City of Aurora

Aurora
All-America City
2008

AURORA

Sustainable Infill and Redevelopment Design Handbook

Purpose and Concept

This handbook is designed to provide guidance concerning property development in the Sustainable Infill and Redevelopment (SIR) Zoning District within the city of Aurora, Colorado. Suggestions included in the handbook are methods by which the development standards specified in the SIR Zoning District regulation can be achieved.

The SIR Zoning District allows a compatible mix of commercial, civic and residential uses in areas suitable for redevelopment and infill development. The new zoning district is targeted in the existing, developed portions of Aurora that are located along major streets, and will support new businesses and maximize living choices. The goals of this district include the following;

- Create new choices not currently available in terms of places to live and locate businesses within the existing city;

- Provide infill locations for new businesses;

- Create public spaces that attract people;

- Improve property values in surrounding areas and increase the value of infill areas for development;

- Complete pedestrian and bicycle connections to surrounding sites and neighborhoods;

- Encourage high quality and creative design to ensure competitive and economically valuable infill locations;

- Promote energy and resource efficiency;

- Provide simple and easy procedures for review and approval of infill development.

These guidelines intend to promote creative approaches to property development in this type of zoning district. Implementation of the guidelines will result in higher quality and economically viable infill development and redevelopment in Aurora. The handbook provides ideas that encourage a collaborative approach among property owners, businesses, designers, and the city to advance economic growth and redevelopment of Aurora's older areas.

Using the Handbook

This handbook describes general concepts and guidelines for development and principles of design that are flexible and predictable to implement. Every element described will not apply to every development. While the handbook is meant to provide guidance to the design community and a basis of development review for city staff, the city will be open to new ideas and flexible in the interpretation of these guidelines. These guidelines are not intended to be applied exactly or literally when such application will inhibit beneficial development and redevelopment in the SIR Zoning District.

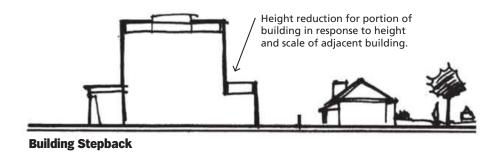## Relationship of the Development Standards to the Handbook

This handbook presents ideas—outlined as "key elements," "purpose," and "priorities" in each section—on how to meet the standards described in the SIR zoning regulation. These statements are not standards; they are thoughts and suggestions on ways to meet the standards in the SIR Zoning District.

The handbook addresses how buildings relate one to another and to the surrounding development. Equally important is how the streets, drives and parking connect with the surrounding street network to create useful places.

Infill development creates unique challenges for property owners, the design community and the city. It takes innovative thinking to provide the necessary ingredients—the financing, design, and customers to create attractive, efficient places that are economic successes. City staff welcomes a collaborative and creative approach with stakeholders to meet common goals.

1.1 Compatibility

Height reduction for portion of building in response to height and scale of adjacent building.

Building Stepback

Key Elements

- General impact on surrounding neighborhoods and properties

- Control changes in traffic and access patterns

- Control environmental impacts

- Control noise and nuisance

- Provide storm water and water quality management

Purpose

Create development that is compatible with adjacent and nearby neighborhoods by designing projects that fit the height, size and scale of surrounding sites. Planning compatible development avoids undesirable impacts.

Priorities

- Design building height, size and scale to respond to surrounding development by incorporating building stepbacks, setbacks, building placement, and landscape buffers.

- Analyze the character of surrounding development and fit the development into the existing context.

- Address negative external impacts of the development, including, but not limited to, noise, traffic, light, vibration, and noxious odors. Address negative external effects by constructing landscaped buffers, including trees, berms, architectural elements, walls and fences.

- Consider the extent to which larger buildings shade surrounding properties that are currently open to the sun.

1.2 Buildings, Street Form and Scale

Key Elements

- Strong street walls to create a quality design impression

- A quality walking environment along the streets

- Emphasis on buildings and people instead of parking lots

Purpose

The relationship of buildings to the streets creates the primary impression of distinctive quality along city streets. It can be used to create comfortable and attractive walking environments.

Priorities

1. On streets adjacent to the site that are not major arterial streets or on streets and drives that are interior to the site:
   - Use buildings to create a street wall and an attractive walking environment along streets by moving buildings up to the street along a consistent line, generally located between zero and 20 feet from the front property line.
   - Provide windows and entrances to the buildings along the streets and drives.
   - Provide a ratio between the width of the streets and the heights of the buildings so that the street creates a sense of enclosure but also sufficient light and air.

2. Place parking to the rear of buildings and not directly on streets.

3. On all streets, use Article 14 Landscape standards, Havana Street Overlay District and Urban Street Standards where appropriate to create a comfortable, safe, and attractive street environment.

1.3 Parking

Key Elements

• Provide sufficient parking to meet the demand

• Do not provide excess parking

• Provide parking that will allow for the reuse of the site in the future

• Avoid increasing parking in surrounding neighborhoods

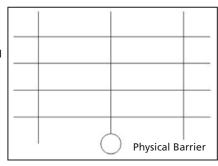• Provide shared parking lots

Purpose

Provide parking in the project in proportion to the demand generated by the project. Avoid negative parking impacts on surrounding properties. Use creative approaches such as shared parking.

Priorities

1. Provide parking at the daily average demand rather than the maximum levels necessary to support peak use.

2. Share parking or use a central parking concept wherever possible.

3. Provide parking through a parking plan supported by information and research appropriate to the scale of the project.

4. Integrate public street parking as a part of the redevelopment.

5. Provide sufficient parking to avoid creating new parking problems in surrounding areas and neighborhoods.

6. Consider creative approaches to meeting parking needs while maximizing the amount of development.

7. Continue to follow city design requirements for parking lots to ensure attractive projects.

8. Provide ample bicycle parking.

9. Place parking to the side or rear of the buildings.

1.4 Connectivity

Grid Street Pattern:
Desirable for commercial, residential, and mixed-use development to avoid traffic congestion and encourage walking and bicycling.

Physical Barrier

300' to 400' local intersection spacing. Includes pedestrian, bicycle, transit, and vehicular modes of transportation. Cul-de-sac at physical barrier only.

Key Elements

- A complete network of automobile, pedestrian and bicycle travel routes

- Increase options for travel routes

- Reduced traffic congestion

- Connections between all uses

- Connections to transit uses

Purpose

By creating a network of streets that form a grid with multiple routes connecting all points in the project, congestion is avoided and multiple means of travel are provided. The street network carries automobile, pedestrian and bicycle traffic safely directly and efficiently.

Priorities

1. Establish connectivity by using standard block sizes and a grid system of streets, drives, and sidewalks that connect to development. Local street intersection spacing averaging 300-400 feet, with a maximum of 600 feet, achieves connectivity.

2. Allow mid-block pedestrian and bicycle connections where appropriate and safe.

3. Use street cross-sections with sidewalks and bicycle lanes.

4. Limit the use of cul-de-sac streets to only situations where there are existing physical barriers that limit the extension of the grid pattern.

5. Provide for future connections when one cannot currently be made.

6. Provide automobile, pedestrian and bicycle connections to all internal and adjoining buildings, parking lots, and public spaces.

7. Pedestrian, bicycle, transit, and vehicular travel should be encouraged equally.

1.5 Reusing Buildings and Sites

Key Elements

- Efficient use of materials and structures

- Potential uniqueness and character provided by older buildings

- Improve and preserve the character of existing neighborhoods through the reuse of buildings and sites

- City staff will work with property owners to ensure that city requirements do not stop the permitted reuse of existing buildings

Purpose

Reusing buildings and sites is a highly efficient form of redevelopment since it uses existing materials and requires fewer new resources. It also helps revitalize existing commercial and neighborhood areas by improving the quality and function of aging buildings.
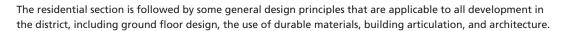
Priorities

1. The reuse of existing buildings should meet the requirements of the Sustainable Infill and Redevelopment District and other city requirements concerning landscaping, signs, and site layout only to the extent possible and feasible.

2. The 2009 International Existing Building Code (2009 International Building Code) addresses the reuse of buildings by providing alternative approaches to achieve compliance with code requirements.

3. Use existing services and infrastructure where possible.

4. Provide for the future reuse of buildings and sites through an analysis of potential uses with consideration of internal circulation, building location and design, utilities, drainage, parking, landscaping and tree preservation.

This chapter offers some suggestions on how to develop infill property, including a focus on the reuse and recycling of existing buildings. These design ideas address a variety of residential building types that fit with mixed-use development, encourage the placement of attractive buildings that will have a long, useful life, and promote designs that fit the existing situation and surroundings. City staff also supports other creative approaches that provide durable, high-quality design.
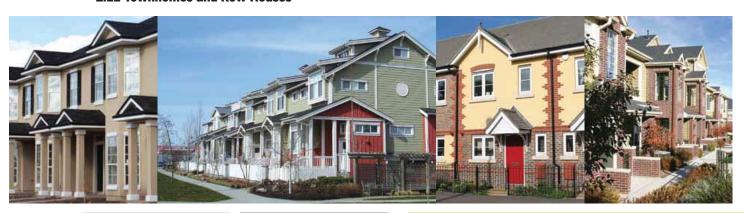
The design chapter is divided into three parts: residential design, general design principles, and commercial design. The residential portion outlines the design templates for the types of residential uses that are allowed in the SIR District, including townhomes, row houses, live/work, elevator apartments, continuing care and garden courts.

The residential section is followed by some general design principles that are applicable to all development in the district, including ground floor design, the use of durable materials, building articulation, and architecture.

The commercial section outlines layout ideas for drive-through facilities.

2.11 Townhomes and Row Houses

Key Elements

- Build with homes facing a street

- Common and consistent approach to quality design and landscaping

Purpose

Townhomes and row houses allow home ownership with reduced maintenance costs and responsibilities. When built with the front entrances along a street, they can provide for a highly attractive street frontage. Part of the attractiveness can also be that all the homes maintain a common and consistent approach to design and landscaping quality.

Priorities

1. Build residences with entrances on the street.

2. Locate parking to the rear of the buildings.

3. Certain desirable features can be used to ensure quality as follows:
   - Use durable materials.
   - Incorporate elevated street entrances.
   - Change the plane of the front of the building often enough to avoid presenting a large blank wall to view.
   - Use changes in the wall planes both horizontally and vertically, a variety of materials, complex roof forms, and quality architecture to create interesting buildings.

4. Each unit should have a private outdoor space; for example balconies and porches.

5. Avoid aligning more than six garage doors in the same plane.

2.12 Live/Work

Key Elements

• Live/work uses provide the opportunity for a small business in the same building as a residence for the business people

Purpose

Live/work uses allow residents of a building to have a small business in the same building. Often, these uses will be in townhome or row home configuration with the businesses on the first floor with entrances along the street. This type of use encourages the creation of small businesses that are conveniently located for those who run the business.

Priorities

Priorities:

1. The live/work use will be provided in a residential type otherwise permitted in the Sustainable Infill and Redevelopment district.
2. Provide entrances along the street or public place.
3. The workspace should generally not be larger than the living space.
4. The resident in the live/work residence should be the owner or employed in the business.

2.13 Elevator Apartments

Key Elements

• Use a variety of design features and landscaping consistently

• Common parking areas with multiple levels or mid-block structures

• Dwellings are served by elevators

Purpose

Elevator apartments provide a new opportunity for renting or owning in a high-quality environment.

Priorities

Priorities:

1. Minimize the visibility of parking by locating it in attached garages, parking structures or by providing parking screened from the street by the building.

2. There should be no exterior stairs or corridors.

3. Main entries face either a street or public space.

4. Certain desirable features can be used to ensure quality as follows:
   • Use durable materials.
   • Change the plane of the front of the building often enough to avoid presenting a large blank wall to view.
   • Use changes in the wall planes both horizontally and vertically, a variety of materials, complex roof forms, and quality architecture to create interesting buildings.
   • Each residence should have a private outdoor space; for example balconies and porches

5. Provide amenities that offer residents exercise, recreation or gathering places.

2.14 Continuing Care: includes Assisted Living and Nursing Homes

Key Elements

- Hospitable environment

- Quality landscaped grounds designed to meet social needs and physical limitations

- Amenities that offer residents exercise, recreation or gathering places

- Good walking connections to surrounding shopping, recreation, and services

- Good connections to public transportation

Purpose

Continuing care provides for aging individuals with a variety of needs that change over time. Care delivery done in a single location so that the individual can remain in one place in an hospitable environment.

Priorities

1. Provide an efficient physical configuration that works to support continuing care operations.

2. Offer safe, pleasant and direct walking connections to surrounding amenities, shopping, recreation, and services.

3. Include quality landscaped grounds designed to meet social needs and physical limitations.

2.15 Garden Court Residences

Key Elements

- All residences on a single lot
- Common courtyard
- Quality design

Purpose

The garden court single family residences provide a living choice that is not commonly available. Residents can live in individual houses without the individual lots that eliminate the possibility of future redevelopment. The Garden Court building type consists of a series of small, detached structures on a single lot, providing multiple units arranged to define a shared court that is typically perpendicular to the street. The shared court provides a private open space and becomes an important community-enhancing element.

Priorities

1. All the homes in a garden should be provided on a single lot.
2. All the homes front on an open courtyard that is at least 20 feet wide and that fronts on and is open to the street.
3. All the homes should be in conformance with the design standards applicable to single-family homes in the Aurora Code.
4. A varying yet consistent approach to building design and landscaping should be provided for each garden court group.

2.21 Ground Floor Design

Key Elements

• Use changes in the wall planes both horizontally and vertically, a variety of materials, and quality architecture to create interesting buildings

• Entrances that open on the street or public space

• Active uses such as retail or offices

Purpose

The design of uses on the ground floors of buildings determines the character of an area. It also determines the experience of the pedestrian walking along streets.

Priorities

1. To make a street particularly attractive and comfortable, the ground floors of the buildings should consist of active uses when feasible, such as retail or office uses with entrances on the street.

2. Windows should be employed on the fronts of buildings along streets with sufficient area to make the street interesting and to allow people in the buildings to view the street.

3. Blank walls should be avoided on the ground floors of buildings along the street.

4. Building entrances should face the street.

2.22 Durable Materials

Key Elements

• Durable materials that provide quality over time

Purpose

Achieve sustainable and high-quality architectural design with durable materials on building exteriors. Durable materials will help maintain the value of infill and redevelopment over time. Durable materials are timeless, speak of quality, provide maintenance benefits, and add value.

Priorities

1. Ground floor designs should incorporate the use of durable materials including masonry, stone, steel, tile and synthetics.

2. Use durable materials such as stone pavers and retaining walls to define outdoor spaces, enhance the character of a place, and provide security.

3. Durable materials that imitate other materials may be used.

2.23 Building Articulation

Key Elements

- Architectural variations and details

- Variations in colors and materials

- Windows and entrances

Purpose

Encourage changes in the planes of building surfaces to make the environments along streets interesting and memorable. Long blanks walls do not make for interesting and comfortable environments for those walking or driving along streets.

Priorities

1. A variety of architectural features, textures, colors, and materials should be used on buildings where they face streets, public spaces or common areas.

2. Blank walls should be avoided on buildings where they face streets, public spaces or common areas.

3. Windows and entrances should be located on buildings where they face streets, public spaces or common areas.

4. Bring the plane of building walls along the horizontal direction forward or back to create articulation. Change the plane or material of walls every two to three stories.

2.24 Architecture

Key Elements

- Unique use of traditional building materials to make a visual statement

- Thinking outside of the "BOX" during architectural design development

- Using well-designed structures as a means of drawing the eye

Purpose

Encourage high-quality architectural designs that are distinguished by noteworthy character, form, color and materials.

Priorities

1. In order to make interesting buildings, include architectural design elements including but not limited to:
   - Uniquely designed windows and doors
   - Changing wall planes, materials and patterns
   - Uniquely designed awnings and wall signs
   - Decorative details

2. Design elements should be provided on all four sides of the building.

3. Use metal only as an accent material on the exterior of buildings.

2.31 Drive-through Facilities

Street

Drive-through
and Canopy

Building

Key Elements

- Minimize the view of the drive-through window and lane from streets and public spaces

- Adequate space in driveways to allow several cars waiting on service

- Minimal impact on streets, public spaces, and surrounding neighborhoods

Purpose

Minimize the view of drive-through elements from streets and public places and surrounding neighborhoods. Provide enough space to avoid traffic problems.

Priorities

1. Avoid placing the drive between the building and streets.

2. Place the drive-through so that the building screens it when it must be parallel to the street.

3. Provide room for at least three cars at the street entry to avoid blocking adjacent streets and internal circulation.

Attractive public places are crucial to enable people to gather, do business and socialize in a development or along a street. The goal in this section is to enhance infill development with smaller scale parks, active main streets, pedestrian ways, and plazas. Successful public spaces are easy to reach, offer something to do, provide comfort, and ensure safety. Public places should provide easy access for pedestrians, bicyclists, and vehicles; include a view, art, or a garden to give the space value; offer places to sit or stand that are friendly and inviting; and be well lighted and open to view to supply safety and comfort. It is critical that these spaces be designed and used so they attract people.

Under the SIR regulations, development or redevelopment projects should plan to provide at least one public space of some type. Staff is particularly open to alternatives and creative solutions for making successful public spaces. There are already a number of fine public spaces in Aurora, some large and some small.

3.11 Urban Parks

Key Elements

- Good pedestrian connections

- Quality elements to make the small urban park a popular gathering space

Purpose

Small urban parks improve the quality of life and increase property values in surrounding areas and neighborhoods. They provide gathering places and locations for active and passive recreation.

Priorities

1. Conform to city regulatory requirements for urban parks.
2. Provide active uses around and through the park.
3. Provide complete bicycle and pedestrian connections nearby neighborhoods and areas.
4. Provide views into the park from nearby buildings and streets.
5. Where possible, provide some street frontage on the park to make it more active and take full advantage of value.
6. Public seating, gathering points, art and quality landscaping contribute to highly popular small urban parks.

3.12 Main Streets and Pedestrian Streets

Key Elements

- Safe and comfortable walking routes

- Quality landscaping and design

- Slow vehicle speeds

- Buildings forming street walls

- Windows and entrances on the street

- On-street parking

Purpose

Well-designed streets can provide comfortable and attractive places to spend time. Such streets will promote social activities and provide safe and interesting environments. They will lead to increased property values for properties on the street and surrounding areas and neighborhoods. They will provide successful locations for new businesses and new housing choices.

Priorities

1. On main streets and pedestrian streets use the Urban Landscape Standards in Article 14 and the Urban Street Standards where appropriate to create a comfortable, safe, and attractive street environment.

2. Use buildings to create a street wall and an attractive walking environment by moving buildings up to the street along a consistent line, generally located between 0 feet and 20 feet from the front property line.

3. Provide active uses such as retail on the ground floor along the street.

4. Provide a ratio between the width of the streets and the heights of the buildings so that the street creates a sense of enclosure but also provides sufficient light and air.

5. Provide windows and entrances to the buildings along the interior streets and driveways.

6. Place parking to the rear of the buildings while at the same time providing parking on the street to increase the level of activity and improve the walking environment.

3.13 Plazas

Key Elements

- Appropriate size

- Active uses around the plaza

- Art elements and seating elements

- Quality materials and landscaping

- Good connections to surrounding areas and neighborhoods

Purpose

Plazas provide a common gathering area that can be used for multiple purposes. Plazas will contribute to improved property values in the site and in surrounding areas and neighborhoods.

Priorities

1. Plazas should be of an appropriate size: not too large so it eliminates a sense of an enclosed space but large enough to provide sufficient space for various activities.

2. The plaza should have active uses abutting and surrounding it such as retail uses on the first floor or entrances to residences or offices.

3. There should be good views into the plaza from surrounding buildings and streets and some street frontage on the plaza will help make it more active.

4. The plaza should include art and places to sit. Seating can be provided in the form of low walls.

5. The plaza should be designed with quality paving, materials and landscaping.

6. The plaza should have good bicycle and pedestrian connections to surrounding areas and neighborhoods.
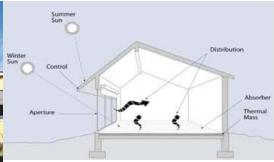
Infill development will play a critical role in reducing energy and water use and reducing the dependence on imported fossil fuels. This section introduces optional elements that will enhance the energy and resources efficiency of infill development. It is clear that there is an increasing demand for efficient developments. The most competitive development sites of the future will be those that make the most efficient use of energy and natural resources.

Energy efficiency and renewable energy components can help businesses lower their operating costs through decreased utility bills for heating, cooling, and lighting. Green infrastructure adds value by conserving water, naturally managing storm water runoff, and creating an aesthetically pleasing environment that attracts people and increases value over time.

The SIR Zoning District requires that projects incorporate one of the conservation measures described in the following sections. In addition, the required approach could involve other creative approaches not described by these sections, and city staff will work with property and business owners to meet common goals.

4.11 Passive Solar

Concept diagram showing elements of passive solar design

Key Elements

- Maximize building orientation to take advantage of solar energy

- Use designs that take advantage of the sun for heating and lighting

- Use designs that provide natural cooling

Purpose

A building's windows, walls, and floors can be designed to collect, store, and distribute solar energy in the form of heat in the winter and to reject solar heat in the summer. Proper building orientation or architectural design elements can result in a 30% to 40% reduction in energy use throughout the calendar year.

Priorities

1. When possible, orient new construction with the long sides oriented east-west.

2. Add window bonnets or awnings to take full advantage of seasonal cooling and heating cycles.

3. Install materials that provide thermal mass such as brick and insulating concrete forms to improve building comfort.

4. Optimize window placement and materials based on orientation to seasonal sun.

5. Provide natural ventilation.

6. When possible, include interior lighting by sunlight.

4.12 Renewable Energy

Key Elements

- Incorporate renewable energy into design

- Select renewable energy type based on individual site characteristics

- Maximize energy efficiency

Purpose

Renewable energy is clean and reduces greenhouse gas emissions. Incorporating solar, wind, and geothermal into new and existing construction offsets energy use and increases sustainability.

Priorities

When possible, based on site characteristics, select the appropriate combination of strategies, such as:

1. Install solar photovoltaic arrays.
2. Install small or district-scale wind systems.
3. Install solar domestic hot water heating systems.
4. Install geothermal heating systems.
5. Combine renewable energy with passive solar for maximum benefit.
6. Incorporate energy efficiency to increase project sustainability.
7. Install electric vehicle charging stations powered by renewable energy.

4.13 Green Infrastructure

Key Elements

- Use water conservation inside and outside

- Use site-specific storm water management methods that take advantage of local and natural conditions

Purpose

Conserving water, managing storm water and incorporating site-specific characteristics to manage run-off result in long-term sustainability. Assuring redevelopment is compatible with Aurora's semi-arid climate reduces the energy demand and increases the value of the project.

Priorities

When possible, based on site characteristics, select the appropriate combination of strategies, such as:

1. Reduce the amount of impervious pavement using alternate materials and landscaping.

2. Construct bioswales to remove pollution from surface runoff.

3. Incorporate storm water management in landscape plans.

4. Identify, evaluate and incorporate adjacent natural spaces or features to minimize run-off.

5. Design irrigation systems that use storm water.

6. Use a combination of fixtures and education to reduce indoor water use.

4.14 Heat Island Reduction

Key Elements

- Reduced pavement area for parking

- Energy Star roofing or cool roofs

- Install paving materials that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements

- Urban forests or vegetation

Purpose

A heat island is an urban phenomenon where built up areas are hotter than nearby rural areas due to the existence of buildings, pavements, roads, and other urban infrastructure. Heat islands affect communities by increasing summertime peak energy demand, air pollution, greenhouse gas emissions, heat-related illness, and water pollution. Lessening the heat island effect will improve Aurora's energy usage, air quality and water quality.

Priorities

1. Reduce the amount of impervious pavement using landscaping and alternate materials like porous and cool paving technologies.

2. Incorporate storm water management in landscape plans.

3. Expand the city's tree population by conserving existing trees and planting new ones.

4. Identify, evaluate and incorporate adjacent natural spaces or features to minimize run-off.

5. Install Energy Star roofing material, especially on flat roofs.

6. Construct cool roofs.

7. Install paving materials that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements.

4.15 Local Food Production

Key Elements

- Community gardens, greenhouses, rooftop gardens and composting

- Farmer's markets and other retailers of local food

Purpose

Local food production is a collaborative effort to build more locally based, self-reliant food economies. Sustainable food production, processing, distribution, consumption, and disposal enhance the economic, environmental and social health of Aurora citizens.

Priorities

When possible, based on site characteristics, select the appropriate combination of strategies, such as:

1. Construct infrastructure for local food production such as community gardens, greenhouses, and rooftop gardens.

2. Provide infrastructure for on-site composting.

3. Provide for farmers' markets or local food distribution sites.

4. Provide retail space for locally produced food.

5. Plant fruit and nut trees.

6. Provide for front, side, and backyard gardens.

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All of our city departments are happy to work with you on implementing your project. Please call us here in Planning and Development Services at 303-739-7250 or go to our web page at www.auroragov.org. to start the discussion.

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