



**PORTLAND
COURTYARD
HOUSING
COMPETITION**

PRINCIPLES OF CHILD FRIENDLY HOUSING

What is "child-friendly" design? This document is intended to help answer this question by summarizing research and other literature on child-friendly housing design, and also includes advice from practitioners.

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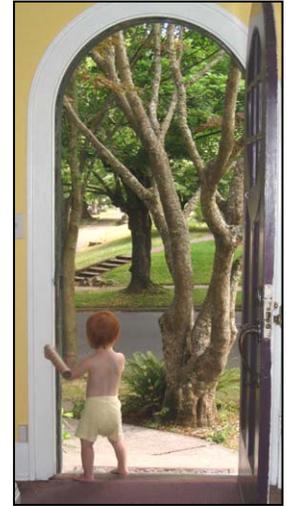
CITY OF PORTLAND, OREGON
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PRINCIPLES OF CHILD FRIENDLY HOUSING

1. Basic Needs of Children

1. “Children need safe, uninhibited outdoor play for their physiological and mental health.
2. Parents need to be able to allow their children outside without constant, close supervision.
3. The environment around children’s homes needs to be safe from traffic, pollution, and unnecessary physical and social hazards.
4. Children should be able to experience the pleasures of finding bugs, picking leaves, smelling flowers, collecting things and so on without their parents or the management harassing them. Through such contact with nature they may develop, among other things, an understanding of basic ecological principles.
5. Children need easy, casual access to other children without a formal invitation to play.
6. Children need places in the communal environment that are undeniably their territories where they can expect to find other children.
7. Children need to create private spaces for themselves (for example, tree houses, forts, or clubhouses) on wild or unmaintained ground away from public view.
8. Children need to be able to move around their home neighborhoods safely and to take little trips farther and farther from home to gain a sense of independence.”

(Cooper & Sarkissian)



2. Unit Design

“Young children relate to the world through their bodies and their senses. They require large amounts of space in which to learn by moving and doing.”
(Olds)

Research indicates that children living in crowded environments can have negative effect on their social adjustment. Several findings from studies indicate a sharp increase in misbehaviors by children living in homes with more than 2.3 residents per room.
(Wohlwill)

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- Market research involving surveys of families interested in living in central Portland indicated that their most important housing design priority was having enough interior living space, with over 85 percent preferring units with 3 bedrooms and two baths. Vehicle parking was the second most desired feature. **(Ferrarini and Associates)**
- Parent's preferences do not necessarily coincide with children's preferences. Some practitioners indicate that children, particularly younger children prefer shared sleeping arrangements and desire more space for common areas. **(Luvmore)**
- Each bedroom should be large enough to accommodate
 - a single bed
 - a dresser
 - a desk or table
 - floor space for playing**(Cooper; City of Vancouver B.C.)**
- The design of the unit should provide for a variety of spaces that can accommodate a variety of uses that do not conflict with each other. **(Cooper; City of Vancouver B.C.)**
- Provide a separate living area to accommodate informal family activities such as games, children's play, teenagers' entertaining, etc. **(Cooper & Sarkissian)**
- Provide creative architecture to accommodate different activities for different users, dividing space into activity zones that allow different user groups (small children, older children, adults) to pursue differing activities, while minimizing conflicts. **(Luvmore)**
- Provide entry areas outside of the dwelling that can accommodate different types of uses. Entry areas adjacent to the kitchen serve as play areas for toddlers because they are easy to supervise and because they are close to the dwelling unit. **(Zeisel & Welch; City of Vancouver B.C)**
- Provide accessible storage space for children in order to allow for independence. **(Kritchevsky; Torelli, M.S.Ed. & Charles Durrett)**
- Provide sufficient bulk storage within the unit or within easy access of the unit. Convenient access to storage for strollers, bikes, toys etc., is important. **(City of Vancouver B.C.)**



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3. Play Areas

It is important to provide places for children relative to their physical needs. The design of the outdoor and indoor areas must have the capacity to encourage children to play. Restriction of children's activity is not conducive to children's healthy development. It is through play that children acquire social, cognitive, and physical skills. Restrictions on the play areas may hamper the developmental process.

(Johnson)

- The outdoor area immediately surrounding the home, particularly in close proximity to doors, is the space most important to small children.
(Cooper & Sarkissian)
- Create a buffer zone for a transition from private –to- semi-public spaces, such as a front porch that leads to a shared outdoor space. These transition spaces allow for children to gradually acquire independence from the home, as well as helping to provide residential privacy.
(Cooper and Sarkissian)
- Provide sufficient space for dual use on pathways for both circulation and children playing. Children over age six ride bicycles, roller skate and run on public pathways near dwelling units.
(Zeisel & Welch)
- The location of the play areas should be near, in and around the central part of the house so that children feel secure and less isolated from their parents.
(Cooper and Sarkissian)
- Observation of children in a housing development revealed that toddlers played mostly on paved areas just outside the kitchen door, rather than in designated toddler play areas at a distance.
(Cooper and Sarkissian; Saile et al)
- Play areas should accommodate different types of play including:
 - Gross motor play: This zone contains the play equipment that offers opportunities for physical activities such as sliding, climbing, reaching, and crossing.
 - Quiet play: Children need quiet time to intently digest the items in their learning environment, like books and puzzles. Quiet play provides children an opportunity to think and reason and can include such activities as:
 - Beading a necklace
 - Working on puzzles
 - Reading or looking at pictures

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- Dramatic play: Role-playing is particularly useful for developing social and verbal skills in young children. This zone provides backdrops that encourages and facilitate children to imitate adult roles by playing house, school, theatre, etc.

(Kritchevsky; National Association for the Education of Young Children; Ruth)

- Planned outdoor activities that help to stimulate children’s developmental growth include but are not limited to:
 - sand and water play
 - construction
 - gardening
 - arts and crafts
 - climbing
 - swinging
 - riding wheeled toys

(Laura C. Johnson)

- When determining the amount of play space necessary to accommodate a given amount of children, one should consider the type of play- simple play, or more complex play. Simple play area’s will entertain children for less time, where as a more complex type of play area will allow for a longer continuous amount of play.
 - Simple play units have one obvious use, such as swings, a jungle gym, rocking horse or tricycle.
 - Complex play units have sub-parts or juxtaposition of two essentially different play materials which enable the child to manipulate or improvise, such as a sand table with digging equipment or a play house with supplies.

(Kritchevsky)

Estimating Square Footage Needs

Since the Gross Motor Play Zone is typically the largest and main zone within a playground, it is helpful to determine the square footage that will be needed for this area early in the design phase. The inclusion of additional zones in the design will require additional square footage. Research indicates that the greater the number of square feet allotted per child, there is a corresponding decrease in the number of injuries. The chart below gives guidelines for sizing the area of the playground that will contain the Gross Motor Play equipment.

(National Institute of Building Sciences)

Quality	Square feet per child*
Substandard	60
Good (Minimum)	75
Better	100
Best	200

*These square footages include the use zone that is strongly recommended around playground equipment for safety. This zone is typically 6' minimum extending in all directions from the perimeter of play equipment; however, there are variations for slides and swings. The recommended use zones of playground equipment are discussed in both [ASTM F1487](#) and on pages 6-8 of the [CPSC Handbook for Public Playground Safety](#).

(National Institute of Building Sciences <http://www.cpsc.gov/cpscpub/pubs/325.pdf>)

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Activities for all ages:

- Children need age-appropriate and developmentally appropriate physical environments that support, promote and include child-directed and child initiated play and learning. Active, creative play and exploration is central to normal child development.
(Stoecklin)
- Teens like to chat on front porches and in un-fenced front yards off public streets.
(Cooper)
- Street activity, or hanging out on the street, is an important social interaction for teens. On the street is where they can be seen and see others on an informal basis.
(Zeisel & Welch)

4. Child Accessibility

In order to ensure child accessibility, the designers must adequately compensate for height restrictions of the child. Child friendly design encourages independence and the development of gross motor skills.

(Weinstein and Thomas)

The scale and positioning of various fixtures in the home should be carefully considered, such as:

- Children's bathroom designed for their access, safety, and play.
- Distinctive corner windows allotted for children's room.
- Light switches in close proximity to beds

(Weinstein and Thomas)

5. Privacy and Public Interaction

Part of the definition people have of home is that it is a place where they control who has access to the space; not only who can walk in but also who can hear and see what is going on in the home. Children, like adults, often need to retreat from the social environment. These places of privacy should be available both inside and outside the home. It is also important to recognize the need for social places. These places help to foster a sense of community and general well-being.

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- Stagger windows and buildings to foster privacy. Be conscious of what rooms face onto the open space. For example, it may be possible to site opposite rows of dwellings lightly closer when bedrooms face living rooms (used at different times of day).

(Cooper and Sarkissian)

- Private balcony/porch/yard- A private zone around dwellings provides three necessities: visual privacy, a buffer zone for noise between the dwelling and children at play, and a needed outdoor space for such essential activities as toddlers play or gardening.

(Cooper and Sarkissian)



- Provide visual privacy between units by separating building facades by 30-80 feet or through screening with architectural and landscape elements.

(Cooper and Sarkissian; City of Vancouver B.C.)

Mitigating Noise Disturbances

Provide an acoustically controlled environment in relation to exterior noise and noise from adjacent living units and public spaces.

- Children playing near dwellings make noise that can bother adjacent residents. Children's play equipment should be placed in the best location to minimize disturbance.

(Cooper and Sarkissian)

- Provide shrubs, trees, and other vegetation that can help block outside noise.

(Environmental Protection Agency)

- Use soundproofing materials in the home, especially in multifamily projects - children need to be able to play while indoors.

(John Zeisel, Polly Welch)

- Appropriate party wall/floor construction is important to limit noise impacts in higher-density family housing. A good wall that reduces noise transfer should have:

- Substantial mass (i.e. gypsum board, plaster).
- A structural break (discontinuity) between the two sides of the party wall ("staggered stud" wall).
- A cavity that is as wide as possible and filled with sound-absorbent material.
- No holes, cracks or gaps.

Party floors/ceilings should be built similarly to party walls for optimal airborne sound insulation (sound resulting from voices, music etc.)

(B.C. Engineering Department)

Community Building

- Provide places where residents/children can interact on a casual basis. This type of spontaneous interaction can occur easily when building entries relate to each other around a common court.
(Becker; Cooper)
- Provide seating areas in outdoor spaces. Seating areas can serve a range of types of users from teens to elderly residents.
(Cooper and Sarkissian)
- Provide appropriate open space to meet the onsite needs of children and adults.
(City of Vancouver B.C.)
- Dwellings should be arranged so that it is possible for neighbors to meet one another, but not so that neighbor contact is forced.
(Cooper and Sarkissian)
- Sharing a common pedestrian open space enhances the potential for neighborly social contact.
(Cooper and Sarkissian)

6. Safety and security

“The best and certainly the cheapest technique of security planning is creating a viable and caring community of residents organized to protect themselves.” (Cooper and Sarkissian)

Oscar Newman’s *Design Guidelines for Creating Defensible Space* identifies five separate design/management mechanisms that contribute, independently or collectively, to the creation of **defensible space**¹:

- Territoriality- Residential environments should be subdivided into zones toward which adjacent residents can easily adopt proprietary attitudes.
- Household Allocation- The assignment to different residential groups of the specific environments they are best able to utilize and control, as determined by their ages, lifestyles, socializing proclivities, backgrounds, incomes, and family structures.
- Surveillance-The juxtaposition of dwelling interiors with exterior spaces and placement of windows to allow residents naturally to survey exterior and interior public areas of their living environments and the areas assigned for their use.

¹ Newman uses the term *defensible space* for environments that exhibit physical characteristics- building layout and site plan- that function to allow inhabitants themselves to become the key agents in ensuring their own security.

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- **Environment-** The juxtaposition of dwellings their entries and amenities, with city streets to as to incorporate streets within the sphere of influence of the residential environment.
- **Image-** The adoption of building forms and idioms that avoids the stigma of peculiarity that allows others to perceive the vulnerability and isolation of a particular group of inhabitants.
- Place windows and orient entries to maximize natural surveillance of shared outdoor spaces.
(Cooper and Sarkissian; Newman; City of Vancouver B.C.)
- The safety of children should be considered both within each unit and in the indoor and outdoor common spaces of a development.
(City of Vancouver B.C.)
- To contribute to safe environments for children, use environmentally friendly materials inside and outside of the home, especially where children will come into contact with materials on a regular basis (such as carpets and play equipment).
(McDonough)
- Protective surfacing under and around playground equipment can reduce the severity of and even prevent playground fall-related injuries.
(The Automotive Safety Program at Riley Hospital for Children, Indiana University School of Medicine; Consumer Product Safety Commission)
- Satisfaction with common outdoor open space increases as residents have control over its use and as outsiders are effectively prevented from entering it uninvited.
(City of Vancouver B.C.)

7. Housing Preference Research

- **A Canadian Mortgage and Housing Corporation's** study, *Housing the New Family: Reinventing Housing for Families*, specifically explored the housing and neighborhood preferences of Canadian families with children (Johnson, 1995) In this study, 450 family households in the three major metropolitan regions of Canada surveyed regarding their housing preferences and potential reactions to higher density living. Of the 152 participants representing the Vancouver metropolitan region, a large majority (89%) *ideally* preferred a detached house. The attributes that were most widely regarded as "extremely important" to families included:
 - A safe dwelling unit
 - A safe neighborhood
 - Privacy
 - Sufficient indoor space
 - Outdoor space
 - Proximity and quality of amenities such as schools and parks

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- **Ferrarini and Associates**, a Portland Oregon Opinion Research and Consultation Company, was hired by the Portland Development Commission to assess the market for family-oriented, ownership housing in the Central City and the Pearl District. The objective of this assessment was to understand who the likely consumers of family-oriented housing are, where they are from and what kind of product they are interested in buying.
The building design features and amenities that were important to families interested in living in high-density housing downtown included:
 - Three bedrooms
 - 2 full bathrooms
 - Convenient parking
 - Soundproofing
 - Private outdoor space
 - Washer/dryer
- **Housing Authority of Portland, Oregon**
Community Design Workshop for Family Housing Design
 - Front doors should be protected by generous stoops and porches, which should be places where people feel comfortable
 - Rooms should be large
 - Family housing units need more outdoor storage, these should be large enough for bicycles
 - Back patios or balconies should be large enough for barbeques.
 - Bathrooms on first floors should be discretely located
 - Provide variety in unit types and plans to give residents choice

8. Practitioner Advice

Perry Bigelow, a Chicago, Illinois based homebuilder

(focuses on family housing oriented to shared outdoor space):

- A “track” on the first floor is important, consisting of a loop that kids can run around as if it were a running track, from the kitchen to the family room to the living room to the foyer and back to the kitchen. Little children need to run, and much of the year the only place they can do it is indoors.
- The kitchen should open to a dining and living area so that kids can be within eyesight of their parents without being underfoot. Small children have a strong need to be able to see their parents while playing independently.
- Children need safe, common land, easily assessed from the child’s own home, on which they can meet other children of similar ages.
- Children use hard surfaces such as concrete walks and patios for 35 to 80 percent of their play.



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Ba Luvmore, a child development specialist based in Portland, Oregon:

Age 0-8 ½ Years Needs:

- Pleasant and safe sensory based relationships

Age 8 ½ - 12 ½ Years Needs:

- Trustworthy people, especially family, extended family, neighbors, friends, and teachers animals and nature.
- Meeting places for friends to play.

Age 12 ½ - 17 ½ Years Needs:

- Places to express creativity and ideas
- A place to be with peers
- Personal privacy and freedom

Bill Wilson, an architect based in Portland, Oregon:

- Security is key – need safe places for children to play close to residences. For small children, it is important to have a physical barrier between courtyards and the public street to keep children in and non-residents out.
- Provide both hardscape and softscape for various types of activity.
- Orient outdoor entry areas to other dwellings to promote neighborly interaction.
- Need elements that provide transitions between private and shared spaces.
- Family housing units should have a minimum of 3 bedrooms and 2 bathrooms.
- Provide gathering spaces, such as sitting areas and alcoves.

Nick Sauvie, Executive Director of Rose Community Development Corporation:

- Provide a front porch or entry way that can accommodate sitting and allow monitoring of outdoor play.
- Family housing units should have a minimum of 3 bedrooms and 1.5 bathrooms.
- Provide outdoor space for a play area and seating areas.
- Covered play areas provide needed outdoor play space in bad weather.
- Provide dual uses such as using a planter as a bench.
- Provide higher window sills for second story windows to prevent falls.
- Provide appropriate equipment for different ages.

9. Children and Shared Streets

From “Changing the Residential Street Scene: Adopting the Shared Street (Woonerf) Concept to the Suburban Environment,” Eran Ben-Joseph:

“Shared streets are more than transportation channels; they are places suited for pedestrian interaction, as people choose to pause and socialize on the street. Shared streets especially benefit children’s activities. They provide play options and increase social contact within a safe home–base territory. The residents’ willingness to take care of the public domain in the shared street is often observed; they view the street as an extension of their personal space and often maintain and relandscape the planting beds



*Dutch Woonerf
(courtesy Ben Hamilton-Baillie)*

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next to their dwellings. More time spent on the street increases the chances for social interaction, and especially so among children at play. A study in Germany found that the street redesign led to a 20 percent increase in play activity, and that play also became more complex. The use of bicycles and toy vehicles, and also of games requiring more space increased. The shift in play location from narrow sidewalks to the street's entire width including the former traffic lane was a notable change (Eubank 1987).

Similar studies in Japan report that 90 percent of those surveyed said the shared street is for people's use rather than for automobile use; 67 percent said that their children play in the street and that it is seen as a safe place to play. Other results show great satisfaction that the street space can be used for more than one purpose, and in particular that children can play throughout, not just in the play-lots. A majority of the residents (66 percent) felt that the shared street encourages social interaction and conversation between neighbors (Ichikawa 1984).

Surveys and opinion polls in Israel also show that the shared streets foster encounters and communication between neighbors. Most residents prefer a dead-end street (cul-de-sac) over a through one-way street, stating that the dead-end street improved the environment and safety of their neighborhood. The majority (81 percent) of the children were found to play every day in the street as their main play zone. Between 88 and 100 percent of the residents said they are willing and want to maintain the public planting beds within the streets, and almost 50 percent said they are actually doing so (Polus 1985, 1990).

A Nationwide study in the Netherlands (Kraay 1985, 1986; Dijkstra 1990) indicates that the residents' attitudes toward shared streets are influenced by the level of satisfaction from the design and social performance of the public spaces, rather than by the functioning of the traffic system. Moreover, the residents are willing to accept restraints on traffic and driving in order to improve their social and residential environment. The surveys found that mothers as well as children consider the shared street safer than an ordinary street. It is also clear that the amount of knowledge one has about shared streets directly corresponds with attitudes toward them. Thus, opposition to implementation is mainly correlated with general lack of knowledge about the shared street concept."

- Consider the controlled mixing of pedestrians and vehicles by means of *woonerfs* or mixer courts. By the elimination of curbs and by the sensitive combination of paving, street furniture, and planting, the *woonerf* enables slow-moving local traffic and children at play to use the same space without hazard to either.
(Cooper and Sarkissian)
- Research conducted by Barnardo's, a major children's charity in the UK, found that *woonerfs* encouraged children to play as well as provided a safer environment from automobiles.
(Jenkins)
- Identify and separate play equipment areas from traffic by bollards, fences or chains. However, do not create the impression that such areas are the only place for children; the whole street is their domain.
(Cooper and Sarkissian)
- Use a variety of street furniture (bollards, benches, lampposts, greenery) in order to calm traffic and to support the residential function of an area.
(International Institute for the Urban Environment)

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