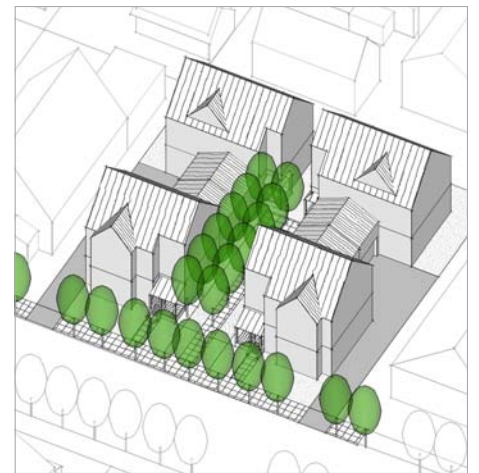
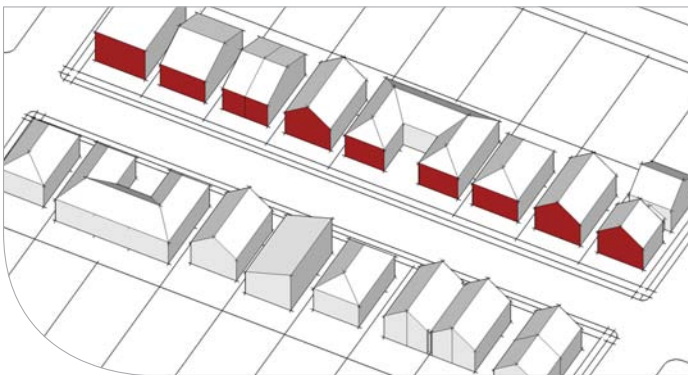
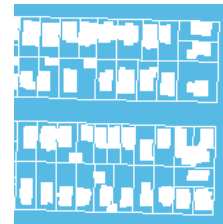


# The Infill Design Toolkit: Medium-Density Residential Development



A Guide to Integrating Infill Development  
into Portland's Neighborhoods

December 2008

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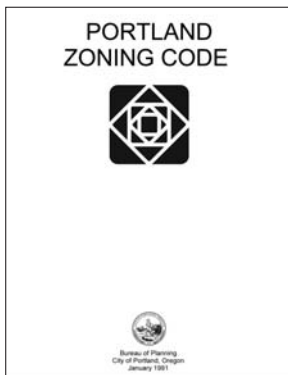
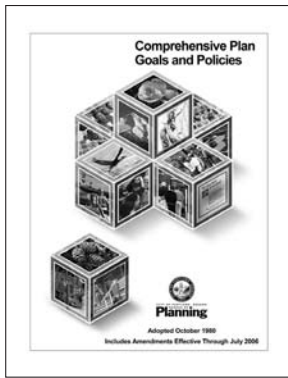


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# Design Principles for Residential Infill Development

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.

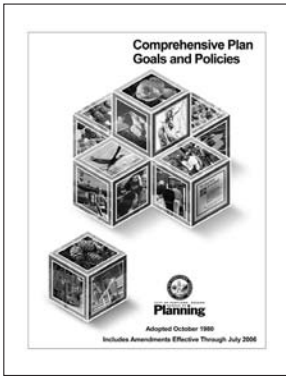
The various components of this guide serve as problem-solving tools, highlighting strategies for achieving context-sensitive design in infill development and ways of overcoming some of the unique design challenges of infill development on small sites.

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 supersede 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.

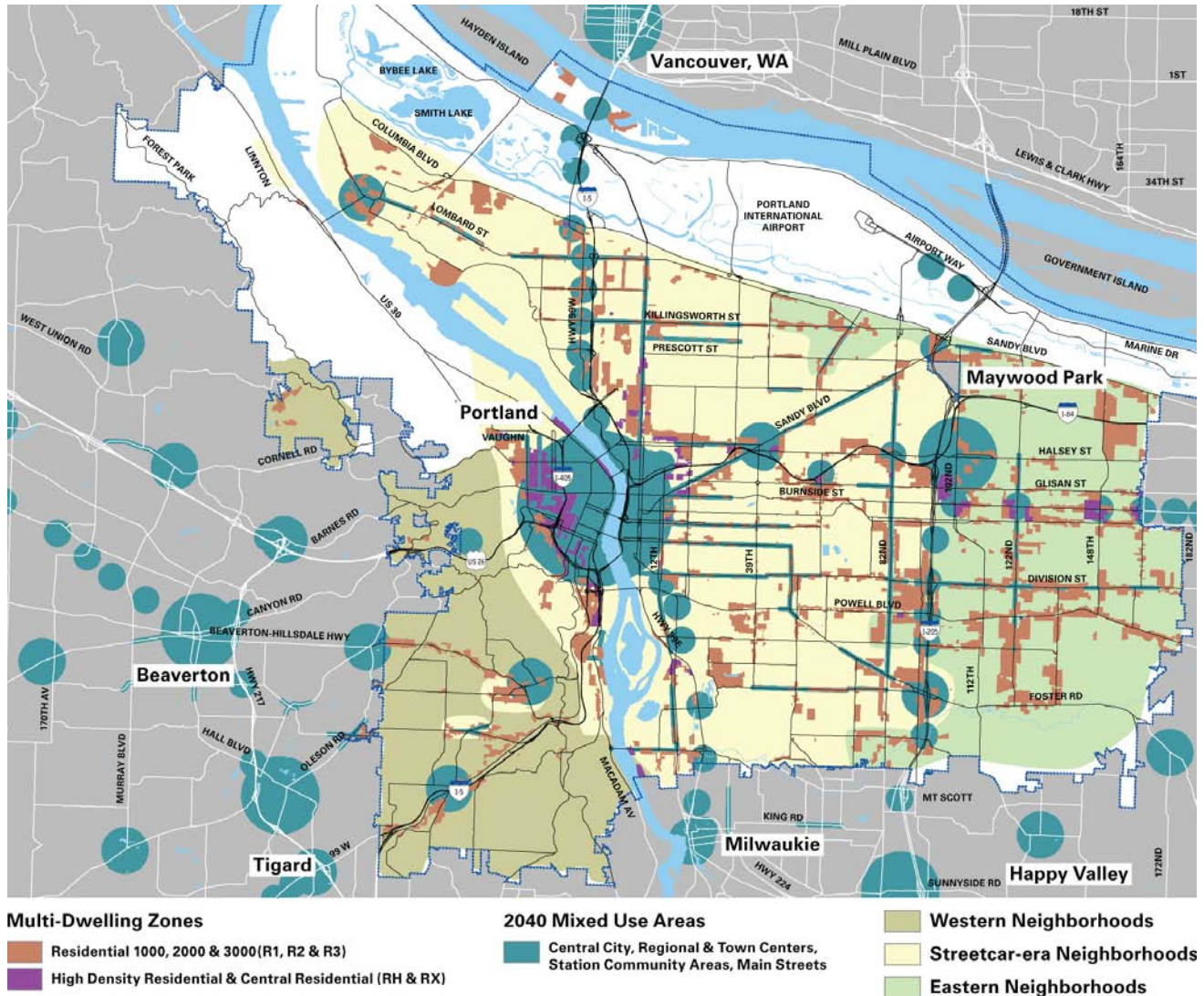
**How to achieve some measure of compatibility is the primary focus of the Infill Design Toolkit.** Compatibility, as treated in the Toolkit, is not about replicating existing scale or reproducing the architectural styles of nearby buildings. Rather, the focus is on highlighting how higher-density infill 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.



## 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

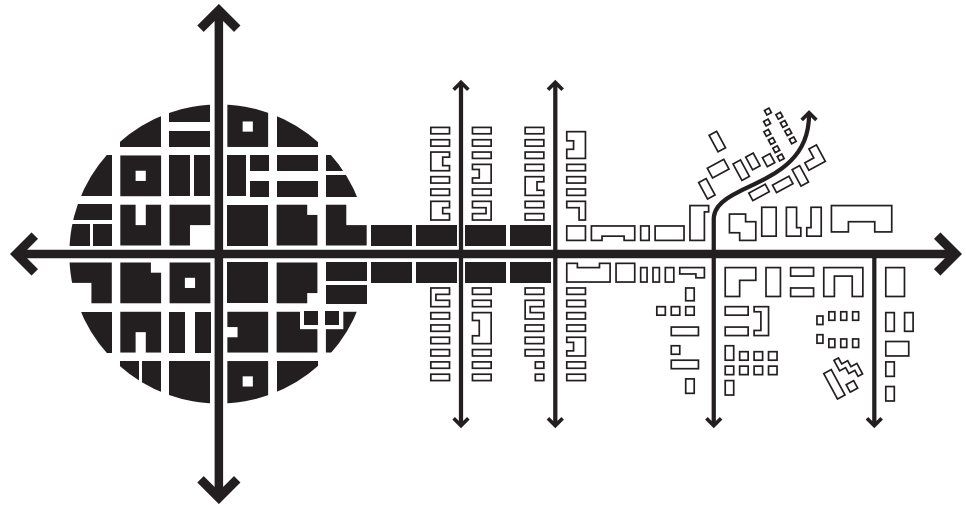
Residential areas have far less consistent lot and block patterns than the inner neighborhoods. Lots in multidwelling-zoned areas are relatively large, but disproportionately deep (often 200’-300’, and sometimes even 400’, deep). Rather than consistency in built patterns and architecture, trees and other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

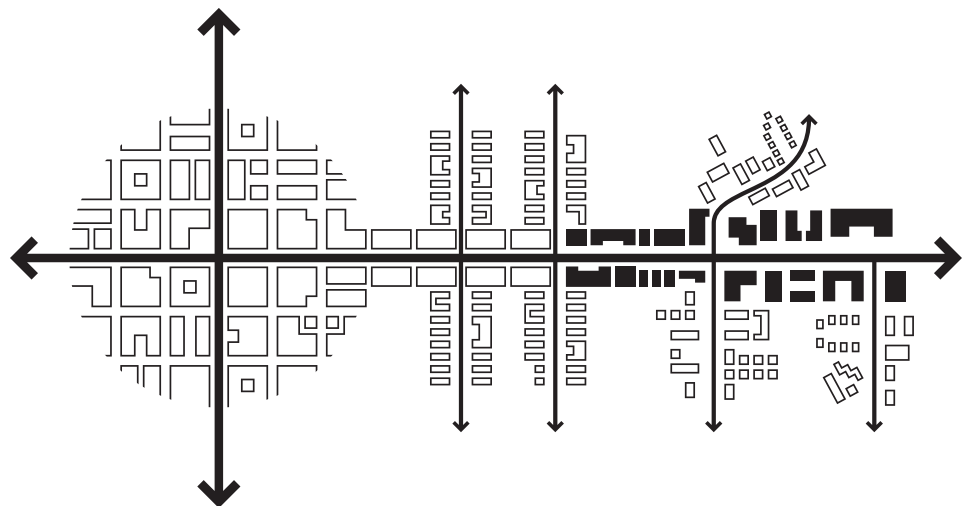
### Mixed-use centers and main streets

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.



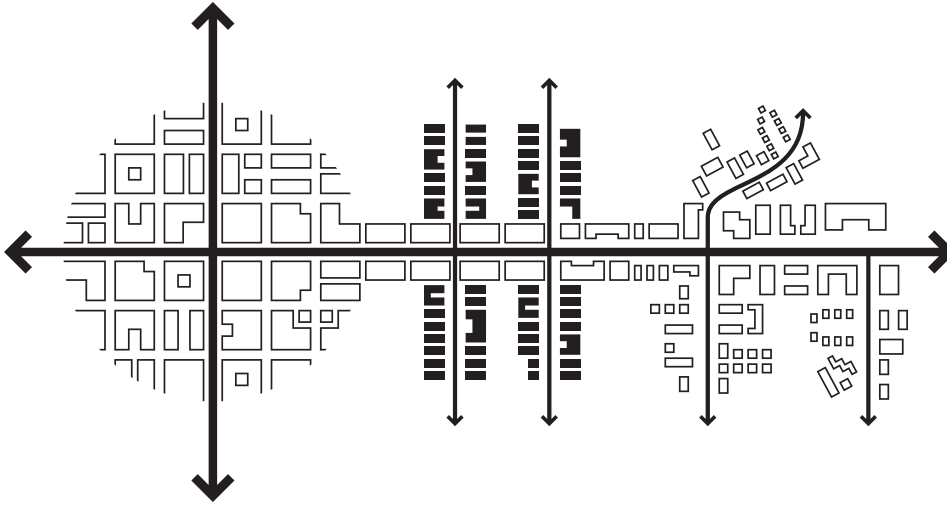
### Residential corridors

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.



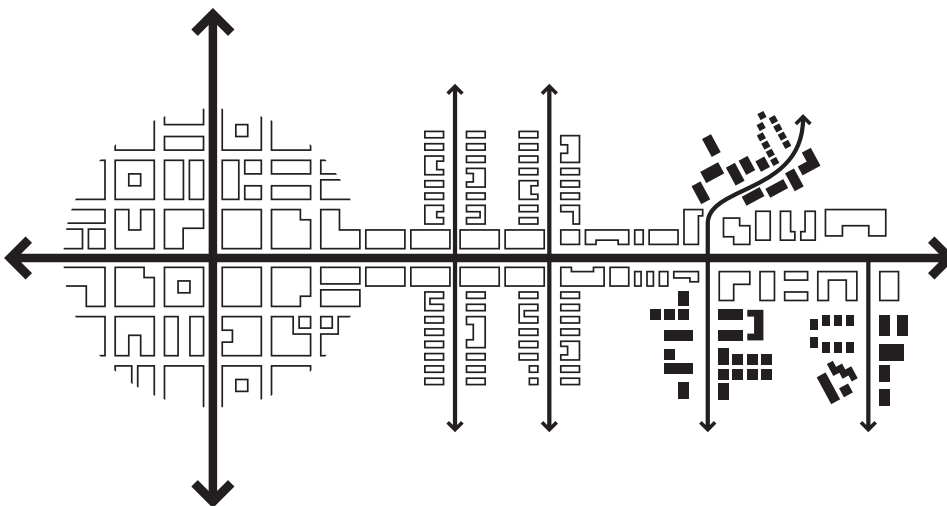


Note that in many cases, these typologies refer more to desired **future** character, rather than existing character. This is particularly so regarding areas where growth and change are intended to be concentrated, such as mixed-use centers, main streets, and corridors; where the low-lying buildings 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.

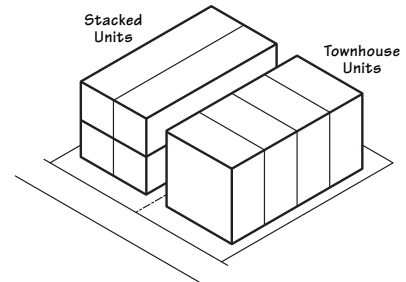


# What is Multi-dwelling Development?

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:

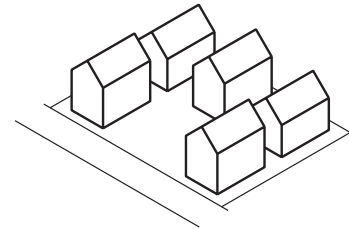
## Plexes (most commonly triplexes and fourplexes)

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



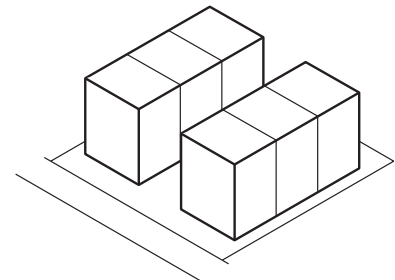
## Cottage Clusters

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



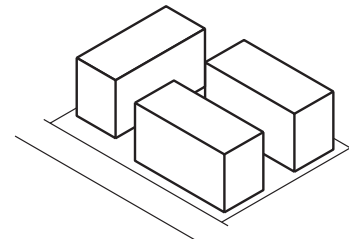
## Courtyard Townhouses

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



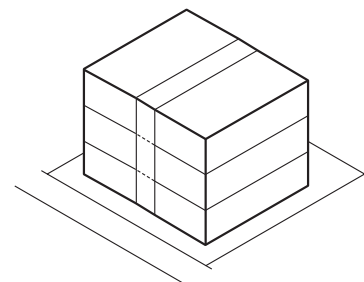
## Apartment Complexes

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



## Block Apartment Buildings

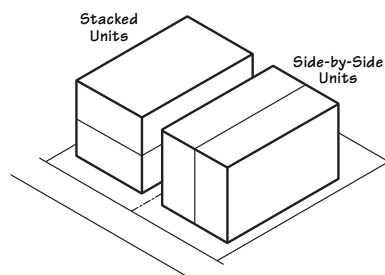
Multi-story apartment buildings with a shared main entrance and with stacked units accessed by interior corridors.



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

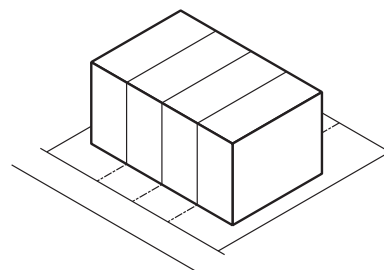
## Duplexes

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



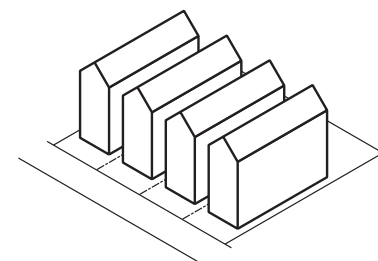
## Rowhouses (also “attached houses”)

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



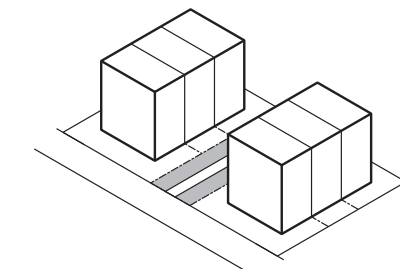
## Narrow Lot Houses

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



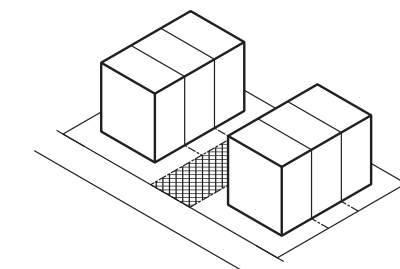
## Common Green Housing

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.*