Introduction

The Greenbelt is described in the City's General Plan as ***the backbone of an open space and park system that extends throughout the city***. Comprised of a series of open space segments, the Greenbelt system will be connected by a multi-use trail extending through each segment. Essentially, the Greenbelt creates an open space border around the City. This Greenbelt is comprised of a variety of natural and park like elements; from the channelized Sweetwater River, along golf courses and banks of the Otay Lakes, following the Otay River valley to the Chula Vista Bayfront.

Each Greenbelt segment offers unique opportunities for passive and/or active recreation that may be connected by a continuous trail system Recognizing these opportunities within each segment will serve to enhance and preserve the benefits and natural amenities of the greenbelt system. The intent of this Plan is to identify opportunities and plan to develop parks and trails as funding becomes available or through the development of master planned communities.

One of the key components of the Greenbelt is the multi-use trail that serves to connect the parks and open space of each Greenbelt segment. Trails are defined as paths used for walking, bicycling, horseback riding or other forms of recreation or transportation. For the purposes of the Greenbelt, there are two general types of trails: *Multi-use Trails* and *Rural Trails*. *Multi-Use trails are trails d*esigned for a variety of users, such as bicyclists, equestrians, pedestrians, joggers, and other non-motorized activities. The *Multi-use Trail* may also be improved with a variety of trail surfaces. *Rural Trails p*rovide access to natural open space areas, and are designed to minimize impacts to natural resource areas, limit access to maintenance and emergency vehicles, and may limit the types of users depending on permitted uses in these resource areas.

The trails identified in this Master Plan represent both existing and proposed trails. The Master Plan is not intended to show precise alignments or locations of trail improvements, although as a result of master planned community design efforts, some trail locations have been identified. Precise locations for other trail segments will be developed on a case by case basis following appropriate review, through the master planned communities design efforts, or as part of a capital improvement project.

In the City's General Plan, the Greenbelt is divided into segments that roughly follow the boundaries of the City along the Sweetwater River, Salt Creek and Otay Lakes, Otay River Valley, and the San Diego Bay. The Greenbelt is not entirely located within the jurisdictional boundaries of the City. Portions of the Greenbelt are located within the Cities of National City and San Diego, and the County of San Diego and Port District. This document recognizes the need for planning with the neighboring jurisdictions and the City will continue to work with

those agencies to cooperatively plan trail connections to ensure the Greenbelt's continuity.

The process for developing this Master Plan included the following key steps:

Identifying open space programs that comprise the greenbelt system;

Evaluating the existing Greenbelt system, existing trails, proposed trails within developing communities, and related open space and trail planning documents;

Summarizing background information on the open space and regional parks of the Greenbelt, and existing trails and proposed trails;

Establishing goals of the Master Plan with supporting policies;

Developing a physical plan showing recommended multi-use trails within the Greenbelt;

Establishing design guidelines for the amenities within the Greenbelt and for the multi-use trail system; and,

Proposing an implementation program for the Greenbelt system.

This document serves as a planning tool to guide future planning decisions. Specific actions and commitments can assure that in the future the entire Greenbelt with interconnecting trails will be developed through commitments by the City and the adjacent jurisdictions, pursuing funding mechanisms, and through sensitive and flexible design criteria. The Greenbelt Master Plan is divided into the following chapters:

Chapter 1: Purpose and Need
Why the Greenbelt Master Plan has been prepared, the need for a master plan, and who will use the Greenbelt trail system?

Chapter 2: Existing Conditions
Where are the existing Greenbelt segments, what trails have been planned and where they are located?

Chapter 3: Goals and Policies
What goals and policies guide the development of the Greenbelt?

Chapter 4: Design Criteria and Standards
What types of trails will be constructed, are there additional amenities that will be provided and what signs will be installed that will provide recognition and guidance to trail users?

Chapter 5 The Plan
Ultimately, where are the existing and future Greenbelt segments and what trails will be located within each Greenbelt?

Chapter 6: Implementation
What actions need to occur to accomplish the goals of the plan?

Chapter 7: Consultation
Sources Consulted and Persons Interviewed

Chapter 1
Purpose and Need

The City of Chula Vista has grown rapidly achieving the status as the second largest city in the San Diego region (See Figure 1). This rapidly growing, diverse community has a population estimated at 200,000. Over time, the City's leaders have recognized the value of open space and the importance of preserving the natural environment, while also understanding that both open space and trails are important to the quality of life of a diverse community. This document is a Master Plan for the greenbelt system surrounding the City and the trails that are an essential component of the greenbelt.

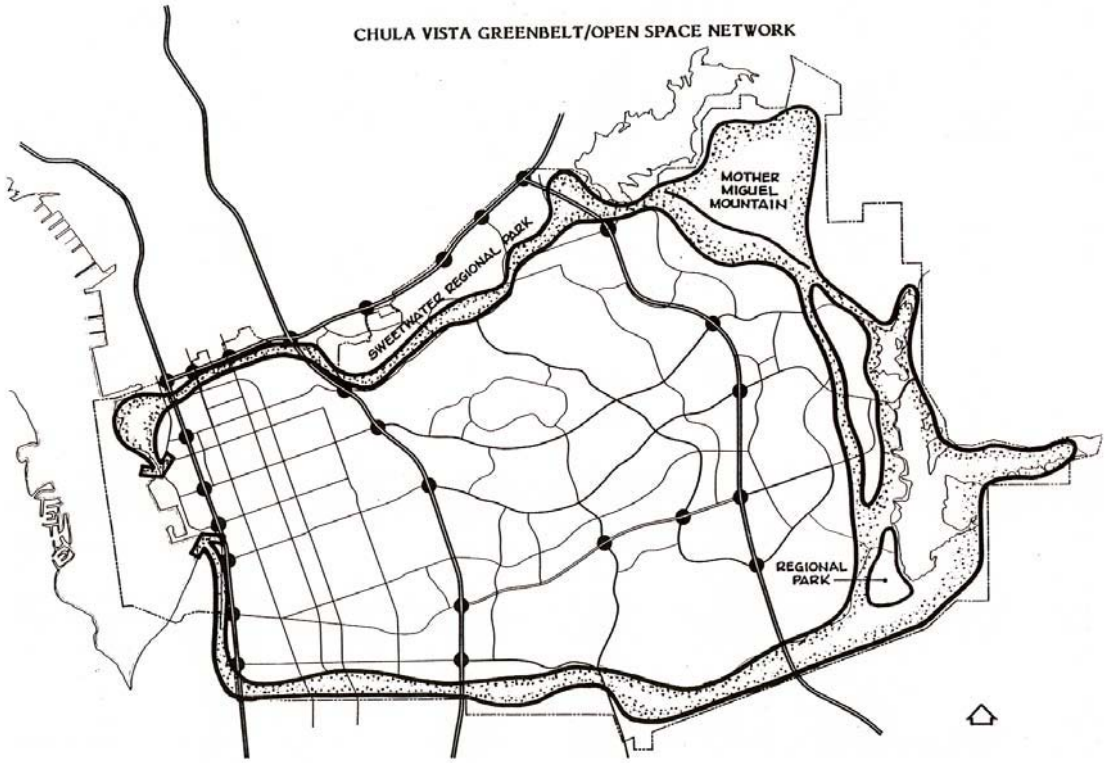
1.1 Purpose of Plan

The Land Use Element of the City's General Plan (pp.1-42) discusses the concept, describes the major components, and includes a diagram of the physical layout of the Greenbelt. The General Plan states, "to assure a coordination of planning for all components of the Chula Vista Greenbelt, an overall master plan is recommended."

The Greenbelt Master Plan (referred to in this document as the Plan) provides guidance and continuity for planning open space and constructing and maintaining trails that encircle the City. The Plan's primary purpose is to provide goals and policies, trail design standards, and implementation tools that guide the creation of a Greenbelt System connected by a system of multi-use trails. The Greenbelt system will create an identity for the City while unifying the west and east. The multi-use trail system is an integral component of the Greenbelt as it links each segment. Each of the Greenbelt segments offers unique challenges to implementing the Plan. Consulting with State and Federal guidelines regarding accessibility will be required prior to final trail design and construction.

The Greenbelt Master Plan serves as a flexible, comprehensive, and long-range planning document. It is a guide for identifying significant open space areas within the Greenbelt and potential multi-use trails and is a tool for planning and developing the entire Greenbelt system.

Vicinity Map
Figure 1



General Plan Greenbelt
Figure 2

1.2 Need for a Greenbelt Master Plan

The City of Chula Vista's Parks Master Plan states that providing well planned leisure opportunities is one of the greatest challenges in the 21st century. Surveys conducted by the City to determine public interest and commitment in parks facilities was conducted in 1995 and 1996 and updated in 2000 (Chula Vista Parks and Recreation Master Plan). The survey resulted in the recognition that 75% of the residents use City parks and that the key programs desired are outdoor court facilities, playing fields, and biking and jogging paths.

Protection of linear corridors and open space networks is vital to providing access to scenic areas, parks, and other public or non-public recreation. Connecting these open space corridors for public access requires preserving corridors for trails, coordination with property owners for trail development, and active public support for trails.

The Greenbelt itself provides visual and environmental benefits. Incorporating a trail throughout the Greenbelt will continue to ensure the feeling of open space, protection of habitat, and providing for public access to the Greenbelt. Trails

provide a relatively inexpensive form of recreation for the general public as well as prove to be an asset to the community and increase property values. Other benefits are more individualized for the user. Trail users realize improved health, increased fitness, convenient access to the outdoors, and a diversified selection of recreational opportunities.

Connecting each Greenbelt segment will result in achieving one of the most desired recreation amenities for communities. The 1993 California Outdoor Recreation Plan states that 88% of the public participated in walking, 55% in hiking, 31% in jogging or running, 46% in biking on paved surfaces, 15% in mountain bicycling and 15% in horseback riding. Urban and suburban development continues to diminish available open space; frequently severing trail corridors used for trail purposes, but never formally designated as public trails. However, the demand for non-motorized trails is increasing. The 1991 Harris Poll cited studies that showed 54% of Americans would cycle if they had safe, separate designated paths on which to ride and 59% said they would walk more if there were pathways separated from motor vehicles (The National Bicycling and Walking Study, pp 30.)

Supporting this need for trails are the results of a telephone survey for the City of Chula Vista conducted in 1995 and 1996 to assess the community's recreation needs and preferences. The results issued by Research Network, Ltd., indicated that 7-8% of those who responded wanted more biking and jogging paths.

Users of trails are classified as either recreationists or commuters. Recreationists are those users who use the trail for exercise, enjoyment, or sport. Commuters are generally defined as bicyclists or pedestrians who walk or bike to school, places of employment or services. It is anticipated that both recreationists and commuters will use the trail system based on the accessibility of trail segments to residential areas and to destination points, such as employment centers, services, schools, and recreation areas. Since the trail system will connect urbanized areas to open space areas, there will be a variety of trail users depending on the location and trail surface.

Bus and/or rail service are readily available and accessible within most parts of the City connecting to Tijuana to the south and the Santa Fe Depot in downtown San Diego. At the Santa Fe Depot, trolley service is available to other points in San Diego County; the Coaster provides service along the coast from Oceanside to San Diego, and Amtrak links San Diego to destinations far north. The Coaster and Amtrak together offer over 98 passenger trains daily with service along the San Diego coast and beyond. Residents of Chula Vista may elect to use the Greenbelt trail system from adjacent residential neighborhoods to bike or walk along the trail to connect to buses or the trolley.

Individuals frequently state that they would ride their bikes to commute to work if there were adequate safe facilities away from roadways with high vehicular traffic

that connect to their home. (San Diego Bicycle Attitude Survey, 1995). Both pedestrians and bicyclists who walk/bike to the trolley or to bus stops are expected to increases when there is a trail system that encounters less cross traffic and connects to employment centers, bus stops, and train service. The Sweetwater segment of the Greenbelt trail and the Bayshore Bikeway along the Bayfront are both identified as regional bikeways in SANDAG's Regional Transportation Plan (RTP) that will provide connections to bus and rail service. One of the key goals of the RTP is to integrate bicycle and pedestrian facilities into the existing multi-modal transportation network and a primary objective of the RTP is to increase, at a minimum of 30 miles each year, the miles of bikeways and another is to increase walking by 150% as a mode of regional commuting trips.

Educational benefits of greenbelts include firsthand experiences highlighting the importance of the natural environment and developing an appreciation of nature. At staging areas, trail kiosks can enhance the experience of the trail users by offering educational experiences.

Some of the economic benefits resulting from recreational uses include expenditures for goods and services, park and trail construction and maintenance jobs, increased tourism (food, lodging and fuel), and increased real estate values. A survey on the relative increase in property values on homes in close proximity to a greenbelt trail system identified that 23% to 30% of respondents felt that a greenbelt significantly increased the value of their homes (Sonoma State University 1992).

An indirect economic benefit involves the increase in the quality of life in the community, improving property values near the trails, and increasing air quality by reducing the number of vehicles.

A 1994 survey of house-buying preferences, by American Lives, Inc., found that 74 percent of homebuyers said the presence of corridors for walking and biking is very or extremely important in their choice of location. This answer was fourth, behind quiet, low traffic area at 93 percent, designed with cul-de-sac streets, circles and courts at 77 percent and lots of natural, open space at 77 percent.

In 1995, Parkwood Research Associates conducted a survey for Rodale Press in which respondents were asked what their current primary means of travel was, and "all things being equal, and if good facilities for each existed, which of these means would you prefer the most"? Persons bicycling and walking rose from 5 percent to 13 percent, while the percentage of people driving alone fell from 76 percent to 56 percent. (Source: Pathways for People, Rodale Press)

Public access areas may be constructed within natural terrain may limit encroachment into the natural environment. Nature cannot be fully appreciated until one is allowed to interact with it and understand it. With appropriate

signage, these trails offer an awareness of the environment and protect varied wildlife species, their habitat, nesting cover, and breeding grounds.

Greenbelts incorporating multi-use trails allow the general public and people with special needs and abilities to access outdoor environments and participate in outdoor activities. Off-road trails improve access to and through areas that otherwise would be difficult or impossible to view and enjoy. A significant portion of the trail system will be designed to accommodate various groups of people, including the very young, elderly, and disabled.

1.3 Components of the Greenbelt

For planning purposes, the Greenbelt is divided into eight segments. Seven of these segments are consistent with the segments of the Greenbelt described in the General Plan except that a more descriptive name has been given to each segment (See Figure 11). An additional corridor, the Otay Ranch Village Greenway, a component of the Otay Ranch General Development Plan, has been added as a component of the Greenbelt since it provides an opportunity to develop a trail corridor connecting from Salt Creek, through the heart of the Otay Ranch and Wolf Canyon, to the Otay Valley Regional Park near Rock Mountain. A more detailed description of each of the segments is included in Chapter 5, The Plan. The segments include:

1. **Lower Sweetwater** (Figure 12)
2. **Sweetwater Regional Park** (Figure 13)
3. **San Miguel** (Figure 14)
4. **Otay Lakes** (Figure 15)
5. **Salt Creek Corridor** (Figure 15)
6. **Otay Ranch Village Greenway** (Figure 16)
7. **Otay Valley Regional Park, East and West** (Figure 16 & 17)
8. **The Bayfront** (Figure 18)

The ***Bayfront*** borders the San Diego Bay and parallels Interstate 5 from the Otay River to the Sweetwater River. It is characterized by its access to the Bay, marinas, and the regional Bayshore Bikeway. The Bayfront hosts several small parks.

Bayfront

Two segments, the ***Otay Valley Regional Park, East and West,*** follow the Otay River from the County Park at the southern edge of Lower Otay Lake and westerly to Interstate 5. The regional park comprises

8,700 acres of a multi-jurisdictional open space that is planned for natural preserve areas, active and passive recreation, and equestrian, hiking, and biking trails. The valley contains a county park situated at the eastern end, "Knott's Soak City" a water slide park, Coors Amphitheatre, and the San Diego National Wildlife Refuge (South San Diego Bay Unit) at the western end.

Otay Lakes (Upper and Lower Otay Lakes) lie east of Salt Creek and are located at the far eastern boundary of the City. The Olympic Training Center overlooks Lower Otay Lake.

Otay Lakes

The ***Salt Creek*** corridor begins at the Auld Golf Course, progresses south through the Rolling Hills Ranch area and follows Salt Creek, passing by the Olympic Training Center to the east and ending at the Otay River Valley.

San Miguel includes the San Diego National Wildlife Refuge (Otay-Sweetwater Unit), the newly developing residential development of San Miguel Ranch and the Auld Golf Course at the base of the San Miguel and Mother Miguel Mountains.

Sweetwater Regional Park includes the County's Summit Park on the west edge of the Sweetwater Reservoir then extends from Summit Park west through the Bonita Golf Course and the Chula Vista Golf Course to Interstate 805. It comprises 570 acres of which 178 acres are located within the boundaries of the City of Chula Vista. It features existing hiking, biking and equestrian trails, an equestrian staging area, Rohr Park (currently the City's largest community park), bordering the Chula Vista Golf Course and Summit Park at the eastern end of the Bonita Golf Course

Sweetwater Regional Park

Lower Sweetwater extends along the Sweetwater River flood channel from Interstate 805 west to Interstate 5. Along this segment, the flood channel generally separates National City and Chula Vista.

Otay Ranch Village Greenway travels through portions of Villages 7 and 11, and the Eastern Urban Center connecting Salt Creek, Wolf Canyon and the Otay Valley, as depicted on the adopted Otay Ranch General Development Plan. This segment begins within urban areas on the east, and then continues through the

Wolf Canyon natural drainage corridor beginning at planned La Media Road and continuing west then south to the Otay Valley Regional Park at Rock Mountain.

Chapter 2
Existing Conditions

2.1 Historical Context

The historical beginnings of Chula Vista are of interest when planning the Greenbelt System since much of the early development, from prehistoric to the early development of California, occurred along the water features that surround the City and which constitute significant portions of the Greenbelt. Over 283 cultural resource sites were located in the Otay River Valley alone which indicates that the early settlers inhabited the river valleys. One of the early developments in Chula Vista occurred with the salt production of the Western Salt Company in early 1871, under the name of La Punta, along the San Diego Bay.

Recognizing the opportunities of Chula Vista, the Kimball brothers formed the San Diego Land and Town Company in 1888. Colonel William Dickinson who managed the S.D. Land and Town Company was well known in the early development of Chula Vista and is considered its earliest town planner. Lower Otay Dam was completed in 1897 and served the South Bay communities until 1916 when it was destroyed by flood. The City of San Diego rebuilt the dam in 1919 providing water to the newly developing agricultural communities west of the Otay Lakes and creating the Greenbelt eastern border of Chula Vista.

At the beginning of World War II, due to Chula Vista's location along the San Diego Bay, Rohr Aircraft Company settled in Chula Vista. With that, industrial development grew and the City saw an influx of new residents.

2.2 Local and Regional Setting

The City of Chula Vista is located south of downtown San Diego and National City, north to northeast of Imperial Beach and north of portions of the City of San Diego and the Baja, Mexico border. Bordering the City to the north is the unincorporated community of Bonita. Much of the area to the north, east and south of the Upper and Lower Otay Lakes is located within the unincorporated County, portions that are designated as open space as part of the Multiple Species Conservation Program (see page 13 for a summary of the MSCP program).

Chula Vista is growing rapidly with a population of approximately 200,000. By the year 2020, the population is expected to reach 270,739. The community is diverse both in economy and ethnicity. Supporting a higher than average

proportion of population less than 15 years of age, the demand for parks, trails, and outdoor activities continues to grow.

2.3 Relationship to Other Local and Regional Plans

City of Chula Vista — General Plan

The City's General Plan recognizes that there are opportunities to create a greenbelt system surrounding the City. The Land Use Element of the General Plan defines the Greenbelt as a circumferential greenbelt utilize(ing) existing developed and undeveloped open space and potential new open space linkages to create a continuous 28-mile open space and park system around the city (See pp 1-42 of GP).

The General Plan identifies the Greenbelt segments as the following (See Figure 2, page 10 of GP):

Bayfront Park to Otay River
Otay River Valley to Otay Lake Regional Park
Otay Lake Regional Park to Mother Miguel Mountain and Sweetwater Reservoir
Sweetwater Reservoir to I-805
I-805 to Bayfront Park

Parks and Recreation Master Plan

The City recently adopted a Parks Master Plan that guides the City's park planning efforts for the developed area of the City, as well as the newly developing areas in the eastern portion of the City. The Parks Master Plan document corresponds to the planning efforts of the Greenbelt Master Plan for the interconnecting subregional trails within Salt Creek Canyon, Wolf Canyon, and the Otay River Valley.

Chula Vista Master Planned Communities (GDP)

A greenbelt system including connecting trails are part of the newly developing master planned community areas known as Eastlake, San Miguel Ranch, Otay Ranch, and Rolling Hills Ranch. These master plans, guided by adopted policies contained within General Development Plans, have designated areas of preserved open space and trails. Many of the trail segments have been constructed or will be constructed during the construction of the communities.

The Eastlake III General Development Plan, containing the Vistas and Woods planning areas, identifies two major off-street pedestrian trails: the Eastlake Community Trail and the Chula Vista Greenbelt Trail. The Eastlake Community Trail (Thematic Corridor) extends from Eastlake Hills through the developed portion of the Eastlake Planned Community to Eastlake Trails within Salt Creek and will be continued across Eastlake Vistas to overlook Otay Lakes. A

pedestrian trail through Salt Creek Canyon will connect to the Greenbelt Trail System.

San Miguel Ranch includes 2,065 acres of an open space preserve which is a key segment of the Greenbelt System. The Greenbelt will be connected by trails from within San Miguel Ranch. Trails within San Miguel Ranch include equestrian, walking and biking trails and will provide access to regional trails and Greenbelt trails.

The Otay Ranch is a master planned community which includes an open space area comprising of approximately 11,000 acres to be set-aside as mitigation for impacts to sensitive resources resulting from the Otay Ranch development. The dominant feature linking the three Otay Ranch parcels is the Otay River system, including a system of canyons and drainage courses and Otay Lakes.

County of San Diego

The County of San Diego borders the City of Chula Vista from approximately Interstate 805 east to the Sweetwater Reservoir, east of the Otay Lake Reservoir, and along the eastern portions of the Otay River. Therefore, planning trails along the Greenbelt in these areas must take into consideration trail connections in the County areas. The County is in the process of developing a Trails Master Plan that is scheduled for public review and adoption in 2002/2003. Additionally, the County completed a study of bicycle trail alignments along the eastern side of the Sweetwater River. Utilizing grant funds, they completed a preliminary design study for the portion of Sweetwater River from Plaza Bonita, in the unincorporated community of Bonita, to the Chula Vista Golf Course. The County is continuing to pursue other grants for trail improvements along the Sweetwater River along the Bonita Golf Course to Summit Park.

Other Local and Regional Planning Efforts

A number of planning efforts have been underway for each of the segments at some level. In order to understand those efforts and the opportunities or constraints that these documents may pose, a short summary of each is presented below.

Sweetwater Bike Path

An Environmental Opportunities and Constraints Analysis for the Sweetwater Bike Path, prepared by Recon (February 14, 2001) analyzes alignment alternatives for a bike path within the Sweetwater Regional Park (identified in the report as Areas 13 and 17).

Otay Valley Regional Park Concept Plan

The key goal of the Otay Valley Regional Park Concept Plan is to link major open space areas within the southern area of San Diego County and South San Diego Bay with lower Otay Lake. The concept plan provides policy direction for the jurisdictions for coordinated land acquisition and development for the Regional Park.

The Regional Park extends from the southeastern edge of the salt ponds at the mouth of the river, through the Otay River Valley, to the land surrounding both Lower and Upper Otay Lakes. Trails should be located on both sides of the river wherever possible, with crossings where appropriate. Trail corridors should provide connections to other regional trails, including the Bayshore Bikeway to the west, the City of Chula Vista Greenbelt trails which will provide a connection to Sweetwater Regional Park, and the Bureau of Land Management (BLM) holdings to the east.

Multiple Species Conservation Program (MSCP) Subarea Plan

The Multiple Species Conservation Program (MSCP) Subarea Plan for the City of Chula Vista was approved by the City Council in May 2003. This comprehensive document is a long-term habitat conservation plan which implements Chula Vista's portion of a 172,000-acre Subregional Plan for the South San Diego County, from Del Mar to the Mexico border. The MSCP addresses the potential impacts of urban growth, natural habitat loss and species endangerment, and creates a plan to conserve habitat that supports a variety of endangered and threatened species, as well as other sensitive species, while providing for future development of both public and private lands within the South County.

Port District/Chula Vista Bayfront Master Plan

Both the San Diego Port District and the City of Chula Vista have begun the preparation of the Bayfront Master Plan that will address the arrangement of land uses on approximately 300-acres west of Interstate 5 freeway and roughly between G Street and Palomar Street. It is the City's intent to coordinate with the Port District to include elements within the Plan that implement the City of Chula Vista Greenbelt concept. As the Bayfront Master Plan is not expected to be completed for about two years, any parks, trails or other facilities identified in this Greenbelt Master Plan are considered conceptual at this time.

Chapter 3
Goals and Policies

Goals and policies provide direction for the overall program of the Greenbelt Master Plan. The following goals and policies respond to the intent of the Master Plan as defined in the General Plan and specific issues for implementation.

Goals are very broad statements of purpose. These are identified below in bold type.

Policies are specific statements guiding action and implying clear commitment. These are identified below in normal type.

Goal 1.0: To establish a comprehensive and coordinated greenbelt system that visually reinforces the natural character of the community and integrates unique historic and cultural resources, open space areas, creeks, and trails.

Policy 1.1: The City will coordinate and cooperate with the San Diego Port District, City of San Diego, County of San Diego, Resource Agencies, Wildlife Refuge, and other public agencies, as well as private interests, to provide open space easements and connecting trail easements linking Chula Vista's Greenbelt.

Goal 2.0: To provide connected open space areas surrounding Chula Vista to enhance the natural beauty and to preserve native biological and cultural resources as well as sensitive habitats.

Policy 2.1: The City will strive to ensure the protection of the natural habitat from encroachment of trail users through education, fencing, signing and design.

Policy 2.2: The City will coordinate implementation of the Greenbelt trail with the Preserve Owner Manager (POM) of the Otay Ranch Preserve.

Policy 2.3: The City will coordinate the implementation of the Greenbelt Master Plan with management plans for the Otay River Valley.

Policy 2.4 The City recognizes the natural value of the open space through the MSCP preserves and will plan for trails that do not diminish the value of the pristine environment.

Policy 2.5 The City will locate trails in areas that avoid or minimize conflicts with natural resources.

Policy 2.6 All proposed trails shall adhere to guidelines contained within the City's adopted MSCP as well as stipulations contained within other mitigation agreements.

Policy 2.7 Impervious trails should be avoided in watershed and flood plain areas where potential contamination of resources could occur.

Goal 3.0: To establish a greenbelt that ensures public access within the greenbelt through an active and passive recreation park system with trails connecting each segment.

Policy 3.1 The City will actively pursue open space programs and and develop trail links connecting to parks and regional trails.

Policy 3.2 The City will design trails that will accommodate a wide range and number of users anticipated.

Policy 3.3 The City will develop a greenbelt system that offers a variety of active and passive recreation experiences.

Policy 3.4 The City will develop trails, wherever possible, which provide for accessibility for all, including those with disabilities.

Policy 3.5 The City will locate staging areas, parking areas, and other amenities in areas that enhance the greenbelt system.

Policy 3.6 The City will utilize existing fire roads, access roads and/or utility easements for the trail system when possible.

Policy 3.7 The City will limit the use of multi-use trails to non-motorized uses except for motorized wheelchairs, and utility, maintenance, and emergency vehicles.

Goal 4.0: To provide a Greenbelt system that receives the necessary resources for open space acquisition, park and trail development, maintenance, and to establish volunteer programs.

Policy 4.1 The City will identify and pursue potential grant programs for trail improvements and open space acquisition.

Policy 4.2 The City will pursue grant programs and opportunities with inter-agency cooperation for park and trail development and implementation.

Policy 4.3 The City will encourage volunteer/community service organizations to assist in the construction and maintenance of trails.

Policy 4.4 The City will collaborate with private organizations for constructing, maintaining, and monitoring trails.

Goal 5.0: To establish a framework for the City to designate a staff person or department(s) who will serve as the manager responsible for open space and park acquisition, obtaining funds, coordination, implementation, and ongoing maintenance of the Greenbelt.

Policy 5.1 The City will facilitate the design of parks and trails in accordance with applicable State and Federal regulations and with best practices available.

Policy 5.2 The City will coordinate maintenance and monitoring programs for the Greenbelt system.

Policy 5.3 The City will facilitate the installation of informational signs and maps within each Greenbelt segment and along the trail system to guide trail users.

Policy 5.4 The City will prepare an implementation plan that establishes department and staff responsibilities for managing open space property acquisition and inter-agency coordination, as well as addresses funding for Greenbelt management and maintenance.

Chapter 4
Greenbelt Design Criteria and Standards

The Greenbelt currently boasts a number of active and passive recreation facilities stemming from:

Regional Parks,
Community Parks,
Neighborhood Parks,
Special Purpose Parks,
Commercial Parks and Recreation,
and Multi-use Trails.

These facilities currently exist and as the Otay Valley Regional Park is implemented, more active and passive recreation parks will be developed. The City's Parks and Recreation Master Plan defines each park type as follows:

Regional Parks – large open space and recreational facilities provided, whether partially or wholly, by the County of San Diego. Included within the Greenbelt are the Sweetwater and Otay Valley Regional Parks. Activities and programs include sports fields, picnicking, camping, hiking, and wildlife refuges.

Community Parks – comprising 15 or more acres, community parks serve more than one neighborhood offering sport fields, recreation centers, picnicking, and playgrounds. Rohr Park, located within the Sweetwater Segment, is a community park and two community parks are being developed within the San Miguel, Otay Lakes, and Salt Creek Segments.

Neighborhood Parks - intended to serve local residents and are within walking distance of ¼ - ½ mile. Neighborhood parks range in size from 5 to 15 acres, frequently adjacent to schools, and picnicking, playing fields, and playgrounds. Neighborhood parks are principally located within each community and are not typically planned for within the Greenbelt system.

Special Purpose Parks – are parks that offer specialized facilities or themes. Located within the Greenbelt are the following: Chula Vista Nature Center within the Bayfront Segment, Summit Park, an equestrian park within Sweetwater Regional Park (County), and the Olympic Training Center within the Otay Lakes Segment.

Commercial Parks and Recreation – consists of a variety of active recreation focusing on special activities or events. Within the Greenbelt there are several golf courses, the Chula Vista Municipal Golf Course and the Bonita Golf Course both within the Sweetwater segment, the Auld Golf Course within the San Miguel

segment, the Coors Amphitheater and Knotts Soak City Water Park, both within the Otay River Valley Regional Park segment, and the Marina View Park with the Bayfront segment.

Multi-use Trails – provide for a variety of uses from equestrians to biking and hiking. Trails have been and are currently being constructed by several developers of residential communities including Rolling Hills Ranch, San Miguel Ranch, Otay Ranch, and Eastlake Trails.

Active and passive parks as described above already define the Greenbelt and it is because of these parks that the majority of the Greenbelt exists. Expanding on the existing parks and creating additional parks, primarily within the Otay Valley Regional Park where there are opportunities for expansion, will further enhance the greenbelt.

Multi-use trails have been randomly developed, both formally and informally. It is the intent of this Master Plan to recognize where trails currently exist and to identify where the trail system may be expanded to enhance the trail system and connect the Greenbelt segments.

This chapter describes *the Greenbelt amenities, trail design, sign standards* and provides guidance for *managing the Greenbelt*. The reader should refer to the City's Parks and Recreation Master Plan for further discussion on park programs and park design within the City.

4.1 Trail Types

The City's Landscape Manual, dated November 1994, sets specific standards for trail construction within the City. The intent of the following trail standards is to augment the standards in the Landscape Manual.

The design guidelines identified in this chapter set forth minimum standards for the two general types of trails specified below. Variation to the minimum standards will be based on consideration of the number and types of trail users and environmental constraints. These factors should guide the width of the trail and the location of the trail to reduce impacts on resources and topography.

For the purposes of the Greenbelt, there are two general types of trails defined: *Multi-use Trail* and the *Rural Trail*. The *Multi-use Trail* is a trail for bicyclists, equestrians (where identified), pedestrians, joggers, and other non-motorized activities. The *Rural Trail* provides access to natural open space areas that may be off limits to vehicles. These trails may serve pedestrians, bicyclists and equestrians depending on permitted uses in the resource areas.

4.1.1 General Standards

By design, the City's trail system encourages use by a variety of different types of users. In cases where the trail is adjacent to, or located along an existing or proposed park, the park design should consider the trail access, trail parking, and trail signage during the park design. Active recreation is recommended to be located at a minimum of twenty feet away from the trail.

Continuity and consistency in trail design is necessary to ensure that the user's expectations are satisfied and will result in the trail being used frequently. A discontinuous trail or one that changes in trail width or trail composition results in complaints by users.

Trails should intersect all crossings at 90° angles, if possible. Motorcycle or vehicular access shall be restricted with signage or additional design or detailing. No curbs or vertical features within five feet of the edge of the trail should be constructed along trails that provide for equestrian use, except where a fence is required for a downhill slope. A minimum of 14'0" overhead clearance shall be provided and maintained for both built and natural features adjacent to the trail. Trail design or construction techniques may vary in order to respond to specific site constraints as determined appropriate by City staff.

4.1.2 Trail Surface

The trail surface may be asphalt, concrete, decomposed granite, a soil-stabilized surface, or native soil. The advantages of an asphalt or concrete surface are that the trail can accommodate the widest range of users and is frequently used in a more urbanized setting. The surface choice will be dependent on the trail connection and the anticipated trail usage. In more rural areas or where the trail connects to a decomposed granite trail, the trail should offer a continuous surface treatment.

A soil-stabilized trail is one constructed of a non-petroleum binder combined with aggregate to produce a compacted pavement surface that retains the characteristics of aggregate but is noted for its comparatively cool summer surface temperature and natural appearance. The soil-stabilized product is applied as a cold treatment and may be constructed at remote locations. This product also avoids the air quality concerns of the construction of hot mix asphalt product. Users of trails constructed of this type of surface may include joggers, bikers, equestrians, wheelchair users, and strollers. The surface is not compatible for roller bladders or skaters.

4.1.3 Multi-Use Trail

A multi-use trail is simply defined as any trail that is used by more than one user group or for more than one trail activity. Multi-use trails are often called "shared

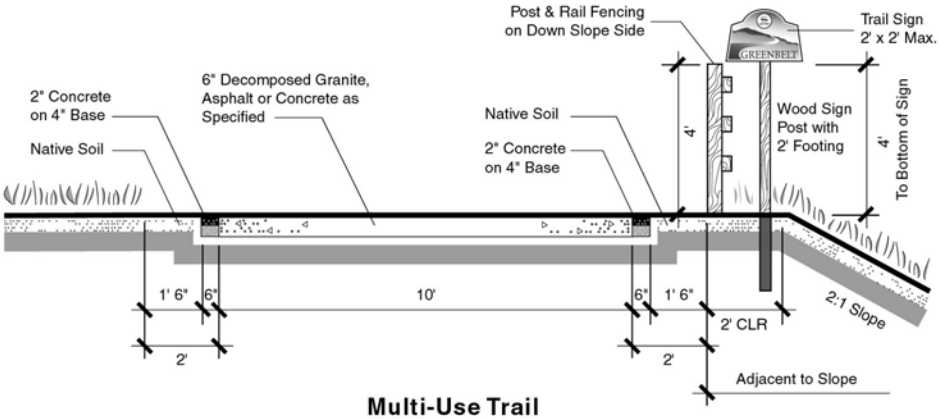
use" or "mutual use" or "diversified use" trails. Multi-use trails accommodate the largest number of user types on a limited land base and development of multi-use trails should be given preference over trails with specific users restricted. Multi-use trails are an efficient, economical, and increasingly common way to provide broad trail opportunities.

Equestrians, mountain cyclists, and hikers typically share unpaved multi-use pathways and bicyclists, walkers, joggers, persons with disabilities, rollerblades, strollers, and other non-motorized activities share paved multi-use pathways. Even a single-track pedestrian-only trail will be used by hikers, backpackers, trail-runners, bird watchers, etc., so that in the broadest sense all trails are multi-use trails.

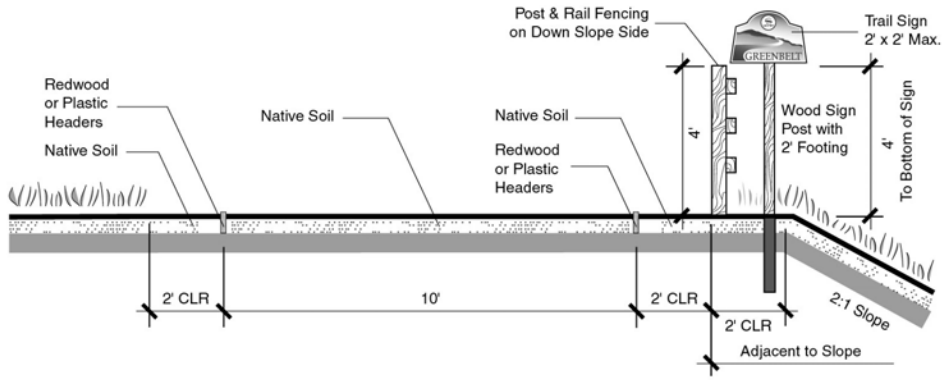
A *multi-use trail* constructed of concrete or asphalt would extend a minimum width of 10'0" with two feet natural shoulders. This hard surfaced pathway consists of 4" of concrete/asphalt over 2" of base and would be ADA accessible. In some instances, there may be opportunities to provide a hard surface trail with a reduced width of five to eight feet with a parallel four to five foot natural trail for equestrians. When the *multi-use trail* is split, a post and rail fence would separate the paved pathway from the natural path. A post and rail fence along side of the trail would be installed where a downslope condition exists greater than 5' bordering the trail.

A *multi-use trail* of decomposed granite (DG) or native soil shall have a minimum width of 10'0" and a depth of 6" of compacted decomposed granite or compacted native soil contained within 6" wide concrete mow curbs along both sides of the trail. 4" plastic recycled headers may be used to contain the trail as determined by the City of Chula Vista. A Concrete Treated Base (CTB) or a similar liquid soil solidifier may be used to solidify the native base. These types of trails utilize the existing decomposed granite and do not change the color of the soil. It has been used for parking lots and service roads to provide stability with the existing soil. These trails are cheaper to construct but require more frequent maintenance. Users may include equestrians, mountain bicyclists, joggers and walkers. Due to the difficulty of rolling on decomposed granite or natural dirt trails, both persons with disabilities or with strollers avoid these trails.

A 5' separation shall be required when a *multi-use trail* parallels or borders a roadway. It is anticipated that pedestrians, joggers, people in wheelchairs, and bicyclists would use this trail. A multi-use trail along a roadway does not replace a bicycle lane installed or proposed or required to be installed within the roadway.



Multi-Use Trail
Not to Scale



Rural Trail
Not to Scale

Multi-Use Trail / Rural Trail
Figure 3

4.1.4 Rural Trail

A *Rural Trail* would be constructed at width of 10 ft. compacted native soil and contained within redwood header strips or some similar material. The *rural trail* would be also designed for a variety of users, such as pedestrians, bicyclists, and equestrians. However, since it would be constructed in rural areas and may be subject to steeper slopes, it may not accommodate all types of user abilities or type of users. In such areas it may also be designed to a reduced width due to environmental concerns (see Section 4.1.5, Special Trail Design Criteria).

A post and rail fence alongside of the trail shall be installed when a slope condition higher than 5 ft. exists within 5 ft. to either side of the trail. These trails would be located in natural resource areas and where available would utilize existing maintenance or fire access roads. *Rural trails* may be located above a creek bed, on a steep slope or along a dirt utility access road.

Table 1
Trail Standards

Design Component	Multi-use Trail	Rural Trail
Standard Width*	10’	10’ Varying width of 4’-5’ in Core Preserve areas or habitat areas
Horizontal Clearance	14’	14’
Vertical Clearance	10’ (14’ where trail use permits equestrian)	10’ (14’ where trail use permits equestrian)
Cross Slope	1 – 4% optimum 6% maximum in approved locations****	Depends on terrain and environmental constraints
Vertical Grades***	0-5%*****	5-20% maximum distance over 500 feet 10-15% maximum for distance limited to 250 feet 15-20% maximum for short distances less than 100 feet.
Standard Shoulder Width	2’ of native or decomposed granite adjacent to concrete or asphalt path or 6” wide concrete strip or 4” plastic recycled headers adjacent to decomposed granite path	No shoulder required
Headers	6” concrete headers	Redwood headers
Surface Treatment	Decomposed Granite Concrete Asphalt Soil-stabilized treatment (As specified for each trail segment)	Native Soil (Decomposed Granite or Soil-stabilized treatment in areas subject to soil erosion) Trail tread to be cleared of rocks over 1” in diameter, debris, and roots.
Fencing** (Fencing to be located outside of shoulder)	Post and Rail (See Fence Exhibit 9)	Post and Rail Fence (wire fence, as appropriate, may be used in areas of native habitat)

*Width may be reduced for short sections where available width is constrained due to environmental or other constraints upon approval of the Director of Planning and Building Director.
** Fencing to be installed on down slope side or separating a paved trail from a natural trail or when a multi-use trail with equestrian use permitted borders a roadway.
*** Switchbacks may be considered in steep slopes
**** Designated wheel chair access routes shall not exceed 2%.
***** Wheel chair routes will have landings every 30 inches of vertical rise.

4.1.5 Special Trail Design Criteria

Depending on where trails are located and the expected type of users, there may be special design criteria required. Short segments of the Greenbelt trail system may traverse exceptionally steep terrain, be located within sensitive habitat areas or co-locate on utility maintenance roads. In these special situations, typical standards for trail construction may not apply. Criteria for trails to minimize the effect of erosion, reduce the impacts of human or equestrian impacts to sensitive animals, or provide adequate stability to allow for the use of maintenance vehicles are addressed below.

Trail Tread Design
The trail will consider the type of use and the unique circumstance where the trail is proposed to be located. Trail design shall consider erosion and diversionary devices to reduce erosion through the use if water bars and berms. Slopes shall be compacted to prevent erosion.

Natural Resource Areas
The Greenbelt travels through urbanized settings to natural, undisturbed resource areas. The hillsides are covered with native upland habitat, coastal sage scrub and the valleys boast oak woodland and riparian vegetation. Together these natural communities provide important and diverse wildlife habitat. The MSCP Preserve lands, as described in Chapter 2, are dedicated conservation lands that will also serve to connect large areas of open space through a series of wildlife corridors. Trails through these areas will be designed carefully to avoid adverse environmental impacts and will be subject to environmental review pursuant to the provisions of the California Environmental Quality Act.

Construction of trails mandates that the natural environment be preserved to the greatest extent possible and that a minimal amount of grading occurs. Clearing of vegetation for trails should be minimized and trails should be located where impacts to these natural communities are limited. All disturbed terrain should be replanted with native vegetation.

Minimizing environmental impacts is a high priority for resource and recreation managers. Natural resources such as wildlife, vegetation, water, and air quality and historic and cultural resources are vulnerable to impacts caused by inappropriate trail usage or overuse of a trail. Resource impacts such as soil erosion, damaged vegetation, polluted water supplies, litter, and vandalism can result in dissatisfaction with trail usage and possible closure of trails to various types of user groups. There have been a number of studies conducted to determine which user groups or the numbers of users that causes the most impact to natural resources. Impacts are generally activity specific. Some activities create impacts more quickly or to a greater degree than others.

Impacts even from the same activity can vary according to such factors as mode of transportation, characteristics of users, size of group, and behavior.

Along a creek, the top of the bank is the preferred location for the trail in order to minimize erosion and bank stabilization problems. Although trails along steep slopes should be avoided, when a trail connection is needed or to optimize the trail network, a trail may be located along a slope using a bench cut to minimize erosion. Cut slopes above the trail should be limited to a 2:1 slope and all disturbed slopes would be replanted with native vegetation.

The following trail design guidelines shall apply within sensitive habitat areas and are consistent with the City's draft Multiple Species Conservation Program (MSCP) Subarea Plan (Section 7.5.3 Public Access, Trails and Recreation):

1) Locate public access, trails, view overlooks, and staging areas in the least sensitive areas of the Preserve. Locate trails along the edges of urban land uses adjacent to the Preserve, or the seam between land uses (e.g., agriculture/habitat), and follow existing dirt roads as much as possible (except where occupied by Quino checkerspot butterflies) rather than entering habitat or wildlife movement areas. Avoid locating trails between two different habitat types (ecotones) due to the typically heightened resource sensitivity in those locations.

2) In general, avoid paving trails in wildlife areas unless management and monitoring evidence shows otherwise. Clearly demarcate and monitor trails for degradation and off-trail access and use. Provide trail repair/maintenance as needed. Undertake measures to counter the effects of trail erosion including the use of stone or wood cross-joints, edge plantings of native grasses, and mulching of the trail.

3) Minimize trail widths to reduce impacts to critical resources. To the maximum extent practicable, do not locate new trails wider than four feet in core Preserve areas or wildlife corridors. Core areas and wildlife corridors, where new trails may be limited to four feet, will be defined in area-specific management directives (plans). Where trails are planned in concert with sewer or water utility easements, the trail width should consider the easement requirements for the utility. Trails should not be encouraged within SDG&E easements. Provide trail fences or other barriers at strategic locations when protection of sensitive resources is required.

4) Limit the extent and location of equestrian trails to the less sensitive areas of the Preserve. Locate staging areas for equestrian uses at a sufficient distance (e.g., 300-500 feet) from areas within riparian and coastal sage scrub habitats to ensure that the biological values of the Preserve are not impaired.

5) Limit the access to finger canyons through subdivision design, fencing or other appropriate barriers, and signage.

6) Provide sufficient signage to clearly identify public access to the Preserve. Barriers such as vegetation, rocks/boulders or fencing may be necessary to protect highly sensitive areas. Use appropriate type of barrier based on location, setting and use. For example, use chain link or cattle wire to direct wildlife movement, and natural rocks/boulders or post and rail fence to direct public access away from sensitive areas. Lands acquired through mitigation may preclude public access in order to satisfy mitigation requirements.

4.2 Greenbelt Design

Within the Greenbelt, the residents enjoy golfing, playing fields and playgrounds, a water park, trails, equestrian staging areas, natural open space, and trails. Other parks and trails have been and are currently being constructed by several residential developments including Rolling Hills Ranch, San Miguel Ranch, Otay Ranch, and Eastlake Trails. The purpose of the Greenbelt Design section of this chapter is to provide design criteria for proposed Greenbelt amenities.

4.2.1 Greenbelt Signs

Visitors to the Greenbelt will be greeted by a consistent, unique logo that identifies the Greenbelt and will guide users along the Greenbelt. The logo should be located at each trailhead or entrance, staging area and along the trail. Signs for entranceways, staging areas, directional signs, regulatory signs and trail markers are important to project safety and inform users on the rules of the road. Trail signs will inform visitors of the location of the trail, where it goes, the type of activity permitted, and enforcement standards. Trail signs are divided into the following: Greenbelt Trail Signs, Trail Kiosk Signs, Trail Sign Posts, and Staging Area signs. All signs shall be painted with graffiti resistant paint. Information about trail usage displayed on the Trail Kiosk signs shall be in both English and Spanish. Greenbelt sign construction and installation responsibilities will be addressed in the implementation plan, to be prepared subsequent to this master plan.

Greenbelt Trail Signs

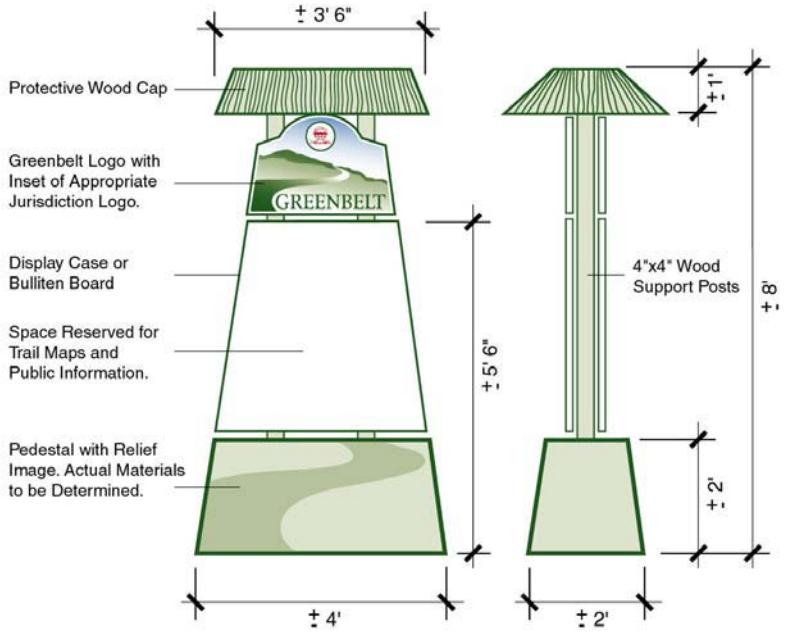
Trail signs will be located at trail access points such as at street crossings and at staging areas. The 4' x 4' x 2" wood trail signs consist of the Greenbelt logo and City logo constructed on an attached to a 6" x 6" post, 6.0' high.

Not to Scale

Greenbelt Trail Sign
Figure 4

Greenbelt Kiosks

A kiosk is a large sign panel that informs the user about the trail. A kiosk is located at active trailheads and staging areas. Each kiosk includes the Greenbelt logo, a trail map, regulation for use of the trails and Greenbelt, community events, and other information. All kiosks will be designed to meet visual and physical ADA access requirements. Kiosks may be designed to include the acknowledgement of sponsorships by local agencies, organizations and/or corporations.

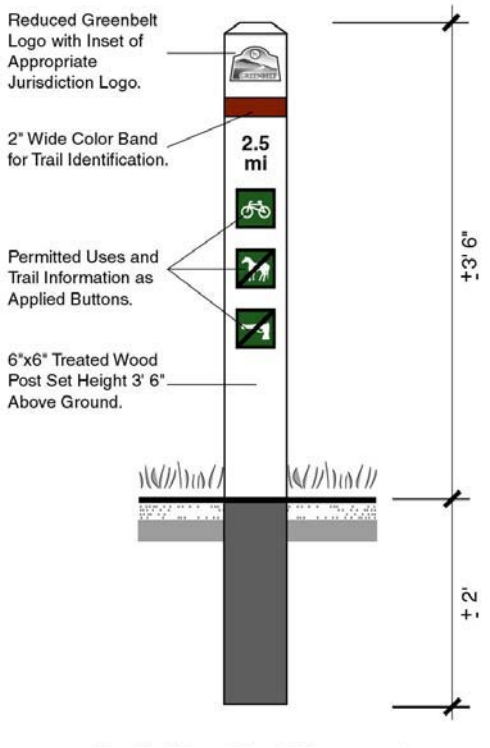


Not to Scale

Trail Head Kiosk Concept
Figure 5

Trail Sign Post

Trail sign posts shall be located along the trail and installed at every half mile, identifying the trail distance. Affixed on each signpost are permitted and prohibited uses, distance, and the identifiable Greenbelt logo. The posts will be constructed of 6” x 6” treated wood posts set in concrete 42” above grade.



Note to Scale

Trail Sign Post Concept
Figure 6

4.2.2 Staging Areas

Staging areas offer a convenience to the trail user by providing parking for vehicles, bicycles and, where noted, tie-ups for horses and other facilities. Facilities for equestrians, such as parking for horse trailers, should be provided where the trail links to trails designated for equestrian use. Other amenities may include restrooms, a drinking fountain, a public telephone, picnic tables and benches, trash containers, water trough and hitching post for horses, mounting stand for equestrians, and a self-latching gated paddock.

Equestrian Staging Area at Bonita Road

Staging areas should be located at all major entrances to trails and at key connection points to other regional rural trails. The number of parking spaces should be determined by the projected demand. The precise number and location or type of future staging or educational areas will be determined as opportunities and funding becomes available. There are three types of staging areas discussed in this plan: staging areas using existing parking lots for parks, libraries and schools or other public parking lots (Staging Area Type I), standard staging areas (Staging Area Type II), and staging areas with equestrian facilities (Staging Area Type III) as described and illustrated below:

Paddocks at Summit Park

Staging Area at Sweetwater Regional Park

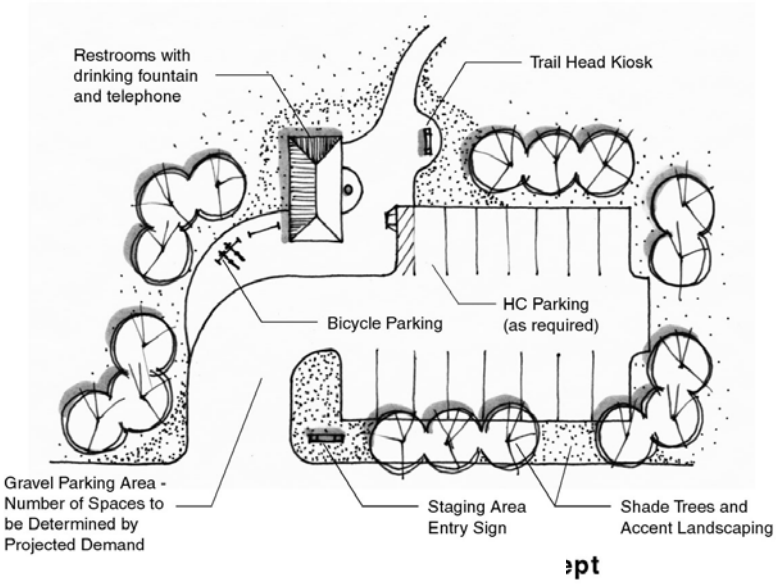
<u>Staging Area Type I- Public Parking</u>
A public parking staging area includes public parking lots for local parks, schools or other public parking. A trailhead sign connecting to a public parking area will identify the entrance to the trail.

<u>Staging Area Type II- General Staging Area</u>
A General Staging Area will be constructed for trail access where appropriate. Additional amenities may be available such as bicycle parking, trash containers, picnic tables, drinking fountains, restrooms with pit toilets or flush toilets, or portable self-contained toilets, benches, air units for pumping bicycle tires, and a

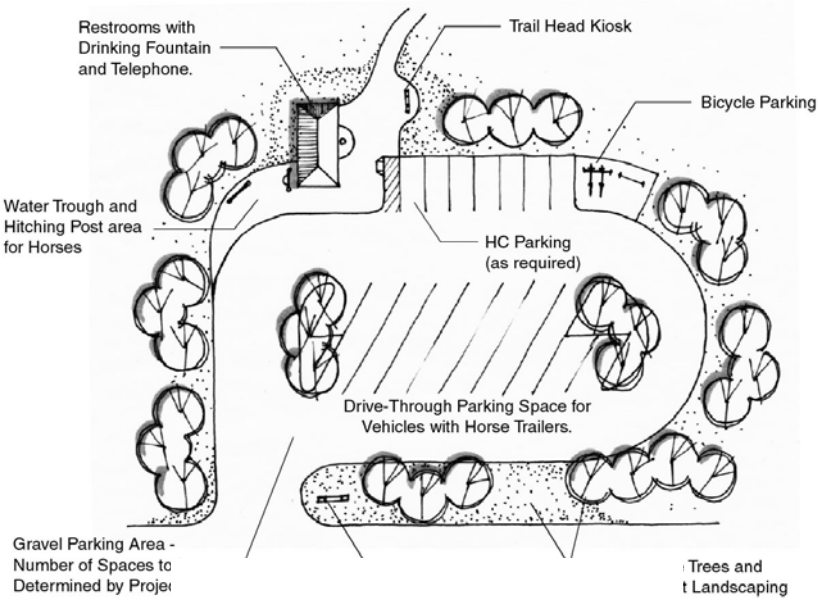
Greenbelt Kiosk with a trail map. A trailhead sign will be erected at the entrance of the trail and the entrance to the staging area.

Staging Area Type III– An Equestrian Staging Area

Staging Area Type III provides equestrian parking for horse trailers, vehicle parking, and bicycle parking and trash containers. Additional amenities for equestrians should include a horse corral with a self-closing gate, hitching posts, mounting benches and water. Greenbelt kiosk signs may include trail map and notices of upcoming events. Additional amenities may be provided such as a drinking fountain, restrooms with either pit toilets or flush toilets, or portable self-contained toilets, and picnic tables. The Greenbelt currently contains three equestrian staging areas located along Sweetwater River: at Plaza Bonita, at Sweetwater Park, and at Summit Park. A trailhead sign will be erected at the entrance to the trail and at the entrance to the staging area.



Typical Staging Area Concept
Without Equestrian Facilities
Figure 7



Not to Scale

Typical Staging Area Concept
With Equestrian Facilities
Figure 8

4.2.3 Site Furnishings

In addition to the trail, other amenities add to the experience of the trail user. At trail entrances, a wider area should be set aside to provide a park-like setting at the entrance, which would add to the enjoyment of the Greenbelt. Site furnishings may include benches, picnic tables, trash containers, drinking fountain, bicycle racks, a shade structure, lighting and/or landscaping. Site furnishings will be made of durable material and be vandal resistant.

Bench and Kiosk at Sweetwater Regional Park

4.2.4 Accessibility Guidelines

The Greenbelt facilities will be developed for many types of users and trails will be designed across various types of terrain and sensitive to the environment. Compliance with the Americans with Disabilities Act presents opportunities to balance accessibility with sensitivity to the environment.

Federal guidelines prepared to assist in the design of recreation facilities for accessibility were completed in 1999 with the release of the "Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas, Final Report" (Accessibility Guidelines). Factors that influence the ability to provide fully accessible facilities such as soil, surrounding vegetation, hydrology, terrain, and surface characteristics, are fundamental to designing for accessibility for the outdoor area.

A continuous path of travel is the single most important park feature to a person with a physical disability. Additionally, four other design components are essential to being a fully accessible park or trail. These design components include:

1) Access to the park or trail, including parking areas and the path of arrival used to get from parking areas,
2) Access and egress points to the park and along the trail,
3) Support facilities and desirable amenities, including the placement of restrooms, drinking fountains, telephones, etc., with respect to the park programs and trail and any access paths leading to these support elements;
4) Access to accurate information regarding the Greenbelt, how to get to the park or trail and potential hazards of a project, plus location and height of on-site interpretive signage programs (Federal Highway Administration, National Bicycle and Walking Study).

4.2.5 Fencing

Post and rail fencing will be used where a fence is required, unless approved by the Director of Planning and Building. Fencing is recommended along the Greenbelt trails to separate the trail from a road and/or development, to guide the trail along steep slopes and canyons, and to restrict access into core Preserve areas or native habitat. The use of post and rail fencing in natural resource areas allows the movement of wildlife through the fence. Other types of fencing may be used when determined by the Director of Planning and Building.

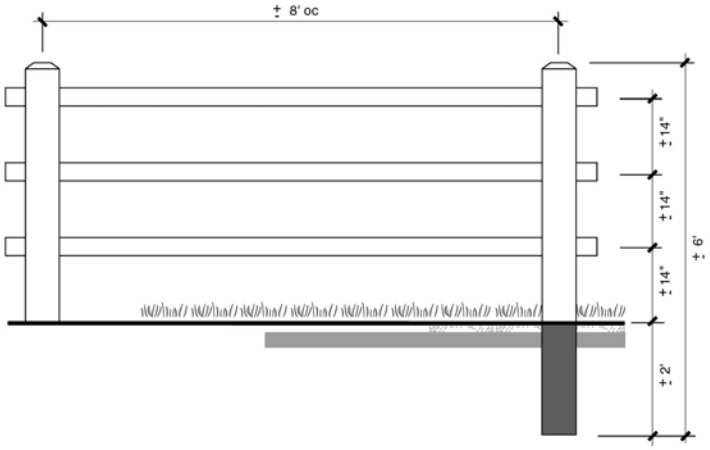
Rural trail along
Sweetwater Road

Fencing should be installed along trails in the following conditions:

When the trail accommodates equestrians and is adjacent to a roadway,
When there is a need to separate user groups in areas where high usage is anticipated or planned for, or
When it is necessary to prevent trespassing on resource lands, private property, or agricultural areas.
When there is a down slope condition (per City specifications).
To separate a multi-use trail from a paved pedestrian sidewalk.
To provide an equestrian paddock at Staging Areas.

Fencing should follow the natural grades along the trail. The City's standard for post and rail fencing include the following and is reflected in the graphic below:

Fence sections are 8'0" on center and 4'0" in height with a 2'0" subgrade footing. The posts shall be a minimum of 6" diameter and the rails shall be a minimum of 3". All lumber is to be CCA Pressure treated. The subgrade at footings is to be at 90% compaction. Footings shall be concrete, each with at least 80 pounds of dry Portland cement. Footings will not be visible upon completion of trail construction. Concrete footings shall be 470-C-2000 Class B concrete. In all instances, there will be an 18" clear space at the bottom of the fencing to allow for movement of wildlife. The lodgepole pine fencing will be treated with wood preservative.



Not to Scale

Post and Rail Fence
Figure 9

Off-road Vehicle Barriers
Off-road Vehicle Barriers shall be constructed where breaks in fences occur that would allow vehicle access onto trails. ORV barriers shall be at least eight feet and eight inches in width and attached to ends of fence posts near to roads.

4.2.6 Arterial Crossings

Where the trail will cross a major roadway carrying traffic volumes in excess 25,000 ADTs (average daily trips) a grade-separated overcrossing may be considered. Overcrossings are typically less expensive than tunneling under a roadway, but require as much as 400 to 500 feet of approach structure on each end due to the maximum 5% gradient as specified by ADA. The following table identifies key criteria for overcrossings:

Table 2
Grade Separated Roadway Crossings

Traffic volume thresholds:	**25,000 ADT or greater**
Recommended minimum trail width	8 feet (undercrossings should provide tapered sides with wider clearances at top)
Recommended minimum overhead clearance	10 feet (14 feet for equestrian use)
Estimated structure costs per linear feet	$600 - 800
Maximum gradient per ADA	5%
Ancillary features	Lighting, call phones, benches

This master plan identifies overcrossings of EastLake Parkway at Hunte Parkway and of Hunte Parkway east of EastLake Parkway. Undercrossings of the trail system are identified through Wolf Canyon at Main Street, La Media Road and at SR125. Other undercrossings are proposed at Otay Lakes Road near the Otay Reservoirs and at several roadway crossings through the Otay Valley and the Sweetwater Valley.

4.2.7 Standard Urban Storm Water Mitigation Plan Requirements

As an implementation measure of the State of California's Clean Water Act, the San Diego Regional Water Quality Control Board on February 21, 2001 adopted National Pollutant Discharge Elimination System standards (Order No. 2001-01, NPDES No. CAS0108758) referred to as "Municipal Permit". The Municipal Permit requires the implementation of a Jurisdictional Urban Runoff Management Program (URMP). The objectives of the Jurisdictional URMP that are to effectively prohibit non-storm water runoff into storm drain systems. The Model Standard Urban Storm Water Mitigation Plan (SUSMP) was developed to

address post construction urban runoff pollution from development projects. These requirements are important to the development of the staging areas when there results in the creation of 5,000 square feet of impervious soil or with greater than 15 parking spaces and potential exposed to urban runoff. Design of staging areas, which are subject to SUSMP, will need to provide Best Management Practices (BMP) that may include such measures to reduce imperviousness such as providing runoff storage measures throughout the site landscape with the use of detention, retention and runoff practices. These measures of may include onsite retention or pavement techniques that allow runoff to remain on-site. BMPs may also include construction of trails with permeable surfaces such as decomposed granite surface or pervious concrete as recommended in this document.

Additionally, the NPDES standards identify pollutants of concern that potentially affect storm water runoff and the quality of groundwater that include animal waste. Within the Greenbelt where equestrians are permitted, signs may be posted that require waste pickup and proper disposal along with the availability of free bags at staging areas and trash receptacles at suitable intervals along the trails.

4.3 Greenbelt Management and Maintenance

The entire Greenbelt falls within five jurisdictions, the Cities of Chula Vista, National City, and San Diego, and the County of San Diego and Port District (Figure 10). Management and maintenance responsibility generally lies with the property owner, which may be one of the jurisdictions, a resource agency, a utility company or a homeowners association. In areas where a segment(s) is within more than one jurisdiction, the greenbelt may be managed by several agencies or the agencies may agree to jointly manage the open space. Management and maintenance within the Greenbelt includes open space, passive and active recreation facilities, and/or trails. Each requires a different level of management and maintenance; however, there are some typical ingredients to consider for any one or all of these components, as discussed in this section.

4.3.1 Greenbelt Management

A good management program is essential to ensure long-term success. After planning and implementation, the success of any Greenbelt system is determined by how well the Greenbelt is managed. While this document does not identify a specific individual or department(s) that will manage the Greenbelt, it does however, recognize that the City of Chula Vista will be responsible for management of that portion of the Greenbelt within its control. Further discussion with other jurisdictions may be necessary to assure coordination on management and potential funding mechanisms for the Greenbelt.

The key tasks of Greenbelt management are to:

Maintain safety,
Protect natural resources, and
Provide high-quality user experiences.

As the Greenbelt system becomes more refined with a comprehensive trail system and other active recreation facilities, the number of users and their diversity increases, management and maintenance will become increasingly important.

An effective management program may employ a variety of tools and may utilize various tools at different times. For example, education and appropriate signage advising users on how to use the Greenbelt have been successful in reducing encroachments into sensitive areas and reducing user conflicts. Depending on the location, purpose of the trail, and level of trail use, hours of operation and trail use restrictions will be important to define.

Hours of operation
The Greenbelt system is primarily intended for use during the day. Signage noting hours of operation restricts nighttime activity. Limiting the use during nighttime hours reduces the impact on adjacent properties. Depending on the segment, and use level, specific hours of operation should be established and posted.

Trail Use Restriction
Although the majority of the trails within the Greenbelt system are designed for and intended to be used by a variety of trails users (e.g. pedestrians, bicyclists, and equestrians) there may be instances within where certain types of users might be restricted, either permanently or temporarily. It is anticipated that this would occur when there are specific concerns related to protection of biological resources; when the trail is undergoing maintenance or construction; when use of the trail would be detrimental to the trail maintenance such as after a rain storm; when there is a potential hazard such as crop spraying or harvesting; or during a emergency situation. Trail signage that identifies the permitted use will be installed at the beginning of each trail segment. A temporary trail closure sign would be posted at each trail segment with an anticipated date for trail reopening. The trails are designed to allow access through open space areas and for the enjoyment of the public. Trail use will be limited to the designated trail by fencing and/or signage.

Open Space Management
In addition to passive and active recreation and trails, the Greenbelt includes large areas of natural resource lands. Much of this land will be protected through the City's Multiple Species Conservation Plan, the Otay Ranch Resource

Management Plan, the Sweetwater Marsh and San Diego National Wildlife Refuges, and the Otay Valley and Sweetwater Regional Parks. Because of the scope and size of the Greenbelt, specific implementation, management, and ownership of these resource lands will vary. Within the Greenbelt, management is currently implemented by the public agencies mentioned above and the federal resource agencies (U.S. Fish and Wildlife Service and California Division of Fish and Game) in the case of the Wildlife Refuges. Figure 10 depicts jurisdictional and agency areas of influence.

As mentioned in the MSCP, management will include a program for short-term management of resources, primarily prior to dedication to the public. Long-term management would include:

Preserve Maintenance
- Removal of trash, trimmings, debris and other solid waste
- Maintenance of trails and fences
- Implementation of security programs to enforce security programs and curtail activities that may degrade resources

Preserve Management
- Implementation of programs to maintain and/or improve, operate and manage Preserve habitat values through removal and control of exotic plant species, treatment of disease or injury, and/or habitat restoration.
- Remediation necessary due to changed circumstances.

Long-term Biological Monitoring

When considering the implementation of the Greenbelt Plan, the precise management program that is used should be defined in the planning process and focused on the three key goals mentioned above: maintaining safety, protecting natural resources, and providing high quality user experiences.

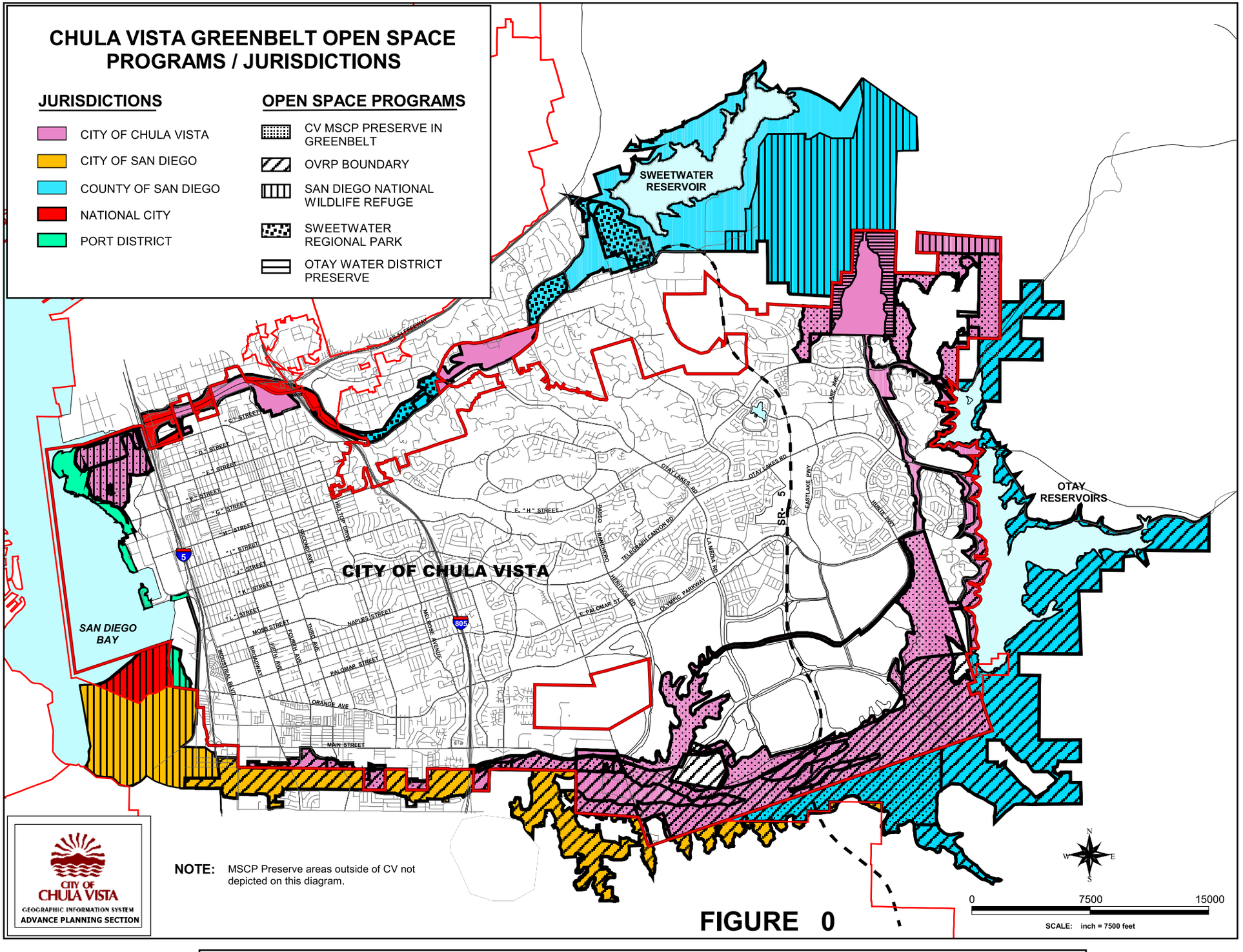


FIGURE 0

Chula Vista Greenbelt Open Space Programs / Jurisdictions Agencies

Trail Costs

The following table may serve as a guide for approximate costs for trail construction.

Table 3
Estimate of Probable Costs

Trail	Approximate Cost Per Mile
Path	
▪ Rehabilitate or upgrade existing path	$50,000
▪ Construct Soil Stabilized Path on base. Includes signing.	$52,000
▪ Construct Soil Stabilized Path on base. Includes signing with removal of existing railroad tracks.	$96,000
Construct asphalt/concrete path on existing level embankment, or right of way, includes signing, striping	$150,000
Construct asphalt/concrete path on existing level embankment, or right of way, includes signing, striping with removal of existing railroad tracks.	$194,000
Support Facilities:	
▪ Signal Loop Detectors	$2,500/intersection
▪ Undercrossing	$150,000 - 350,000
▪ Signing, striping	$5,000
▪ Signing, striping, signals	$65,000
▪ Irrigated Landscaping	$350,000 - 600,000 mile
▪ Non-irrigated Landscaping	$150,000 - 300,000 mile
▪ Bridge (8' wide)	$60 - 100 square foot
▪ Fencing	$20 linear foot
▪ Railroad Crossing	$125,000
▪ Emergency Cellular Phone (installed)	$3,500

Cost estimates were based on 2002 dollars and actual cost experience in various California communities. These costs are estimates only; based on specific conditions costs will vary and more detailed estimates should be developed after preliminary engineering.

4.3.2 Greenbelt Maintenance

Preventive maintenance reduces hazards and future repair costs. Annual trail maintenance costs are generally estimated at 5% of infrastructure replacement costs. For example, if a bridge costs $100,000 to construct, $5,000 should be budgeted for its maintenance each year. (Pedestrian and Bicycle Planning, a Guide to Best Practices, January 31, 2001).

Routine maintenance will include provisions for:

> Removal of debris, dead or decaying vegetation, broken branches in the trail, clearing trail of encroaching brush or grasses, removing rock slides, etc. Collecting and removing trash and litter. Routinely checking and repairing vandalism and/or graffiti,

Maintenance of trail tread such as filling of ruts and entrenchments; reshaping trail bed; repairing trail surface and washouts; installing rip rap (rock placed to retain cut and fill slopes); dragging and rolling trails constructed of native dirt monthly constructing retaining walls or cribbing to support trail tread, repairing damaged redwood headers, etc.

Replacing decomposed granite on DG trails where it has eroded or deteriorated. Erosion control and drainage, replacing or installing necessary drainage structures such as drainage dips, water bars, or culverts; realigning sections of trail to deter erosion or avoid boggy/marshy areas, etc.

Repairing Greenbelt signs and furniture. Repair of trail and/or trailhead structures. This includes replacing deteriorated, damaged, or vandalized parts of structures such as sections of bridges, boardwalks, information kiosks, fencing, and railings; painting; removing graffiti, etc

Maintenance logs are essential to ensuring that the trail remains an asset to the community and does not become a hazard or a liability. A consistent maintenance program should include a mechanism to identify, record, and respond to maintenance programs and to keep written records of remediation efforts. The following table provides a general schedule for routine maintenance.

Table 4
Recommended Maintenance Schedule

Item	Frequency
Sign replacement and repair	1-3 years
Pavement marking replacement	1-3 years
Tree, shrub, trimming/fertilization	5 months – 1 year
Pavement sealing	5 – 15 years
Clean drainage system	1 year
Pavement sweeping	Monthly – annually as needed
Shoulder and grass mowing	As needed
Trash disposal	As needed along trail, several times weekly at staging areas.
Lighting replacement/repair	1 year
Graffiti removal	Weekly – monthly as needed
Maintain furniture (bike racks, tables)	1 year
Fountain/restroom cleaning/repair	Weekly – monthly as needed
Pruning	1 – 4 years
Bridge/tunnel inspection	1 year
Remove fallen trees	As needed
Week control	Monthly – as needed
Maintain emergency phones, CCTV	1 year
Maintain irrigation lines/replace sprinklers	1 year
Irrigate/ water plants	Weekly – monthly as needed

*These are general timeframes. Actual frequency will vary depending on weather, usage, and site conditions.

4.3.3 User Conflicts

The vast majority of users of public open space are satisfied with their experience and few have complaints. However, conflicts among users do occur and if not addressed, may have serious consequences. As the number of users grow at a particular facility and the diversity of the activities expand, the potential for conflict grows.

For instance, with the advent of mountain bicycling, the use of unpaved multi-use pathways has sometimes resulted in conflicts with equestrians and hikers. Rollerblading and skateboarding activities have resulted in user conflicts on paved pathways with pedestrians, persons with strollers, and cyclists when there is a high demand for the trail.

User conflict is defined as "goal interference attributed to another's behavior." This is based on an individual's interpretation or perception of appropriate behavior that may be contrary to their individual trail objectives. Design in accordance with "Best Practices" and on-going maintenance can reduce user conflicts. Although there may be many factors that contribute to user conflict, the manager of the Greenbelt is responsible to resolve conflicts that hinder the success of the Greenbelt system and may decrease safety.

Trail User Conflict

The potential number of incidents of user conflicts may be reduced by monitoring or limiting bicycle speeds, conducting routine surveys, and educating users on safety and courtesy. User conflicts that threaten user safety may include:

Collision and near misses of users and/or their bicycles or horses.
Reckless and irresponsible behavior.
Poor user preparation or judgment.

User conflict is frequently witnessed in areas where there are a high number of users. Generally in areas more remote or when there is predominantly one type of user, there are fewer reported conflicts. However, designing a trail that can accommodate a broad range of users in areas where a large number of users are expected can alleviate or reduce concerns. While research of 37 trails throughout the nation (Rails-to-Trails Conservancy, 1998) revealed that while the estimated usage of the 37 rail trails was approximately 9.2 million users annually, there was only one major accident. Ongoing trail monitoring allows a watchful eye on possible conflicts and continuous trail maintenance will also reduce user dissatisfaction or potential accidents.

In response to a survey conducted by the Rails-to-Trails Conservancy, trail managers identified the following techniques utilized to resolve user conflicts:

Signage
Education
Meeting with user groups
Expanding facilities
Police or ranger patrols
Enforcement of regulations
Brochures and articles in local newspapers
Imposing speed limits
Volunteer patrols
Partial closing
Bicycle bell give-aways.

Establishing a uniform and acceptable “passing alert” phrase such as “passing on the left” reduces numerous potential safety conflicts. In areas where trail use is the heaviest such as near trailheads, it is advisable to provide separate paths for different types of users or to provide a wider pathway. For instances, where trail usage is very heavy around Rohr Park, bicyclists are cautioned to notify trail users before they pass.

Good management may employ any or all of the above mechanisms, or others that will be applicable to the particular situation. The right choice depends on local factors and the individual situation as well as recognition of the conflict before it degenerates beyond reasonably simple solutions. An integrated program of design, marketing, education, regulation, enforcement and maintenance are all needed to ensure a successful, long-term Greenbelt system. Developing partnerships with trail groups that conduct trail maintenance and provide a “watchful eye” while participating in trail activities can assist a trail manager with limited staff.