

# Parks, Open Space, Trails and Recreation Master Plan

2007





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## Acknowledgements

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(A) = *Alternate*

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The many Centennial residents that gave us their time for interviews and surveys.

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## Executive Summary

### Purpose and Focus of the Plan

This is the first Parks, Open Space, Trails and Recreation Master Plan to be completed by the City of Centennial since the City was incorporated in 2001. As such, it establishes a far-reaching vision to transform the City’s “green space” system into its “outdoor living room,” where parks become the community’s social heart, where prairie drainageways become the backbone of its open space, and where a rich network of pathways connect residents to the City’s amenities.

*The Plan is intended to position Centennial’s green space system as one of the key reasons that residents live in the City and businesses choose to locate here.*

The Master Plan is intended to offer a long-range vision, but it also focuses heavily on the next three to five years, on some highly-visible actions that might be taken that will excite residents about the long-term opportunities and benefits provided by the system.

With approximately 103,000 residents and 36,200 households, Centennial is the fourth largest city in

the Denver Metro Area. The city spans 28.2 square miles including over 9,100 developed residential acres. Prior to its formation in 2001, the city was a part of unincorporated Arapahoe County, Colorado’s oldest county.

Parks and open space facilities have been provided to Centennial residents through Arapahoe County, and through a variety of public and private special taxing districts, the largest of which include South Suburban Parks and Recreation District (SSPRD) and the Arapahoe Parks and Recreation District (APRD).

This Plan has been developed to provide an overall vision for Centennial’s green space system, yet another significant impetus is to provide guidance for making investment decisions. The City

has accumulated significant shareback funding from the Arapahoe County Open Space Tax (approximately \$4.5 million to date) as well as the Conservation Trust Fund (approximately \$2.5 million). The Plan is intended to provide guidance for the wise investment of these funds – as well as any future funds that may be obtained – to enhance the City’s green space system and to fulfill requirements of each funding source’s enabling legislation.

## Centennial's Existing Green Space System

Centennial's existing open space presently encompasses some 1,732 acres. Just under half is public open space, provided by South Suburban Parks and Recreation District (SSPRD), Arapahoe Parks and Recreation District (APRD), or Arapahoe County. The remainder includes HOA-maintained open space, HOA-maintained small passive parks, greenbelts, and drainageways. If both public as well as private open space is taken into account, Centennial presently provides its residents with a level of open space comparable to neighboring communities, including Greenwood Village and Parker.

Centennial's parks have developed over the last five decades, as both SSPRD and APRD sought to provide for the recreational needs of growing unincorporated Arapahoe County. APRD, since its inception, has sought to develop joint-use parklands in close conjunction with neighborhood schools, while SSPRD also maintains joint use agreements with selected school campuses.

In total, Centennial residents enjoy an estimated 524 acres of public parkland<sup>1</sup>, or roughly 5.1 acres for every 1,000 people – comparable to Parker and close to Aurora in performance, but substantially less than Greenwood Village.

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1 This analysis also includes five parks within Ward IV that are not within the city limits, but which immediately border the city; these include Toll Gate Park, Pioneer Park, Saddle Park, Piney Creek Hollow Park and Indian Ridge School, all under the jurisdiction of APRD but located within unincorporated Arapahoe County. In total, these parks account for 102 acres of the 524 acre total.

The current public parks system consists of a total of 52 parks and playing fields, some of which are governed by formal joint use agreements with schools. The majority are neighborhood parks that average just over 10 acres in size. There are only five parks in the city that could be classified as “community scale” facilities and these average 25 acres in size; few are large enough to host a very large public festival or gathering.

Centennial's existing community trails system includes a mix of off-street pathways that follow drainage corridors, as well as designated on-street bicycle lanes.

There are approximately 26 miles of principal trail corridors within in the existing Centennial system, encompassing a wide variety of facilities ranging from hard- or soft-surface multi-use pathways, to detached sidewalk connections.

Many residents have expressed a need for more connections to larger regional trails systems, such as the Cherry Creek Trail and State Parks Trail System, the High Line Canal, and the well-developed network of trails within Parker to the south and Greenwood Village to the north.

In addition, many residents feel that existing on-street bike lanes do not yet comprise an efficient and functional network that encourages bicycle commuting. Designated bike lanes are available in selected locations, such as along Clarkson Street, but these often stop abruptly at major intersections, such as with Arapahoe Road, and do not connect to major employment or civic destinations.

## Plan Vision

Centennial residents are deserving of a great green space system! To elevate a system that is presently *very good*—and that residents appreciate—to one that is *great*, this Plan focuses on:

- Strengthening connectivity through a rich network of trail connections and through strategic acquisitions of contiguous parcels;
- Addressing equity issues, especially on the east side;
- Strengthening its organization around the nine prairie drainageways that constitute the City's most valuable natural resources;
- Using this structure to create a memorable, imageable system;
- Encouraging the creation of unique spaces with unique elements; and
- Making our green spaces places of celebration and community events.

## Criteria for Investment Decisions

A number of recommendations are made about potential acquisitions or easements, or specific projects that could enhance the community's green space system. To arrive at these recommendations, the planning team and Advisory Committee developed a series of criteria that can be applied to evaluate whether a particular project is a sound investment opportunity for the City. These include:

- Benefits many Centennial residents—the City as a whole, or major portions of the City where there is a need for parity.
- Completes a major “missing link” or missing piece of the green space system.

- Highly visible, a source of community pride.
- Strong level of community support.
- Strong financial partnership opportunities—with special districts, schools, or other entities.
- Project would not otherwise happen without the investment.

## Recommendations for Open Space

The Plan makes the following recommendations for enhancing open space holdings in the City.

*RECOMMENDATION:* Acquire additional open space (easements and parcels) along major drainageways to create a connected system. Unlike other communities, where large expanses of undeveloped lands may still exist at the perimeter, in Centennial the majority of undeveloped land is within drainageway corridors and associated floodplain areas. The opportunity exists to preserve these high-value riparian corridors, for wildlife habitat and for trail corridors where suitable.

*RECOMMENDATION:* Work with the Southeast Metro Stormwater Authority as they plan drainage projects, to jointly identify opportunities for channel enhancements and trail connections. Partnering with SEMSWA for drainage corridor improvements may provide an important mechanism for habitat restoration as well as trail corridor construction. Partnering may be an important way to leverage public dollars for “multiple benefit” projects.

*RECOMMENDATION:* Work with District partners to incorporate more native areas/habitat into parks. Almost 80 percent of Centennial residents who responded to the community needs assessment survey thought the more natural open space should be incor-

porated into parks, either through retrofitting existing facilities or as new parks are designed.

*RECOMMENDATION:* Explore opportunities to incorporate additional environmental quality protections into land development code/regulations so that “quality” lands are preserved, e.g.:

- Establish minimum buffers along riparian areas
- Encourage preservation of mature trees and landscape
- Encourage restoration of native vegetation in disturbed areas

Many communities have begun to modify their land development code to provide more specific requirements for the protection of significant environmental features, including wetlands, streams, and water features, mature trees and stands of vegetation.

*RECOMMENDATION:* Establish an open space and trails signage program to ensure that properties are identified as within the City of Centennial.

Recommendation: Create an accurate, user-friendly and easy-to-read map of the open space, trails and parks system. Make this available to residents in hard copy form and in digital form on the website.

## Recommendations for Parks and Recreation Facilities

Centennial residents seem very satisfied with the amount of parkland in the community; 68 percent of residents surveyed report that there are enough parks in close proximity to their home or workplace, and with the exception of the eastern portion of Ward III, most Centennial residents live within 1/4 mile of a park. Thus, this Plan does not recommend changes to the existing parkland dedication requirement. It

does, however, make the following policy recommendation: Recommendation: Maintain prevailing standards of walkability and access in all new developments, such that parks are provided within 1/4 mile of residents' homes, where feasible.

*RECOMMENDATION:* Consider “land banking” for a future large community park in center city. Most of the available, undeveloped land is located in the central portion of the community; while these properties are presently zoned commercial, they could be re-zoned to provide for parkland. More important, however, is the opportunity to create a park that is at the community’s “heart,” that brings together the neighborhoods west of I-25 and east of Parker Road, and that would be in close proximity to other civic facilities, including the city office building and county library. A related suggestion was to create, over time, a “city center” that might be similar to Lakewood’s City Center and to Broomfield’s, where municipal facilities, parks, athletic facilities, libraries, recreation centers and retail are variously combined on the same site to provide a rich mix of civic and public facilities and destination shopping.

*RECOMMENDATION:* Encourage the creation of parks that can serve special and unique functions and purposes.

A related suggestion that merits consideration is the creation of unique and special parks, or areas within parks, that would serve as major attractions for the community. Examples included a memorial garden, a “sensory garden” which could appeal to adults and provide learning opportunities for children, or an art walk/sculpture garden.

*RECOMMENDATION:* Evaluate opportunities to provide additional off-leash dog areas, and provide

suitable amenities, including fencing, water, and dog waste stations. Many Centennial residents have expressed interest in additional off-leash dog areas. The Plan recommends that opportunities to provide additional facilities, be evaluated in conjunction with potential partners, including Arapahoe County, SSPRD, and APRD.

*RECOMMENDATION:* Consider intergovernmental partnerships to “land bank” property on the east side, to provide for a regional athletic complex. One possible area is a 175-acre property located west of E-470 and north of Belleview. This property is deed-restricted and cannot be used for residential or commercial uses. It could provide a large athletic complex while keeping roughly 50 percent of the site as open space.

*RECOMMENDATION:* Consider purchasing property outside City boundaries – possibly in conjunction with regional partners – to provide for recreation facilities. Given the relative lack of available land, it may be advisable to partner with Arapahoe and/or Douglas counties, to look for lands somewhat further away, but in locations where lands are plentiful and comparatively inexpensive. This might entail joint purchases for a regional facility – or for lands that could provide for both recreation and open space – perhaps as far east as E-470. Again, the notion of “banking” land to provide for future needs, is a concept that should be emphasized.

*RECOMMENDATION:* Work with District partners on an ongoing basis to assess needs for upgrades and improvements to existing facilities, and work cooperatively to implement projects that benefit Centennial residents. Each of the two major districts’ service populations are comprised of Centennial residents: an estimated 50 percent of South Suburban’s, and over

70 percent of APRD’s. The Plan recommends that the City form an active and ongoing partnership with each district to help fund major capital improvement projects in both parks and recreation facilities that will improve services to Centennial residents.

## Recommendations for a Community Trails System

In the next 5-10 years, the City of Centennial, working in partnership with surrounding jurisdictions and regional park districts, shall strive to have just over 100 miles of pathway corridors completed for public use within Centennial City limits.

### Primary Pathway System

The proposed system is comprised of the following 13 primary corridors.

1. Highline Canal Trail	14.0 miles
2. Cherry Creek Trail	3.0 miles
3. Clarkson Street	2.6 miles
4. University Blvd / Big Dry Creek	7.1 miles
5. Little Dry Creek / Willow Creek	6.1 miles
6. Havana St / Dayton St / Inverness Dr	8.8 miles
7. Lone Tree Creek	6.5 miles
8. West Tollgate Creek to E-470	3.4 miles
9. West Tollgate Creek	4.9 miles
10. Piney Creek	12.5 miles
11. East Caley Avenue	7.8 miles
12. East Easter Avenue	7.1 miles
13. E-470 Trail	17.4 miles

## Recommendations to Facilitate Implementation

To ensure that Master Plan recommendations are positioned for early implementation, a number of organizational and policy recommendations are provided below. These are intended to support the City's ability to move forward with acquisition and/or construction of new facilities.

*RECOMMENDATION:* Identify City staff to be responsible for the green space system. A key recommendation is to identify at least one staff member who will have primary responsibility for oversight of the green space system, including project implementation, long-range planning, ongoing coordination with District, County and other municipal partners, and providing staff support for the Advisory Committee. The intent is not to create a Parks and Recreation Department within the City, although as the City grows, the pros and cons of such an action might be appropriate to discuss. Instead, the intent is simply to ensure that someone within the City is tasked with the formal responsibility of managing the system, and is held accountable for performance.

*RECOMMENDATION:* Create an ongoing partnership structure involving the POST Advisory Committee, District representatives, County and other partners for long-range planning and project review. In just three short months, as this Plan has been developed, mutual respect and collaborative relationships between the above parties have begun to form. It is imperative to build on and strengthen these relationships, through the formation of a standing working group involving the parties above, to maintain a focus on long-range planning as well as short term project implementation.

*RECOMMENDATION:* Develop a three-year work plan for investment based on the opportunity areas and trail corridors identified in previous chapters, and the priority areas identified through planning workshops. This is also a critical follow-on task, as it will set the framework for future decisionmaking. The following steps are recommended.

- Establish a framework and guidelines for the percentage of funds to be disbursed in a given year and the percentage that might be held in reserve.
- Arrange a bus tour for Advisory Committee members and members of Council, to visit the opportunity areas and priority trail corridors. This will allow members the opportunity to evaluate potential projects and prioritize them according to criteria provided.
- Develop a three-year list of project priorities based on evaluation of the opportunity sites, as well as some of the initial priorities that were discussed by the Committee and the public.
- Develop a cooperative process for allocating funds to Districts to complete desirable projects.



# Introduction

## Purpose and Focus of the Plan

This is the first Parks, Open Space, Trails and Recreation Master Plan to be completed by the City of Centennial since the City was incorporated in 2001. As such, it establishes a far-reaching vision to transform the City’s “green space” system into its “outdoor living room,” where parks become the community’s social heart, where prairie drainageways become the backbone of its open space, and where a rich network of pathways connect residents to the City’s amenities.

*The Plan is intended to position Centennial's green space system as one of the key reasons that residents live in the City and businesses choose to locate here.*

The Master Plan is intended to offer a long-range vision, but it also focuses heavily on the next three to five years, on some highly-visible actions that might be taken that will excite residents about the long-term opportunities and benefits provided by the system.

Where feasible, it is desirable that many goals, especially those relating to acquisition or preservation, would be achieved in a much shorter timeframe.

This is necessary to ensure that valuable open space and park properties are protected from development and that easements or acquisitions necessary to support a comprehensive community trails network are obtained.

The Master Plan includes the following elements:

- Analysis of Centennial's current and future needs for open space, parks, and recreation facilities, and analysis of facilities provided by neighboring communities
- An overarching vision for the system, associated goals, and performance measures for tracking progress over time in implementation
- Criteria to guide City investment in specific projects, and for making acquisition decisions.
- A physical plan identifying potential open space, parks, and trails improvements that extend and expand the green space system
- Near-term action steps for implementation

## Centennial's Incorporation As Colorado's Newest City

Centennial was incorporated in 2001 as Colorado's newest city, constituted from areas that had previously been settled as unincorporated Arapahoe County. Seventy-seven percent of voters approved of the incorporation, which at the time was the largest in U.S. history. With approximately 103,000 residents and 36,200 households, Centennial is now the fourth largest city in the Denver Metro Area.

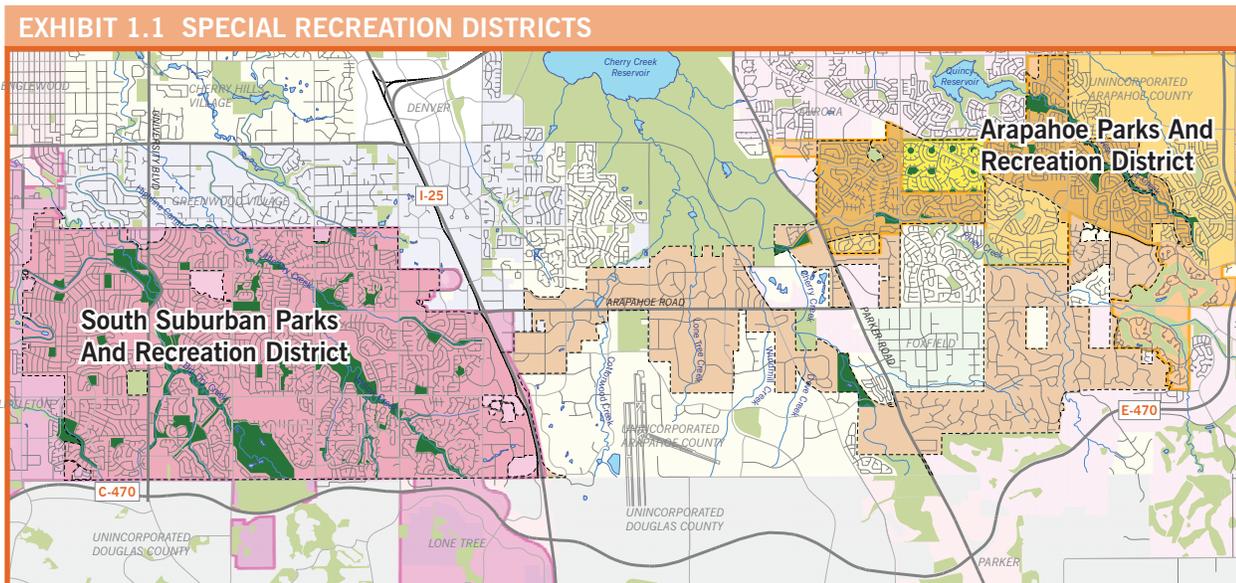
Parks and open space facilities have been provided to Centennial residents through Arapahoe County, and through a variety of public and private special taxing districts, the largest of which include South Suburban Parks and Recreation District (SSPRD) and the Arapahoe Parks and Recreation District (APRD) (Exhibit 1.1).

The South Suburban Parks and Recreation District is a quasi-municipal corporation and a political subdivision of the State of Colorado, formed in 1959 to provide recreational facilities and services for District residents. In 1959, approximately 45,000 people

lived in the District. By 2005, the population totaled nearly 140,000 residents, including an estimated 70,000 residents of Centennial. Because it has been in place for almost five decades, its parks and recreation system is very well-developed, though as an older District, some facilities are showing their age.

The Arapahoe Park and Recreation District was formed in 1982 by the Arapahoe County Commissioners and area land holders for planning, acquiring, developing, maintaining and programming parks, open space, trails and recreational amenities for the residents of unincorporated Arapahoe County (including what is now the City of Centennial) that were not being served by adjacent entities. The District's Service Plan anticipates approximately 100 acres of developed parks, 500 acres of natural open space, and 10 miles of paved trails.

APRD's boundaries have expanded since its formation due to the inclusion of surrounding developments that wanted the convenience of large scale operations. The current boundary includes approximately 10.5 square miles and approximately 40,000 residents, including an estimated 30,000



from Centennial. The population is expected to grow to approximately 80,000 residents upon build-out. In contrast to SSPRD, APRD is faced with a different set of challenges, including tax revenues that do not completely keep pace with growth, and often a lag between when residents are promised parks and when the District has the resources to build them.

As a consequence of its history, Centennial is in somewhat of a unique position as a City – with a well-developed and established parks and open space system that is operated almost entirely by other entities<sup>1</sup>. The City does not presently have a Parks or Open Space Department, and just this past June appointed its first Open Space, Parks, Trails and Recreation Advisory Committee.

### **An Impetus For Planning: Arapahoe County Open Space Sales Tax And Conservation Trust Funds**

This Plan has been developed to provide an overall vision for Centennial’s green space system, yet another significant impetus is to provide guidance for making investment decisions. The City has accumulated significant shareback funding from the Arapahoe County Open Space Tax (approximately \$4.5 million to date) as well as the Conservation Trust Fund (approximately \$2.5 million). The Plan is intended to provide guidance for the wise investment of these funds – as well as any future funds that may be obtained – to enhance the City’s green space system and to fulfill requirements of each funding source’s enabling legislation.

#### *Arapahoe County Open Space Tax*

In November 2003, voters approved a county-wide 1/4 percent sales tax to pay for the preservation of

<sup>1</sup> The city does own one park – Cherokee Trail Park – that provides trails and natural open space.



*Open space at Fox Hill Park*

open space in Arapahoe County. Collection of the sales tax began in January 2004 and is set to expire, or “sunset,” in December, 2013.

The tax is used to preserve urban and rural open space and natural areas; protect lands that preserve water quality; provide, maintain and improve neighborhood parks, open space, sports fields, picnic facilities and multi-use trails; protect wildlife habitat; preserve agriculture and ranch lands and enhance and maintain designated heritage areas.

The Open Space program provides a 50 percent share back to incorporated cities and towns within the County, and also provides a pool of money for grants to special districts and incorporated cities and towns. Funds are also set aside for open space and trails in unincorporated Arapahoe County.

#### *The Conservation Trust Fund*

The Colorado Constitution, as amended in 1992, states that the net proceeds of the Colorado Lottery are to be used for state and local parks, recreation facilities, open space, environmental education, and wildlife habitat.

The Conservation Trust Fund (CTF) is one of three funds established to accomplish these goals. CTF receives 40 percent of all net lottery proceeds. The Department of Local Affairs distributes CTF dollars

from net Lottery proceeds to over 450 eligible local government entities that provide park and recreation services in their service plans. CTF funds are distributed on a per capita basis. Funding can be used for acquisition of new open space or park properties, development of recreational facilities, or for capital improvements or maintenance.

## The Master Planning Process

This Master Plan is the result of concentrated effort over a three month period by the Open Space, Parks, Trails and Recreation Advisory Committee, key stakeholders from the County, SSPRD and APRD, public input received from interested residents, City Council comments, and research and analysis by City staff and consultants.

Planning has been shaped by a series of overarching goals developed by a City Council subcommittee in early 2007, to guide the master planning effort:

- *QUALITY OF LIFE* – enhance the quality of life, including cultural, recreation and related activities for all Centennial citizens
- *ENVIRONMENTAL ISSUES* – address environmental issues such as drainage or preservation of wetlands
- *ECONOMIC DEVELOPMENT* – support economic development and existing businesses
- *PRESERVE PROPERTY VALUES* – protect the value of property in Centennial
- *BUILDING COMMUNITY* – support and preserve Centennial neighborhoods
- *MOBILITY* – enhance the ability of people to move within and through the City using pedestrian and bicycle forms of transportation
- *CITY IMAGE* – enhance the City's image and identity



*Advisory Committee members sought advice from key stakeholder groups during the planning process.*

- *CONNECTIVITY OF FACILITIES* – connect Parks, Open Space, Trails, and Recreation facilities with each other

In June 2007, City Council appointed Centennial's first Open Space, Parks, Trails and Recreation Advisory Committee. This nine-member group includes a regular member and alternate from each of the City's four electoral wards, and one member appointed as the Mayor's representative. The Committee's functions are to:

- Review proposed parks, open space, trail, or recreation projects and plans;
- Score proposed parks, open space, trail, or recreation projects based on criteria established by the Centennial City Council;
- Make recommendations to the Centennial City Council on proposed parks, open space, trail, or recreation projects;

- Make recommendations to the Centennial City Council on changes to scoring criteria and parks, open space, trail, or recreation plans and policies; and
- Encourage members of the community to bring forward project ideas and proposals for funding.

Committee members have participated actively in the planning process, helping to identify priorities for open space acquisition, trails completion, and park improvements; recommending criteria for investment decisions; and weighing in on priorities for the next three to five years.

### Public Input

Good planning efforts are well-grounded in community values and perceived needs. To ensure that community input was aggressively solicited, the planning team used a variety of highly interactive strategies, including “listening” sessions and surveys.

Initial “visioning” sessions were held with the Advisory Committee and the public, to identify the core issues that the Plan should focus on. A highlight of the public “visioning” session was an interactive keypad exercises intended to identify areas of facility need. Based on the visioning work, a community needs assessment survey was conducted in August-

September, using the City’s website. Objectives of the survey were to identify how frequently residents used existing community facilities, to identify perceived needs for future open space or parks acquisition, development, or capital repair; and to obtain their opinions on a number of management and policy issues. Over 700 surveys were completed.

To obtain additional public input in a more spontaneous fashion, brief “intercept” interviews were conducted in August in the following locations:

- deKoevend Park
- Cherry Knolls Park
- Willow Springs Open Space
- Cherry Creek Valley Ecological Park
- Trails Recreation Center
- Goodson Recreation Center
- Koelbel Library
- Smoky Hill Library
- Southglenn Library

Respondents were asked a subset of questions from the longer, web-based survey; many of these were open-ended and allowed for the recording of verbatim feedback. Almost 100 intercept interviews were completed.



Consultants facilitated a dot voting exercise to establish investment priorities during a public meeting.



Centennial residents identify key “missing links” in the trails system.

Throughout the months of August and September, the planning team worked hand-in-hand with the Advisory Committee to present analysis and propose recommendations for enhancing the system. In early September, a second public meeting was held to encourage residents to provide specific feedback on preliminary plan proposals.

### *Research and Analysis*

This plan is supported by extensive research and analysis aimed at documenting Centennial's current and future needs for parks, recreation facilities, trails and open space. Key elements involved estimating the City's current and future population and the current levels of service provided by the City's existing parks and recreation facilities. The consultant team also utilized City-provided Geographic Information System base mapping showing the location and acreage associated with each park and open space property located within Centennial as well as school facilities covered by use agreements. Neighboring city and county staffs were also contacted to coordinate planning activities.

### **Plan Organization**

The Plan is organized in the following chapters to evolve logically from analysis to proposals and recommendations:

*Ch 2: Centennial's Natural Resources and Existing Green Space System*

*Ch 3: Issues Guiding the Plan*

*Ch 4: "Green Space is our Outdoor Living Room:" A Comprehensive Vision*

*Ch 5: Criteria for Investment Decisions*

*Ch 6: Recommendations for Open Space*

*Ch 7: Recommendations for Parks and Recreation Facilities*

*Ch 8: Recommendations for a Community Trails System*

*Ch 9: Recommendations for Implementation*

# 2

## Centennial's Natural Resources and Existing Green Space System

### Local and Regional Context

#### *Community History*

With approximately 103,000 residents and 36,200 households, Centennial is the fourth largest city in the Denver Metro Area. The city spans 28.2 square miles including over 9,100 developed residential acres<sup>1</sup>. Prior to its formation in 2001, the city was a part of unincorporated Arapahoe County, Colorado's oldest county.

The City's heritage is one of ranching and grazing. During the 1860s, farmers took up claims along the streams because of the ample irrigation for their land. Numerous stage routes traversed the area, bringing settlers west to Denver, via the historic Smoky Hill Trail.

From these early beginnings, Centennial has grown significantly, incorporating in 2001 as Colorado's newest city. Seventy-seven percent of voters approved of the incorporation, which to this point has been the largest in U.S. history.

Centennial is a long and narrow city, oriented around four major east-west corridors: Orchard Road, Arapa-

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<sup>1</sup> Source: City website, August 2007.

hoe Road, Dry Creek Road and County Line Road, and stretching from University Boulevard to E-470. This physical configuration, with four major arterial streets, is a feature that influences efforts to create a more connected community.

The city is divided into four electoral wards, as shown in Exhibit 2.1. As a consequence of development patterns and zoning, it is also a community with several distinct subareas, including:

- The older, west side, which includes Wards I, II, and a portion of Ward III, and which abuts the communities of Greenwood Village and Littleton. The area is largely residential, of moderate density, with housing stock that dates to the 1950s through the 1970s.
- The newer east side, which includes significant new development, including some large-lot subdivisions and equestrian properties.
- A central, commercial “core,” oriented primarily around Arapahoe Road. The airport is located in this central core, within unincorporated Arapahoe County.

City planning officials note that, despite the newer

development on the east side, the community is largely built out. Of the city’s land area, only 900 acres (5 percent) remains undeveloped, and this is largely within the central commercial core. Population is expected to grow by only about 4,000 through 2015, and by approximately 19,000 through 2030.

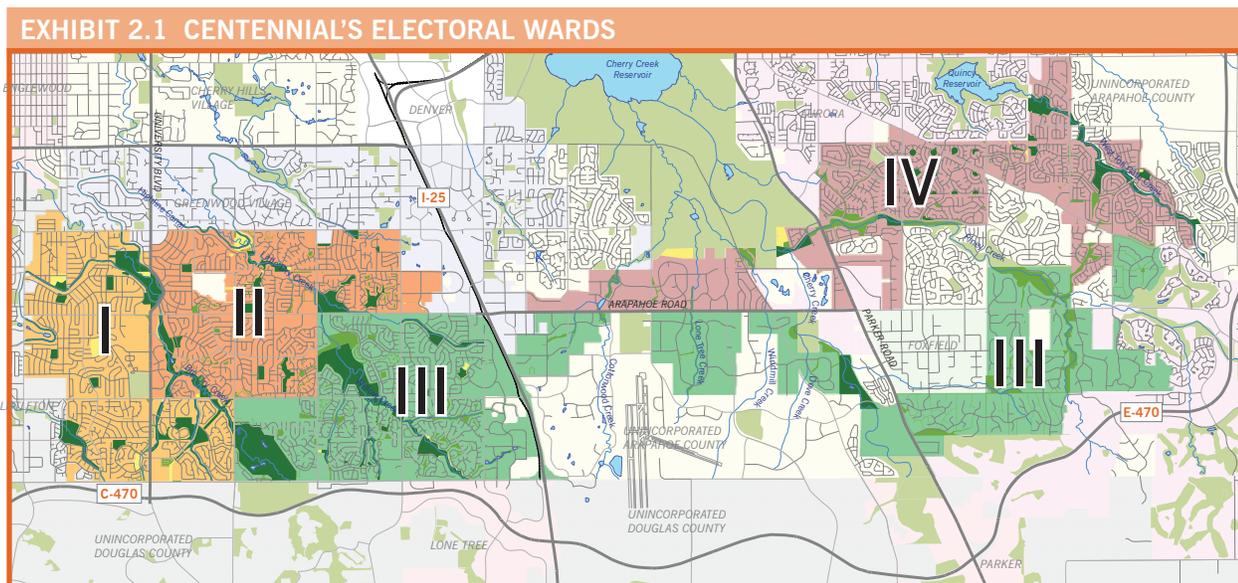
Similar to Arapahoe County, the city is a young community, with a median age of 37 years. Twenty-eight percent of residents are under age 19, and 55 percent are under age 39.

### Regional Setting

Centennial is located at the center of a number of regional facilities that preserve significant open space and provide recreational amenities for area residents (see Exhibit 2.2). As a consequence, it is important to temper projected needs for additional open space, trails, and parkland, with an appreciation for the amenities provided by these facilities. These include:

#### 1. CHERRY CREEK STATE PARK

Anchored around a 880 surface-acre reservoir, the park offers a natural prairie environment and extensive outdoor recreation facilities, including camping, picnicking and facilities for group events. The park



includes a marina, swim beach, shooting range, equestrian facilities, and a very extensive trails system.

*2. QUINCY RESERVOIR*

Located in the City of Aurora, along Centennial's northeastern border, this 289 acre reservoir and surrounding site provide boating and fishing access, and requires payment of user fees for these facilities. The reservoir is located along West Tollgate Creek, but public access is presently closed off where the creek reaches the reservoir.

*3. DOUGLAS COUNTY OPEN SPACE*

Since the creation of the Open Space Sales and Use Tax in 1994, Douglas County has focused on land acquisition – protecting 44,410 acres of open space. Publicly accessible areas in closest proximity to Centennial residents include Bluffs Regional Park in Lone Tree, and Bayou Gulch Regional Park and Open Space south of Parker.

*4. ARAPAHOE COUNTY COMMUNITY PARK* This 57 acre park owned and managed by Arapahoe County, and contains 12 soccer fields, picnic pa-

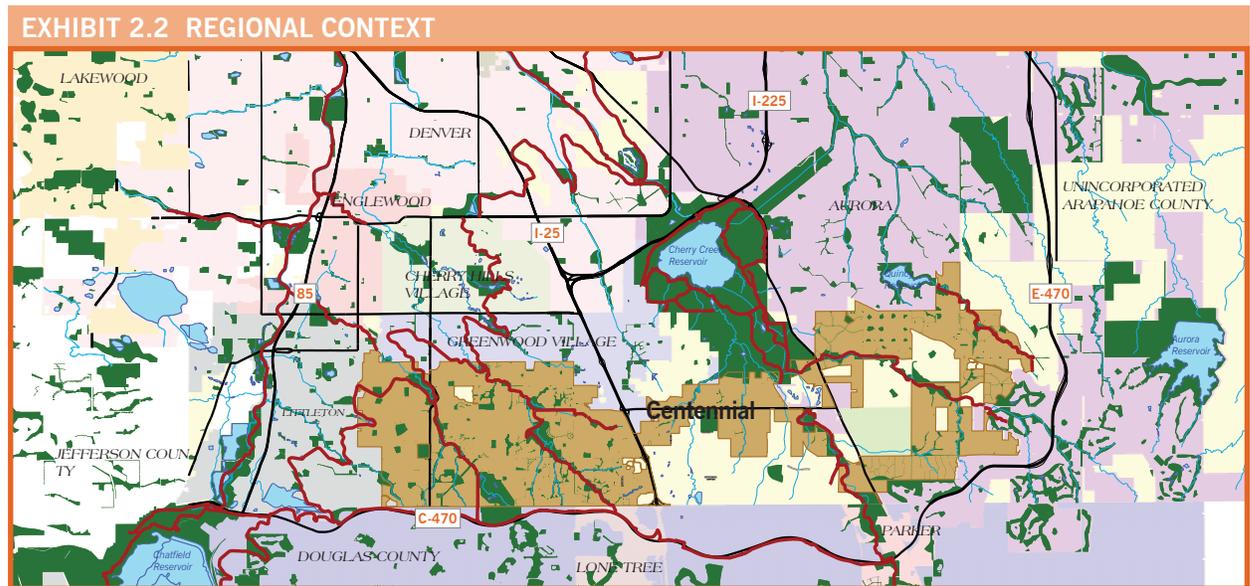


*Cherry Creek Valley Ecological Park*

vilions with barbecues, sand volleyball courts, and two baseball diamonds. Athletic facilities are programmed by the City of Aurora Parks and Recreation Department. The Colorado Storm Soccer Association, Spartans Football and Baseball, and Colorado Rush Men's Soccer are the primary users of these facilities.

*5. 17-MILE PARK*

A unique partnership comprised of nine separate public and private entities, was formed to help Arapahoe County purchase the historic 17 Mile House property located along Parker Road near Highway 83. The property includes a 19th century



“mile house” and stage barn surrounded by 30 acres of open prairie. It is one of three remaining “mile houses” along the Cherokee/Smoky Hill Trail, an important route that connected Bent’s Fort and other settlements along the Arkansas River and Palmer Divide to the gold camps and settlements along the Front Range. Planning for public use of this site is presently underway.

#### 6. ARAPAHOE COUNTY FAIRGROUNDS

The 45,000 square-foot events/exhibition center, the first of several buildings planned for the 236 acre site, is designed to serve a variety of functions in addition to the County Fair. Future phases include an indoor arena, outdoor arena and horse barn, office and maintenance facilities. Approximately 110 acres adjacent to the Fairgrounds is planned for open space, park and trails.

#### 7. CHERRY CREEK VALLEY ECOLOGICAL PARK

Cherry Creek Ecological Park is a 75 acre park owned and operated by Arapahoe County Open Space. The concept for this property was the result of an intergovernmental agreement between Parker Jordan Metropolitan District and Arapahoe County. The goal was to develop a passive, educational park for residents to enjoy, while preserving this valuable riparian reserve. Animals, motorized vehicles, bicycles and inline skates are not permitted.

In addition to these specific resources, cities adjacent to Centennial have planned and developed trail systems and open space corridors that presently connect, or could be connected to, Centennial’s green space system. By coordinating with these communities, Centennial has the opportunity to extend and enhance its system for the benefit of area residents.

### Significant Natural Features: Water Bodies and Waterways

As Centennial has grown, much of the community’s once-valuable prairie has been developed outright, or fragmented significantly. Key exceptions are the community’s nine major drainageways, which largely run north-south, and which form a lined and integrated riparian system as shown in Exhibit 2.3. *These corridors offer the potential to define the structure and character of Centennial’s open space system, as described later in the Plan.*

When combined with significant features like the Cherry Creek Reservoir, these drainage corridors provide important aquatic and riparian habitat as well as passive recreation opportunities. These areas also provide large stands of cottonwoods that offer nesting sites for raptors.

The nine major corridors include the following and are located in Exhibit 2.3:

#### 1. LITTLE DRY CREEK

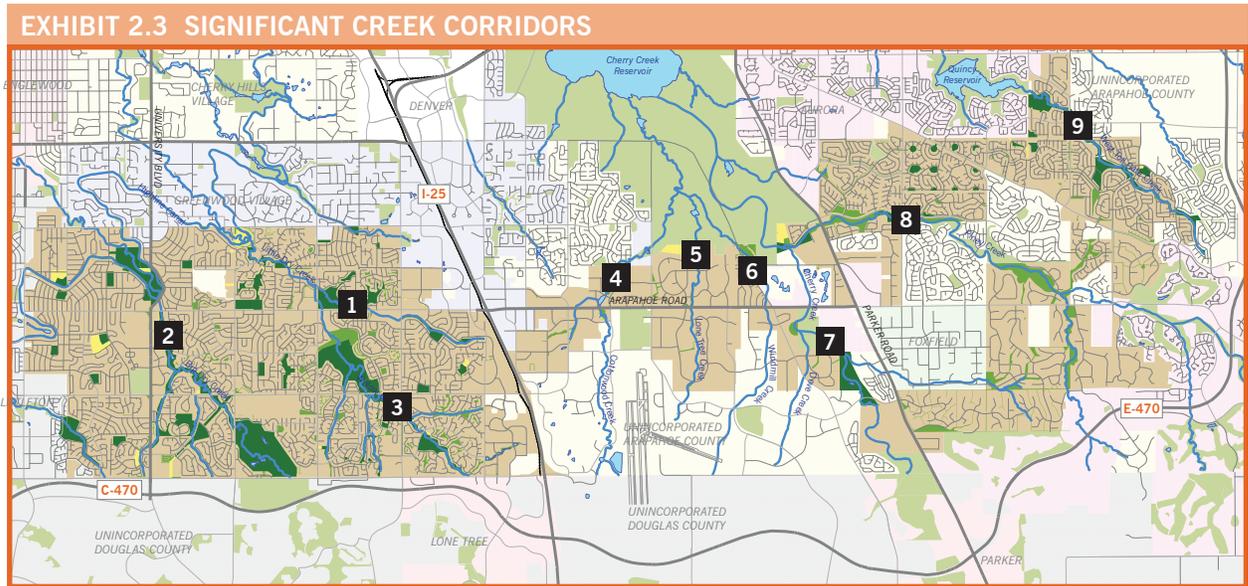
This area is one of the community’s premier water resource, receiving high ratings because of its importance to waterfowl and other species, its isolation from development, surrounding open space, nearby large trees and wetland vegetation.

#### 2. BIG DRY CREEK

This area is highly rated due to the presence of water, wetlands, and large trees.

#### 3. WILLOW CREEK

This area offers high quality cattail wetlands and numerous trees that provide perch/nest sites for raptors and bald eagles that hunt for prairie dogs nearby.



#### 4. COTTONWOOD CREEK

This corridor is one of several major corridors that flow through the center of the city, and like its neighbor, Lone Tree Creek, is edged by many presently undeveloped parcels that might expand the City's open space system. Because of the lack of development, the riparian ecosystem is fairly intact.

#### 5. LONE TREE CREEK

This corridor flows through the center of the City, and like Cottonwood Creek, offers a fairly intact riparian ecosystem.

#### 6. CHERRY CREEK

This is one of the premier corridors in the southeast metro area, flowing through the state park and connecting to the reservoir.

#### 7. WINDMILL CREEK

A small drainage corridor branching from Cottonwood Creek.

#### 8. PINEY CREEK

Significant east-west corridor in the eastern part of Centennial.

#### 9. WEST TOLLGATE CREEK

Flowing from Quincy Reservoir, this drainage provides another significant corridor for the eastern part of Centennial has areas with rich riparian habitat.

### Centennial's Existing Green Space System

What makes a great green space system—and how does Centennial's measure up?

First, the Plan uses the term “green space” to encompass open space, trail corridors and greenways, parkland, recreation facilities, special use facilities like golf courses, and other open lands that might provide flood detention or other functions. Taken together, these lands support habitat, recreation, visual and scenic character, and perform important environmental functions, like cleansing storm runoff. Many communities have begun to value these green space assets for the multiple community benefits that they provide.

A review of outstanding green space systems as documented by the Trust for Public Land and other conservators, suggest that there are six key factors that define high quality systems:

*1. WELL-CONNECTED, IDEALLY WALKABLE FROM HOME OR WORK*

The ideal system involves contiguous parks and open space, that connect to form larger “patches” that serve the needs of wildlife and humans. Ideally, residents can reach this system within a short walk from home or work.

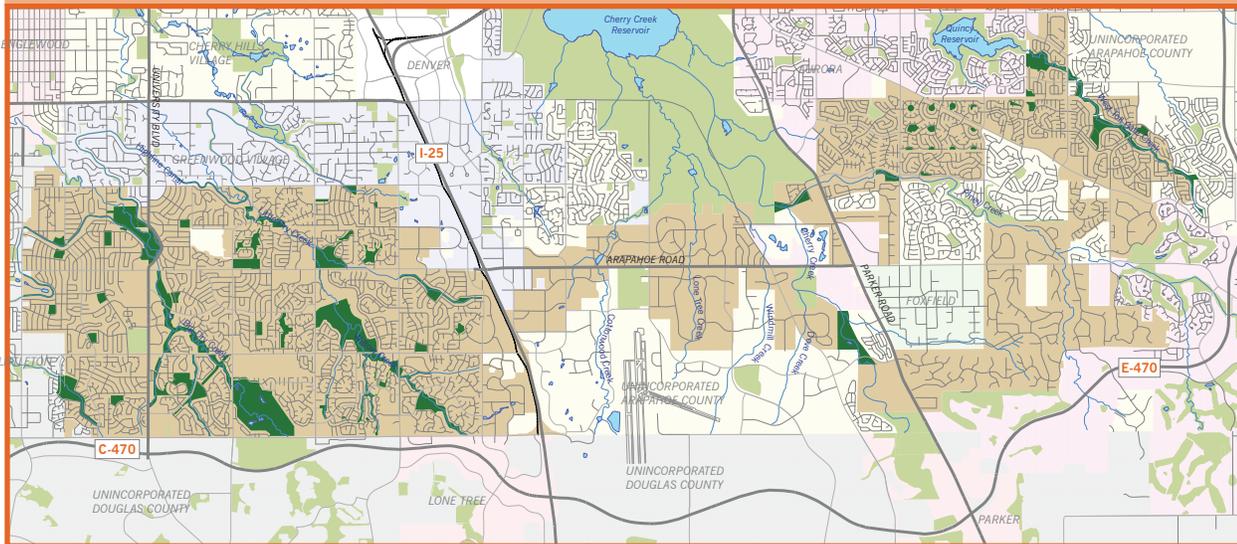
*2. WELL-DISTRIBUTED THROUGHOUT THE COMMUNITY*

Equity and parity are two major considerations; ideally most residents of a community have comparable access to facilities of equivalent value, and few neighborhoods are significantly under served.

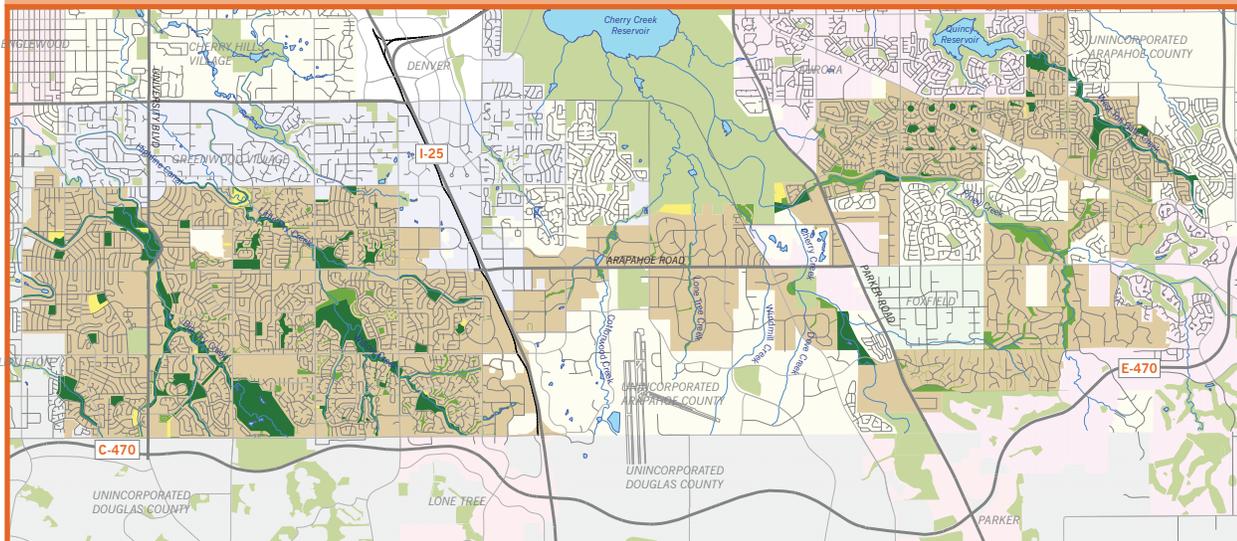
*3. TAKES ADVANTAGE OF NATURAL FEATURES*

Open space and parks that are organized around natural features, including views, riparian corridors, and topography, are inherently more interesting and diverse.

**EXHIBIT 2.4 PUBLIC GREEN SPACE IN THE CITY OF CENTENNIAL**



**EXHIBIT 2.5 PUBLIC AND PRIVATE GREEN SPACE IN THE CITY OF CENTENNIAL**



4. *DISTINCTIVE AND UNIQUE ELEMENTS*

These could include public art, interesting furnishings, and identity elements.

5. *“IMAGEABLE”*

The late Kevin Lynch coined this term to describe places or systems with a strong and clear physical structure that made them immediately memorable and easy to find one’s way around.

6. *CELEBRATED*

Great green space systems are well-programmed, with many events that encourage the community to use and love these spaces.

So, how does Centennial measure up against these great green space criteria? Data from the City’s Geographic Information System, from South Suburban Parks and Recreation District, Arapahoe Parks and Recreation District, and from Arapahoe County, were used to map and characterize the City’s the public components of the system—provided by special districts or the County—as well as private facilities provided by developers and maintained by homeowners’ associations. Exhibits 2.4 and 2.5 illustrate the public and private components of the system.

The mapping illustrates some interesting consequences of sequential and historical development patterns within the City. The public green space map shows extensive facilities west of I-25, primarily located

along the drainage corridors. These facilities begin to form a fairly well-connected system with clear structure. On the east side, however, there are fewer public facilities and these are located primarily within APRD’s district boundaries; they do not connect as well as the facilities on the west side.

When private green space is considered, the system is a bit more strongly defined—again following drainage corridors—but there are more pronounced gaps.

The physical patterning of the system is reminiscent of “beads on a string:” open space and parks arranged along natural drainage corridors, connected by community trails. There are some noticeable gaps in the system: the central commercial core is not included in the system at all, yet there are opportunities for major connections to Cherry Creek State Park, immediately to the north. There are some missing connections and gaps on the east side, which, if completed, could provide a more coherent and better-integrated system.

By the numbers, existing green space currently encompasses approximately 2,484 acres, or approximately 13.8 percent of Centennial’s land area—comparing favorably with Greenwood Village and Parker. Exhibit 2.6 below shows the distribution of these lands by type. The largest component is private facilities, followed by open space.

**EXHIBIT 2.6: EXISTING GREEN SPACE ACRES BY TYPE**

<b>GREEN SPACE ACRES</b>		
Public Parks and Facilities	524 AC	21.1%
Golf Courses	228 AC	9.2%
Open Space	828 AC	33.3%
HOA parks and HOA-maintained open space	904 AC	36.4%
Subtotal	2,484 AC	100%
<b>Green space as a percentage of total planning area acreage</b>		<b>13.8%</b>

The sections that follow describe the components of Centennial’s green space system in more detail. Appendix A provides the inventory documentation compiled for each facility, by type and ward.

### Existing Open Space

Centennial’s existing open space presently encompasses some 1,732 acres. Just under half is public open space, provided by South Suburban Parks and Recreation District (SSPRD), Arapahoe Parks and Recreation District (APRD), or Arapahoe County as shown in Exhibit 2.4. The remainder includes HOA-maintained open space, HOA-maintained small passive parks, greenbelts, and drainageways as shown in Exhibit 2.5.

If both public as well as private open space is taken into account, Centennial presently provides its residents with a level of open space comparable to neighboring communities, including Greenwood Village and Parker, as shown in the box to the right. When only publicly-accessible lands are considered, Centennial is providing only a third to one-half as much.

Some of the more substantial and well-known open space properties and their principal features include:

■ *WILLOW SPRINGS OPEN SPACE*

The property includes riparian corridor and upland prairie that presents an attractive foreground to distant views of the Front Range.

<b>TOTAL ACRES:</b>	<b>1,732</b>
PUBLIC OPEN SPACE	828
HOA MAINTAINED PARKS AND OPEN SPACE	904
ACRES PER 1,000 PERSONS:	16.8
ACRES PER 1,000 PERSONS (PUBLIC ONLY)	8.0
<b>COMPARISON WITH OTHER COMMUNITIES:</b>	
(OPEN SPACE AC/1,000 PERSONS)	
AURORA	20
GREENWOOD VILLAGE	19
<b>CENTENNIAL</b>	<b>16.8</b>
PARKER	15
THORNTON	11
ARVADA	16

■ *CHERRY CREEK VALLEY ECOLOGICAL PARK*

This area includes walkable natural area and an ecological preserve in close proximity to east side residential areas.

When one considers the geographic distribution of open space, there are some differences between wards, some of which are a direct reflection of underlying natural features. Ward III, which includes Willow Springs Open Space, offers the most public open space (333 acres) followed by Ward I (215 acres). Ward IV, which includes both the Piney Creek and West Tollgate Creek corridors, offers (87 acres), yet this ward offers significant private open space.

## Existing Parks and Recreation Facilities

### Parks

Centennial’s parks have developed over the last five decades, as both SSPRD and APRD sought to provide for the recreational needs of growing unincorporated Arapahoe County. APRD, since its inception, has sought to develop joint-use parklands in close conjunction with neighborhood schools, while SSPRD also maintains joint use agreements with selected school campuses.

In total, Centennial residents enjoy an estimated 524 acres of public parkland<sup>2</sup>, or roughly 5.1 acres for every 1,000 people – comparable to Parker and close to Aurora in performance, but substantially less than Greenwood Village.

Exhibit 2.7 shows the current distribution of Centennial’s public parks by size and type of facility.

Pocket parks generally range in size from one to three acres, and typically provide play areas serving children from the surrounding neighborhood. Neighborhood parks provide open turf lawns and play areas, and may also contain a playground, walking paths, picnic areas, and playing fields, depending on size. Community parks, which traditionally range in size from 21 to over 80 acres and provide for a variety of active and informal uses, provide open turf lawns and play areas, as well as playing fields and/or hard courts, picnic areas, trails, and special event areas.

<sup>2</sup> This analysis also includes five parks within Ward IV that are not within the city limits, but which immediately border the city; these include Toll Gate Park, Pioneer Park, Saddle Park, Piney Creek Hollow Park and Indian Ridge School, all under the jurisdiction of APRD but located within unincorporated Arapahoe County. In total, these parks account for 102 acres of the 524 acre total.

### Park Statistics at a Glance

<b>TOTAL ACRES PUBLIC PARKLAND:</b>	<b>524</b>
<b>ACRES PER 1,000 PERSONS:</b>	<b>5.1</b>
<b>COMPARISON WITH OTHER COMMUNITIES: (PARKS AC/1,000 PERSONS)</b>	
<b>ARVADA</b>	<b>16.5</b>
<b>GREENWOOD VILLAGE</b>	<b>13.0</b>
<b>THORNTON</b>	<b>6.4</b>
<b>AURORA</b>	<b>6.0</b>
<b>CENTENNIAL</b>	<b>5.1</b>
<b>PARKER</b>	<b>4.3</b>

The current public parks system consists of a total of 52 parks and playing fields, some of which are governed by formal joint use agreements with schools. The majority are neighborhood parks that average just over 10 acres in size. There are only five parks in the city that could be classified as “community scale” facilities and these average 25 acres in size; few are large enough to host a very large public festival or gathering.

Exhibit 2.8 illustrates the distribution of parks, by type and ward; acres are provided first, with the number of parks of each type in parentheses. This analysis suggests that there is a fairly similar distribution of parkland across the four wards. The analysis also suggests a decreasing emphasis on very small parks as Wards III and IV have built out. Such small parks can consume a disproportionate percentage of maintenance resources, especially for a smaller district, such as APRD. It is also the case that the many Homeowners’ Associations in these wards have

provided many private pocket parks and playgrounds that address very localized needs.

In addition to quantity of park acreage, another common measure of parks level of service adopted by many communities looks instead at proximity. Proximity-based standards specify that facilities must be located within a minimum distance of each resident's home, with the distance varying by type of facility. Neighborhood parks, for example, are typically expected to be a minimum of within 1/4 to 1/2 mile of residents' homes – or within walking distance – while community parks are expected to be a minimum of within two to five miles of residents' homes (see Exhibit 2.9).

To be consistent with walkability performance guidelines established for the trails component of the plan, minimum service standards were established that called for a neighborhood park within 1/2 mile from each Centennial home, and a community park within 2.5 miles. Existing performance was then evaluated to determine where current and future gaps in coverage may be evident.

This analysis indicates that there is solid coverage in most neighborhoods with respect to walkable neighborhood parks, with a few gaps shown in portions of Ward IV. This finding accords well with the community needs assessment survey, in which 51 percent reported that there were enough parks close to where they lived or worked, and another 18 percent reported that there were enough parks, though they were difficult to get to without driving.

Many areas of the city, however, are lacking reasonably close access to community parks, and a full 63 percent of residents surveyed reported a need for a large park that could accommodate community gatherings and festivals.

**EXHIBIT 2.7: EXISTING PUBLIC PARKS BY FACILITY TYPE**

Classification	Size	Number of Existing Parks In Centennial	
		Total Number	Acres
Pocket Park	Under 3 acres	12	24.3
Neighborhood Park	3 to 20 acres	33	275.5
Community Park	21 to 80 acres	7	223.7
<b>TOTAL</b>		<b>52</b>	<b>523.5</b>

**EXHIBIT 2.8: EXISTING PUBLIC PARKS BY FACILITY TYPE, BY WARD**

Classification	Ward I	Ward II	Ward III	Ward IV	TOTAL
Pocket Park	8.5 AC (4)	9.7 AC (5)	3.5 AC (2)	2.6 AC (1)	24.3 AC (12)
Neighborhood Park	61.7 AC (7)	55.6 AC (6)	87.2 AC (10)	71.1 AC (10)	275.5 AC (33)
Community Park	23.7 AC (1)	64.5 AC (2)	0	135.5 AC (4)	223.7 AC (7)
<b>TOTAL</b>	<b>93.9 AC (12)</b>	<b>129.8 AC (13)</b>	<b>90.7 AC (12)</b>	<b>209.2 AC (15)</b>	<b>523.5 (52)</b>

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EXHIBIT 2.9  
LEVELS OF SERVICE

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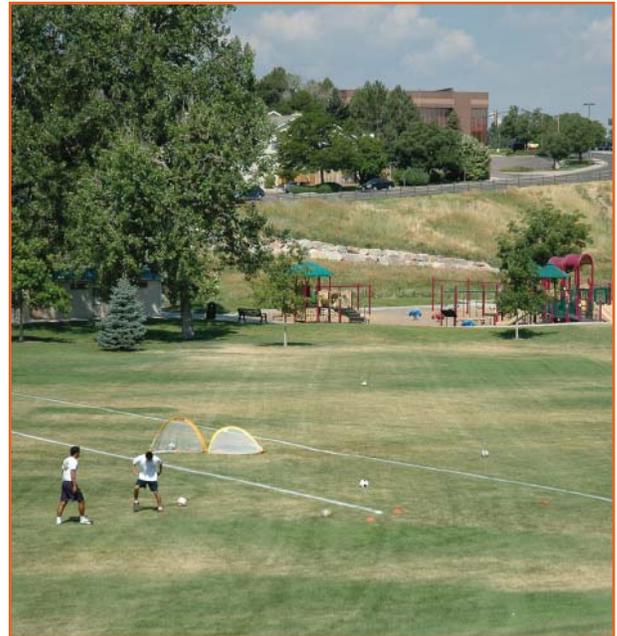
*Recreation Facilities*

Exhibit 2.10 shows the number of playing fields and other recreation facilities that are provided within existing Centennial parks, and at schools that are covered by a formal joint use agreement.

An analysis of facility provision by ward suggests, with the exception of Ward IV, recreation facilities are well-distributed geographically throughout the city. In Ward IV, however, there are only two baseball/softball fields and four football/soccer/multipurpose fields – figures that are two and three times lower than what is available in other areas of the city.

Members of the public who responded to a community needs assessment survey did suggest that certain types of facilities – most notably, soccer and lacrosse fields – were needed. A full 75 percent indicated that more of these facilities were needed, followed by baseball/softball fields (32 percent) and pools for competitive swim teams (30 percent).

As noted in Chapter 7, assessing current and future needs for athletic facilities is a complex task, principally because the teams and leagues that serve



*Multi-Use fields and playground at Cherry Knolls Park*

Centennial and use these fields, serve a substantial portion of the southeast metro region. Thus, while by conventional standards it may appear that Centennial has adequate facilities to serve its own population, one must in fact take the region into consideration.

EXHIBIT 2.10: DISTRIBUTION OF EXISTING RECREATION FACILITIES	
Activity	Number of Facilities
Baseball/Softball Fields	48
Football/Soccer Fields	58
Recreation Center	3
Outdoor Pool	4
Indoor Pool	3
Outdoor Tennis Courts (does not include HOA facilities)	20
Skate Park	1
Playgrounds (does not include HOA facilities)	34



*Skate Park at Trails Recreation Center*



*Outdoor Pool at Holly Park*

## Existing Community Trails

Centennial's existing community trails system includes a mix of off-street pathways that follow drainage corridors, as well as designated on-street bicycle lanes.

There are approximately 26 miles of principal trail corridors within in the existing Centennial system, encompassing a wide variety of facilities ranging from hard- or soft-surface multi-use pathways, to detached sidewalk connections. There are also numerous social or volunteer trails within neighborhoods that provide a useful indication of where formal connections need to be made.

Multi-use separated pathway facilities desirable for recreation have generally been developed within indi-

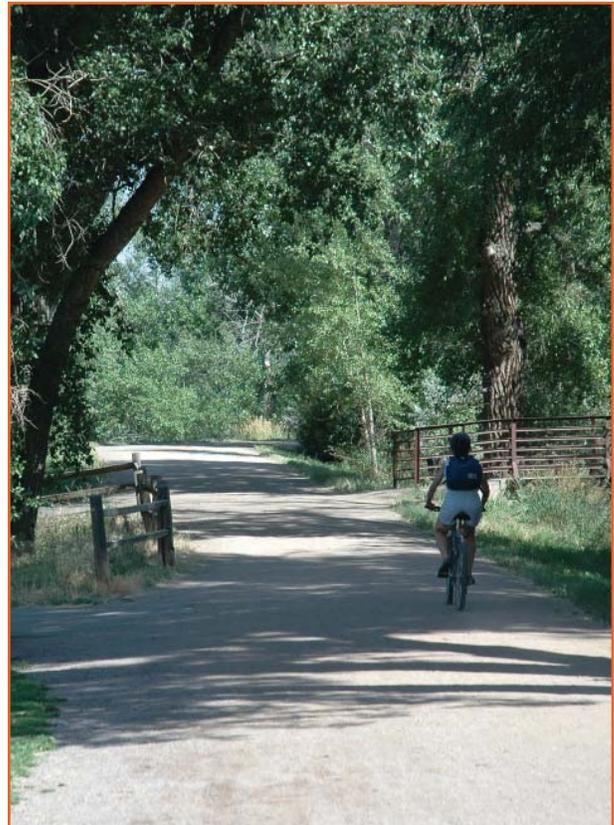
vidual subdivisions, though do not yet link together to provide a community-wide trails system. Detached sidewalks or “side paths” are also present, but multiple arterial streets must be crossed in the process, posing safety considerations. Detached sidewalks provide more limited connectivity from south to north. Moreover, detached sidewalks do not always safely and simultaneously accommodate different types and speeds of user, such as hikers, dog-walkers, and recreational cyclists.

Many residents have expressed a need for more connections to larger regional trails systems, such as the Cherry Creek Trail and State Parks Trail System, the High Line Canal, and the well-developed network of trails within Parker to the south and Greenwood Village to the north.

In addition, many residents feel that existing on-street bike lanes do not yet comprise an efficient and functional network that encourages bicycle commuting. Designated bike lanes are available in selected locations, such as along Clarkson Street, but these often stop abruptly at major intersections, such as with Arapahoe Road, and do not connect to major employment or civic destinations.

## Conclusions

This chapter has described the character of the Centennial community, and the range of open space, parks, recreation facilities and programs, and trails that are available to its citizens. This background provides a useful context for interpreting community values and needs, and for understanding where augmentation of the existing system may be needed.



*Soft Surface Multi-Use Trail at deKoevand Park*



*Cherry Creek Multi-Use Trail at Cherry Creek Valley Ecological Park*

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# 3

## Issues Guiding the Plan

### Overview

The Master Plan has been guided by the values that Centennial residents hold for their community and its green space system. A “values-driven” planning process helps to ensure that recommendations reflect perceived needs and priorities, and that community support sustains the plan through implementation.

To understand community values and perceived needs, “visioning” workshops, interviews in community parks, recreation centers and libraries, and a community needs assessment survey were conducted early in the planning process.

The visioning workshops provided important qualitative information on Advisory Committee members’ and residents’ perceptions of issues facing Centennial’s open lands system. The open-ended nature of

these sessions allowed the planning team to engage in detailed discussions with participants and explore issues in depth.

The intercept interviews, conducted in nine locations throughout the City, allowed the planning team to talk with close to 100 residents in a spontaneous fashion, and to begin to identify important “hot button” issues and needs for particular facilities.

The community needs assessment survey, a web-based survey of Centennial residents, was developed based on the visioning workshop and intercepts, and allowed planners to gauge support for these facilities and perceptions in the wider community.

Highlights of the visioning workshops, intercepts and needs assessment survey are presented below.

## Preliminary Visioning Workshops: The Importance of Green Space to Residents' Quality of Life

Initial “visioning” workshops were conducted with Advisory Committee members, and with members of the general public during the first community meeting on August 2, 2007. These open-ended workshops were intended to identify the major issues that the Plan should focus on, as well as to identify what participants would like to see improved about the current system.

### *Open Space*

Open space and trail connectivity were the two top issues that “rose to the top” in most discussions. Many individuals mentioned the ballot initiative supporting the creation of the Arapahoe County Open Space sales tax in 2003, and the need to remain faithful to the intent of that tax. Others noted that, in light of the rapid pace of development, a concerted effort should be made to acquire or otherwise preserve valuable open space before it was too late.

Most felt that open space should be preserved for its inherent natural resource values, but not necessarily to support public use or passive recreation. Many individuals instead suggested that only minimal public access and rustic amenities be provided at open space sites.

### *Community Connectivity*

Community connectivity was also mentioned as a central focus for planning efforts. Residents sought better connections to the regional system, in particular, the High Line Canal and Cherry Creek trails systems; better connections to adjacent municipalities' trails, for example, those in Greenwood Village and Parker; and improved opportunities for safe bicycle commuting. Many residents also noted the need for



*Drainage corridor through Fox Hill Park*

signage or accurate mapping that would help them to locate trailheads, understand routes, and understand existing trails surfaces.

### *Parks and Recreation Facilities and Programs*

Most residents were very satisfied with the existing parks and recreation facilities provided by the relevant special districts. As confirmed below in the community needs assessment survey, most felt that there were enough parks, and with the exception of the eastern part of Ward III, that they were well-distributed within the community. Many residents did express a need for additional multi-use playing fields, in particular, fields that could support soccer or lacrosse.

### *Community Image and Identity*

Many residents suggested that the green space system could provide an important opportunity to reinforce and celebrate Centennial's identity as a community. Simple ideas such as adding the City's logo to existing parks and open space signs, or incorporating other distinctive identity elements, could communicate to residents that those facilities were an important part of the City and a source of community pride.

## Intercept Interviews

To assess whether these themes were supported more broadly throughout the community –especially in light of the fact that the first public meeting drew only 27 residents, exclusive of staff and Advisory Committee members – “intercept” interviews were conducted at the following locations in Centennial:

- deKoevend Park
- Cherry Knolls Park
- Willow Springs Open Space
- Cherry Creek Valley Ecological Park
- Trails Recreation Center
- Goodson Recreation Center
- Koelbel Library
- Smoky Hill Library
- Southglenn Library

A random sample of users of these facilities were approached and asked to answer five short questions and also talk spontaneously about other issues relating to the green space system within the community. A total of 97 people responded to the request for an interview.

Key themes emerging from the interviews included the following:

- The interviews confirmed the importance of acquiring additional open space; many of those interviewed mentioned it without prompting, and 92 percent thought that land dedication requirements should be increased to ensure that more open space was provided when new subdivisions were built.



*Intercept interviews were conducted outside the Goodson Recreation Center at deKoevend Park.*

- While over 60 percent indicated that there were enough parks close to where they lived or worked, 77 percent saw a need for a large park that could host community gatherings. Residents living in Ward IV were most likely to mention the need for such a large park.
- Almost 70 percent indicated a need for additional athletic facilities, including a pool that could be used for competitive swimming meets, baseball/softball fields, and soccer/lacrosse fields, ranking as the top three priorities.
- Most felt that the community trails system should focus on the needs of pedestrians (walkers, joggers) and bicyclists. Most mentioned the “car-dependent” nature of the community and the desire to create a more pedestrian-friendly environment.

### Validating Perceptions: The Community Needs Assessment Survey

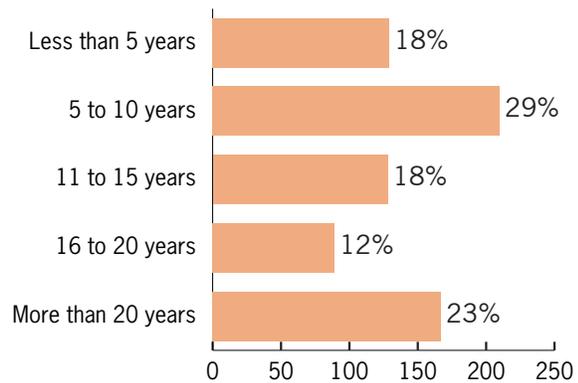
To assess broader community support for the themes and perceptions identified above, a web-based needs assessment survey was conducted between August 17 and September 7, 2007. This brief, 10-minute survey was posted on the City website and residents were encouraged to complete it. Individuals were prohibited from completing the survey multiple times from the same computer, minimizing –though not entirely eliminating –the possibility that responses could be manipulated.

A total of 780 completed interviews were received, which is an extremely high response for this type of survey. Centennial had publicized the survey through its community newspaper and through the Centennial Council of Neighborhoods (CENCON), but it was also noted that many athletic teams and leagues publicized the survey to their membership and encouraged participants to state that more athletic facilities were needed in the community; results should thus be interpreted bearing this in mind. Additionally, analysis of the data indicated that 54 respondents revealed that they did not live in the City, and these respondents were excluded from the tabulations that follow.

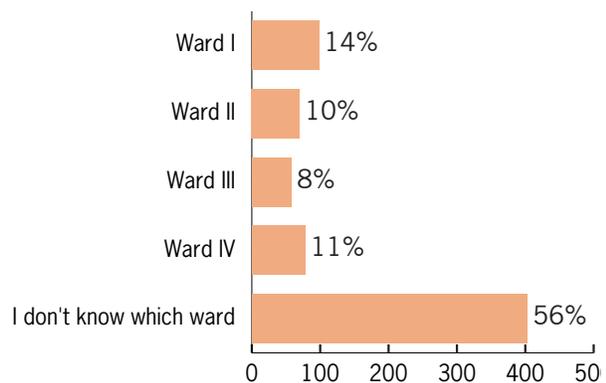
### Length of Residence and Location

- The majority of respondents have lived in Centennial for a long time: 53 percent had lived in the area for at least 10 years, with 23 percent living in the community for more than 20 years. Only 18 percent had lived in Centennial for less than five years.
- Responses were fairly equally distributed across the City’s four wards, though almost 60 percent were not sure which ward they lived in. As a consequence, ward-level analysis is presented below only where there are specific trends and patterns that suggest differences between geographic areas.

#### How long have you lived in the area that is now Centennial?



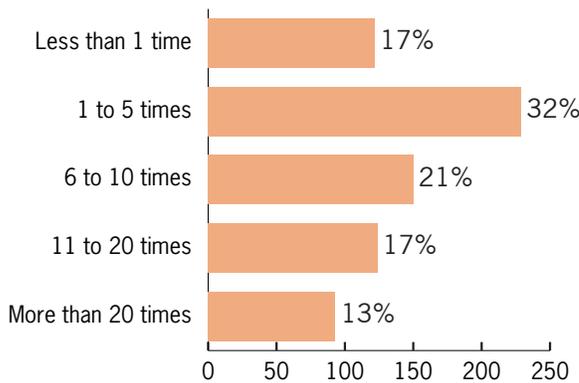
#### Which ward do you live in?



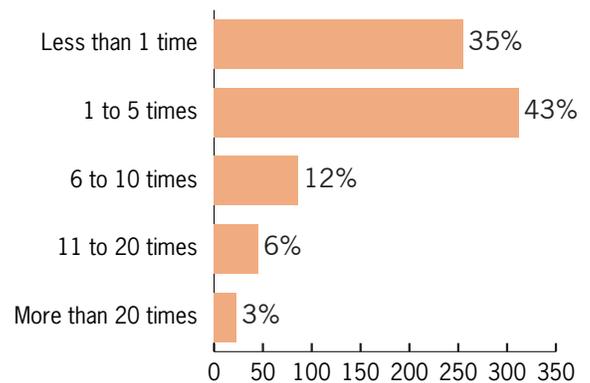
### Trail Utilization and Needs

- Most respondents (32 percent) report using Centennial's trails one to five times in a given month, on average. Thirty percent might be considered very frequent users, however, with at least 10 visits and in some cases, upwards of 20. Seventeen percent do not use the community's trails at all.
- By contrast, while 43 percent are modest users of trails in other communities (1-5 times per month), 35 percent do not use trails outside the City and only 21 percent are frequent (more than 10 visits) users.
- Just under half of respondents indicated that they rarely, if ever, biked or walked to work in a given month. About 14 percent, on the other hand, could be described as "hard core" commuters, with more than 10 trips completed by one of these methods in a month.
- In general, only a small fraction of Centennial's youth are walking or riding their bikes to school; about 10 percent do this one to five times a month, and 37 percent report not doing it at all. At the opposite end of the spectrum, about 13 percent do this most of the time, and the vast majority of these reside in Ward I.

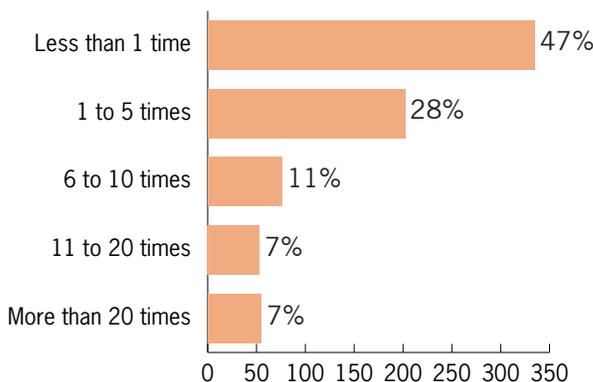
**How often in a month do you use trails in Centennial?**



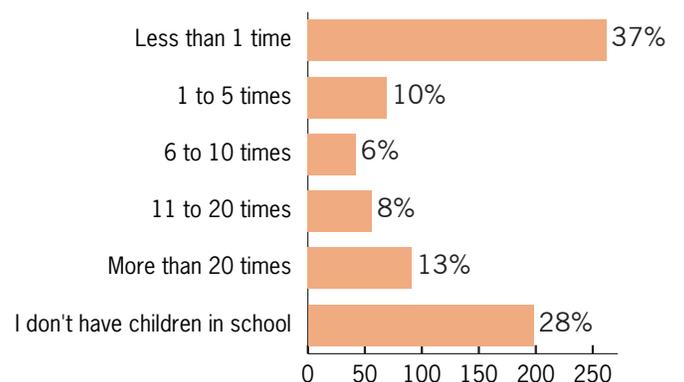
**How often in a month do you use trails outside of Centennial?**



**How often in a month do you walk or ride a bicycle to perform errands or commute to work?**

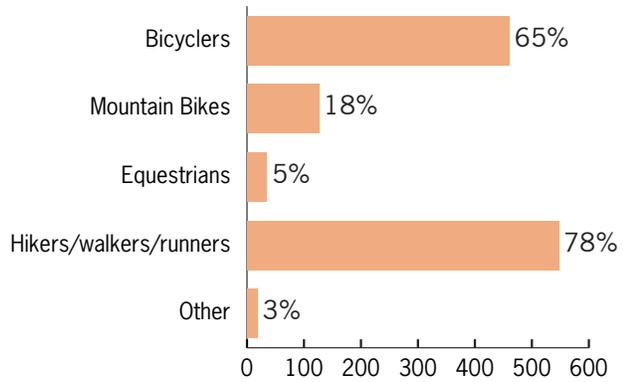


**How often in a month do your children walk or ride a bicycle to school?**

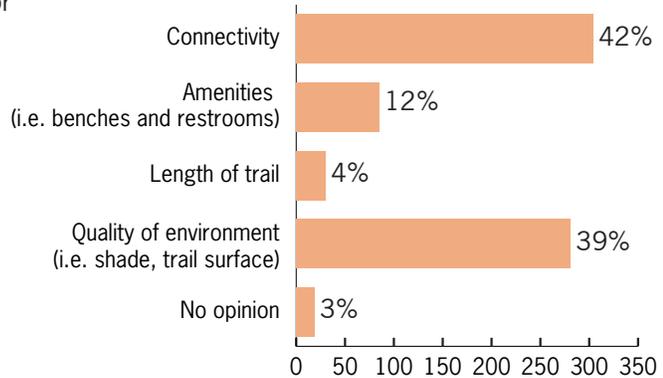


- Respondents overwhelmingly thought the community trails system should focus on meeting the needs of pedestrians (walkers and runners, 78 percent) and bicyclists (65 percent). Only five percent felt a need for equestrian facilities.
- Respondents overwhelmingly emphasized connectivity (42 percent) as the most important consideration in trail system development, followed by quality of environment (shade, surfacing material, 39 percent). Only four percent were concerned about providing trails of adequate length.
- Over half of all respondents felt that parallel sidewalk trails (sidepaths) and striped bike lanes on major streets, should constitute the main elements of Centennial's trails system. About one-quarter felt a need for striped bike lanes on minor streets, or signed shared roadways.

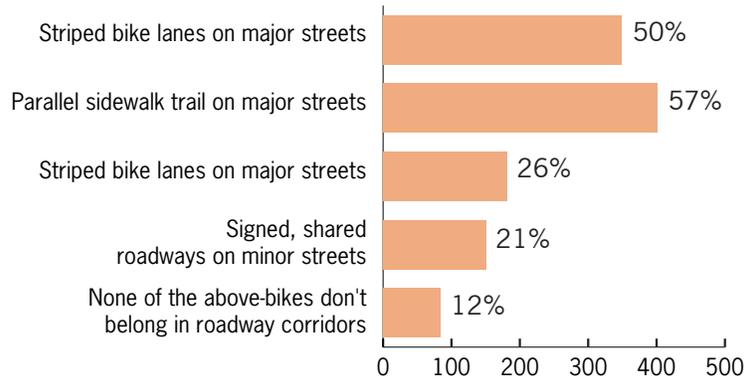
**Which user groups have the greatest need for access to more miles of trails? (May select more than one)**



**Beyond safety, what aspect of trail development and use is most important to you?**



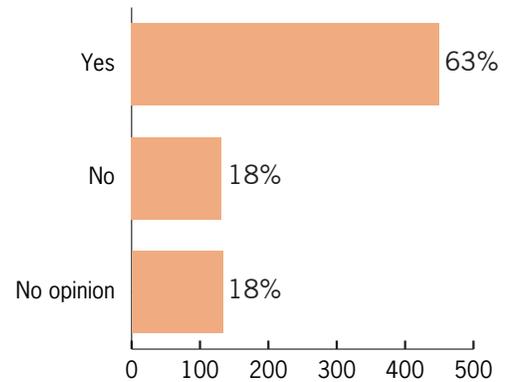
**Which of the following should be included in Centennial's trail system? (May select more than one)**



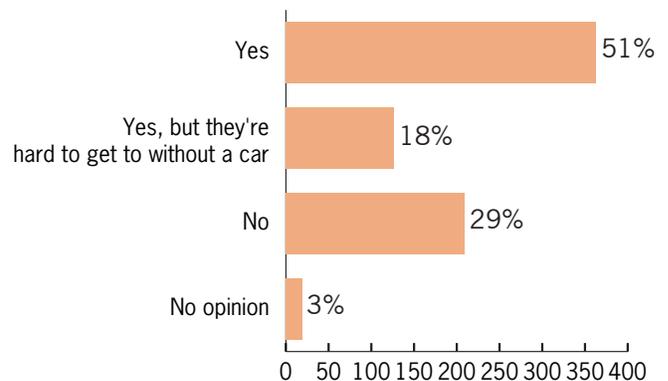
*Parks and Recreation  
Utilization and Needs*

- Close to 30 percent of Centennial residents are very frequent parks users, visiting at least five times in an average month. Another 49 percent visit between one and five times.
- Residents also use regional facilities nearby, with 35 percent routinely using Cherry Creek State Park and another 30 percent each using South Platte Park and Westlands Park in Greenwood Village.
- Sixty-three percent report that they would like to have a large community park within the City that could host festivals and larger community gatherings.
- Most (69 percent) feel that the various parks and recreation agencies are doing a very good job of providing parks in close proximity to where they live or work, although 18 percent feel that they can be difficult to get to without a car.

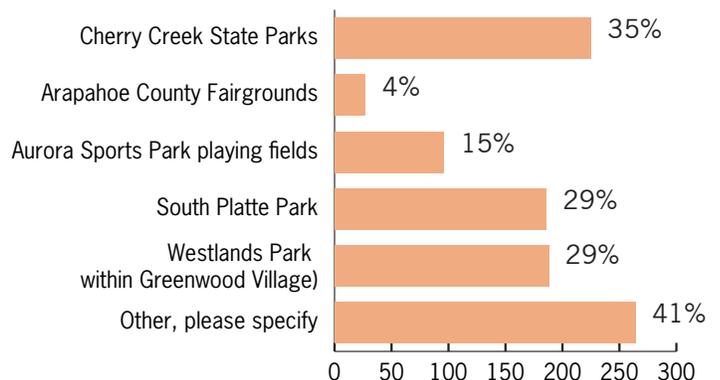
**Does Centennial need a park that can host large community gatherings or festivals?**



**Are there enough parks close to where you live or work?**

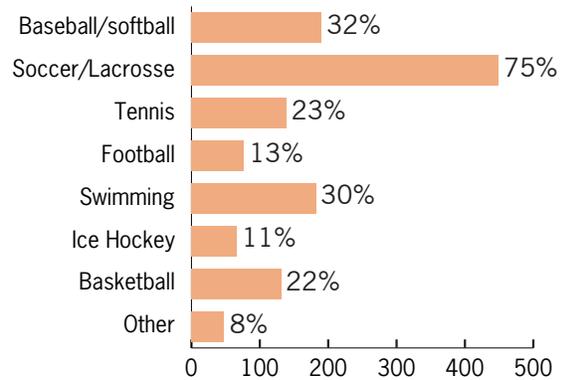


**What are some of the regional facilities that you use most often? (May select more than one)**

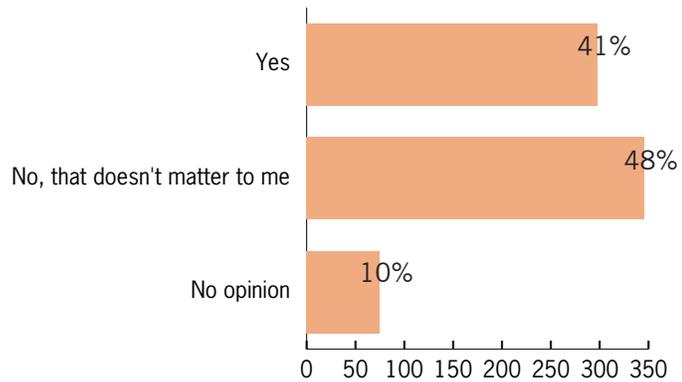


- Seventy-five percent feel a need for more multi-purpose fields that could be used by soccer and lacrosse teams. This sentiment is most prevalent among residents of Ward III, and very prevalent (85 percent) among residents who did not know which ward they lived in.
- Thirty two percent of residents indicated a need for more baseball and softball fields, with 30 percent suggesting a need for a pool that could support swim meets.
- Reflecting a sensitivity to water conservation as well as the incorporation of small patches of habitat, an overwhelming percentage of respondents (79 percent) would like to see parks incorporating more native areas or natural open space, not just manicured turf lawns.
- Respondents were split on whether the community should invest in distinctive signage to mark parks and trails as within the City of Centennial; 48 percent did not think that this mattered, while 41 percent thought it would be a good idea.

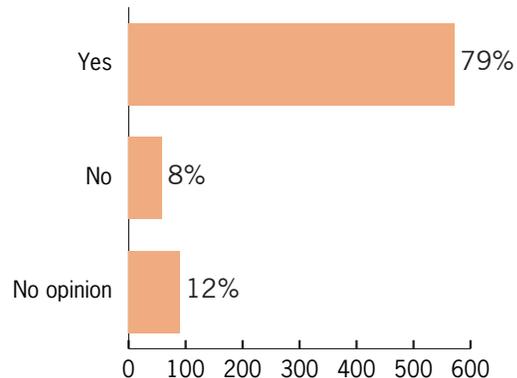
**Are there needs for athletic facilities?  
(May select more than one)**



**Should parks, trails, and facilities in Centennial, be identified as part of Centennial, through the use of signage, logos, or distinctive materials or furnishings, even if they are operated by special districts?**



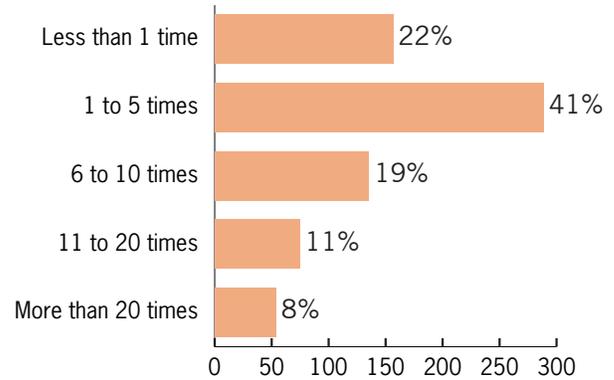
**Would you like to see more parks incorporating native areas or natural open space, in addition to turf lawns?**



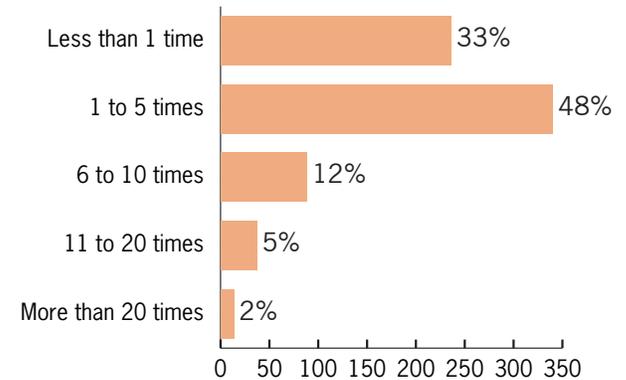
### Open Space Utilization and Needs

- Most respondents (41 percent) indicate that they use Centennial’s open space anywhere between one and five times in a month, but 38 percent visit these areas at least six times in a month, and eight percent report visiting more than 20 times. These percentages are mirrored somewhat when asking about usage outside the City.
- Almost all respondents – 93 percent – believe that the City’s land dedication requirements should be modified to require that more open space and natural areas be preserved when new subdivisions are built.
- Over half think that open space should be preserved entirely because of its underlying natural resource values, including habitat value or scenic quality. Another 28 percent think that passive recreation uses should be considered.

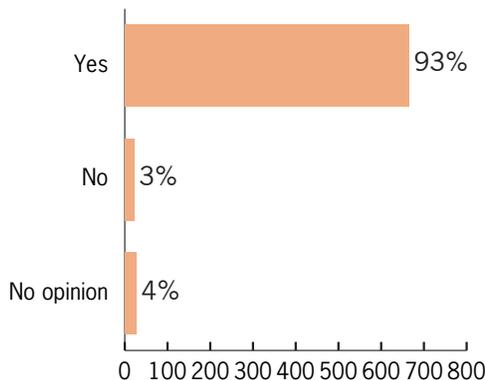
### How often in a month do you use open space in Centennial?



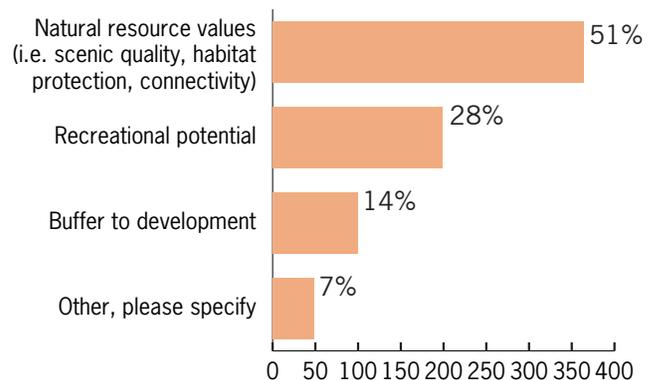
### How often in a month do you use open space outside of Centennial?



### Should Centennial encourage that more open space and natural space be preserved when new subdivisions are built?



### What Criteria are most important in open space acquisition?





*Willow Springs Open Space*

## Conclusions

Results, taken together, suggest that the following issues should be important areas of focus for the Plan:

- Acquisition or preservation of key remaining properties with significant natural resource values;
- Completion of major organizing “spines” of a community trails system that connects key destinations and that links to regional recreational and commuting corridors;
- Selective improvement of the parks system, with possible consideration of a large community gathering space; and
- Addressing perceived needs for athletic facilities.

# 4

## “Green Space is our Outdoor Living Room:” A Comprehensive Vision



*Centennial parks are the heart of the Community*

### Plan Vision

Centennial residents are deserving of a great green space system! To elevate a system that is presently *very good*—and that residents appreciate—to one that is *great*, this Plan focuses on:

- Strengthening connectivity through a rich network of trail connections and through strategic acquisitions of contiguous parcels;
- Addressing equity issues, especially on the east side;
- Strengthening its organization around the nine prairie drainageways that constitute the City's most valuable natural resources;
- Using this structure to create a memorable, imageable system;
- Encouraging the creation of unique spaces with unique elements; and
- Making our green spaces places of celebration and community events.

“Green space is our outdoor living room” is a phrase that captures the overall vision set forth in this Plan. It is a vision for a preeminent green space system that embodies greatness - a system that:

- Establishes parks at the heart of neighborhoods’ and the community’s social life;
- Preserves open space as the City’s prairie heritage, as “breathing space: in the city, and to perform ecological functions such as cleansing storm runoff; and
- Takes advantage of the community’s significant major drainageways as opportunities for trail corridors and connections, to knit this system together into a cohesive whole.

The remainder of this chapter outlines the five major goals, principles and performance measures that support this vision.

## Goals, Performance Measures and Principles

Five core goals and related principles support this vision and anchor the plan. While goals and principles are typical components of any planning effort, performance measures have also been added as a way to gauge progress from year to year and communicate that progress to the community.

### *GOAL 1: CREATE WELL-CONNECTED PUBLIC SPACES*

An interconnected open lands system – parks and open space linked by drainageway corridors and trails, has emerged as a recurring priority for Centennial residents.

### *Goal 1 Performance Measures*

- ✦ Neighborhood parks ideally to be provided within a 10-minute walk of home
- ✦ Public access to open space is compatible with underlying resources
- ✦ Trail segments to be funded based on completion of priority missing links and improved connectivity

### *PRINCIPLES:*

- 1.1 Design trail connections to link open space, parks, recreation facilities and other public places (schools, libraries) into an integrated system.
- 1.2 Utilize existing natural or man-made corridors (drainageways, utility corridors) to support connections where feasible.
- 1.3 Where off-street trail connections are infeasible, ensure that safe and user-friendly on-street connections are provided that maximize separation between pedestrians/cyclists and vehicles, that make street crossings safe, and that provide a pleasant experience.
- 1.4 Identify parks and open space acquisitions that provide physical connections to adjacent open lands and fill in “gaps” in the system. A physically connected “green space” system can strengthen community identity and buffer Centennial from adjacent communities.
- 1.5 Working in concert with broader land use objectives, identify infill sites that can support construction of new parks in areas of need.
- 1.6 Partner and coordinate with District, County, and neighboring municipalities complete inter-community and regional connections.

### Goal 2 Performance Measures

- ✦ Prioritize the acquisition or protection of the highest-value lands first
- ✦ Adopt a “land bank” strategy for valued parcels – with future park or facility development plans to follow based on compatibility with underlying resource values and needs
- ✦ ALL acquisitions should be targeted based on evaluation criteria that reflect residents’ values – don’t simply “buy what’s available”

#### GOAL 2: ESTABLISH A STRONG COMMUNITY IMAGE AND IDENTITY

The qualities that residents value provide direction regarding the types of properties that should be acquired in the future, and the care with which they should be developed.

The following concepts represent just some of the ways open lands can shape community image, form, and identity:

- creating park sites for the celebration of community events;
- incorporating public art into parks, open space and trail locations; and
- distinguishing Centennial’s boundaries and entries with unique and high quality monumentation.

#### PRINCIPLES:

- 2.1 Implement evaluation criteria for assessing potential acquisitions that capture important community values: views, preservation of remaining natural areas, and connectivity.
- 2.2 Acquire and/or develop “signature” facilities or properties that become important landmarks for the community. These may include premium open

space properties, developed parkland, and a well connected trails system.

- 2.3 Acquire and/or develop properties that are physically contiguous and form a connected system. A well-connected “green space” system will help to establish a strong community identity.
- 2.4 Establish a consistent identity and signage program that allows residents and visitors to easily recognize City properties and facilities.
- 2.5 Incorporate distinctive public art into open space and parks where feasible and appropriate.

### Goal 3 Performance Measures

- ✦ Acquisitions to be targeted based on criteria that reflect residents’ values
- ✦ Facilities to be developed or renovated according to US Green Building Council guidelines where feasible

#### GOAL 3: PRACTICE SOUND STEWARDSHIP OF OPEN LANDS

This goal addresses several values shared by members of the public: preservation of significant natural resources, accommodating human use in a manner that preserves the underlying resource, and using materials and technologies that are environmentally responsible and sustainable.

#### PRINCIPLES:

- 3.1 Develop and implement a varied menu of tools and strategies to creatively protect and preserve significant lands and wildlife.
- 3.2 Establish clear guidelines for public use of open space areas that are grounded in their inherent natural resource values, and that provide for public enjoyment that does not compromise these inherent qualities.
- 3.3 Encourage practices for site and building design that are environmentally sustainable and implementable where feasible.

### *Goal 4 Performance Measures*

- ✦ Neighborhood parks ideally to be provided within a 10-minute walk, or six blocks of home
- ✦ Community parks ideally to be provided within a 2.5 mile radius of home
- ✦ At a minimum, maintain existing levels of service for park acreage provided.
- ✦ Future needs for athletic facilities to be based on current level of service adjusted for changes in utilization patterns.

#### *GOAL 4: DEVELOP A PROACTIVE APPROACH TO MEETING FUTURE NEEDS*

This goal is designed to ensure that facilities and programs are developed proactively, in advance of population growth, rather than simply reacting. It also addresses the need to accommodate yet-unknown future recreational desires and preferences within the community.

#### *PRINCIPLES:*

- 4.1 Regularly analyze performance against established measures for access and acreage to identify areas for improvement. Regularly update buildout projections and locations for residential growth to update projected needs for facilities.
- 4.2 Regularly analyze resident participation in organized athletic leagues, and league utilization of Centennial facilities, to ensure that an appropriate level of facilities is provided. Analyze out-of-community utilization of Centennial facilities, to develop reimbursement policies that ensure that their utilization of facilities is accompanied by appropriate compensation.
- 4.3 Establish clear guidelines for accommodating emerging recreational needs and preferences into existing community lands, and on lands that may be provided by private partners.

- 4.4 Establish strategic partnerships with surrounding communities to provide for shared facilities and “specialized use” facilities that may serve the entire region.

#### *GOAL 5: ENSURE EQUITABLE DISTRIBUTION OF FACILITIES*

This goal is intended to ensure that all areas of the city have comparable access to open lands, parks and recreation facilities and programs, and trails.

#### *PRINCIPLES:*

- 5.1 Regularly analyze performance against established measures for access and acreage for major geographic areas of the city. Identify areas falling below 50 percent of the established service standard and target these areas for improvements.
- 5.2 Ensure that all facilities are physically accessible to populations with disabilities.
- 5.3 Ensure that facilities and programs are available to all residents regardless of income.

# 5

## Criteria for Investment Decisions



4th of July parade at Holly Park

### The “Top of the List”

In the three chapters that follow, a number of recommendations are made about potential acquisitions or easements, or specific projects that could enhance the community’s green space system. To begin to arrive at these recommendations, the planning team and Advisory Committee developed a series of criteria that can be applied to evaluate whether a particular project is a sound investment opportunity for the City.

*These criteria were developed not simply in the interest of allocating open space sales tax shareback and CTF funding, but also to guide investment decisions moving forward—to ensure that projects would be undertaken that added significant value to the community.*

The “top six” criteria that have served as a guide for subsequent recommendations, include the following:

- Benefits many Centennial residents—the City as a whole, or major portions of the City where there is a need for parity.
- Completes a major “missing link” or missing piece of the green space system.
- Highly visible, a source of community pride.
- Strong level of community support.

- Strong financial partnership opportunities—with special districts, schools, or other entities.
- Project would not otherwise happen without the investment.

These criteria were used as an initial “first step” in screening potential opportunities, as described below.

### Evaluating Potential Opportunities

To address the goals established in Chapter 4, the planning team considered a number of opportunities within the community that might help to enhance the City’s green space system.

As suggested in Chapter 2, Centennial presently has very little undeveloped land that might be acquired for open space or parkland. However, there are a number of areas within the central portion of the community that might represent possibilities: they are located along major drainage corridors and this have inherent natural resource values; many connect well to the existing green space system; and other areas are large enough to provide significant community parkland or athletic facilities.

The planning team examined approximately 65 undeveloped areas throughout the community, ruling out those with approved development plans or that were

either too small to be of significant value or that were not well-connected to the existing system. Remaining areas and projects (including “missing links” within trail corridors) were then evaluated against the criteria described above. This screening resulted in a total of approximately 75 projects—23 involving potential acquisitions or easements and 43 involving completing missing links in the trails system. These are discussed in Chapters 6-8 that follow.

### Evaluating and Prioritizing Potential Open Space and Parkland

As a further step in guiding sound acquisition decisions, additional criteria were developed to gauge the suitability and desirability of a particular area to support open space or parks functions. Exhibits 5.1 and 5.2 summarize those criteria for open space and parks, respectively.

### Feasibility Evaluation Criteria

An additional set of criteria that address feasibility of acquisition, were also developed (see Exhibit 5.3). Unlike the environmental and functional criteria listed in Exhibits 5.1 and 5.2, a site’s ranking against these feasibility criteria may change over time: for example, the property owner’s willingness to sell may increase, making the site a higher priority for acquisition.

## EXHIBIT 5.1: OPEN SPACE SUITABILITY CRITERIA

Characteristic	Objective	Characteristics of the Area	Area Rating
Scenic Land Quality	Protect scenic quality and community identity	Land is scenic, covers a ridgeline, provides a backdrop to a prominent landscape such as Rocky Mountains or foothills, or is in the viewshed of an important entryway into or corridor.	High Medium Low
Connectivity	Create a system of connected open spaces	Land is adjacent to large protected or planned open space area, trails, or other protected land.	High Medium Low
Environmental Quality and Wildlife Habitat Value	Protect environmental quality, including critical wildlife habitat and natural features	Land provides habitat for wildlife (e.g., may include rare, threatened, endangered species, or habitats or plant communities, or may serve as a wildlife movement corridor) and/or it contains unique natural features such as: large mature trees and stands of trees; wetlands and other water features such as streams, ponds, and lakes; native or indigenous vegetation.	High Medium Low
Passive Recreation and/or Education Value	Provide passive recreation and educational opportunities	Land would offer unique passive recreation and/or educational opportunities.	High Medium Low
Historic or Archaeological Value	Preserve historic or archaeological resources	Land contains historic resources or known archaeological resources	High Medium Low
Green Edge	Create a buffer between Centennial and other communities	Location of land contributes to the creation of a green edge around Centennial.	High Medium Low
Accessible	Acquire open space and trails facilities that are accessible to the community via designated trails and bikeways, transit, and auto	Parcel or area is within a 15-minute walk from neighboring areas.	High Medium Low
TOTAL POINTS			

**EXHIBIT 5.2: PARKS SUITABILITY CRITERIA**

Characteristic	Objective	Characteristics of the Area	Area Rating
<b>Accommodates Specific Park Type and Program:</b>			
<b>Accommodates community park program and facilities (21 – 80 AC)</b>	<b>Address needs for community parks</b>	Area meets/exceeds size criteria and could accommodate community park program elements	
<b>Accommodates neighborhood park program and facilities (3 – 20 AC)</b>	<b>Address needs for neighborhood parks</b>	Area is 12 acres or larger and could accommodate neighborhood park program elements	
<b>Additional environmental criteria</b>			
<b>Offers suitable terrain</b>	<b>Acquire parkland that can accommodate intended uses without extensive earthwork</b>	Area is highly suitable for intended uses, with minimal earthwork required.	<b>High Medium Low</b>
<b>Offers significant natural features or views</b>	<b>Acquire parkland that possesses significant natural or character giving features or views</b>	Area possesses significant unique natural features such as mature trees or stands of trees; wetlands; drainageways or other water features; geologic formations such as rock outcrops; native/indigenous vegetation; or views. These facilities would not be compromised by intended park use.	<b>High Medium Low</b>
<b>Minimizes parking and circulation impacts</b>	<b>Minimize traffic and parking impacts to adjacent neighborhoods from intended park use</b>	Area can accommodate intended park use without significant traffic and parking impacts.	<b>High Medium Low</b>
<b>Maximizes Accessibility</b>	<b>Acquire park sites that are accessible via car, transit, designated bikeway and trails</b>	Area is accessible by multiple modes and will accommodate intended use.	<b>High Medium Low</b>
<b>Facilitates connectivity</b>	<b>Create a system of connected open space, parks, and trails</b>	Area would help to create significant connections between existing and/or planned open space, parks, and trails and other community facilities.	<b>High Medium Low</b>
<b>TOTAL POINTS</b>			

## EXHIBIT 5.3: ECONOMIC FEASIBILITY CRITERIA

Criterion	Objective	Description	Checklist
Threat from Development	Protect properties that face imminent development or resource extraction.	Parcel is for sale or is likely to be developed or have resources extracted within one year. The potential for mineral development and cost of purchasing mineral rights should be evaluated.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Efficient Use of Program Funds	Use program funds efficiently and leverage local funds whenever possible.	Funds or options are available to leverage the cost of purchasing the parcel (e.g., partial gift, grants, conservation easement). Price is fair and reasonable given land sale comparisons or an appraisal, and future infrastructure costs are identified as these costs will potentially now become the responsibility of the city if the land becomes public—infrastructure includes road, water, sewer, and other improvements. Other potential uses that could be developed on the property need to be considered in light of designating the parcel for open space or park uses.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Seller Motivation	Work with willing and motivated landowners.	Landowner is willing to negotiate and may be willing to consider financing options to reduce s cost.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Level of Community Support	Conserve properties that receive a high level of community support or are high visibility.	The local community has evidenced strong support for the project (e.g., organized efforts such as letters, meetings, or background research), and the project will benefit more than one neighborhood.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Partner Participation	Work with partners to acquire and manage open lands.	Another partner or partners are committed to participating in sharing capital or maintenance costs for the parcel.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Management	Manage and maintain properties over the long term in a manner that is efficient and effective.	Parcel will be monitored and maintained over the long-term by an entity other than Centennial, or Centennial will share management responsibilities and costs.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Administrative Ease	Make efficient use of staff resources and time.	Parcel will not require excessive staff resources or time to acquire when weighed against the benefit of the acquisition	<input type="checkbox"/> Yes <input type="checkbox"/> No
Liability	Limit Centennial's future liability	Parcel has no significant liability implications (e.g., oil and gas well environmental concerns, storage of vehicles, etc.).	<input type="checkbox"/> Yes <input type="checkbox"/> No
TOTAL POINTS			

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# 6

## Recommendations For Open Space



Cherry Creek Valley Ecological Park

This chapter provides specific recommendations for future open space acquisitions in Centennial, and for maintaining and managing open space properties. Candidate areas for possible acquisition were identified based on a number of factors, including areas that were presently undeveloped, and areas of significant ecological value as described in the previous chapter.

### *Resident Survey Highlights Concerning Open Space*

- ✦ Almost 90 percent of residents use open space regularly – more than five times in a given month
- ✦ A majority of residents feel acquiring more open space is the community's top priority
- ✦ Over 50 percent feel that open space should be preserved because of natural resource values, and 14 percent feel that it should be preserved as a buffer to development
- ✦ 93 percent of residents feel that more open space and natural areas should be preserved when new subdivisions are built

## Recommendations for Open Space Acquisition

**Recommendation:** *Acquire additional open space (easements and parcels) along major drainageways to create a connected system.*

Unlike other communities, where large expanses of undeveloped lands may still exist at the perimeter, in Centennial the majority of undeveloped land is within drainageway corridors and associated floodplain areas. The opportunity exists to preserve these high-value riparian corridors, for wildlife habitat and for trail corridors where suitable.

Exhibit 6.1 illustrates potential open space acquisition opportunities, or opportunities for significant easements to provide wildlife and trail corridors. The majority of these opportunity areas are located along key drainageways, in particular, along Cottonwood and Lone Tree Creeks (see areas 10, 11, 14, and 15). Other opportunity sites are located along a greenway corridor that could begin to connect the Piney Creek and West Tollgate Creek corridors (areas 20 and 21).

Other areas have been identified that may provide opportunities for joint open space and parks uses. These include areas 8 and 12, located along a branch of Cottonwood Creek, and area 4, which once was a farm. In addition, there are areas east of E-470 that may provide opportunities for acquisition partnerships with Arapahoe County Open Space, to create a large regional green space system similar to Jefferson County Open Space.

Potential costs of acquiring each area are as follows, assuming average land costs of \$250,000 per acre:

<b>Area</b>	<b>Acres</b>	<b>Potential Cost</b>
8	10-20	\$2.5 – 5 million
10	8-10	\$2 – 2.5 million
11	15	\$3.75 million
12	22	\$5.5 million
14	38	\$9.5 million
		(multiple areas involved)
15	8-10	\$2 – 2.5 million

Outright acquisition is not the only mechanism that could be employed to preserve these key areas. Other mechanisms include conservation easements, purchase by conservation partners such as the Trust for Public Land, or preservation through enhanced environmental features protection standards that could be incorporated into land dedication requirements. Other opportunities include partnering with the Southeast Metro Stormwater Authority, as noted below.

**Recommendation:** *Work with the Southeast Metro Stormwater Authority as they plan drainage projects, to jointly identify opportunities for channel enhancements and trail connections.*

The Southeast Metro Stormwater Authority (SEM-SWA) was formed in September 2006 via an Intergovernmental Agreement between the City of Centennial, Arapahoe County, the Arapahoe County Water and Wastewater Authority, East Cherry Creek Valley Water and Sanitation District, and Inverness Water and Sanitation District. This agreement was the outgrowth of several years of studies by the IGA members, a local task force, and a steering group which recommended the formation of the Authority as the solution to the area’s stormwater challenges.

INSERT  
EXHIBIT 6.1  
POTENTIAL OPPORTUNITIES

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The Authority was formed in order to protect people and property from flooding, to comply with unfunded federal environmental regulations, and to provide a funding mechanism so that the stormwater services can be provided. The Authority also will implement the many remedial and capital projects that are needed to maintain and upgrade stormwater infrastructure. Current identified stormwater improvement projects are estimated to cost \$76 million.

Partnering with SEMSWA for drainage corridor improvements may provide an important mechanism for habitat restoration as well as trail corridor construction. It is anticipated that SEMSWA will operate in a manner similar to the metro-area Urban Drainage and Flood Control District, which assists municipalities with both drainage master planning as well as capital repair, but which also encourages funding for restoration and trail corridors. Partnering may be an important way to leverage public dollars for “multiple benefit” projects.

### **Additional Management and Policy Recommendations**

In addition to identifying opportunities for acquisition or easements, the Master Plan has also recommended additional management actions and policies to strengthen Centennial’s open space system.

***Recommendation:** Work with District partners to incorporate more native areas/habitat into parks.*

Almost 80 percent of Centennial residents who responded to the community needs assessment survey thought the more natural open space should be incorporated into parks, either through retrofit-

ting existing facilities or as new parks are designed. Such measures would provide small patches of native areas that could increase habitat value for birds, butterflies and small mammals, provide visual relief from development, and reduce the need for irrigation and consumptive water use. Implementing such measures would necessitate support from South Suburban and Arapahoe Parks and Recreation Districts, whose involvement would be necessary for the conversion and management of these native areas.

***Recommendation:** Explore opportunities to incorporate additional environmental quality protections into land development code/regulations so that “quality” lands are preserved, e.g.:*

- *Establish minimum buffers along riparian areas*
- *Encourage preservation of mature trees and landscape*
- *Encourage restoration of native vegetation in disturbed areas*

Many communities have begun to modify their land development code to provide more specific requirements for the protection of significant environmental features, including wetlands, streams, and water features, mature trees and stands of vegetation. Presently, Centennial’s development code does not address these areas; the following modifications are proposed to provide additional protections.

#### ■ *DRAINAGEWAY AND STREAM (RIPARIAN) CORRIDOR PROTECTION*

Many communities are choosing to require setbacks that vary based on the type of stream, water corridor, or wetland to protect water quality and other ecological values. The following recommendation sets



*Willow Creek*

forth more specific setbacks to allow for protection of riparian areas and allows for mitigation when it is not feasible to meet the setbacks.

- Establish a minimum 50-foot setback requirement from the edge of perennial and seasonal stream banks to the lot line that does not have mature trees. When the stream bank is not determinable, measure 50-feet from the centerline.
- Establish a minimum 100-foot setback from the edge of perennial and seasonal stream banks to the lot line for riparian corridors with mature trees to minimize disturbance to wildlife habitat. The setback should preserve the outermost edge of the land beneath the tree canopy and allow for a buffer area between the developed area of the site and the vegetation located along the stream. In areas where significant habitat exists along the stream bank, a setback greater than 100 feet may be necessary to preserve habitat and wildlife corridors. A site-specific assessment will assist staff in determining the appropriate setback.

- Establish a minimum 50-foot setback from the edge of wetlands.
- Establish a minimum 100-foot wide setback for high-quality wetlands along a drainageway around a marsh or pond to minimize disturbance to wildlife habitat.
- If no feasible alternatives exist for complying with the setback and it creates a physical hardship, a variance may be requested or a portion of the stream channel may be altered, relocated, or piped if restoration is provided. Restoration of wetlands should occur at a 2 to 1 ratio. On-site restoration is strongly encouraged if the end result will be a wetland similar in character to the naturally occurring wetland or stream corridor. In some instances, it may be appropriate to create a wetland that differs in plant species from the impacted wetland to encourage plant community diversity.

#### ■ *TREE PRESERVATION*

Mature trees are a significant asset to any community, as they provide habitat for nesting birds as well as contribute to the landscape character. Increasingly, communities are requesting that developers take steps to preserve mature trees as an integral feature of their projects.

The City of Fort Collins is the model for the recommendations below. The City of Arvada has similar tree preservation and replacement requirements. Another useful resource is: “Tree Conservation Ordinances,” (Duerksen and Richman, 1993) for an example of tree conservation ordinances and rationale for conserving trees.

Centennial's development code might be modified to include:

- Protect large mature trees or “specimen trees” (e.g., trees greater than six-inch caliper at diameter breast height (DBH) should not be removed),
- Protect certain species (e.g., cottonwoods or other desirable species should not be removed, but invasive species such as Russian Olive trees should be removed), and where it is not feasible to protect and retain significant existing tree(s) or to transplant them to another on-site location, the developer shall replace trees to mitigate the loss of value of a removed significant tree, and follow a schedule and requirements for replacement trees.
- The value of trees to be lost is to be determined by a qualified landscape appraiser using the most recent published methods established by the Council of Tree and Landscape Appraisers.
- The developer must replace trees lost with a tree or trees that are equally valued --- up to six replacement trees per every removed tree.
- Replacement trees must meet the following minimum size requirements: canopy shade trees three-inch caliper balled and burlap or equivalent; ornamental trees two and one-half inch caliper; evergreen eight-foot height balled and burlap.
- Adopt tree protection specifications, including no cut or fill within drip line, and erection of barriers prior and during construction.

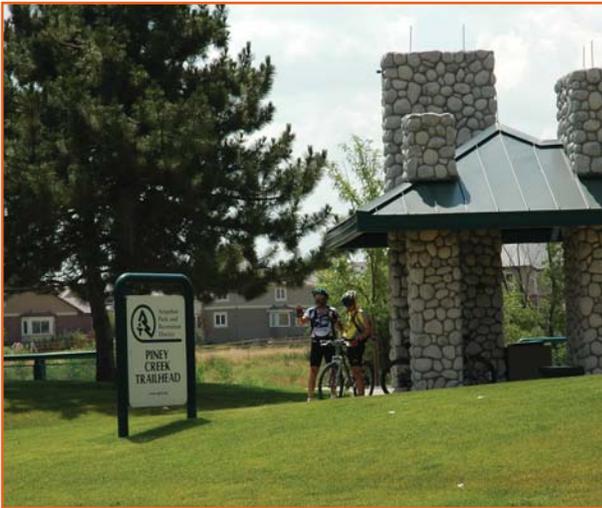


*Cherokee Trail Park*

#### ■ RESTORING NATIVE VEGETATION IN DISTURBED AREAS

By encouraging the restoration of native vegetation in areas that have been disturbed due to construction the need for water to maintain landscaping in the future can be minimized.

- Amend the Code to add general language to require the use of native seed mixes, as well as shrubs and trees if water is deemed adequate for use in disturbed open space areas and other areas disturbed by construction where appropriate. Centennial could develop several approved seed/plant palettes for moist or dry sites. A developer may propose another plant palette but it would need to be approved by Centennial development review staff. Temporary irrigation may be necessary for some restoration plans.



*Typical signage marking Arapahoe Parks and Recreation District parks, trails and open space*

***Recommendation:*** Establish an open space and trails signage program to ensure that properties are identified as within the City of Centennial.

This is one of the more inexpensive recommendations that could be implemented, and could begin to add immediate value. A well-designed signage program can:

- Increase residents' awareness of community open space properties
- Provide wayfinding information along trail corridors
- Provide directional and regulatory information, including prohibited uses
- Provide interpretive information

Ideally, a “family” of signs should be developed, that include identification signs (large signs that announce an open space area, for example), directional and regulatory signs (located along trails and incorporating a map of the trails system as well as trail etiquette), and possibly trail mile markers. Materials and technology should be selected to ensure that

signs can be maintained easily. Where feasible, preference should be given to the use of recycled materials.

***Recommendation:*** Create an accurate, user-friendly and easy-to-read map of the open space, trails and parks system. Make this available to residents in hard copy form and in digital form on the website.

This is perhaps the most inexpensive recommendation to implement, and would provide a real resource to Centennial residents seeking to take advantage of the City's “green space” system.

Presently, residents must find this information from multiple sources, including South Suburban and Arapahoe Parks and Recreation District. Providing comprehensive community-wide mapping and illustrating regional connections, would make it much easier for residents to use the system and understand how to connect to major regional trails.

# 7

## Recommendations For Parks And Recreation Facilities

This chapter examines current and future needs for parks and recreation facilities, provides recommendations for acquisition, and recommends additional management and maintenance guidelines where appropriate. Candidate areas for possible acquisition were identified based on a number of factors, including areas that were presently undeveloped, size, access, and suitability of terrain to support park and recreation functions without significant earthwork.

### Recommended Level of Service Standards for Parkland

Through the efforts of South Suburban and Arapahoe Parks and Recreation district, Arapahoe County, other smaller special districts, and private developers, Centennial presently enjoys approximately 1,368 acres of parkland: 464 acres of public parks and 904 acres of private parklands maintained by Homeowners' Associations. With some exceptions, much of this private parkland is accessible and useable by residents in the surrounding area, irrespective of whether they belong to the Homeowners' Association that is responsible for them. With a population of just over 100,000 residents, this works out to just under 14 acres of parkland provided per 1,000 residents – a figure comparable to that provided within Greenwood Village, and a little over three times the per capita parkland provided in the Town of Parker.

Presently, Centennial's Development Code requires the dedication of 6 acres per 1,000 residents for all new subdivisions, or equivalent cash-in-lieu (Section 11.2.100, July 2005). The community is projected to grow by an estimated 19,000 persons through 2030, according to forecasts supplied by the Denver Regional Council of Governments (DRCOG, 2006). Applying these dedication requirements should increase Centennial's parkland by an estimated 114 acres, or equivalent cash-in-lieu.

Centennial residents seem very satisfied with the amount of parkland in the community; 68 percent of residents surveyed report that there are enough parks in close proximity to their home or workplace, and with the exception of the eastern portion of Ward III, most Centennial residents live within  $\frac{1}{4}$  mile of a park. Thus, this Plan does not recommend changes to the existing parkland dedication requirement. It does, however, make the following policy recommendation:

**Recommendation:** *Maintain prevailing standards of walkability and access in all new developments, such that parks are provided within  $\frac{1}{4}$  mile of residents' homes, where feasible.*

## Recommendations for Specific Types of Parks and Programming

As noted earlier in Chapter 2, Centennial's public parks are largely neighborhood-scale parks, between three and 20 acres in size. Of the 464 acres of public parkland, 263 acres, or 57 percent, represent neighborhood parks, and as noted above, with the exception of the eastern portion of Ward III, they are very well-distributed throughout the community.

As is the case with many municipalities, Centennial does not have as many larger community-scale parks of more than 20 acres in size, and the ones it does have are at the smaller end of the spectrum, averaging 25 acres. Holly Park is the largest community park, at 40 acres. When queried, 63 percent of residents surveyed indicated they thought Centennial needed a larger park (30 to 50 acres in size) that could support community events and festivals. Accordingly, the Plan makes the following recommendation:

***Recommendation:*** Consider “land banking” for a future large community park in center city.

The notion of “land banking” is a concept that is practiced by many communities, using the proceeds from their Parks and/or Open Space sales tax. Desirable parcels are identified, purchased, and held for the long term, even if there is no immediate plan for how the site will be used. Over time, a use plan is developed and improvements at the site are financed, either through bond issues or the General Fund. Given the anticipated appreciation in land prices, purchasing while prices are favorable and then “banking” the land, can be a wise investment.

The center city location is recommended for two reasons. First, most of the available, undeveloped land is located in the central portion of the community; while these properties are presently zoned commercial, they could be re-zoned to provide for parkland. More important, however, is the opportunity to create a park that is at the community's “heart,” that brings together the neighborhoods west of I-25 and east of Parker Road, and that would be in close proximity to other civic facilities, including the city office building and county library.

Indeed, one suggestion that was made was to create, over time, a “city center” that might be similar to Lakewood's City Center and to Broomfield's. In each of these cities, municipal facilities, parks, athletic facilities, libraries, recreation centers and retail are variously combined on the same site to provide a rich mix of civic and public facilities and destination shopping. Sufficient undeveloped land exists within the central portion of Centennial to provide for such a concept.

***Recommendation:*** Encourage the creation of parks that can serve special and unique functions and purposes.

A related suggestion that merits consideration is the creation of unique and special parks, or areas within parks, that would serve as major attractions for the community. Examples included a memorial garden, which could honor loved ones or veterans, and where residents could donate pavers, inscribed benches, artwork, or trees, in memory of a loved one. Other examples might include a “sensory garden” which could appeal to adults and provide learning opportunities for children, or an art walk/sculpture garden. Similar facilities in other communities have proven very popular and have encouraged donations.

**Recommendation:** Evaluate opportunities to provide additional off-leash dog areas, and provide suitable amenities, including fencing, water, and dog waste stations.

Many Centennial residents have expressed interest in additional off-leash dog areas. The Plan recommends that opportunities to provide additional facilities, be evaluated in conjunction with potential partners, including Arapahoe County, SSPRD, and APRD. One such opportunity to explore is at South Adams and South Monroe near Arapahoe Park. The following design principles should be employed to assure human and canine safety and site maintainability:

1. Provide a buffer from surrounding residents such as dense vegetation or opaque fencing.
2. Maintain a 100-foot buffer from a playground or children's facility.
3. Clear separation from athletic fields should be provided.
4. Existing off-street parking should be available.
5. The site should be easily and safely accessible from adjacent/surrounding neighborhoods using pedestrian/bicycle trails.
6. The site must have positive drainage.
7. The site should have an ADA accessible paved path.
8. The off-leash area should be a minimum of two acres.
9. The site should be nonlinear to maximize useable space.
10. The site should have either shade trees or a shade structure.
11. The site should be free of toxic residue from prior site uses.



*Dogs socializing at an off-leash dog park.*

**Recommendation:** In concert with partners, establish a regular program of events in parks to raise awareness and enthusiasm.

One way to build community pride in Centennial's green space system, is to establish a regular program of events that could be hosted in parks – helping to raise awareness, providing a reason to visit regularly, and making them a strong part of the community's social life. These could include summertime "Farmer's Markets," canine agility competitions, music in the park, nature walks for children and adults, and other similar activities. These activities could be developed in partnership with each district, and could be very modest at the outset – to avoid taxing resources. A couple of small pilot projects would be great ways to gauge the level of community interest and support – at the same time as they could be covered in the media and used as a way to "advertise" Centennial's green space assets. Over time, offerings could be expanded based on demand and availability of resources; it is also likely that there may be volunteer groups in the community who may be interested in supporting or organizing events.

## Recommendations for Parkland Acquisition

Exhibit 7.1 illustrates potential parks acquisition opportunities. As is the case with potential open space acquisitions, many sites are located in the center of the community, along Cottonwood and Lone Tree creeks. This is where the largest concentration of undeveloped parcels are located, and they would also support the concept of a centrally located community park. There are comparatively fewer undeveloped areas within the east side of Centennial, though several opportunities have been noted below:

- Piney Creek Hollow Park, at 45 acres, and located within the Arapahoe Park and Recreation District, is a good candidate for expansion of a third multi-use playfield, which would expand recreation opportunities available to east side residents. Arapahoe Park and Recreation District has completed all design, approvals, infrastructure and utility stub outs for construction of the playfield.
- Partner with the school district to create additional park space, in part or whole, at area 20. This 12-acre parcel is presently undeveloped but could provide a potential joint-use facility at a minimum.
- There are opportunities for smaller parks and trail corridors to be created along the floodplain at area 21.
- There are opportunities to partner with Arapahoe Park and Recreation District to provide a connection to Quincy Reservoir if access issues can be resolved with the City of Aurora.

Other areas are smaller in scale and offer the opportunity for “infill” parks where they are now lacking. Two exceptions include area 4, which is a large site that could provide opportunities for both parkland and open space, and area 6, which includes several

individual parcels totaling approximately 18 acres.

## Recommended Level of Service Standards and Projected Future Needs for Recreation Facilities

Level of service standards and future needs for recreation facilities and playing fields were examined using quantitative data compiled by representatives of teams and leagues who use South Suburban and Arapahoe Park and Recreation Districts field located within the City of Centennial.

South Suburban Parks and Recreation District programs a total of 142 fields at 72 parks throughout the district. Of these, approximately 69 percent – encompassing 98 fields at 29 parks – are located within the City of Centennial. Major teams and leagues using the facilities include the Arapahoe Youth League Panthers (baseball, football, lacrosse), Cherry Creek Youth Sports (baseball, football), Creek Indians Boys Lacrosse, Littleton Soccer, Real Colorado Soccer Club, South Metro Sports (baseball), Colorado Storm Soccer, and Dry Creek Baseball. Arapahoe Youth League and Cherry Creek Youth Sports each estimate that between 50 and 70 percent of their participants are Centennial residents.

At present, the users of South Suburban’s fields indicate that their ability to grow is constrained by the supply of available fields, and that more youth could be served if additional fields were provided. Baseball is estimated to grow by only 5 percent a year, and football by 20 percent a year; growth in soccer participation is stagnant because all available facilities are completely programmed. Lacrosse, on the other hand, is increasing in popularity, but the downside is that these teams compete for the same multi-use fields that serve soccer and football.

In 1998, the District surveyed its many field user

INSERT  
EXHIBIT 7.1  
POTENTIAL OPPORTUNITIES  
(NO TRAILS)

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groups to determine existing and future field needs. At that time it was determined that there would be a need for an additional 26 baseball/softball fields, 6 lacrosse fields, 6 football fields, and 22 soccer fields, through 2003. While some additional fields – primarily at the Davis A. Lorenz Regional Park – have been brought on line, they have not been as many as the 1998 study recommended.

The Arapahoe Park and Recreation District programs fields for Colorado Storm Soccer, Centennial baseball, Spartan baseball and football, and the Cherry Creek Little League. Approximately 65 percent of the District’s programmed fields – representing nine fields, located at two parks and three schools – lie within the City of Centennial. Major users of APRD’s facilities include Colorado Storm Soccer, Centennial baseball, Spartan baseball and football, and the Cherry Creek Little League.

A study of athletic facility needs completed in 2003 (Ballard, King and Associates, 2003) indicates that much of this District’s population base is families with younger children; 26 percent of the District is children aged 5-17, and another 37 percent are ages 25-44. The youth population, in particular, is projected to continue to grow, prompting an increased demand for athletic facilities. This study suggested that soccer is the most popular activity, with 22 percent of youth, on average, participating. Soccer is also popular among the youngest age groups: for youth aged 7-11, about 30 percent of District youth participate, compared to 15 percent of youth 12-17. This is also the case for baseball. Participation in both sports grew by roughly 25 percent between 2000 and 2006.

Two other facilities are located in close proximity to Centennial: the Arapahoe Community Park at Dove

Valley, and the Cherry Creek Soccer Complex. Both facilities are used by the Colorado Storm Soccer Association. Arapahoe Community Park has purchased 25 acres east of the park, which could provide approximately six to eight additional fields. The Cherry Creek Soccer Complex, also known as the Gates Soccer Complex, is being leased by the Storm for a 25-year period that began in 1995, and encompasses 13 fields. The Storm estimates that as many as 20 additional fields would be necessary just to meet the current needs of the District, as participation has increased by 20 percent from 1998—2001.

The Ballard King study also examined utilization of facilities within adjacent communities, to assess whether there was potential for some of the shortfall to be addressed by these facilities. Aurora is experiencing significant pressure for soccer and baseball facilities in the southern area, and has long-range plans to construct a second facility similar to Aurora Sports Park. Even if this facility was constructed today, however, it is expected to be used to its full potential. Parker relies on Douglas County Regional Parks for most of its soccer fields needs, and it is reported that demand is outstripping supply there as well.

Based on this information, and on results from the community needs assessment survey, the planning team attempted to project the number of additional fields and facilities that would be needed to address some of the existing shortfalls in facilities, and continuing from there, to meet demands at buildout. This is a challenging undertaking because the teams and leagues that serve Centennial also serve a good part of the southeastern metro region – so in many ways the projected additional facilities should be considered as responding to the needs of the region, and thus developed through regional partnerships – rather than being provided for by the City of Centennial

alone, or the special districts that serve it.

Based largely on interviews with team/league representatives, and analysis of participation growth and projections, Exhibit 7.1 below suggests that between 12-15 baseball fields and 15-20 multipurpose fields, might be needed to accommodate demands in the southeast metro area. As Centennial – and surrounding municipalities – continue to grow and build out, 10-15 additional facilities might be needed over the next 10-15 years.

Because the demands are felt regionally, this Plan stresses regional partnerships to identify solutions. Financial partnerships with teams and leagues are also stressed, as there are precedents for financial support in constructing and maintaining facilities, provided that land can be acquired by a municipal or district entity.

**Recommendation: Consider intergovernmental partnerships to “land bank” property on the east side, to provide for a regional athletic complex.**

One possible area, shown on Exhibit 7.1, is a 175-acre property located west of E-470 and north of Belleview. This property is deed-restricted and cannot be used for residential or commercial uses. It had been “isolated” from its owner’s other holdings and is no longer useable. Even preserving roughly half the site as open space, it could provide up to eight regulation multipurpose fields (and even more for younger soccer players, who use smaller fields), and four baseball/softball fields. The site is affordable either for the City to purchase, or to purchase as a member of a regional consortium. Team and league partner participation should be sought to provide funding for buildout and ongoing maintenance of the fields.

EXHIBIT 7.2: PROJECTED FUTURE NEEDS FOR RECREATION FACILITIES

Activity	Number of Facilities	Projected Additional Facilities Necessary to Meet Current Needs	Additional Facilities Required to Meet Needs at Buildout Based on Maintaining Adjusted Level of Services
Baseball/Softball Fields	47	+12-15	+10
Football/Soccer Fields	57	+15-20	+10-15
Recreation Center	3	-	May want to undertake significant upgrade to an existing center, such as Goodson
Outdoor Pool	3	+1-2	+1
Indoor Pool	2	+1-2	+1
Outdoor Tennis Courts (does not include HOA facilities)	21	-	-
Skate Park	2	-	+5
Playgrounds (does not include HOA facilities)	26	-	66

**Recommendation: Consider purchasing property outside City boundaries – possibly in conjunction with regional partners – to provide for recreation facilities.**

The site above is located in very reasonable proximity to Centennial, though it is not within the City's current boundaries. Given the relative lack of available land, it may be advisable to partner with Arapahoe and/or Douglas counties, to look for lands somewhat further away, but in locations where lands are plentiful and comparatively inexpensive. This might entail joint purchases for a regional facility – or for lands that could provide for both recreation and open space – perhaps as far east as E-470. Again, the notion of “banking” land to provide for future needs, is a concept that should be emphasized.

**Recommendation: Work with District partners on an ongoing basis to assess needs for upgrades and improvements to existing facilities, and work cooperatively to implement projects that benefit Centennial residents.**

Each of the two major districts' service populations are comprised of Centennial residents: an estimated 50 percent of South Suburban's, and over 70 percent of APRD's. The Plan recommends that the City form an active and ongoing partnership with each district to help fund major capital improvement projects in both parks and recreation facilities that will improve services to Centennial residents. The types of projects that might be considered are an active partnership to “build out” Fox Hill Park, which has not been fully completed due to a lack of financial resources, or a major upgrade to Goodson Recreation Center. It is assumed that routine maintenance would be covered by each district's operating budget, but that such major improvements might represent very beneficial reasons for partnering.



Arapahoe Park and Recreation District would like to consider an active partnership to ‘build out’ Fox Hill Park (left). South Suburban Parks and Recreation District would like to see upgrades to Goodson Recreation Center

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## 8

## Recommendations For A Community Trails System

The trails chapter of the Centennial Parks, Open Space, Trails and Recreation Master Plan is intended to assist the City of Centennial and partner jurisdictions in determining where to focus investments to effectively create a communitywide trails system. This chapter presents recommendations for a network of community trails, defines appropriate facility types to create a system of primary travel corridors, and identifies the “missing links” that must be built to make this system complete.

### The Planning Approach

The proposed Centennial trails system outlined in this plan was created based upon four guiding principles:

- *SUPPORT A VARIETY OF USES* - The trails system should serve many different types of users including walkers, joggers, cyclists of varying abilities, horseback riders, children traveling to school, and adults walking for recreation or utilitarian purposes.
- *PROVIDE A VARIETY OF FACILITIES* – Several trails exist in Centennial, primarily following drainageways. An expanded toolkit of facility types is needed to connect these pieces of existing trails into a cohesive system.
- *CONNECT THE COMMUNITY* – Overcoming barriers and creating connections to a variety of community destinations is the cornerstone of the proposed trail network. Safe access to existing regional trails, between neighborhoods, and to recreation facilities, parks, employment and shopping areas are all important.
- *IMPLEMENT THE SYSTEM* – The City needs a means to prioritize investments to construct key “missing links” in the trail system, as well as to implement a variety of actions to further promote bicycling and walking.

### *Resident Survey Highlights Concerning Trails*

- ✦ 32 percent use trails 1-5 times per month, 51 percent use more than 6 times
- ✦ 25 percent are regular bicycle or pedestrian commuters
- ✦ Connectivity is the most important feature in a community trails system, followed by shade and type of surface

## Who are Centennial's Trail Users?

A majority of residents use portions of Centennial's trails system. People recreate on trails - they go for a stroll, run or bike ride, take the dog for a walk, or simply head toward open space to escape the hustle and bustle of daily life. Others view walking and bicycling as forms of transportation - they use parts of the trail system to go to work, make personal trips, go shopping, or access transit.

This plan intends to accommodate a wide variety of pathway users and uses. To do so, a basic understanding of the similarities and differences between trail user groups is needed.

### *Bicyclists and Pedestrians*

Although bicycling and walking are often considered special interest recreational activities, these modes can also be used for transportation, particularly for short-distance trips. Certain demographics, namely those from low-income households or those too young or too old to drive, rely on non-motorized forms of transportation as their primary means of mobility. Others elect to make utilitarian trips on foot or on bike to incorporate physical activity into their daily

routines, or for ecological, environmental, and energy conservation reasons.

While the benefits of bicycling and walking may be similar, the needs and user characteristics of bicyclists and pedestrians differ greatly. By law, bicycles are vehicles and bicyclists are considered drivers. Bicycles can travel at faster speeds (5-30 mph), cover moderate distances (2.5-mile national average trip length), and require large curve radii for turning movements, gentle grades, and adequate braking distances.

Pedestrians, on the other hand, typically travel at slow speeds (2-4 mph), walk short distances (0.25-mile average trip length) and frequently stop, change directions, and laterally shift their path of travel. These differences require that facility planning address each mode separately.

Activities such as recreational walking, jogging and running may occur on rambling multi-use pathways removed from the street system. However, most utilitarian walking occurs within street rights-of-way on sidewalks, or on walkways within developments that provide access from vehicular parking to building entrances.



Likewise, bicycling may occur on recreational pathways, but a majority of bicycle trips occur on area streets and roadways that provide connectivity to destinations.

### *Types of Bicyclists*

It is generally recognized that there are two types of cyclists: Group A: Advanced Bicyclists, and Group B: Basic Bicyclists. There is also a Group C: Children, whose needs are similar to the basic bicyclists and thus the two are often classified together as Group B/C.

- **GROUP A: ADVANCED** - Composed of experienced riders who can operate a bicycle under most traffic conditions. This group includes bicycle commuters, bike club riders, and other cyclists currently following the rules of the road and riding on area streets and roadways with no special accommodations for bicyclists. In most communities, Group A comprises a small segment of the population, but logs the majority of bicycle miles ridden.
- **GROUP B: BASIC** - Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced level, but nationally there will always be millions of basic bicyclists who prefer comfortable access to destinations and well-defined separation of bicycles and motor vehicles.
- **GROUP C: CHILDREN** - Pre-teen cyclists who typically ride close to home under close parental supervision.

Bicycle planning generally promotes a “design cyclist” concept that recognizes and accommodates the needs of both Group A and Group B/C bicyclists.



*Shared or multi-use pathway*



*Sidepath within street right-of-way*



*On-street bicycle lane*

Group A cyclists are best served by making every street bicycle-friendly by removing hazards and maintaining smooth pavement surfaces. Group B/C riders are best served by providing designated bicycle

facilities in key corridors, such as signed and striped bicycle lanes on selected roadways, and off-road trails following waterways and other linear open space corridors.

While sidewalks may be the best choice for the youngest riders, they are not typically considered bicycle facilities in bicycle planning. It is important to recognize that sidewalks are pedestrian spaces, and their presence is not meant to substitute or preclude bicyclist use of streets and roadways.

Ideally, all parts of the region should be accessible to all bicyclists, regardless of skill or comfort level. However, throughout the region, existing development patterns have created places with varying levels of bicycle-friendliness due to the trip distances required to travel between destinations and the automobile orientation of physical infrastructure provided.

Certain place types (mixed-use areas and school sites, for example) serve as community destinations and should be designed to higher standards to accommodate and encourage access by the broad cross-section of the community represented in the B/C bicycling group. Other places (rural countryside and suburban strip developments) offer intimidating cycling conditions to all but the most experienced Group A riders.

Since this pathways plan is a subcomponent of the community's Parks, Open Space, Trails and Recreation Master Plan, the focus of the trails system is to accommodate Group B/C bicyclists. This practice aligns with national recommendations to identify key travel corridors and provide designated bicycle facilities on selected routes within these

corridors. Providing designated bicycle facilities will encourage use by Group B/C riders. Specific accommodations include:

- Neighborhood streets with low speed limits and slower travel speeds ensured through enforcement or traffic calming strategies.
- A network of designated facilities - bike lanes and paths - provided in key travel corridors.
- Roadway shoulders of adequate width on rural highways.
- Off-road paths, where feasible, to provide safe and convenient travel alternatives to complete the system.

This plan also recognizes the need to make subsequent improvements to major roadway corridors to benefit the Group A riders. Ideally, all streets should be designed and maintained to accommodate shared use by bicycles and motor vehicles, including design treatments such as wide curb lanes and hazard removal recommended for Group A bicyclists.

### *Other Non-Motorized Users*

The Centennial trails system should also accommodate other non-motorized users, including rollerbladers, scooters, and wheelchair users. In most cases, following standards presented in the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities will produce facilities compliant with all uses, including provisions required by the Americans with Disabilities Act (ADA).

## How Does Centennial Define “Urban Trails?”

Creating a bicycle and pedestrian network requires moving beyond traditional greenway planning by also using roadway corridors to make connections. In a survey of Centennial residents, respondents indicated that Centennial’s trail system should include bike lanes on major and minor roads, sidepaths with street rights-of-way, and a limited number of signed, shared roadways.

Different people have differing viewpoints on where bicyclists should ride. Many motorists believe slower moving bicyclists belong off the roadways. Less experienced cyclists often say that they feel more comfortable riding on trails and sidewalks. Safety experts and experienced bicyclists disagree, mainly because of the conflicts that can occur between bicyclists and motor vehicles at intersections when bicycles are removed from street travelways and motorist fields of vision. Conflicts between pedestrians and bicyclists can also occur on sidewalks and on narrow pathways when these spaces are shared by both groups.

The planning and design approach undertaken in most communities thus provides multiple options to meet the needs of various users. A bicycle plan does not equal a trails plan, as off-road pathways cannot adequately serve the needs of all bicyclists. Nor will a roadway improvements plan offer the perceived levels of comfort and safety desired by those intimidated by riding in traffic.

***A network plan that provides different facility types for users with different comfort levels and skill sets is thus the recommended planning approach.***



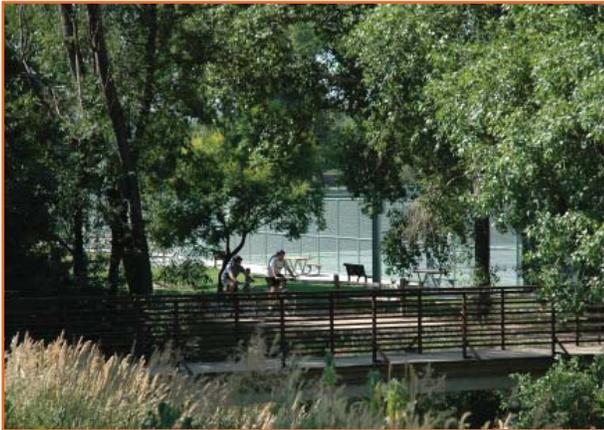
*Paved shoulder*



*Sharrow pavement marking - shared roadway*



*Sidewalk for pedestrian use*



Highline Canal Trail at deKoevend Park

Such an approach includes a complete toolkit of on- and off-road facilities types summarized following and described in detail in Appendix B of this plan. Each of the following facility types is applicable in limited locations, thus necessitating a systemwide planning approach that combines facility types to allow Centennial residents access through all parts of the community.

- **SHARED USE PATH OR MULTI-USE PATHWAY** - A bikeway physically separated from motorized vehicular traffic by an open space or barrier. May be located either within a street right-of-way or within an independent right-of-way, and may be paved or constructed of compacted crusher fines material.
- **SIDEPATH** – A type of multi-use path running immediately parallel to a street or roadway, like an extra wide sidewalk.
- **BICYCLE LANE** – A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use by bicyclists.
- **ROAD DIETS** – Roadway retrofit projects where existing roadway space is reallocated through lane re-striping.

- **PAVED SHOULDER** – The portion of a roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of sub-base, base and surface courses.
- **SHARED ROADWAY** – A roadway which is open to both bicycle and motor vehicle travel.
- **SIGNED SHARED ROADWAY OR BIKE ROUTE** - A shared roadway which has been designated with signing as a preferred route for bicycle use to provide continuity to other bicycle facilities, or to designate preferred routes through high-demand corridors.
- **SIDEWALK** – The portion of a street or highway right-of-way designed for preferential or exclusive use by pedestrians.

## Network Connectivity

Completing individual pathway projects does not create a bicycle system that works for either Group A: Advanced or Group B/C: Basic/Child bicyclists. The 1994 National Bicycling and Walking Study (NBWS) completed for the U.S. Department of Transportation found that most communities fail to address the major impediments to utilitarian bicycling - distance and safety. This means discontinuities in routes (missing links) and barriers to travel (major street crossings, railroad crossings, river crossings, etc.) need to be addressed. Furthermore, NBWS Case Study No. 1 found that higher levels of bicycle commuting are found in cities where on-road facilities are present.

### Citywide System

To overcome distance and safety impediments and provide coverage across the community, the City of Centennial needs a system that combines on-road and off-road facilities. Trips 2.5 miles in length (the national average) are feasible and necessary to reach destinations. Therefore, continuous routes at least this long that overcome barriers and connect the community's principal origins and destinations must be created.

To accomplish this, a system of primary bicycling corridors at least 2.5 miles in length should be implemented. Facilities within the primary corridors should consist primarily of two types: off-road multi-use trails within open space corridors, and signed and striped bicycle lanes on area streets.

Over time, secondary corridors will feed into this system. Secondary corridors will be shorter in length to create a finer grid (closer spacing) of bikeway facilities that connect various parts of the local community with the primary backbone system.

The type of bikeway may vary throughout the length of a given bicycle corridor, but transitions should be seamless and free of barriers in an effort to provide bicyclists with viable alternatives for cross-town travel. Completing strategic pieces of the primary system should be the highest priority for the City of Centennial to ensure barrier-free travel options that serve the city's population and link into and through the community to major activity destinations.

### Regional System

Centennial's primary corridors have been designed to link with trail and bike systems planned in adjacent communities, and connect to and extend major regional facilities that are part of the wider metro-



area trails system. Key major regional links include:

- *MARY CARTER GREENWAY* – A paved, 8-mile multi-use pathway running along the South Platte River, adjacent to Hudson Gardens.
- *HIGHLINE CANAL TRAIL* – A 66-mile trail running east/northeast through Douglas, Arapahoe, and Denver Counties. The trail is paved through most of North Denver and Aurora, and mostly soft surface in South Suburban, Highlands Ranch and Chatfield.
- *CHERRY CREEK TRAIL* – A paved, 15-mile multi-use trail running along Cherry Creek from the Cherry Creek Reservoir to downtown Denver.
- *E-470 TRAIL* – A paved, 35-mile trail running along C-470/E-470.
- *FAST-TRACKS LIGHT RAIL SYSTEM* - Centennial's proposed trail system includes a direct link to the RTD station at Caley Avenue to encourage combined bike/transit trips.

## Implementation

In the next 5-10 years, the City of Centennial, working in partnership with surrounding jurisdictions and regional park districts, shall strive to have just over 100 miles of pathway corridors completed for public use within Centennial City limits.

### *Primary Pathway System*

The proposed system is comprised of the following 13 primary corridors. Exhibits 8.1 through 8.3 identifies each of the corridors and further details recommended facility treatments for each segment.

<i>1. Highline Canal Trail</i>	<i>14.0 miles</i>
<i>2. Cherry Creek Trail</i>	<i>3.0 miles</i>
<i>3. Clarkson Street</i>	<i>2.6 miles</i>
<i>4. University Blvd / Big Dry Creek</i>	<i>7.1 miles</i>
<i>5. Little Dry Creek / Willow Creek</i>	<i>6.1 miles</i>
<i>6. Havana St / Dayton St / Inverness Dr</i>	<i>8.8 miles</i>
<i>7. Lone Tree Creek</i>	<i>6.5 miles</i>
<i>8. West Tollgate Creek to E-470</i>	<i>3.4 miles</i>
<i>9. West Tollgate Creek</i>	<i>4.9 miles</i>
<i>10. Piney Creek</i>	<i>12.5 miles</i>
<i>11. East Caley Avenue</i>	<i>7.8 miles</i>
<i>12. East Easter Avenue</i>	<i>7.1 miles</i>
<i>13. E-470 Trail</i>	<i>17.4 miles</i>

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EXHIBIT 8.1  
TRAILS MAP

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EXHIBIT 8.2  
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<b>EXHIBIT 8.3 SEGMENT-LEVEL IMPROVEMENTS</b>		Segment Length	Exst. Facility	Minor Impvt.	Major Impvt.
<b>Corridor #1 – Highline Canal Trail</b>					
1a.	Major existing regional trail, 66 miles in length, continuous through Centennial and extending both north and south of the city.	13.99 mi	X		
<b>Corridor #2 – Cherry Creek Trail</b>					
	Major regional trail, with current routing on Jordan Road for the segment between E. Caley Avenue and E. Otero Avenue. Desired to be completed as a continuous off-road pathway as follows:				
2a.	Existing trail within Cherry Creek State Park. Terminates on E. Caley Ave.	2.92 mi	X		
2b.	Sign bike route with sharrow pavement markings on Caley Avenue to Jordan Road.	.18 mi		X	
2c.	Gap from E. Caley Avenue to existing trail segment within Cherry Creek Valley Ecological Park being implemented by City of Aurora and Cornerstar Development. Will be a sidepath on east side of Jordan Road to Arapahoe, and north side of Arapahoe to new at-grade signal just east of Cherry Creek. Cornerstar to continue new trail alignment south to Ecological Park. (Arapahoe County has hired Vision Land Consultants to conduct a feasibility study for a pedestrian underpass or bridge over Arapahoe Road. This is the preferred long-term alternative when CDOT reconstructs the Arapahoe Road bridge.)	1.86 mi			X
2d.	Existing 1/3-mile trail segment with Arapahoe County's Cherry Creek Valley Ecological Park.	.82 mi	X		
2e.	Gap from Cherry Creek Valley Ecological Park/Broncos Parkway to Douglas County line. Current planning by Arapahoe County and City of Centennial for the proposed trail to route on the east side of Cherry Creek.	.06 mi			X
2f.	Existing trail begins at the Douglas County line, routes under E-470 and connects with the eastern terminus of the E-470 Trail. The Cherry Creek Trail then extends south to E. Scott Avenue, with additional planned and existing segments continuing south.	2.7 mi	X		
<b>Corridor #3 – Clarkson Street</b>					
3a.	Street is too narrow to stripe on-street bike lanes from Orchard Road to Arapahoe Road. Sign 25 mph street as a bike route and use sharrow pavement markings.	.39 mi		X	
3b.	Add on-street bike lanes from Arapahoe Road to E. Dry Creek Road.	1.03 mi		X	
3c.	Existing on-street bike lanes from E. Dry Creek Road to East County Line Road. Street is very wide and segments may need to be restriped with on-street parking and bike lanes as applicable.	.89 mi	X	X	
3d.	Use part of existing Lee Gulch Trail to link to E-470 Trail.	.26 mi	X		
	<i>*At-grade crossing assistance desired at Arapahoe Road, Dry Creek Road and County Line Road.</i>				X
<b>Corridor #4 – University Boulevard/Big Dry Creek</b>					
4a.	Existing Big Dry Creek Trail - from Highline Canal to South Suburban Golf Course.	2.05 mi	X		

		Segment Length	Exst. Facility	Minor Impvt.	Major Impvt.
4b.	Enhanced connection to E-470 Trail desired: <ul style="list-style-type: none"> <li>Option 1: Develop new trail following drainage alignment along S. Madison and E. Otero. Would require a crossing of Big Dry Creek, a mid-block crossing on E. County Line Road or segments of sidepath along East County Line Road and S. University Blvd to connect to the E-470 Trail.</li> <li>Option 2: Improve existing sidepath along S. Colorado Blvd to bike path standards.</li> <li>Option 3: Explore feasibility of trail extension around north and east edge of golf course.</li> </ul>	5.08 mi			X   X X
<b>Corridor #5 – Little Dry Creek/Willow Creek</b>					
5a.	Existing Little Dry Creek Trail from the Highline Canal to South Fairfax Way.	1.16 mi	X		
5b.	Substandard asphalt trail to be improved from South Fairfax Way/Lenski Elementary to South Forest Way.	.34 mi			X
5c.	Sign on-street bike route on South Forest Way to Holly Street.	.1 mi		X	
5d.	Existing Willow Creek Trail from Holly Park to the E-470 Trail.	4.49 mi	X		
<b>Corridor #6 – Havana/Dayton/Inverness</b>					
6a.	Existing trails within Cherry Creek State Park that link the Cherry Creek Trail to Havana Street.	2.87 mi	X		
6b.	Existing on-street bike lanes from Belleview Avenue south to E. Caley Avenue.	1.6 mi	X		
6c.	Jog west on Caley Street (same as segment #11j) using existing on-street bike lanes from Elmira Circle to Havana Street.	.57 mi	X		
6d.	Continue on Dayton Street to Costilla Avenue, ideally restriping both to accommodate on-street bicycle lanes.	.87 mi		X	
6e.	Completion of this corridor on S. Clinton Street/ Inverness Drive will require significant long-term investment to link to E-470 Trail. Retrofit Inverness Drive West/Inverness Parkway with bicycle accommodation south to South Valley Highway. Construct short trail segment to link to the E-470 Trail.	2.86 mi			X
<b>Corridor #7 – Lone Tree Creek</b>					
7a.	Work to make new trail connection north of Caley Avenue to Garcia Place within the Cherry Creek State Park.	.56 mi			X
7b.	New trail south along Lone Tree Creek to utilize and improve existing pedestrian box culvert under Arapahoe, continuing south to E. Briarwood Avenue.	.65 mi			X
7c.	Existing loop trail both sides of creek between E. Briarwood Avenue to S. Revere Parkway. Probably needs to be improved to primary bike trail standards.	.54 mi		X	
7d.	Add bicycle facilities to E. Fremont Place, E. Fremont Avenue and S. Blackhawk Street.	1.27 mi			X
7e.	New trail segment along eastern edge of Arapahoe County Community Park.	.38 mi			X
7f.	Future bicycle accommodation needed along S. Chambers Street to future S. Potomac Street.	1.35 mi			X

		Segment Length	Exst. Facility	Minor Impvt.	Major Impvt.
7g.	Then trail under new Jordan Road bridge along drainageway to existing trail behind Kalispell Circle that links to the Cherry Creek Trail.	1.73 mi			X
<b>Corridor #8 – West Tollgate Creek to E-470</b>					
8a.	New trail segment along drainageway from the West Tollgate Creek trail to S. Jericho Way.	.55 mi			X
8b.	Sign S. Jericho Street as bike route with sharrow pavement markings. Will require at-grade crossing assistance of E. Smoky Hill Road.	.65 mi		X	
8c.	New segment of trail to connect to Piney Creek Trail.	.16 mi			X
8d.	Use section of the Piney Creek corridor as proposed in segment #2h.	.25 mi			X
8e.	New segment of trail to connect to S. Himalaya Way.	.13 mi			X
8f.	To connect into an E-470 Trail extension in Douglas County: <ul style="list-style-type: none"> <li>Option 1 - Sign S. Himalaya Way and S. Ireland Way as bike routes with sharrow pavement markings. Will require at-grade crossing assistance of E. Arapahoe Road.</li> <li>Option 2 – Explore feasibility of new trail development along drainageway south into Douglas County.</li> </ul>	1.67 mi 2.17 mi		X	X
<b>Corridor #9 – West Tollgate Creek</b>					
9a.	Connection to City of Aurora facilities at Quincy Reservoir – either by trail improvements on east side of the reservoir or by roadway corridor routing. Resolve access issues between Fox Hill Park and Quincy Reservoir.	.27 mi		X	
9b.	From Fox Hill Park, major stretch is existing. Not sure if desired to be upgraded or not.	2.5 mi	X		
9c.	Complete various gaps in the West Tollgate Trail to connect to Piney Creek.	1.07 mi			X
9d.	Sign Versailles as an on-street bike route.	.85 mi		X	
9e.	Complete trail connection to Piney Creek Trail.	.21 mi			X
<b>Corridor #10 – Piney Creek</b>					
10a.	Existing on-street bike lanes on Orchard Road east of Havana and on Cherry Creek Drive to S. Peoria Street.	1.15 mi	X		
10b.	Existing sidepath on Peoria to new pedestrian underpass and trail being constructed to link with existing Cherry Creek State Park facilities.	.82 mi	X		
10c.	New proposed piece to make more direct east/west connection to Garcia Place.	.24 mi			X
10d.	Follow existing Garcia Place road and Cherry Creek State Park Trail to Piney Creek Trail.	1.0 mi	X		
10e.	Existing Piney Creek Trail to S. Telluride Way.	2.12 mi	X		
10f.	Missing section of Piney Creek Trail from Telluride to S. Waco Street.	.49 mi			X
10g.	Existing segment of Piney Creek Trail to just past Tower Road.	.78 mi	X		

		Segment Length	Exst. Facility	Minor Impvt.	Major Impvt.
10h.	Missing section of Piney Creek Trail between Tower Road and S. Jericho Way. <ul style="list-style-type: none"> <li>Option 1 - route between subdivisions.</li> <li>Option 2 - try to follow creek more directly.</li> </ul>	2.43 mi			X
10i.	Existing trail to Arapahoe/Liverpool intersection and beyond to roughly East Ottawa Circle.	1.74 mi	X		
10j.	Incomplete section of Piney Creek Trail between Arapahoe/Liverpool and N. Gartrell Road.	.39 mi			X
10k.	Existing segment of Piney Creek Trail continuing south-east past E-470.	1.3 mi	X		
<b>Corridor #11 – East Caley Avenue</b>					
11a.	Multiple routing options are being considered as part of the conceptual Castlewood Greenway from DeKoevend Park to Holly Park: <ul style="list-style-type: none"> <li>Option 1 - Sign on-street bike route on S. Josephine Way.</li> <li>Option 2 – New trail in powerline ROW.</li> </ul>	.32 mi		X	X
11b.	Trail link from S. Josephine Way to S. Steele Street.	.32 mi			X
11c.	<ul style="list-style-type: none"> <li>Option 1 – Sign on-street bike route on E. Caley.</li> <li>Option 2 – Develop parallel sidepath.</li> </ul>	.82 mi		X	X
11d.	Use existing segment of Little Dry Creek Trail from Colorado Blvd to S. Fairfax Way/Lenski Elementary.	.09 mi	X		
11e.	Multiple routing options are being considered as part of the conceptual Castlewood Greenway from DeKoevend Park to Holly Park: <ul style="list-style-type: none"> <li>Option 1 - Develop new trail segment along power line across Holly Street to connect with E. Caley Drive. Then sign on-street bike route on E. Caley Drive to S. Locust Way.</li> <li>Option 2 – Improve existing Little Dry Creek Trail to Holly to connect with E. Caley Drive. Then use existing trail link.</li> </ul>	.79 mi		X	X
11f.	Existing ½ block trail link to connect Caley to Caley.	.07 mi	X		
11g.	Sign on-street bike route on E. Caley Drive to Quebec Street.	.55 mi		X	
11h.	Existing sidepath along Caley and Fiddlers Green Circle to Yosemite, continuing on sidepath bridge facility over I-25 to the RTD station at Caley.	.35 mi	X		
11i.	Missing facilities from Yosemite to Elmira Circle.	.68 mi			X
11j.	Existing on-street bike lanes to Havana.	.39 mi	X		
11k.	Sign on-street bike route on Caley	.12 mi		X	
11l.	Explore options to get through or around Vintage East gated community: <ul style="list-style-type: none"> <li>Option 1 – Sign on-street bike route on S. Jamaica Court and use existing concrete path connection to Caley.</li> <li>Option 2 – Add mid-block crossing on Havana at new trail segment to connect to East Peakview Avenue. Do a road diet treatment to restripe East Peakview Avenue and South Kenton Street with on-street bike lanes.</li> </ul>	.17 mi	X	X	X
11m.	Road diet treatment to add on-street bike lanes on Caley to S. Peoria Street.	.85 mi		X	

		Segment Length	Exst. Facility	Minor Impvt.	Major Impvt.
11n.	Sign on-street bike route on Caley to proposed trail along Lone Tree Creek corridor and continuing to S. Abilene Street.	1.03 mi		X	
11o.	Complete a pathway link from Abilene to Jordan Road, or sign for alternative on-street routing.	1.2 mi			X
<b>Corridor #12 – East Easter Avenue</b>					
12a.	Starting at the Highline Canal Trail, sign on-street bike route on E. Costilla Avenue.	.33 mi		X	
12b.	Jog south on existing Clarkson Street bike lanes.	.26 mi	X		
12c.	Sign on-street bike route on E. Easter Avenue, E. Nobles Road and E. Easter Avenue to S. Holly Street.	3.14 mi		X	
12d.	Existing trail connection to Willow Creek Trail.	.72 mi	X		
12e.	Upgrade existing Little Dry Creek Trail to primary corridor standards to Walnut Hills Park.	2.07 mi			X
12f.	Long-term future connection to Havana Street with bicycle accommodation on E. Costilla Avenue, including bicycle facilities as part of the future I-25 underpass.	.62 mi			X
	<i>*At-grade crossing assistance desired at University Blvd, Colorado Blvd. and Holly Street.</i>				X
<b>Corridor #13 – E-470 Trail</b>					
13a.	Existing trail in Douglas County from west of Centennial City limits to the terminus at the Cherry Creek Trail.	12.8 mi	X		
13b.	Future extension of the E-470 Trail in Douglas County from Cherry Creek to Piney Creek.	4.64 mi			X

## Secondary Corridors

Throughout the planning process there have been, and will continue to be, requests for additional trail segments to be completed beyond the proposed 13 primary corridors outlined above. Such facilities are viewed as secondary trail corridors and represent a second tier priority to connect various parts of individual Wards and neighborhoods into Centennial's primary trail system.

Secondary corridors, if greater than one mile in length, should be constructed to the same AASHTO standards as primary bikeway facilities, as detailed in Appendix B.

## Supplemental Actions To Promote Bicycling and Walking

In addition, there are several supplemental actions that should be undertaken to promote bicycling and walking within the City of Centennial. These follow an accepted "4-E" approach to non-motorized planning that comprehensively addresses Education, Encouragement, Enforcement and Engineering needs within a community. These include:

- *PROVIDE ROUTINE ON-ROAD ACCOMMODATION FOR GROUP A BICYCLISTS* – While this plan focused primarily on creating a system of designated facilities to encourage new and increased levels of use by Group B/C bicyclists, there is also a need to routinely accommodate cyclists in all roadway planning undertaken in Arapahoe County and the City of Centennial. Group A bicyclists need attention paid to hazard removal and maintenance of the right-hand edge of roadways.
  - *PROVIDE SIDEWALKS FOR PEDESTRIAN USE* - All streets, and particularly arterials and collectors, shall have sidewalks provided on both sides of the street. Ideally, sidewalks will be detached or separated from the curb with a grassy planting strip. All sidewalks shall be designed, constructed and maintained to meet ADA requirements.
  - *INSTALL BICYCLE PARKING* – All public and private destinations throughout the community shall provide bicycle parking racks per guidelines developed by the Association of Pedestrian and Bicycle Professionals (ABPB). An eight-page color brochure is available for distribution to area governments, businesses and developers at <http://www.bicyclinginfo.org/pdf/bikepark.pdf>. Key components to address include:
    - Parking racks shall be styles that adequately support the bicycle.
    - Individual racks shall be sited to permit convenient user access.
    - Rack parking areas shall be located adjacent to building entrances.
    - Consider providing bicycle lockers or indoor storage in locations where bicycles will be parked overnight or for longer durations.
  - *DEVELOP SAFE ROUTES TO SCHOOL* - SRTS is a federal reimbursement program that provides funding for infrastructure projects and educational activities that assist Cities, Counties, and School Districts to enable children to walk or bicycle to
- They also desire paved shoulders, wide curb lanes and/or on-street bicycle lanes to be provided on all major and minor arterial streets.

school more safely. Funding is provided through CDOT to local public authorities and school districts working cooperatively to address safety and encouragement at the local level.

- *PROVIDE REGULAR MAINTENANCE ON ROADWAYS WITH DESIGNATED BICYCLE FACILITIES* - Focus sweeping activities and maintenance attention to the right-hand edge of roadways and promptly fix problem areas. Pavement cracks (such as the gap between two slabs of pavement) and projections (including sinking drainage grates or crude patch jobs) pose particular hazards to bicycle travel.
- *PROVIDE REGULAR MAINTENANCE ON OFF-ROAD PATHWAYS* - Focus maintenance on removal of sand, gravel, broken glass, branches and encroaching vegetation. Fix potholes, corrugations, and other rough surfaces. As an interim measure, post warning signs along pathways notifying trail users of an upcoming hazard if the problem cannot be fixed promptly.
- *CREATE A SPOT IMPROVEMENT PROGRAM* - Allow individual cyclists and pathway users to report small improvements needed on either pathways or roadways. Create a standard reporting form and/or on-line resource for collecting all reported problems.
- *PLAN FOR SAFETY AND LONG-TERM MAINTENANCE IN DESIGN* - Design facilities to national AASHTO bicycle standards that have been established for user safety and to minimize future maintenance needs.



*Little Dry Creek Trail at Holly Park*

- *DESIGN INTERSECTIONS TO ACCOMMODATE NON-MOTORIZED TRAVEL* - Use signal detection practices such as bicycle sensitive pavement loops or video surveillance that allow bicycles to trip signals. Adjust signal timing to provide an adequate clearance interval for bicyclists who begin crossing at the end of a green light. In corridors where bicycle lanes are present and space allows, follow AASHTO and MUTCD guidance for locating bicycle lanes to the left of right-hand turning lanes, or dropping the bicycle lane in advance of the intersection and resuming lane striping on the far side.
- *DESIGN SAFE, CONVENIENT AND VISIBLE PATHWAY CROSSINGS OF MAJOR ROADWAYS* - Follow national standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD) for signing and pavement markings at trail/roadway intersections. Use highly visible “ladder-style” crosswalks with longitudinal lines for added visibility. Plan for minimal maintenance by slightly adjusting the spacing of pavement

markings to avoid the path of vehicular tire wear. Use MUTCD warning and regulatory signing on all intersection approaches (trail and roadway). Consider installing pedestrian actuated signals to stop vehicular traffic for trail user crossings.

- *PRINT AND DISTRIBUTE A TRAILS MAP AND/OR BICYCLE USERS MAP* - Develop a map showing existing pathway facilities and suitability ratings of collector and arterial roadways for bicycling. This action item may be undertaken by local bicycle clubs who can formulate a business plan for advertising and map sales to generate club revenues.
  
- *CONDUCT SPECIAL EVENTS TO ENCOURAGE INCREASED LEVELS OF BICYCLING AND WALKING* - Participate in national events designed to focus attention on and increase usage of non-motorized transportation modes. The City of Centennial should be encouraged to participate in the annual Colorado Bike to Work Week each June, and International Walk to School Day the first week in October.
  
- *EDUCATE BOTH BICYCLISTS AND MOTORISTS ON RULES OF THE ROAD*  
– Local law enforcement agencies and non-profit groups shall work together to bring bicycle rodeo and safety programs to area youth. Target additional bicycle safety education and “share the road” messages toward motorists.

# 9

## Recommendations For Implementation

To ensure that Master Plan recommendations are positioned for early implementation, a number of organizational and policy recommendations are provided below. These are intended to support the City's ability to move forward with acquisition and/or construction of new facilities.

***Recommendation:*** Identify City staff to be responsible for the green space system.

A key recommendation is to identify at least one staff member who will have primary responsibility for oversight of the green space system, including project implementation, long-range planning, ongoing coordination with District, County and other municipal partners, and providing staff support for the Advisory Committee.

The intent is not to create a Parks and Recreation Department within the City, although as the City grows, the pros and cons of such an action might be appropriate to discuss. Instead, the intent is simply to ensure that someone within the City is tasked with the formal responsibility of managing the system, and is held accountable for performance.

***Recommendation:*** Create an ongoing partnership structure involving the POST Advisory Committee, District representatives, County and other partners for long-range planning and project review.

In just three short months, as this Plan has been developed, mutual respect and collaborative relationships between the above parties have begun to form. The entities involved have begun to develop a dialogue around the types of improvements that can best benefit Centennial residents – as well as the types of challenges faced by each district, whether they involve aging infrastructure or gaps between residential construction and infusions of tax dollars needed to complete projects. It is imperative to build on and strengthen these relationships, through the formation of a standing working group involving the parties above, to maintain a focus on long-range planning as well as short term project implementation.

Such a working group could meet twice, or ideally, four times per year, with meetings scheduled to respond to grant application cycles for projects that might be completed in partnership. At least one of these meetings would involve a comprehensive planning session to identify and confirm projects to

be completed in the subsequent fiscal year, as well as sources of funding and commitments from each partner.

Yet another important partner – particularly as relates to open space and trails – is SEMSWA, the new stormwater authority. SEMSWA representatives should be invited to worksessions to discuss their drainageway improvement priorities and determine whether there are projects that might be reasonable opportunities for partnering.

It may be desirable for the POST Advisory Committee to continue to meet on its own, during the “off-months.” This would allow group members an opportunity to discuss implementation progress or other issues and concerns that may arise. Many communities’ Advisory Committees choose to meet on a monthly schedule, while others feel that quarterly meetings are sufficient. It may also be desirable for the POST Advisory Committee to consider joint meetings with Boards from other jurisdictions periodically.

**Recommendation: Develop a three-year work plan for investment based on the opportunity areas and trail corridors identified in previous chapters, and the priority areas identified through planning workshops.**

This is also a critical follow-on task, as it will set the framework for future decisionmaking. The following steps are recommended.

- Establish a framework and guidelines for the percentage of funds to be disbursed in a given year and the percentage that might be held in reserve. Even though there is a backlog of approximately \$6.5 million in Open Space sales tax shareback and

Conservation Trust Fund revenues, with roughly \$2 million additional expected each year, Advisory Committee members were wary of distributing all of that money at once. Instead, the group recommended that some percentage be carried forward so that a reserve balance was maintained from year to year. The group should consider the level of retainage that provides an appropriate balance between making sufficient dollars available for construction that significant projects can get built, versus keeping enough in reserve to provide a reasonable balance for larger projects in the out-years. A place to begin this discussion might entail making 60 percent available for acquisition/construction, and retaining 40 percent. This would provide up to \$3.9 million for acquisition or construction of projects in the first year alone. Any reserve amount recommended during the implementation of this plan should be treated as a flexible guideline that the City may deviate from to capitalize on opportunities and meet the needs of the community as determined in the future.

- Arrange a bus tour for Advisory Committee members and members of Council, to visit the opportunity areas and priority trail corridors. This will allow members the opportunity to evaluate potential projects and prioritize them according to criteria provided in Chapter 5.
- Develop a three-year list of project priorities based on evaluation of the opportunity sites, as well as some of the initial priorities that were discussed by the Committee and the public. These included:
  - Acquire more open space and habitat (including easements and parcels, where feasible) along drainageway corridors.

- Acquire and “land bank” property near the center of the City which might provide parks, open space and possibly City facilities.
  - Complete as many “missing link” trail segments within high priority corridors, as financially feasible.
  - Acquire and “land bank” property on the east side of the City for park/athletic facilities.
  - Financially partner with CDOT and the County to create safer crossings of major arterial streets.
  - Financially partner with Districts, neighboring municipalities, and the County to purchase land outside Centennial’s boundaries to provide facilities that benefit Centennial residents, or that provide an open space buffer for development.
  - Design and construct signature gateways and identity signage to clearly mark major parks and trailheads within the City.
  - Financially partner with special districts, neighboring municipalities, and the County to make significant improvements to facilities that benefit Centennial residents.
- 
- Develop a cooperative process for allocating funds to Districts to complete desirable projects. An early premise on the part of the City was that a grants program would be established to aid in allocating funds to special districts or other entities, such as schools, who might seek to undertake projects that would benefit City residents. After a discussion of the pros and cons of a grant-based approach versus an approach that would direct funding to specific projects, the recommendation was made to pursue a more directed approach as a first option.

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## **Appendices**

City of Centennial, Existing Public Parks and Open Space Inventory.....A-3

Title.....A-2

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# A.1

## **City of Centennial Existing Public Parks and Open Space Inventory**

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INVENTORY PAGES

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# A.2

## **TRAILS: A Network Planning Approach**

**A Handout for the Centennial Parks and Open Space Advisory Board  
August 2007**

**prepared by  
Charlier Associates, Inc.**



## A Network Planning Approach

### *Planning for Bicyclists and Pedestrians*

Bicycling and walking are often considered to be special interest recreational activities. However, these modes can also be used for transportation, particularly for short-distance trips. Certain demographics, namely those from low-income households or those too young or too old to drive, rely on non-motorized forms of transportation as their primary means of mobility. Others elect to make daily utilitarian trips on foot or on bike to incorporate physical activity into their daily routines, or for ecological, environmental, and energy conservation reasons.

While the benefits of bicycling and walking may be similar, the needs and user characteristics of bicyclists and pedestrians differ greatly. By law, bicycles are vehicles and cyclists are considered to be drivers. Bicycles can travel at faster speeds (5-30 mph), cover moderate distances (2.5-mile national average trip length), and require large curve radii for turning movements, gentle grades, and adequate braking distances. Pedestrians, on the other hand, typically travel at slow speeds (2-4 mph), walk short distances (0.25-mile average trip length) and frequently stop, change directions, and laterally shift their path of travel. These differences require that facility planning address each mode separately.

Activities such as recreational walking, jogging and running may occur on rambling multi-use pathways removed from the street system. However, most utilitarian walking occurs within street rights-of-way on sidewalks, or on walkways within developments that provide access from vehicular parking to building entrances.

Likewise, bicycling may occur on recreational multi-use pathways, but a majority of bicycle trips also occur on areas streets and roadways that provide connectivity to destinations.

### *On-Road or Off-Road Bicycle Accommodation?*

Different people have differing viewpoints on where bicyclists should ride. Many motorists believe slower moving bicyclists belong off the roadways. Less experienced cyclists often say that they feel more comfortable riding on trails and sidewalks. Safety experts and experienced bicyclists disagree, mainly because of the conflicts that can occur between bicyclists and motor vehicles at intersections when bicycles are removed from street travelways and motorist fields of vision. Conflicts between pedestrians and bicyclists can also occur on sidewalks and on narrow pathways when these spaces are shared by both groups.

The planning and design approach undertaken in most communities thus provides multiple options to meet the needs of various users. A bicycle plan does not equal a trails plan, as off-road pathways cannot adequately serve the needs of all bicyclists. Nor will a roadway improvements plan offer the perceived levels comfort and safety desired by those intimidated by riding in traffic. A network plan that provides different facility types for users with different comfort levels and skill sets is thus the recommended planning approach.

### *The Need for Network Connectivity*

Completing individual pathway projects does not create a bicycle system that works for either Group A, Advanced or Group B/C, Basic/Child bicyclists. The 1994 National Bicycling and Walking Study (NBWS) completed for the U.S. Department of Transportation found that most communities fail to address the major impediments to utilitarian bicycling - distance and safety. This means discontinuities in routes (missing links) and barriers to travel (major street crossings, railroad crossings, river crossings, etc.) need to be addressed. Furthermore, NBWS Case Study No. 1 found that higher levels of bicycle commuting are found in cities where on-road facilities are present.

To overcome distance and safety impediments and provide coverage across the community, the City of Centennial needs a system that combines on-road and off-road facilities. Trips 2.5 miles in length (the national average) are feasible and necessary to reach destinations. Therefore, continuous routes at least this long that overcome barriers and connect the community's principal origins and destinations must be created.

To accomplish this, a system of primary bicycling corridors should be implemented. Facilities within the primary corridors should consist primarily of two types: off-road multi-use trails within open space corridors, and signed and striped bicycle lanes on area streets.

Over time, secondary corridors will feed into this system. Secondary corridors will be shorter in length to create a finer grid (closer spacing) of bikeway facilities that connect various parts of the local community with the primary backbone system.

The type of bikeway may vary throughout the length of a given bicycle corridor, but transitions shall be seamless and free of barriers in an effort to provide bicyclists with viable alternatives for cross-town travel. Completing strategic pieces of the primary system should be the highest priority for the City of Centennial to ensure barrier-free travel options that serve the city's population and link into and through the community to major activity destinations.

### *Assessment of Existing Conditions*

We are still collecting data and surveying Centennial citizens, but initial assessments include the following:

- Individual pieces of pathway have been built within the community and within surrounding jurisdictions, but they are not connected to form a system or network that people can use to travel from place to place.
- The easy pieces of trails have been built. Now the City of Centennial and its partnering agencies need to prioritize missing gaps in the off-road trail network and focus on using the roadway network to create an interconnected system that links to community destinations and regional trail facilities.
- For bicycling and walking to be effective, the network needs to be fine-grained. This means designated north/south corridors need to be spaced periodically and connected with continuous east/west corridors to provide people with travel options between various origins and destinations. Focusing on one facility as a community-wide solution won't work.
- Facilities in the network may be of various types (multi-use paths, on-street bicycle lanes, paved shoulders, etc.) but need seamless connections between segments to facilitate cross-town travel.
- Emphasis needs to be placed on creating a primary system of longer pathway corridors. Once this system is in place, shorter secondary corridors and local projects can connect into the system and increase its effectiveness.
- Planning and designing individual facilities and network connections must be done with the primary goal of enhancing the safety of pathway users.





# A.3

## **TRAILS: Facility Types for Consideration**

**A Handout for the Centennial Parks and Open Space Advisory Board  
August 2007**

**prepared by  
Charlier Associates, Inc.**



## Facility Types for Consideration

### Shared Use Paths or Multi-Use Pathways

A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths are also typically used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users.

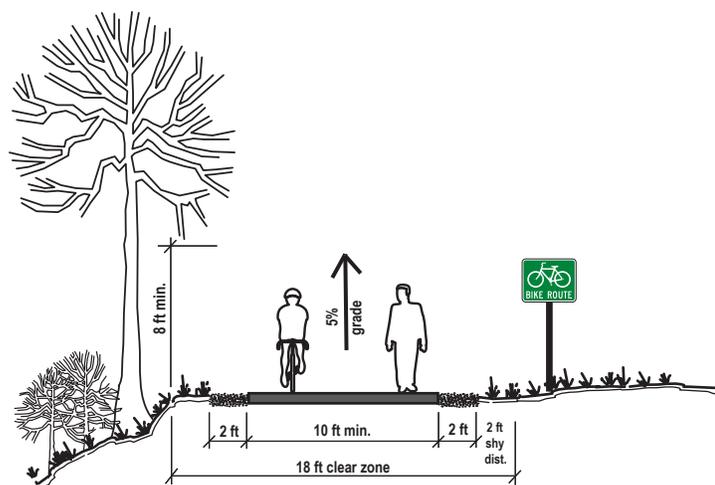
Paths must meet bicycle transportation standards including a 10-foot minimum surface width, 3-foot lateral clearances, 8-foot vertical clearances, 5 percent grade, and 95-foot turning radii.

#### PROS:

- Often located along streams and in other open space corridors, thereby providing pleasant, shaded travel environments.
- Can provide enhanced connectivity for non-motorized travel through areas where the street system does not go.
- May provide opportunities to cross major roadways with grade-separated overpasses and underpasses.
- Often preferred by less experienced bicyclists and families with young children due to the perceived safety of bicycling away from vehicular traffic.
- May fulfill multiple community objectives including flood management, wildlife habitat protection, community greening, recreation opportunity and non-motorized transportation.
- Funding opportunities, although competitive and limited, are available for local governments to build this type of facility as independent transportation projects.

#### CONS:

- Pedestrians and bicyclists can have conflicts sharing facilities if pathways are poorly designed, too narrow, or lacking in enforcement or user etiquette.
- Opportunities to create complete bicycle systems comprised only of trails are typically limited and often do not connect to shopping and other major destinations within a community.
- Adjacent properties owners may feel that their privacy, personal security and/or property values are impacted by the adjacent public trail use.
- Separate rights-of-way and/or public access easements need to be purchased.
- Special design features are needed at all roadway crossings to separate users and/or alert drivers of non-motorized crossings. Bridges, underpasses and pedestrain-actuated signals are expensive project elements.
- User safety and security needs must be accommodated in the planning, design and construction of trail projects, as well as ongoing maintenance and operations.



Multi-Use Pathway

## Sidepaths

A type of multi-use path running immediately parallel to a street or roadway, like an extra wide sidewalk. Sidepaths have special design challenges, as motor vehicles may not expect to encounter bikes entering an intersection from outside the travel lanes. AASHTO discourages two-way paths located immediately adjacent to roadways due to the operational and safety issues that are likely to occur.

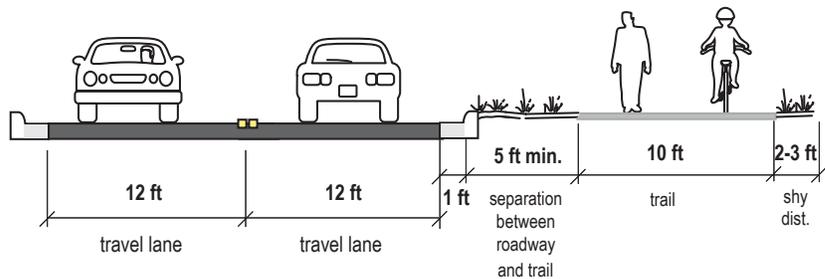
Sidepaths should not be considered a substitute to street improvements even when the path is located adjacent to a highway, as many bicyclists find these paths less direct or convenient than streets, particularly for utility trips. Sidepaths must also meet AASHTO transportation standards including a 10-foot minimum path width and a 5-foot minimum separation distance from street, or a 42-inch vertical barrier from adjacent traffic.

### PROS:

- Provide an alternative to roadway travel on busy streets when roadway corridors have adequate right-of-way and infrequent driveway and street intersections.
- Often preferred by less experienced bicyclists and families with young children due to the perceived safety of bicycling away from vehicular traffic.
- Accommodate both bicyclists and pedestrians, thereby eliminating the need for bike lanes plus sidewalk facilities.
- Sidepaths may thus offer a cost-effective alternative to roadway widening to provide bicycle lanes.

### CONS:

- Places faster moving cyclists into space traditionally reserved for pedestrians.
- Unless separated, sidepaths require one direction of bicycle travel to ride against motor vehicle traffic, contrary to normal rules of the road.
- Can be less safe for cyclists than riding on the street since drivers are focused on the roadway. Cyclists are especially at risk at intersections when riding wrong-way, against traffic.
- Sidepath users must stop and yield at all intersecting streets and driveways, whereas bicyclists using roadway facilities maintain right-of-way like vehicles.
- When only provided on one side of a roadway, can cause cyclists to ride wrong-way on the road to access the path and reach destinations on the opposite side of the street.
- Many experienced cyclists and commuters often will use the roadway instead of the sidepath because they find the roadway to be more convenient, better maintained or safer. (Note: bicycles are vehicles by law and must not be precluded from roadway use when a sidepath is present.)



Sidepath



## Bicycle Lanes

A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use by bicyclists. Bike lanes are established with appropriate pavement markings and signing to delineate the right-of-way assigned to bicyclists and motorists, and to provide more predictable movements by each.

Bike lanes are usually paired, one-way facilities located on both sides of streets with moderate to heavy traffic volumes. They are typically not needed on local streets, but are well suited to collectors and minor arterials.

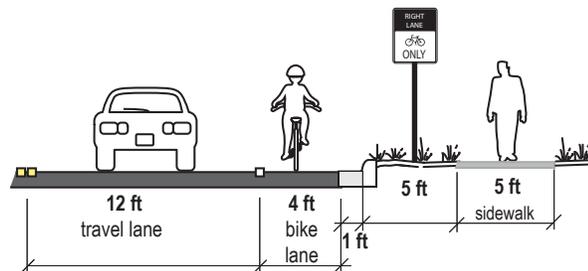
The minimum width of a bike lane is 4 feet, or 5 feet if adjacent to on-street parking or if measured from the curb face. Bicycle lane design at intersections must be treated carefully, following AASHTO and MUTCD guidance to minimize conflicts between bicycle and auto movements.

### PROS:

- Delineate roadway space for bicyclists and motorists, encouraging more predictable movements by each.
- Are one-way facilities located on either side of a street with arrows and pavement markings indicating direction of travel. This discourages wrong-way riding, a major cause of bicycle-motor vehicle crashes.
- Offer a designated and visible space for bicyclists and can be a significant factor in route choice, especially for Group B/C riders.
- Restriping wide roadways with on-street bike lanes and narrower travel lanes offers traffic calming benefits.

### CONS:

- Can complicate turning movements at intersections if improperly designed.
- Require extra width when on-street parking is present, and must always be located to the left of the parking lane.
- Are not advisable where angled parking is present, unless back-in parking is used.
- Require an additional commitment to maintenance and attention to roadway edge conditions.
- Concern by some jurisdictions that bike lanes attract less experienced riders to environments that exceed their skill level. Other jurisdictions routinely provide this facility type on all arterial and collector streets specifically to better accommodate the Group B/C bicyclists.



On-Street Bicycle Lanes

## Road Diets

Roadway retrofit projects where existing roadway space is reallocated through lane re-striping. “Road Diets” are often conversions of four-lane undivided roads into three lanes (two through lanes and a center two-way left turn lane or on-street parking). The right-of-way of the fourth lane is used to stripe two 5- to 6-foot wide bicycle lanes.

Application is most appropriate on streets with moderate traffic volumes, such as minor arterials and collectors that have been designed to the same roadway standards as the region’s principal arterials. (See the Appendix for details.)

### PROS

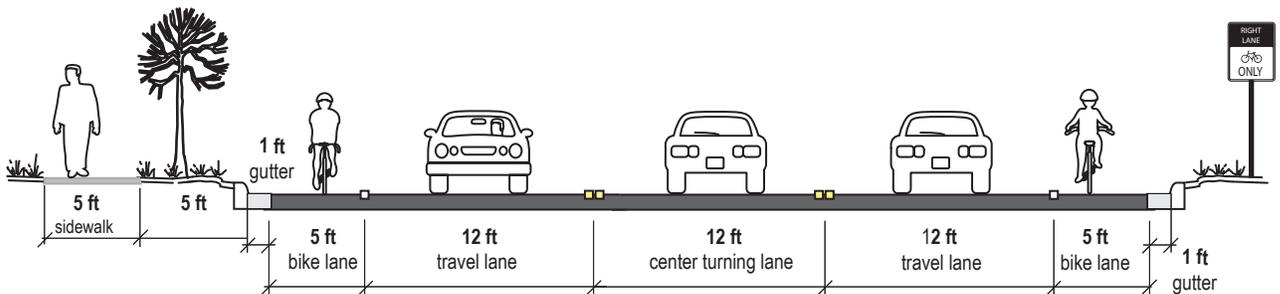
- Benefits both vehicles and pedestrians when moderately traveled four-lane roadways are

restriped. Often adds value to adjacent properties. Space for bicycle lanes is an added benefit.

- Reduces vehicle speeds and vehicle interchanges during lane changes, which may reduce the number and severity of vehicle-vehicle crashes.
- Does not affect a roadway’s vehicular capacity, but creates a more desirable corridor for use by other modes.

### CONS:

- Initial perception is that restriping takes away two of four travel lanes, thus reducing roadway capacity. However, if intersections are properly designed, capacity is more or less unaffected.
- Is typically applied to roadways with 15,000-18,000 ADT or less. Around 23,000 ADT is the maximum traffic volume that a three-lane design can support.



Road Diet with Bicycle Lanes

## Paved Shoulders

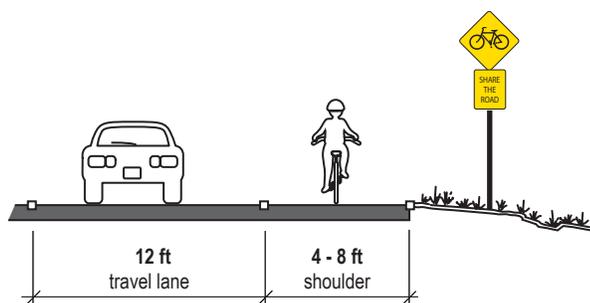
The portion of a roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of sub-base, base and surface courses. Paved shoulders should be free of rumble strips and be at least 4 feet wide to accommodate bicycle travel; additional width is desired if motor vehicle speeds exceed 50 mph.

### PROS:

- Best solution in rural areas to provide additional operating width.
- Paving shoulders offers overall benefits including extending the service life of the road surface, providing a break-down area for motor vehicles, and providing added roadway space for slower moving bicyclists.

### CONS:

- Should not be designated as Bike Routes where speeds exceed 40 mph or truck volumes are high. Share-the-Road warning signs are a preferred MUTCD treatment. However, the corridor should not be signed for bicyclists if the roadway fails to meet AASHTO guidelines for shoulder bicycle facilities.
- Must be paved and maintained to the same surface standard of regular travel lanes.
- Rumble strips and raised lane markers should not be used on routes intended for bicycle travel.



Paved Shoulders for Bicycling

## Shared Roadway

A roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders. Shared roadways typically have no bikeway designation, but should be designed and constructed under the assumption that they will be used by bicyclists and be without hazards to bicycle travel. Shared lanes are typically 12 feet wide or less, allowing cars to safely pass bicyclists only by crossing the center line or moving into another traffic lane.

### PROS:

- To varying extents, bicycles will be used on all streets and highways where they are permitted.
- Some experienced cyclists dislike special bicycle accommodation on roadways and prefer instead to use their bicycle as a vehicle in shared lanes by following the principles of “Effective Cycling.”
- Shared roadways are a prudent solution for local streets where bike lanes and sidepaths are not needed due to low traffic volumes and speeds.

### CONS:

- Width is the most critical variable affecting the ability of a roadway to accommodate bicycle traffic. Heavily traveled shared roadways are encouraged to provide outside lanes that are 14 feet wide to allow bikes and motor vehicles to better share the road.
- Lack of designated bicycle accommodation will not encourage people to ride within a given corridor, particularly when traffic speeds and volumes are moderate to high.

## Signed Shared Roadway or Bicycle Route

A shared roadway which has been designated with signing as a preferred route for bicycle use to provide continuity to other bicycle facilities, or to designate preferred routes through high-demand corridors.

Applications for this treatment are limited within the WAMPO Region, as qualifying low-volume streets typically provide no connectivity. On through streets, other roadway improvements such as on-street bike lanes will likely be required before a corridor should be designated as a bicycle facility.

A shared lane pavement marking or “sharrow” treatment can also be used to indicate that bicyclists and motorists are expected to share the travel lane. With effective placement, sharrows can increase motorist awareness and help legitimize bicyclist use of the travel lane.

### PROS:

- Indicates to cyclists that there are particular advantages to using these routes compared to alternative routes.

- Provides wayfinding for routes that provide continuity to other facilities such as bike lanes and shared use paths.
- Identifies local streets that provide connectivity and lead to an internal destination such as a school, park or commercial district.

### CONS:

- Erecting Bike Route signs does not improve overall travel conditions within a corridor. Hazard removal and maintenance needs must also be addressed.
- Traffic control devices may need to be adjusted to give greater priority to cyclists on the route. Local streets that have unsignalized intersections with major arterials are not good candidates for Bike Route signing due to the hazards associated with unsignalized at-grade crossings.
- Offers a low-cost solution for streets with acceptable volumes, speeds and connectivity.

