

# CHAPTER 5

## HOUSING AND NEIGHBORHOOD DESIGN

This chapter of the Housing Master Plan provides an overview of the current architectural and design conditions in the City of Thornton and summarizes the City's architectural and subdivision design standards. Additionally, a variety of housing and neighborhood design options, including "green" design, mixed use and transit oriented development are explored. The chapter concludes with the City's goals related to housing and neighborhood design.

### A. History of Architecture and Neighborhood Design in Thornton

Development in Thornton has taken place in phases and under varying regulatory constraints, resulting in inconsistent design throughout the City. Since incorporation in 1956, City Council has periodically adopted higher standards for residential and commercial development in the City. Older residential development lacks any dominant or defining architectural or design theme, and therefore some of Thornton's older homes and subdivisions reflect only minimum standards of aesthetics and design. In October 1999, in an effort to improve the quality of residential units and preserve property values, City Council adopted two City Code revisions. The first revision established design standards for residential development and changed the development process to require architectural review approval prior to application for a building permit. The second revision established subdivision design criteria for private lots and public improvements, such as streets, drainage, water, wastewater, public utilities, and parks and recreation facilities.



*Subdivision standards promote neighborhood identity through high-quality entry treatments.*

In 2000, growth pressures led the City to adopt a residential growth pacing ordinance in order to further manage the design and resource use of Thornton's neighborhoods. Due to the recessionary decline in home building, the City currently faces the challenge of attracting new construction without compromising the implementation of these adopted architectural and subdivision design requirements. One obvious response has been the suspension of Thornton's growth pacing ordinance.

### Development Phases



*The City's current architectural standards encourage at least a portion of new homes to be covered in masonry.*

Noticeable differences define the phases of residential development in Thornton. The 1950s and 1960s "Original Thornton" neighborhoods are comprised of post-World War II suburban ranch homes, typically having carports instead of garages, curvilinear streets, and cul-de-sacs. The 1970s gave way to larger homes with front facades dominated by garages. Many of the homes from the 1970s through the late 1990s reflect the City's lax architectural guidelines at the time. This is evident in the lack of design detail in façade materials, window placement, garage setbacks, and rooflines; as well as repetition of identical home models. Additionally, the

neighborhood design during this period lacks connections between neighborhoods, trails, landscaping and entry treatments, quality perimeter fence design, detached sidewalks and open space.

### Current Conditions

Since 2000, the adopted architectural and subdivision design requirements have greatly improved neighborhood aesthetics and character. Subdivisions now incorporate

architectural design elements such as high-quality front façade materials including brick or masonry, increased window area on the front façade, regulated roof pitches and color, garage offsets, and front porches. Additionally, each development incorporates a mixture of at least four different home models whose



*Better architectural standards have greatly improved neighborhood aesthetics and character.*

placement is regulated to avoid repetition in close proximity. Neighborhood elements, including increases in landscaping, open space, accessible trails, and

public recreation facilities; as well as detached sidewalks and quality entry and perimeter treatments, are evident results of the subdivision quality enhancement standards.



*The different development phases of Skylake Ranch provide a side-by-side visual comparison of design quality in Thornton. The homes on the left side of the photo were built in the 1990s prior to the City's adoption of residential architectural design standards. The homes on the right side of the photo were built in accordance with the new requirements.*

## **B. Design and Neighborhood Stabilization**

The goals and recommendations of the 2007 Comprehensive Plan call for high-quality residential design and development standards for the long-term stability and desirability of neighborhoods. By requiring new development to focus on high-quality design, the City can ensure that neighborhoods will remain assets to the community over time. *Chapter 3: Preservation and Revitalization of the Housing Stock* reveals that some neighborhoods in Thornton suffer from substandard home and yard maintenance.

### **Quality of Building Materials**

The quality of building materials with which a home is built can affect the homeowner's required level of maintenance. As a result of the economics of housing construction, many of the homes built in the City prior to 2000 utilized lower-quality building materials which deteriorate faster and therefore require a higher level of maintenance. The higher quality materials required by the current architectural standards have helped to mitigate this problem in homes built since 2000. The City should encourage residents who want to remodel their older homes or build accessory structures to also use high-quality, durable materials.

### **Landscaping Principles**

The labor and resources required for yard maintenance can be reduced by using water-wise and xeriscape landscaping techniques. Water-wise landscaping

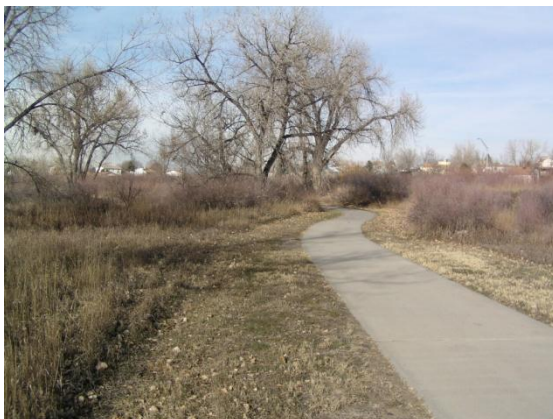
utilizes low water demand and native vegetation, efficient irrigation systems, and organic, biodegradable soil amendments and mulches to retain moisture. The use of these techniques increases the likelihood that minimum maintenance standards are met.

In recognition of Colorado's semi-arid climate and limited water availability, the City currently requires all developers to use water-wise landscaping. However, the City does not currently mandate the same principles for homeowners. The City should be proactive in educating and encouraging homeowners to use water-wise landscaping to improve the appearance of yards and promote the efficient use of resources. Thornton Forestry, a Division of the Community Services Department, provides advice to residents concerning their landscaping and plant selection. The City's website provides a phone number to contact Forestry staff; however, it does not provide direct information about water-wise and xeriscape options. A summary, or web-links, describing these principles and options could be made available on the City's website.



*Xeriscaping, shown here at the Margaret Carpenter Recreation Center in Thornton, is an attractive, low-maintenance landscaping option that preserves natural resources.*

## C. Transportation and Neighborhood Design



*Trails, such as the one pictured here in Riverdale Park Subdivision, facilitate bicycle and pedestrian modes of transportation.*

The quality and livability of neighborhoods depend, in part, on the ability of residents of all ages to travel around and through the neighborhood using various forms of transportation, a concept known as multimodalism. In neighborhoods designed for, and dominated by, motorized modes of transportation, mobility is limited for residents without access to motor vehicles. Auto-oriented design also contributes to the housing-transportation cost burden discussed in *Chapter 4: Affordable Housing*. Subdivision design elements and infrastructure which

facilitate the use of alternative transportation such as bicycling, walking and transit are important for public health, sustainability, and increased mobility.

### **Pedestrian and Bicycling Conditions**

Sidewalks, trails, and dedicated bike lanes or routes provide pedestrians and cyclists with safe travel routes. An efficient and extensive trail system also provides an amenity for the residents of the City, offering recreational opportunities and access to the City's park system, neighborhoods and commercial districts.

Neighborhood design should include the street and trail connections necessary to allow travel and social interaction between other residential neighborhoods and commercial development so that residents are not funneled to arterial or collector streets for every trip. High-volume traffic and wide streets which enable speeding create unfriendly conditions for pedestrians and cyclists. Additionally, the auto-oriented design of many commercial centers in the City hinders pedestrians and cyclists from feeling at ease traveling to and through the commercial centers.

Since neighborhood design and transportation conditions affect the ability of residents to access community amenities, both inside and outside of the neighborhood, they also affect the quality of life and long-term desirability of the neighborhood. Neighborhoods that have a lot of walkers and cyclists on the street are safer because these residents have their "eyes on the street", deterring theft or violence. Safe, accessible and pleasant sidewalks and trails improve the health of the neighborhood and its ability to serve residents of all ages. There



*Detached sidewalks provide pedestrians with a pleasant path at a safe distance from vehicular traffic.*

are many residents, such as seniors and children, who do not have regular access to cars. Therefore, pedestrian and bicycle connections within the community are important amenities enabling these residents to remain active.

### **Mixed Use and Transit Oriented Development**

Neighborhood accessibility can be increased through zoning and design that encourage a higher-density mix of residential and commercial uses within the same development. Additionally, residents' mobility can be expanded when mixed use developments are located within walking distance of transit stations. The 2007 Comprehensive Plan recognizes the importance of integrating the

mixed use and transit-proximity concepts within the City's long range planning efforts and identifies future development areas that are appropriate for this type of development.

In October 2009, the City adopted a Mixed Use Zoning District ordinance to implement the future land use framework of the Comprehensive Plan. The Mixed Use District is intended to accommodate the development of a compatible mix of uses that can include commercial, office, institutional and higher-density residential uses in locations consistent with the Comprehensive Plan. Specific characteristics of this district include the following:

- Uses catering to automobiles, such as drive-in and drive-through restaurants and similar uses, are limited in this district to foster a pedestrian environment and encourage the use of public transportation.
- The district is intended to create a planned and integrated land use development with common landscaping, architectural and design elements, rather than a fragmented development that responds to fluctuating market conditions.
- The higher density and pedestrian orientation of this district promotes the public health, safety and welfare by encouraging fitness through walking and minimizing the environmental impacts associated with less-compact, automobile-oriented development.

The City is also drafting a Transit Oriented Development (TOD) Zoning District ordinance which is expected to be considered for adoption by Thornton City Council in 2010. TOD-appropriate areas were identified in the City's 2005 North Washington Subarea Plan, as well as a 2005 Urban Land Institute advisory report. These areas are anticipated to be future station locations for the voter-approved FasTracks North Metro commuter rail line.

The TOD District will focus on a diverse mix of uses, with emphasis on a vertical mix of components, within approximately one-half mile of transit stations in locations consistent with the Comprehensive Plan. The district encourages residential development patterns with sufficient density to support transit use, combined with commercial and retail uses to serve the shopping and service needs of district residents, employees, and commuters. The district will foster a pedestrian-oriented environment and create settings that enable social interaction and active, healthy lifestyles.

## **D. Green Design and Sustainability**

Nearly half of America's carbon emissions come from buildings, starting with the extraction, manufacturing and transport of building materials for construction, and continuing through the ongoing energy-intensive operation of the finished building. The life-cycle costs of buildings include non-monetized negative externalities paid for by society in the form of climate change and the overconsumption of limited energy, land, and water resources. Neighborhoods

designed around the use of motorized vehicles further contribute to this unsustainable growth pattern. The compact design of mixed use and TOD developments help mitigate this problem at the neighborhood level. However, changes in the way buildings are designed, constructed and operated must also be considered as a component of policies aimed at improving future housing and neighborhood design.

Many policy options now exist for adapting building and development to a more sustainable pattern. These range from simple community education on sustainability issues or use of energy efficient appliances, to the more complex construction of “green homes.” Green homes use less energy, water and natural resources, create less waste, and are more durable and comfortable for occupants. This section outlines a number of community tools available for promoting sustainability and calls out efforts that the City is currently employing.

### **Energy Efficiency Improvements for Existing Homes**

Existing homes can benefit from energy efficiency improvements. Improvements are targeted to the needs of the home and can include options such as replacing inefficient appliances with ENERGY STAR-rated appliances, air sealing, strategic insulation, and control adjustments.

These improvements can make the home healthier and safer; increase comfort; conserve electricity, gas and water resulting in lower utility bills; and enhance home value. The City should encourage residents to have a home energy audit performed. The auditor can evaluate the function,



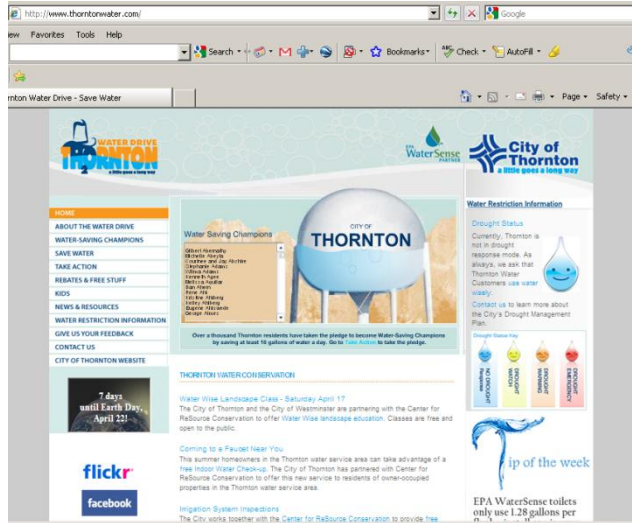
*This Thornton home is utilizing solar panels as an alternative source of energy.*

efficiency, and interactions of the energy systems in the home and suggest options for improving energy performance. Free audits are available for eligible low-income residents through the Arapahoe County Weatherization Program. The City is also promoting the Colorado Governor’s Energy Office’s rebate initiative program, ‘Recharge Colorado’, launched April 19, 2010. The initiative is designed to help citizens plan for energy efficiency upgrades such as new appliances, furnaces, water heaters, and other energy-related services.

## Green Building Certification Programs and Systems

A variety of programs are available which provide guidelines for builders to integrate green building in new construction or remodels. Currently, the City encourages, but does not require, developers to utilize green building techniques. In 2008, the City added language to the commercial design standards in the City Code to encourage the use of “sustainable and green practices through all phases of site planning and building design for the purpose of reducing energy consumption, waste, natural resource use, and overall building impacts on human health and the environment” and specifically refers to the practices outlined by the U.S. Green Building Council for Leadership in Energy and Environmental Design (LEED) certification. In order to address residential construction, similar language should be included in the City Code for residential design in Thornton.

As a step towards facilitating green building in the City, two Thornton Building Department Plans Examiners are expected to obtain LEED accreditation in 2010



to review submitted building plans for buildings seeking a LEED rating. Additionally, the City could provide descriptions and links to the programs identified in **Exhibit 5.1** (on page 5.10) on the Thornton City Development webpage. To further encourage green building, appropriate City Development staff should be knowledgeable about these programs and able to discuss green options with developers and builders.

*Thornton Water Resources Division has had success with encouraging water conservation through their webpage.*

## Raising Community Awareness

Community awareness campaigns are intended to achieve specific

behavioral goals for the benefit of the community. The City should explore options for increasing community awareness of energy and resource efficiency, alternative transportation options, and other sustainability practices. Often, residents’ lack of knowledge is the biggest barrier to adopting sustainable habits.

Techniques employed to raise community awareness have already proven successful in the City. In 2007, Thornton’s Water Resources Division initiated the Thornton Water Drive Social Marketing Campaign which has been effective in reducing resident water waste. The Water Resources Division maintains an informative water conservation webpage which lists the names of Thornton resident “water saving champions” who have pledged to save at least 10 gallons

of water per day. The fun and interactive nature of the campaign, and recognition of individual champions incentivizes residents to change their behavior without mandatory requirements.

## E. Parks and Open Space

Open spaces and parks directly affect housing and neighborhood quality and design. By integrating usable public and private open spaces and parks into neighborhoods, the City helps guarantee that all residents will have access to recreation amenities. This integration also enhances the overall identity of Thornton's neighborhoods.

### Parks and Open Space Master Plan

The Parks and Open Space Master Plan establishes the City's goals and policies related to open space and parks. This plan was first adopted on June 26, 2000 and was most recently updated in February 2008. The open space and parks priorities established in the Parks and Open Space Master Plan should

be considered and integrated with the design of residential development. Therefore, the Parks and Open Space Master Plan and the Housing Master Plan will act in concert to maintain and enhance Thornton neighborhoods.



*Realization of the goals of the Parks and Open Space Master Plan will help to prevent non-continuous trails, like this one in Eastlake Estates.*

**Exhibit 5.1: Green Building Certification Programs and Systems**

Program	Program Description
<b>Built Green Colorado</b>	This is a voluntary Colorado model energy efficiency building program. Started in 1995 by Denver’s Home Builders Association (DHBA), the program encourages home builders to use technologies, products, and practices that result in homes that are built better, and are better for the environment. It allows builders to use alternative methods and still receive the "Built Green" designations.
<b>U.S. Green Building Council (USGBC) and LEED</b>	USGBC is a non-profit organization of leaders working to make green buildings available to everyone. USGBC developed “Leadership in Energy and Environmental Design” (LEED), an internationally recognized green building certification system, which provides third-party verification that a building or community was designed and built using strategies aimed at improving performance across all important metrics: energy savings, water efficiency, carbon dioxide emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. LEED offers a number of rating systems applicable to residential development including ‘LEED for Homes’, which promotes the design and construction of high-performance green homes, and ‘LEED for Neighborhood Development’ which integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design. In 2010, two Thornton Building Department Plans Examiners are expected to obtain LEED accreditation to review submitted building plans for potential LEED certification.
<b>National Association of Home Builders (NAHB) “Green” Program</b>	This program promotes energy efficiency and the use of sustainable or recycled products in home building. It includes voluntary guidelines covering seven areas, including resource efficiency and energy efficiency.
<b>ICC-700-2008 National Green Building Standard</b>	In 2007, NAHB and the International Code Council (ICC) partnered to establish a nationally-recognizable standard definition of "Green Building." The resulting American National Standards Institute (ANSI)-approved ICC-700-2008 National Green Building Standard defines green building for single and multifamily homes, residential remodeling projects and site development projects while still allowing for the flexibility required for regionally-appropriate best green practices. The goal of ICC-700 is to encourage greater energy, water, and resource-use efficiency while reducing long-term costs.
<b>Energy Star – New Home</b>	This is a joint program by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) created in 1992 to help consumers save money and protect the environment through energy efficient products and practices. To earn the ENERGY STAR® rating, a home must meet EPA guidelines for energy efficiency. These homes are at least 15 percent more energy efficient than homes built to the 2004 International Residential Code (IRC) and include additional energy-saving features that typically make them 20–30 percent more efficient than standard homes.
<b>Passive House (or Passivhaus) Standard</b>	This is energy efficient building standard developed in Germany in 1988 and introduced in the U.S. in January 2008. Passive House design uses fully-integrated building techniques to capture solar energy. High performance windows, super-insulation, an airtight building shell, limitation of thermal bridging, and balanced energy recovery ventilation result in reductions in energy use and carbon emission. Passive House can reduce the energy use of a home by up to 90% over traditional code-built homes. Although it is mostly applied to new buildings, Passive House has also been used for remodels.

## **F. Goals**

### **The City of Thornton's Housing and Neighborhood Design goals are:**

- 5-A** Continue to encourage design compatibility within and adjacent to neighborhoods.
- 5-B** Encourage the development of residential neighborhoods with easy access to amenities.
- 5-C** Encourage sustainable practices and green building in existing and new neighborhoods.