4th Lecture

Compact building design

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2022-2023

Compact building design Definition

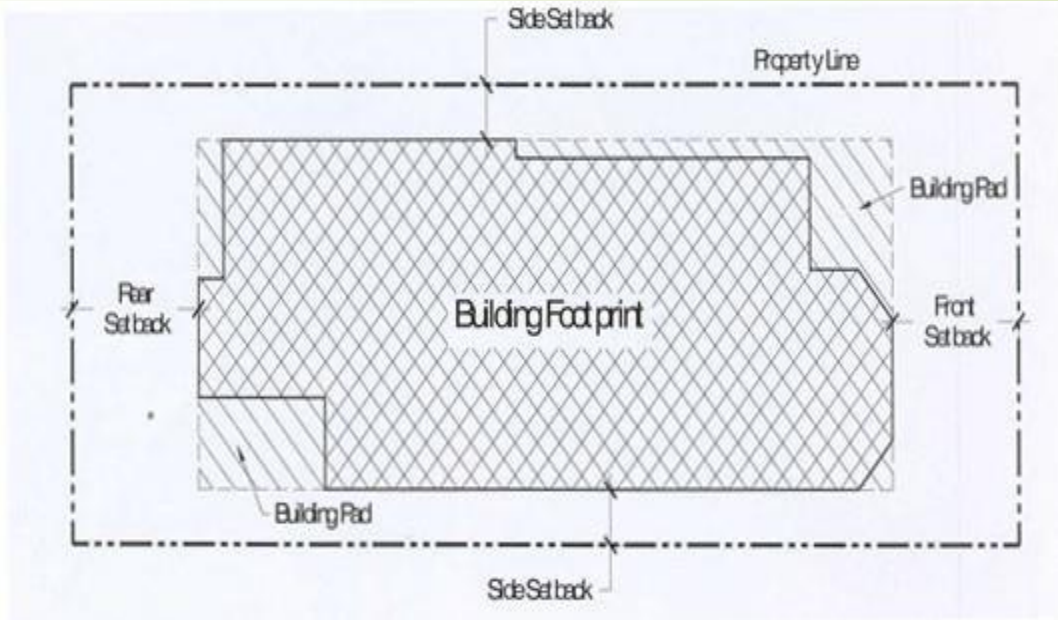
- Compact building design simply means using the least amount of land for development and supporting infrastructure that is reasonable under the circumstances.

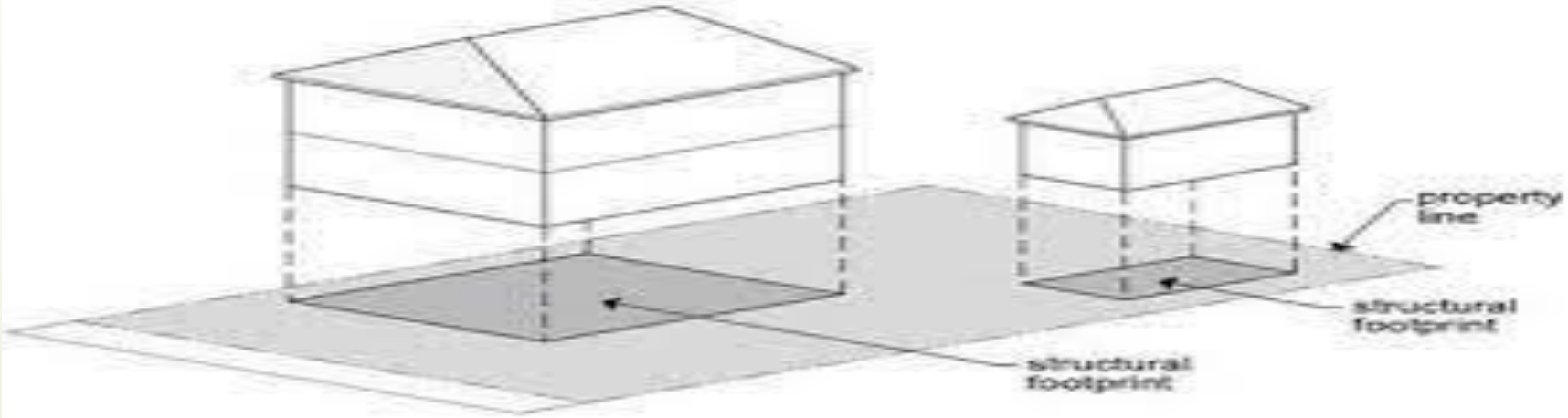
Compact building design

- **Goals:**
- Compact building design allows communities to be designed in a way that:
- 1. preserves more open space
- 2. makes more efficient use of land and resources.
- **Methods:**
- By encouraging buildings to grow vertically rather than horizontally,
- by incorporating structured rather than surface parking,
- for example, communities can
- reduce the footprint of new construction preserve more green space (Smart Growth Online).

Building footprint definition

- **Building footprint means** the edge of a building at the outer edge of the outside walls of the building, including cantilevered portions of a building.





$$\text{lot coverage (\%)} = \frac{\text{total area of structural footprint(s)}}{\text{total lot area}}$$

Why should we take advantage of compact building design?

- Compact development
- helps support a wide range of transportation options
- while conserving valuable open space.
- Communities can guarantee ready access to open space in compactly developed places by providing for a range of cluster development options, using density to conserve open space.
- A design review process can be used to ensure that compact development reflects required design standards.

Low-density versus Higher-density development

1, **Low-density residential and commercial development**

- consumes far more land per person than most development prior to WWII.
- Although this trend is partially driven by :
- consumer demand
- state subsidies,
- it can largely be referred to local ordinances that require large areas of land to be used for various types of development.

1. low-density, (continued)

- There were unfortunate results from the large-scale exodus from cities and building in a low-density, sprawling pattern.

1. the conversion of active agricultural and forestry lands to other uses.
2. Increases in water and air pollution.
3. increased travel time and traffic congestion,
4. decreased time families spend with each other,
5. increased obesity.
6. decrease in the visual quality of our communities and others.
7. The decline in quality of life and increased costs associated with low-density.
8. automobile-dependent development has led to renewed interest in compact building design.

2.Higher-density development

- **From a transportation standpoint**

- It is a key element to creating walkable communities and providing more transportation options.
- . More riders in the same area mean that bus or rail service becomes more practical and convenient.
- people are free to select from a variety of transportation modes — walking, bicycling, mass transit, automobile — to complete their daily routines, such as commuting to work or school, running shopping, and taking their children to daycare
- , Whereas a low-density development may only justify a stop on the development's edge
- a development with more people may attract a central transit stop within a short walking distance for all residents.

Higher-density development

- From a retail standpoint,
- more density means more customers.
- A neighborhood that includes more compact development can support more stores and restaurants within its boundaries.
- From housing choices stand point.
- Higher-density development can also contribute to a wider range of housing choices.
- Higher-density projects can reduce per-unit construction costs, allowing developers more flexibility to respond to the market and thus offer a range of housing types to a variety of consumers.
- Young singles can find smaller units with convenient access to entertainment;

From housing choices (Continued)

- families can seek large yards and multiple bedrooms;
- retirees who are tired of maintenance can downsize their yards in favor of housing with more amenities and services.
- Providing these options in the same neighborhood enables residents to change housing arrangements without having to move from the community.
- This promotes intergenerational equity, allowing children to continue to live in the community they grew up in and for their parents to be able to afford to stay.
- For households with limited income, higher densities mean more housing choices at different price points.
- Consumer desires for convenient neighborhoods with many amenities, as well as public sector efforts to address traffic and use public resources efficiently, are creating increased interest in more compact development.

Why compact building design is important?

- In Our cities we are consuming more land than ever before.
- For Example in America
- During the last two decades of the 20th Century, Americans developed land three times faster than they grew as a nation.
- the amount of urbanized land used for development increased by 45 percent from approximately 51 million acres in 1982 to 76 million acres in 1997.
- The population grew by only 17 percent during this same time period.

Wide, Shallow Compact Lots, Santa Rosa CA

Reasons Behind Compact Building Design importance

- 1. open space and use of land and resources.
- 2. transportation choices and amenities.
- 3. housing choices and reduced infrastructure
- 4. Social interaction

1. open space and use of land and resources.

- Compact building design suggests that communities be designed in a way which permits more open space to be preserved,
- and that buildings can be constructed which make more efficient use of land and resources:
- By encouraging buildings to grow vertically rather than horizontally,
- by incorporating structured rather than surface parking,
- communities can reduce the footprint of their new construction and preserve more greenspace.
- Not only is this approach more efficient by requiring less land for construction,
- it also provides and protects more open, undeveloped land that would not exist otherwise to absorb and filter rain water, reduce flooding and stormwater drainage needs, and lower the amount of pollution washing into our streams, rivers and lakes.

Baker Place, San Jose – Four affordable units per grand house

Baker Place, San Jose – Four affordable units per grand house

2. transportation choices and amenities

- Compact building design is necessary to support wider transportation choices and provides cost savings for neighborhoods.
- Communities seeking to encourage transit use to reduce air pollution and congestion recognize that minimum levels of density are required to make public transit networks viable.
- Local governments find that on a per-acre basis, it is cheaper to provide and maintain services like water, sewer, electricity, phone service and other utilities in more compact neighborhoods than in spread communities.
- Compact development is the strategy of increasing the density of urban areas while adding amenities that make them more comfortable.
- For example, a key assumption of compact development is that by using less land area for buildings and roads, more open space can be set aside, for parkland or agricultural uses.

3. housing choices and reduced infrastructure

- Compactly designed communities can provide more housing choices
- This approach helps address the central problem of affordable housing.
- By offering greater suitability, less need for driving, and pedestrian-friendly environments, compact developments are more human-centered and less car-centered.
- Compact developments achieve the population densities needed to support viable alternative transportation systems such as trains, buses and taxis, bike trails and foot paths.
- Compact developments result in smaller areas of impact, make more efficient use of utilities and infrastructure such as roads, reduce consumption of land, and can result in significant energy savings, as well as tax savings due to reduced infrastructure construction and maintenance.

4. Social interaction

Above: In this compact development in Port Hueneme, the houses were designed with porches in front, to encourage social interaction. The curbs are not cut with driveways, improving safety for walkers and kids at play. An alley in the back provides access to garages.

Multi-story buildings provide more space and potential funding for amenities like parks and preserve areas. (Image from WaterColor in Santa Rosa Beach, Florida).

Compact buildings can provide a very high quality of life. This residence in the Cotton District of Starkville, MS integrates interior and exterior spaces creating a manageable courtyard garden and a compelling adjacent porch. The home is reminiscent of the Charleston single house style originated in Charleston, SC.

Compact building design works , Why?

- An equal or greater number of units can be built on smaller lots
- More housing at a variety of prices is possible
- More acreage of open space is conserved
- Open space and parks make developments more attractive
- Wildlife benefits from land conserved as open space
- Lower infrastructure costs due to fewer roads, shorter lengths of water, sewer and utility lines
- More pedestrian friendly, resulting in less traffic

compact building design strategies include:

- Encourage greater development density
- Concentrate commercial development in mixed-use nodes
- Reduce setback/dimensional standards
- Use density-based districts
- Update density and height requirements
- Use density bonuses
- Locate highest density residential near existing and future mixed-use centers
- Revise Parking Standards
- Revise screening/buffer standards

Encourage greater development density

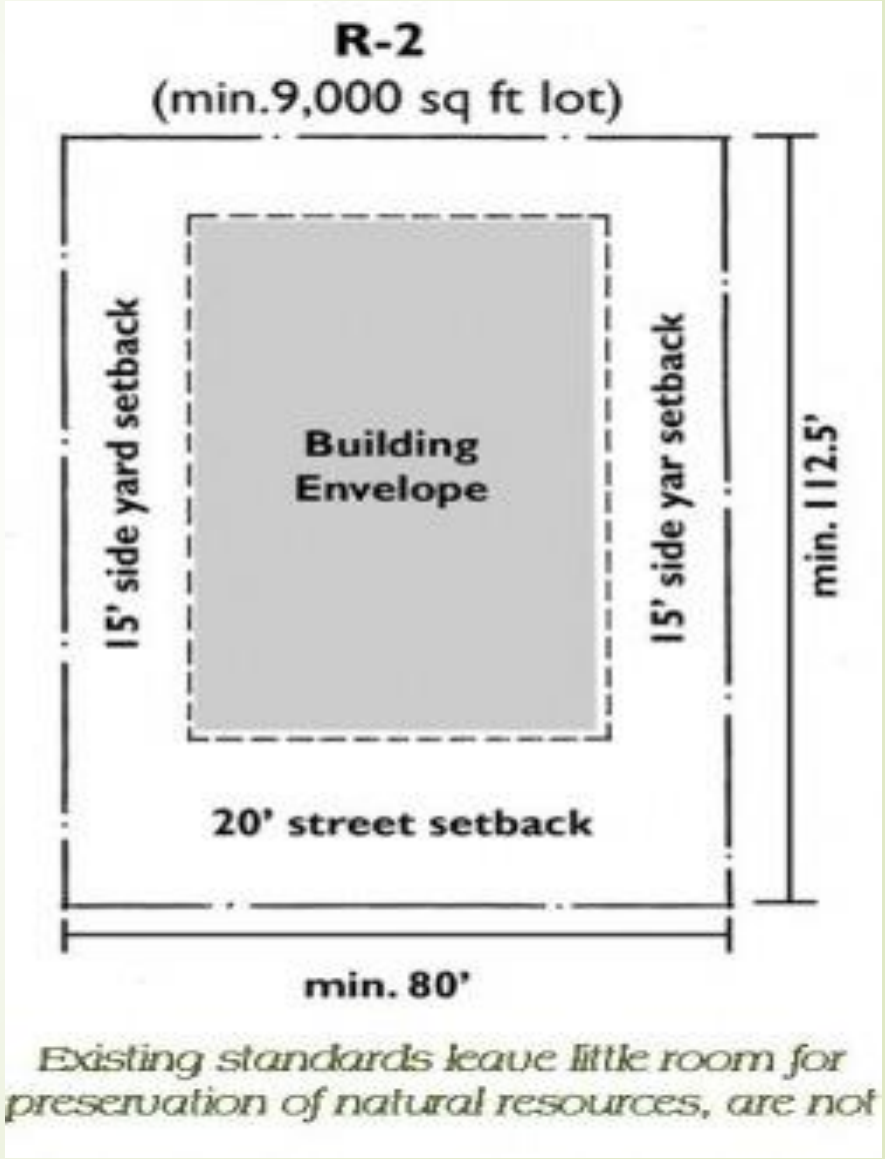
- use the most buildable land more efficiently by building more compactly and more vertically.
- **Higher density development:**
- Is a key element to creating walkable/bikeable communities
- Provides more transportation options
- Contributes to a wider range of housing choices along with more affordable options
- Generate less stormwater runoff

Concentrate commercial development in mixed-use nodes

- Focusing commercial development to pre-automobile era standards provides for multi-block nodes consisting of multiple uses in an area designed to be covered on foot.
- Consolidating our commercial zoning into nodes of mixed-use districts
- encouraging to pedestrian friendly access
- preserves open space
- reduces our carbon footprint

Reduce setback/dimensional standards

- The limited approach to setbacks provides little room for the preservation of natural resources.
- By bringing buildings closer to the sidewalk, the street becomes more pedestrian-friendly providing a greater sense of enclosure and security and enables easier interaction.
- Reducing minimum lot size, lot width, and setback dimensions can encourage the development of townhouses, multi-family and small lot single family dwellings on infill lots in or near downtown and identified mixed-use nodes.
- This places higher density areas within walking distance to amenities and services.



Existing standards leave little room for preservation of natural resources, are not

Use density-based districts

- A better and more flexible tool than minimum lot sizes is the application of maximum permitted density.
- Density-based zoning achieves the goal of limiting development density by district, but permits variety in lot sizes and housing types based on market conditions and environmental conditions.
- Base densities can aid in neighborhood design by permitting (but not necessarily requiring) a variety of lot sizes within close proximity while regulating the actual number of units that impact surrounding infrastructure.

Update density and height requirements

- Most Unified Development Ordinances include various restrictions on the mass and height of buildings.
- When combined with relatively large minimum lot sizes, these regulations result in a land use pattern that is inefficient and not at all compact.
- Consideration of increased allowable building heights should be considered in identified mixed-use nodes.
- A minimum number of stories or minimum Floor-Area-Ratio (FAR) may be appropriate in some areas to achieve the desired building and density patterns.

Emeryville, CA 55 units per net acre

Emeryville, CA 55 units per net acre

Use density bonuses

- Communities across the county are using density bonuses as a way to achieve community objectives while at the same time increasing development rights.
- There are numerous objectives for which density bonuses can be offered as encouragements:
- Provision of affordable housing
- Provision of publicly available parking
- Provision of publicly available open space
- Provision of public art
- Conservation of natural areas beyond what is required
- Achieving certain green building standards, including reduced water consumption and advanced stormwater management
- Historic preservation of buildings and/or facades

Locate highest density residential near existing and future mixed-use centers

- The normal order of density progression is to concentrate people and activities closer together at the town center and other mixed-use centers to provide efficient service and encourage a healthy, vibrant pedestrian environment.
- The best locations for high density developments should be evaluated in the context of an overall community master plan effort

Revise Parking Standards

- Parking requirements are one of the most universal restrictions to compact building development and walkability in American communities.
- Area devoted to parking is usually more than double that devoted to building on commercial properties.
- Studies have shown that typical commercial parking lots are grossly overbuilt. Strategies to reduce parking impacts include:

Revise Parking Standards

- Reduce parking minimums; apply parking maximums
- Require less parking in walkable, mixed-use area
- Require less parking in areas with transit service
- Require less parking for residential uses designed for seniors, low-income or disable individuals
- Count on-street parking towards the minimum required
- Provide density credits for publicly available parking in downtown and mixed-use areas
- Provide encouragements for greater use of shared parking
- Require bicycle parking

Revise screening/buffer standards

- A buffer requirement is a blunt instrument and a suburban standard, applied too heavily and broadly in too many contexts.
- Office, institutional and compatibly scaled multi-family developments can function without buffers between them.
- Screening requirements do provide beneficial greening, they can also increase the distances between land uses and restrict the ability to create compact, mixed-use centers.
- Context-based building and site design standards are a much more precise and appropriate way to deal with land use compatibility

Thank You

Any Questions?