provide spaces for environmental education in the home and residential area:

- Provide space for community gardens and nurseries;
- Through the Community Development Officer (CDO) engage residents in planting schemes;
- Educate children about the practical value of landscaping and the protection of natural flora and fauna; and
- Within local parks, provide both running and still water, and habitats for aquatic animals, mammals, reptiles and insect life. Along with ecologically based landscaping, they are the ingredients of the natural adventure playground.

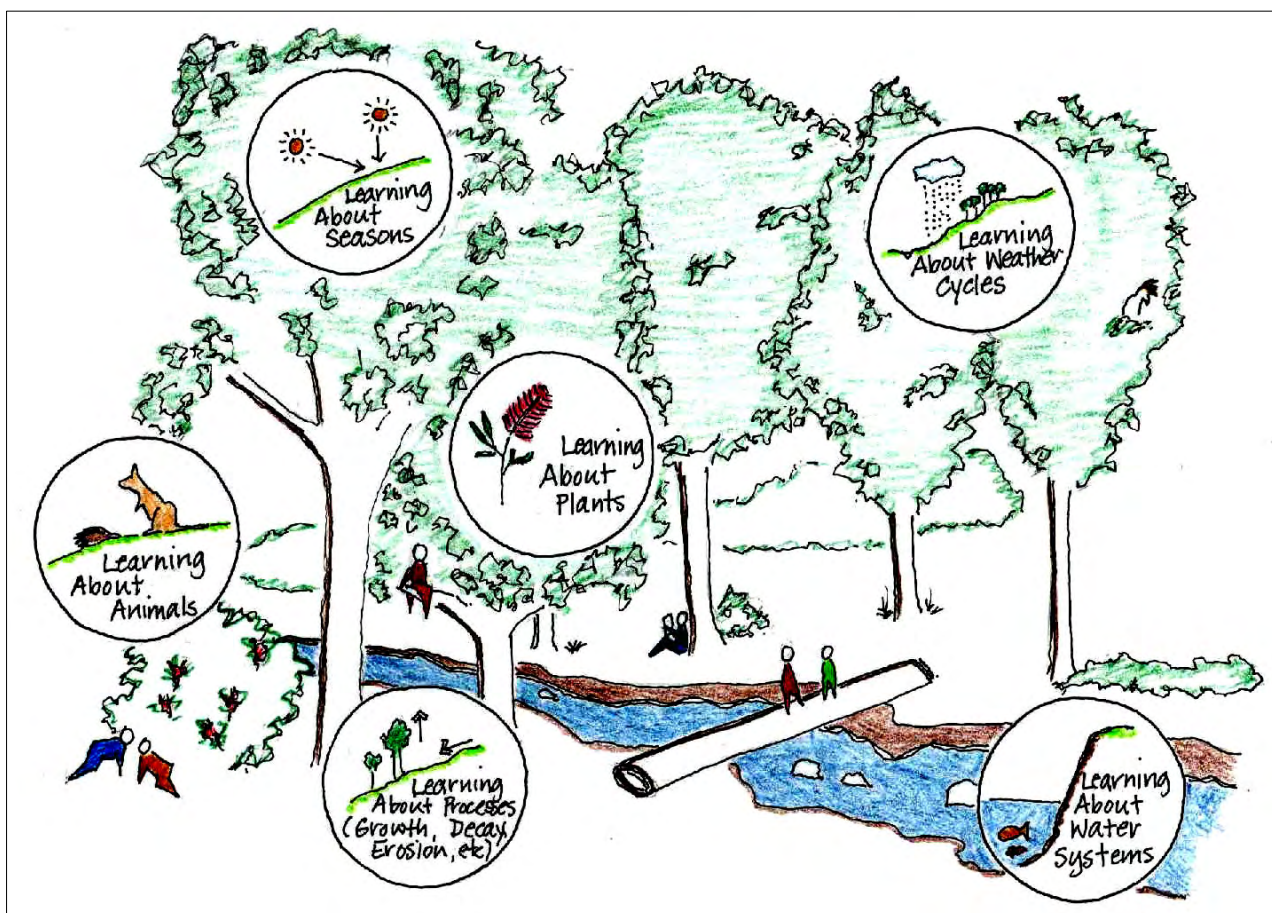


Figure 5: Ecological Learning

3.6 LEFTOVER SPACES

“A first step is to recognise people’s strong need for nature, which may be a very deep emotion: the need for something green and wild or a place to go for sanctuary or solitude, a place to experience ‘wilderness’ in the city.”

(Elkin and McLaren with Hillman, 1991:245)

Because children love to play creatively in wild or leftover places, try to leave part of the site undeveloped at least until all residents have moved in. Therefore:

- Retain the most attractive and stimulating natural portion of the site for a creative play area; and
- During construction periods, consider whether it is really necessary to fence off all undeveloped property, which can provide exciting temporary play opportunities for children.

3.7 TOPOGRAPHY

Level changes are valuable assets if creatively incorporated into the design of play environments. Topography should be accommodated and taken advantage of in the design of play opportunities. A conflict may arise between mounding for privacy and screening and the need for creating a variety of levels for play opportunities (especially for children with a disability) on the one hand, and problems of blocking natural surveillance from surrounding dwellings on the other. It is most important that play areas for small children be within sight and calling distance of as many dwellings as possible. Thus:

- Consider using mounds to increase the accessibility of play equipment (especially slippery dips) for children with a disability (see Figure 6); and
- Take into account surveillance from adjacent dwellings when using mounding to define children’s play areas.



Figure 6: An accessible slide

3.8 DESIGN FOR THE SENSES

“The first intriguing feature... is a cluster of child-height posts... powered by tiny solar panels and emitting sounds of birds, bells, whales, distant drums and waves crashing.... Children (and adults) stop in surprise, wondering where the sounds are coming from and how they can get them to start again. Just beyond the sound posts is a bed of soft ornamental grass, and few can resist sweeping their hands through the waving foliage. Round a bend, and one comes on a series of hollow wooden pipes forming a xylophone. Through a gap in the bamboo is... a set of nine individual foot sized panels set into the pathway. As each is stepped on, a different note sounds; with some ingenuity, children soon learn to make chords and tunes.”

(Description of the Music and Movement Garden in the Diana, Princess of Wales Memorial Playground in London. Cooper Marcus, 2001:85)



Figure 7: Interactive sound play in Victoria

To create environments for the senses:

- Create an environment rich in scent, sound, sight and texture;
- Select flowering shrubs and trees that change colour with the seasons. This will be appreciated by adult residents as well;
- Consider planting a 'senses garden' with a high percentage of perfumed plants;
- Use plants and flowers to attract insects and birds that will make a variety of sounds;
- Design for auditory features such as wind chimes, rustling branches or falling water;
- Use media such as grass, sand, bark, plants, buildings, community art sculptures, water features, gravel, street planting, etc. to provide a rich variety of tactile stimulation; and
- Consider incorporating 'sound garden' features such as those described above (see Figure 7).

3.9 RISK, CHALLENGE, ADVENTURE AND EXCITEMENT

Create an environment that channels children's play without the need for excessive rules and regulations. To create an atmosphere of freedom / unrestricted setting:

- Ensure that as much of the site as possible is available for play;
- Avoid creating spaces which are exclusively the domain of one group, thereby requiring regulations;
- Avoid 'keep-off' landscaping (thorns, etc.) in areas which could be used for play; and
- Avoid areas which are fenced for no apparent purpose.

4.0 COMMUNITY ENVIRONMENTS FOR PLAY

4.1 NURTURING A SENSE OF PLACE

In *11 Steps to Place*, Project for Public Spaces Inc. (2000) makes an important distinction between 'place' and 'space'. They elaborate how physical elements, such as seating and landscaping, make people feel welcome and comfortable or how activity-generating pedestrian circulation patterns create a lively atmosphere.

To nurture a community which gives children a sense of place:

- Encourage positive social interactions for healthy socio-emotional development of children and a community atmosphere. This work can be undertaken as part of a community development project by the CDO;
- Design playgrounds to encourage community involvement in playgrounds and play;

- Form partnerships with community groups which support children, such as schools, museums, sports clubs, or even local shops;
- Communicate that children are valued members of the community by taking their convenience into account in all planning and design decisions;
- Have a vision for the residential area that is informed by children and the new residents and is flexible and open to change;
- Experiment and refine simple, short-term improvements (such as public art installations, outdoor cafes and community gardens) which will generate an active and playful atmosphere and enhance the sense of place;
- Recognise the real costs and benefits of investing in places for children within their physical environment and their community; and
- Communicate that children's needs are important through avoiding using signs with negative messages (e.g., 'no ball playing').

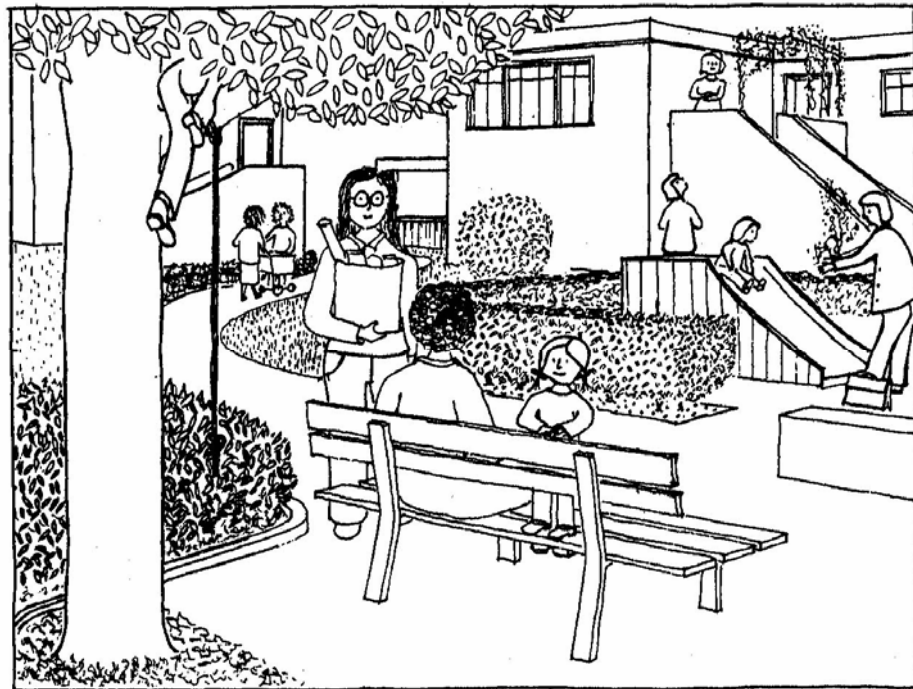


Figure 8: Spontaneous social encounters and intergenerational interaction

4.2 ENCOURAGING INTER-GENERATIONAL INTERACTION

Communal, shared and public playspaces are not only important for children's development, they also encourage social interaction among adult caregivers, and across generations, enhancing community interaction and social capital¹ (see Figure 8). It is essential that these

¹ "Social Capital refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit." (Putnam, 2001)

spaces acknowledge both the requirements of children and those of the wider community so that they can be utilised.

To provide opportunities for children to interact with older siblings, adults and others:

- Provide spaces which encourage spontaneous (unplanned) interactions;
- Provide sitting and play spaces for all ages to be involved with children;
- Provide appropriate facilities for children and supervising adults; and
- Ensure that play equipment is within view of adult seating areas.

4.3 CREATING COMMUNITY SPACES

To encourage community interaction and neighbourliness, and ensure that the common space or territory of dwellings provides a safe and easily surveyable play space, especially for smaller children:

- Always plan for the provision of common space or shared spaces which belong to a group of units;
- In cluster configurations, provide outdoor communal spaces which are totally or partly enclosed by dwellings and can be seen directly from windows of activity rooms (kitchens, living rooms, dining rooms) of those dwellings (see Figure 10);
- Ensure that each common or shared area is clearly the territory of a specific group of dwellings;
- Provide access to common open space, either directly from the dwelling or via ground-level private open space;
- Design common open spaces which are roughly square or rectangular to enable supervision of children at play;
- Locate pedestrian ways so that adults will walk through common landscaped areas en route to on-site or off-site destinations. Do not locate routes so that pedestrian traffic will interrupt play or where it is likely that children playing will harass adult pedestrians (particularly older people) (see Figure 9);

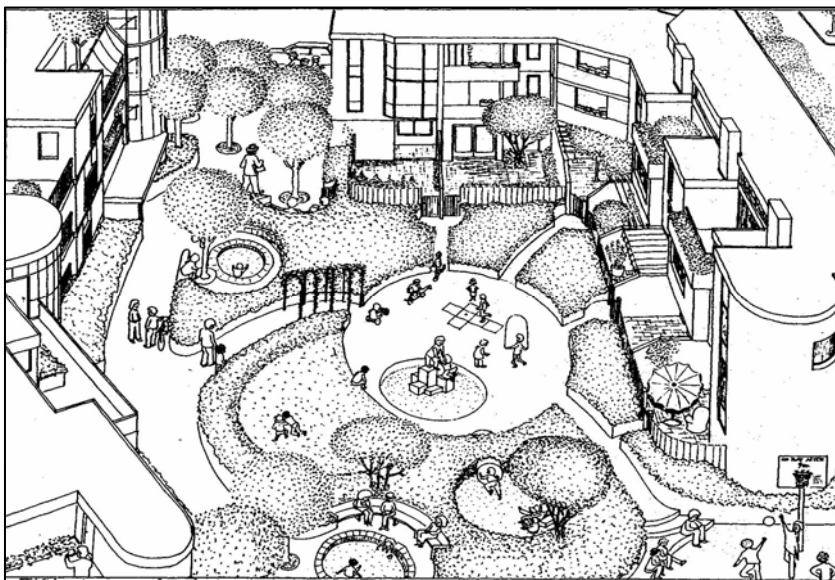


Figure 9: Running the Gauntlet: there are several situations in this scene where residents might feel they are violating the territory of a particular user group by passing along certain pathways

- Where possible at ground level, design walls of dwellings facing common open spaces, cul-de-sacs and pathways to have no windows, small or high-level windows or windows with double-glazing to reduce noise problems; and
- Separate play areas from adjacent dwellings by means of landscaping, fencing, earth mounding or distance, while still permitting some surveillance of play areas from surrounding dwellings (see Cooper Marcus and Sarkissian, 1986).

4.4 FRONT YARD PLAYSPACE

Small children and their parents or caregivers greatly value opportunities for informal social contact via the front yard. Where front fences are not permitted, children and parents are required to limit socialising to the back yard unless adequate play areas are provided close to home or a car is available. This limits choice. Lack of a front fence may also result in some younger children (particularly girls) being kept indoors, especially in the case of more traditional families.

Therefore, it is important to:

- Provide for front fences to enhance front yard playspaces for children and their caregivers;
- Consider limiting fence height to 900 mm. in higher density developments where fences may create the sense of overcrowding;
- Provide options for cut-out and see-through fences which are still secure enough to protect a small child from wandering into the street.

4.5 PRIVATE/PUBLIC SPACE BOUNDARY

So that children can clearly determine which property is private and therefore not for everyone's use, ensure that boundaries between private and common open space are clearly defined (see Figure 10):

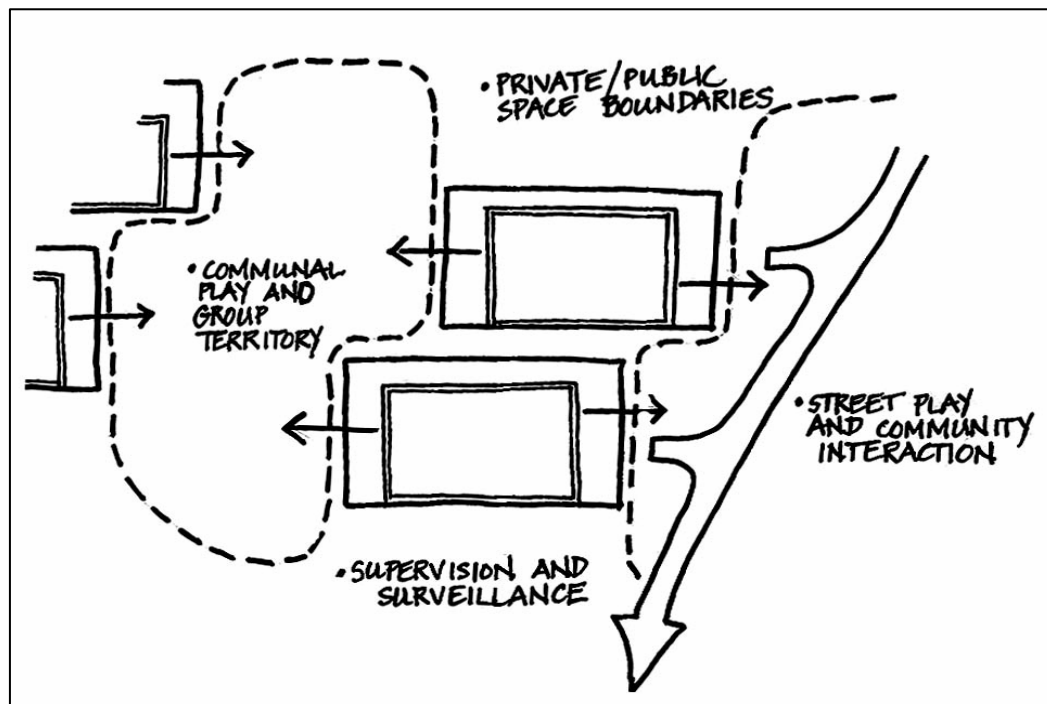


Figure 10: Public/private space boundaries and communal play space

- Use fencing, even if it is primarily symbolic, to delineate boundaries.
- Locate and buffer paths with landscaping so that they do not violate the privacy of dwellings and private yards.

4.6 PUBLIC PLAYSPACE

Design of public open space must consider its users and acknowledge the reality that public space is a gathering place for children and others. Suggestions include:

- Locate play areas for children in areas under constant natural surveillance.
- Using lighting as a design tool and light safety zones, not simply paths.
- Providing at least two ways of entering and exiting park spaces.
- Using building types which provide opportunities to overlook other spaces and encourage natural surveillance or 'eyes on the park'. Issues related to community safety are addressed in Working Papers 4 and 5.

4.7 EFFECTIVE PARKS

Research reveals a number of precise characteristics of successful and well-used parks. These characteristics are reflected in the following guidelines (City of Toronto, 1990):

- Create a strong park identity with easily recognised and distinctive features;
- Design visible and well-marked entrances and exits;
- Plan public streets which surround and penetrate community spaces;
- Avoid isolated pockets of space;
- Provide equipment and layouts which are appropriate to user's needs, in particular, the needs of children;
- Develop a set of strategies to minimise vandalism;
- Provide a clear distinction between public and private realms;
- Create a unique attraction in the park which will draw users to the space; and
- Maintain a high maintenance level, which indicates that maintenance staff and local residents care about the space.

4.8 CAREGIVERS AND SUPERVISORS

Both children and adults value a residential environment that is safe, easy to supervise, conducive to making friends and which elicits creative behaviour on the part of the child. While we hope that appropriate planning and design of Burswood Lakes will encourage children's independence in moving around the site, adults' preferences must also be accommodated. To accommodate the requirements of adult caregivers in common, shared or public playspaces:

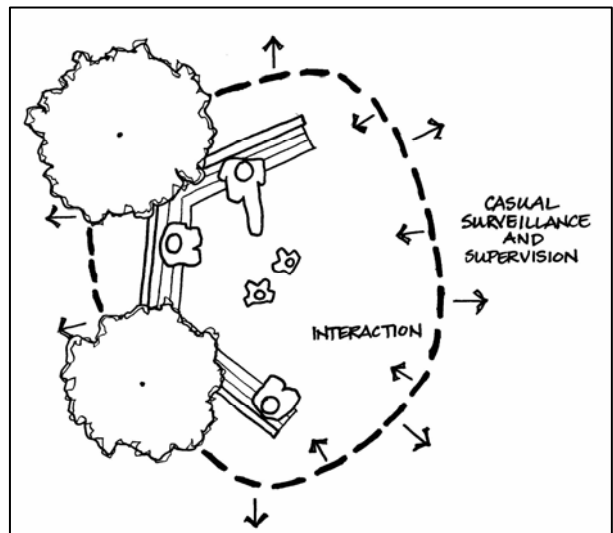


Figure 11: Conversational Seating

- Locate benches on walking circuit routes so that supervising adults can have casual social encounters with other adults who may be walking or running in the open space.
- Group seating for conversations among supervising adults (see Figure 11).
- Ensure that seating is sheltered from wind, rain and direct sunlight.
- Select deciduous trees so that shade is available in summer but light reaches seating areas during winter months.
- Position benches so that adults are able to see a wide area (and play opportunities for children of different ages) from a seated position.
- Design benches to accommodate the needs of older people, people with a disability and pregnant women. In particular, site them a minimum of 450 mm. high and ensure that they have armrests and straight backs.

4.9 NATURAL SURVEILLANCE

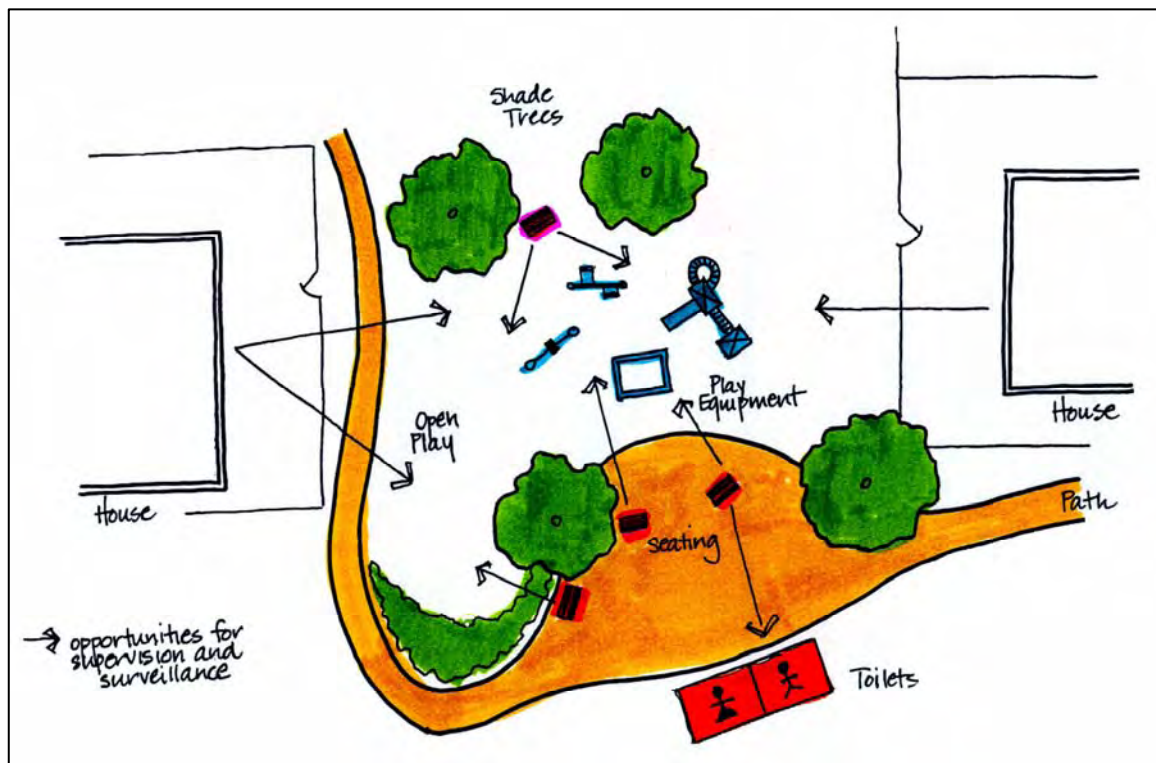


Figure 12: Natural surveillance of a public play space

4.9.1 NEIGHBOURLY SURVEILLANCE

The potential of “eyes on the street” or natural surveillance of places which children will use, will greatly increase the perceived safety of the place and encourage greater use. While there are limitations to the effectiveness of surveillance, in general, the more windows of activity rooms in dwellings directly overlooking a space, the safer it will feel to children and caregivers. Thus:

- Without violating the privacy of any dwelling, locate windows of activity rooms and orient entries to maximise natural surveillance of the site;

- Design dwelling-siting policies to permit higher fences (say 1800 mm.) for dwellings which have sides on courts or pathways;
- Where privacy needs to be protected more than natural surveillance provided, encourage dwelling designs which have windowless walls, carports or garages, or windows of rooms such as bathrooms and laundries on the side adjacent to the open space.
- Ensure that visual surveillance is provided by other adjacent dwellings whose property does not directly abut the open space (see Figure 12); and
- Pay particular attention to the landscaping and lighting of these spaces to reduce graffiti to fences and keep play away from fences. This can be done by 'keep-off' planting or 'greenscreens', which are not high enough to hide intruders but provide a buffer to keep playing children away from the fence. Good lighting is essential, especially where visual surveillance of cul-de-sacs is reduced in efforts to protect dwelling privacy.

4.9.2 YARD SURVEILLANCE

To ensure that the enclosure of private open space will not prevent natural surveillance:

- Fence private open space so that surveillance into and out of the space is enhanced without infringing too greatly on dwelling privacy;
- Use 'cut-out' fencing (which residents can add to) with open slats above, say, waist height;
- Locate private yards away from public spaces or shield them by use of building forms or adjoining private yards;
- Recommended back fence height: 1800 mm;
- Choose landscaping carefully so as not to impede visibility. Select trees with high canopies or low level shrubs which are too small for a person to conceal themselves;
- Avoid strict separation of land that may result in the isolation of some buildings or spaces;
- Ensure that any spaces which may be used by vulnerable groups (such as children) and may attract inappropriate behaviour (because of isolation from or closeness to any activity) are in locations with the maximum opportunities for surveillance;
- Establish clear sightlines through the sensitive location of buildings and other site features;
- Avoid obstructive landscaping design features (berms (mounds), walls, grade changes etc.); and
- Select perimeter fencing which is optically permeable. Choose fencing colour with care. Light colours reflect light toward the observer and restrict visual penetration. While light colours provide good privacy protection, dark colours are best for surveillance from the street.

4.9.3 DWELLING FRONTS TO THE STREET

Research revealed problems with street patterns which have dwellings backing onto arterial roads. Both children and adults express concern for their safety on streets lined by 1800 mm back fences. Therefore:

- Wherever possible, design road patterns and dwelling-siting policies so that dwellings face streets and windows of activity rooms overlook streets, pedestrian circulation routes and children's play spaces; and
- Where this is not possible, pay particular attention to landscaping, lighting and sightlines to reduce crime and fear of crime.

5.0 LINKS TO THE NEIGHBOURHOOD

5.1 HIERARCHY OF PLAY SPACES

Children's play is a process of integration into the adult world and the radius of a child's activities expands as self-reliance develops. Careful site planning and design can support this development. Particularly younger members of the 5 to 12 age group value this, because of their more limited territorial range. As children are the greatest users of outdoor spaces and will literally play anywhere, the outdoor environment must be designed to cater for this. Some place structuring of activities is necessary, however, to protect the environment and places for adult use (See figure 13).

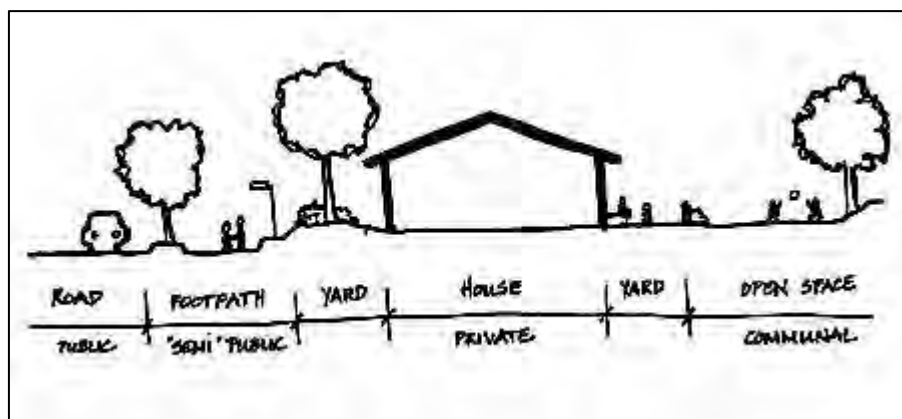


Figure 13: Hierarchy of Play Spaces

Therefore:

- Provide a hierarchy of play spaces for children of all ages to explore at increasing boundaries.

5.2 PLAYING CLOSE TO HOME

The realm of the home and areas immediately adjacent to it are essential for children's play, especially for girls and younger children. The territory outside the front door is the place where children make contact with their friends and begin to participate in the action of street and community life. There is a need for a balance between private play space for children and opportunities for adults to supervise, especially in the case of small children.

To allow for sensitive supervised playing close-to-home:

- Ensure that play spaces are close to dwellings;
- Provide enclosed areas such as a front porch for toddlers' 'doorstep play';
- Locate play spaces close to frequently used pathways;

- Provide a variety of play opportunities convenient to home via a safe and interesting route; and
- Locate parks close together as children are not likely to travel by foot over 700m to a play destination.



Figure 14: Doorstep Play

5.3 ALL-WEATHER USE OF SPACES CLOSE TO HOME

In cold and rainy weather, it is still important that children have places to play outside away from the dwelling. Sheltered play areas (such as gazebos) can extend play opportunities and take the pressure off dwellings. Therefore:

- Provide a variety of play locales for all seasons, with some which are protected from extremes of weather;
- Pay particular attention to child (and supervising adult) comfort when designing play areas;
- Select trees with broad canopies to protect children from light rain.
- Use existing landscape and structures to mitigate strong winds; and
- Provide protection from wind by planting early and installing advanced landscaping where possible.

5.4 CHILDREN ON THE MOVE

Moving around the neighbourhood is children's most frequent outdoor activity, particularly after the age of four. To design for movement around the neighbourhood:

- Assume that children will play everywhere and will not restrict their activities to designated areas;
- Avoid obvious hazards (steep slopes, high retaining walls, poisonous or thorny plants);
- Where areas are clearly not for children's play, use boundaries, buffers and landscaping to mark those areas;

- Provide paths at least 2.4 m wide which:
 - follow an interesting circuit;
 - lead to distinct places and avoid 'dead space';
 - run adjacent to, without intruding into, distinct activity areas;
 - are rounded at corners;
 - do not have low-branching vegetation adjacent; and
 - are well-lit for evening use;
- Consider locating mounds in safe locations (possibly at the perimeter of the site) for bicycle jumping, rollerblading or skateboarding;
- Design and locate paths with moderate level changes and rest places; and
- Ensure that paths do not create conflicts between children's play and the needs of older people or people with a disability.

5.5 NETWORK OF PLAY

Footpaths and quiet streets, if thoughtfully designed, will contribute to a "network of play" by linking together all elements of a play environment system in the wider neighbourhood. This allows for greater independent mobility of children and increased social exchange for all ages. Reduction in automobile traffic directly benefits children, as they 'reclaim' the street as a playspace. (See figure 15.)

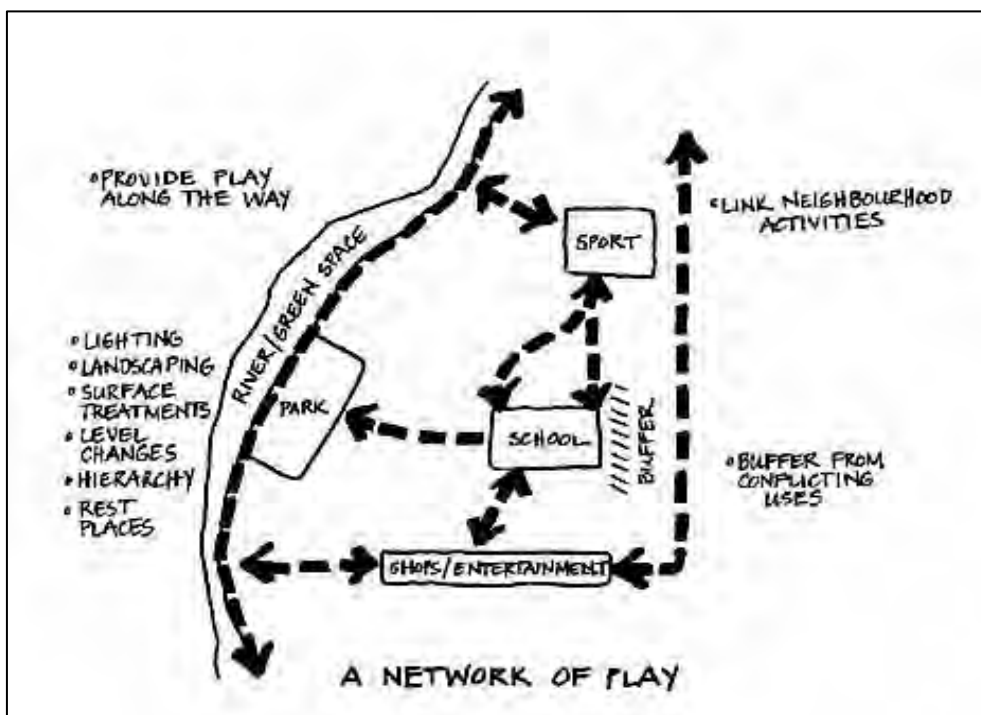


Figure 15: A Network of Play

To create a network of play:

- Link paths to and from the child's home with parks, schools and other favourite children's places, thus making for safe play opportunities along the way;

- Design footpaths and cycle paths by making them very attractive so that they will attract users and become social spaces;
- Provide continuous access via footpaths (with no dead ends or gaps in provision). This is important for all users, not just those with mobility impairments;
- At junctions, design to provide variety and change in surface treatment and conditions; and
- Strengthen lighting at intersections to highlight changes in conditions.

5.6 FOOTPATH ACTIVITIES

There is considerable evidence to support the necessity of having wide footpaths throughout a residential neighbourhood. Wide landscaped verges do not meet children's needs for hard-surface play and cannot substitute for footpaths and roads as play spaces. As children like to play on hard surfaces near home, it is important to design footpaths as part of the community space. The footpath network will not benefit children if paths are too narrow.

To encourage footpath activities:

- Provide a variety of hard-surfaced areas, including wide pathways and small areas off the circulation route;
- Where a footpath is within the site, ensure that it is wide enough for play and socialising (6-9 m.) at the widest points;
- Design dwelling entries to allow children to venture from doorstep play onto a safe circulation route as they grow older;
- Ensure direct and easy access via kerb cuts at all intersections. (Parents and children in new residential neighbourhoods complain about the lack of continuous accessibility at intersections, especially through and across roundabouts);
- Provide paths to and from the child's home and from other parks, schools and favourite children's places, thus making for safe play opportunities along the way;
- Ensure that the main footpath route is unobstructed by providing good sightlines at intersections for children on bicycles, rollerblades and skateboards;
- Ensure that footpaths are capable of natural surveillance from the activity rooms of adjacent dwellings. This may require alterations to dwelling-siting policies to incorporate crime prevention principles, as well as passive solar design and privacy considerations;
- Provide play spaces and footpaths in common or shared landscaped areas;
- Provide seating for children and adults along footpaths. Locate benches at popular street corners or at major pathway intersections. (Care should be taken to ensure that security problems do not result from these location decisions); and
- In the early stages of development, try to avoid the necessity for children to take long routes because some areas are fenced off due to construction activity.

5.7 LEGIBLE ENVIRONMENTS

Children are much smaller than adults and their vision (in particular their peripheral vision) is not well developed. As a result they often have trouble "reading" the public realm. It is important to design from the child's perspective and consider what they see to ensure their safety. Therefore, seek to:

- Provide clear hard and soft landscaping signals so that children are able to read possible dangers in the public realm;
- Ensure that the view from the perspective of the child pedestrian or cyclist is taken into account in order to eliminate 'invisible roads'; and
- Provide age-appropriate signage.

6.0 PLAY ENVIRONMENTS FOR ALL CHILDREN

6.1 DEMOGRAPHIC CONSIDERATIONS

While the populations of residential neighbourhoods do inevitably age, it is possible to estimate the characteristics of the initial populations with some accuracy. Socio-economic and ethnic characteristics of households are available, based on experience in other Fini and Mirvac Fini housing developments. It is essential that a diversity of play equipment be provided for resident children. Thus:

- Match play equipment to the socio-demographic profile of the (expected) population —at least the initial provision of play opportunities²;
- Ensure that play equipment is selected to meet the developmental needs of children and not exclusively the maintenance needs of the managing authority; and
- Provide access to and within playgrounds for parents/caregivers and children with a disability (this will be much less expensive than altering it in the future).

6.2 ALL AGES CAN PLAY

Where a number of play areas are provided, some should appeal to young and some to older children. They should not, however, be so specialised that they appeal to only one age group. If appropriate recreation spaces are not also provided for young people (over the age of 12), they may misuse and damage play structures and dominate areas designed for younger children. They may also intimidate younger children. Therefore:

- Design play areas in zones appropriate to children's age and development;
- Place age-specific play areas within view of each other so that older siblings can supervise younger ones (see Figure 16);
- Provide identifiable meeting places for each age group;
- Ensure that younger children are not bullied or 'run over' by the activities of older children; and
- Segregate meaningful play activities for 2 to 5 year olds from meaningful play activities for 5 to 12 year olds.

² This also applies to residential developments marketed to older people (aged 50-plus), as recent research has revealed that a very high proportion of older people now have regular care responsibilities for the care of grandchildren. In Queensland in 1995, for example, one person in every eight aged 50-59 reported this responsibility in an ABS survey. For those Queenslanders in the 60-69-age bracket, an even higher proportion of people were caring for grandchildren: one person in six (ABS statistics). There is no reason to expect that these proportions do not apply to Perth.

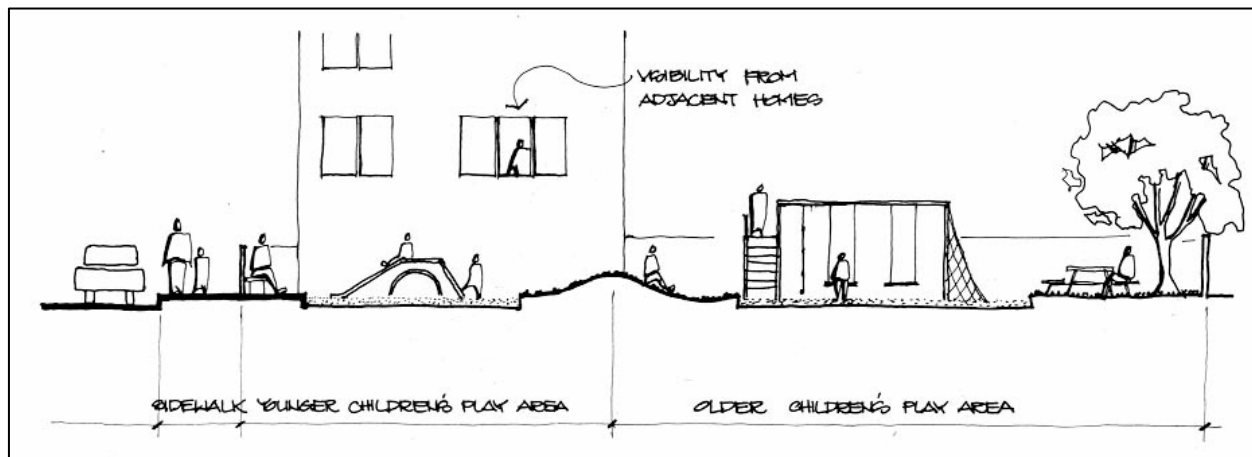


Figure 16: If a residential park is large enough for two play areas, locate the one for younger children nearer the entrance (source: Cooper Marcus and Francis, 1998:159)

6.3 GENDER ISSUES

Children aged between eight and twelve are an adventurous group but they have short play ranges. Gender differences in play patterns need to be accommodated, as girls play significantly closer to home than do boys. Therefore:

- Provide an adequate range of play opportunities (for girls and younger children) within sight and calling distance of home (no more than 200 metres);
- In general, provide more small-sized and intimate spaces for solitary play (away from the action) and the more social play of girls in groups;
- Ensure that there is adequate provision for the more active play of boys so that they do not dominate those spaces as well;
- Males tend to dominate outdoor play and older boys and teenagers will dominate the most attractive play areas and parts of green space. Girls play less often in parks than boys do. Therefore, provide an alternative to parks for play by girls; and
- Consult local people from culturally diverse communities (and their advocates) regarding the location and design of play opportunities to ensure that they provide equal access for girls and the specific needs of different cultural groups. This can be facilitated by the CDO.



Figure 17: Ensure that quiet and private play is catered for

6.4 DESIGN FOR INCLUSION

A good space should accommodate children with different abilities. Children with a disability are children first and foremost. Much of the advisory material on designing for children with a disability focuses on the needs of children with mobility impairments. While this is a critical consideration in ensuring that residential environments are fully accessible to these children,

there is more to the story. Some children experience a disability related to hearing, reduced visual acuity or lack of sensory awareness, including sense of smell.

While a clear and legible environment increases the independent mobility of children with a mobility impairment, a rich and complex residential environment can stimulate the senses of children with other disabilities, enhance their learning and cognitive development and help to promote independence.

Children with a disability are likely to have a great amount of enforced free time but are often denied the right to participate in play through isolation, thus compounding their disability and often leading to social retardation. As 80 percent of a child's learning occurs before they are eight, the play environment **for all children** is of vital significance.

Not all impairments that affect children are mobility impairments. Vision impairments can limit children's appreciation of the residential environment and their play opportunities. Therefore:

- Ensure that it is easy to hold a mental map of the play environment. Some children with a disability will have impairments which may cause them to easily lose their way. Simple and legible arrangements need not conflict with the need for complexity in the play opportunities provided;
- Design facilities to allow parental and caregiver monitoring at a close range. For some children, a more closely contained area is necessary for monitoring and safety;
- Provide shading as often as possible, as it is essential for most groups of younger people;
- Provide frequent and readily accessible drinking fountains;
- Pay special attention to the provision of toilet facilities;
- Plan for activities at multiple physical levels. Children will, crawl, sit at varied wheelchair levels, ambulate at varied wheelchair levels, stand and run;
- Provide a variety of activities where able-bodied children are required to do things like crawl or scoot along, so that children who are not able to walk, skip or climb have opportunities to play at the same level as others; and
- Provide a variety of swings, including swings large enough for an adult to sit with a young child on, or swings with some back support.

6.5 DESIGN FOR MOBILITY

Inattention to detailed design matters will result in non-use of play areas by children in wheelchairs or who have other forms of mobility impairment. The key requirements for children's play are the following:

- Provide protection from direct sun and prevailing winds. Many children with a disability can become dehydrated quickly and may perspire freely because



Figure 18: A themed slippery dip, accessible from the mound

of the medication they take. Areas providing shade and all-weather shelter should be an integral part of the play environment;

- Provide accessible drinking fountains wherever possible;
- Connect the pedestrian circulation system of the playground with the neighbourhood or community pedestrian network, but separate it from vehicular traffic;
- Use a hierarchy of path sizes and construction materials to delineate the importance and use of different play areas;
- Provide flat rest areas at several points along the path system;
- Avoid steep sites unless the slope can be specifically integrated into designs for children with a disability (such as slippery dips which do not need to be accessed via a ladder but may be approached from the top of a mound, see Figure 18).
- Pay particular attention to maintenance and repairs. Children with a disability are often vulnerable to accidents and illnesses. Thus, the area should be well maintained. Cracks in hard surfaces used by wheeled vehicles fixed immediately.
- Design according to Australian Standards (AS1428) for children with mobility impairments.



Figure 19: Bumpy textures can be fun for wheelchairs and bikes.

6.6 PLAYSPACES FOR CHILDREN WITH WHEELCHAIRS

While it is not necessary to provide 'separate' playgrounds for children with a disability, some specific features can support integrated play and mainstreaming. Helping the able-bodied child relate to children with a disability will enhance play opportunities for all. Children who are wheelchair users will be able to access recreational environments more readily if certain factors are considered. These include:

- Select sites for play areas which have flat or mildly undulating topography. Avoid steep slopes;
- Endeavour to ensure that at least 70 per cent of each entire playground is universally accessible to children of all abilities;
- Permit unimpaired wheeled vehicle access and design the circulation system to follow the natural flow of play between facilities;
- Ensure that, for a given play component, a child can get "to it, on it, through it, off it and back to where they got on it, via an accessible circuit". Ensure that the whole object is within reach - a child cannot play hopscotch if they can only reach the middle row;

- Provide room for children using a wheelchair to approach and manoeuvre within the play area (manoeuvring space must be 1500mm x 1500mm and clear ground area must be 750mm x 1200mm);
- Provide hand holds or gripping surface as means of support for children transferring onto play equipment. Provide manipulable objects (such as game panels, sound walls, raised sand or water tables) within reach of children on wheelchairs (between 450mm and 1 m. from ground level);
- Design slides, swings and spring rockers at a transferable height (between 275mm and 600mm from the ground) for children in wheelchairs;
- In appropriate play areas, purpose design curvilinear paths with changing textures to provide experiential variety for children in wheelchairs (see Figure 19);
- Provide rails and kerbs near water features;
- Provide appropriate parking near pools and water features; and
- Accessible picnic tables should have a clear space of approximately 750 mm from the ground to the underside of the table with a clearance beneath the table of 610 mm. The space should be at least 750 mm wide.

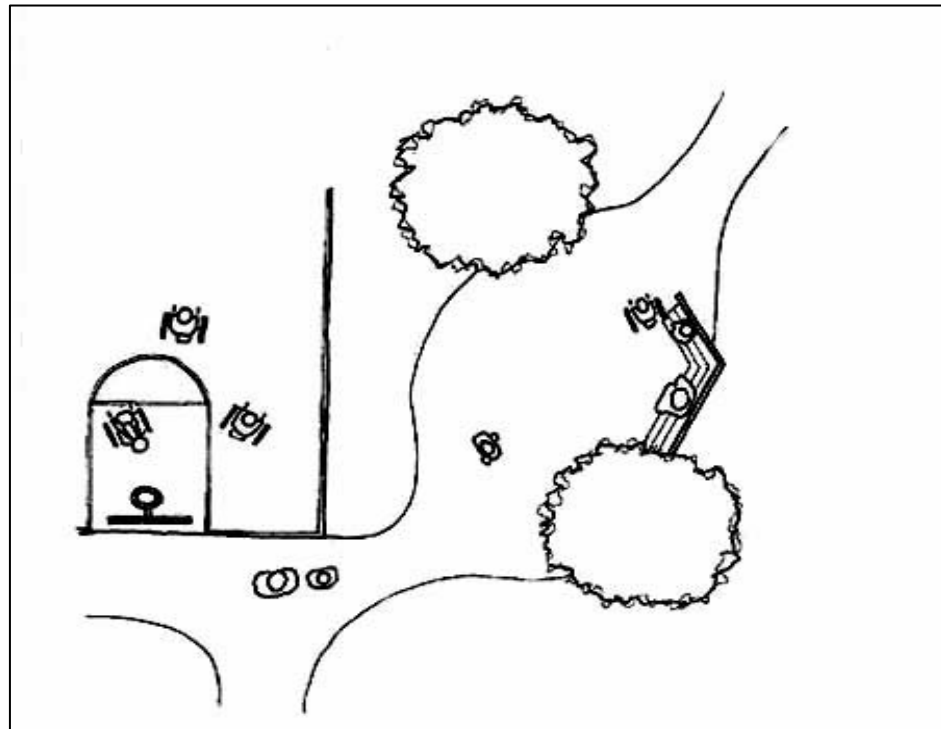


Figure 20: Wide paths and accessible circuits for children with wheelchairs

7.0 SAFETY

7.1 DESIGNING FROM A CHILD'S PERSPECTIVE

Children are much smaller than adults and their vision (in particular, their peripheral vision) is not well developed. As a result, they often have trouble “reading” the public realm. It is important to design from the child's perspective.

Smaller children have difficulty predicting dangerous encounters with vehicles, pedestrians and others on wheeled vehicles. Consider what they see to ensure their safety, and:

- Ensure that the view from the perspective of the child pedestrian or cyclist is taken into account in order to eliminate 'invisible roads';
- Ensure that children's sightlines are not blocked by front fences, especially at intersections and on corners. Lowered fences at corners or see-through fences can be used; and
- Provide clear hard and soft landscaping signals so that children are able to read possible dangers in the public realm.

7.2 ROAD HIERARCHY AND LEGIBILITY

Children have no traffic maturity equivalent to adults until they are aged between nine and twelve years. Younger children have severely restricted peripheral vision, which means that they literally cannot see dangers approaching. Cycling maturity comes even later than traffic maturity. These developmental realities have significant implications for the design of residential areas. Messages must be communicated in strong and clear terms to protect children from "misreading" the environment and to help them decode signs of danger. An example is the intersection between a cycle path and a major road, which can be particularly dangerous for children.

Significant changes in surface treatment, lighting, and care in ensuring sightlines are required to protect the child cyclist or even the child pedestrian.

In many new residential areas, parents report major difficulties in teaching children road safety. This is largely because they have difficulty explaining how to distinguish between safe and unsafe streets for play. Safe streets, they would prefer to tell their children, are ones, which do not have footpaths (i.e., streets which do not carry heavy traffic loads). However, in many new estates, *major collector roads* also do not have footpaths. Parents and children also complain about the divisive nature of major roads, separating parts of estates.

This makes it very difficult for parents and caregivers to provide consistent messages. The call is for *consistent* road patterns where a clear *road hierarchy is easily discernible*. Thus:

- Make a clear distinction between major and minor roads, using design features to help children distinguish between them.

7.3 SAFE PATHS

Small residential courts without footpaths are often designed on the assumption that people will walk on the street. These layouts are often criticised because heavy traffic densities make streets unsafe, especially for children. This matter must be addressed with the utmost care. Thus:

- Provide a clear hierarchy of roads which children can easily distinguish and adults can easily explain;
- Provide footpaths on all major roads;
- Provide support to parenting by designing roads and paths to educate children about safe behaviours, especially regarding traffic safety;
- Distinguish between local roads and those which carry heavier traffic loads with clearly identifiable characteristics such as paving, lighting, fencing, and pedestrian crossings;

- To reduce confusion, consider greater use of transit-oriented designs (TOD) with grid patterns, rather than cul-de-sac patterns;
- Provide very clear signals for children at intersections between major and minor roads; and
- Develop a specific policy (and associated design and planning guidelines) for managing the design of intersections of paths and roads.

7.4 CHILDREN SAFE FROM CARS

"We've re-shaped our idea of neighbourhood so much that walking or cycling are no longer the most common way to get around. As more people drive, roads and traffic become less safe for both drivers and pedestrians. This is a problem."

(Off ramps: Moving for change, 2000:2)

The key principles to protect children and ensure that pedestrians have priority in areas shared with cars are:

- Reducing traffic volume and speed on local residential streets;
- Providing footpaths along all roadways; and
- Locating walkways so that they safely cross roadways and driveways.

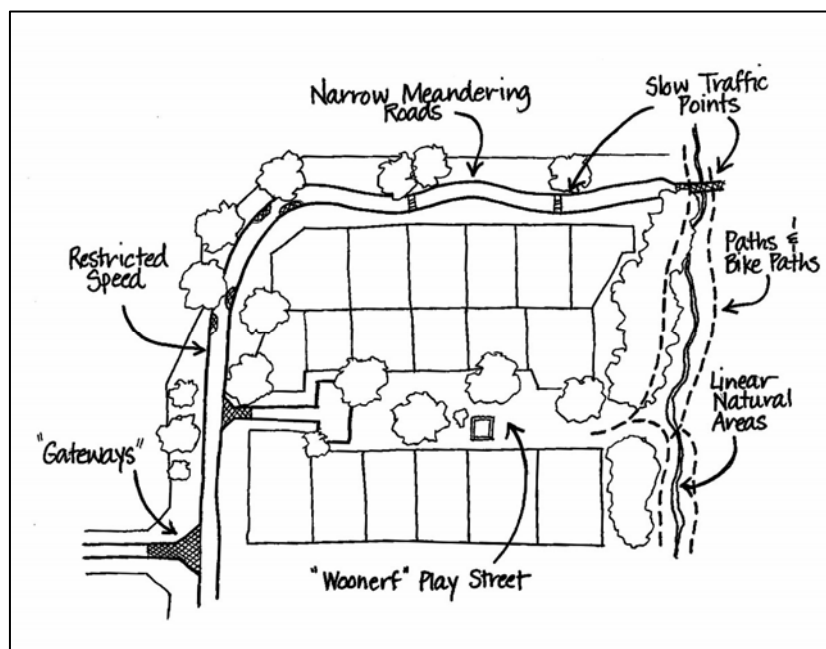


Figure 21: Road safety for children

To ensure safety of children with respect to streets:

- Use *woonerfs* or other traffic-calming methods to direct, control and slow traffic in areas used by children;
- Limit vehicle speed to a walking pace of 12 to 20 km/h by humps, sharp bends, or narrow sections of roadway no more than 50 m. apart;
- Avoid long sightlines which might encourage higher speeds;

- Avoid causing a vehicle to pass too close to dwellings facing onto the street (minimum distance 6 m);
- Identify and separate play equipment areas from traffic by bollards, fences or chains, while not creating the impression that children should be separated from the rest of the street;
- Limit parking to locations where it causes no inconvenience to other street users and designate parking with distinctive paving and signs;
- Design lighting so that speed-reducing features are clearly visible at night (poles 3.5 m. high, spaced 25 m. apart);
- Clearly designate entrances to a traffic-controlled area with signs and paving changes;
- In cluster housing configurations, try to provide as extensive a traffic-free area as possible as the common or shared space of the groups of dwellings and ensure that each dwelling has visual and functional access to a street on one side and a pedestrian-oriented court on the other;
- In cluster housing, provide play spaces and footpaths in common or shared landscaped areas;
- Consider the concept of a "play street", especially in areas with low levels of car ownership (see Figure 22);
- Consider widening one verge to a road to allow for group play on neutral territory within a very short distance of the dwelling. It is essential to maintain good sightlines and add some form of barrier to prevent children inadvertently running onto the road. Ensure that there is still a footpath of adequate width running through this verge;
- Locate electricity utility boxes and other large meter boxes so that they do not block sightlines from the perspective of a walking or cycling child; and
- Pay particular attention to the treatment of change of condition at intersections between footpaths and major roads to ensure that children receive strong signals that they are approaching a potentially dangerous intersection.



Figure 22: Children utilising a play street

7.5 CHILDREN SAFE FROM ADULTS AND OLDER CHILDREN

It is essential to provide opportunities for older children and young people to "hang out" in places where their activities do not cause difficulties for neighbouring residents and others using open space. Therefore:

- Provide guaranteed places which young people can call their own, where they can hang out and socialise among their own peers without adult interference. These places can be outdoor or indoor spaces used at certain scheduled times (see Figure 23);
- Locate benches at popular street corners, overlooking a recreation area, on the edge of a car park, or at major pathway intersection. (Care should be taken to ensure that security problems do not result from these location decisions);
- Group benches in a right-angled or u-shaped arrangement to facilitate group conversation;
- Locate benches against a retaining or free-standing wall so that young people can choose to sit on the wall as well as on the benches;
- Locate a rubbish bin nearby;
- Ensure that planting will not be damaged in any seating area that young people may take over; allow plenty of standing, sitting and sprawling space around benches; and
- Install unbreakable lighting fixtures near places that young people may use.

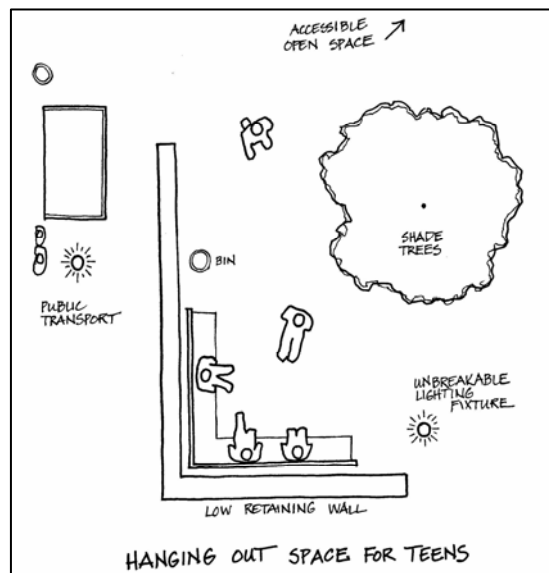


Figure 23: It is essential to provide comfortable places for young people

7.6 OUTDOOR SAFETY

The Physical safety of young people is a major concern of parents and caregivers. Attention to micro-design details can greatly assist in protecting children.

To ensure child safety in outdoor areas:

- Site dwellings on the block so that vehicular access to the garage or carport is inaccessible from the major children's playing areas;
- Ensure that doors do not open onto driveways;
- Protect gully traps and open drains to restrict access by young children;
- Avoid wing walls and other features which could allow easy access to the roof by young children ('natural ladders');
- Encourage natural surveillance of children's play areas by locating them close to households where children are likely to live (100-400 m);
- Ensure that child pedestrians and cyclists have clear views at potential danger spots; and
- Ensure that meter boxes and fences do not block children's views of traffic and other potential dangers.

7.7 MAINTENANCE

7.7.1 WEAR AND TEAR, HEAVY USE AND VANDALISM

- Ensure that the Town of Victoria Park is fully involved in the planning to ensure their commitment to ongoing maintenance of any parts of the site which are their responsibility;
- Vigorously resist any attempts to reduce maintenance and management costs by combining all public open space into one or two sites;
- Take local soil and microclimate conditions into account when developing a landscaping and planting plan;
- Explore with the CDO opportunities for resident (including children's) participation in site development and maintenance;
- At the pre-design stage, clearly spell out management and maintenance arrangements for any housing with common landscaped spaces or shared open space;
- Specify robust equipment made of durable materials;
- Provide litter bins and avoid corners or small niches which collect litter and are difficult to clean;
- Use suitable ground cover for 'hard wear' areas;
- Wherever possible, provide mature landscaping in areas with harsh conditions;
- Ensure that management and maintenance policies take these conditions into account. Special attention (and additional resources) will need to be directed to any parts of the site with difficult conditions; and
- Select equipment (such as sprinklers) which will withstand hard use (and possibly attempts at vandalism) and be suitable to harsh conditions.

7.7.2 PROMPT REPAIRS

Deterioration in appearance of a residential neighbourhood can arise from causes other than vandalism (such as accidental damage, misuse or ordinary wear and tear, or weathering, decay or corrosion). If these are allowed to develop, conditions favouring vandalism can become established in a residential neighbourhood previously free from it, or re-established in one from which it has been eliminated. It is therefore important to:

- Employ a 'quick fix' policy and repair all damage promptly;
- Ensure that maintenance staffing and budgeting allow for prompt repair of damage;
- Encourage an effective policing and reporting system - essential to enabling a 'quick fix' policy to operate effectively;
- Strengthen on-site management to insist on responsible behaviour by adults, young people and children; and
- Involve local children and young people in management and repair programs to foster their sense of ownership.

7.8 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

Children are vulnerable users of the residential environment in that they do not always understand which places are safe for them to play or to use. Unfortunately, it is also a fact of modern urban life that children can be victims of predatory practices. Parental fears can inhibit children's use of the environment, as discussed above. Therefore, making sure that Burswood Lakes is designed with attention to principles of Crime Prevention through Environmental Design (CPTED) will reduce the potential for limiting children's independent mobility by making residential neighbourhoods safe in the first place. See Working Papers 4 and 5.

8.0 PLAY EQUIPMENT: BALANCING SAFETY AND CHALLENGE

8.1 BALANCING SAFETY AND RISK IN THE PLAYGROUND

The key issue in designing outdoor environments for children is to find a balance between safety from accidental injury (and traffic and hostile adults) and the child's need for challenge. The temptation to design exclusively for safety and thereby ignore the important value of challenge and risk-taking in child development must be resisted. It is not possible to eliminate injuries in a play environment. Nevertheless, some clear strategies can assist in reducing injuries.ⁱⁱ

It is essential to provide a balance of safety and challenge in built play environments. Detailed guidelines are available to aid in equipment selection. The following are critical considerations:

8.2 PLAY EQUIPMENT SELECTION

LOCATION

- Locate play pieces in relation to each other so that children can make a circuit and move from one piece to another in an uninterrupted pattern of activity.
- Provide many junctions where the child can decide to stop and rest, go higher or lower, or continue on through the "system" via a difficult or easy route.

DURABILITY

- Ensure that the structure is stable.
- Select structures with durable materials which will weather nicely.
- Consider how the structure will look in 5 years.
- Regularly inspect, repair and maintain equipment.

COMPLEXITY

- Select equipment with a variety of ways to get up and down.
- Select equipment which:
 - can be used by more than one child at a time
 - can be used in more than one way or does it prescribe a fixed pattern of use
 - does not have any dead-ends (point at which the child must stop and go back the same way they came)
 - encourages co-operation among children
 - children can add to or modify the environment

- has parts that serve more than one function
- permits a variety of different circuits to be made over, under, around and through it, and
- allows the greatest variety of different activities.

8.2.1 SAFE PLAY EQUIPMENT

An important feature of a safe playground is the provision of soft impact-absorbing surfaces under equipment. They could cut injury rates by more than half.

- Design play equipment with gaps which are large enough that heads or limbs do not get trapped in them and small enough that children cannot fall through.
- Cover or recess any bolts, hooks, springs and other fixtures to prevent protrusions which might cause lacerations or catch on clothing.
- Set slides into a slope to avoid high ladders.
- Choose rubber equipment, such as swing seats, instead of wood and metal.
- Utilise appropriate under-surfacing such as pine mulch, bark mulch, shredded rubber, washed river sand or synthetic materials such as wet-pour rubber and high-density foam.
- Maintain loose fill at a depth of at least 250mm and extending to a distance of 2.5m from the equipment.
- Ensure that the maximum fall-height of equipment does not exceed 2.5m.
- Provided handrails between 19mm and 38mm in diameter over platforms and bridges which are over 500mm high.
- Provide vertical (or solid in-fill) guardrails on platforms over 1 m. high.
- Rake over loose fill in order to remove rubbish.
- Ensure that edges of equipment are rounded, and wood is splinter-free.
- Keep equipment clear of wet and slippery areas.

8.2.2 HARD AND SOFT PLAY SURFACES

Although paved areas seem preferred by children for most activities, open grassed areas provide for a softer running and tumbling surface for ball games, play-fights, tag, kite flying and so on. Thus:

- Provide a good mix of surface treatments;
- Provide a variety of hard-surfaced areas, including wide pathways and small areas off the main circulation route;
- Use dark paving in some areas for hopscotch;
- Try to ensure that the design of court heads facilitates play without



Figure 24: Hard and soft play surfaces

causing hazards to pedestrians or inconvenience to residents in adjacent dwellings. Protect adjacent dwellings with higher fences (1800 mm) and buffer landscaping in cul-de-sacs or court heads; and

- As rollerblading is popular among children in this age group, try to develop ways to accommodate this activity. This will require opportunities for spectators to hang out, as well as for the activity itself.

8.2.3 SAND UNDER PLAY EQUIPMENT

Sand is generally regarded as the safest under playground equipment. Other materials can contribute to injuries, especially concussion. Asphalt and concrete should be avoided. Even wood chips are less safe than sand, provided it is at least 300 mm. deep. Sand has the added advantage of being a moulding material: manipulating sand is a favourite activity among children, who are likely to dig elsewhere if sand is not provided. Therefore:

- Use sand under play equipment where possible;
- Never use materials with low-impact levels, such as concrete or asphalt, packed earth, or rubber tile;
- Avoid using grass as it becomes muddy and slippery in wet weather;
- Enclose sand areas with concrete or wooden walls at least 250 mm. above sand surface;
- Ensure that the sand extends well beyond the equipment to leave areas free for general sand play;
- Select sand with a balanced mixture of particle sizes (1.5 mm. to very fine);
- Use seaside, estuary, or clean, natural sand and wash sand before using in sandboxes. Avoid building sands, which may stain hands and clothing;
- Ensure that sand is deep enough: 300 mm. minimum; 400 to 450 mm. preferred;
- Ensure that sand areas are well defined and at a different level from the surrounding area, with a step up and a step down before entering the sand pit. This discourages animals from entering the sand area and also provides a rough surface for children to scrape some of the sand off their shoes as they leave;
- Locate part (but not all) of a sandbox in shade to keep some of the sand damp and malleable;
- Locate part of the area to be open and exposed to the morning sun to permit sand to dry out and sanitise itself;
- Protect sand areas from direct sun and prevailing winds;
- Rake sand at least once a week and replace at regular intervals; and
- Provide adequate drainage, via percolation, drainage to a storm sewer, or a tile and drain leach field.



Figure 25: Sand under play equipment

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Endnotes

i *Woonerven* typically have speeds of between 4 and 7 km/hr. However, speeds of 20 to 25 km/hr have been found to be satisfactory, even for school crossings in West Germany.

ii A 1988 report revealed that one in every three children injured on a local council playground in South Australia sustained a head injury. Four in ten sustained a bone fracture, while one in five injured children required hospital admission and two out of three who were hurt were injured falling to the ground surface under the equipment.

Among children injured by the ground surface, about 70 per cent fell onto hard soil and about 15 per cent onto concrete or bitumen (Thompson and Somers, 1988: 6).