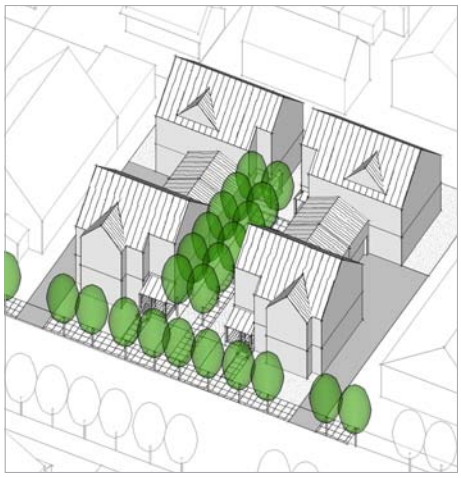
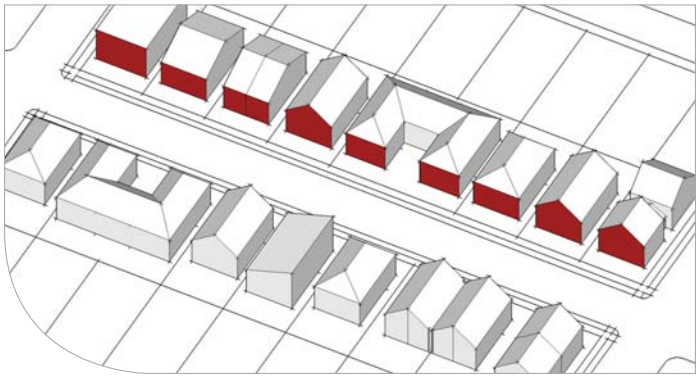
The Infill Design Toolkit:

Medium-Density Residential Development








A Guide to Integrating Infill Development into Portland's Neighborhoods

December 2008

CITY OF PORTLAND
BUREAU OF
PLANNING

Contributors

Portland City Council

Tom Potter, *Mayor*
Sam Adams, *Commissioner*
Nick Fish, *Commissioner*
Randy Leonard, *Commissioner*
Dan Saltzman, *Commissioner*

Portland Planning Commission

Don Hanson, *President*
Amy Cortese, *Vice President*
Michelle Rudd, *Vice President*
André Baugh
Catherine Ciarlo
Lai Lani Ovalles
Howard Shapiro
Jill Sherman
Irma Valdez

Bureau of Planning

Tom Potter, *Mayor, Commissioner-in-charge*
Gil Kelley, *Planning Director*
Steve Dotterrer, *Principal Planner*

Project Staff

Bill Cunningham, *City Planner*

Other Bureau of Planning Contributors

Kevin Martin, *Graphics*
Carmen Piekarski, *GIS Analyst*
Ralph Sanders, *Graphic Design*

CITY OF PORTLAND
BUREAU OF
PLANNING

City of Portland, Oregon
Bureau of Planning
1900 SW Fourth Avenue, Suite 7100
Portland, Oregon 97201-5380

503-823-7700
Fax: 503-823-7800

www.portlandonline.com/planning

The City of Portland will make reasonable accommodation for people with disabilities.

Please notify us no less than five (5) business days prior to the event by phone at 503-823-7700,
by the City's TTY at 503-823-6868,
or by the Oregon Relay Service at
1-800-735-2900.

Infill Design Advisory Group

City Agency Representatives

Greg Acker, *Office of Sustainable Development*
Kristin Cooper, *Bureau of Development Services*
Cherrie Eudaly, *Office of Transportation*
Ben Howell, *Bureau of Development Services*
Jim Harris, *Bureau of Development Services*
Tom Liptan, *Bureau of Environmental Services*
Shawn Wood, *Bureau of Development Services*

Community Representatives

Sean Batty, *Central Northeast Neighbors area*
Christine Caruso, *Portland Planning Commission (2003–2007)*
Jeff Fish, *Home Builders Association*
Don Genasci, *Neighbors West/Northwest area*
John Gibbon, *Southwest Neighbors area*
Jason Graf, *Northeast Coalition of Neighborhoods area*
David Hassin, *Home Builder*
Mark Kogut, *Southeast Uplift area*
Laurence Qamar, *American Institute of Architects*
Eric Schnell, *Alan Mascord Design Associates, Inc.*
Louise Turner, *East Portland Neighborhood Office area*
Tif'eret Valentine, *North Portland Neighborhood Services area*
Dorene Warner, *Human Solutions*
Loren Waxman, *Portland Design Commission*
Gary Whitehill-Baziuk, *Portland Metropolitan Association of Realtors*
William Wilson, *William Wilson Architects*

Other Contributors and Reviewers

Bureau of Development Services

Debbie Cleek
Eric Engstrom
Emily Hughes
Matt Wickstrom

Fire and Rescue

Richard Haney
Dawn Krantz
Jerry Randall

For more information on the Infill Design Project:

Bill Cunningham, *City Planner*
bcunningham@ci.portland.or.us

Printed on recycled paper

Contents

Introduction i

Infill Design Strategies 1

- Medium-Density Residential Development 1
- Respond to Basic Neighborhood Patterns 3
- Integrate Parking 15
- Minimize Scale Contrasts 29
- Limit Privacy Impacts 35
- Create Usable Outdoor Spaces 39
- Alternative Housing Types 45

Housing Prototypes A-1

- Inner Neighborhoods
  - Cottage Cluster A-3
  - Cottage Court A-5
  - Contextual Rowhouses A-7
  - Contextual Rowhouses Variant A-9
  - Townhouse Cluster A-11
  - House-plex A-13
  - Shared Court Rowhouses A-15
  - Corner Rowhouses A-17
- Outer East Neighborhoods
  - Courtyard Townhouses A-19
  - Big Cottage Court A-21
  - Mirrored Green A-23
  - Courtyard Flats A-25
  - Courtyard Townhouses A-27

Technical Pages B-1

- Structured Parking B-1
- Driveways: Transportation and Emergency Access Requirements B-9

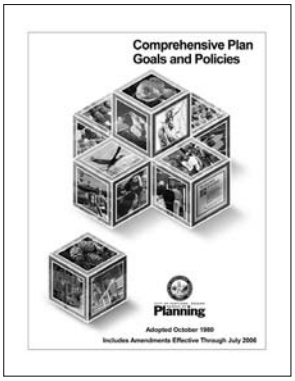
Project Profiles C-1

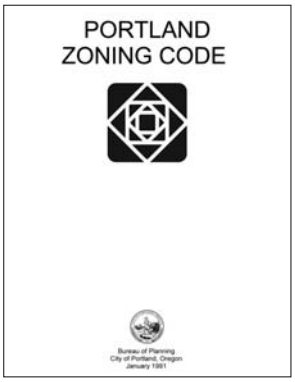
- Rowhouses C-2
- Duplexes C-15
- Plexes C-17
- Cluster Housing C-22
- Courtyard Townhouses C-26
- Apartments C-29

Gallery of Historic Portland Examples D-1

Examples from Elsewhere E-1

Neighborhood Design Policies F-1





Design Principles for Residential Infill Development

Based on design guidance from the Comprehensive Plan, Community Design Guidelines, Zoning Code, and other City documents

Bulleted statements listed below the basic principles are included to clarify the potential ways of implementing the principles.

1 Contribute to a Pedestrian-Oriented Environment

- Use architectural features (such as façade articulation, window and entrance details, and porches or balconies) that provide a human-scaled level of detail
- Avoid large areas of blank wall along street frontages
- Minimize the prominence of parking facilities
- Provide strong connections between main entrances and sidewalks

2 Respect Context and Enhance Community Character

*(While the continuation of existing community character may be a priority in established neighborhood areas, contribution to a desired **future** character may be more important than compatibility in areas where change is expected and desired, such as in mixed-use centers)*

- Arrange building volumes and use setback patterns in ways that reflect neighborhood patterns or that contribute to its desired character
- Consider utilizing architectural features (such as window patterns, entry treatments, roof forms, building details, etc.) and landscaping that acknowledge the surrounding context and neighborhood
- Use site design that responds to natural features of the site and its surroundings
- Minimize solar access impacts on adjacent properties

3 Consider Security and Privacy

- Orient windows and entrances to the public realm to provide opportunities for "eyes on the street" and community interaction
- Minimize impacts on the privacy of neighboring properties

4 Provide Usable Open Space

- Maximize the amenity value of unbuilt areas, providing usable open space when possible
- Make usable open space, not surface parking, the central focus of larger projects

5 Design for Sustainability

- Use durable building materials
- Use energy-efficient building design and technologies
- Minimize stormwater runoff

The Infill Design Toolkit

A guide to integrating infill development into Portland's neighborhoods

This guide is intended to serve as a resource for community members—builders, designers, neighbors and others—all who are involved in designing, building, or participating in dialogue about the new development that continues to shape the form of Portland's neighborhoods. Its focus is on new "infill" development in established neighborhood areas, particularly where continuation of positive aspects of existing character is a community priority. Infill development can take place as construction on vacant land or as redevelopment that replaces pre-existing buildings.

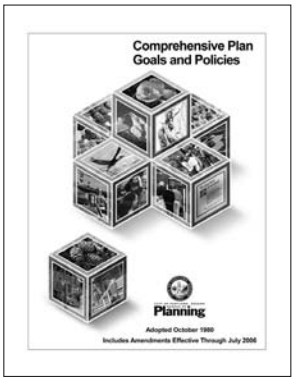
The various components of this guide serve as problem-solving tools, highlighting strategies for achieving context-sensitive design in infill development and ways of overcoming some of the unique design challenges of infill development on small sites.

The initial components of the *Infill Design Toolkit* are focused on medium-density residential development (such as rowhouses, plexes, courtyard housing, and low-rise multifamily development). Future additions to the Infill Design Toolkit will focus on other types of infill development, such as development along main streets and other higher-density corridors, and new housing in single-family zones. For guidance on appropriate design for mixed-use centers (for example, Hollywood, St. Johns, Gateway), see area-specific policy plans and design guidelines.

The *Infill Design Toolkit* is composed of the following sections on:

- **Strategies—**highlighting "best practices" for integrating new development into neighborhood patterns and showing how to identify these patterns.
- **Prototypes—**illustrating "approvable" housing types and configurations that are suitable for common infill situations, meet City regulations and design objectives, and are market feasible.
- **Technical Pages—**providing more detailed, technical information on strategies that can contribute toward quality infill design.
- **Project Profiles—**providing information on completed projects with design features that contribute to meeting the community's design objectives. The profiles are followed by examples of historic Portland housing and international precedents.
- **Neighborhood Design Policies—**a compilation of policies and other design guidance from Portland's adopted neighborhood and community plans.

Note that information included in these sections should be considered to be suggestions only. The design strategies and other materials included here do not hold any standing as design policies or as design review criteria. Nor do they supercede the area-specific standards and guidelines that apply in historic districts and plan districts. The Zoning Code *and other regulations, as well as City staff from relevant regulatory bureaus, should be consulted regarding details related to the regulatory provisions referred to in this document.*



Portland's Comprehensive Plan

Goal 12.6 ("Preserve Neighborhoods") objectives:

1. Encourage new developments to respond to the positive qualities of the place where they are to be built and to enhance that place through their development.
2. Respect the fabric of established neighborhoods when undertaking infill development projects.
3. While accommodating increased density build on the attractive qualities that distinguish the area. Add new building types to established areas with care and respect for the context that past generations of builders have provided.

Compatibility: More About Patterns, Less About Details

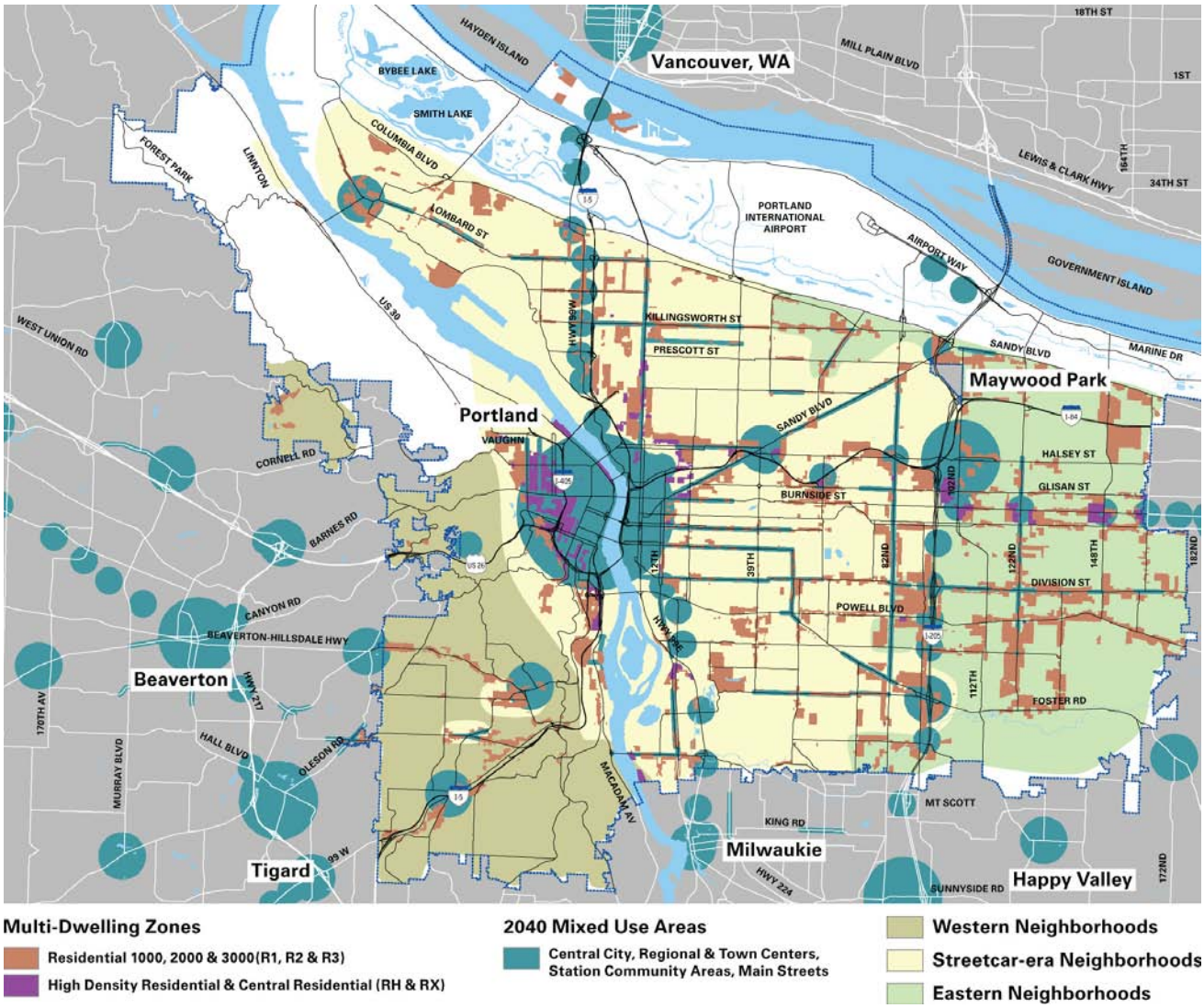
Portland's design policies, including *Comprehensive Plan* Goal 12.6, call for infill development in established neighborhoods to be designed to respect positive aspects of neighborhood context. Reinforcing this emphasis, nearly all of Portland's adopted neighborhood plans call for new development in established residential areas to be "compatible" with existing community character *(see section on Neighborhood Design Policies)*. While it is one of the most frequently recurring terms associated with community objectives for the design of infill development, the vagueness of "compatibility" has also been the source of much contention, especially as it relates to new, higher-density infill development that is typically larger in scale than existing housing.

How to achieve some measure of compatibility is the primary focus of the Infill Design Toolkit. Compatibility, as treated in the Toolkit, is not about replicating existing scale or reproducing the architectural styles of nearby buildings. Rather, the focus is on highlighting how higher-density infill development can be designed to respond to more basic neighborhood ***patterns,*** whose continuation allows change to be accommodated while preserving cherished aspects of neighborhood character.

The housing in most neighborhoods display a variety of architectural styles. A single street in an older neighborhood may have styles ranging from Victorian, Craftsman, English Cottage, Colonial, to Modern. The architectural styles and details of new buildings change over the years, but basic patterns are more lasting. These patterns are defined by recurring characteristics—such as the green street edges of front yards and street trees and by the frontage patterns, forms, and orientation of buildings—the specifics of which vary by neighborhood, street, and block. The continuation of these patterns can accommodate a diversity of architectural styles, while providing an underlying sense of cohesion and "place" that helps define the character of neighborhoods.

Neighborhood Patterns

Portland can be characterized as having three fundamental residential neighborhood geographies, each with its own distinct development patterns and characteristics. The following map indicates, at a very general level, the locations of the inner "Streetcar-era" neighborhoods and the outer neighborhoods toward the west and east. The characterizations described here apply primarily to residential areas with multidwelling zoning, outside Downtown Portland.



Multi-Dwelling Zones

- Residential 1000, 2000 & 3000(R1, R2 & R3)
- High Density Residential & Central Residential (RH & RX)

2040 Mixed Use Areas

- Central City, Regional & Town Centers, Station Community Areas, Main Streets

- Western Neighborhoods
- Streetcar-era Neighborhoods
- Eastern Neighborhoods

Western neighborhoods

Streets are sometimes curvilinear, following contours of the area's hilly terrain. Lots in multidwelling-zoned areas are typically larger and more irregularly shaped than those in the inner neighborhoods. Multidwelling-zoned areas, primarily located adjacent to major arterial streets, also often lack the rectilinear block structure of other parts of the city. Trees and lush vegetation are unifying aspects of neighborhood character, particularly along neighborhood side streets.

Inner neighborhoods

Characterized by a fairly regular pattern of residential lots approximately 50'-wide by 100'-deep. This original platting established during the streetcar era provides a fine grain pattern of relatively small-scale buildings. The shallow lots facilitate buildings oriented to the street.

Eastern neighborhoods

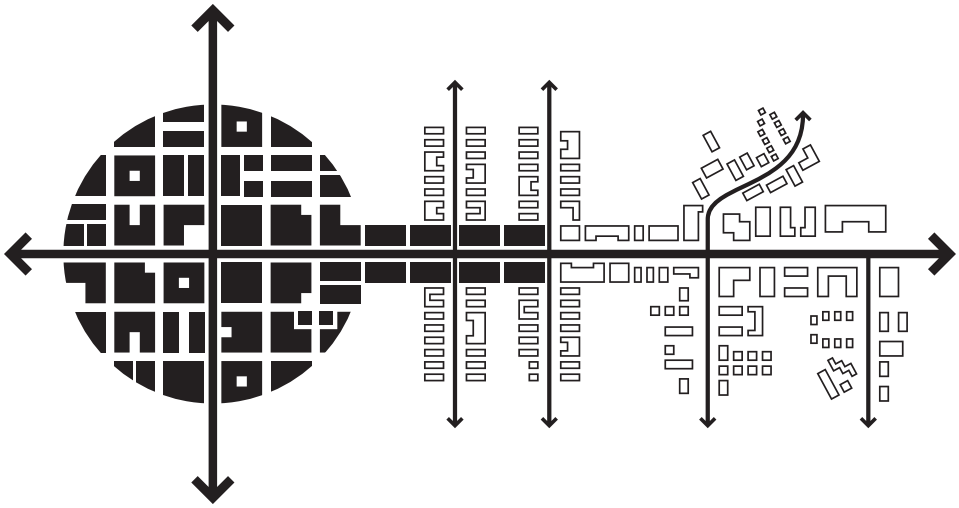
Residential areas have far less consistent lot and block patterns than the inner neighborhoods. Lots in multidwelling-zoned areas are relatively large, but disproportionately deep (often 200'-300', and sometimes even 400', deep). Rather than consistency in built patterns and architecture, trees and other vegetation are often key character-giving elements of residential areas.

Context

Medium-density zoning and development occurs in areas of diverse architectural character that require differing design approaches if new development is to be compatible or contribute to their desired character. While the diversity of neighborhood contexts can be difficult to categorize, represented below are four basic types of neighborhood contexts typical of where medium-density development occurs.

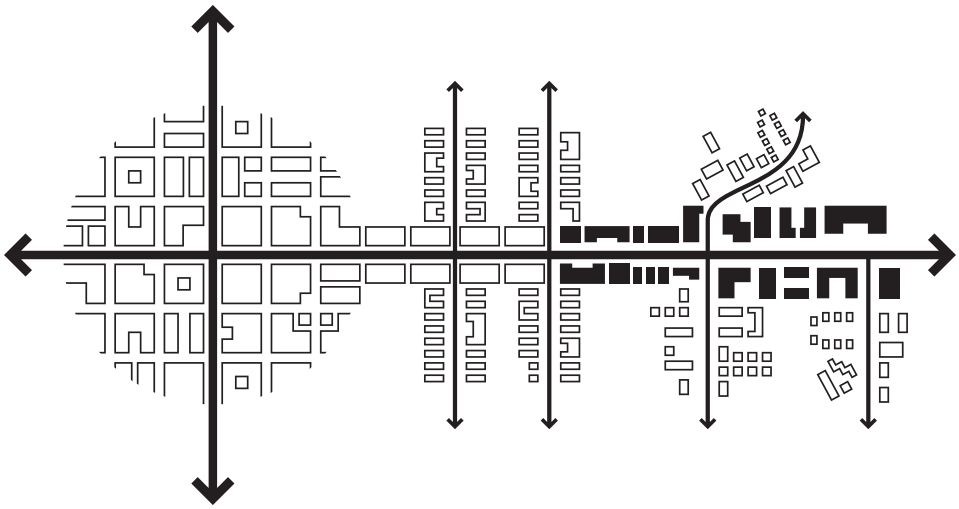
Mixed-use centers and main streets

Buildings are typically located close to sidewalks, with little or no front setback. A relatively continuous streetwall of multistory buildings provides a strong street edge, creating a sense of enclosure that defines the urban space of the street.

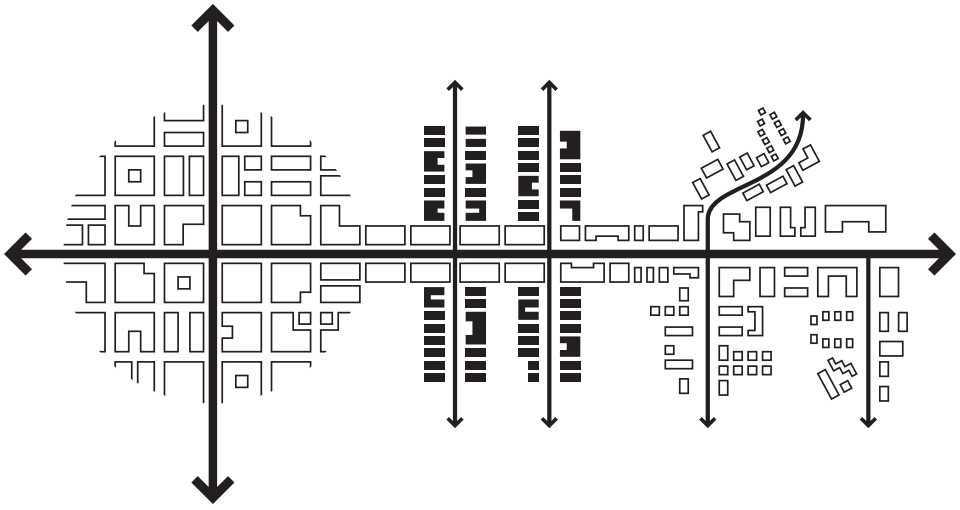


Residential corridors

Located along major streets, development in multifamily-zoned corridors should contribute to creation of a strong street edge of buildings, but with landscaped front setbacks that highlight their residential character and provide a buffer for residences from street traffic.

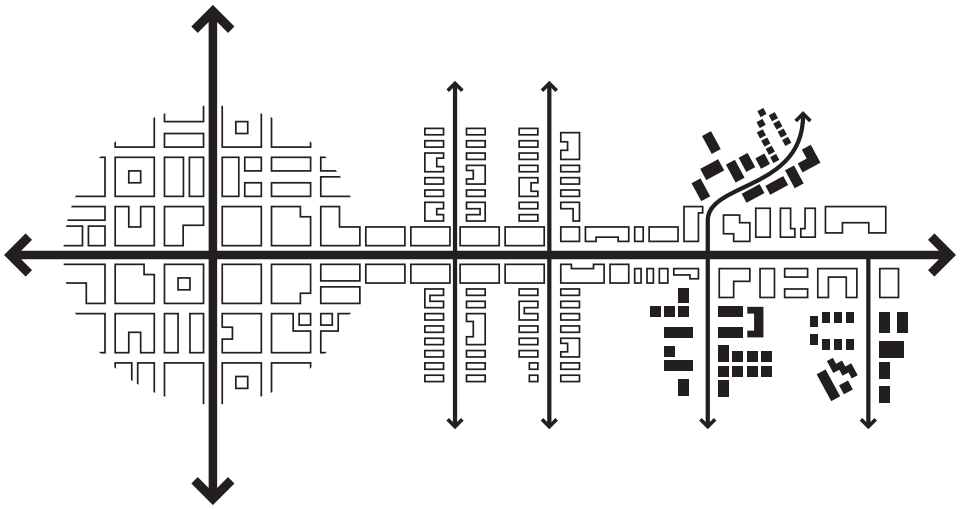


Note that in many cases, these typologies refer more to desired ***future*** character, rather than existing character. This is particularly so regarding areas where growth and change are intended to be concentrated, such as mixed-use centers, main streets, and corridors; where the low-lying buildings that predominate in some areas will be replaced by more intense development over time. Outside of these areas, along nearby residential side streets, the continuation of ***existing*** character tends to be a greater community priority. ***The focus of this guide is on the design of development along the residential side streets, and therefore places an emphasis on strategies for responding to existing context.***



Residential side streets—inner neighborhoods

A green edge of landscaped setbacks and courtyards, combined with a less continuous street wall of buildings, differentiate these streets from the hardscape of mixed-use centers and main streets. The rhythm of buildings along these streets typically reflects patterns established by houses on 50'-wide lots.



Residential side streets—outer neighborhoods

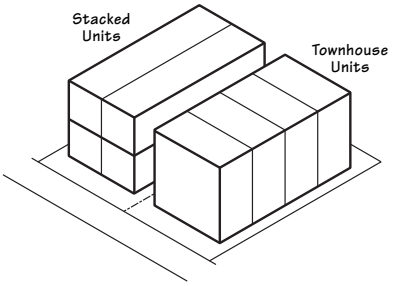
Trees and vegetation define the cherished character of these areas, often to a greater extent than building-defined street edges or architecture.

What is Multi-dwelling Development?

The following summarizes the terminology used in reference to the different housing types that constitute "multi-dwelling development" or that are being built in the multi-dwelling zones. Portland classifies a wide range of residential development types that feature more than one dwelling unit on a shared lot as "multi-dwelling." Multi-dwelling development includes:

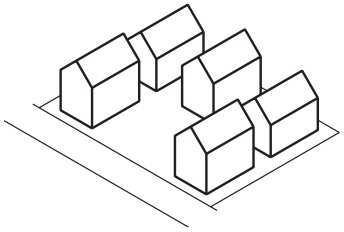
Plexes (most commonly triplexes and fourplexes)

Often have a house-like form, can be in stacked-unit ("flats") or townhouse configurations.



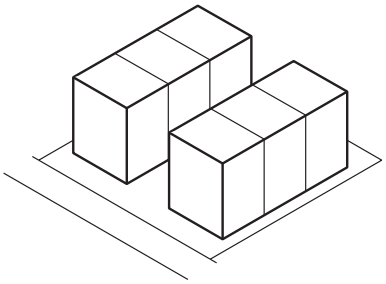
Cottage Clusters

Detached houses on a shared lot, often oriented around a common open space.



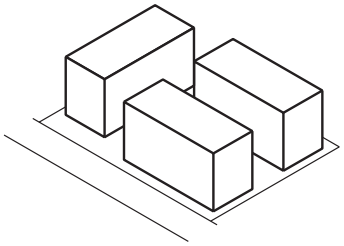
Courtyard Townhouses

Units similar to rowhouses, but feature a shared driveway and are often oriented around common open space, rather than to the street.



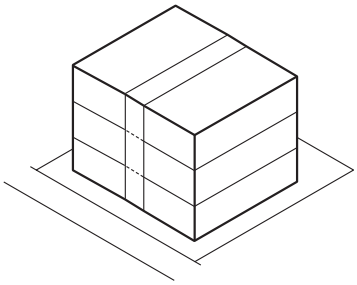
Apartment Complexes

Clusters of low-rise apartment buildings. Only possible on larger sites.



Block Apartment Buildings

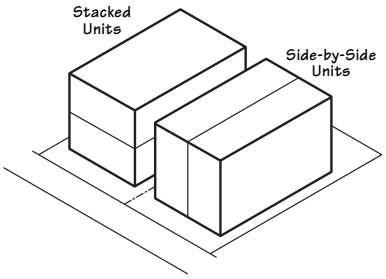
Multi-story apartment buildings with a shared main entrance and with stacked units accessed by interior corridors.



Other housing types, not classified as "multi-dwelling" housing, but commonly built in the multi-dwelling zones include:

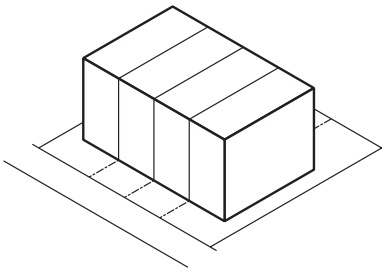
Duplexes

A two-unit structure on a shared lot. Two attached units on separate lots are classified as rowhouses.



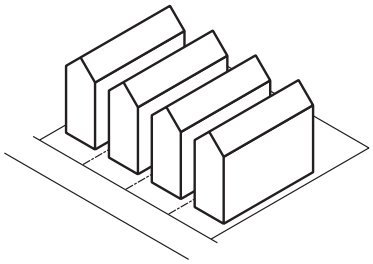
Rowhouses (also "attached houses")

Attached units, each on a separate lot, and each with its own entry from a public street.



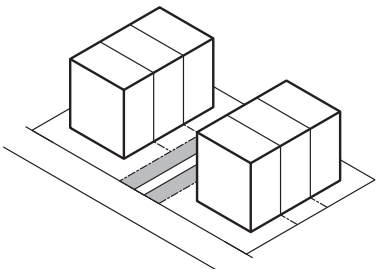
Narrow Lot Houses

Detached houses on narrow lots, with density similar to that of rowhouses.



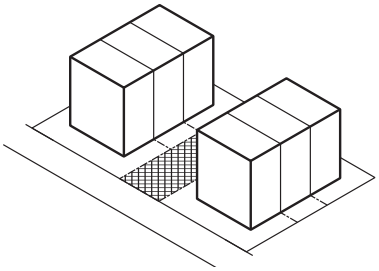
Common Green Housing

Housing units, on separate lots, oriented to a landscaped courtyard that provides pedestrian access.



Shared Court Housing

Housing units, on separate lots, oriented to a courtyard-like street shared by pedestrians and vehicles, with special paving and other features that highlight prioritization of pedestrians and community activities.



Medium-Density Zones: What Can Be Built?

The medium-density multi-dwelling zones—R3, R2 and R1—allow a wide-range of residential building types. Below is a summary of some of the basic regulatory parameters governing the intensity and scale of development allowed in the medium-density multi-dwelling zones. The images are examples of projects built in each zone—the upper images highlighting development at the upper limit of allowed building scale and the lower images showing projects at the lower end of intended development intensity.






R3	
Allowed Density*	
Max:	1 unit per 3,000 SF of site area
Min:	1 unit per 3,750 SF of site area
(3 units on a 10,000 SF site)	
Building Height	
Maximum 35 feet	
Minimum Building Setbacks	
Front:	10 feet
Side/ rear:	5–14 feet (depending on size of building wall)
Building Coverage	
Maximum 45% of site area	
Landscaping	
Minimum 35% of site area	

R2	
Allowed Density*	
Max:	1 unit per 2,000 SF of site area
Min:	1 unit per 2,500 SF of site area
(4–5 units on a 10,000 SF site)	
Building Height	
Maximum 40 feet	
Minimum Building Setbacks	
Front:	10 feet
Side/ rear:	5–14 feet (depending on size of building wall)
Building Coverage	
Maximum 50% of site area	
Landscaping	
Minimum 30% of site area	

R1	
Allowed Density*	
Max:	1 unit per 1,000 SF of site area
Min:	1 unit per 1,450 SF of site area
(7–10 units on a 10,000 SF site)	
Building Height	
Maximum 45 feet	
Minimum Building Setbacks	
Front:	3 feet
Side/ rear:	5–14 feet (depending on size of building wall)
Building Coverage	
Maximum 60% of site area	
Landscaping	
Minimum 20% of site area	

**Note: Accessory dwelling units (ADUs) can exceed the maximum allowed density. Also, minimum required densities for sites smaller than 10,000 SF are less than those shown here.*

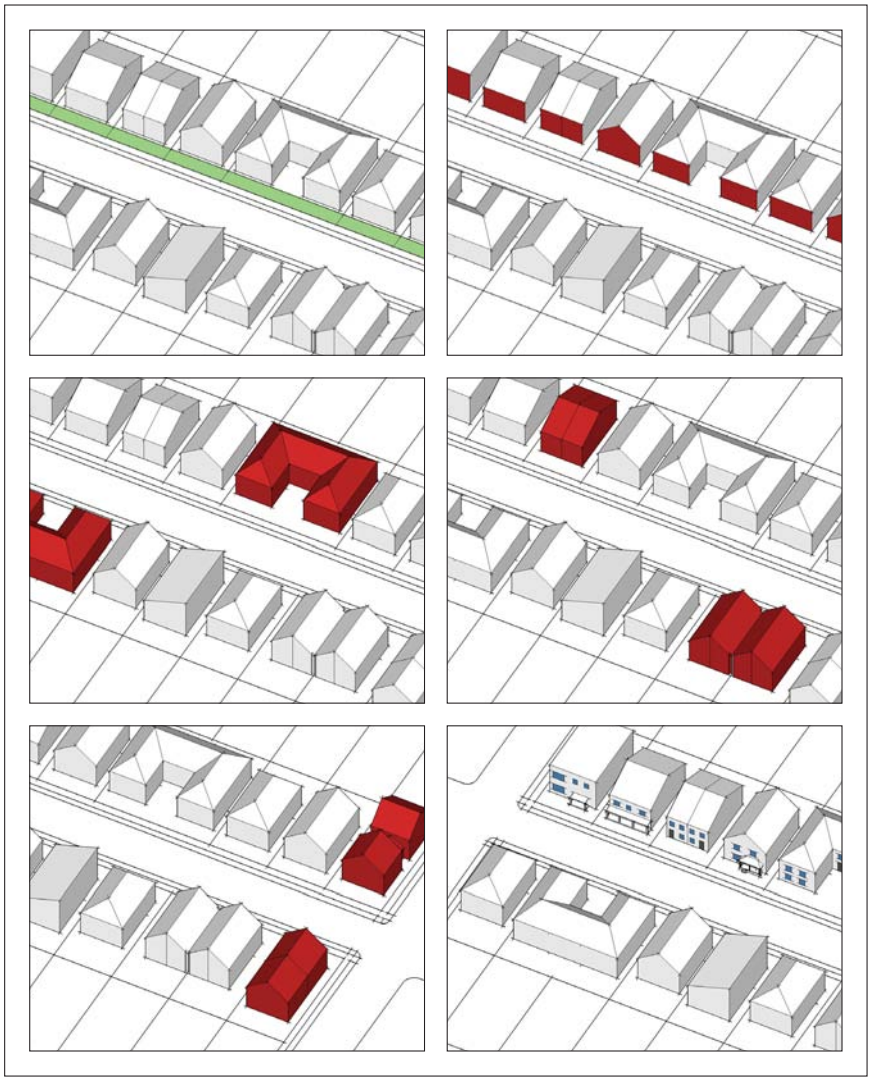
Infill Design Strategies

Best practices for context-responsive infill design

This section presents a summary of best practices for integrating new medium-density housing into the fabric of existing neighborhoods. The strategies presented are particularly oriented to development in the R1, R2, and R3 multidwelling zones, but can also be relevant to infill development in the R2.5 and RH zones and to medium-density residential projects in commercial zones.

Components

Respond to Basic Neighborhood Patterns 3
Integrate Parking 15
Minimize Scale Contrasts 29
Limit Privacy Impacts 35
Create Usable Outdoor Spaces 39
Alternative Housing Types 45

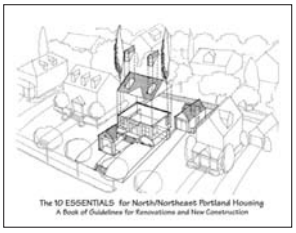


The Infill Design Toolkit:
Medium-Density Residential Development

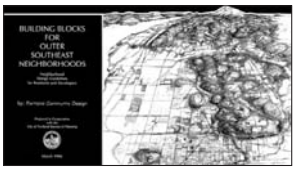
A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008



The 10 Essentials for North/Northeast Portland Housing (1991)



Building Blocks for Outer Southeast Neighborhoods (1996)

Focus on Patterns, Spaces, and Housing Types

The residential streets of Portland's neighborhoods often include a diversity of architectural styles and housing types, yet present a sense of cohesion due to recurring patterns—such as street-oriented buildings, fine-grain "rhythms" of development, and green street edges created by front yards and gardens. *The focus of this section is on strategies for continuing these and other fundamental neighborhood patterns,* with particular attention paid to the integration of parking and minimization of scale contrasts—which are often key challenges to integrating higher-density development into neighborhoods. This section also focuses on challenges resulting from the space limitations typical of higher density infill development, highlighting strategies for limiting privacy impacts and creating usable outdoor spaces. Finally, this section highlights alternative types of medium-density housing appropriate for infill situations. For information on other, more detailed, aspects of design—such as those related to architectural details, entrance treatments, roof forms, etc.—other Planning Bureau documents should be consulted, including *The 10 Essentials for North/Northeast Portland Housing* (1991) and *Building Blocks for Outer Southeast Neighborhoods* (1996)

Respond to Basic Neighborhood Patterns

Basic neighborhood patterns to look for to inform the design of infill development, explained further below, include:

Street frontage characteristics 4
Rhythm of development along the street 5
Building orientation 9
Front setback patterns 10
Landscaping and trees 11
Backyard patterns and topography 12
Architectural features 13

The inclusion here of these aspects and the related design strategies that follow are not intended to suggest that these patterns must be continued in all cases. Rather, they should be read as suggestions for context-responsive strategies if these aspects are important to the community. Neighborhood plans and community members should be consulted to determine their relevancy to any specific site and neighborhood.

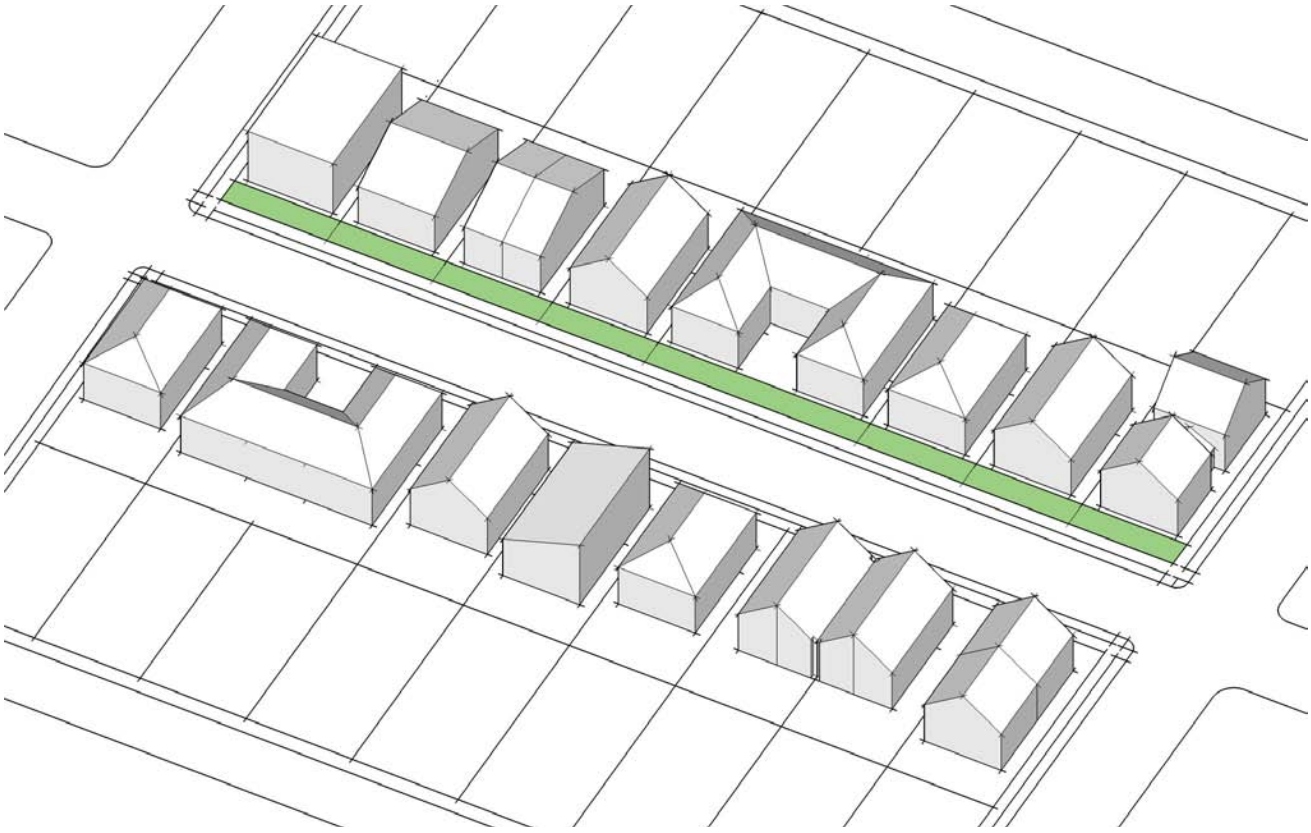
The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

STREET FRONTAGE CHARACTERISTICS

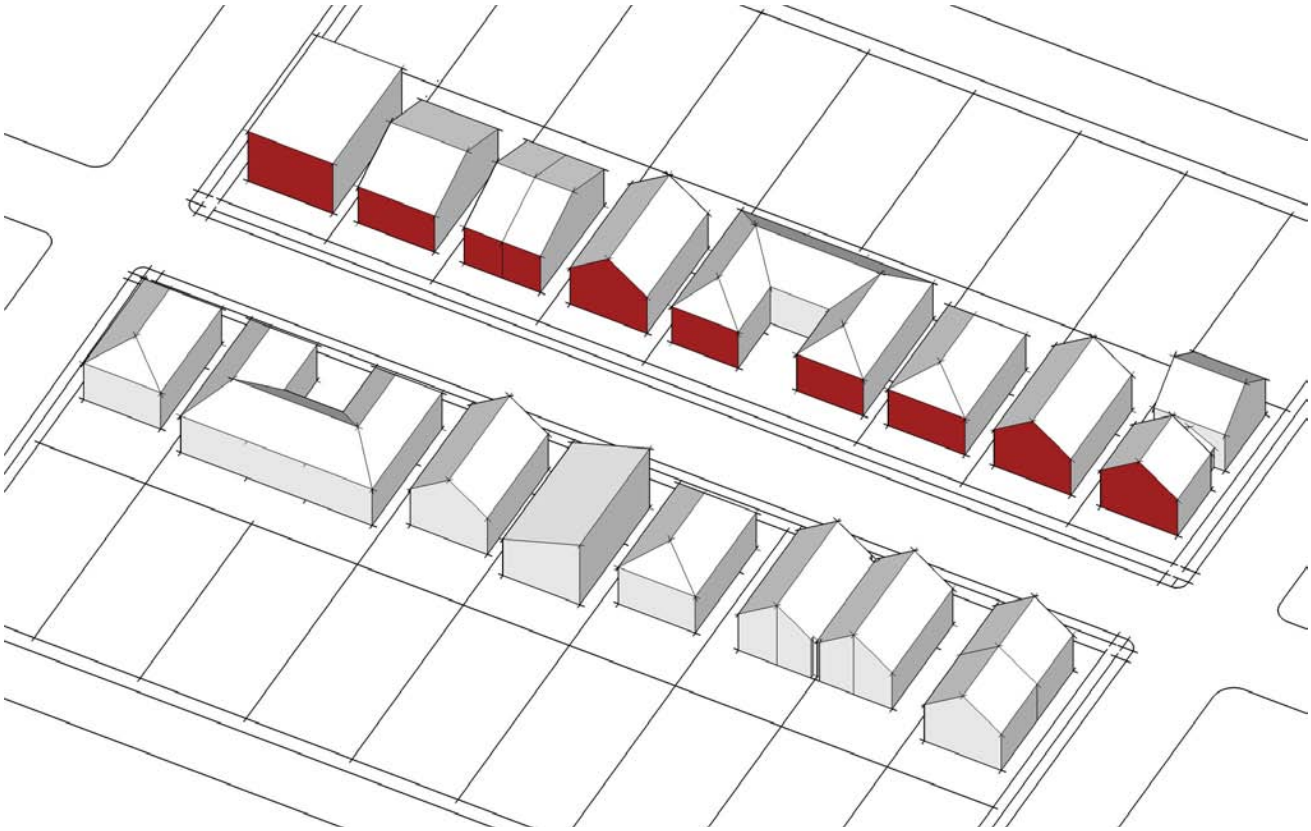


Green street frontages

Most neighborhood residential streets in Portland are characterized by landscaped setbacks between the fronts of buildings and sidewalks. This "green edge" provides residential streets with a clearly-identifiable character that serves as a counterpoint to the "hardscape" of commercial main streets. In many areas, this green edge is reinforced by planting strips and street trees.

Principle: Along residential side streets, limit interruptions to front setback landscaping. A key way of achieving this is by minimizing the amount of frontage devoted to paved vehicle areas *(see pages 15–28).*

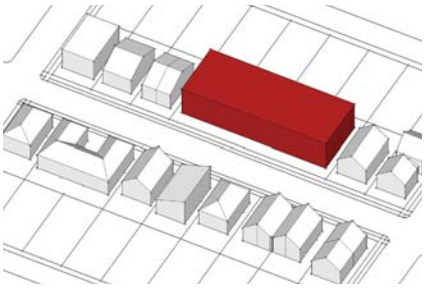
Contemporary infill (upper)—front landscaping ties these attached houses into the neighborhood fabric (City Life demonstration project—1995). This provides a stronger contextual fit than the rowhouses (lower), despite the latter's more traditional architectural details. That shed roof forms are used instead of gables is of less consequence than the continuation of neighborhood street frontage arrangements.



Rhythm of development along the street

Neighborhood block frontages are often characterized by a consistent rhythm of development created by recurring building patterns. In inner neighborhoods this is typically defined by development patterns established by the original platting pattern of 50'-wide lots.

Principle: Continue established building rhythms along street frontages.



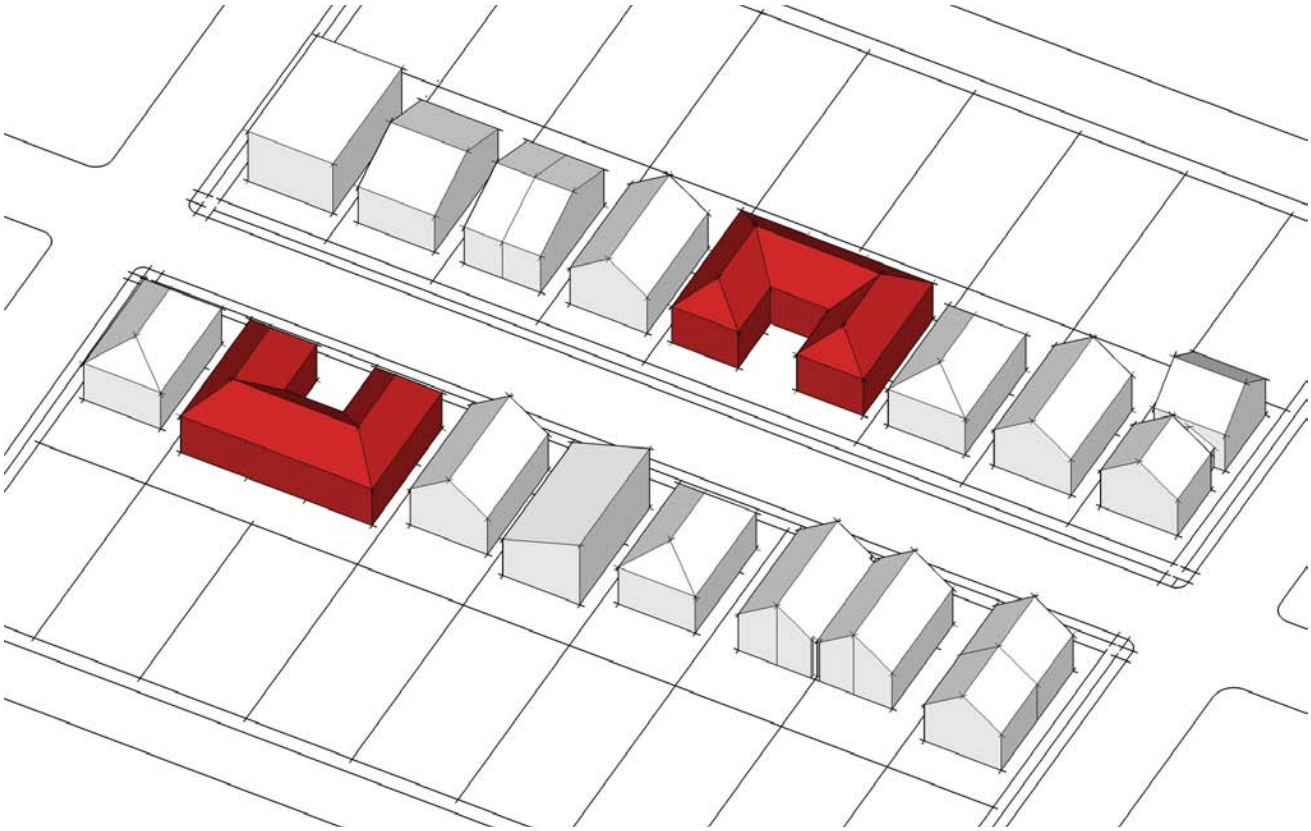
Avoid *monolithic massing—disrupts fine-grain neighborhood pattern*

Street lined with houses, duplexes, and fourplexes built in the early 20th Century. The rhythm of development along the street is consistent, despite differences in density.

Contemporary infill continues street frontage rhythm

Projects on sites larger than nearby houses can continue such patterns by dividing buildings into volumes reflective of the established building rhythm. Conversely, projects of small-lot land divisions (such as those comprised of 25'-wide lots) can often best respond to neighborhood context by including attached houses, instead of using of narrow houses on each lot. In older neighborhood houses, paired attached houses can achieve a much more successful continuation of established patterns than is possible with narrow, detached houses, which can disrupt established neighborhood patterns characterized by houses on 50'-wide lots.

RHYTHM OF DEVELOPMENT ALONG THE STREET | COURTYARD HOUSING

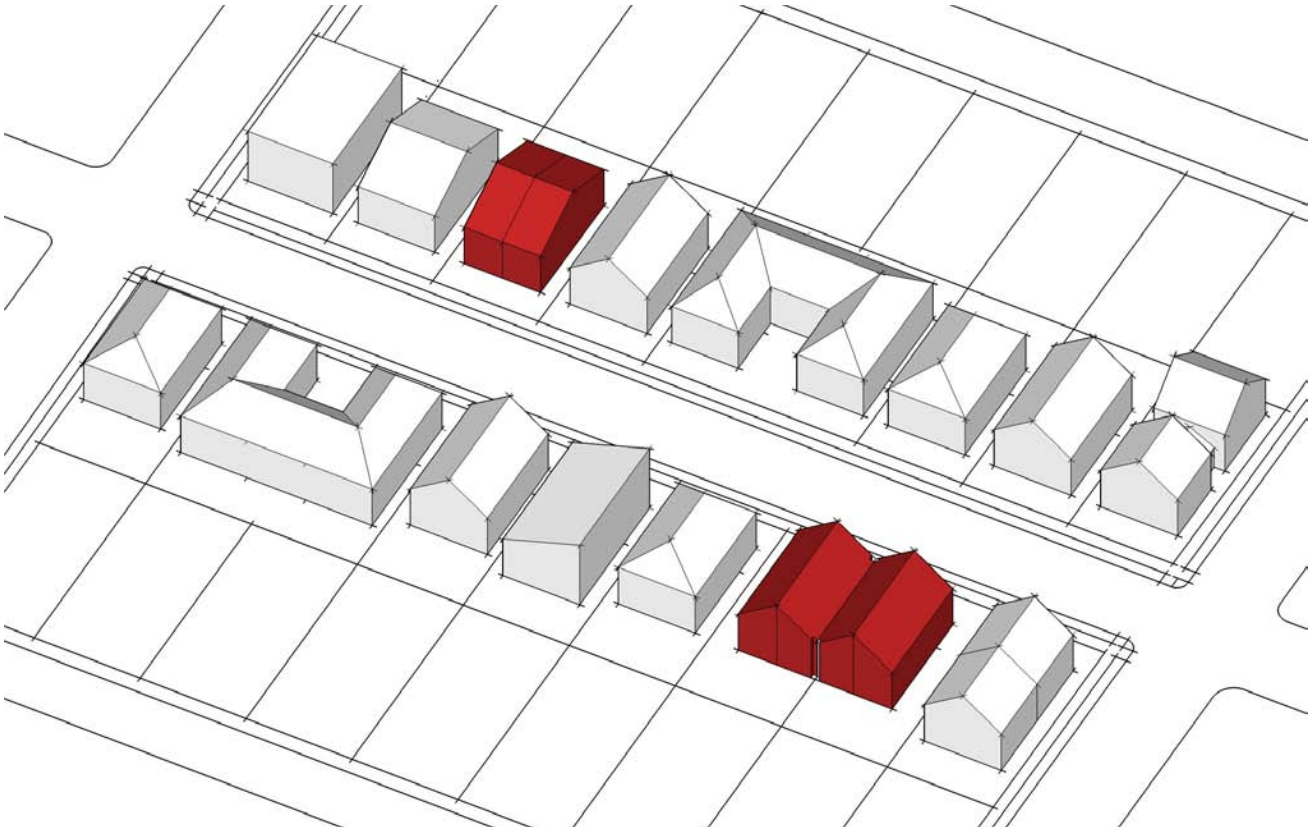


Courtyard housing. The divided massing of courtyard housing, especially when street-fronting units have house-like forms, provide opportunities to integrate higher-density housing into neighborhood patterns where detached houses predominate.

1920s courtyard apartments. Form of end units reflects neighborhood context of detached houses.

Recent courtyard housing examples with house-like forms at street frontages

RHYTHM OF DEVELOPMENT ALONG THE STREET | PAIRED ROWHOUSES



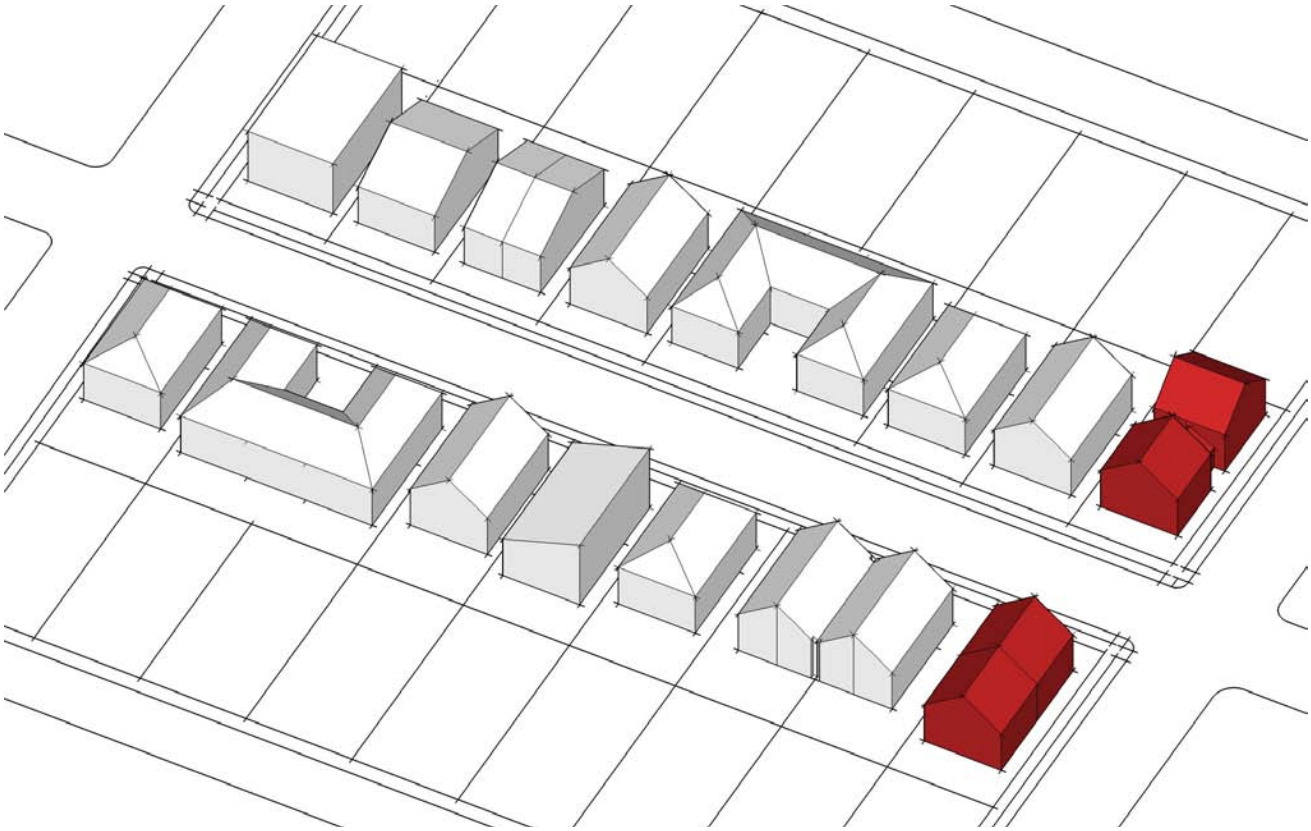
Paired rowhouses. Divide rowhouse projects into paired units, with massing reflective of nearby detached houses. Contextual fit can be optimized by pairing units under the same roof form, instead of using separate gables for each unit.

Four-unit rowhouse project divided into distinct building volumes, with two units under each gable, that reflect massing of nearby houses (pre-existing house visible to right)

"House" at center is actually two side-by-side rowhouse units, each only 10' wide. Their combination into a single house-like form avoids any appearance of being overly narrow and continues the neighborhood rhythm.

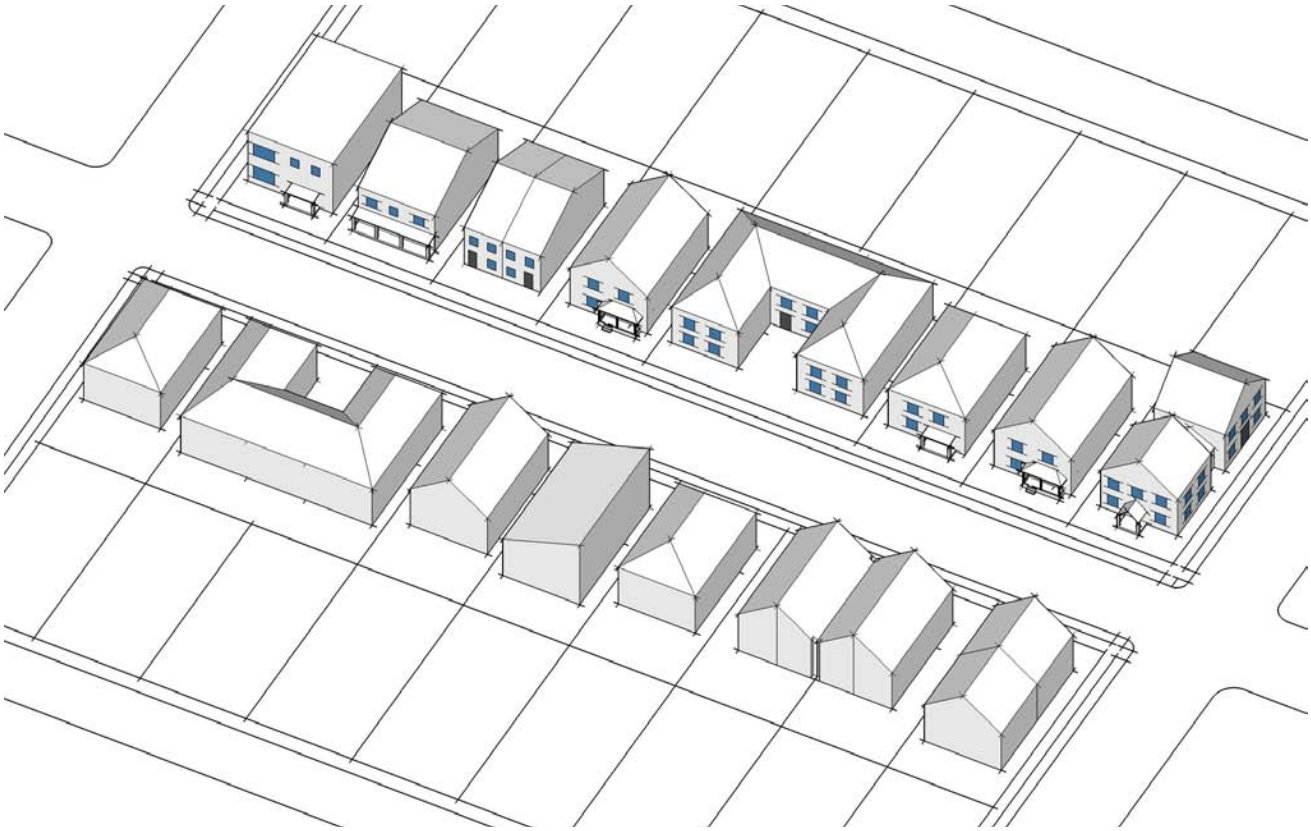
Examples of paired rowhouses (also called semi-detached houses)—continue patterns established by houses on 50'-wide lots

RHYTHM OF DEVELOPMENT ALONG THE STREET | CORNER ATTACHED HOUSES



Corner Attached Houses. Corner sites provide opportunities for attached houses to reflect neighborhood patterns, by enabling units to be oriented to different street frontages, providing the appearance of distinct houses.

Attached houses (joined at garage visible in top image) divided into volumes similar in form to nearby detached houses.



Street orientation

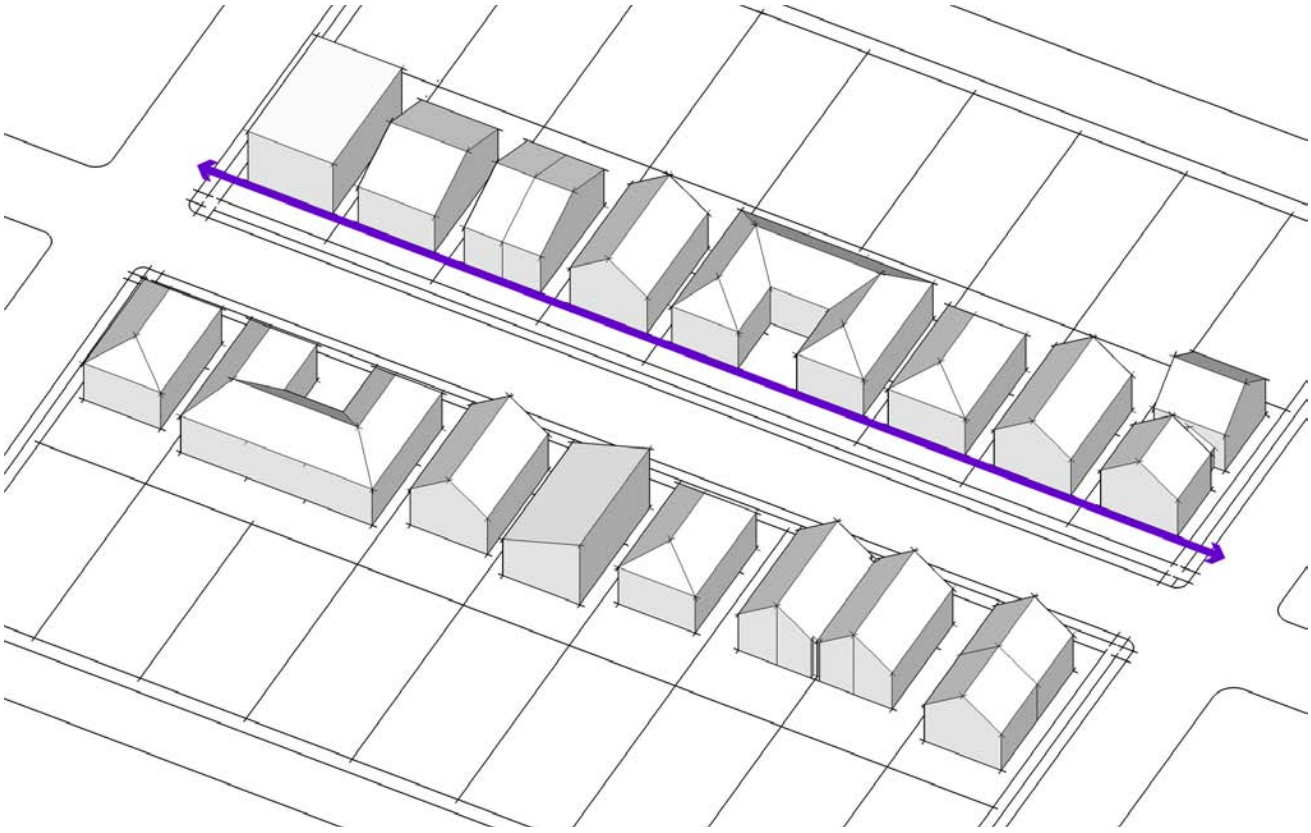
Buildings oriented toward streets are a key characteristic of Portland's neighborhoods. This orientation is achieved by having features such as windows, main entrances, and porches oriented toward the street. This street orientation also contributes toward a pedestrian-friendly street environment, providing a visually-rich street edge; and contributes to safety by allowing residents to survey street activity (the "eyes-on-the-street" concept).

Principle: Along street frontages, orient windows, main entrances, and other primary building façade elements toward the street. Care should be taken to avoid the appearance of buildings turning their backs or sides toward the street. Courtyard buildings can contribute to this by orienting main entrances toward courtyards that serve as a semi-public extension of the public realm of adjacent streets.

Triplex with "front" doors and most windows oriented toward side, away from street.

Contrasting images of similarly-configured apartment developments, but featuring very different street orientations. *Left example includes main entrances and many windows oriented toward the street. Porches bring additional prominence to the street-facing entrances, while architectural details and façade articulation provide additional visual interest that contributes to a pedestrian-friendly street environment. Right example appears to "turn its back" to the street, with no main entrances along the street frontage and large areas of blank wall.*

Triplex with main entrances, windows, and porches oriented toward street.



Front setback patterns

Some streets feature consistent front building setbacks that help define neighborhood character.

Principle: Continue established building setback patterns, where this is a neighborhood priority and is practical. Note: deep front setbacks can compromise the ability to provide backyard space and/or rear parking, particularly at higher densities.

Shallow setbacks along a Lair Hill street

Generous setbacks along an Irvington street lined by a mix of apartment buildings and houses

Landscaping and trees

In outer neighborhoods the predominance of landscaping and trees are often more central to neighborhood character than the architecture and building frontage patterns.

Principle: Use landscaping and trees to achieve compatibility in areas where these are unifying elements of community character.

An urban neighborhood is almost invisible beneath a vast green canopy—created, in large part, by street trees.

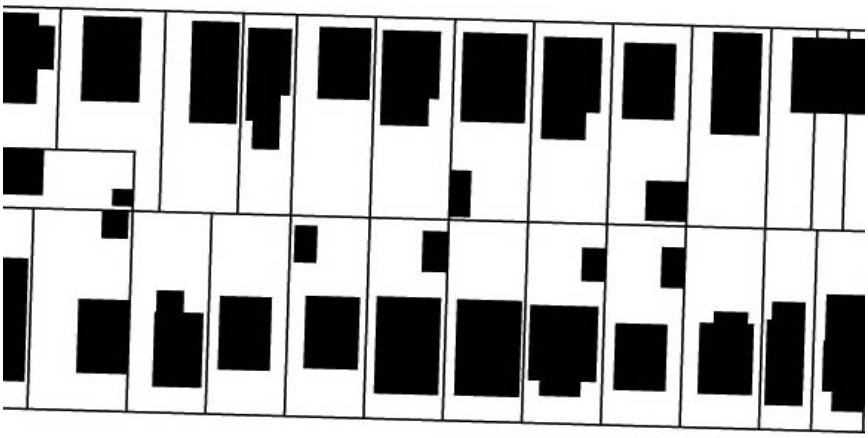
Street trees and neighborhood character. Street trees can be as central to neighborhood character as development patterns or architecture, as these views of Northeast Portland highlight. To help continue this tradition when undertaking infill projects, minimize driveway widths and curb cuts to maximize opportunities for street trees. Careful consideration should be given to selecting tree species appropriate for the planting strip width, site conditions, and surrounding context (contact the City Forester for more information).

Backyard patterns

Most residential areas zoned for medium-density development have established patterns of backyards, which create a much-valued "private realm" of outdoor spaces that contrast functionally with the "public realm" of street frontages. Infill development which intrudes significantly into the backyard realm can have substantial privacy and solar access impacts and is often a key concern of neighbors *(see pages 35–37)*.

Principle: Respect the backyard realm by minimizing intrusions by larger structures, where this is a priority.

Note: Courtyard housing, which provides opportunities for reflecting established street frontage patterns through courtyard landscaping and divided building volumes, tend to intrude into the backyard realm (see page 48). *Such trade-offs need to be considered.*

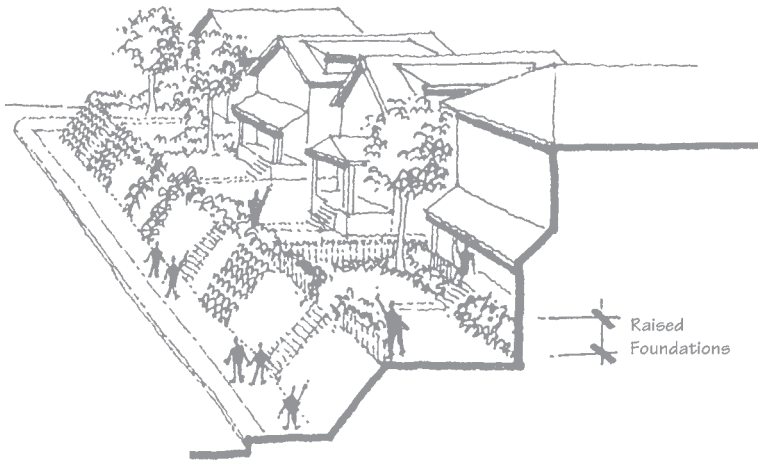


Topography and Grade

Raised lots are a character-giving feature of some neighborhoods, as are patterns established by the predominance of houses with raised foundations.

Principle: Continue characteristic aspects of neighborhood topography, such as raised lots and the relationship of buildings to grade, in areas where these aspects form prevalent patterns.

Note: Providing for the accessibility needs of residents needs to be considered when designing buildings with raised foundations.



From The 10 Essentials for North/Northeast Portland Housing

Architectural features

Some neighborhood areas are characterized by recurring architectural features (such as porches or other entry treatments, window patterns, roof forms, building details, materials, etc.) that are valued by community members as key aspects of community character.

Principle: Consider designing buildings to respond to prevalent architectural features of the surrounding neighborhood context, especially in areas where patterns established by recurring architectural features are well-established and valued.

Note: Consideration should also be given to avoid mimicry of existing buildings, so that opportunities for the continuation of the evolution of architectural style are not stifled.

The focus of this design guide is on fundamental neighborhood patterns, rather than on the details of architectural features. For more information on the latter, see The 10 Essentials for North/Northeast Portland Housing *(1991) and* Building Blocks for Outer Southeast Neighborhoods *(1996).*

This duplex includes features common to nearby Craftsman-style houses (such as extended roof eaves supported by brackets, covered entries, pitched roof, lap siding, and window trim), while using more contemporary forms, providing the neighborhood with additional architectural variety within the framework of the neighborhood's urban fabric.

A word on "pedestrian-friendly" design . . .

Portland's neighborhood plans and design-related policies frequently call for new development to contribute toward a pedestrian-friendly street environment, which also helps achieve objectives for transit-oriented design. While the focus of this document is on infill design strategies that respond to surrounding neighborhood context, a few rules-of-thumb are listed below regarding pedestrian-friendly design because of its key place among Portland's design values and because of its frequent overlaps with issues related to neighborhood context. Besides the essential provision of sidewalks*, some ways of achieving pedestrian-friendly design as part of residential infill projects include:

- **Provide visual interest and a human-scaled level of detail, avoiding large areas of blank wall or garage doors.** People are attracted to walking along streets that provide visual interest and include elements that relate to the human scale. This can be achieved by using architectural features such as: façade articulation (breaking up larger building volumes that might otherwise appear monolithic), quality building materials that provide visual interest, window and entrance details, and porches and balconies (these provide residents a means to personalize the public frontage of their residences, particularly in higher-density situations); as well as by locating garages toward the rear of sites or by minimizing the prominence of front-accessed garages. For these strategies to be effective in contributing to a visually-rich street environment, buildings should be located close to sidewalks, which also helps to provide an inviting sense of enclosure and defines the "urban space" of the streetscape.
- **Provide convenient pedestrian access to destinations, with strong connections between main entrances and sidewalks.** This can be achieved by locating buildings and their entrances close to sidewalks, avoiding situations in which pedestrians must cross parking lots to reach buildings from sidewalks. At a larger level, concentrating destinations and residences within a community also contributes toward pedestrian accessibility.
- **Use trees and vegetation, particularly along residential streets.** Besides providing pedestrians shelter from the sun during summer months, studies have shown that people respond positively to environments rich in trees and landscaping. Street trees and planting strips also help buffer pedestrians from vehicle traffic.
- **Minimize disruptions to sidewalks.** The safety of sidewalks is diminished when there are frequent interruptions by driveways, which bring more potential for vehicle-pedestrian conflicts. These disruptions to the pedestrian environment of sidewalks should therefore be minimized, such as—in the case of rowhouses—by providing a single point of access to parking, instead of separate front driveways for each unit.
- **Provide places to rest and gather.** Particularly in larger projects, it is important to provide comfortable places along pedestrian circulation routes for residents to sit, rest, and interact.

** See the Office of Transportation's "Portland Pedestrian Design Guide" for standards and guidelines for public sidewalks*

Integrate Parking

The prominence and extent of parking and other vehicle areas along the frontages of residential infill projects should be minimized. Not only is this important for continuing neighborhood patterns of landscaped front setbacks and street-oriented buildings, but this helps contribute toward pedestrian-friendly streets; while limiting the number and width of driveway curb cuts preserves on-street parking. Strategies for rear parking arrangements and for minimizing the prominence of front parking are outlined on the following pages. As only a small portion of residential areas in Portland have existing alleys, these strategies focus on the challenges of providing parking access from street frontages.

Integrating parking in ways that do not dominate the site is one of the greatest challenges of designing infill projects

Street-oriented buildings and front landscaping typically define the character of Portland's residential streets. Prominent front vehicle areas disrupt this character.

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Structured parking

Shared structured parking, such as in the form of basement parking garages, has multiple benefits. It is the optimum higher-density parking solution in terms of meeting multiple objectives, such as:

- **Parking—**accommodates more parking than otherwise possible on small, higher density sites;
- **Outdoor Space—**allows more site area to serve as an outdoor space amenity for residents, instead of being devoted to driveways and parking;
- **Environmental—**allows less site area to be devoted to paved vehicle areas, while increasing opportunities for landscaping; and
- **Privacy—**provides an opportunity for residential units to be raised above grade, increasing privacy along busy streets.

While construction costs can be a drawback of structured parking, there are cost-efficient strategies that make structured parking practical in many situations *(see Technical Pages, Structured Parking section).*

Note: Care must be taken so that structured parking does not dominate the ground level of street frontages. This can be achieved by excavating the parking, so that living space above is brought closer to ground level, or by wrapping the front of structured parking with active building spaces.

Duplex (2003) to left, shared basement parking facilitated its development on a small urban lot.

Fourplex (1997) with basement parking (see case study, page 28).

Townhouses (Victoria Townhomes, Seattle—1999), basement parking shared with adjacent building

Rear parking

Locating parking toward the rear of sites, while less space efficient than structured parking, also facilitates opportunities for pedestrian-friendly, context-responsive street frontages. Other advantages of rear parking arrangements, particularly in regard to rowhouses, include:

- **Maximizes parking opportunities** by preserving on-street parking and often allowing two side-by-side garage parking spaces (e.g., on 20'-wide lot, a rowhouse with an alley-accessed garage can have 2 side-by-side garage parking spaces, instead of the single-car garage to which a rowhouse with a front garage is limited). At higher densities, rear parking arrangements can allow 3 parking spaces (two in rear garages, one on street), versus the 2 parking spaces (one in garage, one in driveway) common with front parking arrangements.
- **Allows ground floor living space and good entrance arrangements** (no need for tall stairways or narrow entrance corridors typical of front garage rowhouses).
- **Facilitates two-story height** (no need to stack living space above front garages).

Trade-offs to consider: rear parking can limit opportunities for back yards and can result in larger amounts of site area devoted to vehicle maneuvering space, if not carefully designed.

Rowhouses with clearly contemporary design (left), whose rear parking allows preservation of landscaped setbacks, achieving a more meaningful contextual response than is provided by the rowhouses (right), despite the latter's more traditional gabled roofs.

Rowhouses with rear-accessed parking, highlighting how this allows for continuation of the surrounding neighborhood's pattern of landscaped setbacks.

REAR PARKING

This paired rowhouse project, with only 50 feet of street frontage, illustrates that rear parking can be achieved on even very small sites. Note, however, that this results in most of the backyard being paved. The designer of these rowhouses indicated that it was only marginally more expensive to do rear parking.

Triplex (above) with rear parking on a 5,000 sq.ft. lot in the R1 zone, built to a standardized plan (see Plex Profile 2). *Note contrast with triplex with front garages (5,000 sq.ft. lot), pictured right, which highlights the very different impacts on neighborhood context resulting from their respective parking arrangements.*

Contrasting pairs of narrow-lot houses. Left, shared driveway provides access to rear parking, allowing strong street orientation (with ground-level living space and porches) and minimizing curb cuts and disruptions to front landscaping; in contrast to the examples with front garages (right).

Regulatory Tips

Rear parking arrangements are relatively easy to achieve on larger sites and corner locations. Rear parking is more challenging on small sites in mid-block locations, where it becomes imperative to use narrow driveways to provide enough room for both structures and vehicle access as well as to minimize the proportion of site area devoted to the impervious surface of driveways. Regulatory options that help facilitate rear parking include:

- Driveways of small multidwelling projects can be as narrow as 10-feet wide on sites up to 50-feet wide, as well as on larger sites when the driveway provides access to no more than 10 parking spaces and access is from a local service street.
- Multidwelling driveways serving up to 5 parking spaces can be located adjacent to side property lines if screened by a fence (minimum 3-feet high).
- Vehicle and pedestrian access can be combined within the same driveway space if paving blocks or bricks are used, as an alternative to grade-separated walkways for access to buildings without street frontage.
- Rear alley easements as narrow as nine feet can be used to provide shared access to rear parking for attached and detached houses for up to five lots (alley access to more lots requires an alley tract, which must be wider).
- Rear parking should be designed to provide a back-out distance of at least 20 feet to allow vehicles to maneuver out of parking spaces. However, vehicle area not needed for such maneuvering can be narrower.

Driveway (above), surfaced with paving blocks, providing shared pedestrian and vehicle access to rear buildings and parking—a space-efficient alternative to requirements for grade-separated walkways (top).

For other information related to driveway requirements, see Transcription and Fire Access Requirements (beginning on page B-9).

Rear Parking—solutions to potential pitfalls

The following strategies can be used to address potentially negative aspects related to rear-accessed parking arrangements.

Landscaping and trees should be used, whenever possible, to break up expanses of rear vehicle areas.

Note: While a 20' vehicle back-out distance is typically needed behind parking spaces or garages, spaces between rear garages can be landscaped or used for trees.

Whenever possible, avoid designing alleys as a paved "no man's land" (right) by including landscaping (below, left) and trees (below, right) between garages.

Use water-permeable paving (right) to help minimize the negative environmental impacts of the additional amount of paved vehicle area needed for rear parking arrangements.

REAR PARKING

Avoid rear parking arrangements that result in blank walls along street frontages. A mistake which takes away some of the design advantages of rear parking is having the "backs" of rear-accessed garages line ground-level street frontages, resulting in blank walls and a poor relationship to the street. This can be avoided by:

- **Including ground-level living space in front of garages,** or by
- **Partially excavating the garage level or berming up land in front of the garage wall,** so that living space above garages becomes the primary, street-fronting part of the building.

The lower-level, rear accessed garages of these rowhouses are partially-excavated below grade, allowing the upper living space to relate strongly to the street (providing a street relationship similar to historic patterns of houses built over partially-excavated basements).

Front Parking

Front parking arrangements, such as rowhouses with front-accessed garages, are typically more disruptive of neighborhood contexts and pedestrian-friendly street frontages than are rear parking arrangements. However, there are various ways of minimizing these impacts and the prominence of front garages:

- **Recess the garages**

- **Use other building elements, such as porches, that take "center stage."** Extending features such as porches or trellises over garages takes the focus away from garage doors, making them visually subservient to other elements.

- **Excavate into grade.** Locating garages partially below grade allows living space above to be closer to ground level, providing a stronger relationship to the street.

  This arrangement also reduces building height, allowing less of a contrast in scale in many neighborhood contexts and continuing patterns of raised foundations prevalent in older neighborhoods.

FRONT PARKING

- **Mask with landscaped berms.** In this example, integrating stairways with the berm landscaping also "grounds" the units, in contrast to the tall, raised stairways of some rowhouses that can result in an appearance of disconnection with neighborhood context.

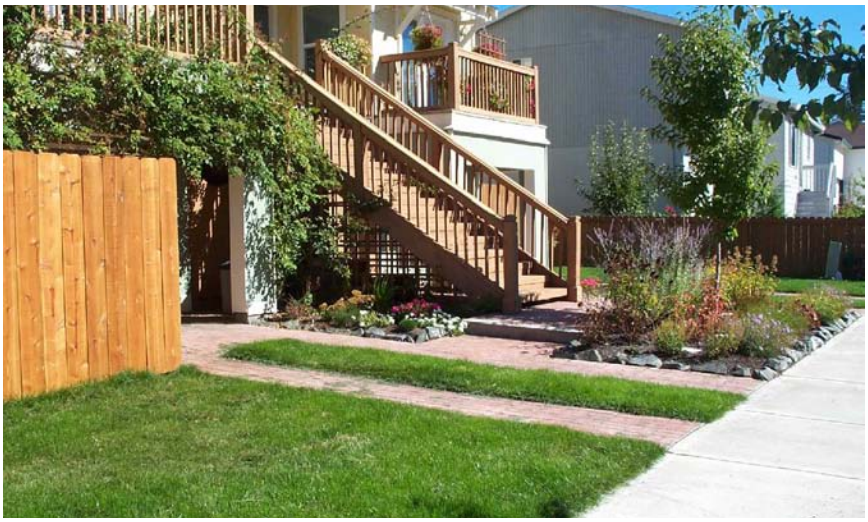
- **Combine and narrow driveways where they cross sidewalks.**

- **Use dark, subdued colors for garage doors** to minimize their prominence.

FRONT PARKING

- **Use windows in garage doors** to increase visual interest and avoid "blank wall" appearance.

- **Incorporate greenery within the driveway** (such as tread paving or grasscrete).



For optimal effect, use as many of these strategies as practical.

Parking Pads

Parking pads are a low-cost off-street parking option that allows front-accessed parking and backyards, while avoiding the negative impacts caused by garage doors on the streetscape.

Paired rowhouses with separated parking pads, allowing landscaping to be central. The Office of Transportation generally requires driveways to be paired, but will often allow separated driveways if an on-street parking space is preserved between driveways.

Narrow-lot house with parking pad (left), instead of the more usual front garage configuration (right).

Note: projects without garages should incorporate storage areas to meet needs otherwise met by garages.

No Off-Street Parking

A final option that optimizes potential for context-sensitive design is to include no off-street parking. This option is made possible by Zoning Code provisions that waive minimum parking requirements for projects located within 500 feet of a street with frequent transit service (20 minute peak hour service). The no parking option very much simplifies the design of infill development, with no need to find space to fit vehicle areas onto small infill sites, and entirely avoids the problem of how to minimize the visual and environmental impacts of parking. Not including parking also significantly reduces the cost of new housing units. In the case of rowhouses, the lack of driveway curb cuts maximizes opportunities for on-street parking; sometimes allowing as much parking as would be provided by front-accessed garages (which sometimes result in the loss of all on-street parking). Some builders have found that there is a market niche for new housing without off-street parking, with several financially successful projects recently being built.

Left: Paired rowhouses with no off-street parking. Right: Stacked duplex (built 2004) with no off-street parking on a 2,500 sq.ft. site.

Fourplex (built 2002) with no off-street parking on a 5,000 sq.ft. lot. Represents a solution for accommodating density on small infill sites, allowing a strong street orientation and a house-like form reminiscent of Streetcar Era plexes.

7-unit structure (built 2004) with no off-street parking on a 4,000 sq.ft. site. Includes 4 townhouse condominium units (over 3 ground-level studio units), which sold quickly. Developer related that buyers were more concerned about adequate bicycle storage than the lack of off-street parking.

Trade offs: Increasing competition for on-street parking is often a key concern in some neighborhoods. Proposals for infill projects that do not include off-street parking can therefore be contentious.

Case Study: Clinton Street Lofts

Small condominium project with no off-street parking

Housing type	Four townhouse units (condominiums) over three ground-level studio apartments
Neighborhood	Hosford-Abernethy
Address	2021 SE Clinton St.
Zoning	CN1
Site size	4,000 SF
Units	7
Density	1 unit per 571 SF (76 units/acre)
Parking	None
Size of units	900 SF townhouses
Year completed	2004
Developer	Robert Ross
Designer	Kevin Burgee

KEVIN BURGEE

While its contemporary design and flat roof are a departure from the architecture of nearby houses, the Clinton Street Lofts continue the neighborhood's small-lot development pattern and tradition of pedestrian-oriented building frontages.

The Clinton Street Lofts are an example of ownership housing built without off-street vehicle parking that achieved market success. This arrangement allowed the project to accommodate seven units on a small (4,000 square foot) mid-block site, which would not have been practical if on-site parking spaces were to be provided for each unit, and resulted in significant savings in construction cost. Not including vehicle parking on the 40'-wide site also helped contribute to a pedestrian-oriented street environment by allowing avoidance of driveway interruptions to the sidewalk and enabling ground-level building frontage to be occupied by living space, rather than garage.

The project consists of four two-level townhouse units over three ground level studio units. The townhouse units sold quickly as condominiums for $20,000 more than their original asking prices, with sales prices ranging from $226,000 to $246,000. Buyers were drawn to the urban amenities and pedestrian-oriented environment of the surrounding neighborhood and were more concerned about adequate bicycle storage than about car parking. This project also serves an emerging market niche by providing new low-maintenance housing with contemporary design and sustainable building features (including an ecoroof)—qualities provided by few other properties in a popular inner-eastside neighborhood where older detached houses are the predominant housing options.

Case Study: Eliot Neighborhood Fourplexes

Basement parking for small multidwelling structures

Housing type	Fourplex
Neighborhood	Eliot (Eliot Conservation District)
Address:	145 NE Sacramento Street (similar projects elsewhere)
Zoning	R2a
Site size	7,500 SF
Units	4
Density	1 unit per 1,875 SF (23 units/acre)
Parking	4 spaces in basement level (additional at rear)
Size of units	1,368 SF (3 bdrms)
Year completed	1997
Developer	William Reed/WCR Company
Designer	Michael Dowd, AIA

The Eliot neighborhood fourplexes, built by developer Bill Reed, are an example of how partially-excavated basement parking can be an economically-feasible part of small projects, when cost-efficient construction strategies are followed. Reed indicates that key to making this basement parking arrangement cost efficient was not excavating more than 4' below grade, which allowed him to avoid the need for engineered walls and associated costs. Simple poured concrete walls up to 4' high are used, with wood framing above. The parking structure is naturally ventilated, avoiding the need for mechanical systems. On top of his structured parking, Reed usually pours a 12" concrete slab with a waterproofed roof, so that it can be used as a podium. This usually does not have to be engineered, but the slab is designed to use a simple pattern of rebar that is repeated throughout the structure. The simple pattern allows for the use of less skilled labor, with no commercial contractors needed.

Reed also sometimes uses pre-engineered wall systems, such as Conform Blocks that can retain up to 8' of soil. Reed's serving as his own general contractor also helped to keep construction costs to $45–50 per square foot (1997 dollars) for the Eliot neighborhood fourplexes.

Context: Fourplex is second from right. To left of fourplex is another recent infill plex.

The resulting partially-excavated basement parking configuration allows the fourplexes to better relate to the scale of the surrounding two-and-a-half story structures (compared to what have resulted from building the parking above grade), while also allowing the units to better relate to the street, minimizing the visual prominence of the parking, and allowing for efficient use of site area.

Minimize Scale Contrasts

Higher-density infill projects are typically larger in scale than the single-family houses that predominate in most neighborhoods. Such scale contrasts are often central to community concerns about the impact of new development on neighborhood architectural character. In those neighborhood areas where the existing scale of development also corresponds to the desired future character, the following are various strategies for minimizing scale contrasts.

The Infill Design Toolkit:
Medium-Density
Residential Development

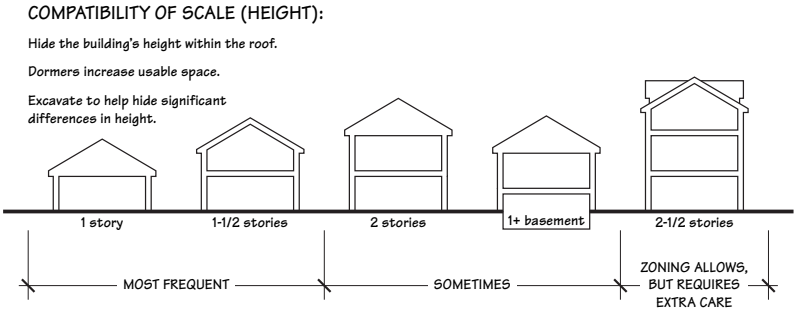
A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Accommodate upper-level living space within dormers. This reduces apparent building scale by concealing living space within the roof.

Duplex bungalow (1907) with upper-level living space within dormers (an arrangement common in the early 20th-century bungalows that predominate in many Portland neighborhoods).



From *Building Blocks for Outer Southeast Neighborhoods* (1996)

The effectiveness of the above approach, combined with partially excavated basement parking, is highlighted by these contrasting images of paired rowhouse projects with similarly-sized units:

Left: three-level rowhouses with no design treatment relieving their height and verticality.

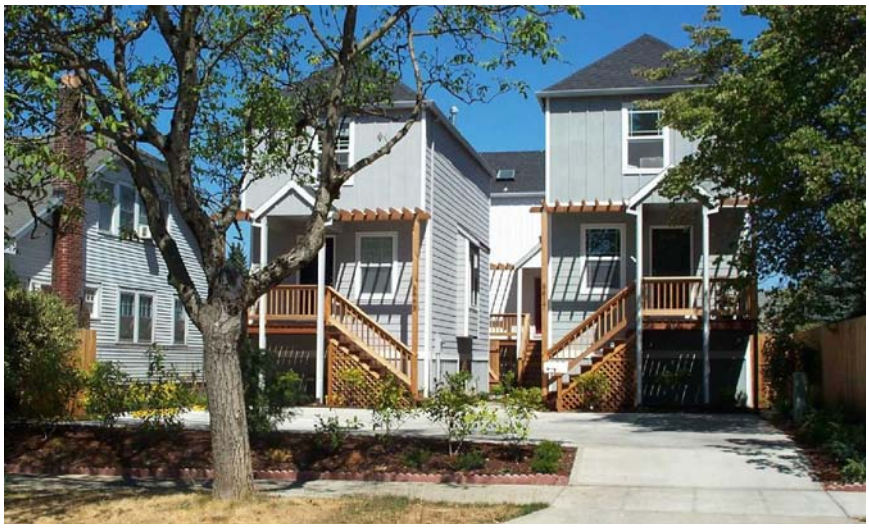
Right: three-level rowhouses with top floor accommodated within dormers and featuring excavated basement parking.

Use excavated basement level, instead of having all building area above grade.

These examples illustrate how height contrasts between three-level buildings and surrounding contexts of 1½- and 2-story houses can be minimized by lower-levels that are partially excavated (instead of at-grade).

Rowhouses with excavated lower-level garages

Fourplex with excavated basement parking



Cluster of three-level detached houses with excavated basement living space

Step back upper stories of taller structures.

Rowhouses with upper-levels set back within covered terraces, helping to mitigate their four-level height.

Three-story fourplex, with top floor stepped back.

Break-up large buildings into smaller forms reflective of the scale of nearby structures.

Apartment project in Outer East Portland, with facade divided into "house-like" building volumes.

Use porches or balconies to counteract the vertical emphasis of taller buildings.

Porches on these three-level rowhouses (above) help reduce their apparent scale, in contrast to the uninterrupted verticality of the similarly-scaled rowhouses (left).

Use single-level building volumes and horizontally-oriented building elements in areas where low-lying buildings are cherished aspects of community character.

Recent infill projects in Outer East, with design features providing a horizontal emphasis reflective of the area's characteristic low-lying housing.

Roof forms set at single-level height help mitigate the scale contrast between these paired rowhouses and the adjacent small cottage.

Use trees and landscaping to soften scale differences, particularly in areas where trees and vegetation are unifying aspects of community character. Preserving existing significant trees can be particularly effective. Note that deeper building setbacks may be necessary to accommodate plantings.

Use a change of materials and/or darker colors to de-emphasize upper levels.

The predominance of glass, combined with the subdued colors, step backs and terrace plantings of upper levels diminish apparent building scale.

PAYTON CHUNG

Upper-level step backs, differing façade materials and darker colors help focus attention on bottom two-three levels, de-emphasizing the presence of the upper stories. (Vancouver, BC)

On larger sites, provide a transition in scale to adjacent smaller houses. Sites with higher-density zoning are often located along transit streets where new development is intended to be concentrated, but at their rear often abut lower-density zoning and houses. In such situations, larger building volumes should be concentrated along the transit street, with smaller buildings toward the rear.

Limit Privacy Impacts

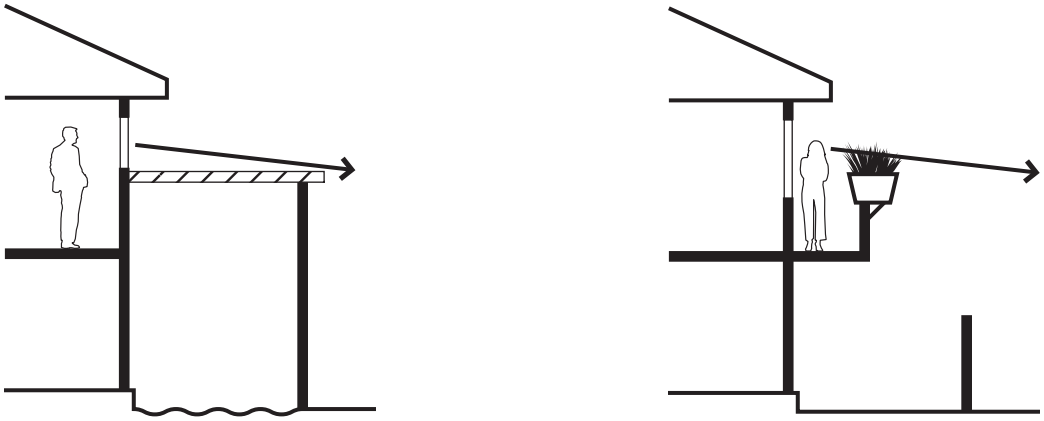
Privacy impacts caused by infill development, such as windows and balconies that compromise the privacy of adjacent residents, are often significant concerns for neighbors. Thoughtful design can minimize such impacts. There are many ways of achieving this, but all require careful consideration of the relationship of the proposed development to specifics aspects of adjacent properties.

The Infill Design Toolkit:
Medium-Density
Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

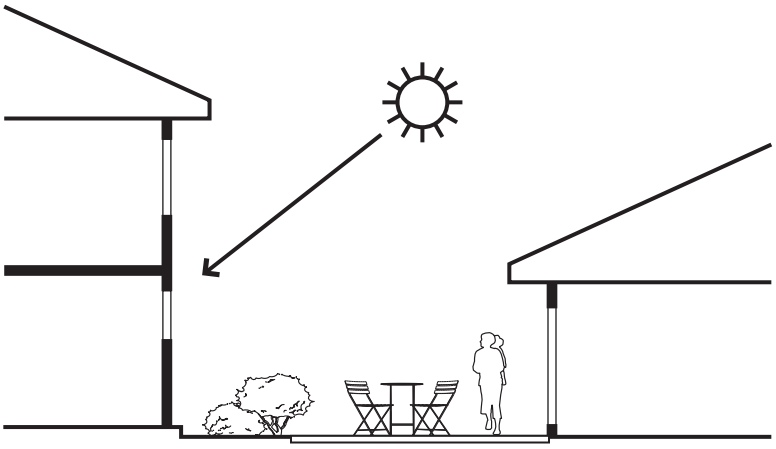
December 2008



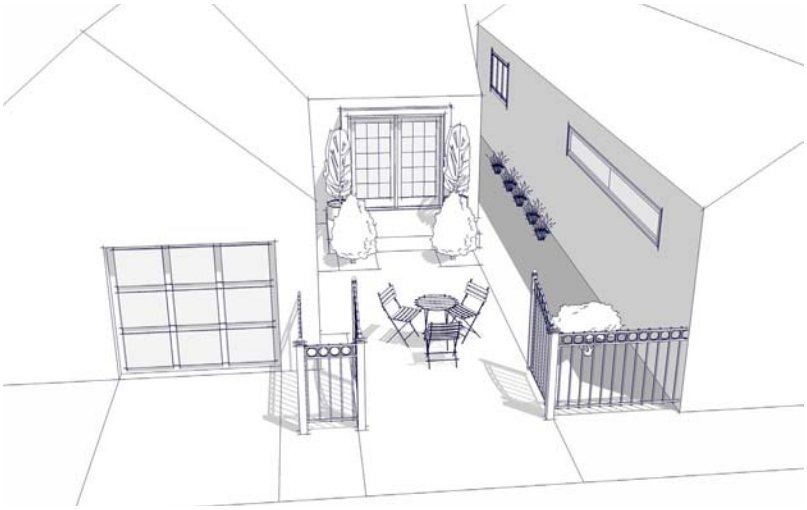
Trellises, planters, and other features can be located to obstruct views, while retaining the benefits of windows and upper-level outdoor spaces.

Locate and design windows and balconies to minimize overlook impacts on adjacent yards and residential interiors

This is especially important for configurations when sideyards are the primary private outdoor spaces for adjacent properties (e.g., sideyard easements and zero lot-line development, *see page 40*).

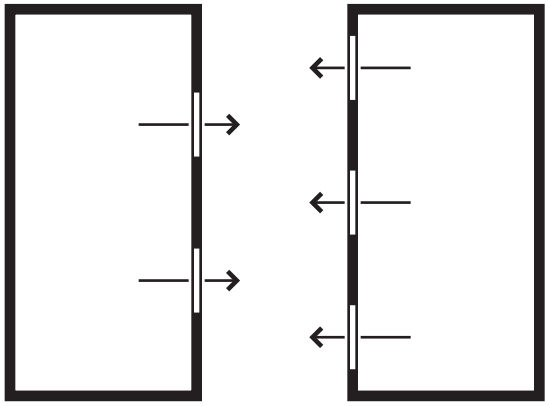


Locate windows high on walls to avoid overlook problems adjacent to neighboring outdoor space, while providing access to natural light.

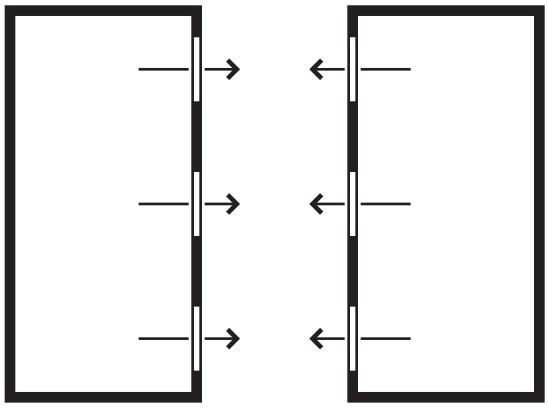


For projects in which sideyards are the primary private outdoor space, walls of abutting portions of residences not using these spaces should not have windows or should locate windows high on walls

Avoid having windows align with those of neighboring residences



This



Not this

Other strategies

Step back upper portions of taller buildings away from property lines adjoining nearby residences and rear yards to limit overlook problems and solar access impacts

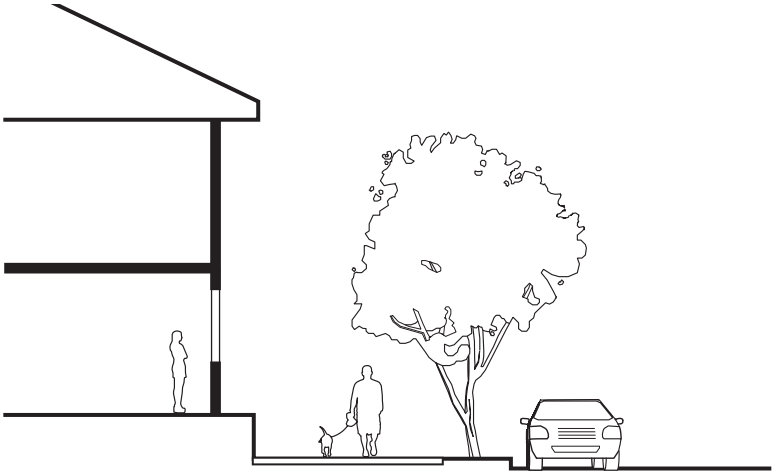
Use sight-obscuring glass or window film, if it is not practical to locate windows in ways that minimize privacy impacts. Such treatments allow access to natural light, a benefit that can be further maximized by leaving upper portions of windows unobscured.

Strategically place trees and other plantings to screen views of the private spaces of neighboring properties. If trees are intended to become large enough to screen views from upper floors, sufficient setback area must be provided to accommodate tree growth. (See the Bureau of Development Services' Tree and Landscaping Manual for the space needs of various tree species).

Consider the privacy needs of future residents

Careful attention should be paid to design that provides for the privacy of building residents and ensures livable residential environments. These considerations are particularly important adjacent to busy streets, along which much of Portland's multifamily zoning is concentrated and where residential livability can be significantly compromised without careful design. To create quality residential environments in such locations, particular care must be given to design housing so that negative impacts to the privacy of future residents are minimized. Strategies to provide a successful transition or buffer between busy streets and residential interiors include:

■ **Raise living spaces above grade**



■ **Set housing behind a landscaped buffer**

Ground-level units in this apartment building are both buffered from the street by a landscaped setback and raised above sidewalk level

■ **Locate spaces for non-residential uses or for less private household activities along ground-level street frontages**

Multifamily building with lobby/office at street frontage, with residences above

Create Usable Outdoor Spaces

At higher densities, outdoor space is too valuable to waste. The design of both the site and buildings needs to be carefully coordinated to allow for strategies that will create outdoor spaces that are usable. Not only must usable outdoor spaces be sufficiently sized, but buildings should be designed to provide convenient access to these spaces. Whenever possible, outdoor areas should be designed to be multifunctional, simultaneously serving recreational, environmental, and even vehicle access functions. Vehicle maneuvering areas, such as driveways, are an outdoor resource that often occupy a significant portion of small infill sites, but are typically used for only a few minutes each day when cars pass over them. With careful design, however, such areas can serve other valuable roles. Some strategies for creating usable outdoor space on constrained infill sites are summarized in this section.

ALLAN POLENDEY

Driveway designed as extension of patio space

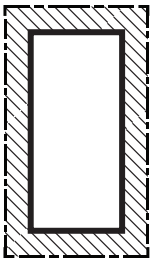
Carve out room for private outdoor space

Private courtyard on a rowhouse lot less than 1,700 square feet

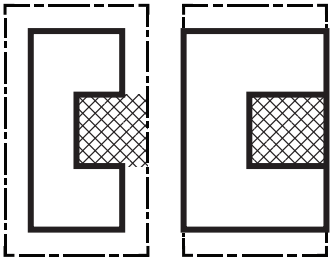
Side and rear yard setback areas are often too small to be very usable. When sufficiently-sized backyard spaces are not feasible, as is often the case on small lots or with rear-parking arrangements, alternative approaches include:

- Central courtyard space, which allows indoor and outdoor spaces to be closely integrated; and
- Side yard easements, extending over adjacent lots, which create a single usable outdoor area in place of narrow side yards, while avoiding the more expensive firewall construction requirements that would apply to structures built on the property line. Typically, one adjacent unit would use the side yard easement, with door and window connections into this space, while abutting walls of the other adjacent unit would have windows located in ways that avoid privacy intrusions *(see page 36)*.

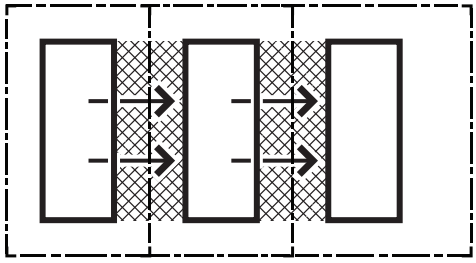
Note: central courtyards or usable sideyards are especially important when alley-accessed parking leaves little room for backyards.



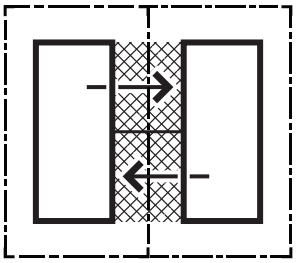
Unusable Space



Central Courtyards



Side Yard Easements



Mutual Side Yard Easements for Two Lots

Use shared courtyards

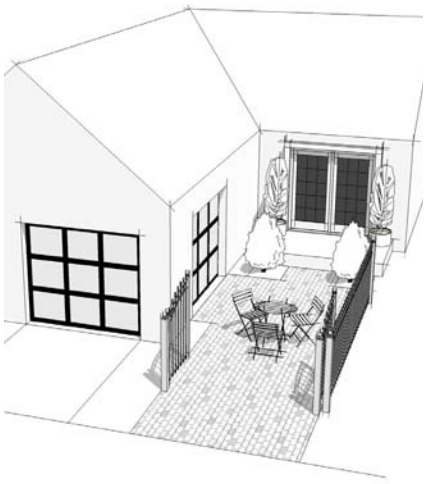
At higher densities, shared courtyards can provide larger outdoor space than would be possible to provide separately for each unit. *(See pages 46–57 for more on courtyard-oriented housing)*

Courtyard with vegetable garden and community space

Courtyards are especially useful in providing space of sufficient size to be usable by children, particularly when it is not possible to provide private yards large enough to serve as play space.

Create multi-use outdoor space

Driveways and other vehicle areas can be designed to accommodate other uses, while courtyards can both serve as a community amenity and provide a stormwater management function.



On a small lot, unbuilt area can be designed to serve interchangeably as a private patio or as a parking space, depending on the needs of residents. Surfacing with sand-set pavers highlights this dual purpose, while also limiting stormwater runoff.

ARLENE KIMURA

Avoid designing large areas solely to accommodate vehicle maneuvering. Vehicle areas often occupy a large percentage of small, higher-density infill projects and represent an underutilization of scarce outdoor space.

Townhouses fronting onto a courtyard that also provides vehicle access to garages. Use of paving blocks highlights the courtyard's function as pedestrian-oriented space.

CABE/DAVID MILLINGTON PHOTOGRAPHY LTD.

Example of space designed to accommodate cars along with a range of community activities (Pepys Estate, London)

Outdoor amenity and environmental function

This apartment courtyard includes features that manage stormwater, while also serving as an outdoor amenity for residents and providing a unifying, central design focus.

Use the roof

Flat roofs can be used to provide outdoor space, often in the form of rooftop decks, terraces, and ecoroofs. The latter also provide environmental benefits by managing stormwater, limiting urban heat island effects, and can increase the lifespan of roofs (Portland's Ecoroof Program provides information and technical assistance, see www.portlandonline.com/bes)

Roof terrace

PORTLAND BUREAU OF ENVIRONMENTAL SERVICES

Ecoroof

Plan for trees

Careful site planning can accommodate new trees or preserve existing trees even on constrained infill sites, allowing them to serve as valuable amenities for residents and the surrounding community. Appropriately-sized courtyards, setbacks, and rear yards are key ways of accommodating trees; making room for such spaces must be considered early in the design of a project. (See the Bureau of Development Services' *Tree and Landscaping Manual* for the space needs of various tree species)

The Infill Design Toolkit:
Medium-Density
Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Alternative Housing Types

Rowhouses, narrow-lot houses, and low-rise apartments are housing types frequently associated with medium-density residential development. There are, however, many other possibilities, some of which have long been a part of Portland's neighborhood fabric.

This section highlights alternative housing types that hold potential for meeting the community's design objectives as small-lot infill solutions, including:

Courtyard housing, including ownership housing options provided by common greens and shared courts **46**
House-like plexes **59**
Townhouse clusters **61**
Attached duplexes **62**
Accessory dwelling units **62**

Recent rowhouse development

Mix of housing types in an older Portland neighborhood

Courtyard Housing—General

Characteristic features of courtyard-oriented housing, such as divided building volumes (instead of the wall-like form of rowhouses) and courtyard landscaping, can make such housing a good contextual "fit" in many residential neighborhoods. Historically, courtyard apartments were a common Streetcar-Era infill housing type in Portland's neighborhoods, providing density while continuing the landscaped character of neighborhoods where detached houses predominate. Renewed public interest in courtyard housing was demonstrated by recent design preferences surveys, from which contemporary courtyard housing projects emerged as the most favorably-rated housing types, and by the market success of recent courtyard-oriented housing projects. Besides possibilities they provide for context-appropriate design, opportunities provided by courtyard housing include:

- Shared courtyards can provide larger, usable outdoor spaces that are not possible in the form of private yards at higher-densities;
- Allows space for bigger trees and larger landscaped areas;
- Provides room for managing stormwater on site;
- Fosters interaction among residents and a sense of community (courtyard-oriented housing has been a common configuration of co-housing communities and other intentional communities);
- Provides for an additional layer of "urban space," beyond the public street, supporting creation of a distinct sense of place;

Courtyard Housing—Historic Portland Precedents

COURTYARD HOUSING

- Facilitates medium-density housing arrangements appropriate for elders and others with impaired mobility, as courtyard arrangements allow for wider, single-level houses without stairways, which can be difficult to achieve with rowhouses or other narrow lot housing types.
- Allows creation of "pocket-neighborhoods" that, while integrated with the surrounding neighborhoods, have their own identity as a distinct ensemble – which can be particularly useful for marketing infill housing in areas struggling with creating a positive image attractive to potential residents.

ADRIAN WELCH

While courtyard housing historically tended to consist of rental units, Zoning Code provisions for "common greens" and "shared courts" now allow housing units on separate lots to front onto courtyards, facilitating the development of courtyard housing as an ownership housing type *(see information on pages 52–57)*.

"Cottage clusters," oriented toward shared green space, have become a popular housing option in the Puget Sound region (Ericksen Cottages, Bainbridge Island)

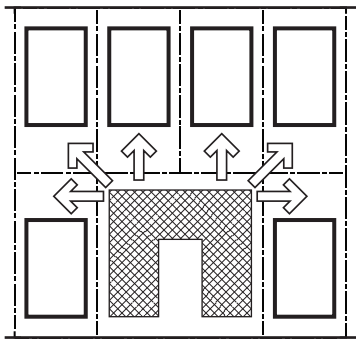
Shared courtyards provide opportunities for play space at higher densities.

Recent Portland courtyard housing project, "Hastings Green," featuring cottages oriented to a shared courtyard. Developed as condominiums, all units sold before project completion, indicating market demand for such housing.

Potential Pitfalls

The design of courtyard housing should seek to avoid or minimize potential pitfalls related to such configurations, including:

- **Potential impacts to the privacy of abutting properties,** since courtyard units are typically pushed toward the rear and side edges of a site, close to neighboring properties (in contrast, rowhouses are typically located along the public street frontages of sites, further removed from neighboring backyards). Impacts can be limited through strategies such as screening, window placement, stepping upper levels back from neighboring properties, and through additional building setbacks *(see pages 35–37).*
- **Privacy within a project.** For units that face each other across narrow courtyards (less than 50'), consideration should be given to minimizing privacy impacts, such as by careful window placement and screening. Also, it is desirable to provide a transition between shared courtyard space and the interiors of units by including small privately-controlled outdoor space in front of each unit.
- **Street-fronting end units.** Courtyard end units adjacent to public streets should be designed to have a strong orientation to the street. Avoid design that provides the appearance of turning away from the street, with large areas of blank wall.



Even though main entrances face toward the courtyard, wrap-around porches, windows and other building details enliven the street frontage of these end units, providing a strong street orientation.

In contrast, the relatively featureless street frontage of this end unit (clearly its "side", rather than a primary facade) presents a weak street orientation.

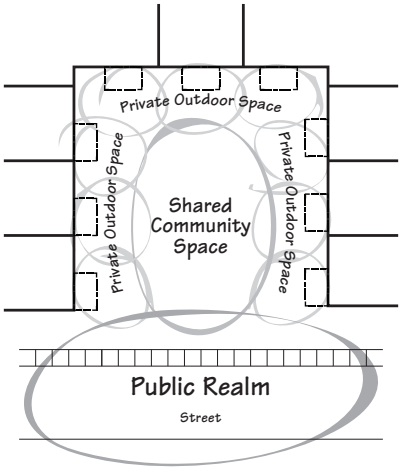
- **Inward orientation.** Since courtyard units are typically oriented toward outdoor space at the center of sites, care should be taken to avoid configurations that appear to "turn their back" to the surrounding neighborhood. On corner sites, street-facing houses or rowhouses may be more appropriate than courtyard arrangements because of the difficulty of designing units to simultaneously front onto both a public street and a courtyard.
- **Courtyard design, maintenance, and appropriateness for residents' needs and capabilities must be carefully considered,** to prevent the shared space of courtyards from becoming disused, poorly-maintained space. Courtyards must be carefully integrated with adjacent residences to maximize access and opportunities for surveillance, as well as to provide a sense of shared ownership and responsibility. Unless the courtyard is a public accessway, courtyards should typically be designed to discourage use by non-residents, in order to allow residents to feel secure and develop a sense of control over of the space.

Corner sites can be problematic for courtyard housing, and historically have often resulted in garages lining an entire block frontage (top). The example at middle and left (built 1928), with a shared parking garage excavated below the courtyard, illustrates a solution that reduces impacts to the streetscape. Another solution is to wrap the corner with street-fronting rowhouses with rear parking (see Prototype 3b), instead of a courtyard-oriented arrangement.

COURTYARD HOUSING

- **Living space, not garage walls, should front onto courtyards.** Courtyard housing units tend to be relatively shallow in depth, leaving little room to include living space in front of ground-level, rear-accessed garages. This can result in situations in which the "backs" of rear-accessed garages are the primary ground-level building element fronting onto the courtyard, with the undesirable outcome of courtyard space lined by blank walls instead of by living spaces. This can be avoided by:
- Including enough building width to allow ground-level living space alongside the garages for each unit; by
  - — Raising the grade of the courtyard or partially-excavating garage levels, so that living space above garages becomes the primary courtyard-facing part of the buildings; or by
  - — Designing courtyard-fronting portions of garages as "flex-space," suitable for use as workshop or play space, that open up to the courtyard space and provide the opportunity for active uses *(see illustration on page 42).*

Raised courtyard allows strong relationship to these rowhouse units' entry porches and living spaces, while lower-level garages are tucked unobtrusively below.



- **Outdoor space sequencing.** The sequencing and design of outdoor spaces is key to successful courtyard housing design. The shared community space of the courtyard should be distinct from the public space of the public street and sidewalk. In turn, private outdoor space (typically in the form of small gardens, patios, or porches) should be included at the interface between residential units and the shared courtyard to provide for a transition to the privacy of unit interiors and allow individually-controlled outdoor space.

JEFF PETERS/STUDIO E ARCHITECTS

STUDIO E ARCHITECTS

Courtyard housing with contemporary design, highlighting how the design possibilities of this ancient housing form are not limited to traditional architectural styles

FLETCHER FARR AYOTTE PC

Courtyards designed to provide both pedestrian and vehicle access

TENDAI CHITTEWERE

More courtyard examples

Left: Shared courtyards are common design features of cohousing communities because of their ability to foster community interaction (EcoVillage at Ithaca, NY) Right: Courtyard with naturalistic wetland plantings fed by stormwater runoff serving as the central design feature (Bo01 Housing Exposition apartments, Malmo, Sweden)

CITY OF SEATTLE

JOHNSTON ARCHITECTS PLLC

JOHNSTON ARCHITECTS PLLC

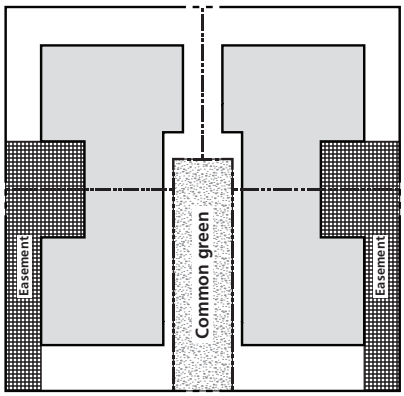
Innovative Seattle examples of detached houses oriented to shared courtyards. Left example (Ravenna Cottages), with 9 units on a 10,500 SF site, achieves a density of 37 units an acre.

Common Greens

A common green is a landscaped courtyard that serves as a pedestrian "street" providing access to adjacent units. Common greens facilitate ownership housing oriented to courtyards by allowing separate residential lots to be created that front onto the common green (as an alternative to requirements that residential lots front onto conventional streets). Common greens can be particularly useful for creating residential lots on deep sites (common in East Portland) that lack enough street frontage for conventional street-oriented housing. Besides providing pedestrian access and facilitating ownership housing, common greens are also intended to serve as a shared open space amenity for residents.

Detached houses fronting a common green with play equipment (R2 zone, New Columbia).

Common greens are particularly appropriate at medium densities, such as for development in the R2 and R3 multidwelling zones, similarly-scaled residential development in commercial zones, as well as for the R2.5 and R5 single-dwelling zones. At higher densities, such as in the R1 and RH zones, common green housing can be combined with street fronting units to achieve intended densities.



Example of how a common green can be used to create residential lots on a site that would otherwise lack sufficient street frontage for the same number of units (see Prototype 4c).

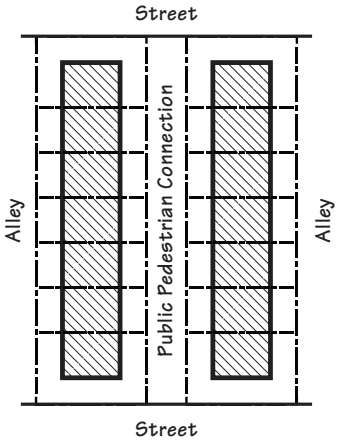
Pedestrian tract at the center of this project (Belmont Dairy Rowhouses) facilitates higher-density ownership housing, in conjunction with street-fronting units (36 units/acre)

Key Regulatory Details

- Common greens are regarded as private street tracts
- Must have a minimum with of 15 feet (including a 5-foot wide walkway)
- No vehicle access is allowed across a common green (vehicle access to parking is typically provided by rear alleys)
- Common greens are not allowed to provide through pedestrian connections between public streets (see "Public Pedestrian Connections," next page)

Public Pedestrian Connections

Residential lots can also front onto a "public pedestrian connection," allowing arrangements similar to that of common greens, but providing a through connection between streets. Public pedestrian connections are public rights-of-way that are intended primarily for pedestrians, not motor vehicles. Public pedestrian connections are especially desirable as part of development in areas with poor street connectivity (City standards call for sidewalks and other pedestrian connections at least every 330 feet).



Housing oriented toward a public walkway (example from downtown Gresham)

Key Regulatory Details

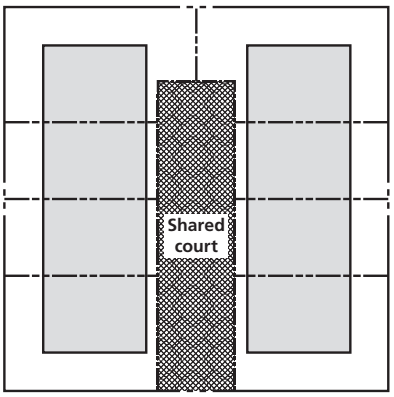
- Minimum width of 15 feet (including a 6-foot wide walkway) in most residential zones.
- Must typically be designed to provide an unobstructed view through the length of the connection (for security).

Shared Courts

Shared courts are courtyard-like streets designed to accommodate—within the same circulation space—access for pedestrians and vehicles to adjacent properties (similar in concept to the Dutch woonerf street type). Shared courts are intended to be designed so that vehicles are treated as "occasional visitors" into space that gives priority to pedestrians and community activities. Shared courts feature special paving treatments to highlight their role as pedestrian-oriented space (providing a contrast to the asphalt of vehicle-oriented roadway) and include community-enhancing features, such as street trees, landscaping, and street furniture.

Because they do not have separate roadway and sidewalks, shared courts can be narrower than conventional streets, helping to make efficient use of small sites and allowing less impervious surface. Shared courts also facilitate the creation of higher-density ownership housing by providing access to housing lots on sites too small to accommodate conventional streets. Another opportunity provided by shared courts is that they allow preservation of on-street parking and facilitate a more pedestrian-friendly street frontage by having a single vehicle access point, rather than the multiple curb cuts common with rowhouses.

Note that configurations similar to shared courts can also be used in multi-dwelling and condominium developments without a land division or separate access tract.



SOLOMON E.T.C.

The single vehicle accessway of this six-unit shared court project minimizes disruptions to the neighborhood streetscape, while street-fronting units continue patterns established by nearby early 20th-century houses (Eastern Crossing, Seattle)

Stormwater planters integrated into the design of shared pedestrian/vehicle space (Meriwether Townhouses)

Rules-of-thumb

Because shared courts are intended to serve a wider-range of functions than conventional streets, particular care should be given to their design, as well as to how they are integrated with adjacent housing. Some issues to be aware of include:

- Community enhancing features, such as street trees, landscaping, stormwater planters, benches and other street furniture, should be included within street area not required for vehicle maneuvering or emergency access. This is important for making shared courts attractive places for residents to spend time in, encouraging their use for purposes other than just vehicle maneuvering.
- Consider locating housing up close to shared courts to maximize opportunities for rear yards, provide a stronger relationship between residences and the shared court, and allow more separation from adjacent properties (limiting privacy and solar access impacts).
- Avoid having garages terminate the view into the shared court.
- Building facades along shared courts should be given as much attention as conventional street frontages, with prominent entries, windows, and architectural details.
- In areas where greater connectivity is needed, shared courts can contribute toward this with a pedestrian connection to the next street.

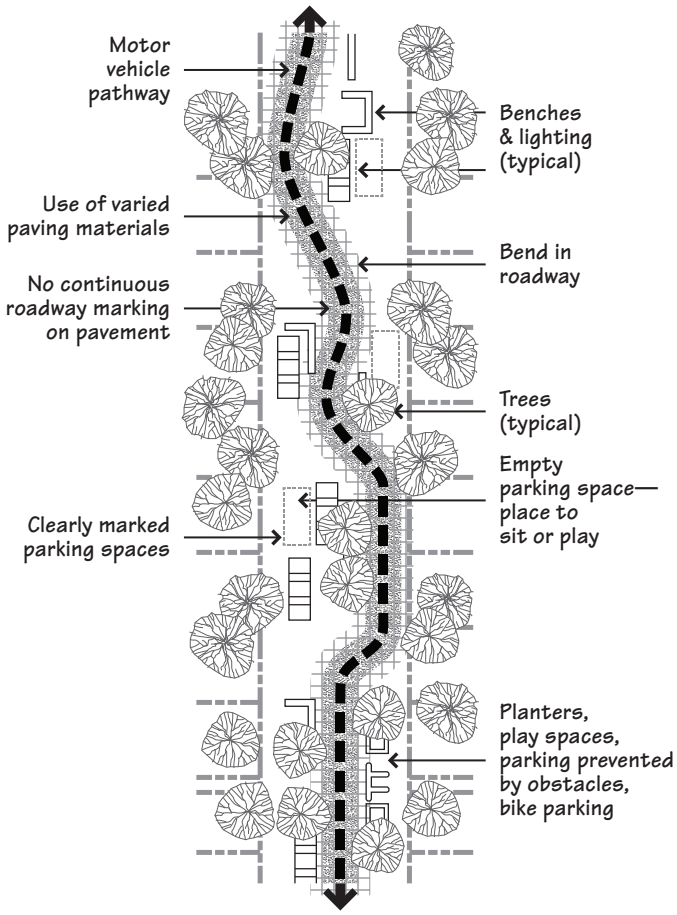
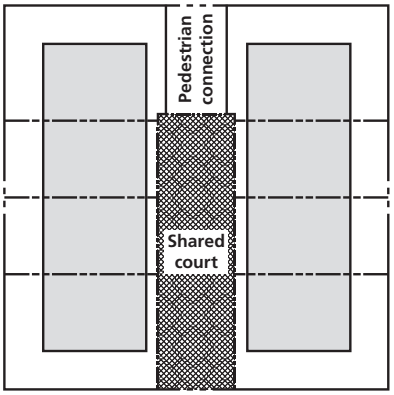


Diagram showing how trees, street furniture, and on-street parking, can be included within shared court.



Shared Court Precedents

BEN HAMILTON-BAILLIE

Dutch "woonerf"—has become a standard street type in medium-density neighborhoods in the Netherlands

Japanese shared street

NORTHMOOR URBAN ARTS PROJECT

British "home zone"—multi-use streets have been promoted by the UK's Children's Play Council as a means of obtaining additional play space in areas where outdoor space is limited.

Rowhouses front onto a portion of NW Irving Street (left) that serves as both pedestrian space and provides vehicle access to parking. Portland projects with features similar in form to shared courts (Belmont Dairy Rowhouses [middle]) and River Place [right]).

Key Regulatory Details

- Shared courts must be private street tracts
- Allowed only in the multidwelling, commercial, and employments zones (not in single-dwelling zones)
- To limit the amount of vehicle traffic on shared courts, they:
  - Must be dead-end streets no more than 150-feet long;
  - May provide frontage for no more than 16 lots;
  - Are limited to development of attached houses, detached houses and duplexes; and
  - Must be surfaced with paving blocks or other ornamental paving.
- Buildings may be located as close as 3 feet from the shared court (instead of the 10' front setback usually required in some zones)

Opportunities provided by interlocking concrete pavers

INTERPAVE

Permeable pavers

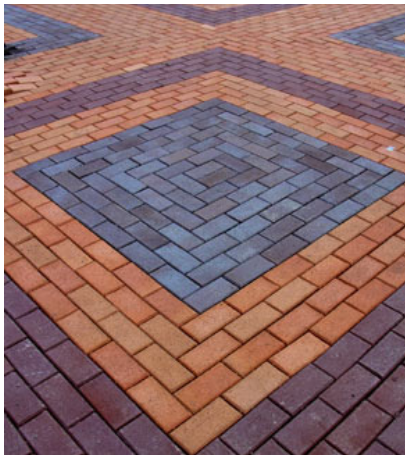
PORTLAND BUREAU OF ENVIRONMENTAL SERVICES

Shared street space, surfaced with pavers in an ornamental pattern (Nye Beach, Newport, Oregon)

Shared courts must be surfaced with paving blocks or other ornamental paving to clearly indicate their intended use as space where pedestrians have priority, providing a contrast to the asphalt surfacing of conventional roadways. Utilizing sand-set, interlocking concrete pavers is one readily-available way of meeting this requirement. While more expensive to install than asphalt, interlocking concrete pavers provide several cost-effective advantages, including:

- **Durability.** Sand-set interlocking pavers resist cracking and can withstand heavy loads, as they function as flexible pavement with loads spread through shear transfer across adjacent pavers and to the base and soil subgrade. Because of this durability, interlocking pavers have been used in bus malls, marine terminals, and airports.
- **Maintenance and re-use.** Interlocking pavers can be removed for repairs to underground utilities or tree root incursions and then replaced, allowing a visually seamless patch. The ability to reuse this paving provides cost savings and a sustainable approach to building materials.
- **Amenity value.** In other places where streets similar to shared courts have been introduced, developers have used the visual amenity of pavers along with other community-enhancing street features (landscaping, benches, fountains, etc.) as part of the sales pitch for housing developments.
- **Space and materials efficiency.** Because the use of shared court pavers allows narrower street widths compared to conventional streets with separate roadway and sidewalks, the reduced amount of site area that must be devoted to street area and the lesser amount of street and sidewalk paving provide cost savings that can make up for the additional per-square foot costs of pavers.
- **Stormwater management.** If permeable pavers that eliminate stormwater runoff are used, they can provide the additional benefit of helping to meet stormwater management requirements.

Portland Transit Mall



SOUND TRANSIT

Transit station paving inspired by Salish woven basket patterns

House-Like Plexes

Two-, three-, and four-unit plexes, were a commonly-built multifamily housing type in Portland neighborhoods during the early 20th century. Often built on small lots, these plexes were typically house-like in form, allowing them to blend in with nearby single-family houses. House-like plexes are being built once again, as they provide the advantage of accommodating density on small sites in ways that continue neighborhood patterns.

Accommodating off-street parking is one of the greatest challenges of this housing type, typically necessitating shared basement parking or tuck-under garages. Alternatively, projects in areas well-served by transit may be built without off-street parking; an arrangement which greatly simplifies their design and reduces housing costs (several projects have been built recently without parking and have achieved market success, including some built as condominiums).

House-Like Plexes—Historic Portland Precedents

Fourplex (1910)

Pair of duplexes (1908)

Plexes—Examples

Duplex at left (2,670 sq.ft. site, shared basement parking)

Duplex (1,450 sq.ft. site, no off-street parking)

Fourplex (3,133 sq.ft. site, shared first level parking toward rear)

Fiveplex (condominiums, 5,000 sq.ft. site, rear parking)

Recent plex infill project (condominiums) in Irvington, adjacent to Streetcar Era plexes. An example of how the plex type can continue established neighborhood patterns. Despite including no off street parking, this project proved financially successful.

Three-unit project in Seattle. A hybrid form of owner-occupied housing, consisting of a two story owner-occupied unit over two studio apartments (essentially a house with two ADUs). Serves as a solution for 5,000 sq.ft. lots in the R1 zone, as an alternative to purely rental projects.

Townhouse Clusters

Townhouse clusters are groupings of townhouse units on small infill sites. This housing type has become one of the most common forms of ownership infill housing in Seattle. On a typical infill site of approximately 5,000 square feet, this configuration accommodates four townhouses, with two units fronting onto the street and two other units toward the rear of the site. This arrangement allows for greater density on small sites compared to conventional rowhouses, while the shared driveway arrangement minimizes the visual prominence of parking facilities and allows building forms along the street frontage that reflect common neighborhood patterns.

Rules-of-Thumb

Opportunities and issues that should be considered when designing townhouse clusters include:

- Consider cantilevering portions of the units over vehicle maneuvering areas to make efficient use of limited site area.
- Ensure that the backs of garages do not end up lining ground-level street frontages by including living space in front of the garages or by partially excavating the garages *(see page 21)*.
- Because units in this configuration are typically three levels and extend toward the rear of sites, care must be taken to minimize impacts to the privacy of abutting properties (particularly when adjacent to rear yards). Providing additional rear yard setbacks and stepping back upper levels can help limit such impacts.
- To provide two street-facing units on small sites, it is typically necessary to minimize accessway width by combining driveway and walkway space into a single shared driveway (surfaced with paving blocks or bricks to highlight its use as pedestrian space) and by using a screening fence instead of a landscaped setback along the driveway *(see page 19)*.

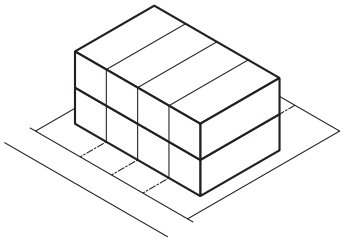
Four-unit townhouse cluster in Seattle, with partially-excavated garages.

Context

Attached Duplexes

Attached duplexes are similar in appearance to rowhouses, but feature two units (typically stacked) on each lot. Opportunities provided by attached duplexes include:

- Allows twice the density of rowhouses, while providing a similar street-oriented residential form.
- Units are clustered at the street frontage, providing opportunities for back yards.
- Provides additional homeownership/rental options, as this housing form is conducive to arrangements in which a homeowner rents out their second unit.



BRIAN ROSE/WWW.DESIGNADVISOR.ORG

Pair of attached duplexes (note four doors). Each duplex has a two-story owner-occupied unit and a second 920 sq.ft. rental flat (Sojourner Truth Homes, New York)

Accessory Dwelling units

Accessory dwelling units (ADUs – sometimes called "granny flats") can be a useful part of medium-density projects. An ADU is a small unit that is subsidiary to a primary residential unit (typically an owner-occupied house or rowhouse). Some opportunities provided by ADUs include:

- They provide additional solutions for accommodating additional density on small sites, particularly in situations in which site or market constraints make it difficult include enough primary residential units to meet minimum density requirements.
- In higher-density zones (such as R1), ADUs facilitate ownership housing types, such as houses and rowhouses, that may not otherwise meet density requirements by themselves.

ADU over rowhouse's rear garage (Fairview Village)

Secondary unit, over garage, allowed this house to meet R2 density requirements

ACCESSORY DWELLING UNITS

- Utilizing ADUs as part of projects also allows rowhouses and other housing to be built on lots deep enough to accommodate both rear parking and backyards (without ADUs, larger, deep lots often do not meet density requirements).
- Provides flexibility for homeowners, who may, for example, use ADUs for rental income or use them to provide semi-independent living space for grown children.
- Contributes to housing affordability, both by providing homeowners with supplemental income that can be applied toward mortgage payments, and by providing opportunities for inexpensive, small-unit rental units.

Project with four rowhouse units and two ADUs over rear garages, which enabled R1 density requirements to be met.

Key Regulatory Details

- ADUs can be used to meet minimum density requirements in the multidwelling zones, but not in single-dwelling zones (they do not count against maximum density requirements in any zones).
- Only allowed in conjunction with a primary unit that is a detached or attached house.
- Limited in size to 33% of the living area of the primary unit, or 800 square feet (whichever is less).
- May be either attached or detached from the primary unit.
- Must be similar to the primary unit in terms of exterior finish materials, roof pitch, windows, and trim.
- Entrance must not face the street if the primary unit's entrance does (intent is that the ADU appear clearly subsidiary to primary units, avoiding the double front doors associated with duplexes).
- No parking required for ADU units.

Case Study: Hastings Green Cottage Cluster

Courtyard Housing

Housing type	Clusters of detached cottages (condominiums) oriented to shared courtyards
Neighborhood	South Tabor
Address	SE Clinton between SE 70th & 71st
Zoning	R5 & R2.5
Site size	30,592 SF (first phase)
Units	10 (first phase)
Density	1 unit per 3,059 SF (14 units/acre)
Parking	10 spaces (in garage structures)
Size of units	1,134–1,253 SF (1–2 bdrms)
Year completed	2003
Developer	Hastings Green LLC / Patrick C. Jackson
Designer	JDA Architects & Planners

Hastings Green was Portland's first cottage cluster infill project, of small detached houses oriented to shared outdoor space. South Tabor Neighborhood Association representatives identified Hastings Green as an exemplary infill project that fit into the character of the neighborhood more effectively than typical rowhouse projects. The project appealed to a niche of buyers who wanted the strong sense of community fostered by the shared outdoor spaces, which include a vegetable garden, flower beds, and multi-use turf areas. Within the first year after project completion, residents had formed a reading group and a cooking club.

(continued on next page)

Case Study: Hastings Green Cottage Cluster

The project was financially successful, according to the projects' developer, Patrick Jackson. The first phase of 10 units sold within 6 weeks (from between $190,000 and $240,000 in 2003), while the second phase of 13 cottages were all sold before completion. This suggests there is pent-up buyer demand for such courtyard-oriented housing.

Efficient, carefully-considered unit design and outdoor spaces, as well as quality materials and landscaping, were important for making the small cottages attractive to buyers. Relatively simple construction afforded by the detached houses kept hard construction costs to $100 per square foot (2003 dollars).

Context: Pre-existing house at far right

While the Hastings Green cottages were sold as condominium units, the developer relates that zoning code "common green" provisions that now allow similar courtyard-oriented housing to be built on separate lots should encourage development of similar projects by more developers, many of whom prefer to develop ownership housing on individual lots to avoid of the high liability insurance rates often required for condominium projects. Jackson indicated that he was able to obtain favorable liability insurance rates by convincing insurance underwriters of the lesser risks of free-standing condominium units compared to stacked or attached condominiums.

Case Study: Jake's Run

"Shared Court" Townhouses

Housing type	Townhouses and carriage houses
Neighborhood	Northwest District
Address	2527–2531 NW Westover Rd.
Zoning	R1
Site size	6,720 SF
Units	5 (3 townhouses, 2 carriage houses)
Density	1 unit per 1,344 SF (32 units/acre)
Parking	5 (garages accessed from court)
Size of units	844–2,548 SF
Year completed	2000
Developer	Nick Stearns/Rural Homes, Inc.
Designer	Fletcher Farr Ayotte

Jake's Run features a courtyard that provides access for both pedestrians and residents' cars, an arrangement now facilitated by regulatory provisions for shared courts. The courtyard is fronted by the townhouses' entry stoops, with space for potted plants, reinforcing the pedestrian-oriented scale of the courtyard. Surfacing with paving blocks, as well as carefully-detailed wood garage doors, further emphasize that the courtyard space is something more than just vehicle maneuvering area. Providing a single vehicle accessway also allowed a more pedestrian-oriented street frontage, compared to the multiple front garages and driveways characteristic of many rowhouse projects; while facilitating development of this small, constrained infill site.

Similar courtyard configurations are possible both in the form of land divisions, with housing lots fronting onto a shared court street tract, and through provisions for multifamily development that allow surfacing of driveways with paving blocks or bricks to substitute for separate pedestrian facilities. The Jake's Run project architect indicated that the cost of using concrete paving blocks was similar to what would have been required for poured concrete

Sold as condominiums, Jake's Run consists of three townhouse units fronting onto the courtyard, with two smaller "carriage house" units located over the garages and fronting onto the public street. Division of the units into two structures reflects the scale of nearby large single-family houses. For the courtyard arrangement, the architects were influenced by the traditional English mews, which are narrow lanes providing access to what were originally carriage houses or stables that have been converted to residences—highly desired in part for their location on the quiet, intimate street environment of the mews.

Inner Neighborhoods

Prototype 1:
10,000 SF site in the R2 zone

1a. Cottage Cluster **A-3**
1b. Cottage Court **A-5**
1c. Contextual Rowhouses . . . **A-7**
1d. Contextual Rowhouses Variant **A-9**

Prototype 2:
5,000 SF site in the R1 zone

2a. Townhouse Cluster **A-11**
2b. House-plex **A-13**

Prototype 3:
10,000 SF site in the R1 zone

3a. Shared Court Rowhouses **A-15**
3b. Corner Rowhouses **A-17**

Outer East neighborhoods

Prototype 4:
95' wide by 180' deep site in the R2 zone

4a. Courtyard Townhouses **A-19**
4b. Big Cottage Court **A-21**
4c. Mirrored Green **A-23**

Prototype 5:
90' wide by 220' deep site in the R1 zone

5a. Courtyard Flats **A-25**
5b. Courtyard Townhouses **A-27**

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND BUREAU OF PLANNING

December 2008

Housing Prototypes

Solutions for achieving density and neighborhood-friendly design on small infill sites

The housing prototypes of this section are intended to serve as a problem-solving tool to help improve the design of medium-density infill housing projects, particularly in the R2 and R1 multidwelling zones. The prototypes highlight medium-density housing types and configurations that are suitable for common infill situations, meet City regulations and design objectives, and are feasible from a market perspective. They illustrate solutions for common infill design challenges such as balancing parking needs with pedestrian-friendly design and providing usable open space while achieving density goals. They are also intended to help broaden the range of housing types being built in Portland by presenting innovative configurations, with a particular focus on arrangements conducive to ownership housing. The prototypes continue characteristic neighborhood street frontage patterns by featuring house-like building volumes along street fronts and by providing opportunities for landscaping.

The prototypes are based on site configurations common in different parts of the city, such as those of close-in neighborhoods where infill sites are typically in increments of the 50'-wide lots established by Streetcar Era platting; and the very different sites typical in Outer East where lots are larger but disproportionately deep. This set of housing prototypes is intended to be the beginning of a collection that will be added to over time to expand the range of design solutions.

Each prototype includes cross references to other sections of the Infill Design Toolkit. These sections can be referenced for more detailed information on specific design issues and for information on case studies and built examples.

Guiding Criteria

The housing prototypes were designed to:

- Meet City regulatory requirements;
- Be financially realistic;
- Minimize the prominence of vehicle areas, while limiting impervious surfaces and providing at least one parking space per unit;
- Provide usable outdoor space;
- Respond to typical neighborhood contextual situations (through site design, arrangement of building volumes, etc.); and
- Include configurations conducive to ownership housing (such as by allowing housing units to be on separate lots).

Regulatory Review

To ensure that the housing prototypes illustrate "approvable" configurations that can meet the requirements of the various City regulatory agencies, they have been reviewed by the following City bureaus:

- Planning
- Development Services
- Office of Transportation
- Environmental Services *(regarding stormwater management)*
- Fire and Rescue

Caveats

While the housing prototypes focus on illustrating configurations that meet regulatory standards, in certain cases code adjustments or appeals would be necessary for particular aspects of the prototypes to be approved. In these situations, the "Regulatory Notes" included with each prototype highlight aspects of the prototypes that would require additional review. (Their inclusion here does not guarantee the outcome of a code adjustment request or appeal.)

Also note that the prototypes do not take into account area-specific regulations or design review criteria that may apply to a site, or other site-specific issues and constraints. For example, Prototypes 1b, 2a, 4a, 4b, and 5b would not meet requirements of the Community Design Standards (applicable in areas with design review), which call for all primary buildings to be set back no further than 25 feet from front lot lines. Bureau of Development Services staff and other relevant agencies should be consulted regarding site-specific issues and the general applicability of the prototype configurations to any particular site.

Pitched roofs are used for the prototypes because many community members consider them to be more "design neutral" than flat roofs in a generalized residential context. The intent of this is to encourage attention to be focused on more fundamental aspects of housing form and site organization, rather than on the relative merits of traditional or contemporary architectural style. The illustrated roof forms are not intended to indicate that other roof forms would not be equally or more appropriate for any particular housing project or specific context.

Prototype Sites

The prototype sites and their attendant issues are summarized below:

Inner neighborhoods

- **Prototype 1: 10,000 SF site in the R2 zone**
  What can be built besides 4-5 rowhouses?
  Opportunities for courtyard housing?
- **Prototype 2: 5,000 SF site in the R1 zone**
  How to fit 3-5 units, plus parking?
- **Prototype 3: 10,000 SF site in the R1 zone**
  Opportunities for courtyard housing and additional homeownership possibilities? (Such sites often require too great a density for conventional rowhouses to be practical.)

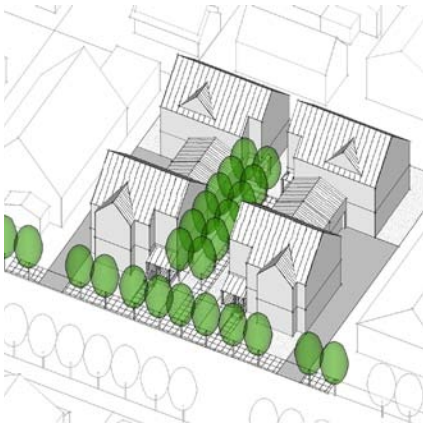
Outer East neighborhoods

- **Prototype 4: 95' wide by 180' deep site in the R2 zone**
  How to design density for narrow sites?
  Homeownership opportunities?
- **Prototype 5: 90' wide by 220' deep site in the R1 zone**
  On a busy arterial street?
  How to provide livable housing close to traffic, contribute to a transit-oriented environment, transition to lower-density housing, and fit 14-20 units and vehicles?

Housing Prototypes Consulting Team

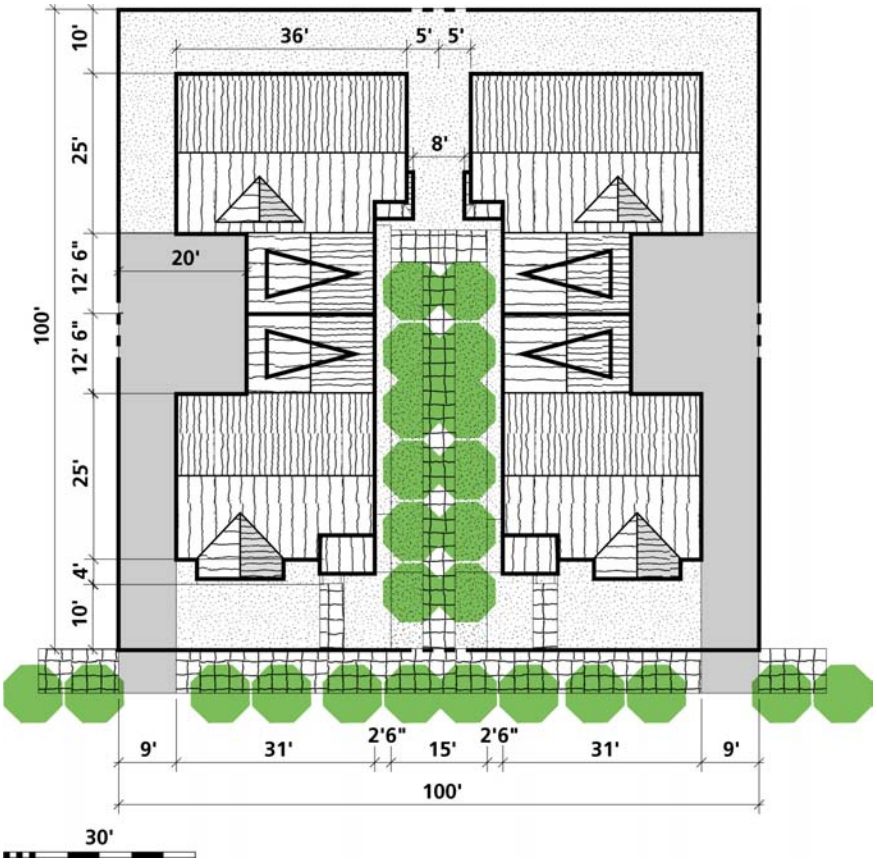
Van Meter Williams Pollack, LLP; Urbsworks, Inc.; E.D. Hovee & Company

1a Cottage Cluster



Site Axonometric View

- 4 units (1,500–1,950 sq.ft each) arranged around a common green, either attached or detached.
- Intended to allow fee simple ownership, with common green held as a common tract.
- Massing of front units reflects neighborhood patterns of houses on 50'-wide lots.



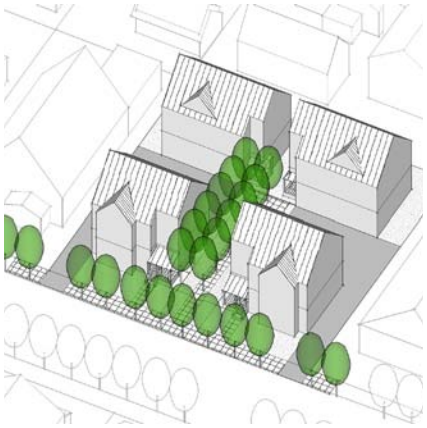
Precedents

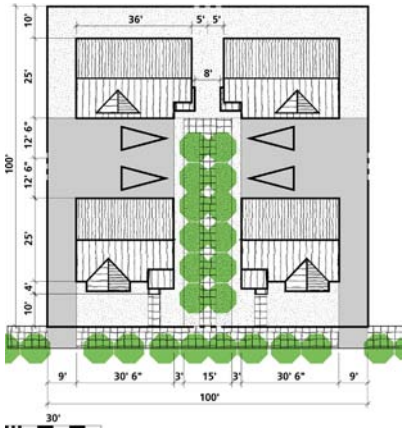
Neighborhood Context

1a **Cottage Cluster** Details

Regulatory Notes

- As shown, would require code adjustment for reduced setback to common green (3' setback required). The 2½' setback shown is needed to accommodate enclosed garages. If parking pads are used, 3' setbacks are possible.





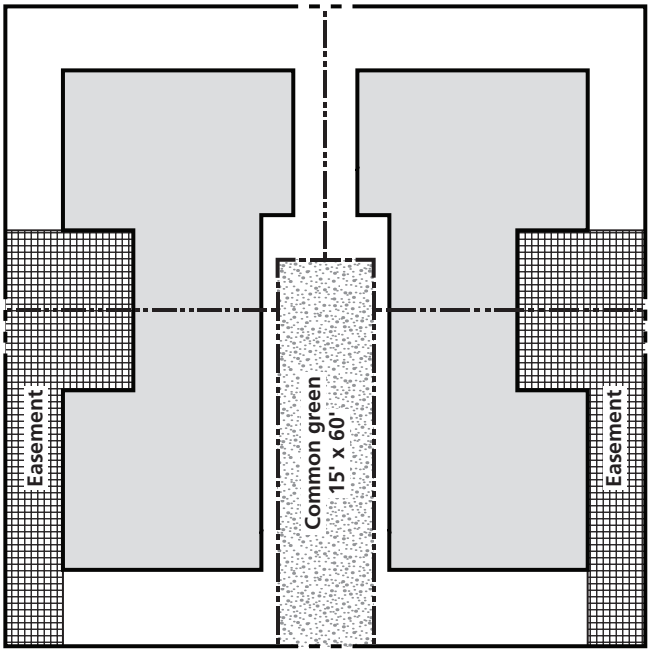
Alternative with detached houses and parking pads

Related Sections

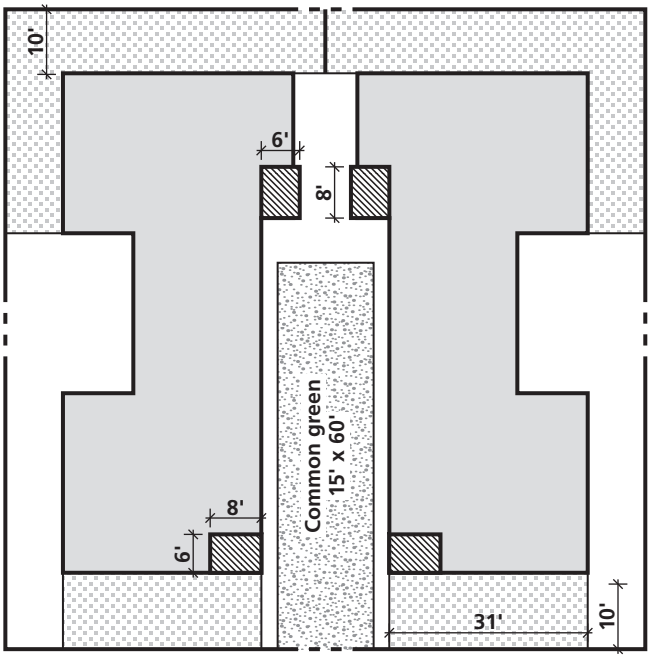
Driveways and parking **19**
Courtyard housing **46–51**
Common greens **52–53**

Case Studies

Hastings Green **64–65**
Cluster Housing Profiles
1,2,6 . . . . . **C-22**



Parcelization Plan



Open Space Plan

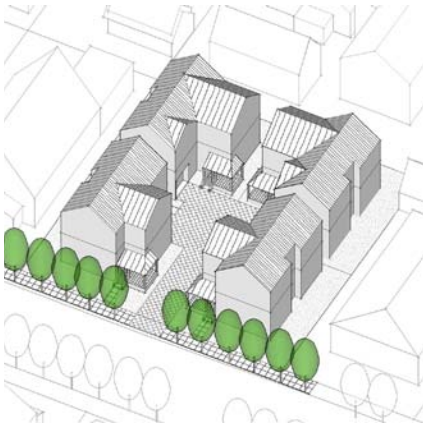
30'

Common Open Space

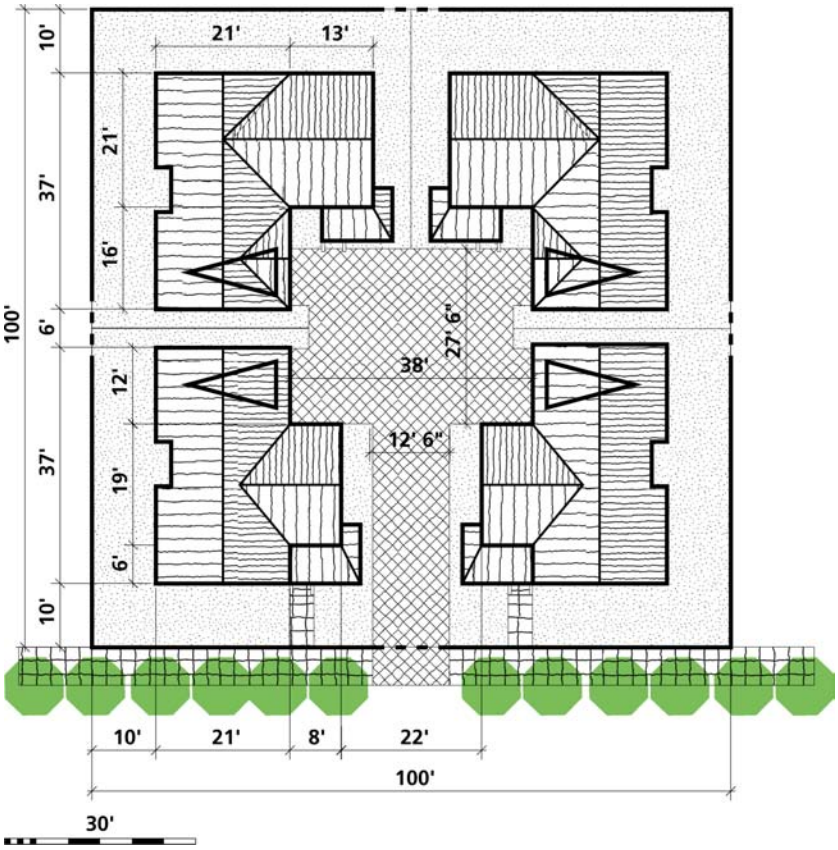
Private Open Space
(Frontyards/Sideyards/Backyards)

Private Open Space
(Porches/Balconies)

1b Cottage Court



Site Axonometric View



- 4 or 5 attached or detached units (1,600–1,850 sq.ft each) possible
- Two units face public street, gives appearance of two single-family homes from street.
- As shown would require condominium ownership. With modifications, may also be possible as a “shared court” configuration, with units on separate lots oriented toward a shared court street tract.
- Shared driveway with special paving provides both vehicle and pedestrian access. Single access point allows up to 4 on-street parking spaces.

Precedents

Neighborhood Context

1b Cottage Court

Details

Regulatory Notes

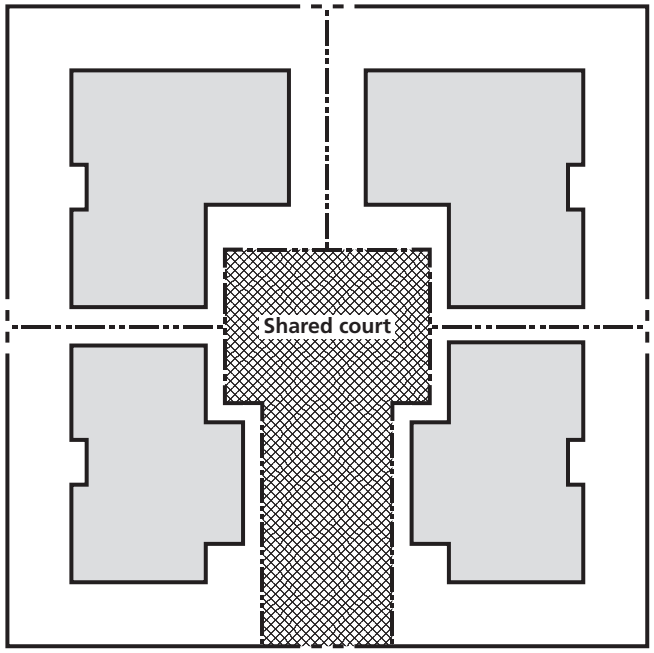
- If a shared court street tract is to be created, building layout would need to be modified to accommodate minimum tract width of 20'.
- Land division option shows the use of an alternative development option allowing 3' side setbacks for detached houses.

Related Sections

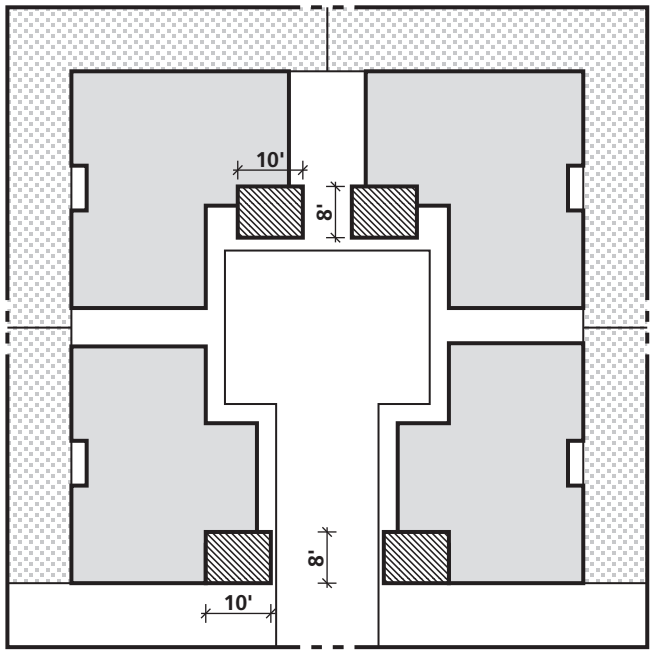
Driveways and parking **19**
Courtyard housing **46–51**
Shared courts **55–57**

Case Studies

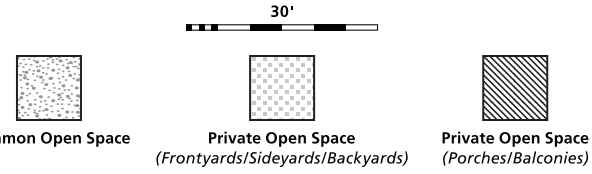
Jake's Run **66**



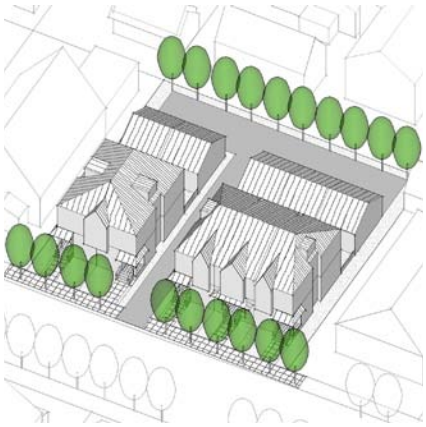
Option: Parcelization Plan with shared court



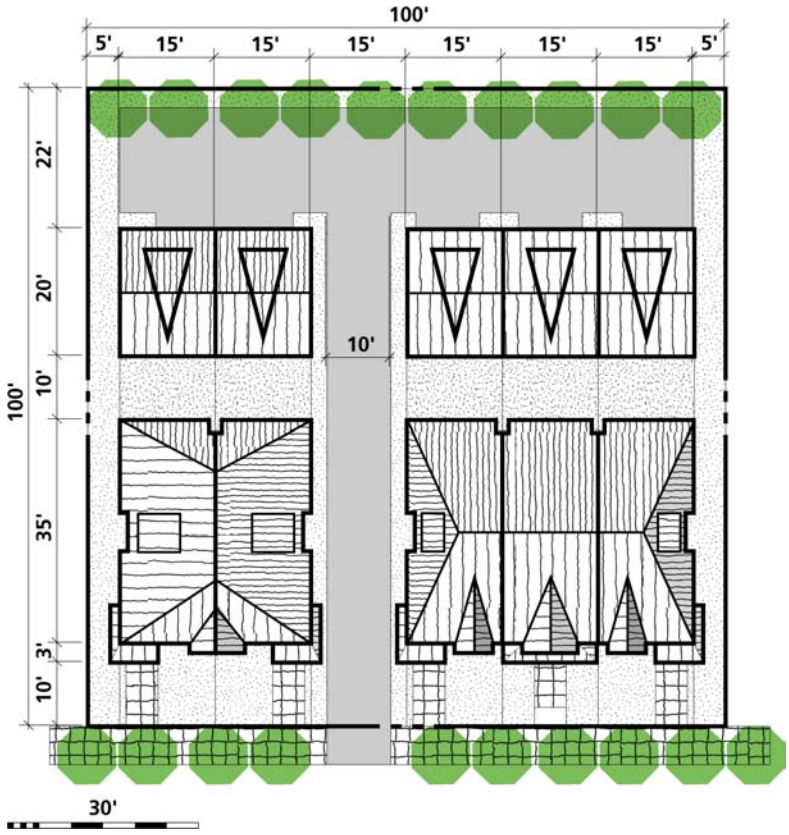
Open Space Plan



1c Contextual Rowhouses



Site Axonometric View



- 5 rowhouse units (1,050–1,300 sq.ft each).
- Massing intended to blend with surrounding single-family context.
- Parking in detached garages to the rear of each unit, accessed by alley easement.
- Small private gardens between each unit and the garages.
- Additional square footage is possible if living space is added in a full third story or above garages.

Precedents

Neighborhood Context

1c Contextual Rowhouses

Details

Regulatory Notes

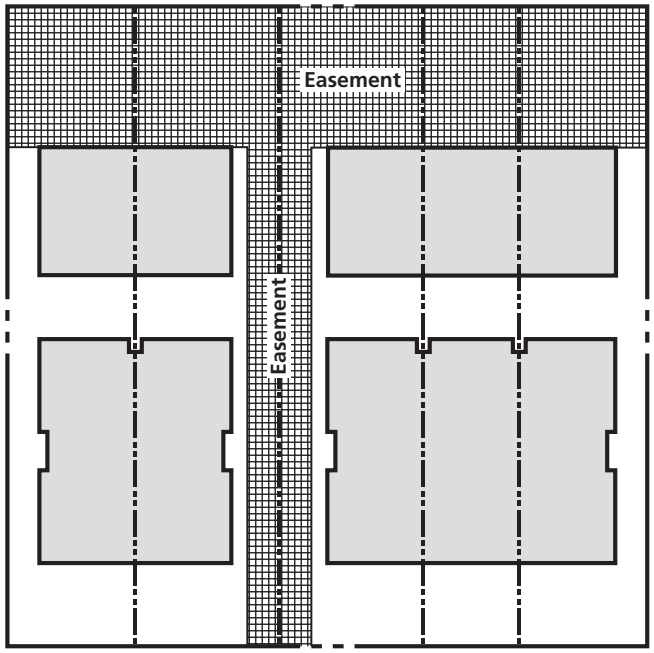
- As shown, would require code adjustment, as one lot does not meet minimum lot size requirement of 1,600 sq.ft.
- Rear alley easement (instead of tract) allowed when it serves no more than 5 lots.
- This configuration could be used in the R1 zone if at least 2 accessory dwelling units are placed over garages to meet density requirements.

Related Sections

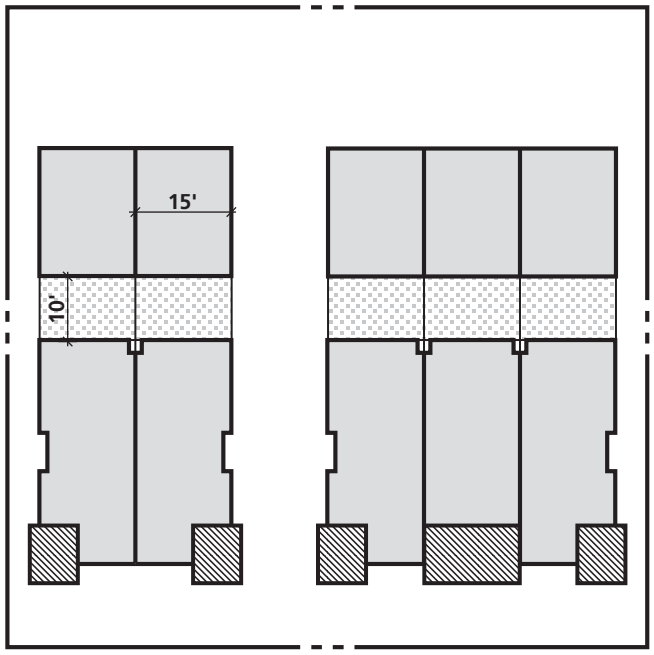
Rear parking **17, 20**
Driveways and parking **19**

Case Studies

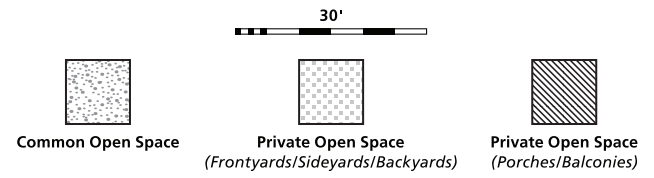
Rowhouse Project Profiles **C-2**



Parcelization Plan

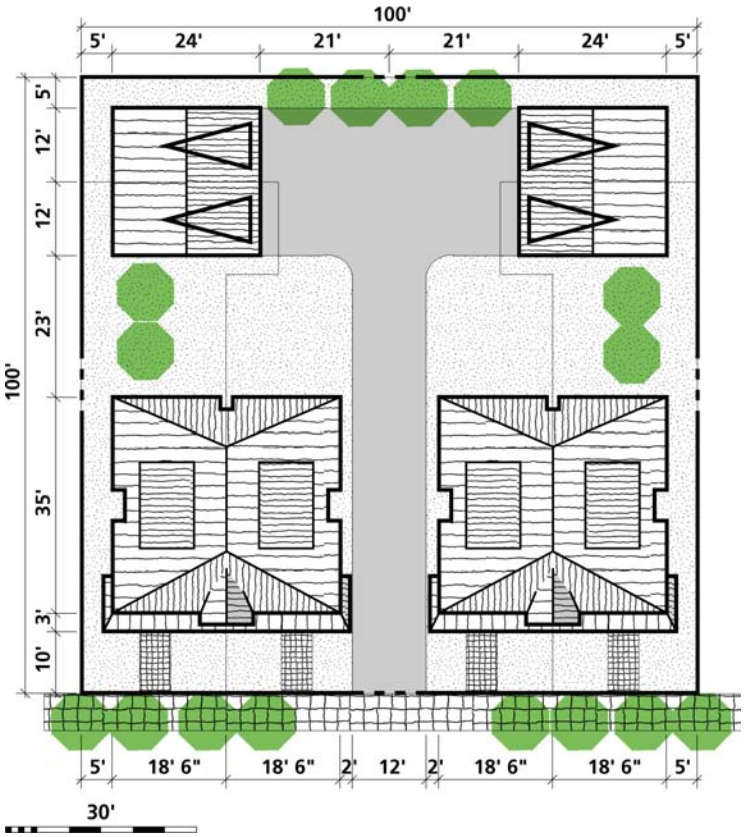


Open Space Plan



1d Contextual Rowhouses Variant

Site Axonometric View



- 4 rowhouse units (1,300–1,600 sq.ft each).
- Units grouped in pairs, providing building forms reflective of typical neighborhood patterns, avoiding the wall-like effect of four attached units.
- Double-loaded rear alley makes efficient use of site area, allowing larger backyards than possible with conventional rear parking (also possible to locate garages closer to each other, further reducing impervious surface area).

Precedents

Neighborhood Context

1d Contextual Rowhouses Variant Details

Regulatory Notes

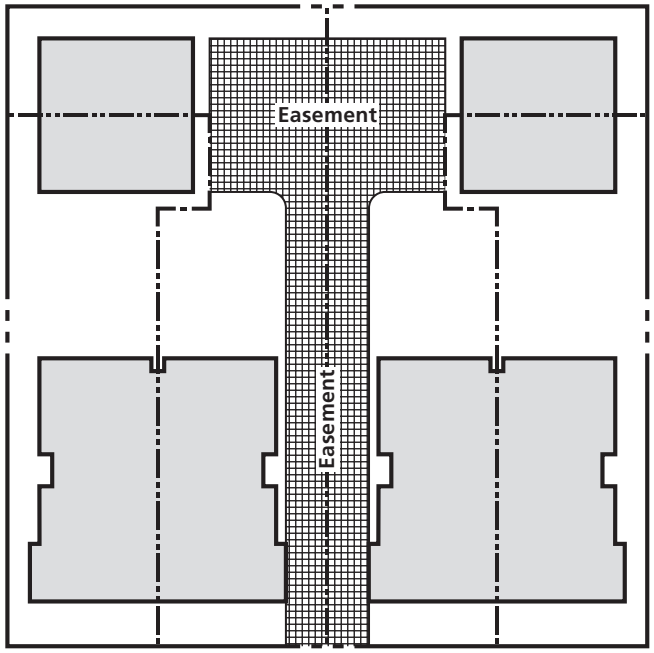
- This configuration also appropriate for the R2.5 zone, providing a solution that meets requirements for 15' of uninterrupted street curb in front of each unit, which is required for lots less than 36' wide in the R2.5 zone.
- Rear alley easement (instead of tract) allowed when serves no more than 5 lots.

Related Sections

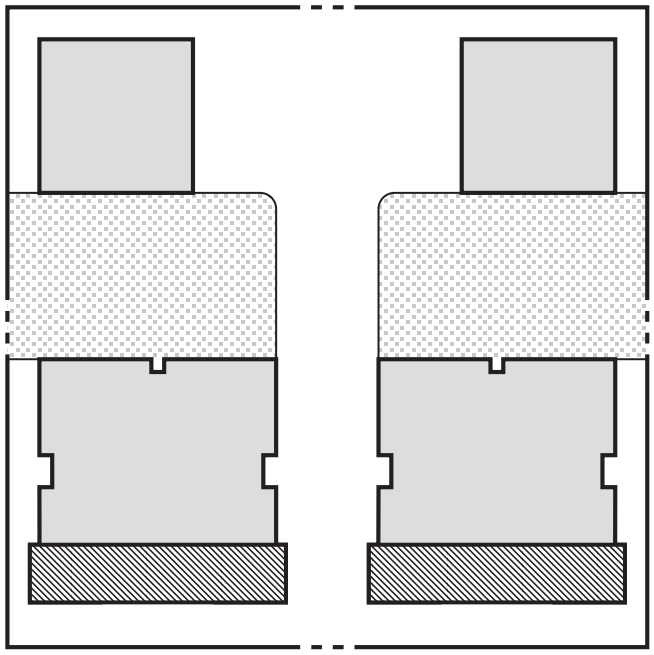
Rear parking **17, 20**
Driveways and parking **19**

Case Studies

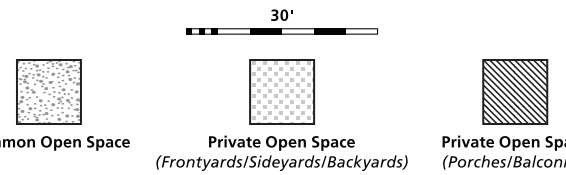
Rowhouse Project Profiles **C-2**



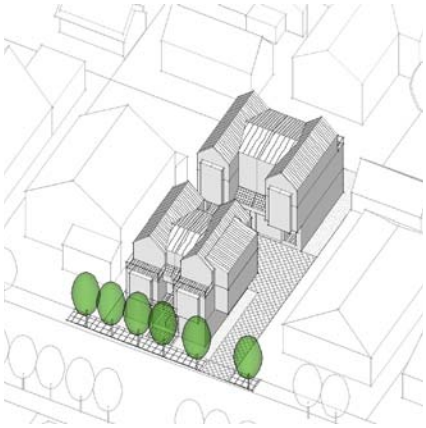
Parcelization Plan



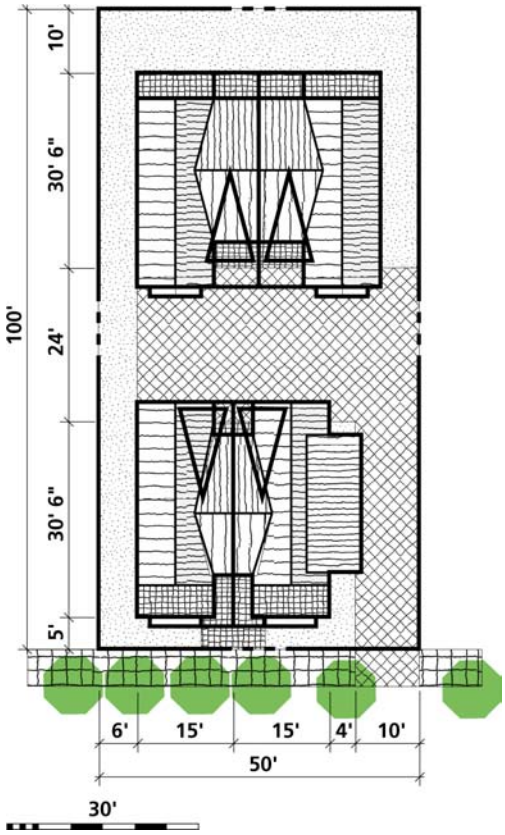
Open Space Plan



2a Townhouse Cluster



Site Axonometric View



- Two sets of paired townhouses, 4 units total (1,000–1,300 sq.ft each, not including garages).
- This configuration has become one of the most common owner-occupied infill housing types in Seattle. Possible in Portland as either condominiums or rental units.
- This prototype illustrates the use of driveway paving blocks as an alternative to a grade-separated walkway for access to rear units.
- Cantilevering living space over vehicle areas provides efficient use of limited site area.

Precedents

Neighborhood Context

2a **Townhouse Cluster**

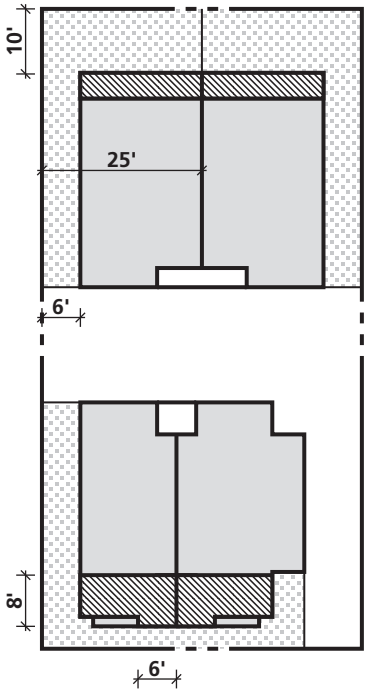
Details

Regulatory Notes

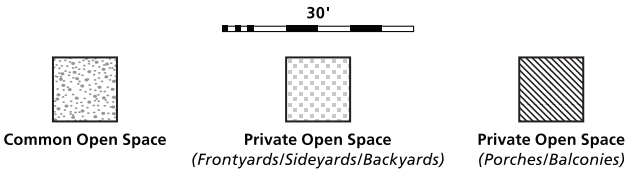
- This driveway configuration requires screening by a fence (minimum 3' high) as alternative to requirements for a 5'-deep landscaped buffer.
- Wider driveway entrance may be required for sites fronting onto arterial streets ***(see Prototype 2b).***

Related Sections

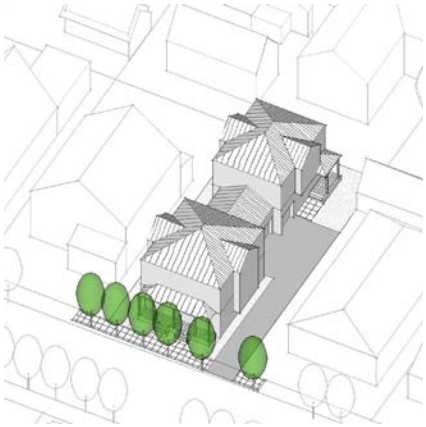
Driveways and parking **19**
Townhouse clusters **61**



Open Space Plan

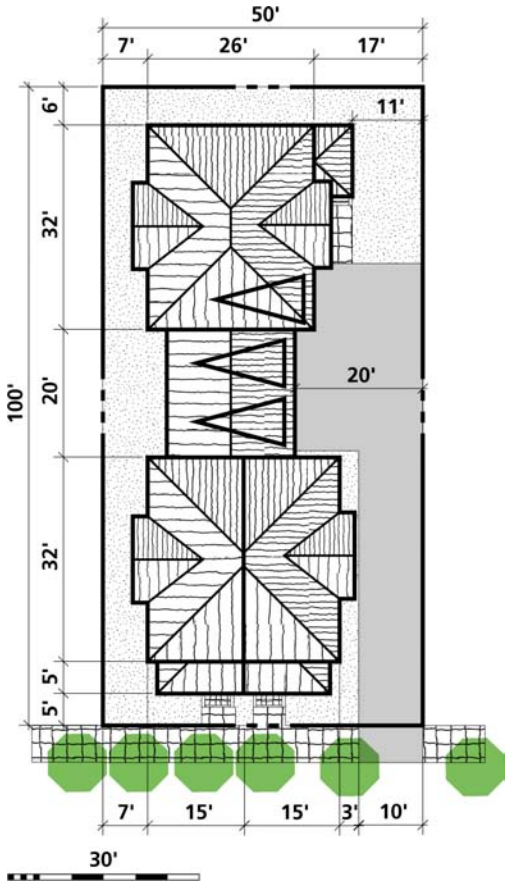


2b **House-plex**



Site Axonometric View

- 3–4 units (1,000–1,400 sq.ft each, not including garages).
- Street frontage designed to reflect scale of a single-dwelling house to blend with neighborhood context.



Precedents

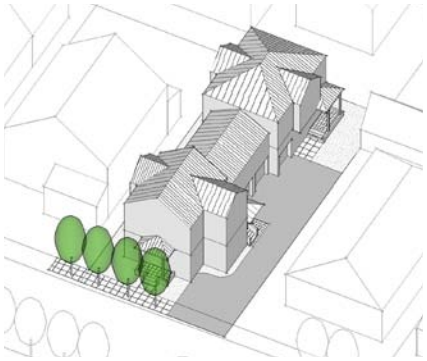
Neighborhood Context

2b House-plex

Details

Regulatory Notes

- This driveway configuration requires screening by a fence (minimum 3' high) as alternative to requirements for a 5'-deep landscaped buffer.
- Wider driveway entrance may be required for sites fronting onto arterial streets as shown in alternative plan view. If so, driveway can be narrowed 20' from street curb.

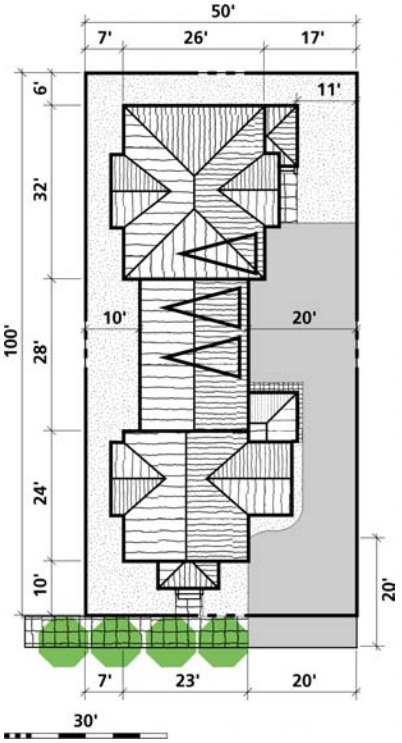


Related Sections

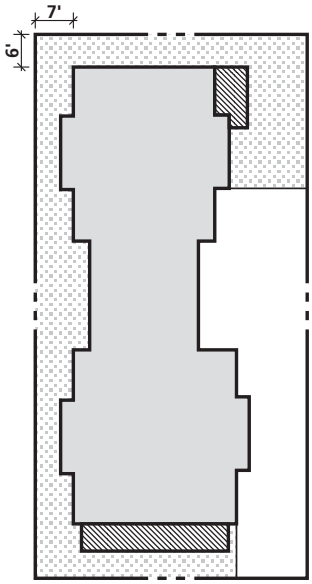
Driveways and parking **19**
Driveway width **B-10**
House-like plexes **59–60**

Case Studies

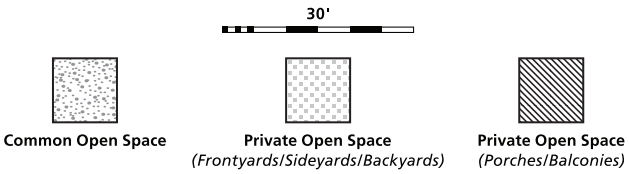
Plex Profile 2 . . . . . **C-17**



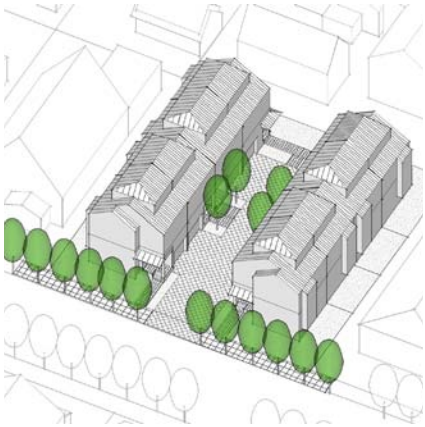
Alternative with wider driveway entrance for arterial streets



Open Space Plan

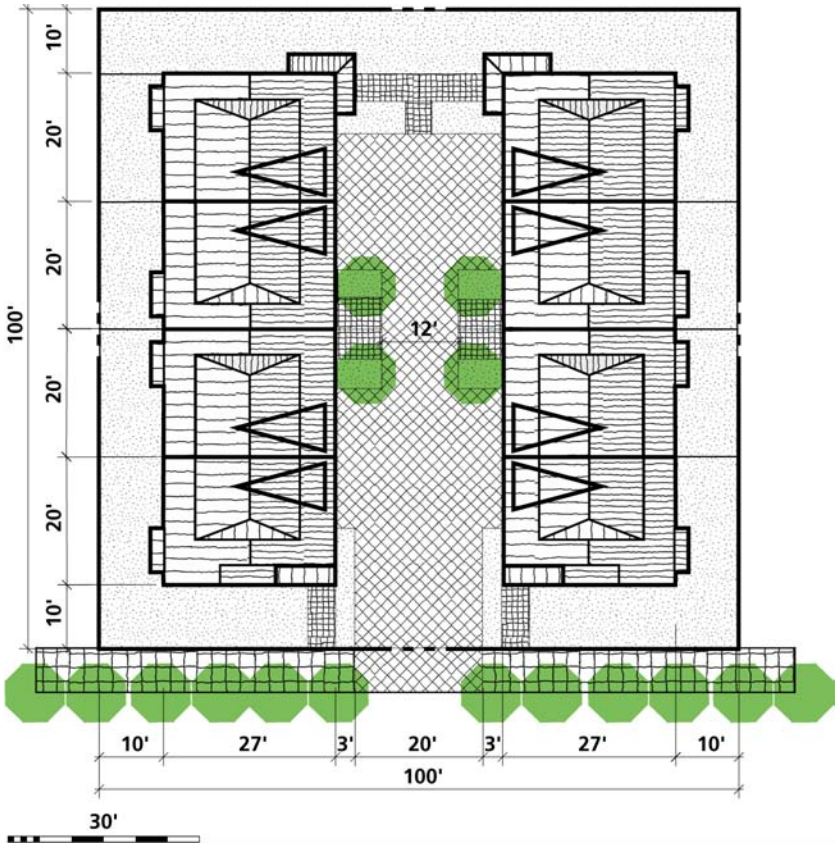


3a Shared Court Rowhouses



Site Axonometric View

- 8 attached units (1,025 sq.ft each) grouped around a shared court (detached units also possible).
- Intended to allow fee simple ownership, with lots fronting onto a "shared court" tract designed to accommodate pedestrians and vehicles within the same space.
- Larger units are possible with addition of full third story (may compromise contextual fit).



Precedents

Neighborhood Context

3a **Shared Court Rowhouses** Details

Regulatory Notes

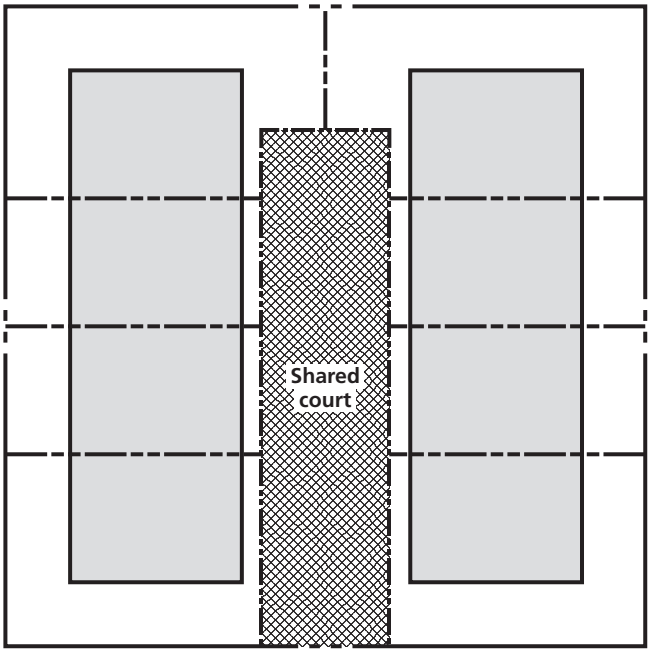
- The shared court is a private street tract featuring special paving materials as a space-saving alternative to streets with separate roadway and sidewalks.

Related Sections

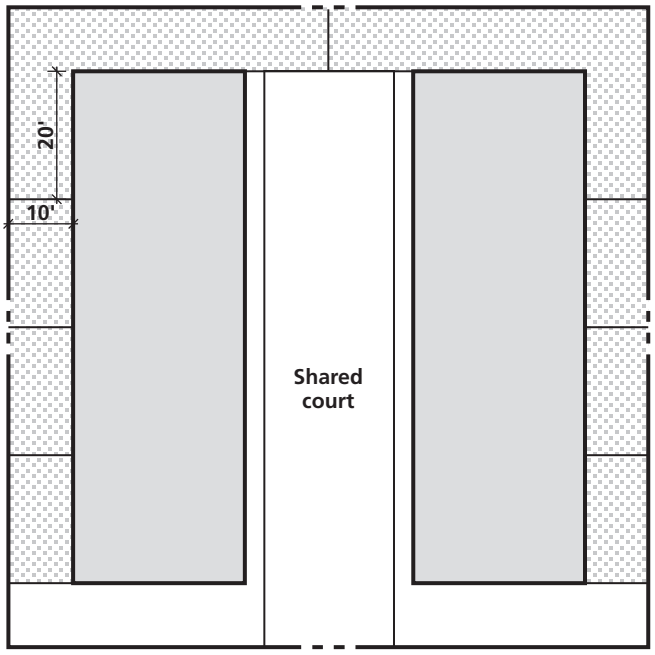
Shared courts **55–57**
Courtyard housing **46–51**

Case Studies

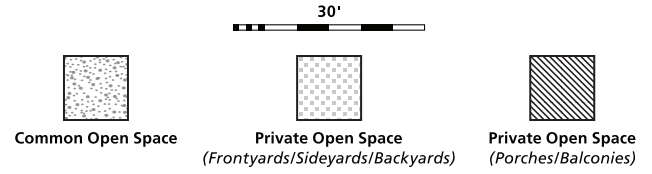
Courtyard Townhouses
Profiles 4, 6 . . . . . **C-28**



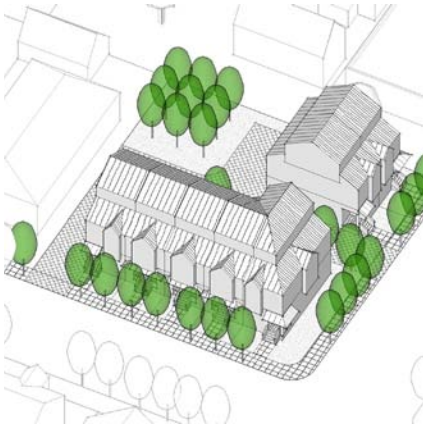
Parcelization Plan



Open Space Plan

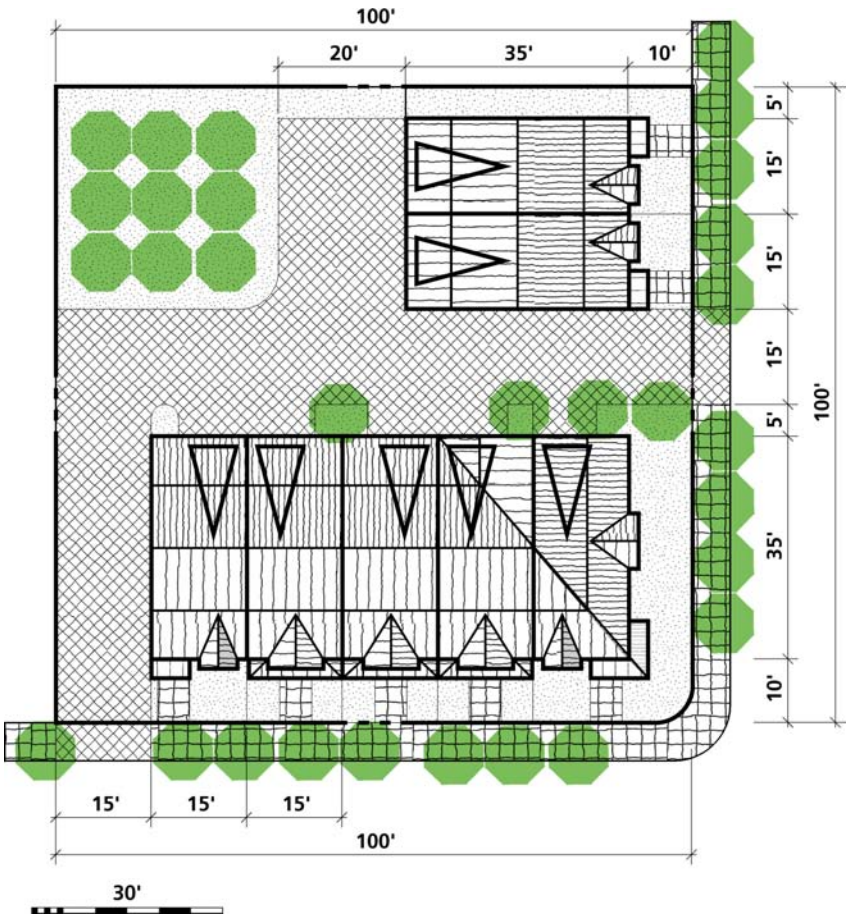


3b Corner Rowhouses



Site Axonometric View

- 7 rowhouses units (950–1,050 sq.ft each) situated on a corner parcel.
- Larger unit sizes possible with a full-size third level.
- Parking in "tuck-under" enclosed garages at the rear of each unit.
- Shared open space allows larger recreation space than would be possible separately for each unit.



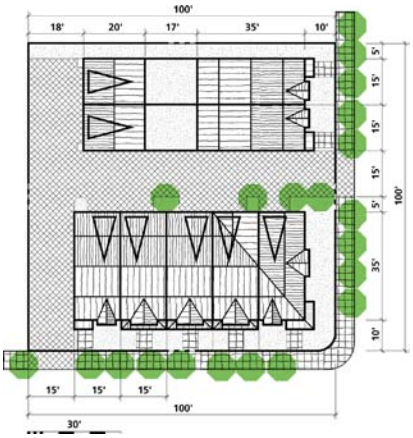
Precedents

Neighborhood Context

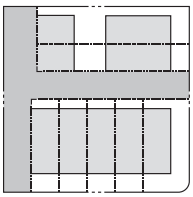
3b **Corner Rowhouses** Details

Regulatory Notes

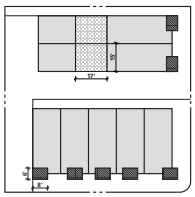
- Would require street standards code appeal for reduced corner radius at turn in rear alley.



Alternative with backyards



Alternative Parcelization Plan



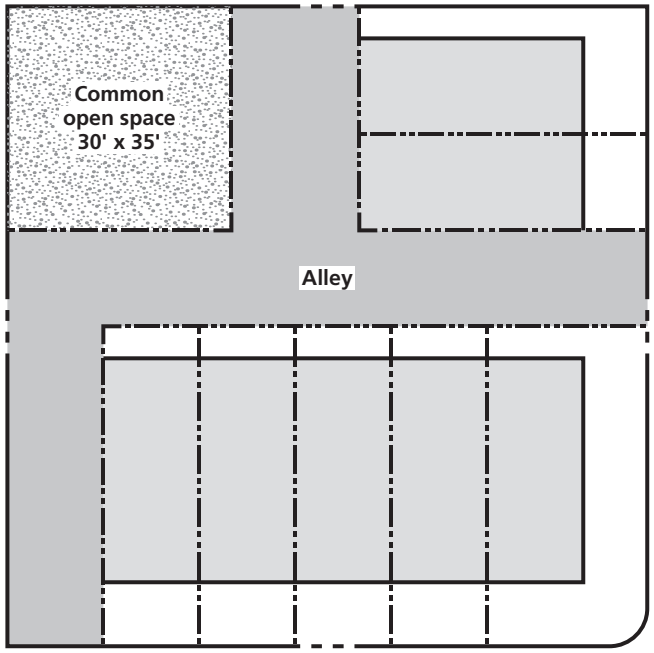
Alternative Open Space Plan

Related Sections

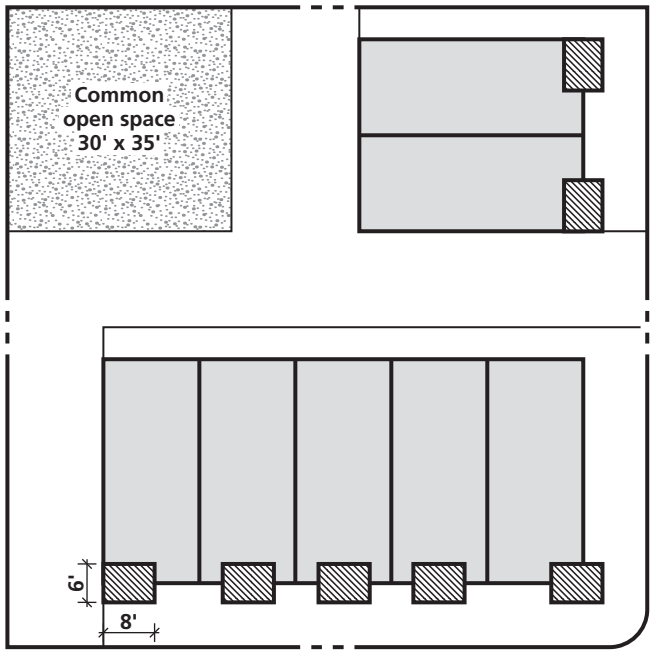
Rear parking **17, 20**
Driveways and parking **19**

Case Studies

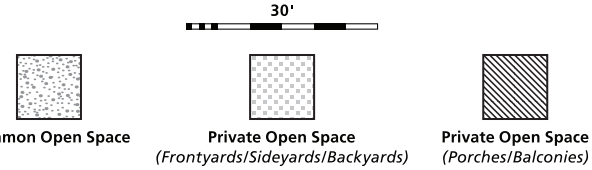
Rowhouse Project Profiles **C-2**



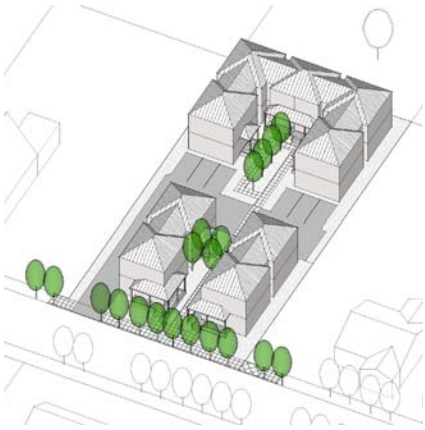
Parcelization Plan



Open Space Plan

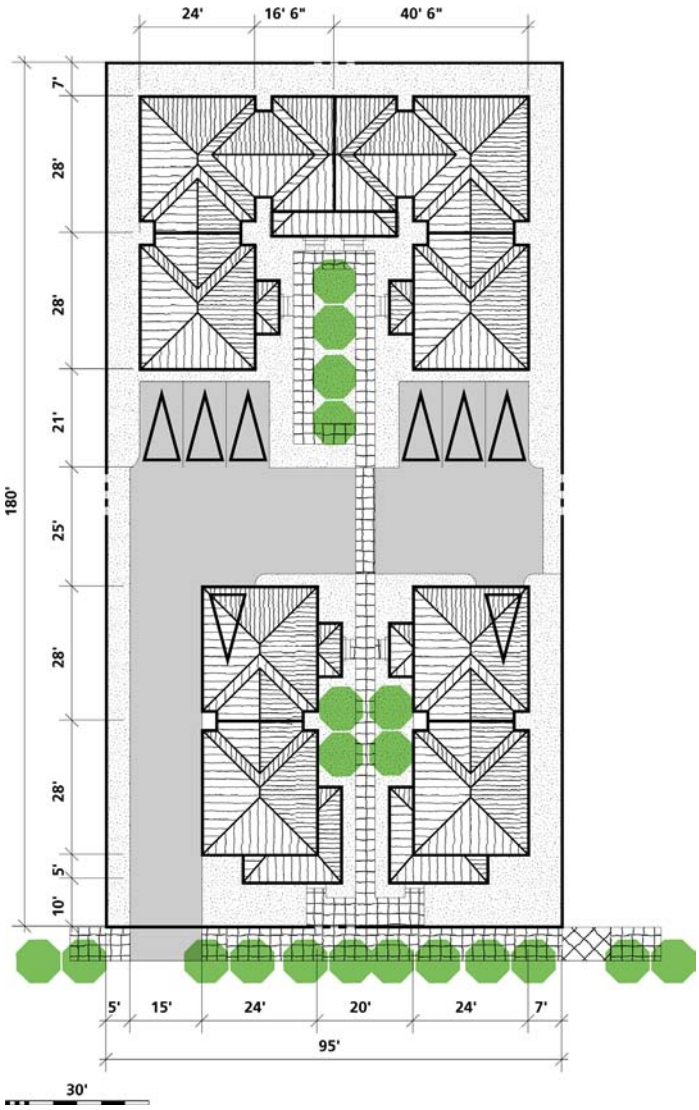


4a Courtyard Townhouses



Site Axonometric View

- 8 units in 3 buildings (1,100–2,150 sq.ft each, not including garages) arranged around a courtyard pedestrian walkway.
- Shared surface parking area at the middle of the site.
- Specially paved walk crosses driveway to link pedestrian walkway to a courtyard.
- This configuration would need to be apartments or condominiums.
- "House-like" form of front units and courtyard landscaping respond to neighborhood character.



Precedents

Neighborhood Context

4a Courtyard Townhouses

Details

Regulatory Notes

- Driveways narrower than 20' allowed when access is from a local service street and no more than 10 parking spaces. On other streets, PDOT may require wider driveway entrance.
- If rear units are not sprinklered, 20'-wide driveway would be required for fire access.

Related Sections

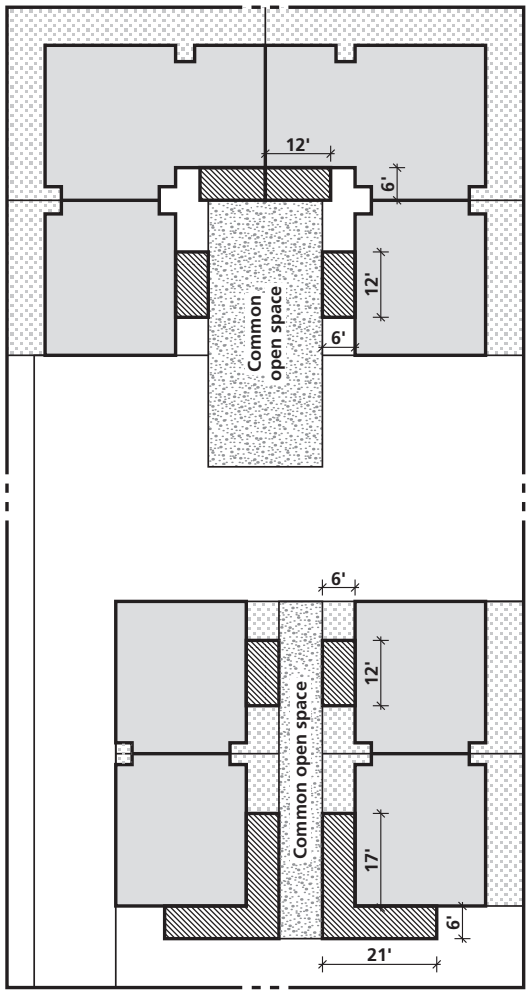
Driveways and parking **19**

Transportation and emergency access **B-9–B-14**

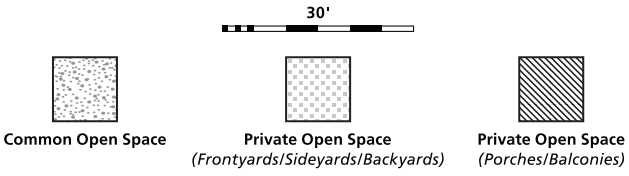
Courtyard housing **50–55**

Case Studies

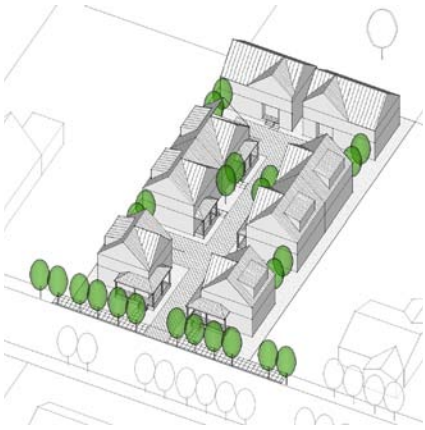
Courtyard Townhouses Profile 1 . . . . . **C-26**



Open Space Plan

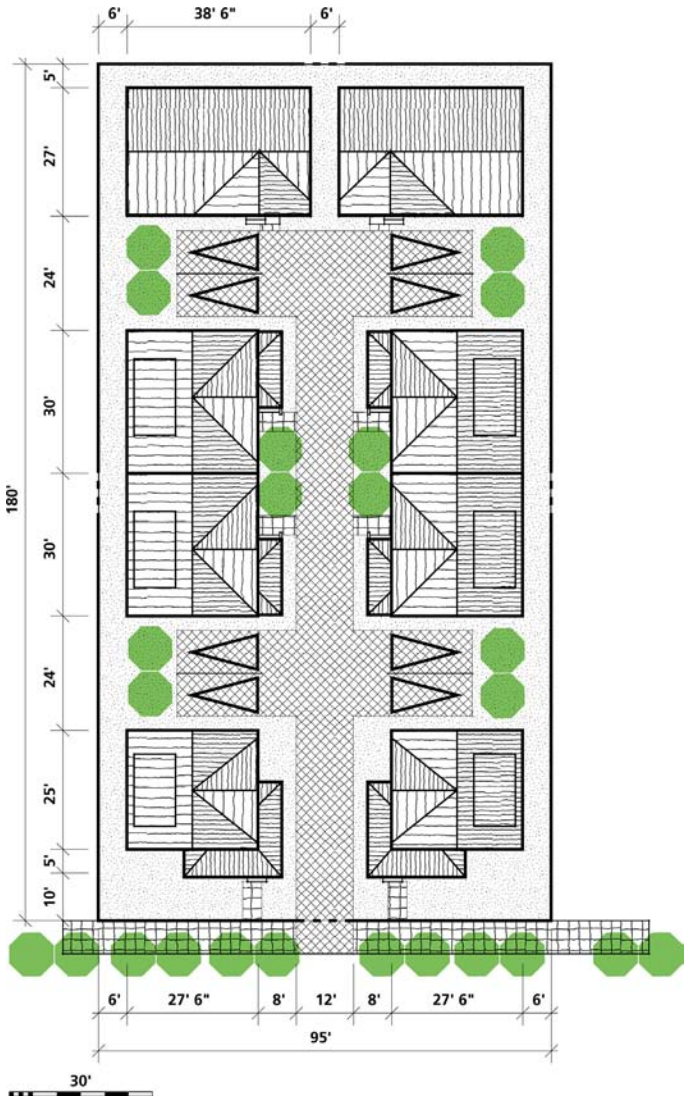


4b Big Cottage Court



Site Axonometric View

- 8 units in 5 buildings (1,380–2,250 sq.ft each) arranged around a driveway with decorative paving.
- Surface parking spaces near each unit.
- As shown, would require condominium ownership or be apartments.
- Driveway with special paving serves as alternative to grade-separated walkway and provides multifunctional space.
- With a wider accessway and other modifications may also be possible as a shared court with units on separate lots.



Precedents

Neighborhood Context

4b **Big Cottage Court** Details

Regulatory Notes

- Narrow driveway, as shown, requires rear units to be sprinklered. If not sprinklered, 20’-wide driveway required for fire access.

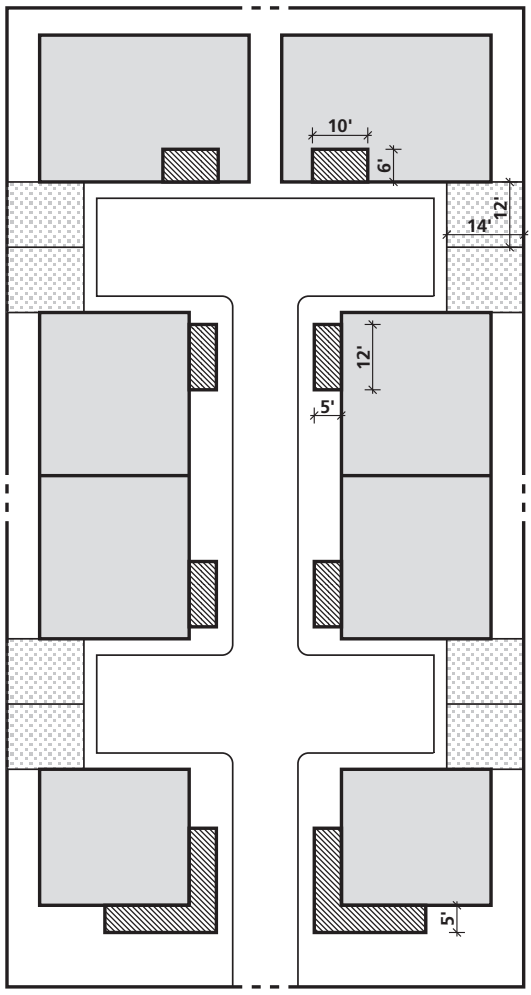
Related Sections

Driveways and parking **19**

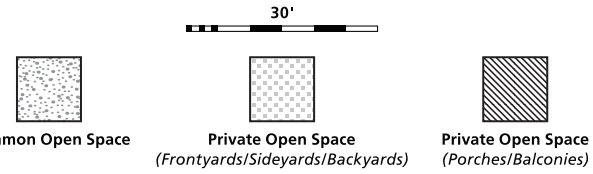
Transportation and emergency access **B-9–B-14**

Courtyard housing **46–51**

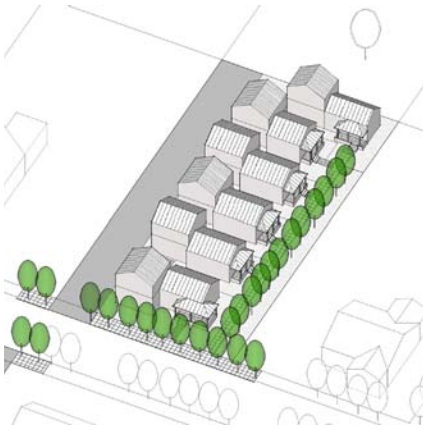
Shared courts **55–57**



Open Space Plan

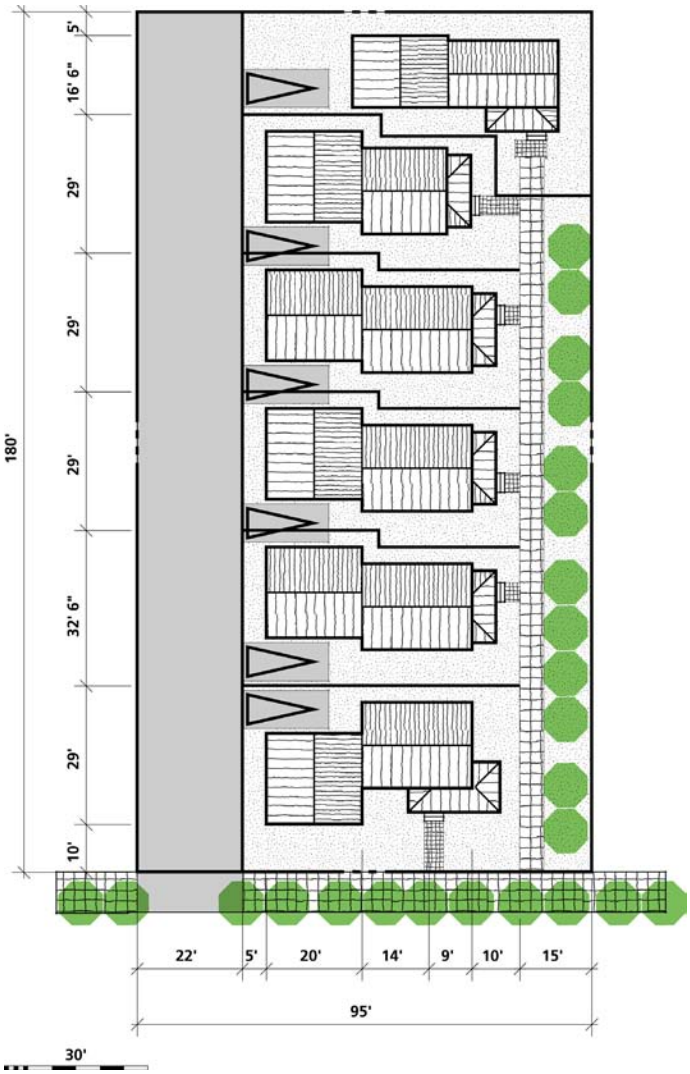


4c **Mirrored Green**



Site Axonometric View

- 6 ownership units (900–1,200 sq.ft each, not including lofts) on separate lots arranged around a common green.
- Detached, 1½ story units are designed to blend in with landscape-intensive, low-lying character of outer east neighborhoods.
- Mutual easements provide for 10’-wide sideyards between houses.
- Design intended to allow a pattern of mirrored greens to develop over time, as shown in neighborhood context.



Precedents

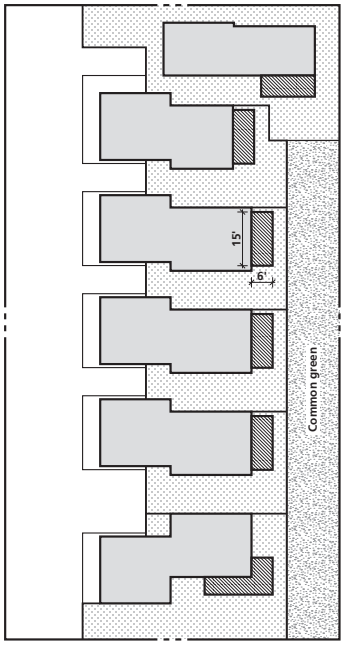
Neighborhood Context

4c **Mirrored Green**

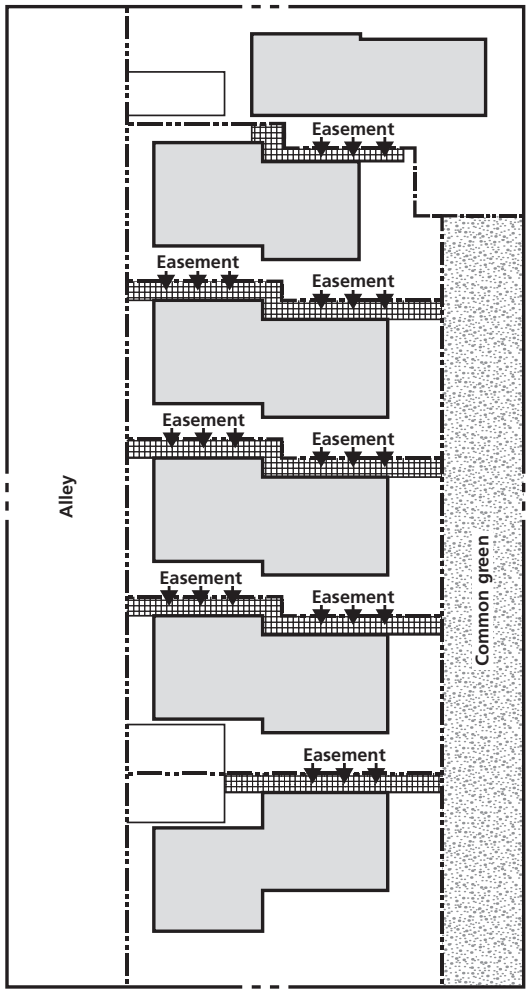
Details

Regulatory Notes

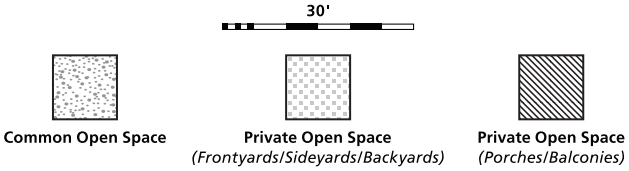
- An alley easement (instead of tract) as narrow as 12' would be possible if only 5 lots are created (such as by including a duplex or house with ADU on front lot). Two rear-most houses would need to be sprinklered to avoid requirement for 20'-wide fire access.
- If alley is needed to provide fire access the two rear-most units need to be set 10' away from the alley.



Open Space Plan



Parcelization Plan. Easements allow usable side yards and parking for each unit.



Related Sections

Transportation and emergency access **B-9–B-14**
Side yard easements **40**
Courtyard housing **46–51**
Common greens **52–53**

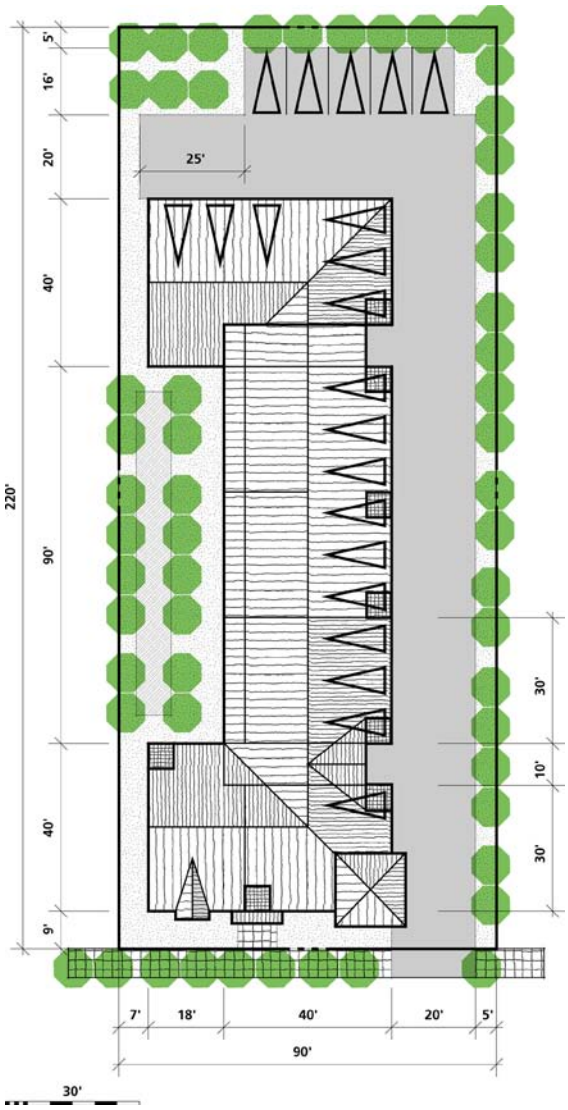
Case Studies

Hastings Green **64–65**
Cluster Housing Profiles 1, 2 . . . . . **C-22**

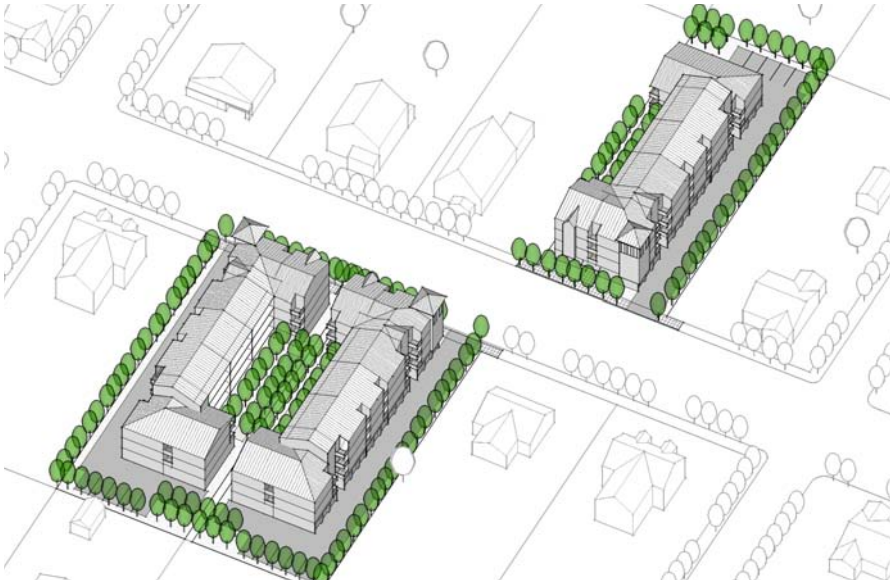
5a **Courtyard Flats**

Site Axonometric View

- 18–20 stacked-unit apartments (900–1,000 sq.ft each) grouped around a shared open space.
- Provides a strong edge to busy arterial street and creates an open space sheltered from traffic.
- Features open "tuck-under" parking. Considered more economical than structured or underground parking, while allowing more efficient use of site area than surface parking.
- Plan could be mirrored on adjacent or larger site, with a single large central courtyard.



Precedents



Neighborhood Context

5a **Courtyard Flats**

Details

Regulatory Notes

- Rear portion extends more than 150' from street. This portion must be separate structure and limited to 30' in height, otherwise a 26'-wide driveway set 15' from the building would be required for fire access.

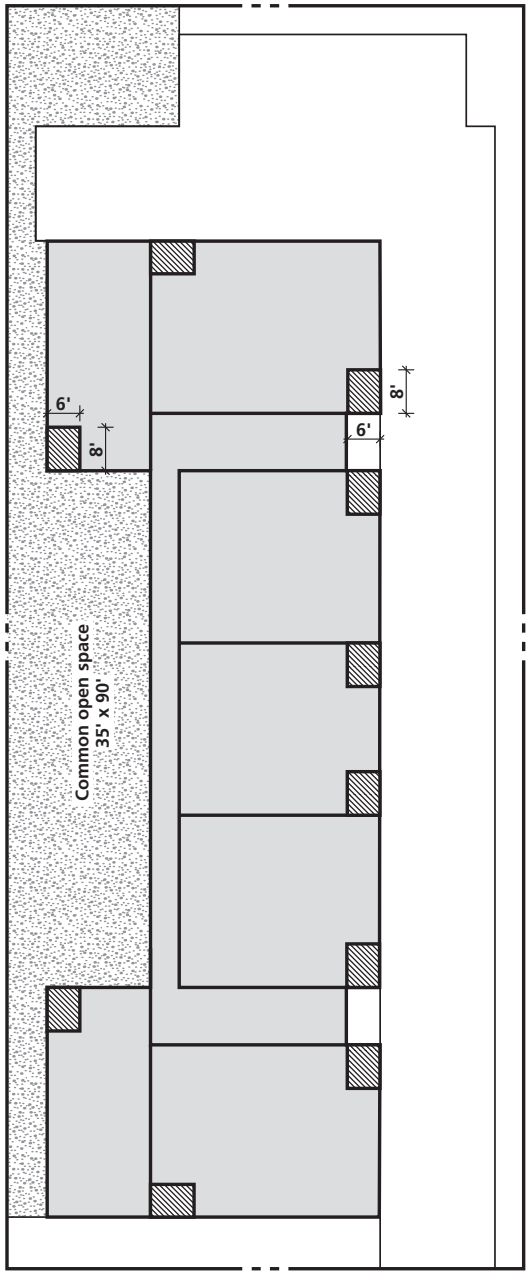
Related Sections

Transportation and emergency access **B-9–B-14**

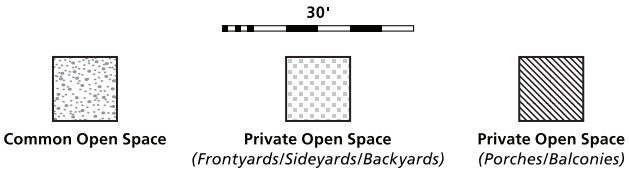
Structured parking **B-6**

Case Studies

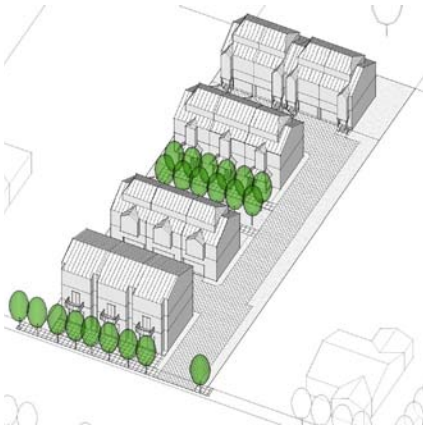
Apartments Profile 5 . . . . . **C-31**



Open Space Plan

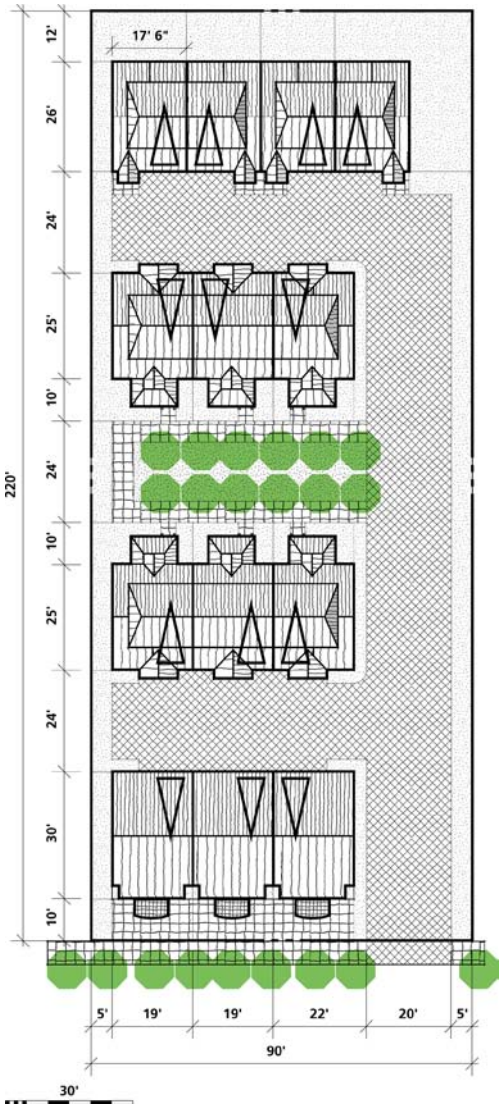


5b Courtyard Townhouses

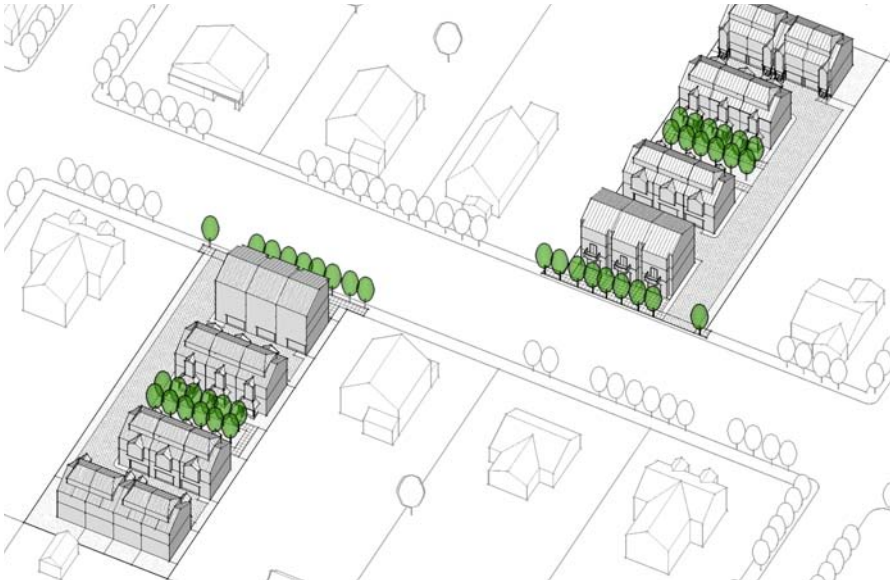


Site Axonometric View

- 13 Townhouse-type units (900–1,150 sq.ft) grouped along courtyards and accessed by rear drives, plus three potential studio units along street frontage.
- Buildings divided into smaller groupings, instead of the long, barracks-like buildings common on similar sites.
- As shown, would need to be condominiums or apartments.
- Three-story units along site frontage intended to provide edge to busy arterial, with ground-level spaces suitable as home offices, entry hallways, or studio units.



Precedents

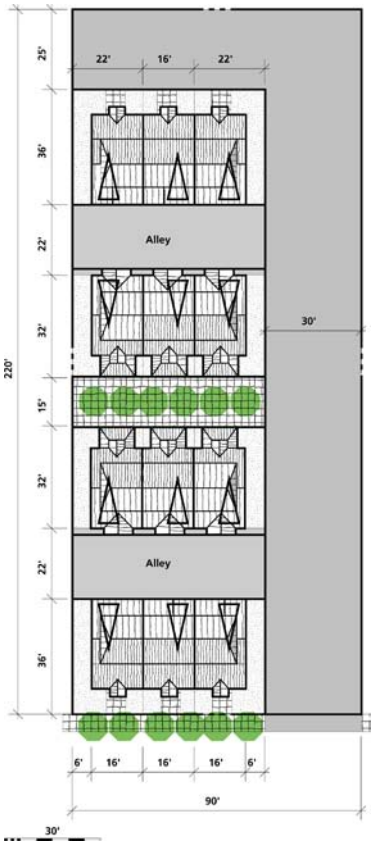


Neighborhood Context

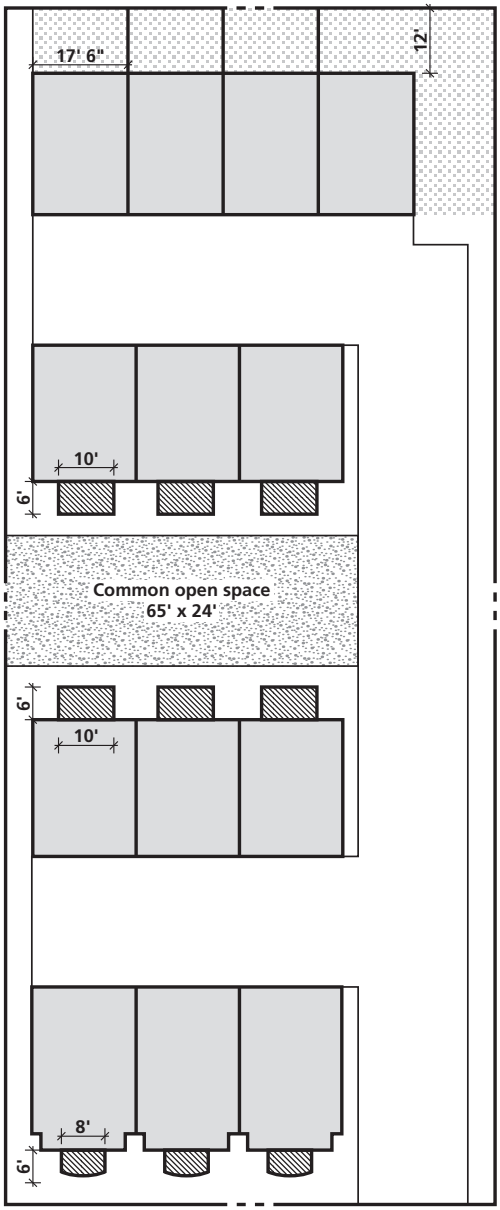
5b **Courtyard Townhouses** Details

Regulatory Notes

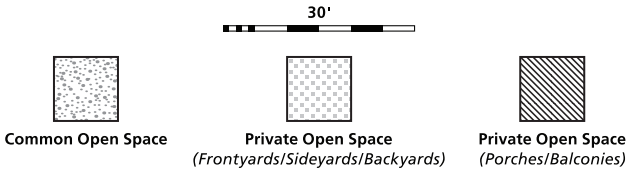
- Large lots, such as this, are typically located in areas with poor street connectivity, which may trigger requirement for new street connections.



Alternative Site Plan with ⅔ public street (allows creation of separate lots for each unit).



Open Space Plan



Related Sections

Rear parking solutions **20**
Transportation and emergency access **B-9–B-14**
Courtyard housing **46–51**

Case Studies

Courtyard Townhouses Profile 3 . . . . . **C-27**

Cost Efficient Strategies for Structured Parking:

- The separation required by the building code between parking structures and residences has been reduced to a 1 hour fire barrier allowing for conventional concrete block, wood, or light steel frame construction for the entire building.
- Taller/higher density buildings may be designed with parking structures constructed of concrete or fire-proofed steel under a residential structure built using any construction method including concrete block, conventional wood or light steel frame.
- Partially sub-grade (4 to 5 feet above grade) parking structures reduce excavation costs and can be naturally ventilated eliminating the need for mechanical ventilation.

Structured Parking

Structured or podium parking has typically been used on large-scale urban mixed use and residential developments. However, small-scale medium density infill developments are increasingly utilizing podiums as a viable alternative to individual garage parking or surface lots, and as a way of providing on-site parking for residents while providing more usable open space. This section provides insight into the types of developments which can benefit by using structured parking, explore many of the issues concerning podium parking, discuss the constructability and code related issues concerning structured podiums, and outlines the benefits of building podium parking for medium density residential projects.

Developers of medium density infill projects are looking at shared structured parking as a viable strategy to increase density while providing usable open space and meeting parking demand.

Developers, builders and designers of medium density infill housing developments need to balance the number of units, open space and parking requirements with the neighborhood and city's desires for a project. On sites where the desired density, open space and need for parking impacts the overall site development to such an extent that traditional buildings are impractical, podium parking should be used or considered as a viable alternative to individual garage or surface clustered parking. Podiums can be used to improve the overall amount of parking provided when low parking ratios might not be accepted, improve the amount and quality of open space, and allow residents to maintain a strong connection to open space and the street.

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Structured Parking Consulting Team

Van Meter Williams Pollack, LLP; Urbsworks, Inc.; E.D. Hovee & Company

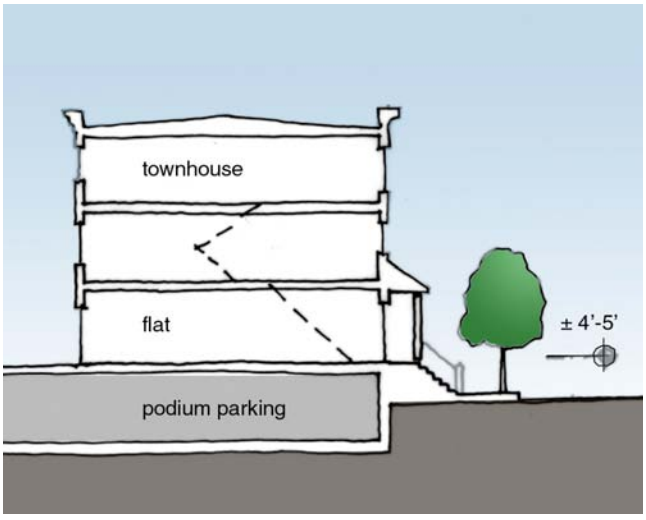
Types of Buildings Which Can Utilize Podium Parking

Structured or podium parking is a valuable alternative to surface parking for medium density infill housing projects. The podium allows for increases in parking ratios while maintaining or increasing open space on the site. The shared parking podiums can support a variety of housing types, including row houses, flats, courtyard apartments, and other multifamily buildings. Structured parking garages also provide opportunities for additional storage and other shared facilities.

Structured parking is currently not commonly used in the Portland area by small builders and developers for a variety of reasons:

- Small builders are often not familiar with the building codes and construction methods necessary for building and designing concrete parking podiums.
- Small builder/developers often do a substantial portion of the construction work themselves and typically don't "sub out" as large a task as a podium may require them to perform.
- They often do not use the professional services of an architect, or use architects and engineers who may not have experience with podium developments.
- The cost of podium parking is greater for the developer and needs to be evaluated and weighed relative to the associated benefits of higher densities, providing greater parking and open space.
- The shared nature of parking podiums has cost liability considerations, which need to be understood and addressed, particularly in condominium developments.

Sub-grade parking is seen in many new developments because it places parking underneath buildings, allowing the site to support more building area and open space.



Podiums are most successful when they are only 4–5' above grade.

Construction Methods and Building Codes

Parking podiums generate flexibility in building. The International Building Code (IBC) with Oregon Amendments allows many options, depending on the height of the building. Conventional wood or light steel construction built above a concrete parking podium can often be built independently of the structural system of the garage, allowing for a large variety of building configurations. Through-slab utilities and any exceptional loads should be coordinated with the design of the parking structure and concrete slab. Structured parking can be built using any type of construction, but is most often built with Type I Construction. Common methods include heavy steel with fireproofing, conventional slab and post-tension slab construction methods. Post-tension slabs use less reinforcing and are often more cost effective, but require greater planning of through-slab utilities.

The ability to use conventional wood or light steel construction above the parking podium allows for structured parking to be incorporated into building projects in a cost effective way, utilizing construction methods that small builders tend to be more familiar with. These opportunities, together with efficiencies gained with not having to devote additional site area solely to vehicle parking and the resulting solutions this provides for small infill sites, make structured parking practical for a wide range of higher-density residential project, especially on the constrained sites typical of infill development.

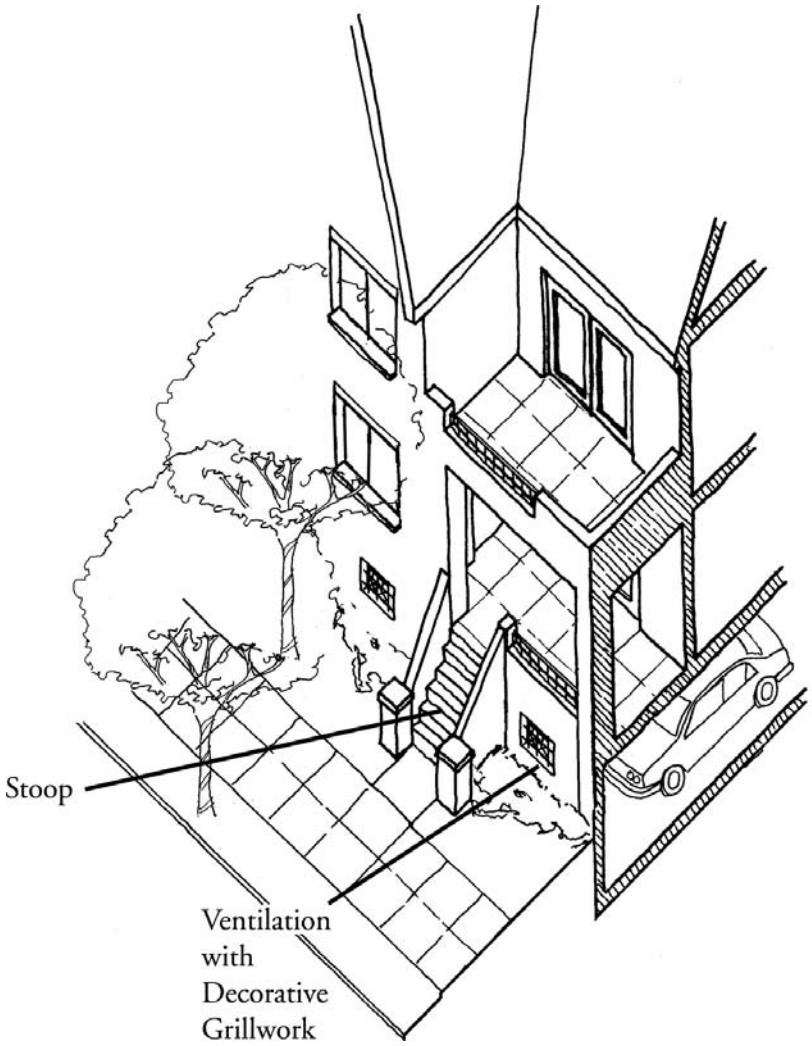
Concrete slab podiums are a more common construction type used for structured parking. Coordination of penetrations is critical.

A combination of concrete block, steel, and wood framing can now be used as long as the parking is solely for the residents. Builders are often more familiar with steel and wood frame methods of construction.

Design and Engineering

Partially sub-grade parking is seen in many new developments because it places parking underneath buildings, typically extending 4–5 feet above grade, allowing the site to support more building area and open space. It is more cost effective than fully underground parking because of less excavation and it can often be naturally ventilated. It also elevates the first floor living area above the street level, which can increase privacy and allow for raised stoops or porches, which fits into many residential neighborhoods. Compared to above-grade parking, partially subgrade parking reduces the bulk and the height of the building, helping to mitigate scale contrasts with smaller adjacent structures.

However, if not treated properly semi-depressed parking can result in the habitable portion of the building appearing to be overly separated from the street and the sidewalk pedestrian environment. A careful balance is needed between raising the building high enough to allow natural ventilation, but low enough to create a quality pedestrian environment. A common solution is to screen the exposed portion of the parking with architectural elements, such as stoops, bays and balconies, that restore a connection between the building and the ground and enhance the streetscape. Ventilation openings can be designed as integral elements of the facade.

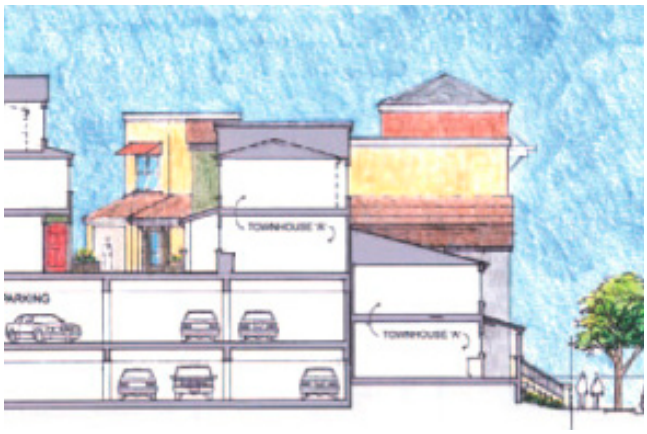


Above-grade Parking

Above-grade parking can be more cost effective than parking that is below or semi-depressed from grade, but is more likely to create blank facades and result in a poor relationship between buildings at grade and buildings above the podium. Attaching habitable space at grade, as a liner, adjacent to the parking structure can mitigate the ground-level frontage of the podium. The upside to above ground parking is greater opportunities to provide adequate ventilation for the parking. This may be useful for small lots or attached infill housing. However in areas where height or relationships to adjacent properties is a major concern, partially sub-grade or totally sub-grade parking may assist in a project's acceptance by the community.

Below-grade Parking

Below-grade parking can be used to increase the relationship between dwelling and grade, while reducing the bulk and height of a building. Below-grade parking structures need to be mechanically ventilated and further excavated, increasing the cost of the parking structure. Although the positives relate to mass and relationships to adjacent homes, the access to a sub-grade structure is typically a large ramp, which if located outside, may have tremendous negative impacts on the streetscape and the building design.



Structured parking can be concealed by placing habitable uses in front, as well as through variations in grading.

Portland plex, partially sub-grade shared parking

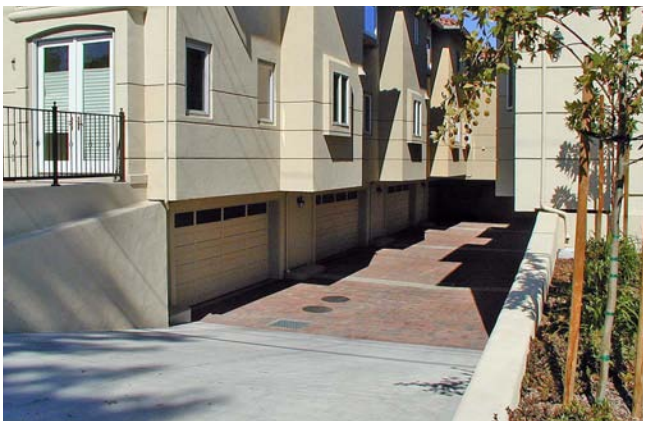
Building fronts should face other building fronts or open spaces whenever possible.

Tuck-under Parking

Tuck-under parking is a relatively inexpensive compromise between surface parking and fully-structured parking. A rowhouse with tuck-under parking will have parking located to the rear of the building, accessed by an alley. Tuck-under parking reduces the visual front facade impact of a full garage story by partially submerging the alley. The garage and alley should be at a lower level graded approximately half a story below the front yard and sidewalk and should include two parking spaces in a side by side or tandem orientation.

Podiums as Open Space

One of the benefits of podium parking is that the podium allows for more habitable open space. The slab can be landscaped as circulation, shared or private space depending on the development type. There are a wide variety of planting options for podiums requiring a varying amount of attention and planning. The podium can be landscaped with deep integrated planters for major landscape elements, such as trees and large shrubs, or landscaped with potted landscape, furniture, play structures and even turf or other ground cover. Downsides to using the podium as open space include waterproofing and drainage concerns, somewhat more limited landscape choices, smaller trees, and the overall cost of providing the planters, irrigation and landscape. Some of these problems can be solved by decreasing the lot area of the parking structure to provide on-grade landscaping and by proper planning before the design of the podium.



Rowhouses should provide rear accessed at-grade or slightly below grade parking garages for resident parking.

Podiums can be landscaped with a variety landscape options including turf.

A parking podium in Boulder, CO with integrated planters under construction.

Potted plants limit the size and type of plants that can be used. If one chooses to design for larger trees and planters, special planning and coordination is needed to provide proper structural support. Large trees and planters can add extra hidden costs and increase reinforcement requirements for the structure. Large built-in planters require special attention to waterproofing, construction and detailing, particularly when they abut the buildings on the podium. Consultants, specializing in waterproofing, and architects familiar with these details can provide appropriate direction during construction.

Podium Garage Auto Entries

The garage entry has the greatest potential negative impact on the podium project's streetscape and requires special consideration of its location and design so as to be integrated into the building and minimally impact the streetscape. The ramped entry width should be minimized and the garage door should be integrated into the building façade. The podium access can often be best handled on developments on corner lots where drive access can be located on the side yard.

Potted plants are often used as a low cost alternative to integrated planters.

Waterproofing and flashing protects the building and podium around integrated planters

The garage entry has the greatest potential to negatively impact a projects relationship with the street. Parking garage entries should be integrated into the overall design of the project.

Structured Parking and Building Codes

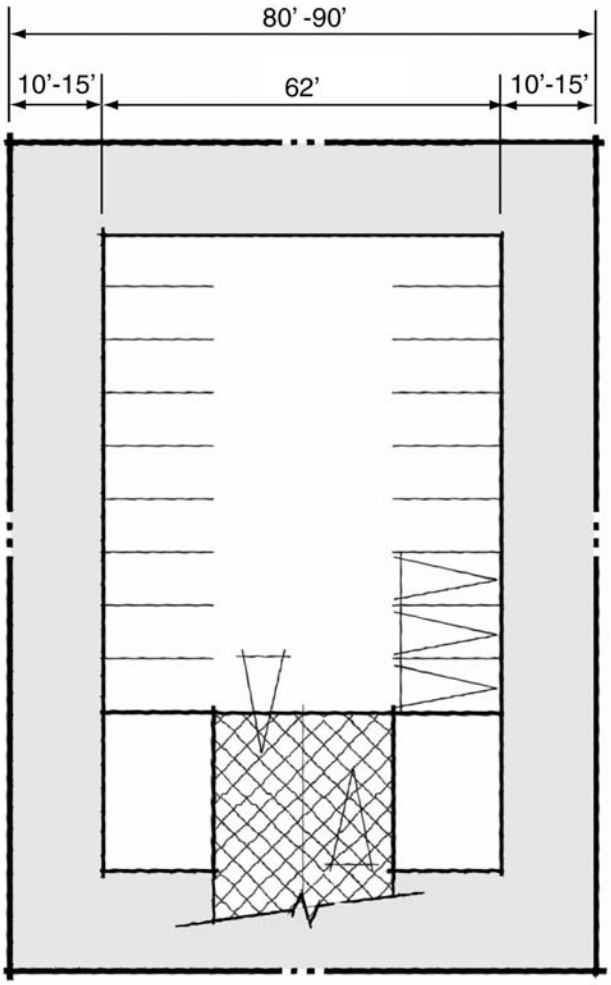
The International Building Code (IBC) with Oregon amendments has several viable options for including parking garages in residential buildings.

A private parking garage for residents' use only, and not more than 3,000 square feet in floor area, can be classified as a U Occupancy and be built using any Construction Type including conventional wood frame (Type V). Mechanical ventilation is not required. More than one 3,000-square-foot U-Occupancy parking garage is allowed in the same building if they are separated by fire walls.

Larger parking garages are classified as S-2 Occupancies, and are further classified as either open with natural ventilation, or enclosed with mechanical ventilation. Open parking garages must be of Construction Types I, II or IV (non-combustible or heavy-timber), but are usually built using concrete or steel. Open parking garages must have uniformly distributed openings on at least two sides with a cumulative area of at least 20% of the total perimeter wall area, and a cumulative length of at least 40% of the perimeter of the floor. Enclosed parking garages may be built of any Construction Type and must have mechanical ventilation as required by the Oregon Mechanical Code.

Parking garages in buildings governed by the Oregon Structural Specialty Code must be separated from other uses in the same building by one-hour fire-resistive walls and/or floor-ceilings. The location of the parking garage on the property depends on the placement and area of exterior wall openings. Walls less than 3 feet from a property line may not have any openings. Walls 3 – 5 feet from the property line may have up to15% of their area open, walls 10–15 feet from the property line may have up to 25% of their area open, walls 10 – 15 feet from the property line may have up to 45% of their area open. These distances protect against fire traveling from building to building.

The International Residential Code (IRC) with Oregon amendments offers more flexibility for parking garages below residential structures including one and two-family dwellings, rowhouses (side-by-side dwellings on separate lots) and townhouses (multiple side-by-side dwellings on the same lot). Garages built using the Residential Code are not required to be ventilated and the separation between the garage and dwelling is less stringent.



The Infill Design Toolkit:
Medium-Density
Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Driveways: Transportation and Emergency Access Requirements

The size of driveways and other vehicle maneuvering areas are key elements that influence the design of higher-density infill projects. Besides Zoning Code development standards, other City requirements related to transportation and fire access play key roles in shaping these elements and the overall design of residential infill projects. To provide a clearer understanding of how driveways can be designed to meet the City's various regulations, this section summarizes relevant Office of Transportation ("Transportation") and Fire and Rescue ("Fire Bureau") requirements. Note that these are generalized summaries only and do not take into account the many site-specific issues that typically have a bearing on requirements that would apply to a specific development proposal. Transportation and Fire Bureau staff should be consulted for greater detail and authoritative information.

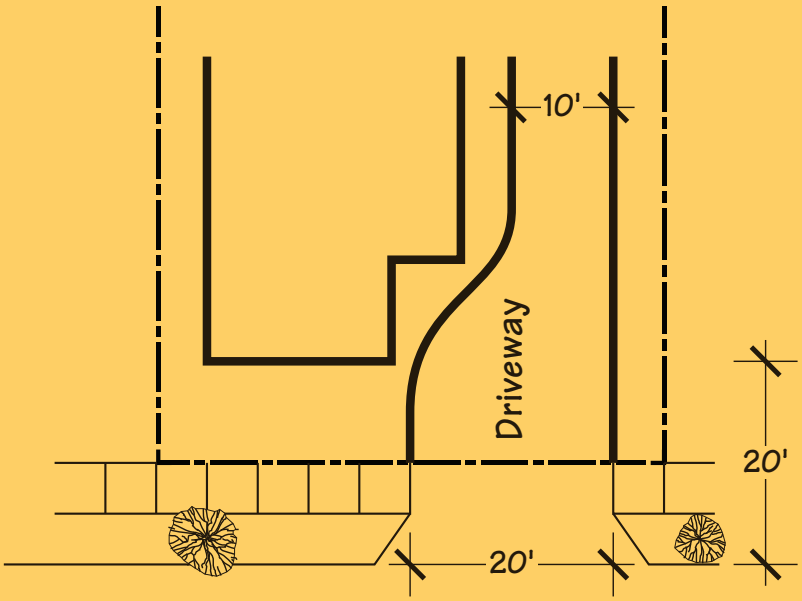
Understanding requirements and allowances related to driveway width can make the difference between a project dominated by driveway surfaces (left) and one in which the driveway nearly disappears from view (above).

Transportation

Besides their responsibilities for public streets and other public rights-of-way, the Office of Transportation has authority regarding aspects of site design that have an impact on traffic safety and on-street parking. Regarding the site design of small infill projects, Transportation's requirements are typically related to traffic safety when vehicles enter and exit public streets and to the preservation of on-street parking. Rules-of-thumb regarding Transportation's requirements include:

Driveway widths *(see Section 17.28.110 of the City Code)*

- Driveways for houses, attached houses, and duplexes can be as narrow as **9'**
- For multidwelling projects, driveways as narrow as **10'** are allowed for
  1. Sites with no more than 50' of street frontage, and
  2. Wider sites, when the driveway provides access to no more than 10 parking spaces and access is on a local service street
- **20'**-wide driveways are typically required for larger multidwelling projects, as well as for small projects when driveway access is on a busy street. This additional width is intended to ensure that two vehicles entering and exiting the driveway from a street can pass by each other, to avoid the traffic hazard posed by a vehicle having to stop in traffic while waiting to be able to enter the driveway.

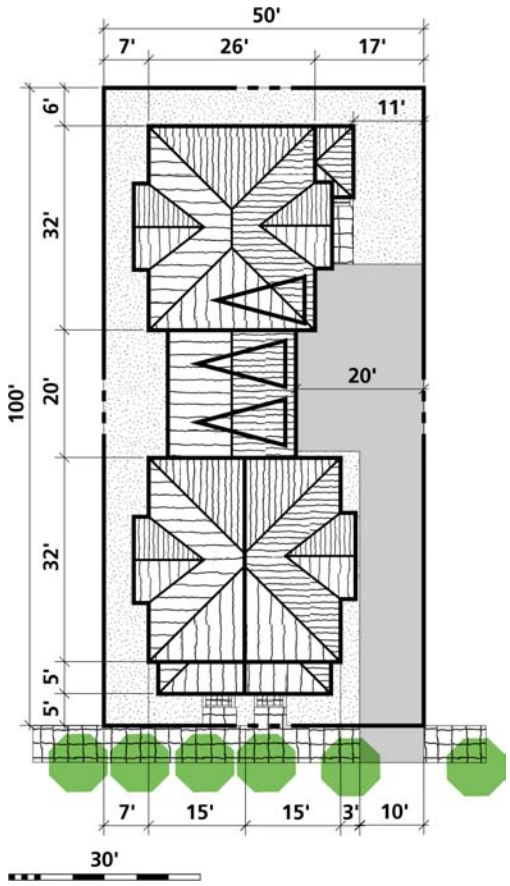


Regulatory Tip

Transportation's primary concern regarding driveway width is where the driveway throat meets the street. When a 20' width is required, it may be possible to have the driveway become narrower elsewhere on the site, particularly in the case of small multidwelling projects. The wider 20' width is typically required for a length of 20', measured from the street curb, after which point the driveway can be narrowed.

Maneuvering space to allow forward motion of vehicles

- Multidwelling vehicle areas are typically required to be designed to allow vehicles to enter and exit streets in a forward motion. To allow for this, a minimum **20' back-out distance** is typically necessary behind parking spaces to provide enough room for vehicle maneuvering.
- This forward motion requirement does not typically apply to houses and rowhouses, except in the case of projects along busy streets, when a shared driveway or alley may be required instead of separate driveways for each unit. When rear, alley-accessed parking is included, however, the 20' back-out distance is typically necessary.



Paired driveways

In order to preserve lengths of street curb for on street parking, front-accessed rowhouse driveways are typically required to be paired to limit the amount and frequency of curb cuts. For two-unit projects, however, Transportation staff may allow driveways to be separated if enough space for parking (approximately 18') is provided between driveways.

Paired driveways are typically required for rowhouse projects (as in left image) to preserve on-street parking. An alternative to this for small, two unit projects is to provide enough space between driveways to allow an on-street parking space, which provides the design benefit of allowing landscaping to be the central feature (as in right image).

DICK HARRIS/PORTLAND FIRE & RESCUE

Fire Bureau

Requirements for fire access can play a key role in shaping the overall configuration of residential infill projects. While area required for fire access can sometimes occupy a significant portion of small sites, alternative strategies can be pursued that allow more space-efficient solutions for higher-density projects on small sites. Rules-of-thumb regarding fire access requirements include:

A fire accessway is *not* needed if:

(Note: distances from street curb are measured in terms of accessibility by fire hose)

1. All portions of buildings are within 150' of a public street curb, or
2. Buildings have fire sprinklers, are within 250' of a street curb, and are not taller than 30',

A fire accessway *is* required for:

1. Unsprinklered buildings that extend more than 150' from a street curb;
2. Any building that extends more than 250' from a street curb; or
3. Any building more than 30' tall that extends more than 150' from a street curb or is not adjacent to a public street.

Regulatory Tips

- The 30’ measurement of building height is measured up to the mid-point of pitched roofs. However, the Fire Bureau will also consider allowing the lower building standards to apply to slightly taller buildings whose roof eaves (at gutter level) or exterior walls are no taller than 30’, as a primary concern is the ability to access windows within 30’ of ground level.
- On a deep site intended for higher-density development, it is possible to avoid having to include an emergency accessway if taller buildings are concentrated close to the street, with development on portions of the site that are more than 150’ from the street kept to lower-scale buildings less than 30’ high and sprinkled (see Prototype 5a).

DICK HARRIS/PORTLAND FIRE & RESCUE

Fire accessway width

(Applicable to driveways and private streets)

1. When required for buildings up to 30' tall, fire accessways must typically be at least 20' wide and set back at least 10' from buildings being served by the accessway.

   Exception: If structures with no more than 2 units extend beyond 150' from a street curb, a 12'-wide emergency accessway is allowed (however, this narrower dimension is usually not granted if the accessway is lined by multiple units, due to concerns that larger numbers of units increase the likelihood that the accessway will be obstructed by illegally-parked vehicles).

2. For buildings more than 30' tall that require a fire accessway, aerial apparatus access (for ladder trucks) must be provided that:

   a. Is at least 26' wide in the immediate area of the building, and

   b. Is located at least 15' and a maximum of 30' from buildings being served by the accessway (this standard applies to at least one required access route).

   Exception: Aerial apparatus access may not be required for taller buildings sprinkled to higher standards (NFPA13, which requires sprinklers in closets and attic space) and that include stairways with roof hatches providing roof access. A fire code appeal is necessary to determine if the added sprinkler coverage is an adequate substitute for an aerial access lane.

Other fire access requirements especially relevant to site design

- **Two separate fire accessways are typically required for:**

  a. **Multifamily projects with more than 100 dwelling units** when the project does not have adequate fire access from a public street. An exception is that multifamily projects with up to 200 units may have a single fire accessway when buildings are sprinklered.

  b. **Developments with 30 or more one- or two-unit buildings,** except when all units have sprinkler systems.

- **Area for fire truck turnaround** is required if the fire accessway extends more than 300' from a street. *(see the 2005 Portland Fire Code for details of approved turnarounds)*

- **Deeper building setbacks** than those allowed by the Zoning Code may be required by the Fire Bureau for emergency access to third-story rescue windows.

A Note on Fire Sprinklers . . .

Installing fire sprinkler systems as an alternative to fire accessways allows for space-efficient configurations and can be particularly useful for higher-density projects on small sites. Sprinkler systems are typically required for residential buildings with three or more units. Sprinklers can also be a cost-effective option for houses and duplexes as alternatives to emergency accessways, as they:

- Decrease the amount of site area and materials that would otherwise be needed for an emergency accessway, providing cost savings that can defray much of the cost of sprinkler systems;
- Allow less impervious surface, decreasing the need for and costs of stormwater management systems;
- Are relatively inexpensive for houses and duplexes (about $1.50 per square foot of living space, utilizing the regular water system and meter).

20'-wide fire accessway

Without sprinklers (20'-wide accessway required)

With sprinklers

Projects are organized first by housing type, secondarily by configuration, and then (somewhat loosely) by density:

Rowhouses C-2
Duplexes C-15
Plexes C-17
Cluster Housing C-22
Courtyard Townhouses C-26
Apartments C-29

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Project Profiles

This section is a compilation of summary information on recent medium-density residential projects that include features that contribute to meeting the community's design objectives. These projects serve to illustrate how built projects have used design strategies that achieve objectives such as minimization of the prominence of parking, contribution toward pedestrian-friendly street frontages, response to established neighborhood patterns, or that serve as examples of innovative housing types and configurations.

Most project information presented here comes from Bureau of Development Services records. The accuracy of some of this information has not been verified with project developers, owners, or designers.

Rowhouse Profile 1

Housing type	Rowhouses, rear garages
Neighborhood	Russell
Address	1529–1549 NE 132nd Avenue
Zoning	R3
Site size	18,270 SF
Units	6
Density	1 unit per 3,045 SF (14 units/acre)
Parking	12 spaces (in rear garages detached from primary structure)
Size of units	1,257–1,471 SF (3 bedrooms)
Year completed	2000
Developer	Status Corp.
Designer	Design Headquarters

An uncommon (in Portland) example of a rowhouse project that includes both rear parking and rear yards, a combination facilitated by the 120' depth of the site. Rooflines and porches provide a horizontal emphasis that responds more successfully to the ranch houses and other low-lying houses that predominate in the surrounding neighborhood than would the more typical rowhouse arrangement of multiple front gables.

Rowhouse Profile 2

Housing type	Rowhouses, rear parking
Neighborhood	Boise (Mississippi Conservation District)
Address	4102–4120 N Mississippi St.
Zoning	CSd
Site size	9,985 SF
Units	4
Density	1 unit per 2,496 SF (18 units/acre)
Parking	4 spaces (parking pads accessed from alley)
Size of units	1,312 SF (3 bedrooms)
Year completed	2001
Developer	Portland Habitat for Humanity
Designer	FWL Architects

Rowhouses on 100'-deep lots with parking accessed from pre-existing alley, which allowed for both rear yards and rear parking pads.

Rowhouse Profile 3

Housing type	Rowhouses, rear parking
Neighborhood	Brooklyn
Address	3904–3932 SE 16th Ave. ("City Life")
Zoning	R2
Site size	14,101 SF
Units	6
Density	1 unit per 2350 SF (19 units/acre)
Parking	6 spaces (along rear alley)
Size of units	1,231 SF (3 bedrooms)
Year completed	1995
Developer	REACH Community Development
Designer	Roderick Ashley and Andrew Feinberg

Winners of the 1994 "City Life" design competition, these rowhouses provide private outdoor space between each unit. Parallel parking on the one-way alley allows additional rear-yard space.

Rowhouse Profile 4

Housing type	Rowhouses, rear garages
Neighborhood	Powellhurst-Gilbert
Address	SE Steele St. & SE 136th Ave. ("Stark Street Town Homes")
Zoning	R2a
Site size	105,340 SF (incl. 22,610 SF street area)
Units	36 (34 rowhouses, 2 ADUs)
Density	1 unit per 2,298 SF (19 units/acre)
Parking	2 spaces per unit (1 garage, 1 surface)
Size of units	1,162–1,822 SF (3 bedrooms)
Year completed	2000
Developer	Housing Alternatives
Designer	Delvin L. Mace, Architect & Planner

Configuration of this rowhouse project allows both rear parking and a rear outdoor area by utilizing single-width rear garages, leaving a small unbuilt space to the rear of each lot. Most of these spaces, however, are paved to provide additional parking; only a minority are landscaped.

Rowhouse Profile 5

Housing type	Rowhouses, rear garages
Neighborhood	South Portland
Address	6130–6160 SW Virginia St. ("Walker Rowhouses")
Zoning	CGd
Site size	13,631 SF
Units	6
Density	1 unit per 2,272 SF (19 units/acre)
Parking	12
Size of units	1,334–1,658 SF (2 bedrooms)
Year completed	1993
Developer	Urban Homes
Designer	Cornerstone Architecture & Planning

The only rowhouse project built during Southwest Portland's late-1980s/early-1990s rowhouse building boom to feature rear parking. Also one of Portland's few rowhouse projects built on a 100'-deep site to include both rear garages and rear yards (albeit, only 10' deep).

Rowhouse Profile 6

Housing type	Rowhouses and ADUs, rear garages
Neighborhood	Hosford-Abernethy (Ladd's Addition Historic District)
Address	1822–1836 SE 12th Ave.
Zoning	R1
Site size	10,148 SF
Units	4 rowhouses and 2 ADUs
Density	1 unit per 1,691 SF (26 units/acre)
Parking	6 spaces (alley garages, detached from primary structures)
Size of units	1,566 SF (2 bedrooms), 725 SF ADUs
Year completed	1996
Developer	Nanette Watson
Designer	Winn Architecture

This project's massing (gables shared between two units, instead of the more usual arrangement of separate gables) reflects house forms of the surrounding neighborhood. Met R1 zone density requirements by including ADUs over rear garages.

Rowhouse Profile 7

Housing type	Rowhouses, rear garages
Neighborhood	Sullivan's Gulch
Address	1626–1630 NE Halsey St.
Zoning	RH
Site size	4,350 SF
Units	2
Density	1 unit per 2,175 SF (20 units/acre)
Parking	2 (rear garages)
Size of units	1,905–2,020 SF (2 bedrooms)
Year completed	2000
Developer	Marvin Wakefield and Tim and Susan Brown
Designer	Colab Architecture

Part of a larger project that also includes Rowhouse Profile 8. For both, rear parking allows landscaped front setbacks that continue established neighborhood patterns.

Rowhouse Profile 8

Housing type	Rowhouses, rear garages
Neighborhood	Sullivan's Gulch
Address	1409–1427 NE 17th Ave.
Zoning	RH
Site size	6,440
Units	4
Density	1 unit per 1,610 SF (27 units/acre)
Parking	4 (rear garages)
Size of units	1,782–2,057 SF (2 bedrooms)
Year completed	1998
Developer	Marvin Wakefield and Tim and Susan Brown
Designer	Colab Architecture

Rowhouses with contemporary design, whose landscaped front setbacks and lack of front garages result in street frontages that continue the green, landscaped character of the surrounding neighborhood.

Rowhouse Profile 9

Housing type	Rowhouses, rear garages
Neighborhood	Pearl District
Address	NW Irving & NW 11th/12th
Zoning	EXd
Site size	22,000 SF
Units	14
Density	1 unit per 1,571 SF (28 units/acre)
Parking	21 (rear garages)
Size of units	845–2,296 SF (2 bedrooms)
Year completed	1996
Developer	Urban Homes
Designer	MCM Architects

This project shares a newly-created mid-block alley with Rowhouse Profile 10, allowing rear-accessed parking and small, private courtyards (located between the residences and their garages).

Rowhouse Profile 10

Housing type	Rowhouses, rear garages
Neighborhood	Pearl District
Address	NW Johnson & NW 11th/12th ("Johnson Street Townhouses")
Zoning	EXd
Site size	19,000 SF
Units	13
Density	1 unit per 1,462 SF (30 units/acre)
Parking	20 (rear garages)
Size of units	1,750–2,840 SF (1–3 bedrooms)
Year completed	2000
Developer	Hoyt Street Properties
Designer	Mithun Partners

Units are raised above street level and set back behind landscaped terraces, providing privacy in a high-density urban environment. Units feature private courtyard spaces that provide natural light and an outdoor amenity.

Rowhouse Profile 11

Housing type	Rowhouses, rear garages
Neighborhood	Center
Address	5910–5954 NE Hoyt St. ("Center Commons Town Homes")
Zoning	RH
Site size	33,240 SF (portion of larger project)
Units	26
Density	1 unit per 1,278 SF (34 units/acre)
Parking	26 spaces (rear garages)
Size of units	1,505–1,567 SF (2 bedrooms)
Year completed	2001
Developer	Innovative Housing
Designer	Otak Architects

Rowhouses with contemporary design, whose rear parking allows for a more pedestrian-friendly street frontage. Trees located between the rear garages help relieve the hardscape of the rear alley.

Rowhouse Profile 12

Housing type	Rowhouses, rear garages
Neighborhood	Beaumont-Wilshire
Address	4602–4642 NE Fremont St. ("Alameda Row")
Zoning	R2h
Site size	7,000 SF (portion of larger project)
Units	4
Density	1 unit per 1,750 SF (25 units/acre)
Parking	8 spaces (in attached rear garages)
Size of units	1,308–1,318 SF (2 bedrooms)
Year completed	2002
Developer	GPB Development
Designer	Merrick Architecture & Planning

Impervious surface was minimized by limiting width of the rear alley to just 12' and including landscaping between garages. Cantilevered rear balconies make vertical use of site area otherwise used only for vehicle maneuvering.

Rowhouse Profile 13

Housing type	Rowhouse, rear parking
Neighborhood	Montavilla
Address	360–364 NE 78th Ave.
Zoning	R2.5
Site size	5,000 SF
Units	2
Density	1 unit per 2,500 SF (17 units/acre)
Parking	2 (rear garages)
Size of units	2,260 SF (3 bedrooms)
Year completed	2001
Developer	John Skoro/A & J Quality Construction
Designer	Scott Benthin & Associates

This project, on a site with less than 50' of street frontage, indicates that rear parking is possible on even very small sites.

Rowhouse Profile 14

Housing type	Rowhouses, rear surface parking and shared common area
Neighborhood	King
Address	NE Killingsworth & Mallory
Zoning	R1ah
Site size	8,300 SF
Units	5
Density	1 unit per 1,660 SF (26 units/acre)
Parking	5 spaces (rear surface parking)
Size of units	974–1,184 SF (2–3 bedrooms)
Year completed	2001
Developer	Habitat for Humanity
Designer	Fletcher Farr Ayotte

Surface parking and a shared outdoor play area are provided in a commonly-held tract, an unusual arrangement for a rowhouse project. Results in a space- and cost-efficient parking configuration.

4205–4209 NE 6th Avenue

Rowhouse Profile 15

Housing type	Rowhouses, side parking pads
Neighborhood	King
Address	3544–3548 NE 6th Ave. also 4205–4209 NE 6th Ave.
Zoning	R2.5a
Site size	5,000 SF
Units	2
Density	1 unit per 2,500 SF (17 units/acre)
Parking	4 spaces (parking pads)
Size of units	1,332 SF (3 bedrooms)
Year completed	1999
Developer	Sabin CDC
Designer	Portland Community Design

The form of these paired rowhouses reflects the surrounding neighborhood pattern of houses on 50'-wide lots. Instead of separate gables for each unit, the units share the same side-gabled roof, similar in form to the "house-like" duplex bungalows built in Portland in the early 20th century. The use of parking pads provides off-street parking at minimal cost, while avoiding the visual impacts associated with garage doors and allowing backyards (which are not possible in conjunction with rear parking on small sites). Locating the parking pads toward the sides allows the landscaped front yards to be the central visual focus.

Rowhouse Profile 16

Housing type	Rowhouses, side parking pad
Neighborhood	Eliot
Address	601–609 NE Graham St.
Zoning	R2a
Site size	5,375 SF
Units	2
Density	1 unit per 2,688 SF (16 units/acre)
Parking	Side parking pad for 1 unit
Size of units	1,452 SF (3 bedrooms)
Year completed	1999
Developer	Anne Galisky
Designer	James Kaczmarowski

Paired rowhouses whose form is similar to a single house, accommodating greater density while allowing a seamless continuation of existing neighborhood patterns.

Rowhouse Profile 17

Housing type	Corner rowhouses with parking pads
Neighborhood	Buckman
Address	SE Alder Street & 20th Avenue
Zoning	R1
Site size	5,000 SF
Units	3
Density	1 unit per 1,667 SF (26 units/acre)
Parking	3 spaces (parking pads)
Size of units	727–1,287 SF (2–3 bedrooms)
Year completed	1997
Developer	REACH Community Development
Designer	Cynthia Bankey Architects

An example of rowhouses meeting R1 density requirements, while reflecting the scale of nearby detached houses. Two rowhouse units are combined into a single house-like building form at the corner (with entrances facing different streets), while a third attached unit is visually set apart by a recessed portion of the structure, providing the appearance of a separate small cottage or accessory structure.

Rowhouse Profile 18

Housing type	Townhouses
Neighborhood	Humboldt
Address	1–21 NE Wygant St. ("Wygant Lofts")
Zoning	R1a
Site size	7,350 SF
Units	6
Density	1 unit per 1,225 SF (36 units/acre)
Parking	None
Size of units	1,209 SF (3 bedrooms)
Year completed	2007
Developer	Sakura Urban Design Concepts
Designer	David Spitzer Architect

These are technically condominium townhouses, not rowhouses, since all the units are on a shared lot. This financially-successful project included no off-street parking, although curbside space provides room for at least 8 cars along the public street—most of this on-street parking would have been lost if this project featured front garages. Not including garages and driveways also facilitated a strong street orientation and front landscaping.

Rowhouse Profile 19

Housing type	Rowhouses, front garages
Neighborhood	Center
Address	307–317 NE 56th Ave.
Zoning	R2
Site size	6,000 SF
Units	3
Density	1 unit per 2,000 SF(22 units/acre)
Parking	3 (front garages)
Size of units	1,304 SF (3 bedrooms)
Year completed	1997
Developer	NOHZ Group-DUBCO Investments/ Cambridge Classic Homes
Designer	J. E. Krause, Architect

The prominence of front garages is minimized in this project by their being recessed between living spaces and by providing relatively wide frontages for each unit, allowing the garages to not occupy the majority of the ground level of each unit. The recessed garages also highlight the individuality of each unit.

Rowhouse Profile 20

Housing type	Rowhouses, front garages
Neighborhood	Eliot
Address	NE Knott & NE Russell streets, 500 block ("Knott Street Townhomes")
Zoning	RH
Site size	75,630 SF
Units	42
Density	1 unit per 1,801 SF (24 units/acre)
Parking	1 space each (front garages)
Size of units	1,199–1,338 SF (2–3 bedrooms)
Year completed	1999
Developer	L & W Development
Designer	Robert S. Leeb, Architects & Planners

Wider rowhouses, such as these 25'-wide examples, allow preservation of some on-street parking, front landscaping, and ground-level living space. Higher density was achieved with relatively shallow lots and the use of a mid-block "woonerf"-type street, which allowed additional lots to be created at the center of the site.

Rowhouse Profile 21

Housing type	Rowhouses, front garages
Neighborhood	Humboldt
Address	4910–4914 N. Williams Street
Zoning	R1a
Site size	5,426 SF
Units	2
Density	1 unit per 2,713 SF (16 units/acre)
Parking	2 (front garages)
Size of units	1,700 SF (4 bedrooms)
Year completed	1999
Developer	Northeast CDC
Designer	Giuliette & Associates

This project avoids the "towering" appearance typical of three-level rowhouses through strategies such as partially-excavated basement parking, upper-level living space accommodated within dormers, and roof forms and porches emphasizing the horizontal. Reflects the form of nearby bungalows.

Rowhouse Profile 22

Housing type	Rowhouses, grouped front garages
Neighborhood	Richmond
Address	3823–3827 SE Woodward St.
Zoning	R2.5
Site size	5,002 SF
Units	2
Density	1 unit per 2,501 SF (17 units/acre)
Parking	2 (front garages)
Size of units	1,984–2,060 SF (3 bedrooms)
Year completed	2003
Developer	George A. Zifcak & Co.
Designer	Barry R. Smith, Architect

Prominence of front driveway is minimized by narrowing its width near the sidewalk, which also allowed additional landscaping and tree preservation. This "neck-down" approach is now required for rowhouse development in the R2.5 zone, but not in the multidwelling zones.

Rowhouse Profile 23

Housing type	Rowhouses, front garages
Neighborhood	King
Address	3808–3816 NE 7th Ave.
Zoning	R2.5
Site size	7,500 SF
Units	3
Density	1 unit per 2,500 SF (17 units/acre)
Parking	2 (front garages)
Size of units	1,987 SF & 514 SF basement (3 bedrooms)
Year completed	2006
Developer	Hardy Garner Properties Inc.
Designer	Grant Garner

Porches and excavated garages reduce the apparent scale of these rowhouses. Driveways are surfaced with grasscrete, minimizing stormwater runoff.

Rowhouse Profile 24

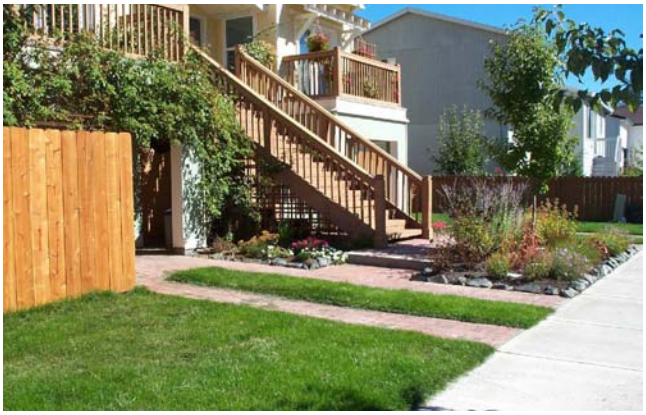
Housing type	Rowhouses, front garages
Neighborhood	Sabin
Address	4202–4222 NE 11th Ave. ("Sabin Greens")
Zoning	R5a
Site size	10,000 SF
Units	4
Density	1 unit per 2,500 SF (17 units/acre)
Parking	4 (front garages)
Size of units	2,608 SF (3 bedrooms)
Year completed	2004
Developer	Terrafirma Building Inc./David Hassin
Designer	Portland Professional Design & Drafting Inc.

Varied paint schemes, balconies, façade articulation and details help break up the mass of these large rowhouses and provide visual interest.

Rowhouse Profile 25

Housing type	Rowhouses, front garages
Neighborhood	Powellhurst-Gilbert
Address	12003–12007 SE Schiller St.
Zoning	R2a
Site size	4,575 SF
Units	2
Density	1 unit per 2,288 SF (19 units/acre)
Parking	2 (front garages)
Size of units	1,321 SF (2 bedrooms)
Year completed	1999
Developer	Comer Development Co.
Designer	Hochhauser/Blatter Architecture & Planning

Illustrates how driveways with only treads paved can minimize impervious surface area and allow continuation of the patterns of landscaped front yards characteristic of most residential neighborhoods.



Rowhouse Profile 26

Housing type	Rowhouses, front garages
Neighborhood	Hosford-Abernethy
Address	2746–2760 SE 26th Ave.
Zoning	R2.5
Site size	8,534 SF
Units	4
Density	1 unit per 2,133 SF (20 units/acre)
Parking	8 spaces (tandem front-accessed garages)
Size of units	2,240 SF (3 bedrooms)
Year completed	1996
Developer	Waxman & Associates, Inc.
Designer	Loren Waxman

Excavated garages, porches, trellises, rooflines, and recessed balconies break-up the scale of these four-level rowhouses, allowing a better contextual response to the adjacent smaller houses.

Rowhouse Profile 27

Housing type	Detached houses
Neighborhood	King
Address	4102–4110 NE 7th Ave.
Zoning	R2.5
Site size	6,000 SF
Units	3
Density	1 unit per 2,000 SF (22 units/acre)
Parking	3 (front garages)
Size of units	1,846 SF & 558 SF basement (3 bedrooms)
Year completed	2006
Developer	Hardy Garner Properties Inc.
Designer	Grant Garner

Row of small-lot detached houses with details providing a modern take on the porches, brackets, architectural trim, varied façade materials and pitched roofs common in nearby early 20th-century Craftsman-style houses. Excavated garages minimize their prominence and bring porches and living space closer to street level.

Duplex Profile 1

Housing type	Stacked duplex
Neighborhood	Northwest District
Address	46 NW 22nd Place
Zoning	RH
Site size	2,670 SF
Units	2
Density	1 unit per 1,335 SF (33 units/acre)
Parking	2 (basement garage)
Size of units	853–890 SF (2 bedrooms)
Year completed	2003
Developer	West Portland Construction, Harry C. Murphy, and Suzann Baricevic
Designer	Alan Mascord Design Associates

Stacked-unit duplex reflects the form of nearby houses and a similar scale is maintained through the use of partially-excavated basement parking (instead of the more usual arrangement of at-grade parking).

Duplex Profile 2

Housing type	Stacked duplex
Neighborhood	Sunnyside
Address	914 SE 33rd Ave.
Zoning	CS
Site size	2,498 SF (33' wide x 75' deep)
Units	2
Density	1 unit per 1,249 SF (35 units/acre)
Parking	None
Size of units	2 bedrooms
Year completed	2004
Developer	Chris Nichols & Colleen Traut
Designer	Designer:

Stacked-unit duplex continues the pattern of nearby detached houses and is very similar in form to the many early-20th century duplexes found in the surrounding neighborhood.

Duplex Profile 3

Housing type	Stacked duplex
Neighborhood	Buckman
Address	1428 SE 26th Ave.
Zoning	CS
Site size	1,450 SF
Units	2
Density	1 unit per 725 SF (60 units/acre)
Parking	None
Size of units	913 & 1,202 SF (1 & 2 bedrooms)
Year completed	2004
Developer	Jeffrey McCaffrey
Designer	Matt Loosemore

This stacked-unit duplex accommodates high density in a small package reflective of neighborhood patterns, while displaying a mix of traditional and contemporary architectural features.

Plex Profile 1

Housing type	Back-to-back townhouse fourplex
Neighborhood	Eliot (conservation district)
Address	145 NE Sacramento Street
Zoning	R2a
Site size	7,500 SF
Units	4
Density	1 unit per 1,875 SF (23 units/acre)
Parking	11 spaces (2.75 per unit)
Size of units	1,368 SF (3 bedrooms)
Year completed	1997
Developer	William Reed/WCR Company
Designer	Michael Dowd

Partially-excavated basement parking limits impacts on street frontage, minimizes building scale, and provides opportunities for backyard space. Project developer indicated that this configuration was not expensive (total construction costs in 1997 of $45–50 per sq.ft.), but felt that such arrangements are avoided by most other builders due to their lack of familiarity with cost-effective construction techniques for excavated basement parking.

Plex Profile 2

Housing type	Townhouse three-plex (rear unit over garages)
Neighborhood	Woodlawn
Address	6545 NE Grand Avenue
Zoning	R1adh
Site size	5,000 SF
Units	3
Density	1 unit per 1,667 SF (26 units/acre)
Parking	3 spaces (tuck under, rear)
Size of units	2 bedrooms
Year completed	2004
Developer	Roy & Helmeta Davy
Designer	Bruinier & Associates

With three units, this project illustrates that R1 density requirements can be met on small sites while accommodating off-street parking (located beneath rear unit) and reflecting neighborhood street frontage patterns.

Plex Profile 3

Housing type	Back-to-back townhouse four-plex
Neighborhood	Madison South
Address	NE Russell & Knott, between NE 84th & 86th ("Madison Place")
Zoning	EG2h
Site size	Building lots typically 5,400 SF
Units	3–4 units on each lot
Density	up to 1 unit per 1,350 SF (32 units/acre)
Parking	4 (attached rear garages)
Size of units	2 bedrooms
Year completed	2000
Developer	Pacific Western Homes
Designer	Pacific Western Homes

Part of a full-block project of triplexes and fourplexes with garages accessed from a rear alley. On small infill sites, a similar configuration to this plex would only be possible at corner locations.

Plex Profile 4

Housing type	Duplex and detached unit
Neighborhood	Irvington (conservation district)
Address	1929–1937 NE 13th Ave.
Zoning	R1a
Site size	4,000 SF (part of larger site)
Units	3
Density	1 unit per 1,333 SF (32 units/acre)
Parking	None
Size of units	1,208–1,333 SF (2–3 bedrooms)
Year completed	2003
Developer	Gary Whitehill-Baziuk
Designer	Builders Design Inc.

This project is an addition to a row of early 20th-century plexes, continuing their form, street orientation, and architectural features. Sold as condominium units, this project proved financially successful despite including no off-street parking.

Plex Profile 5

Housing type	Stacked four-plex
Neighborhood	Overlook
Address	1740 N Killingsworth St.
Zoning	R1
Site size	5,000 SF
Units	4
Density	1 unit per 1,250 SF (35 units/acre)
Parking	None
Size of units	1,000 SF (2 bedrooms)
Year completed	2002
Developer	LHC Enterprises
Designer	Skyline Homes & Design

House-like fourplex whose front porches, windows and doors provide human-scale and a strong street orientation. The problem of where to located off-street parking on such a small site was solved by including no off-street parking. The builder indicated that City requirements for a 20'-wide driveway (because of its access from a busy street) thwarted plans to include a driveway and rear parking. Despite the lack of parking, the builder indicates that this project—located near the Interstate light rail line—was financially successful.

Plex Profile 6

Housing type	Stacked seven-plex
Neighborhood	South Portland (South Portland Historic District)
Address	3401–3417 SW 1st Ave.
Zoning	R2
Site size	7,403 SF
Units	7
Density	1 unit per 1,058 SF (41 units/acre)
Parking	7 (rear surface and tuck under)
Size of units	1–2 bedrooms
Year completed	1997
Developer	Andre Cozzetto
Designer	Vallaster & Corl Architects

Illustrates how a corner site can be used to advantage by wrapping the corner with dwelling units—providing a strong orientation to the street and the corner—and locating parking at rear. Units are stacked, but building is divided vertically, reflecting the scale of the neighborhood's Victorian houses.

Plex Profile 7

Housing type	Stacked five-plex (condominium)
Neighborhood	Northwest District
Address	1974 NW Lovejoy Street
Zoning	RH
Site size	5,000 SF
Units	5
Density	1 unit per 1,000 SF (44 units/acre)
Parking	4 spaces (surface, rear)
Size of units	809–1,434 SF (1–3 bedrooms)
Year completed	1996
Developer	Urbano Development
Designer	Donald Genasci & Associates

Five units were accommodated on a 5,000 sq.ft. site, together with 4 parking spaces at rear of site, while providing a strong street orientation.

Plex Profile 8

Housing type	Stacked four-plex
Neighborhood	Northwest District
Address	2173 NW Everett Street ("The Scanlan Apartments")
Zoning	RH
Site size	3,133 SF
Units	4
Density	1 unit per 783 SF (56 units/acre)
Parking	4 spaces (basement garage)
Size of units	Studio & 2 bedroom units
Year completed	1995
Developer	Kathleen Tamble
Designer	Donald Genasci & Associates

Four units and structured parking were accommodated on a site just over 3,000 sq.ft. Third level is stepped back, minimizing the scale contrast with the adjacent cottage.

VALLASTER & CORL ARCHITECTS

Plex Profile 9

Housing type	Stacked triplex
Neighborhood	Northwest District
Address	2533 NW Thurman St.
Zoning	CS
Site size	1,590 SF
Units	3
Density	1 unit per 530 SF (82 units/acre)
Parking	None
Size of units	1 bedrooms and studio
Year completed	1997
Developer	Tom Saunders
Designer	Vallaster & Corl Architects

High density (twice that allowed in the R1 zone) is accommodated here in a small-scale structure. Features two stacked units, with third unit located to rear to avoid costs associated with building code requirements for two stairways, which would be needed for three stacked flats. This project was only possible on such a small site because of its location in a Commercial zone, where no minimum side setbacks apply.

Plex Profile 10

Housing type	Four townhouse units (condominiums) over three ground-level studio apartments
Neighborhood	Hosford-Abernethy
Address	2021 SE Clinton St.
Zoning	CN1
Site size	4,000 SF
Units	7
Density	1 unit per 571 SF (76 units/acre)
Parking	None
Size of units	900 SF townhouses
Year completed	2004
Developer	Robert Ross
Designer	Kevin Burgee

Seven units were accommodated on a site only 4,000 sq.ft., made possible by not including any off-street parking. A hybrid of housing tenures, it includes four condominium townhouses (which were quickly sold above asking price) over three rental studio apartments. This project, while featuring clearly contemporary design, continues the surrounding neighborhood's small-lot pattern of development.

Cluster Housing Profile 1

Housing type	Cottage cluster (condominiums) with landscaped courtyard
Neighborhood	South Tabor
Address	SE Clinton between SE 70th & 71st
Zoning	R5
Site size	30,592 SF (first phase of larger project)
Units	10
Density	1 unit per 3,059 SF (14 units/acre)
Parking	10 spaces (garage structure)
Size of units	1,134–1,253 SF (1–2 bedrooms)
Year completed	2003
Developer	Hastings Green LLC
Designer	JDA Architects & Planners

Portland's first "cottage cluster" infill project, oriented around shared open space. Sold as condominiums, the second phase of cottages were all sold before project completion. This suggests there is buyer interest in this type of housing. In other cities, similar housing has appealed to older homebuyers, as they facilitate a greater level of accessibility than possible in multilevel rowhouses.

Cluster Housing Profile 2

Housing type	Cottage cluster (condominiums) with landscaped courtyard
Neighborhood	Forest Park
Address	NW Edgewood & NW Miller
Zoning	R2
Site size	99,500 SF (minus unbuilt environmental overlay zone areas)
Units	33
Density	1 unit per 3,015 SF (14 units/acre)
Parking	2 per unit (attached rear garages)
Size of units	1,355–1,587 SF
Year completed	2001
Developer	Edgewood LLC
Designer	Patrick Schmitt, Designer

Cottage cluster project with shared open space in Forest Heights. The landscaped courtyard provides a place-defining element not provided by typical rowhouse projects.

Cluster Housing Profile 3

Housing type	Duplexes oriented to central courtyard with green space and driveway
Neighborhood	Cully
Address	4414 NE Killingsworth St.
Zoning	R2h
Site size	36,286 SF
Units	14
Density	1 unit per 2,592 SF (17 units/acre)
Parking	14 spaces (surface)
Size of units	1,076–1,514 SF (2–4 bedrooms)
Year completed	2004
Developer	Habitat for Humanity
Designer	Ankrom Moisan Architects

Duplexes surround a courtyard with a central green and a circular drive with parallel parking, an arrangement which accommodates vehicle access and parking while minimizing its visual prominence.

Cluster Housing Profile 4

Housing type	Duplex and detached house
Neighborhood	Multnomah
Address	8008–8010 SW 45th Ave.
Zoning	R2
Site size	7,069 SF
Units	3
Density	1 unit per 2,356 SF (18 units/acre)
Parking	3 spaces (surface)
Size of units	1,153–1,182 SF (2–3 bedrooms)
Year completed	2003
Developer	The Housing Authority of Portland
Designer	Iselin Architects

By having the driveway pass under the front building, this project solves the problem of how to simultaneously have street-oriented building frontage and accommodate vehicle access on a narrow site.

Cluster Housing Profile 5

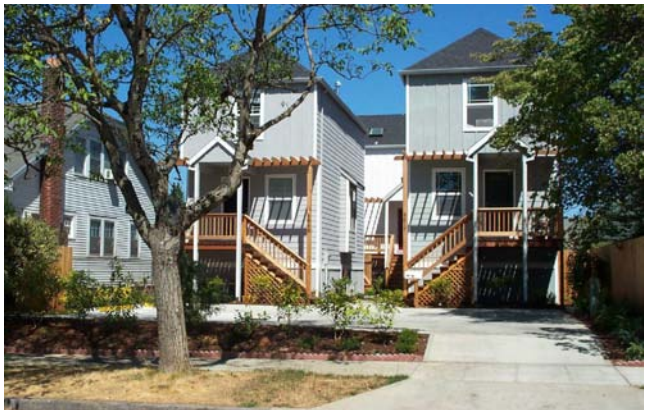
Housing type	Duplex and detached house
Neighborhood	Eliot (conservation district)
Address	34–42 NE Stanton St.
Zoning	R2a
Site size	9,844 SF
Units	3 new construction (4 total)
Density	1 unit per 2,461 SF (18 units/acre)
Parking	2 spaces (surface)
Size of units	2 bedrooms
Year completed	2006
Developer	Kaiser Group Inc./Ben Kaiser
Designer	PATH Architecture

Features a shared vehicle/pedestrian accessway providing access to rear units and parking. Accessway is surfaced with permeable paving blocks, providing both stormwater management and aesthetic benefits, while making efficient use of constrained site area.

Cluster Housing Profile 6

Housing type	Duplexes with landscaped courtyard
Neighborhood	Powellhurst-Gilbert
Address	2627–2647 SE 125th Ave. ("Ivon Court Duplexes")
Zoning	R1a
Site size	13,985 SF
Units	8
Density	1 unit per 1,748 SF (25 units/acre)
Parking	4 spaces (surface)
Size of units	3–4 bedrooms
Year completed	1999
Developer	Human Solutions
Designer	Church & Merrill Architects

Duplexes, house-like in form, are oriented around shared open space with a play area. Little off-street parking is provided, but corner site provides many on-street parking opportunities.



Cluster Housing Profile 7

Housing type	Detached houses (condominiums)
Neighborhood	Montavilla
Address	8009–8017 SE Morrison St.
Zoning	R1
Site size	5,243 SF
Units	3
Density	1 unit per 1,747 SF (25 units/acre)
Parking	3 spaces (front surface)
Size of units	1,401–1,431 SF (2 bedrooms)
Year completed	2003
Developer	LHC Enterprises
Designer	Studio 5 Building Design

Project consists of three detached houses on a 5,000 sq.ft. lot. Illustrates how cluster housing is possible on even very small infill sites. Building height of these three-level houses was minimized by using partially-excavated basement living space.

Cluster Housing Profile 8

Housing type	Rowhouses and townhouses
Neighborhood	Eliot
Address	430–440 NE Fargo St. (“Fargo Court”)
Zoning	RH
Site size	6,251 SF
Units	4
Density	1 unit per 1,563 SF (27 units/acre)
Parking	4 spaces (surface)
Size of units	(3–4 bedrooms)
Year completed	2000
Developer	Franciscan Enterprise
Designer	Portland Community Design

House-like form of paired rowhouses at front reflects neighborhood patterns, while two townhouses at rear provide additional density.

Cluster Housing Profile 9

Housing type	Duplex and detached houses
Neighborhood	Foster-Powell & Brentwood-Darlington
Address	Two similar projects: ("Marysville Commons" & "Woodmere Commons") 7704–7716 SE Raymond Street 8002–8010 SE Duke Street
Zoning	R1a
Site size	7,500 SF & 7,138 SF
Units	5 (Marysville) and 4 (Woodmere)
Density	1 unit per 1,500 SF (29 units/acre)
Parking	3 spaces (surface)
Size of units	2–3 bedrooms
Year completed	2003
Developer	ROSE Community Development
Designer	The Wasserberger Design Group Architects

The design of these projects was shaped by input from neighbors, who desired buildings more similar in form to the surrounding houses, rather than the rowhouse-type buildings originally planned. Parking areas are surfaced with paving blocks, providing a courtyard-like appearance.

Courtyard Townhouses Profile 1

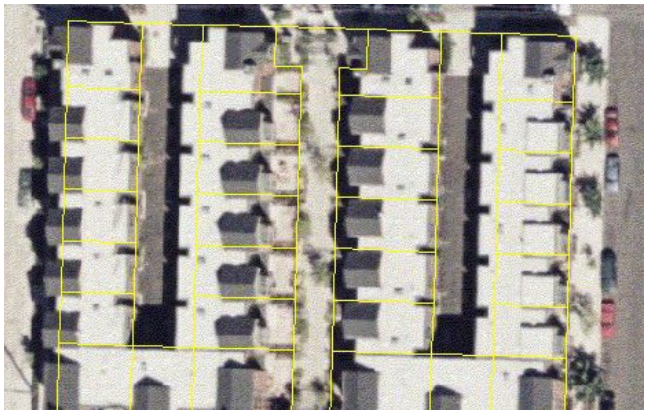
Housing type	Two-story attached townhouses (condominium ownership) oriented to landscaped courtyard
Neighborhood	Brentwood/Darlington
Address	8024 SE Cooper Street
Zoning	R2.5a
Site size	27,000 SF
Units	12
Density	1 unit per 2,250 SF (19 units/acre)
Parking	15 spaces
Size of units	745–925 SF (2–3 bedrooms)
Year completed	2000
Developer	ROSE Community Development
Designer	Portland Community Design

Landscaped courtyard and house-like forms of the individual units respond to the character of the surrounding residential neighborhood, where detached houses predominate.

Courtyard Townhouses Profile 2

Housing type	Townhouses oriented around landscaped courtyard, rear parking
Neighborhood	Brooklyn
Address	3810–3846 SE 16th Ave. ("City Life Courtyard Housing")
Zoning	R2
Site size	20,000 SF (part of larger site)
Units	10
Density	1 unit per 2,000 SF (22 units/acre)
Parking	11 (parallel spaces along alley)
Size of units	1,000–1,200 SF
Year completed	1995
Developer	Reach CDC
Designer	Robertson, Merryman, Barnes Architects

Winner of the 1994 "City Life" design competition for courtyard housing, this project is a precursor to more recent "common green" allowances for housing lots oriented to a landscaped courtyard. Off-street parking is provided by parallel parking along the rear alley, which makes efficient use of limited site area.



Courtyard Townhouses Profile 3

Housing type	Townhouses on separate lots, central pedestrian way/courtyard, rear garages
Neighborhood	Sunnyside
Address	SE Alder & SE Morrison, at SE 34th Ave. ("Belmont Dairy Rowhouses")
Zoning	CS
Site size	36,700 SF (including access tracts)
Units	30
Density	1 unit per 1,223 SF (36 units/acre)
Parking	30 spaces (rear garages)
Size of units	1,300–1,700 SF
Year completed	1999
Developer	Alder Street Holdings/ Shiels Obletz Johnson
Designer	GBD Architects

Another precursor to common green housing arrangements, a central courtyard provides pedestrian access to rowhouses lacking street frontage. Rear alleys provide access to most of the garages, allowing street frontage to be preserved for on-street parking. Also, access tracts along west side of project feature special paving and provide access for both vehicles and pedestrians, similar to the "shared court" concept.

Courtyard Townhouses Profile 4

Housing type	Townhouses (condominiums) clustered around autocourt
Neighborhood	Multnomah
Address	7832–7876 SW 31st Ave. ("Multnomah Village Townhomes")
Zoning	R1
Site size	18,018 SF
Units	12
Density	1 unit per 1,502 SF (29 units/acre)
Parking	24 (enclosed garages)
Size of units	1,428–1,546 SF (2–3 bedrooms)
Year completed	2003
Developer	COHO Partners
Designer	Barry R. Smith, Architect

Form and orientation of the end units provide a house-like appearance along the street, while the central autocourt accommodates a relatively high-density of townhouse units and associated parking. The single vehicle access point and curb cut minimizes adverse impacts on the streetscape.

Courtyard Townhouses Profile 5

Housing type	Townhouses and carriage houses (over garages) with shared court
Neighborhood	Northwest District
Address	2527–2531 NW Westover Rd. ("Jake's Run")
Zoning	R1
Site size	6,720 SF
Units	5 (3 townhouses, 2 carriage houses)
Density	1 unit per 1344 SF (32 units/acre)
Parking	5 (garages accessed from central court)
Size of units	844–2,548 SF
Year completed	2000
Developer	Nick Stearns/Rural Homes, Inc.
Designer	Fletcher Farr Ayotte

The central courtyard, surfaced with paving blocks, provides access for both pedestrians and vehicles, serving as a precursor to the shared court concept. The single access point allows for a pedestrian-friendly public street frontage lined by residences, instead of garage doors.

Courtyard Townhouses Profile 6

Housing type	Townhouse units and flats with central auto/pedestrian court
Neighborhood	Lair Hill
Address	245 SW Meade St. ("The Lair")
Zoning	R1
Site size	10,000 SF
Units	13
Density	1 unit per 769 SF (57 units/acre)
Parking	10 (garages)
Size of units	490–1,385 SF (studio, 1–3 bedrooms)
Year completed	2005
Developer	Hartman Strong Hartman, LLC
Designer	Potestio Architect

Continues the surrounding neighborhood's partial-block scale of development, but in a form that is clearly contemporary. Variety of façade materials, articulation and details provide visual interest. Features a central court, surfaced with paving blocks, that provides shared vehicle and pedestrian access to courtyard units and parking.

Apartments Profile 1

Housing type	Townhouse duplex and stacked sixplex
Neighborhood	Hazelwood
Address	41–45 NE 127th Ave.
Zoning	R1d
Site size	13,775
Units	8
Density	1 unit per 1,722 SF (25 units/acre)
Parking	8 spaces (surface)
Size of units	872–1,041 SF (2–3 bedrooms)
Year completed	2001
Developer	Portland Community Reinvestment Initiatives
Designer	Portland Community Design

Details, such as façade articulation, porches, and window treatments, provide a human scale and pedestrian-friendly street frontage.

Apartments Profile 2

Housing type	5 townhouse units, 1 flat
Neighborhood	Overlook
Address	2705–2717 N. Killingsworth St. ("Buka's Place")
Zoning	CN1/R1
Site size	10,660
Units	6 (plus 1 pre-existing house)
Density	1 unit per 1,523 SF (29 units/acre)
Parking	4 spaces (tuck under)
Size of units	2–3 bedrooms
Year completed	2003
Developer	UBA Building Services
Designer	Salmon Street Design

L-shaped building wraps around an existing detached house. Building forms and details respond to the surrounding context of early-20th century homes.

Apartments Profile 3

Housing type	Stacked flats and townhouses, central courtyard
Neighborhood	Glenfair (East Corridor Plan District)
Address	211–293 SE 160th Ave. ("Sequoia Square")
Zoning	R1d
Site size	80,999 SF
Units	54
Density	1 unit per 1,500 SF (29 units/acre)
Parking	57 spaces (surface)
Size of units	822–2,179 SF (2–5 bedrooms)
Year completed	2001
Developer	Housing Authority of Portland
Designer	Carleton & Hart Architecture

Oriented around a central courtyard with a play area, the buildings of this project are divided into house-like forms that reflect the scale of the surrounding neighborhood's detached houses.

Apartments Profile 4

Housing type	Stacked townhouses and flats
Neighborhood	Northwest District
Address	2327 NW Northrup St. ("Northrup Commons")
Zoning	R1
Site size	20,000 SF
Units	19
Density	1 unit per 1,053 SF (41 units/acre)
Parking	68 spaces (basement garage)
Size of units	898–2,972 SF
Year completed	2000
Developer	Northrup Commons LLC
Designer	Sienna Architecture Co.

Stacked townhouse units over structured parking make efficient use of limited site area, while façade articulation reflects patterns of the surrounding neighborhood.

Apartments Profile 5

Housing type	Stacked flats and townhouses around central courtyard
Neighborhood	Mill Park
Address	10918–10930 SE Stark St. ("Park Vista")
Zoning	R1a
Site size	60,824 SF
Units	59
Density	1 unit per 1,031 SF (42 units/acre)
Parking	69 spaces (surface and tuck under)
Size of units	350–1,474 SF (studios, 1–4 bedrooms)
Year completed	2001
Developer	Human Solutions
Designer	William Wilson Architects PC

Strong street orientation contributes to an urban streetscape, while a central courtyard/play area is provided that is sheltered from the busy street. The non-profit developer of this project indicates that it has been very popular with families. Tuck-under parking allows efficient use of site area at significantly less cost than full structured parking.

Apartments Profile 6

Housing type	Stacked flats and townhouses
Neighborhood	Mill Park
Address	12044 SE Lincoln St. ("Lincoln Woods")
Zoning	R1a
Site size	29,355
Units	30
Density	1 unit per 979 SF (44 units/acre)
Parking	35 spaces (rear surface)
Size of units	720–930 SF (2 bedrooms)
Year completed	2001
Developer	Jay Woodworth
Designer	Barry R. Smith, Architect

In contrast to many apartment projects along major streets in Outer East Portland, which often feature prominent surface parking lots, this project focuses its buildings along the street frontage, creating a strong street presence. Living spaces are raised above grade, providing needed separation from street traffic. Two-story townhouses at rear of site provide a step-down in scale to the adjacent neighborhood.

Apartments Profile 7

Housing type	Stacked flats
Neighborhood	South Portland
Address	3535 SW Corbett St. ("La Stella Apartments")
Zoning	CS/R2
Site size	23,000
Units	28
Density	1 unit per 821 SF (53 units/acre)
Parking	15 spaces (rear surface)
Size of units	(studios, 1–2 bedrooms)
Year completed	2003
Developer	SOPO Properties
Designer	Fletcher Farr Ayotte

Human-scaled details and quality materials serve as a positive contribution to the street. Of this project, a neighbor commented, "I think it's out-of-scale with the neighborhood, but its design makes up for it."

Apartments Profile 8

Housing type	Stacked flats
Neighborhood	Northwest District
Address	2537 NW Thurman St. ("Thurman Street Condominiums")
Zoning	CS
Site size	6,144 SF
Units	12
Density	1 unit per 512 SF (85 units/acre)
Parking	12 spaces (basement garage)
Size of units	747–1,017 SF (1–2 bedrooms)
Year completed	2001
Developer	MacNaughton Partners
Designer	Robert S. Leeb Architects & Planners

Excavated basement parking allows off-street parking to be accommodated as part of high-density housing on a small site. Building form reflects the surrounding neighborhood's tradition of block-type apartment buildings (known locally as "brickers").

Apartments Profile 9

Housing type	Special needs housing, stacked units
Neighborhood	Powellhurst-Gilbert
Address	2730 SE 92nd Ave. ("Clinton Ridge")
Zoning	R2a
Site size	14,500 SF
Units	29
Density	1 unit per 500 SF (87 units/acre)
Parking	6 spaces (basement garage)
Size of units	397–1,140 SF
Year completed	2003
Developer	Rose CDC
Designer	William Wilson Architects

Provides a strong-street presence and is an example of the type of urban-scale, transit-supportive development that is intended along transit corridors.

Apartments Profile 10

Housing type	Stacked flats around central courtyard
Neighborhood	Kerns
Address	430 NE 16th Ave. ("Buckman Heights")
Zoning	EXd
Site size	54,364 SF
Units	144
Density	1 unit per 377 SF (116 units/acre)
Parking	Tuck-under and surface parking
Size of units	443–808 SF (studios, 1–2 bedrooms)
Year completed	1998
Developer	Prendergast and Associates, Inc.
Designer	William Wilson Architects, PC

Courtyard includes features designed to manage stormwater. This project illustrates how courtyards can simultaneously serve an environmental role, function as an amenity for residents, and provide a unifying, central design focus.

Courtyard apartments
NE Multnomah & 22nd (1927)

Duplex
2519-23 SE Madison (1925)

Courtyard apartments
Patricia Court
NW Hoyt & 22nd (1930)

The Infill Design Toolkit:
Medium-Density
Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Gallery of Historic Portland Examples

This section is a sampling of Portland's tradition of medium-density housing. These structures are typically located in neighborhoods with a mix of single-family and multi-family housing and serve as examples of how higher-density housing can be designed to blend into neighborhood fabric.

Duplex
NE 21st & Wasco (1926)

8716 SE 11th (1907)

SE 17th & Belmont (1909)

2300 block of SE Salmon (1927 & 1907)

SE 32nd & Pine (1926). Example of a classic Portland corner duplex. Designed to provide the appearance of a single-family house, with two units within a single house-like mass and entrances facing separate streets.

SE Yamhill & 21st (1911)

NW 18th & Lovejoy (1911)

NE Thompson & 14th (1926)

1430 NE 22nd (1929)

SW 2nd & Meade (1886)

SE 18th & Ash (1910)

N. Rosa Parks Way & Commercial (1942)

Larger than fourplexes, these apartment buildings were similarly designed to blend into the context of single-family houses, incorporating multiple units within a building form that evokes the appearance of a grand house.

1425 SE Main (1910)

2420 NE 15th (1925)

NW Irving & 17th (1893)

SE 37th & Madison (1930)

SE 24th & Madison (1926)

SE Clay & 29th (1928)

NE 21st & Halsey (1950)

800-864 SW Vista (1941). Designed by renowned Portland architect, Pietro Belluschi.

Halsey Court – NE 45th & Halsey (1930)

SE Ash & 20th (1949)

NE Brazee & 9th (1928)

Salerno Court – NE Flanders & 24th (1928)

Peninsula Park Commons – N. Albina & Holman (1938). Converted into a co-housing community with shared garden

TEGNESTUEN VANDKUNSTEN

TEGNESTUEN VANDKUNSTEN

TEGNESTUEN VANDKUNSTEN

Scandinavian housing (Tegnestuen Vandkunsten architects). These provide contemporary reinterpretations of pitched roofs and other traditional Scandinavian village forms.

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Examples from Elsewhere

This section provides examples of residential projects outside of Portland, with a focus on those that combine modern design with a continuation of vernacular architectural forms and patterns. While these projects reflect the unique building traditions of their respective locations, which may differ from those of Portland, they highlight how it is possible for new development to reflect established patterns while incorporating contemporary architectural approaches.

NETHERLANDS BTC

HORF ZIMMERMAN

Borneo-Sporenburg canal houses, Amsterdam (left). *A contemporary take on the traditional Amsterdam canal house pattern* (above).

CALA DOMUS/CABE

CALA DOMUS/CABE

Cala Domus, UK (PCKO Architects). *This project reflects the scale of traditional local villages, while providing a contemporary twist to house-like forms and accommodating vehicles and pedestrians within the same street space.*

ALEX ELY/CABE

Vauban District, Germany. *A former military base was redeveloped into an environmentally-sustainable community of family housing. These buildings integrate vernacular forms with green features. Pitched roofs with overhanging eaves serve as platforms for solar panels; an arrangement which could be at home with Portland's building traditions.*

PROSPECT NEW TOWN, COLORADO

Prospect, Colorado. *Rowhouses with contemporary design utilize traditional design elements, such as stoops, porches, house-like proportions, street-oriented windows, rear-parking, etc.*

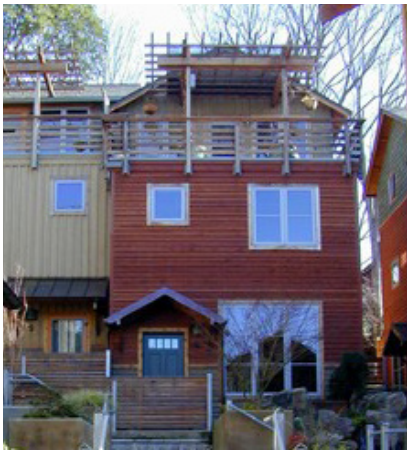
PUBLIC

Dutra Brown Building, San Diego (Public). *Reflects surrounding neighborhood's tradition of small-scale, partial-block development.*

DAVIDS KILLORY ARCHITECTURE

Daybreak Grove, California (Davids Killory Architecture). *Inspired by Californian and Latin American courtyard precedents.*

Projects in the Puget Sound area, Washington. *These projects provide a contemporary interpretation of elements associated with architecture in the Pacific Northwest, such as the prominence of wood and structural features, as well as features—such as landscaping, trellises, and balconies—that blur distinctions between indoors and outdoors.*



JOHNSTON ARCHITECTS PLLC

Stonewater Townhouses (Johnston Architects)

THE MILLER/HULL PARTNERSHIP

Decatur Island House (Miller-Hull Partnership)

Since Portland has few examples of shared streets or courts, the following are contemporary examples from other communities of projects that have features similar to shared courts. These examples highlight various approaches to designing mixed pedestrian/vehicular space in ways that highlight their function as multipurpose space.

Japanese shared street

TIM CROCKER

Contemporary London mews

CESAR RUBIO/DAVID BARKER + PARTNERS

West End Commons, Oakland, CA
(David Baker + Partners Architects)

CARSTEN SPERLING/INSTITUTE OF TRANSPORTATION RESEARCH

Vauban District, Freiburg, Germany

A/Z PHOTO/JAMES M. EVANS, AIA — COLLABORATIVE DESIGNWORKS

The 505, Houston, TX
(Collaborative Designworks)

G. LYON PHOTO/JAMES M. EVANS, AIA — COLLABORATIVE DESIGNWORKS

JOHNSTON ARCHITECTS PLLC

JOHNSTON ARCHITECTS PLLC

Fremont Lofts, Seattle, WA (Johnston Architects). *Note prominence of entries and opportunities for personalization*

MOGAVERO NOTESTINE ASSOCIATES, ARCHITECTS

Metro Square, Sacramento, CA
(Mogavero Notestine Associates). *12'-wide accessway reads either as a wide walkway or a narrow drive*

THIS PAGE INTENTIONALLY LEFT BLANK

The Infill Design Toolkit:
Medium-Density Residential Development

A Guide to Integrating Infill Development into Portland's Neighborhoods

CITY OF PORTLAND
BUREAU OF
PLANNING

December 2008

Neighborhood Design Policies

The following is a compilation of policies and other design guidance from adopted neighborhood and area plans, outside the Central City Plan District, that convey the community's aspirations regarding the design of residential infill development. Neighborhood plan text that has been adopted by ordinance and serves as City policy is shown in quotations. Text shown in *italics* is not adopted City policy, but highlights neighborhood plan content that clarifies community design aspirations.

Albina Community Plan (1993)

"Protect and improve the livability of the residential neighborhoods within the Albina Community. Direct new development to those areas that have experienced or are experiencing a loss of housing. Ensure the compatibility of new development with nearby housing. …Promote increases in residential density without creating economic pressure for the clearance of sound housing."

(Policy Area I: Land Use—Policy B: Policy B: Livable Neighborhoods)

"Review new infill development to ensure that it reinforces the neighborhood's positive characteristics."

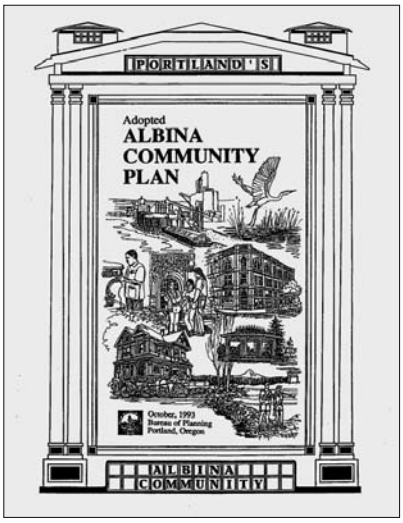
(Policy Area I: Land Use—
Policy B: Policy B: Livable Neighborhoods, Objective 3)

"Improve the physical appearance of Albina. Enhance the desirable and distinctive characteristics of the Albina Community and its individual residential, commercial and employment districts. …Create a safe and pleasant environment for pedestrians. Strengthen the pattern of green that exists throughout the Albina Community."

(Policy IX: Community Image and Character—Policy B: Urban Design)

"Protect and enhance Albina's historic and cultural characteristics and encourage compatible, quality development."

(Policy IX: Community Image and Character—
Policy B: Urban Design, Objective 8)



Arbor Lodge Neighborhood Plan (1993)

"Maintain the single dwelling residential character of Arbor Lodge while allowing for the development of multi-dwellings in appropriate areas."

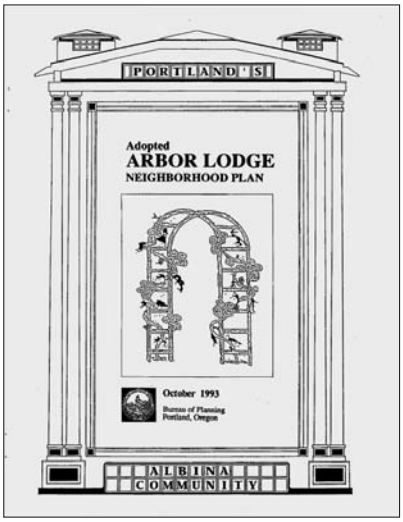
(Policy 2: Housing)

"Encourage infill developments in the neighborhood that are attractive and compatible with the surrounding area."

(Policy 2: Housing, Objective 3)

"Provide a variety of housing types for neighborhood residents with different incomes, needs and physical abilities."

(Policy 2: Housing, Objective 5)



Boise Neighborhood Plan (1993)

"Provide good quality housing in Boise at affordable prices and rents through new construction and the rehabilitation of existing housing. New construction and rehabilitation of existing housing should be in keeping with the character of the neighborhood."

(Policy II: Housing)

"Allow development of alternative housing types in Boise."

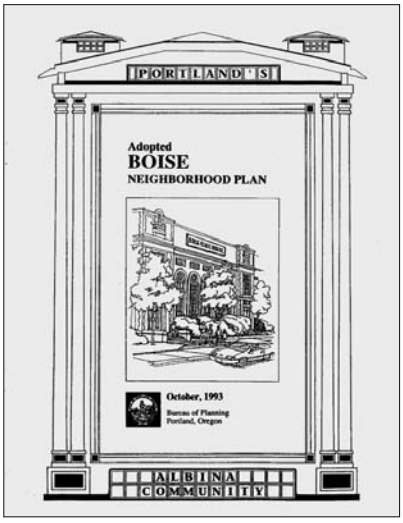
(Policy II: Housing, Objective 5)

"…Encourage compatible infill development of vacant land by improving the image of the neighborhood and marketing development opportunities in Boise."

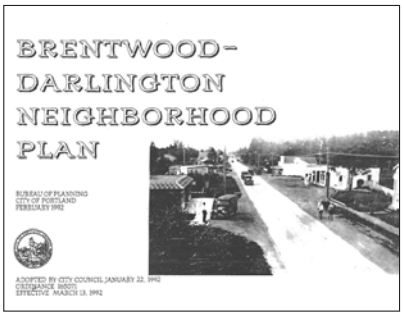
(Policy III: Neighborhood Maintenance and Image)

"Encourage development of new residential and commercial uses on vacant land in Boise. Ensure that these are compatible in scale and design with the neighborhood."

(Policy III: Neighborhood Maintenance and Image, Objective 3)



Brentwood-Darlington Neighborhood Plan (1992)

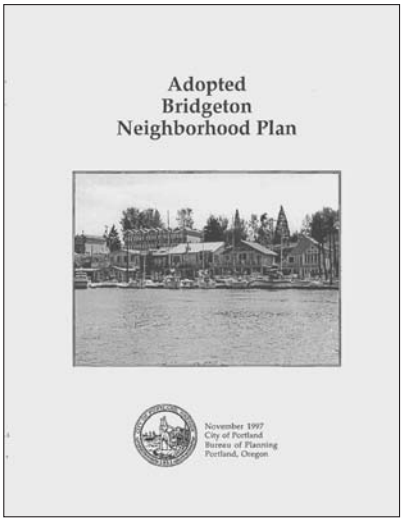


"Support multifamily development only where services are available and adequate… when the following conditions are met: a. sanitary sewer services are available, b. adjacent streets are paved, c. transit service is available within ¼ mile, and d. the site review criteria of this plan and other applicable code requirements are met."

(Policy 4: Housing, Objective 3)

Site review criteria includes guidelines calling for preservation of trees, preservation of solar access, consideration of privacy, etc.)

Bridgeton Neighborhood Plan (1997)



"Ensure that all new development enhances the river, natural and village character of Bridgeton."

(Policy 1B: Neighborhood Design, Objective 1)

"Encourage a mix of housing types that are compatible with Bridgeton's casual lifestyle."

(Policy 1B: Neighborhood Design, Objective 2)

"Promote a streetscape that reflects and enhances Bridgeton's sense of community on the water and on the land."

(Policy 1B: Neighborhood Design, Objective 3)

"Ensure that all new harborside developments open directly onto the promenade for public accessibility."

(Policy 1B: Neighborhood Design, Objective 4)

"Encourage developers to meet the voluntary neighborhood design guidelines…."

(Policy 1B: Neighborhood Design, Objective 5)

The plan's implementing action items include: *"Encourage developers to include representatives of the neighborhood association early in their development design process" (H11); "Work with developers and builders to ensure design, lighting and landscaping which is in character with the neighborhood and which integrates in a cohesive manner with the neighborhood, the multi-use character of the street, and the river" (H13); and "Encourage a variety of building designs which are also in character with the neighborhood. This could be achieved through the use of different paint, sidings, plantings, window and door treatment, eaves, and lighting" (H14).*

Brooklyn Neighborhood Plan (1991)

"Work with community development corporations to develop and build on vacant land in a way complementary to neighborhood goals."

(Policy 4: Housing, Objective 4.4[5])

The Housing Policy introduction states: *"the character of infill development, which the neighborhood supports, should be compatible with the character of the neighborhood."*

"Strongly encourage developers to accommodate a variety of family sizes when building multifamily housing."

(Policy 4: Housing, Objective 4.4[6])

Buckman Neighborhood Plan (1991)

"Maintain and improve the quality and urban character of Buckman's physical environment and attract compatible development."

(Policy 1: Urban Design and Livability)

"Encourage new development and renovation of existing structures to meet Buckman commercial and residential architectural guidelines."

(Policy 1: Urban Design and Livability, Objective 1.5)

"Work with developers early in the design process to comment on their plans…"

(Policy 1: Urban Design and Livability, Objective 1.6[A])

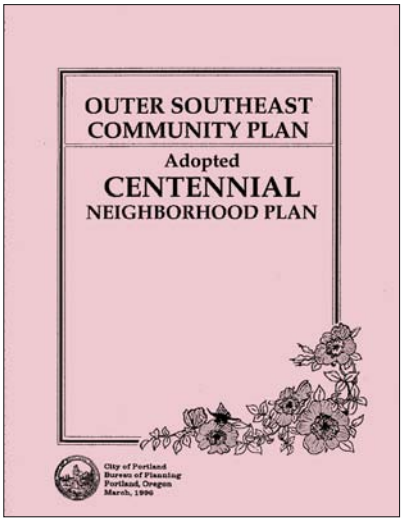
"Work with realtors and developers to attract development compatible with the neighborhood."

(Policy 1: Urban Design and Livability, Objective 1.6[B])

"Use the design review process in the CEID to encourage development that is compatible with the surrounding area and encourage voluntary design review in the rest of the neighborhood."

(Policy 1: Urban Design and Livability, Objective 1.11)

The plan states that: *"The (Buckman design) guidelines are intended to maintain and enhance those desirable qualities which make Buckman a unique historic neighborhood: the tree-lined streets and the variety of late 19th and early 20th century building styles…. The guidelines are intended to ensure maximum compatibility of new buildings with historic buildings, not to build "new old buildings" or be exact duplicates of older styles."*



Centennial Neighborhood Plan (1996)

"Enhance Centennial's livability by protecting, maintaining and improving the quality and suburban character of the physical environment."

(Policy 2: Community Design and Livability")

"Encourage development projects to meet the voluntary design guidelines included in this plan for the Centennial Neighborhood."

(Policy 2: Community Design and Livability, Objective 1).

The voluntary design guidelines for multi-family development place priorities on providing shared outdoor recreation areas, minimizing the prominence of parking, limiting privacy impacts on adjacent single-family areas, and encourage builders to limit building height to respond to the neighborhood's predominantly single-family character.

"Support planning, design, and site development that enhances livability, provides connectivity, and reduces traffic impacts."

(Policy 2: Community Design and Livability, Objective 3).

"Encourage development to be compatible with the character of the neighborhood."

(Policy 2: Community Design and Livability, Objective 5).

"Enhance and preserve the established residential character of Centennial."

(Policy 4: Housing, Objective 2).

Concordia Neighborhood Plan (1993)

"Encourage rehabilitation and infill construction consistent with the character and architecture of the neighborhood."

(Policy 2: Housing, Objective 10)

"Reinforce the identity and character of the Concordia Neighborhood. Use design features in building rehabilitation and new construction which enhance neighborhood attractiveness and livability. Design streetscapes and site layouts to promote safety and encourage pedestrian use of the streets."

(Policy 7: Design).

"Support the use of the Ten Essentials *(for North/Northeast Portland Housing)* design guidelines to promote compatible residential rehabilitation and design."

(Policy 7: Design, Objective 2).

Prologue to the plan's voluntary design guidelines states: *"New construction and the alteration of existing buildings should be thoughtfully designed to respect adjacent historic development, be compatible with the existing building's form and pattern, and provide an overall standard of quality. …Where changes in scale and form are unavoidable, the use of shared design elements from surrounding buildings can ensure that new development is compatible with the surrounding area."*

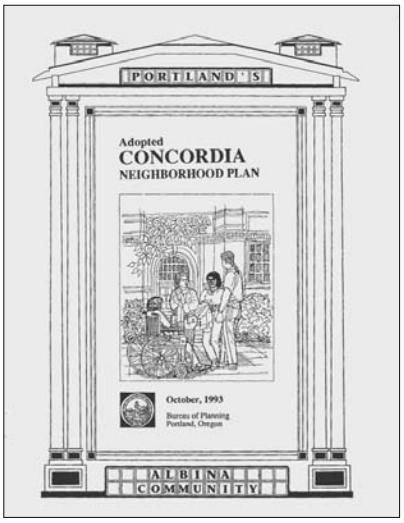
"Encourage the revitalization of the NE Alberta and NE 42nd Avenue project areas. Support new construction and development which is compatible with existing neighborhood architecture and styles."

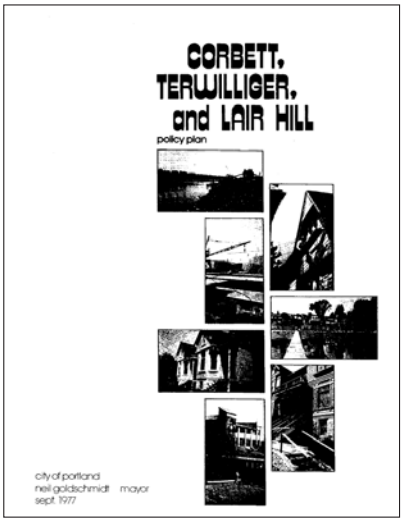
(Policy 7: Design, Objective 3)

Corbett, Terwilliger, and Lair Hill Policy Plan (1977)

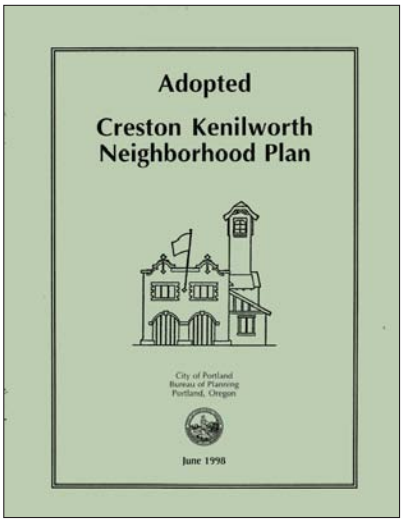
"Preserve the existing residential neighborhoods (Lair Hill, Corbett and Terwilliger) by maintaining the existing dwellings and stimulating compatible housing development and supporting services."

(Plan Policy)





Creston Kenilworth Neighborhood Plan (1998)



"Promote development that is pedestrian-friendly, has human scale and contributes in its design and form to the livability of the neighborhood."

(Policy 4A: Land Use, Urban Design and Historic Preservation)

"Step down new larger development built along the corridors to the scale of the existing adjacent buildings in the established residential areas."

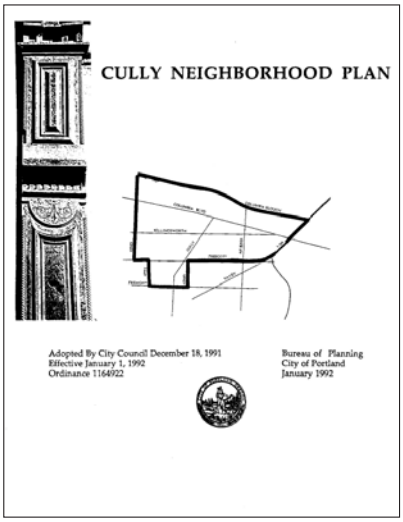
(Policy 4A: Land Use, Urban Design and Historic Preservation, Objective 4.3)

"Promote good design in areas where intense commercial and multifamily development will occur, especially along the SE Powell, SE Foster, SE Thirty-ninth, SE Fifty-second and SE Holgate corridors."

(Policy 4A: Land Use, Urban Design and Historic Preservation, Objective 4.12)

"Encourage developers to follow the design themes in Creston Kenilworth's urban design concept and be consistent with the voluntary design guidelines."

(Policy 4A: Land Use, Urban Design and Historic Preservation, Objective 4.13)
The voluntary design guidelines *"are intended to ensure maximum compatibility of new buildings with the existing," with a focus on continue architectural features of Streetcar-Era buildings, such as building siting, foundation height, roof forms, exterior siding material, front façade elements, etc. Regarding existing mid-20th century apartment buildings, the design guidelines state: "Apartment structures built in the 50s and 60s, often referred to as motel style, are common in Creston Kenilworth. These structures can be adopted to better integrate with the neighborhood's character through parking lot and landscaping redesign, window trim addition, and modification of architectural details."*



"Encourage a diversity of housing types that serve a range of income levels and types of households."

(Policy 5C: Housing)

"Encourage developers, realtors and contractors to build a variety of housing types such as accessory dwelling units, co-housing, duplexes, rowhouses and mixed-use buildings."

(Policy 5: Housing, Objective 5.3)

"Encourage new housing and remodels to be well-designed and friendly to pedestrians."

(Policy 5: Housing, Objective 5.4)

Cully Neighborhood Plan (1992)

"Maintain and improve the quality and historic character of the neighborhood's existing physical environment while attracting compatible development."

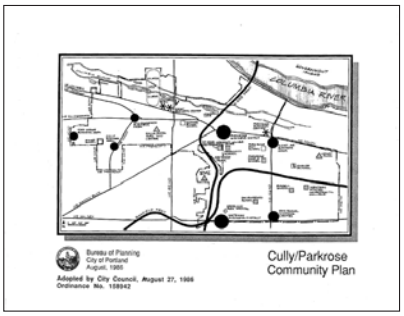
(Policy 2B: Urban Design and Historic Preservation)

Cully/Parkrose Community Plan (1986)
Cully portion of plan superseded by
Cully Neighborhood Plan)

"Attached residential and multifamily residential zones must meet the following: (1) Have direct access to an arterial or collector street; (2) Avoid routing of through traffic on local neighborhood streets; (3) Have public transit available or planned to be available within one-quarter mile of the site; and (4) Be designed to be compatible with existing residential uses by the use of design features such as buffering, landscaping, screening, and building orientation."

(Policy 4: Housing Location, Section A)

The plan's design guidelines include calls for the use of landscaping as a key design feature, new development in scale with the existing community, and preservation of natural features.



Eliot Neighborhood Plan (1993)

"Require new development in the neighborhood to be compatible with the area's historic character."

(Policy 1: Historic Conservation and Urban Design, Objective B)

"Develop housing in the neighborhood that is designed to complement Eliot's historic character."

(Policy 1: Historic Conservation and Urban Design, Objective D)

"Ensure that new multidwelling housing in Eliot is designed to respect existing single-dwelling residential patterns."

(Policy 3: Housing, Objective E)

"Ensure that new housing in Eliot is designed to capitalize on, complement and emphasize the neighborhood's historic character."

(Policy 3: Housing, Objective F)

"Rehabilitate historic buildings and promote creation of historically compatible housing in Eliot."

(Policy 3: Housing, Objective I)

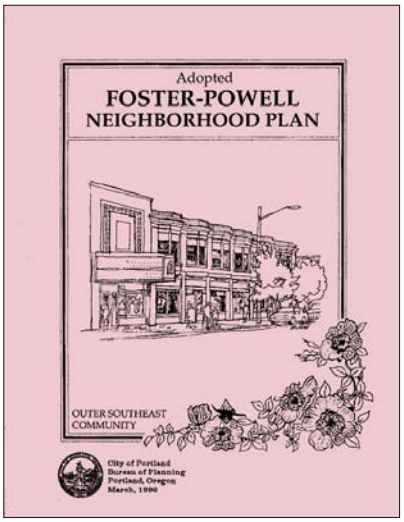
Foster-Powell Neighborhood Plan (1996)

"Ensure an adequate supply of housing at a variety of prices and rents by promoting new home ownership opportunities, improvement of the existing housing stock, responsible rental property ownership, and the development of compatible infill housing."

(Policy 4: Housing)

"Encourage the construction of new infill housing that is compatible with the neighborhood. Require design review or conformance to compatibility guidelines for development not currently allowed in existing residential zones."

(Policy 4: Housing, Objective 3)



Hazelwood Community Plan (1986)

"Promote the development of a variety of housing types."

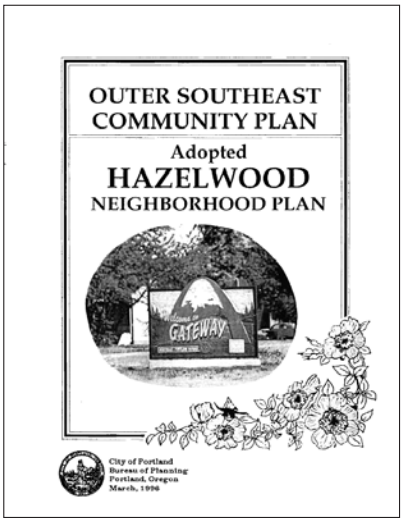
(Policy 5: Housing, Objective 1)

"Assure that all new developments—single and multi-family housing, commercial and business—are planned and constructed to minimize adverse impact on the community and neighborhood, including traffic and traffic patterns."

(Policy 6: Community Design and Livability, Objective 1)

"Encourage development projects to meet the voluntary design guidelines included in Appendix C of this plan for the Hazelwood Neighborhood."

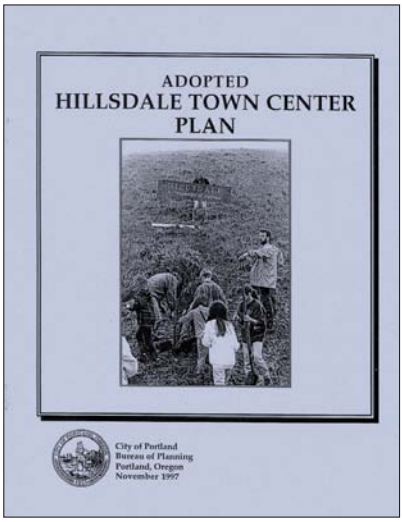
(Policy 6: Community Design and Livability, Objective 2)
The voluntary design guidelines call for multi-family projects to be set back from sidewalks, use landscaping for screening and for aesthetics, use building materials that blend with those of nearby owner-occupied housing, provide open space and recreation areas, and include adequate on site parking.



Hillsdale Town Center Plan (1997)

"Enhance Hillsdale's character and livability as an attractive urban village by fostering urban design excellence."

(Policy 4: Urban Design) Implementing "Actions" include: *"Create voluntary design guidelines for design elements not addressed in the Community Design Guidelines and Community Design Standards. Provide examples of the desired attributes of single family and multidwelling housing" (UD2); "Design residential developments to respect the scale, visual quality, privacy, security needs, and character of existing neighborhoods" (UD11); and "Encourage projects which function well, use suitable materials, and whose scale is appropriate and compatible" (UD12).*



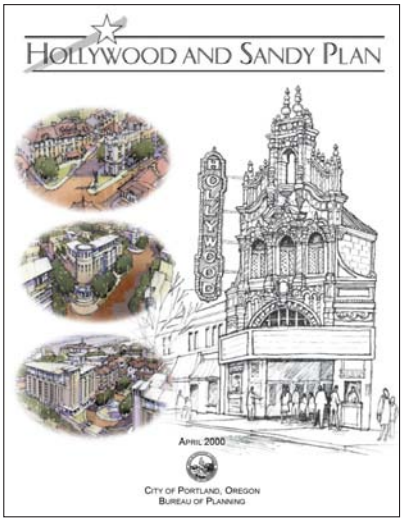
Hollywood and Sandy Plan (2000)

"Ensure that new commercial and mixed-use development along Sandy Boulevard and Broadway, and along the edges of the Hollywood District, step down and relate to the scale and character of the adjacent established residential areas."

(Policy 1: Land Use, Urban Design and Historic Preservation, Objective 8)

"Encourage new development that fosters a pedestrian-friendly and attractive environment particularly along the Enhanced Pedestrian Streets of Sandy between 37th and 47th Avenues, and 42nd Avenue from Tillamook to the Hollywood Transit Center."

(Policy 1: Land Use, Urban Design and Historic Preservation, Objective 11)



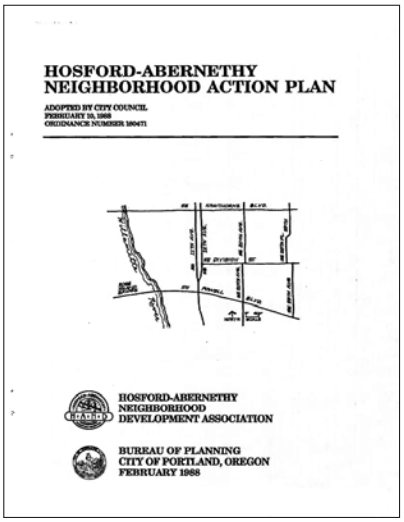
Hosford-Abernethy Neighborhood Action Plan (1988)

"Protect and improve existing housing while providing the opportunity of new housing for people of all ages and income levels."

(Policy 2: Housing)

"Promote the opportunity for owner occupancy of single-family homes and cooperative or condominium ownership of multifamily dwellings."

(Policy 2: Housing, Objective 2.6)



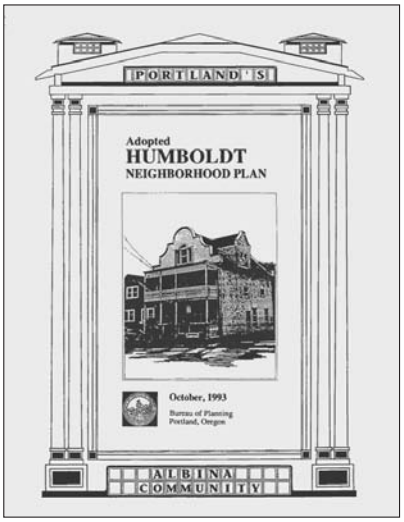
Humboldt Neighborhood Plan (1993)

"Maintain a link between Humboldt's historic past and the present through the preservation of its historic development patterns and structures and through the promotion of architectural compatibility and excellence."

(Policy 5: Urban Design and Historic Preservation)

"Require new buildings to respect and respond to the special architectural qualities of the Humboldt Neighborhood and the City of Portland."

(Policy 5: Urban Design and Historic Preservation, Objective 4)



Irvington Neighborhood Plan (1993)

"Ensure that new residential construction is architecturally compatible with the neighborhood's historic character."

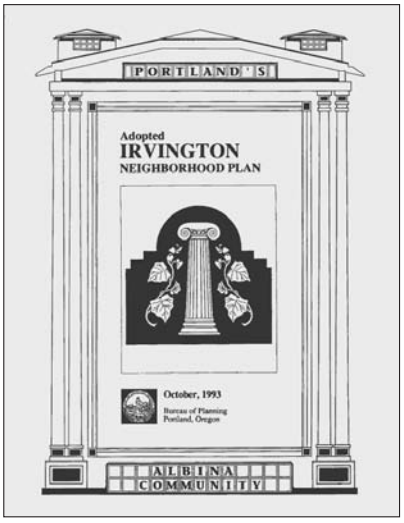
(Policy II: Historic and Neighborhood Preservation, Objective 3)

"Provide diversity in the type and density of housing within the neighborhood in order to ensure an adequate supply of safe, attractive housing at a variety of prices and rents."

(Policy III: Housing)

"Encourage the replacement of unsound structures with infill development which is in keeping with the character of surrounding properties."

(Policy III: Housing, Objective 8)



Kenton Neighborhood Plan (1993/2001)

"Ensure that new residential and commercial development is compatible with Kenton's historic character."

(Policy 6: Historic and Natural Resources, Objective 4)

Kerns Neighborhood Action Plan (1987)

"Provide a quality urban environment with compatible residential, commercial and retail uses and service amenities."

(Policy 9: Neighborhood Commercial Areas)

"Encourage new development which provides a mixture of residential and commercial uses and is compatible with the surrounding area."

(Policy 9: Neighborhood Commercial Areas, Objective 9.2)

King Neighborhood Plan (1993)

"Promote building designs that ensure crime prevention through environmental design and protect streets, open spaces, and architectural integrity of the neighborhood."

(Policy I: Urban Design, Objective 2)

"Encourage developers to consider and conform to design standards for new developments in the King Neighborhood."

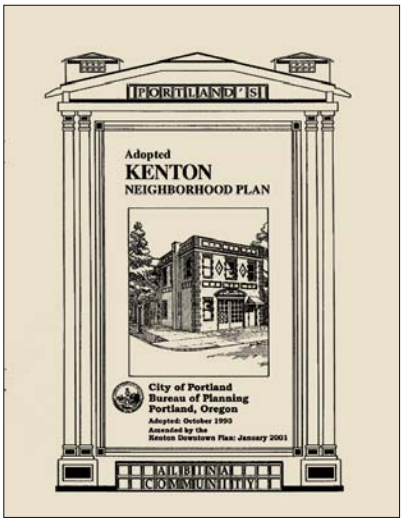
(Policy I: Urban Design, Objective 4)
Action chart cites "The 10 Essentials for North/Northeast Portland Housing" for this guidance.

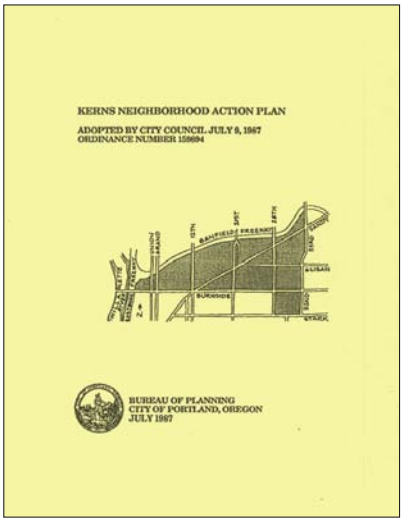
"Encourage visual vitality by allowing a variety of housing types where compatibility of scale, bulk and design can be assured."

(Policy II: Housing, Objective 1)

"Encourage development of alternative housing types that promote efficient land use."

(Policy II: Housing, Objective 2)





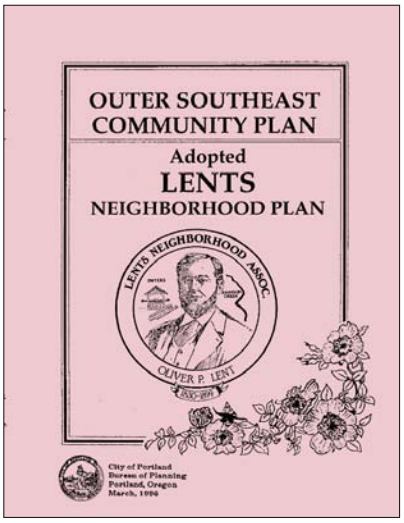
Lents Neighborhood Plan (1996)

"Encourage a sense of community pride in Lents by maintaining, restoring and rehabilitating existing homes and taking advantage of opportunities to build a variety of new housing."

(Policy 6: Housing)

"Recreate small-town historic Lents neighborhood."

(Policy 7: Neighborhood Livability, Objective 5). Implementing Action Item L10 states *"Try to ensure that the scale of new development is compatible with the surrounding residential and commercial areas."*



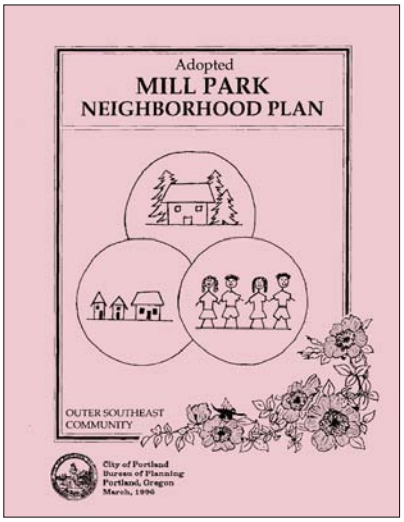
Mill Park Neighborhood Plan (1996)

"Preserve the character of the existing housing stock in Mill Park while emphasizing the continued development of single-dwelling housing in areas where they currently exist."

(Policy 5: Housing)

"Encourage developers to build new housing that is compatible in size and design with the current housing stock in the immediate surroundings."

(Policy 5: Housing, Objective 2).



Montavilla Neighborhood Plan (1996)

"Preserve and improve Montavilla's existing housing stock and build new housing for people of all ages, income levels and physical abilities."

(Policy 1: Housing and Neighborhood Livability)

"Encourage developers to construct new buildings that are compatible with nearby buildings in the neighborhood."

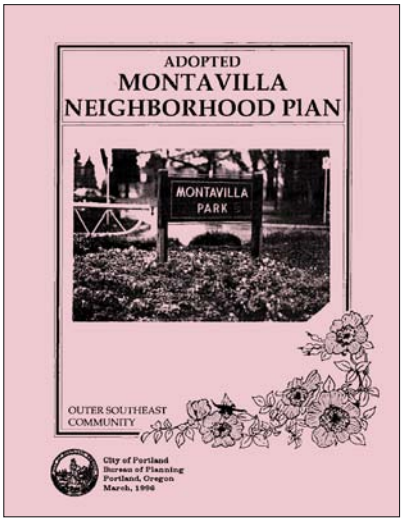
(Policy 2: Historic Preservation and Urban Design, Objective 4)

"Encourage Montavilla residents and the Montavilla Neighborhood Association to provide voluntary design review and technical support for new developments and renovations in the neighborhood."

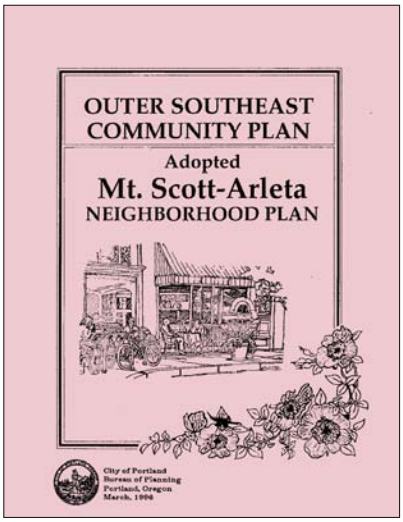
(Policy 2: Historic Preservation and Urban Design, Objective 5)

"Encourage 'Main Street' type developments along portions of NE Glisan, SE Division, 82nd and SE Stark as a means of accommodating more people and businesses along transit streets."

(Policy 3: Transportation, Objective 12).



Mt. Scott-Arleta Neighborhood Plan (1996)



"Encourage development projects and alterations to respect the bulk, form, setbacks, and detailing of surrounding buildings."

(Policy 1: Urban Design, Objective 3)

"Improve Mt. Scott-Arleta's supply of housing by protecting existing homes and encouraging the construction of a variety of attached housing types on infill lots. New housing should blend into the neighborhood and meet the needs of residents of various ages, income levels, and backgrounds."

(Policy 2: Housing and Livability)

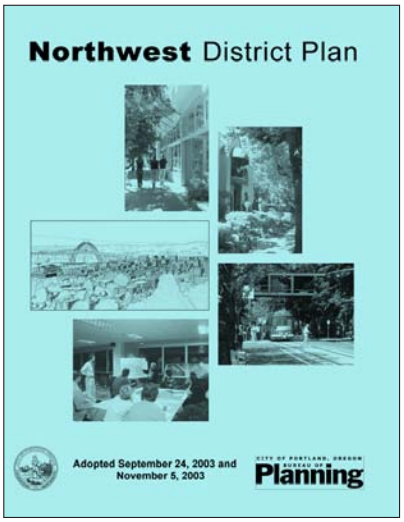
"Encourage the dispersion of many small-scale attached housing (i.e., rowhouses, multiplexes, courtyard housing, etc.) throughout the neighborhood, rather than large apartment complexes in a few places."

(Policy 2: Housing and Livability, Objective 1)

"Encourage infill housing to be similar to the height, bulk and setback of adjacent homes. Advocate for front porches on all houses to enhance public safety. Porches should be emphasized and garages should not dominate the house."

(Policy 2: Housing and Livability, Objective 5)

Northwest District Plan (2003)



"Retain the district's existing housing stock and mix of types and tenures. Promote new housing opportunities that reflect the existing diversity of housing and support a population diverse in income, age, and household size."

(Policy 5: Housing)

"Respect the urban design principles and architectural qualities that define the district's human-scaled, pedestrian-oriented character."

(Policy 7: Urban Design)

"Integrate new development with the existing urban fabric by acknowledging the scale, proportions, orientation, quality of construction and other architectural and site design elements of the building's immediate area."

(Policy 7, Urban Design Objective A)

"Preserve and enhance the distinct character of different parts of the Northwest District."

(Policy 7, Urban Design Objective C)

The implementing "Desired Characteristics and Traditions" statement for the Nob Hill Residential Areas, which have multidwelling zoning, call for new development to "utilize design elements that distinguish the residential side streets from the more intensely hard-scaped main streets, with street frontages divided into distinct components that continue the established fine-grain urban pattern. Development should also acknowledge the scale, proportions, and street orientation of existing Pre-World War II structures and continue the areas' diverse range of building typologies."

"Foster a continuous frontage of buildings and active uses along main streets and the Portland Streetcar line."

(Policy 7, Urban Design Objective E)

"Encourage new development on main streets and the Portland Streetcar line to include additions to the public realm, such as additional sidewalk width, a public square, or other open space."

(Policy 7, Urban Design Objective F)

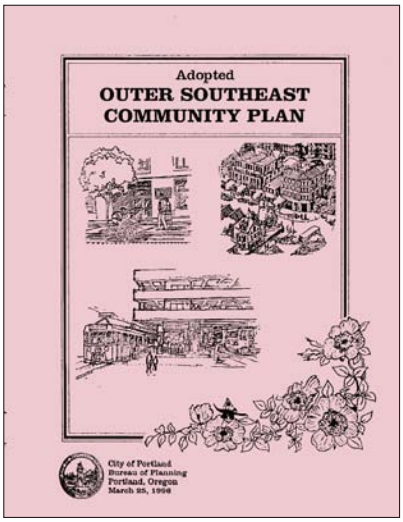
"Encourage building designs that consider solar access impacts on streets and other public spaces."

(Policy 7, Urban Design Objective G)

"Discourage the creation of new vehicle areas between the fronts of residential buildings and streets."

(Policy 7, Urban Design Objective I)

Outer Southeast Community Plan (1996)



"Promote construction of attached housing designed to be owner-occupied to accommodate smaller households."

(Housing Policy, Objective 4)

"Foster a sense of place and identity for the Outer Southeast Community Plan area by reinforcing existing character-giving elements and encouraging the emergence of new ones as envisioned in the Vision Plan."

(Urban Design Policy)

Implementing Action Item UD5 calls for Planning Bureau involvement in a project to "Publish and distribute a handbook of development prototypes for compatible infill residential projects, contemporary main streets, village squares, gateways, and pedestrian districts. Seek resources to include sites from outer southeast in the proposed handbook."

"Promote 'main street' development on portions of Foster Road, Glisan Street, and Woodstock Boulevard, on Division and Stark Streets, and 82nd and 122nd Avenues. Locate Buildings with entrances off the sidewalk. Encourage sidewalk cafes, display windows, benches, street trees, awnings, small scale signs that are directed to the pedestrians, and on-street parking."

(Urban Design Policy, Objective 4)

This objective refers to the plan's "Vision Plan Map," regarding which the plan states: "The Vision Plan Map recognizes that, generally, most outer southeast streets are auto-oriented corridors. …This Vision Plan Map envisions a transition to a more pedestrian-friendly environment by widening sidewalks and adding street trees. Some of these streets will be a new kind of 'Main Street' with buildings placed next to the sidewalk with ground floor windows and entrances facing the street."

"Apply CPTED principles to both public and private development projects. Encourage land use arrangements and street patterns that provide more eyes on the street. Encourage site layouts and building designs that encourage proprietary attitudes and natural surveillance over shared and public spaces."

(Public Safety Policy)

Public Safety Policy Objective 2 lists potential ways of achieving this policy, including locating windows in building walls that abut sidewalks, placing porches or balconies to overlook streets, setting back garages, and building new streets to provide better emergency vehicle access.

"Encourage compatible infill at densities which support transit on vacant lots in established residential areas."

(Subarea Policy I: Traditional Urban Neighborhoods, Objective 4).

"Provide a pleasant and diverse pedestrian experience by providing connecting walkways within a structure to adjacent sidewalk areas."

(Subarea Policy IV: Gateway Regional Center, Objective 3)

"Create a sidewalk environment which is safe, convenient, and attractive. Enliven the environment, creating vitality and interest, with building walls with windows and display windows."

(Subarea Policy IV: Gateway Regional Center, Objective 5)

"Discourage surface parking lots."

(Subarea Policy IV: Gateway Regional Center, Objective 6)

"Improve the pedestrian orientation of buildings and streets around light rail stations."

(Subarea Policy V: MAX LRT Corridor, Objective 2)

"Promote new streets that form a network that accommodates an efficient development pattern, regular lot patterns, multi-modal capability, and multiple access for emergency vehicles."

(Subarea Policy VII: Mixed-Era Neighborhoods, Objective 4)

"Use alternative street standards to achieve connectivity where standard city streets are not possible due to lot configuration, existing development, etc."

(Subarea Policy VII: Mixed-Era Neighborhoods, Objective 5)

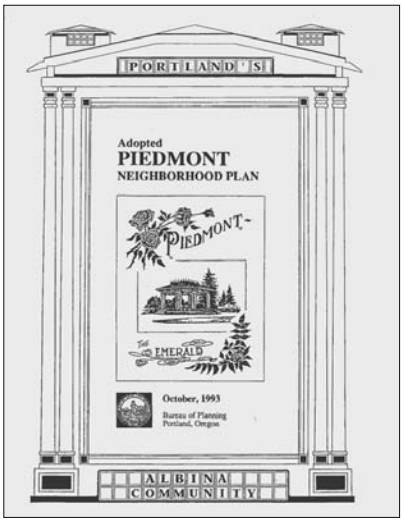
Piedmont Neighborhood Plan (1993)

"Encourage new residential developments to be consistent with the existing character of the neighborhood."

(Policy 1: Housing, Objective 4)

"Require new development in and adjacent to the Piedmont Historic Design Zone to be compatible with the area's historic character."

(Policy 3: Historic Preservation, Objective 3)



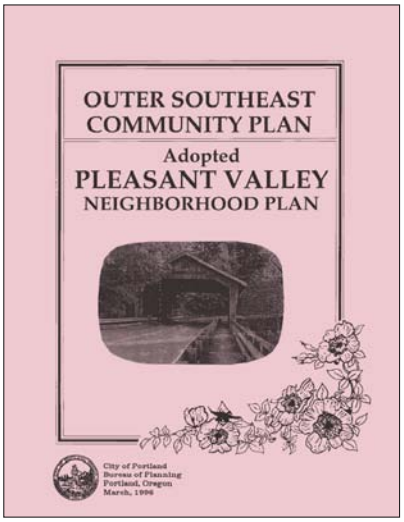
Pleasant Valley Neighborhood Plan (1996)

"Retain and reinforce the open space characteristics and identity of the neighborhood."

(Policy 4: Housing and Neighborhood Livability, Objective 1)

"Assure a wide variety of housing types, while retaining the character of Pleasant Valley."

(Policy 4: Housing and Neighborhood Livability, Objective 2)



Portsmouth Neighborhood Plan (2002)

"Improve Portsmouth neighborhood's appearance by maintaining property, keeping the neighborhood clean, and planting more green and landscaped areas. Encourage new development to be compatible with the existing character of the neighborhood."

(Policy 4B: Neighborhood Livability—Neighborhood Appearance)

"Encourage developers to construct buildings that are compatible with the neighborhood's voluntary design guidelines."

(Policy 4: Neighborhood Livability, Objective 5)
Implementing Action Item NL15 calls for "Building Blocks for Outer Southeast Neighborhoods" to serve as the voluntary design guidelines.

"Encourage buildings and landscaping along Lombard Street that create a safe, pleasant environment for pedestrians."

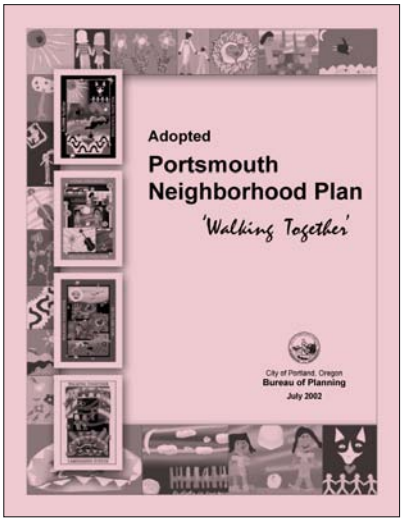
(Policy 6: Business Growth and Development, Objective 3)

"Provide a variety of housing types for neighborhood residents with different incomes, needs, desires, and physical abilities."

(Policy 8: Housing, Objective 1)

"Encourage 'visitability' to residential buildings. (Homes that have a ground floor living area, dining area, and bathroom accessible to people with disabilities.)"

(Policy 8: Housing, Objective 8).



Powellhurst-Gilbert Neighborhood Plan (1996)

"Encourage infill residential development while assuring compatibility with the surrounding area."

(Goal C)

"Assure that the new housing which is developed is both livable and a good neighbor to existing development."

(Goal D)

"Improve the neighborhood and encourage and allow for diversity in the type and density of housing within the neighborhood."

(Policy 4: Housing and Neighborhood Livability)

"Encourage the replacement of unsound structures with higher density infill development which is in keeping with the character of surrounding properties."

(Policy 4: Housing and Neighborhood Livability, Objective 3)

"Use design elements such as landscaping, screening and building orientation to ensure good design of new development and cohesive commercial areas."

(Policy 5: Historic Preservation and Urban Design, Objective 5)

Richmond Neighborhood Plan (1994)

"Accommodate anticipated population growth through 'main street' development (mixed residential/commercial uses along major transit streets) or other construction methods that retain or enhance existing neighborhood character."

(Policy 4: Housing, Objective 4.4)

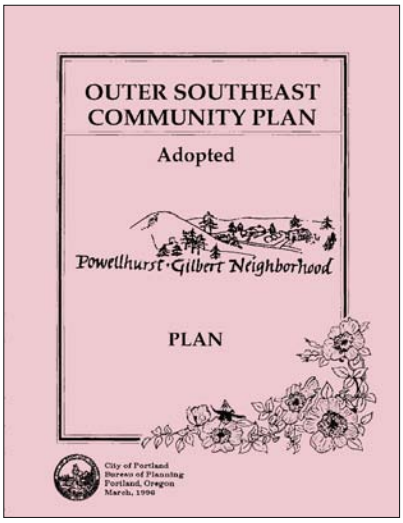
Sabin Neighborhood Plan (1993)

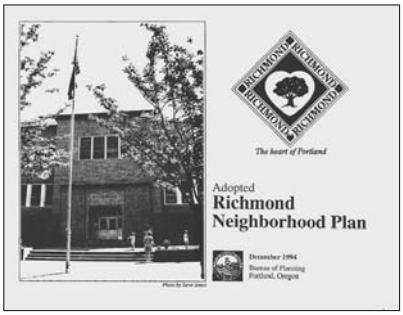
"Foster the preservation and development of affordable, quality housing that is compatible with the existing single-family character and socio-economic diversity of the Sabin Neighborhood. Enhance a sense of pride and commitment to the community."

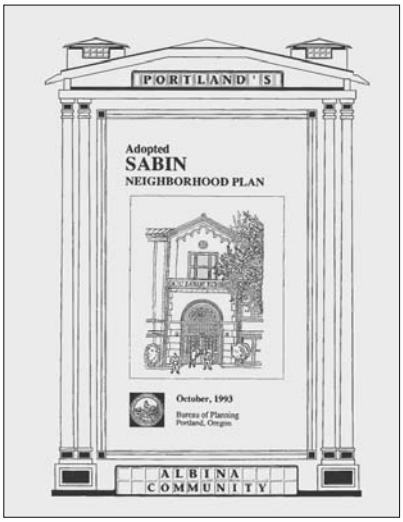
(Policy 1: Housing)

"Allow housing densities compatible with Sabin's existing community character. Establish development standards that reflect this character."

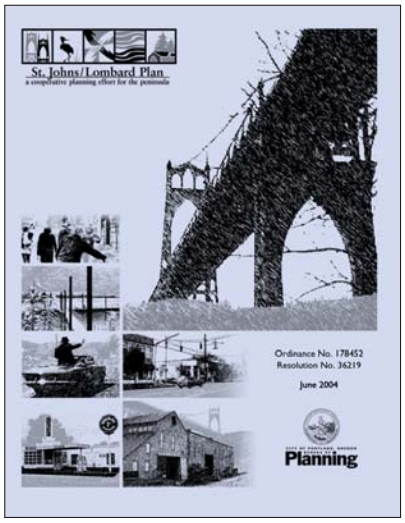
(Policy 1: Housing)







St. Johns/Lombard Plan (2004)



"Accommodate growth and change in a manner that fosters the area's sense of place as a small town and main street within the city. Take advantage of its unique setting near the Willamette River, and support development of vital commercial areas."

(Policy 1: Land Use and Placemaking)

"Strengthen the identity of the St. Johns and Lombard Street areas through development and community activities that integrate and build on the area's distinctive history and architecture."

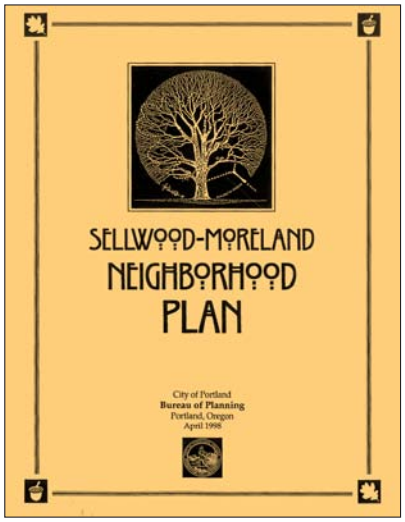
(Policy 2: History and Identity)

Adopted design review provisions call for infill development in residential areas to reflect features of Streetcar Era houses, continue front setback patterns, provide a pedestrian orientation, and to locate parking toward the rear of buildings. These provisions also call for development in downtown St. Johns to respond to its small-town character and pedestrian-friendly environment, while development in hillside residential areas should acknowledge and celebrate the hillside topography.

"Provide for a broad range of well-designed and compatible housing to accommodate local and regional housing needs, and to support development of vital town center and main street commercial areas."

(Policy 5: Housing)

Sellwood-Moreland Neighborhood Plan (1998)



"Respect the character of Sellwood-Moreland by sensitively integrating new development with the historic elements of the community."

(Policy 1: Historic Preservation, Objective 3)

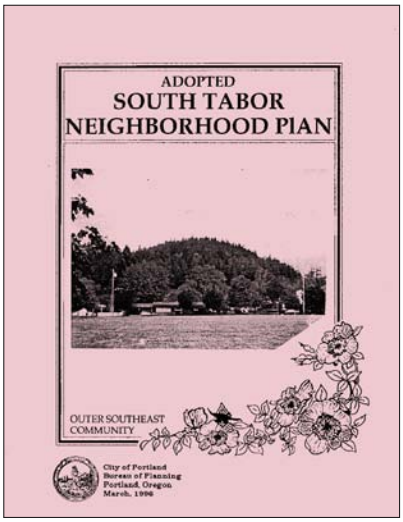
"Preserve the predominantly pedestrian scale and design of the neighborhood's residential areas, emphasizing the street as an important public open space element."

(Policy XI: Residential Areas)

"Ensure a mix of housing units to serve the needed range of types, sizes and income levels that will accommodate a socially and economically diverse neighborhood population."

(Policy XI: Residential Areas, Objective 1)

South Tabor Neighborhood Plan (1996)



"Preserve and improve existing housing while providing opportunities for new housing attractive to long-term, responsible residents."

(Policy 1: Housing)

"Encourage the construction and possible conversion of a variety of housing types."

(Policy 1: Housing, Objective 2)

"Encourage owner occupancy."

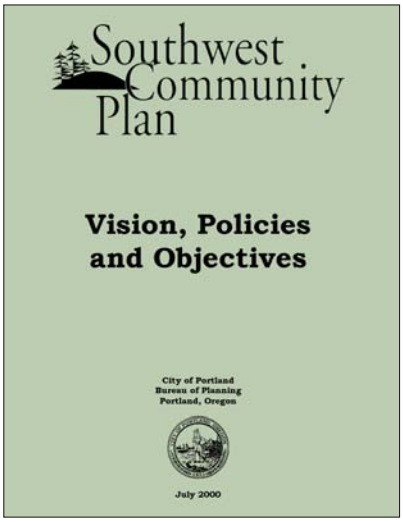
(Policy 1: Housing, Objective 4)

"Encourage site and design review to promote functional, safe and attractive developments which are compatible with surrounding development and uses and with the natural environment."

(Policy 7: Urban Design, Historic Preservation, and Neighborhood Livability, Objective 2)

Implementing Action Item U10 calls for the residential projects to be oriented to the street with garages that are not prominent, include front porches and front yards, feature building height that preserves solar access and privacy for surrounding dwellings, be visually compatibility with existing housing, and provide greenspace for tenants.

Southwest Community Plan (2000)



"Enhance Southwest Portland's sense of place as a community and a collection of distinct neighborhoods. Accommodate Southwest Portland's share of regional growth while protecting the environment in all areas. Encourage the realization of compact, transit and pedestrian-friendly, mixed-use centers while responding to the need for a range of housing types and prices. Outside of the mixed-use areas, allow infill housing opportunities which increase neighborhood diversity, stability and home ownership while limiting redevelopment."

(Land Use and Urban Form Policy)

"Ensure compatibility of new development with Southwest Portland's positive qualities."

(Land Use and Urban Form Policy, Community-wide Objective 1)

"Encourage innovative designs in public and private development that are in harmony with the natural character of Southwest Portland."

(Land Use and Urban Form Policy, Community-wide Objective 2)

"Ensure that development and redevelopment occurring outside of mixed-use areas respects the scale and desired neighborhood character identified in individual neighborhood plans."

(Land Use and Urban Form Policy, Community-wide Objective 6)

"Encourage development within main streets and town centers that enhances commercial vitality and the desired characteristics of these areas."

(Land Use and Urban Form Policy, Mixed-Use Areas Objective 3)

"Encourage employment and housing growth in Southwest Portland's town centers, main streets, and at designated areas along corridors, while effectively managing stormwater runoff and protecting creeks and waterways."

(Land Use and Urban Form Policy, Mixed-Use Areas Objective 4)

"Enhance the environment for pedestrians in Southwest Portland's town centers, main streets, and transit corridors."

(Land Use and Urban Form Policy, Mixed-Use Areas Objective 8)

"Within the boundaries of town centers, create transitions along the edges that respect the planned density, design, scale and character of the contiguous neighborhoods."

(Land Use and Urban Form Policy, Town Center Objective 2)

"Respect the planned density, design, scale and character of the contiguous neighborhood when increasing residential and employment density within main streets."

(Land Use and Urban Form Policy, Main Streets Objective 1)

"Provide a variety of affordable housing choices adequate to meet the needs of current and future Southwest residents. Regard the existing housing stock as one resource to meet this need. Encourage development of housing types that will increase home ownership opportunities for Southwest residents."

(Housing Policy)

"Provide for diversity of size, type, and affordability of housing to meet the needs of young adults, small and large families, empty nesters, the elderly, and others."

(Housing Policy, Objective 2)

"Increase opportunity for building more detached single family housing by reducing minimum lot sizes and encouraging the construction of smaller size houses."

(Housing Policy, Objective 3)

"Encourage public and private developers to vary the affordability, type and size of units in new housing developments to foster the development of inclusive communities."

(Housing Policy, Objective 5)

"Increase the supply of affordable rental housing of all types for families. This includes units with three or more bedrooms."

(Housing Policy, Objective 7)

"Encourage site layouts and building designs that encourage proprietary attitudes and natural surveillance of shared and public spaces."

(Public Safety Policy, Objective 7)

"Protect and enhance Southwest Portland's environment and natural resources on a watershed by watershed basis. Integrate stormwater management into land use planning and development in a way that prevents net degradation of water quality, aquatic, streamside and riparian habitats and ecosystems, and plant and animal habitats throughout the stream corridor."

(Watershed Policy)

Sullivan's Gulch Neighborhood Action Plan (1987)

"Support new residential or mixed residential and commercial development between NE 15th and 16th that are oriented toward the neighborhood and sensitive to neighborhood character in terms of scale and style."

(Policy 2: West End, Objective 2A)

"Encourage and support high-density residential development that is compatible with surrounding land uses on the blocks between NE 16th and 17th."

(Policy 2: West End, Objective 2B)

"Maintain a mixture of housing types and opportunities which are in keeping with the neighborhood character."

(Policy 3: Neighborhood Core-West, Objective 3A)

"Preserve the qualities which contribute to the overall character of this area which include the age, style, uniform setbacks, narrow tree-lined streets and landscaping."

(Policy 4: Neighborhood Core-East, Objective 4A)

"Encourage redevelopment east of NE 28th which is compatible with the nearby residential areas and will not cause significant detriment to them."

(Policy 5: East End)

"Maintain and preserve the existing housing stock while providing opportunities for additional density through internal conversions and development of vacant and underdeveloped sites. Provide housing for a diverse population close to the Central City."

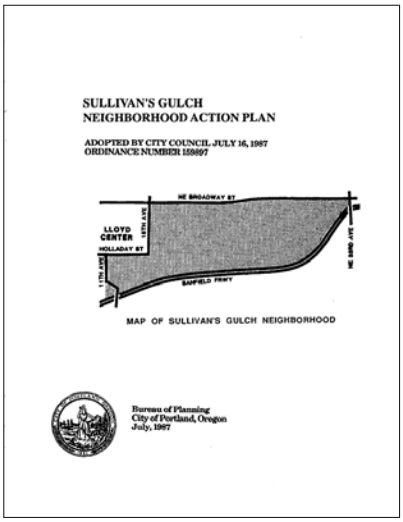
(Policy 7: Housing)

"Encourage a variety of sound, well-maintained housing at all price and rental levels suitable to the needs of a variety of households such as the elderly, both large and small families and young single persons."

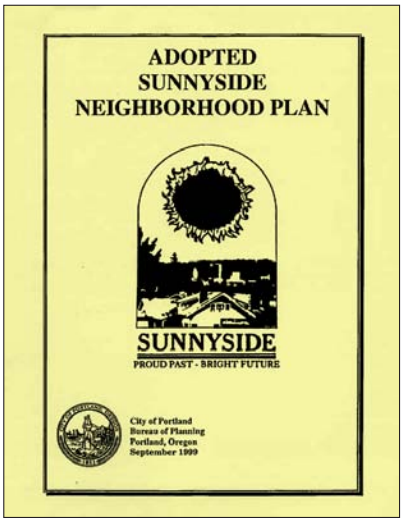
(Policy 7: Housing, Objective 7A)

"Increase opportunities for owner occupancy of existing multifamily housing through cooperative or condominium ownership and in new rowhouse developments."

(Policy 7: Housing, Objective 7D)



Sunnyside Neighborhood Plan (1999)



"Preserve the intrinsic character of the neighborhood."

(Policy 4: Land Use, Objective 1)

Relevant implementing action items include: "Advocate for redevelopment of auto-oriented buildings into designs compatible with pedestrians" (LU5), "Support appropriately scaled and compatibly designed in-fill multifamily development through communications with review bodies" (LU6), Promote building projects with designs that support the pedestrian nature of the streetscape and the use of transit and bicycles" (LU7), "Create a booklet of desirable and undesirable development styles, including landscaping, which can be shared with planners and developers, to encourage creative, diverse and compatible development" (LU8), and "Advocate for the City to add design review to all multi-family and commercial zones" (LU9). The plan's voluntary design guidelines encourage pedestrian-friendly design, front porches, preservation of privacy, locating parking at rear, and compatibility with nearby residences.

"Encourage a mix of housing types, including quality, affordable and attractive single and multifamily housing and accessory rentals, to serve a diverse population."

(Policy 4: Land Use, Objective 2)

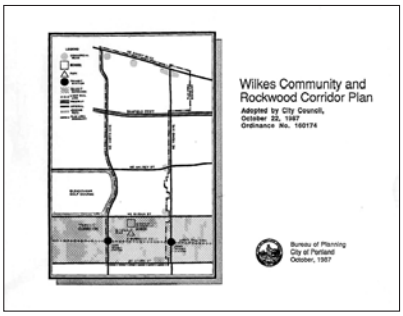
"Work with the City of Portland and other agencies to ensure that regulations are effective, reasonable and support the maintenance and expansion of the character of the neighborhood as expressed in the adopted neighborhood vision and policies."

(Policy 4: Land Use, Objective 4)

"Discourage drive-through developments, garages in front of houses, and commercial intrusions into the residential areas in Sunnyside."

(Policy 4: Land Use, Objective 5)

Wilkes Community and Rockwood Corridor Plan (1987)



"Encourage new single-family and multifamily development scaled and designed to be a part of the community and protect the privacy of adjoining properties."

(Plan Objective F)

"Use design features such as landscaping, screening, and building orientation to ensure compatibility of new attached single-family and multifamily residential developments with surrounding existing residential developments."

(Policy 12: New Residential Development)

"Use Community and Site Design Guidelines of this plan as a guide in land use and land division reviews and site review."

(Policy 13: Design Guidelines)

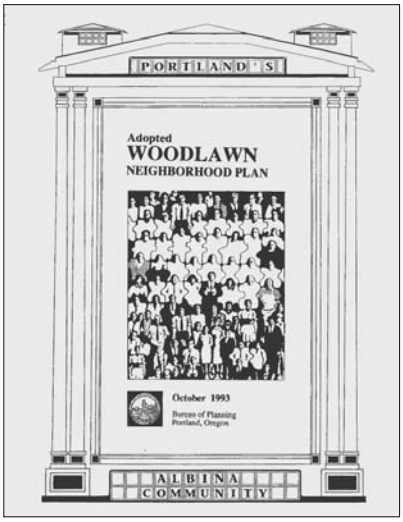
The plan's design guidelines include calls for preservation of wooded areas, preservation of residential privacy, good pedestrian connections, joint use of driveways and other vehicle areas to reduce paved area, landscaped buffers between areas zoned for multi-dwelling and single-dwelling development.

"Require new medium density multifamily residential zone development to comply with the following locational requirements: (1) Have direct access to an arterial or collector; (2) Avoid routing of through traffic on local neighborhood streets; (3) Have public transit available or planned to be available within one-quarter mile of the site; and (4) Use design features such as landscaping, screening, and building orientation to ensure compatibility with surrounding residential developments."

(Policy 21: Housing Location, Section A)

"Require new low density multifamily, townhouse, and attached residential zone developments to comply with the following locational requirements: (1) Have direct access to major city traffic street or district or neighborhood collector streets, or local service streets where traffic volume capacities will not be exceeded; and (2) Use design features such as landscaping, screening, and building orientation to ensure compatibility with surrounding residential developments."

(Policy 21: Housing Location, Section C)



Woodlawn Neighborhood Plan (1993)

"Promote the construction of residential housing that will accommodate people of varying income levels and physical abilities."

(Policy 4: Housing, Objective B)

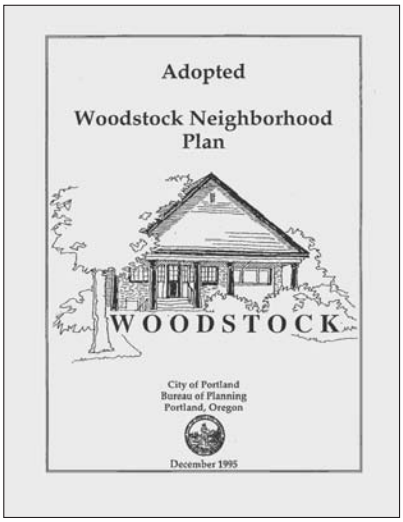
"Encourage construction of a variety of housing types in the neighborhood including mixed commercial/residential development."

(Policy 4: Housing, Objective C)

"Promote compatible infill development in residential areas throughout the neighborhood."

(Policy 4: Housing, Objective D)

Woodstock Neighborhood Plan (1995)



"Enhance Woodstock's character while attracting development that preserves and improves and enhances neighborhood livability."

(Policy 14: Urban Design)

"Encourage new construction and remodeling to contribute to an attractive and engaging streetscape by ensuring that ample land is reserved for planting strips when rights-of-way are improved."

(Policy 14: Urban Design, Objective 14.2)

"Encourage new development to be attractive and compatible with the surrounding neighborhood."

(Policy 14: Urban Design, Objective 14.7)

"Establish voluntary residential design guidelines and market these guidelines in a Woodstock development brochure. Promote their use by developers, designers, builders and homeowners. Develop guidelines to address the issues of compatible development between commercial and neighborhood residential areas."

(Policy 14: Urban Design, Objective 14.8)

"Improve and add to the supply of housing in the Woodstock Neighborhood. Ensure a mix of housing types to serve Woodstock's diverse population and a variety of household types."

(Policy 16: Housing a Diverse Community)

"Support the siting and construction of housing designed to meet the needs and income levels of young adults, one and two person households, families, physically and socially challenged, and senior housing."

(Policy 16: Housing a Diverse Community, Objective 16.1)

"Reinforce home ownership by encouraging the development of affordable housing that is compatible with the character and design of neighboring homes."

(Policy 16: Housing a Diverse Community, Objective 16.4)

"Encourage infill housing designs that create a pedestrian friendly streetscape."

(Policy 17: Character of Infill Housing)

"Discourage the use of designs in residential neighborhoods where garages are the dominant feature in the front yard."

(Policy 17: Character of Infill Housing, Objective 17.1)

"Where alleys exist, encourage designs and lot development patterns where garages are accessed through the alleys."

(Policy 17: Character of Infill Housing, Objective 17.2)

"Support building projects with designs that consider the pedestrian environment of the streetscape and the use of transit. Look for incentives to encourage builders to construct housing of this type in Woodstock."

(Policy 17: Character of Infill Housing, Objective 17.3)

THIS PAGE INTENTIONALLY LEFT BLANK