

Bear Canyon Open Space Visitor Use Plan



City of Albuquerque
Parks & Recreation Department
Open Space Division
November 2019 Draft



ACKNOWLEDGEMENTS

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Volunteers are the backbone of stewarding Albuquerque-owned Open Space. The Open Space Division would like to acknowledge and thank those who give their work and time to preserving and maintaining their public lands.

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1. Introduction

The City of Albuquerque Open Space Division (OSD) manages nearly 30,000 acres of public lands in and around Albuquerque “to retain their natural character to benefit people throughout the metropolitan area by conserving resources related to the natural environment, providing opportunities for outdoor education and recreation, or defining the boundaries of the urban environment” (*City of Albuquerque Major Public Open Space Facility Plan, 1999*).

A significant area of Major Public Open Space (MPOS) is the Sandia Foothills, which help shape much of the eastern urban boundary of Albuquerque, and include various trails, trailheads, and canyons draining runoff from the Sandia Mountains. The Bear Canyon Arroyo serves as a drainage way from the Foothills and is owned and managed by various departments within the City of Albuquerque (COA) as well as the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA). The OSD manages the natural habitat and recreational aspects of a portion of the Bear Canyon Arroyo known as Bear Canyon Open Space (BCOS).

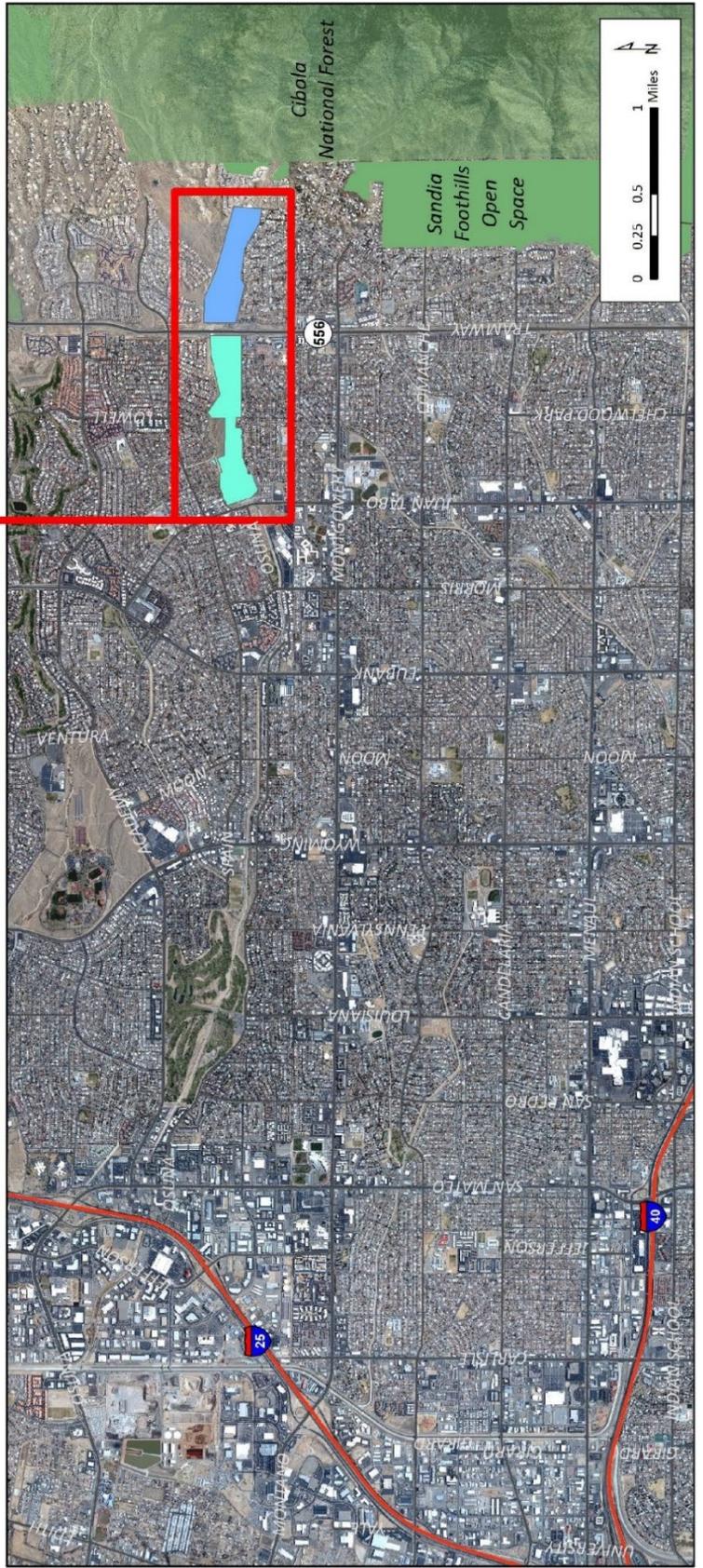
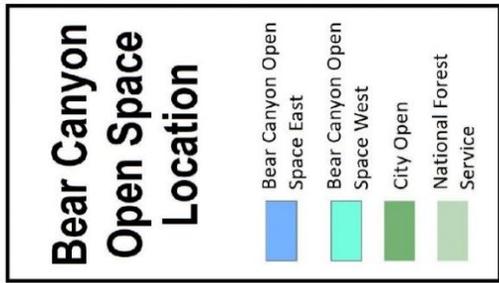
Purpose

The purpose of this plan is to create a guiding framework for the management of visitor use within the section of Bear Canyon Arroyo managed for recreation by the OSD. The unique natural features and human use of the area create both challenges and great potential for a natural escape for both urban dwellers and wildlife. An approach that balances the needs of wildlife, the natural environment, and all users and neighbors of the space, is inherent to a successful management strategy.

Bear Canyon Open Space Location Description

The Bear Canyon Arroyo and Embudito Canyon drain west from the United States Forest Service (USFS) Cibola National Forest and through High Desert Homeowners Association (HD HOA) private open space before joining in BCOS. The Bear Canyon Arroyo then continues through the City of Albuquerque’s Northeast Heights, and empties into the North Diversion Channel and eventually the Rio Grande. The OSD owns much of and manages for recreation all of the eastern-most section of the publicly-owned Bear Canyon Arroyo, approximately 170 acres stretching from the Foothills west to the John B. Robert Dam at Juan Tabo Boulevard NE, and generally situated between Manitoba Drive to the south and Spain Road to the north.

Tramway Boulevard bisects BCOS north to south near its center and serves as a convenient geographic separation. For the purposes of this plan, Bear Canyon West (BCW) refers to Bear Canyon managed by the OSD between Juan Tabo Boulevard and Tramway, and Bear Canyon East (BCE) to the land managed by the OSD between Tramway and the private open space.



Policy Framework

The Albuquerque Metropolitan Arroyo Flood Control Authority Resolution No. 1980-15 Drainage Policy (1980). This policy regulates the construction, design and alteration of AMAFCA facilities, which include the Bear Canyon Arroyo and Embudito Channel running through much of BCOS, and the John B. Robert Dam and drainage basin marking its western-most boundary.

Facility Plan For Arroyos (1986). The Bear Canyon Arroyo is identified in the Rank II *Facility Plan For Arroyos* as a high priority Urban Recreational Corridor due to its location in a populous residential area and its now well-realized potential to connect multiple transportation and recreation corridors and destinations. Because of the presence of the arroyo, BCOS's primary function is to facilitate drainage, with recreation addressed within the confines of drainage-related easements, structures, and other necessary erosion control efforts.

Bear Canyon Arroyo Corridor Plan (1991). The Bear Canyon Arroyo Corridor Plan, a Rank III plan adopted by City Council, provided policies and regulations for the development of the entire arroyo and its tributaries from the Sandia Mountains west to its terminus at the North Diversion Channel. While this plan was superseded by the *Albuquerque/Bernalillo County Comprehensive Plan* and *Integrated Development Ordinance* adopted in 2017 and 2018 respectively, it still provides an important baseline and historical reference for this visitor use plan. This arroyo corridor plan was comprehensive to the entire arroyo and its tributaries, but made specific mention of Major Public Open Space arroyo policies.

City of Albuquerque Major Public Open Space Facility Plan (1998). The mission of the Open Space Division is "to acquire, protect, manage, and maintain the significant natural landscapes and cultural resources while providing low impact recreation for current and future generations." The Rank II *Major Public Open Space Facility Plan* was developed with that mission in mind, and contains a general overview and management strategies for the unique types and areas of MPOS.

Bear Canyon Open Space lies within an arroyo, but due to its location is also included in Sandia Foothills area policies and management as protected, undeveloped open space without developed facilities. According to the MPOS Facility Plan, "Protected, Undeveloped Open Space [is a] significant undeveloped or conserved area with outstanding natural features or scenic qualities suitable for low impact recreational activities with no substantial facilities or improvements." Policy A.1.C. states:

This type of Major Public Open Space shall be protected from excessive public use and shall be conserved for its unique features, natural resources and overall visual

significance. Trails can be paved or unpaved, however, alignments should be part of a resource management plan, master development plan or site plan. Protection of these areas should include fencing, signage, natural barriers, controlled use, and patrol by rangers.

As an arroyo and linear corridor, a major recreation and transportation function identified by the MPOS Facility Plan is to provide non-vehicular, multi-use trail links to other trails, facilities, and activities.

Bikeways and Trails Facility Plan (2015). This Rank II plan proposes projects, corridors, and programs intended to connect and improve non-motorized transportation and recreation corridors and facilities across Albuquerque.

Albuquerque/Bernalillo County Comprehensive Plan (2017). The Albuquerque/Bernalillo County Comprehensive Plan identifies goals and policies relevant to Bear Canyon Open Space, including providing low-impact recreational and educational opportunities, managing sensitive lands to protect natural resources, connecting trails to the larger multi-modal system to encourage the use of alternative types of transportation, and utilizing arroyos for recreation without impeding their primary drainage function.

2. Existing Conditions

BCOS consists of a generally undeveloped natural landscape, with the exception of the arroyo drainage features. Basic components typical of protected, undeveloped MPOS that are present here include primitive multi-use trails, boundary fencing, multiple public access points, signage, and natural vegetation.

There are no developed parking areas provided by the City with the exception of the Embudito Trailhead, located east of and accessible through the adjacent private open space. There are no restroom facilities or payment areas, and therefore no need for permanent staff presence. The City provides trash receptacles and mutt mitt stations at several entrances. There is also one mutt mitt station and receptacle for pet waste in BCE, which are both serviced by neighborhood volunteers.

Public Use

The trail network in BCOS is open to various types of low-impact recreation including hiking, mountain biking, and horseback riding. Additional activities include bird watching, individual and group yoga, and geocaching. BCOS also provides space for a local school cross country team to practice and race.

Motorized vehicles are prohibited per Open Space policy. Unauthorized motor vehicle access appears to be minor to non-existent.

Trails

There are approximately 7.93 miles of official trail in Bear Canyon Open Space. This includes primitive multi-use trails and maintenance roads, as well as AMAFCA drainage ways that trail users may also access.

Official trails include arterial connections through the arroyo and public Open Space to official access points and other desirable areas of the Open Space, without overly burdening vegetation and wildlife habitat. AMAFCA drainages are also included in the trail network. As drainages in Bear Canyon Open Space are soft channels allowed to remain in a natural state, they may meander and cause erosion to other official trails; this results in the need for ongoing trail monitoring and maintenance, and potentially trail relocation. Maintenance roads necessary for both City and AMAFCA access are included in the trail network. The below-grade street crossing allows the arroyo, wildlife, and trail users to access the Open Space on either side of Tramway Boulevard, or leave the arroyo to travel on the multi-use path running north and south along Tramway.

While the OSD strives to design and construct sustainable trails according to International Mountain Bicycling Association (IMBA) standards, segments of these official trails may require maintenance and potentially relocation if they are too incised or eroded or impair user experience. This includes trails adjacent to major arroyo flows in danger of eroding into the drainage, trails in low-laying areas with little slope and contour that allow little opportunity for water to flow off of the trail, or simply trails that developed in unfavorable locations.

The OSD offers Foothills trail access and parking that meet Americans with Disabilities Act (ADA) regulations at the Elena Gallegos Picnic Area Nature Trail. Due to conditions related to slope and the primitive nature of the trail system, trails in BCOS are not ADA accessible and there are no current plans to construct ADA trails or facilities.

A network of unofficial user-created trails is also prevalent and a concern due to resulting decreased vegetation, increased erosion, and wildlife habitat disturbance. User trails include shortcuts between official trails and trails connecting unauthorized entry points from adjacent private properties to main trails. A number of these are unsustainable and have major erosion and pooling issues because they were not intentionally designed to follow critical slope and construction guidelines. Many are also redundant and do not enhance the circulation of the overall trail system.



User-created trails connect private access points to official trails

Access Points and Parking

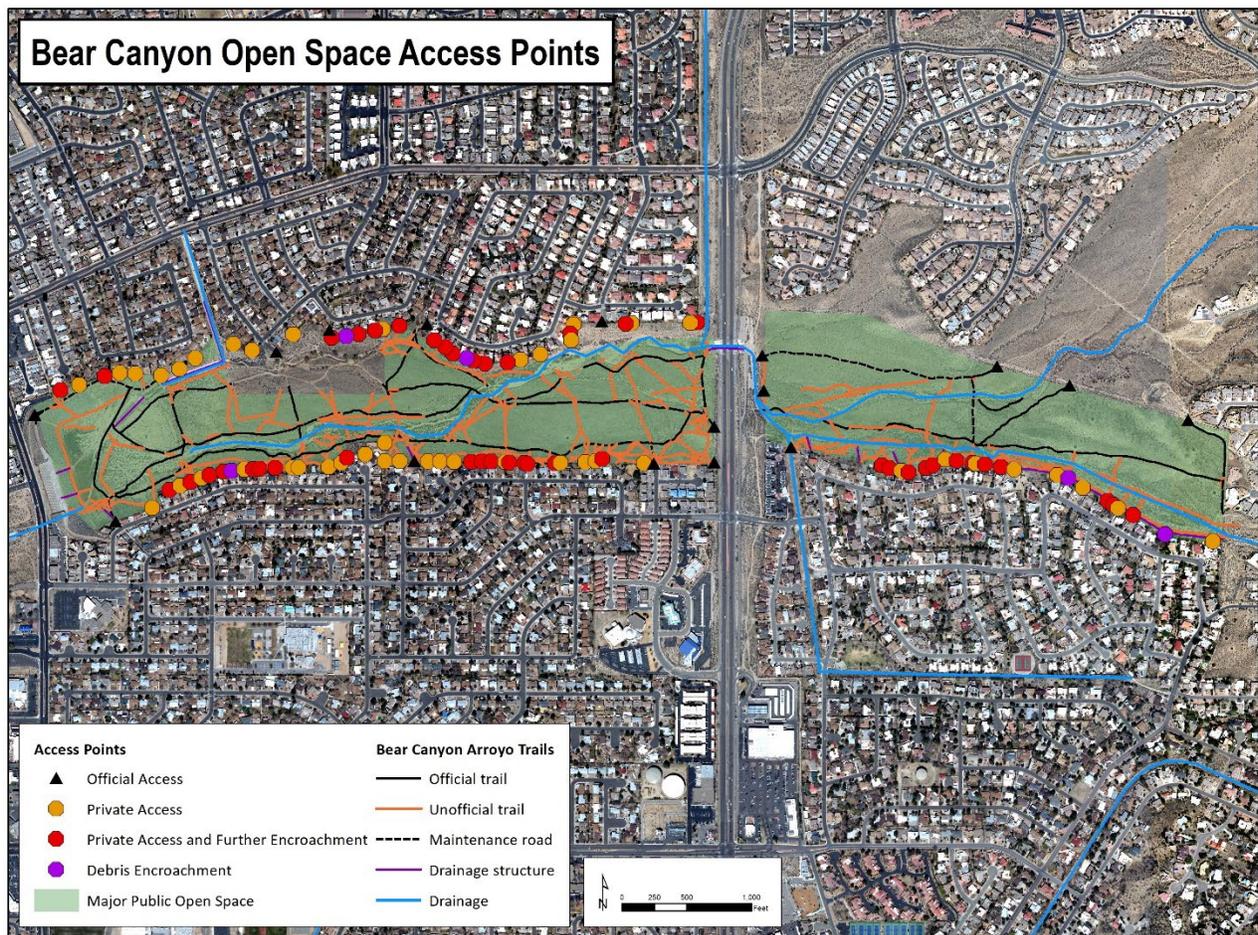
The majority of BCOS is separated from adjacent uses by roadways, drainage facilities, and fencing or gates maintained primarily by private residents and the HD HOA. There are 14 official access points, as depicted in the map on the following page; note that several official access points are privately owned and maintained trailheads. Official access points include maintenance road entrances, and trail connections to other private open space areas and the street network. The private open space adjacent to BCE is owned and managed by the HD HOA and has a public parking area and trail connections to both the Cibola National Forest and COA Sandia Foothills Open Space at the Embudito Trailhead and parking area. The Embudito Trailhead parking area provides space for forty-three vehicles.

Other parking areas not maintained by the OSD are the unpaved area between Juan Tabo Boulevard and the John B. Robert Dam on the western-most boundary of BCOS, and the two-

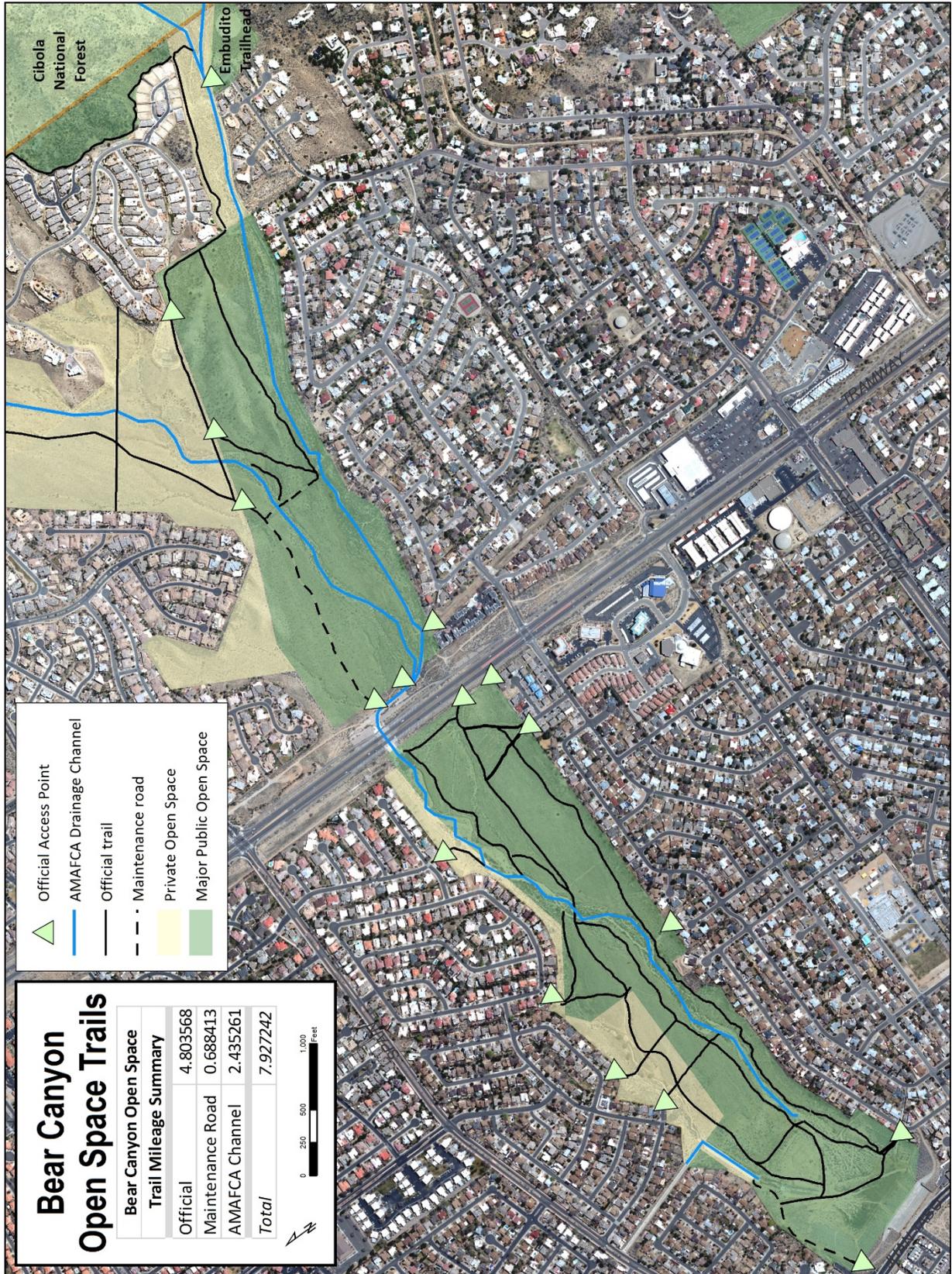
vehicle parking area at the corner of Vista Lejana and Camino Arbustos NE. There are an additional nine official non-vehicular access points at various locations around BCOS.

Official access points are signed with general information on BCOS, as well as rules and regulations for using City Open Space.

Unofficial access points consist primarily of gates opening directly into Bear Canyon Open Space from approximately 95 adjacent private properties. As noted above, trails leading from these unofficial access points create a spider web of user trails that drastically increase soil, vegetation, and wildlife disturbance. Additional forms of encroachment on the Open Space often accompany these gates and exacerbate disturbance; this includes stairways, landscaping, flagstone paths, composting areas, lawn chairs, and debris and yard waste.

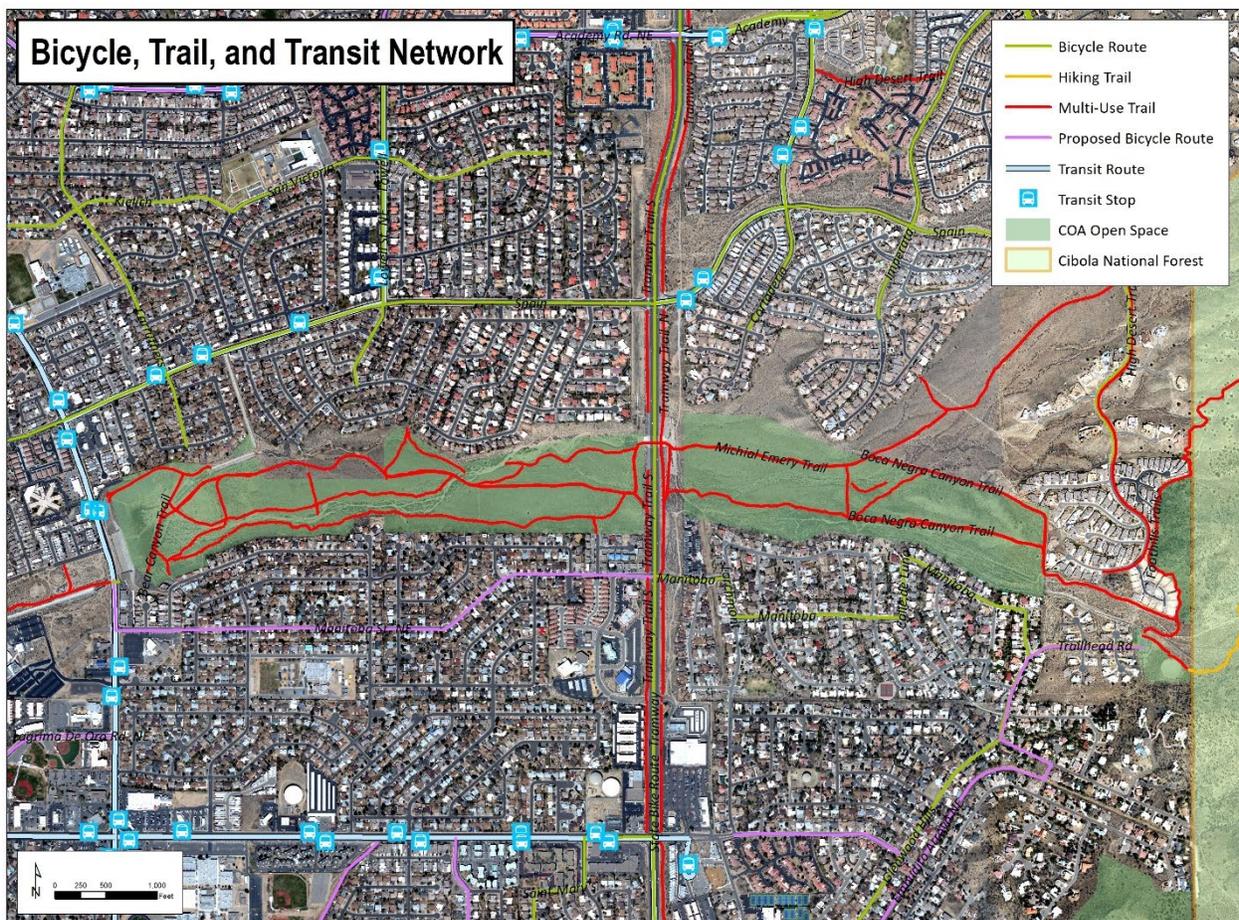


The map on the following page designates official access points and trails in more detail.



Connections to the Existing Transportation Network

The Major Public Open Space Facility Plan, the Facility Plan for Arroyos, and the Bikeways and Trails Facility Plan all identify the development of a comprehensive transportation and recreation network as a major goal. Bear Canyon Open Space trails meet this goal by providing non-motorized connections with other transportation and recreation corridors and facilities including Cibola National Forest; private HD HOA open space; sidewalks and bicycle routes on the road network, including an important arterial multi-use path on Tramway Boulevard; and public transit stops. The closest public transportation stop is on Juan Tabo Boulevard just north of the John Roberts Dam access point; there is another stop at Tramway and Spain approximately ¼ mile north, connected to BCOS via the multi-use path on Tramway Boulevard. The following map illustrates these connections.



Environmental Characteristics

The major natural feature of Bear Canyon Open Space is the arroyo that provides drainage from the foothills of the Sandia Mountains and adjacent development west to the North Diversion Channel, which eventually empties into the Rio Grande running south through the center of the

City of Albuquerque. Albuquerque’s weather patterns include months of drought conditions interrupted by a season of heavy summer monsoons. These monsoons create significant and potentially destructive bursts of water flow and potential flooding that produce both the cause and necessity of urban arroyos. Arroyos provide an avenue for that water to reach its eventual local destination, the Rio Grande, that allows for as minimal property damage as possible. Trail erosion during these storm events necessitates ongoing monitoring and maintenance.

Much of the Bear Canyon Arroyo to the west of BCOS is closely surrounded by residential and commercial development and channelized through a narrow corridor and human-made flood control structures. However, Bear Canyon Open Space is considerably wider and undeveloped, and therefore more conducive to a semi-natural arroyo with adjacent, primitive, multi-use trails that encompass an array of native vegetation and wildlife habitat. Much of this section of the arroyo is not channelized, with the exception of some concrete or wire-enclosed riprap structures constructed to direct the flow of the Bear Canyon Arroyo and Embudito Channel. The John B. Robert Dam and drainage basin is the major drainage facility at the western boundary and managed by AMAFCA. The OSD has no authority to alter these features.



Vegetation management is one focus of this plan, although it is secondary to the modification of the recreational system and its impacts. Bear Canyon Open Space is home to various species of vegetation including trees, grasses, cacti, and shrubs, ranging from native to non-native and invasive. The elevation of BCOS, ranging approximately from 5,700 to 6,200 feet above sea level, means it mainly falls within the Grasslands and lower Piñon-Juniper Woodland vegetation (*Sandia-Manzanita Mountains: Land Use and Recreation Master Plan*); native species include chamisa, prickly pear and cholla cacti, different species of grama grasses, snakeweed, four-wing saltbush, and apache plume.



Cholla in bloom at Bear Canyon Open Space

While much of BCOS is vegetated, the sandy soil and annual flows prevent much vegetation from taking hold within the arroyo itself, as well as in the John B. Robert Basin at the western edge nearest the dam.

While both native and non-native invasive species provide wildlife habitat, erosion control, shade, and other environmental benefits, invasive species also compete against native species for resources and are particularly successful in disturbed areas. Species of concern in BCOS are common non-native invasive species throughout much of the region: Siberian elm, particularly in the arroyo, Russian thistle (tumbleweed), kochia, and horehound.

In addition to living vegetation, collections of dead Russian thistle (tumbleweed) have also been observed in certain areas of the canyon, and as it tends to accumulate, can increase wildfire concerns and potentially become habitat for rattlesnakes and rodents.

This wealth of vegetation over a large area provides exceptional and necessary wildlife habitat for various species of birds, reptiles, amphibians, and mammals. Due to its location within a highly populated urban area and its role as a natural linear corridor, this is a crucial function of BCOS.

Bear Canyon Open Space, as stated in the goals of the MPOS Facility Plan, provides visual and physical relief from the urban environment. Standing within the arroyo, visitors and neighbors can appreciate an uninhibited view of the nearby Sandia Mountains to the east, as well as an exceptional vista to the west and north encompassing the City of Albuquerque and beyond: the cottonwood forest (*bosque*) along the Rio Grande, the volcanoes and escarpment of Petroglyph



The view west from Bear Canyon Open Space

National Monument, Mount Taylor, and the Jemez Mountains. It offers a natural relief from the urban built environment to both visiting recreationists and adjacent private landowners.

Volunteerism

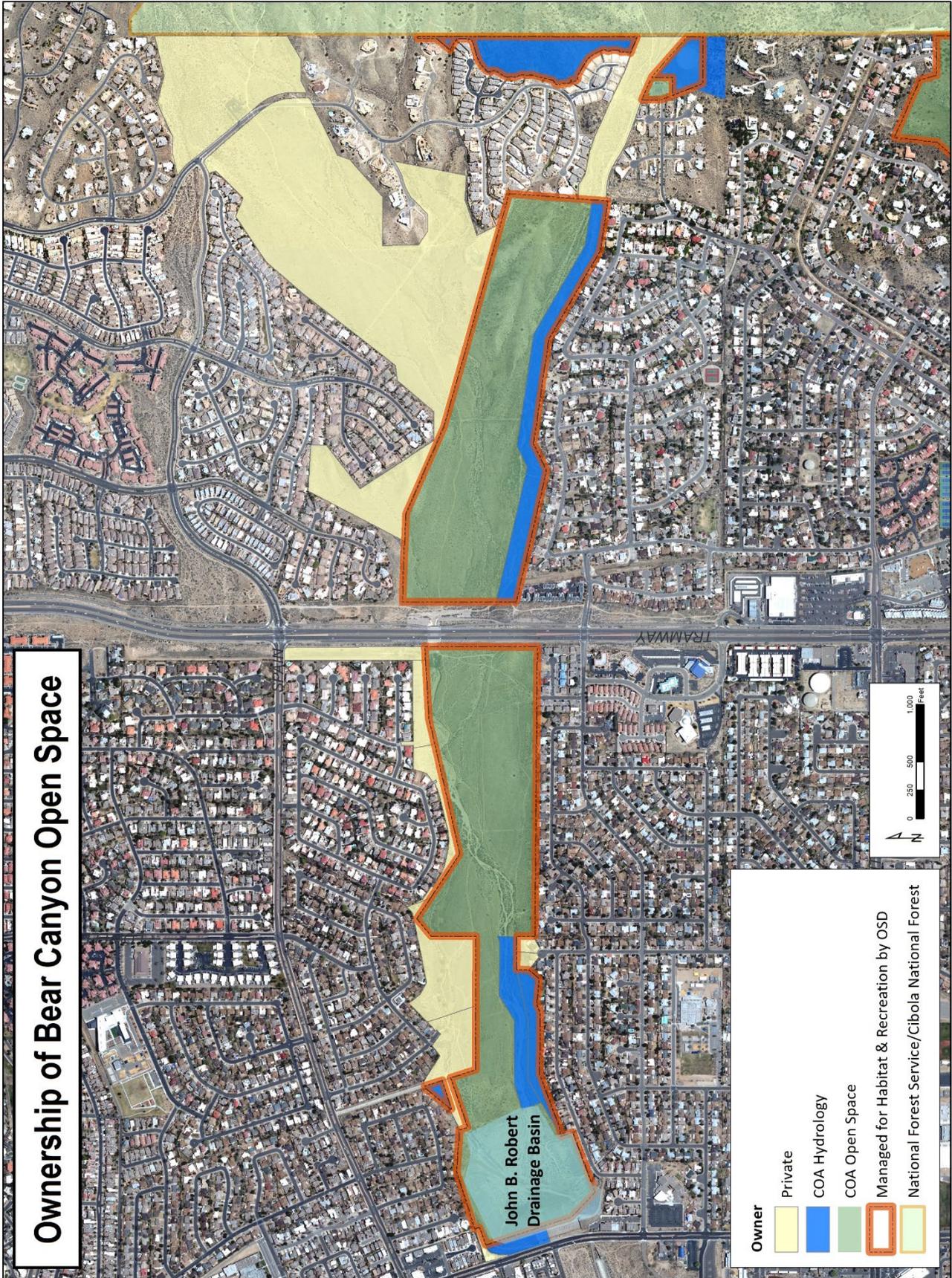
Education, restoration, and volunteerism are three often-interconnected aspects of public stewardship and maintenance of public lands. Because the City of Albuquerque manages nearly 30,000 acres of land in Bernalillo and Sandoval

Counties as Major Public Open Space and has access to limited staff and resources, the OSD relies on a large group of Trail Watch Volunteers (TWVs) to observe and report conditions at the City MPOS properties they visit frequently. Volunteers also assist in maintenance through one-time projects, which consist of trail maintenance (drain dips, rerouting, etc.), trash clean-up, revegetation, and graffiti removal.

Land Ownership

While the entirety of Bear Canyon Open Space is managed for natural habitat and recreation by the Albuquerque Open Space Division, sections are also owned and managed by City Hydrology and AMAFCA as part of the floodplain. This creates some restrictions on visitor use management, as drainage must serve as its primary function and the OSD does not have the authority to alter AMAFCA or City Hydrology drainage features.

Ownership surrounding Bear Canyon Open Space consists of private properties to the north and south, including residential development and privately owned and managed open space; the John B. Robert Dam, owned and operated by AMAFCA to the west; and small areas of residential development and private open space bordered in turn by City-managed Foothills Open Space, the Embudito Trailhead, and the National Forest Service to the east.



3. Visitor Use Plan Goals

This plan's primary focus is the management of visitor use and recreation facilities. For Albuquerque-owned Major Public Open Space, this requires balancing the needs of various users and neighbors, healthy vegetation and wildlife habitat, and drainage, the primary function of the arroyo.

Sustainable Trails in Desirable Locations

One of the primary goals of this Visitor Use Plan is to design a sustainable, thoughtful, and equitable trail system in BCOS. This effort will utilize select current trails, while constructing new or rerouting and closing other trails identified as unsustainable, redundant, or unsuitably placed.

Reduce Unofficial Trails

Unofficial user-created trails tend to be unsustainable and located for the convenience of a select few users rather than the comprehensive system as a whole; this creates multiple issues for the health of public land including decreased vegetation and habitat and increased erosion. One common cause of redundant and unsustainable trails and avoidable erosion is the presence of unapproved access points that results in foot traffic to and from official trails. This plan will identify opportunities to reduce the prevalence of user trails from unofficial access points and thus the unnecessary vegetation damage and erosion. Due to the density of private properties surrounding BCOS, it would be difficult to create additional public access points. However, 14 official access points exist and are considered sufficient for public and official needs.

Vegetation management

As this is an important area for recreation, drainage, vegetation, and wildlife habitat, this plan will discuss the balance of preventing erosion, the further establishment of invasive species, and the availability of wildlife habitat.

Maintenance

The Open Space Division maintains the recreational facilities in BCOS which are primarily primitive multi-use trails. Drainage features including the arroyo and concrete and rip rap structures are not under OSD ownership or maintenance authority. This plan will only discuss anticipated maintenance practices of OSD-maintained recreational features.

4. Recent Projects

The Open Space Division regularly conducts routine, annual, and specific one-time projects at Bear Canyon Open Space utilizing both internal and external labor. This includes a combination of the OSD's Visitor Services, Maintenance, and Bosque Reclamation staff time and resources, neighborhood and Trail Watch Volunteer time, youth corps like the Rocky Mountain Youth Corps (RMYC) and Open Space Youth Corps (OSYC), and student groups interested in educational service experiences.

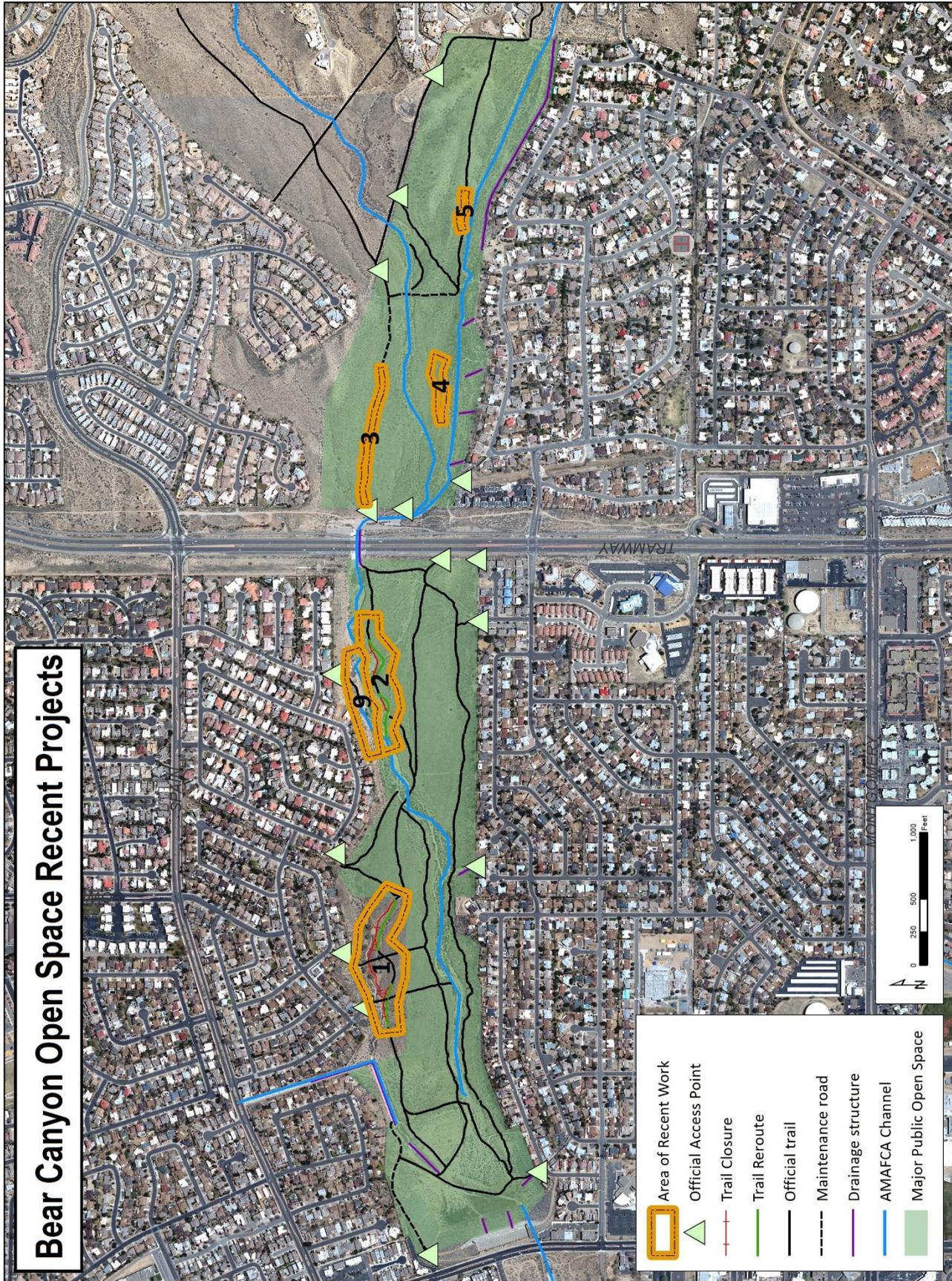


Trail construction project at BCOS by a student volunteer group

City Hydrology and AMAFCA also occasionally construct drainage or erosion control projects within the Bear Canyon Arroyo and Embudito Channel.

Below is a summary of these recent and ongoing projects (see the overview map and detailed maps of Projects 1 and 2 for locations).

Bear Canyon Open Space Recent Projects

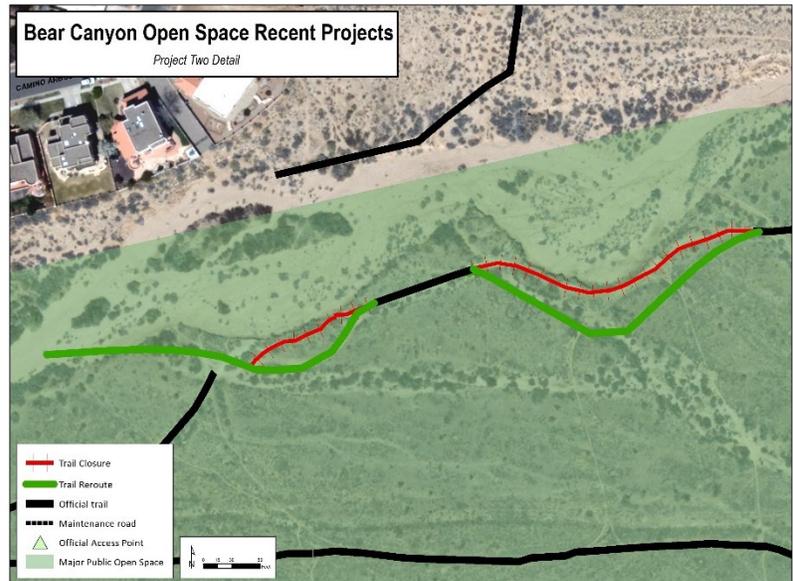


- Trail closure and reroute on neighboring private open space. There are two access points on the private open space at this location that BCOS visitors may utilize, and unmanaged trails on the private open space cause further unsustainable user trails and erosion on the adjacent MPOS. The OSD performed trail



work on the private open space north of Bear Canyon West during October 2018 and July 2019, closing an eroding trail near incised drainage and formalizing a lower trail to form a connection across the private open space.

- The OSD worked with ACE Charter School in 2018 to close and reroute additional sections of official trail in BCW that had partially collapsed into the drainage channel during a heavy flood event. The OSD did additional cactus plantings in 2019 to increase vegetation coverage and prevent usage of the closed section.



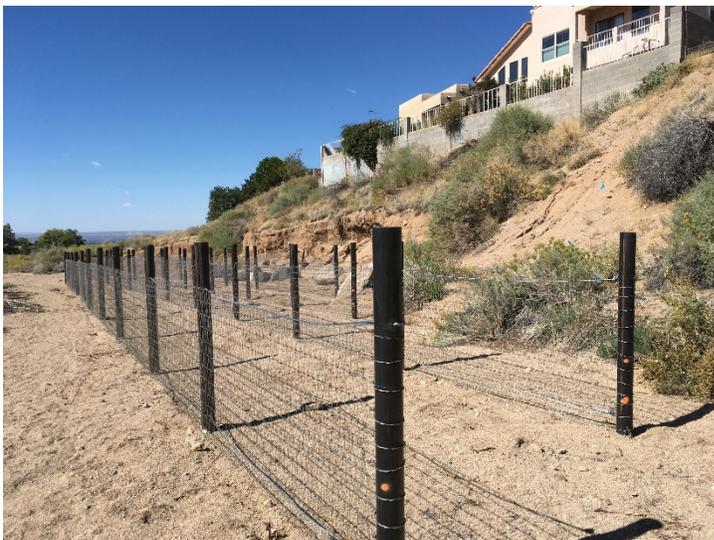
- The OSD and volunteers performed trail maintenance including drain dips on approximately ¼ mile of a trail and maintenance road in BCE in both 2018 and on National Trails Day in 2019. Constructing drain dips is a sustainable trail practice that

routes flowing water off of the trail and onto adjacent lowland to prevent the water from forming ruts or pooling in the trail. Due to the location and condition of this road, continued maintenance in the future will be necessary.



Trail closure by ACE Charter School student volunteers

4. The OSD and RMYC removed accumulated dead Russian thistle from a section of BCE in early summer 2019.
5. On National Trails Day 2019, the OSD and volunteers performed trail maintenance including drain dips and recontouring on an eroding official trail in BCE.
6. Neighborhood volunteers participated in National Trails Day 2019 and committed additional personal time to remove Russian thistle sprouts (various locations, not mapped).
7. The OSD performs annual Siberian Elm sprout removal throughout BCOS. Continued sprout removal will be necessary to prevent an inundation due to the public demand to allow the mature trees to remain (various locations, not mapped).



Erosion control system constructed by COA Hydrology in Bear Canyon West (Project Nine)

8. The OSD planted Desert Willows approximately eight years ago and successfully established the species in BCOS, as they are now dropping seeds and propagating new plants (various locations, not mapped).

9. During summer 2019, City Hydrology constructed erosion control structures within the Bear Canyon Arroyo in BCW. This work is intended to prevent undercutting near residences during heavy rain events (photo on right).

5. Implementation

Trail Priority Projects

The OSD has identified several priority trails and general areas that require reroutes, closures, or maintenance in order to satisfy the goals of this plan. The following map illustrates an overview of these projects which is preceded by smaller-scale, project-specific maps and descriptions.

Note that these trail alignment locations are approximate and will not be finalized until staff determine a sustainable layout just prior to construction. All trail construction conducted by volunteers or youth corps members shall be under the direction of OSD staff. Trails identified for closure will be rehabilitated using cactus cuttings, rocks, and vegetative debris found naturally within the immediate area. If necessary, closed trails will be further identified with signs notifying users that the areas are closed to allow for revegetation.

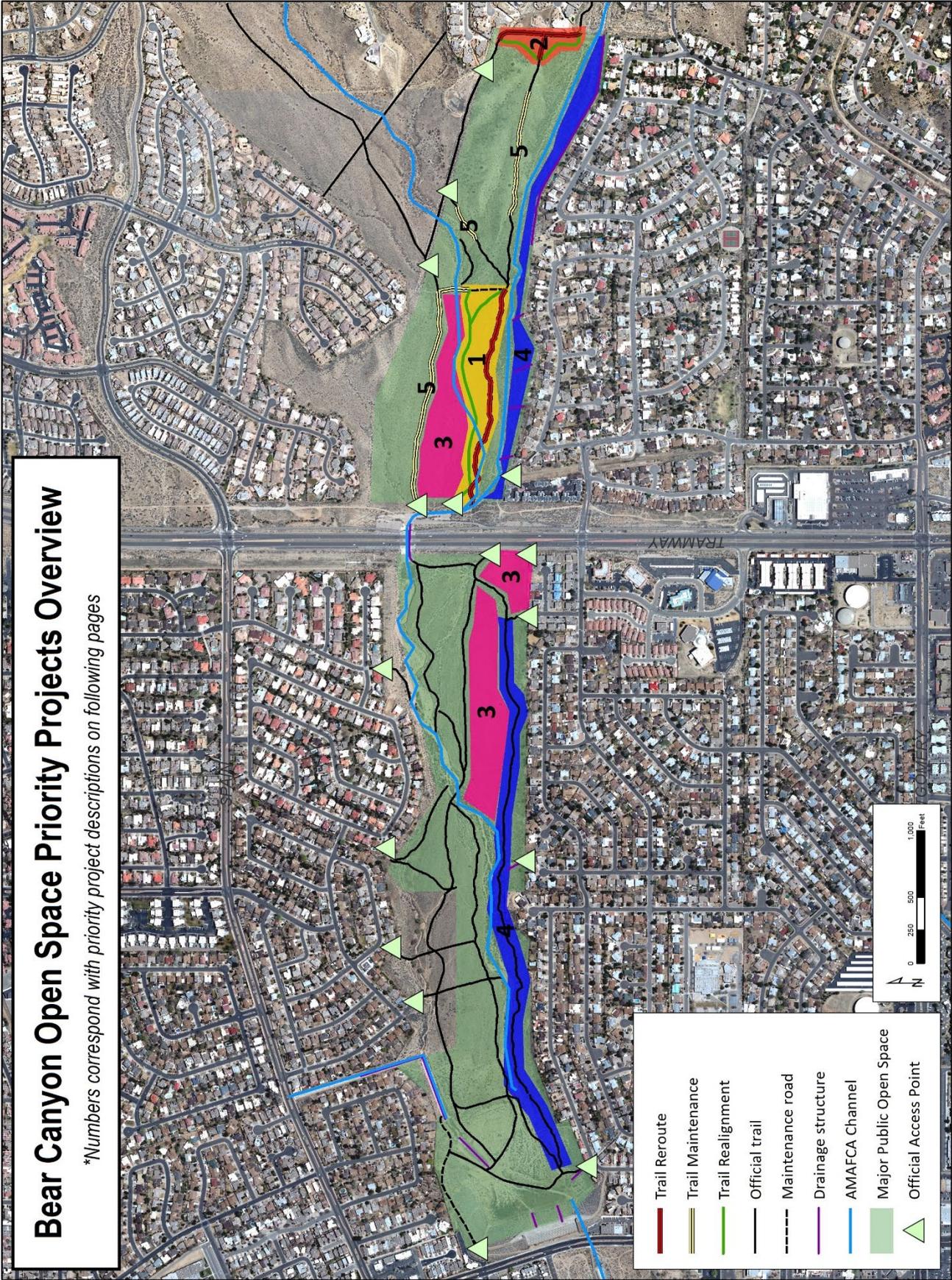
Currently, there are approximately eight miles of official trails in BCOS, including multi-use paths, maintenance roads, and AMAFCA channels (see trail network map on page 8); additionally, there are approximately six miles of unofficial user-created trails. Through the implementation of this plan, the OSD anticipates closing approximately five miles of trail, constructing one mile, and adopting or rerouting one mile of unofficial trail, making the total official trail mileage approximately ten miles. The OSD also anticipates conducting trail and road maintenance on approximately 1.5 miles of the BCOS network.

Estimated Trail Projects Mileage Summary

<i>Existing</i>	
Official Trails	8
Unofficial Trails	6
Total	14
<i>Implementation</i>	
Trail Closure	5
Trail Construction	1
Trail and Road Maintenance	1.5
Total Trails After Implementation	10

Bear Canyon Open Space Priority Projects Overview

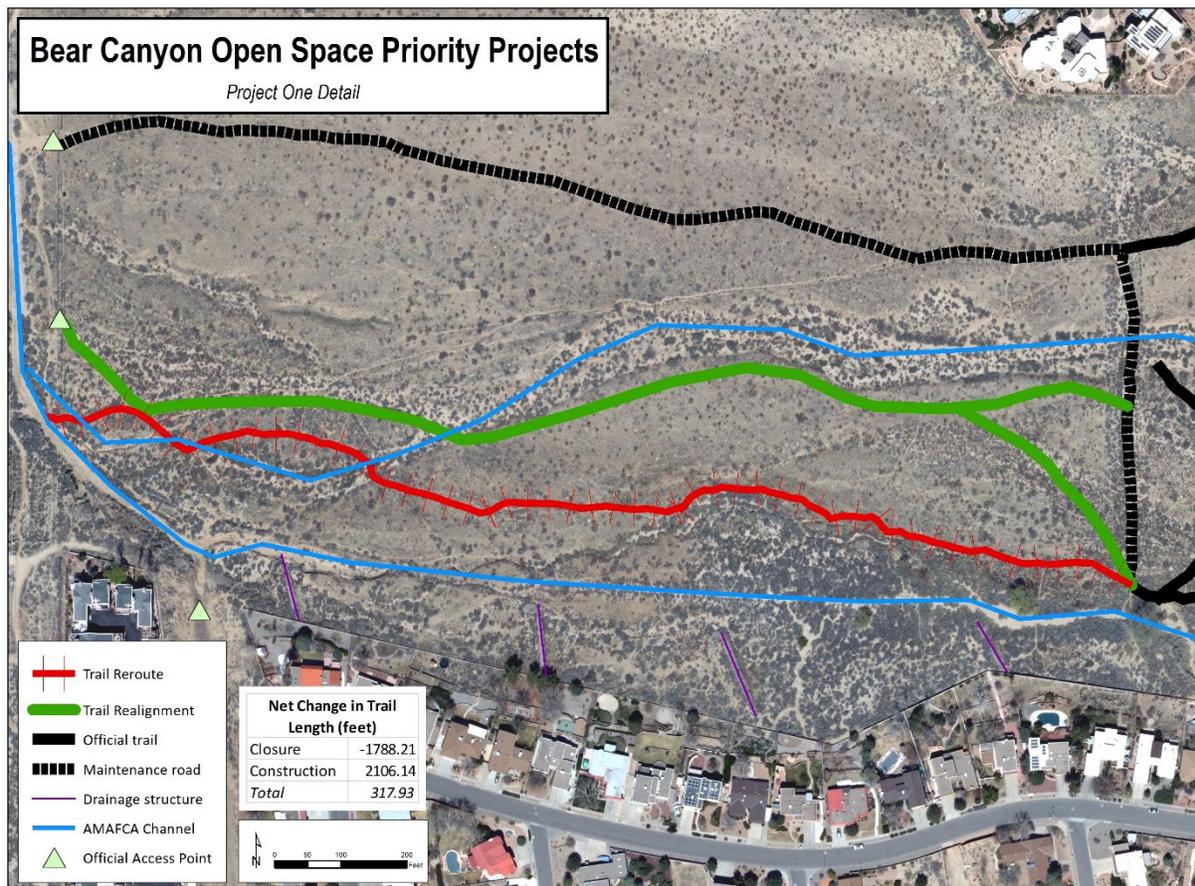
**Numbers correspond with priority project descriptions on following pages*



Priority Project One: Trail Reroute

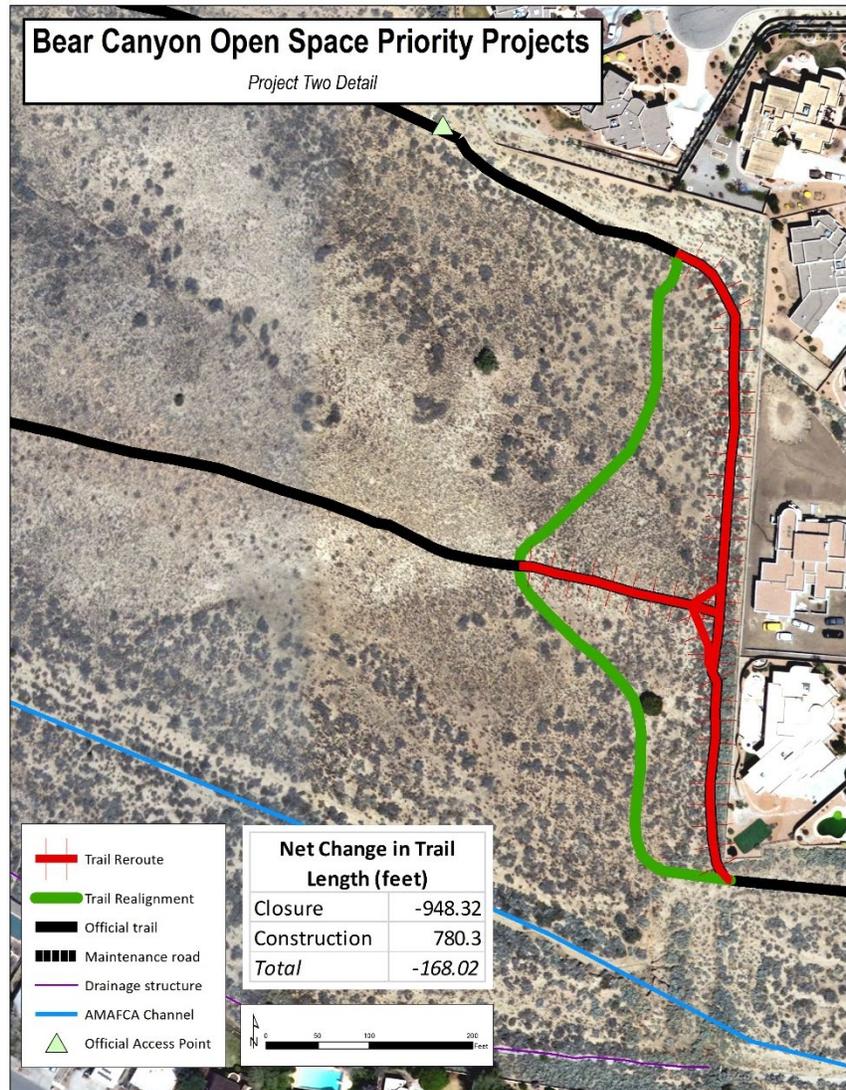
Description. Much of the current trail (approximately 1,800 feet in length) running east to west across the southwestern quadrant of BCE is incised or in danger of eroding into the drainage directly adjacent. The first priority identified in this planning effort is the realignment of this trail to a location further north. This realignment will take advantage of natural side slopes to encourage drainage across rather than straight down the trail. It will form a connection between the fence line just to the east of the Tramway entrance and the maintenance road running north to south in the center of BCE. As with all trail realignments constructed by City Open Space, the new trail will be completed before the retired trail is closed and revegetated.

Anticipated Timeline/Projects. The OSD anticipates beginning this reroute late 2019 and continuing, if necessary, through spring 2020. Work would begin with OSD staff measuring slopes and judging curves, connections, and potential erosion issues to determine appropriate placement. Construction will likely be a combination of staff and volunteer projects, potentially assigning group projects to this location during spring clean-ups at Foothills trailheads and National Trails Day if needed. The New Mexico Volunteers for the Outdoors (NMVFO) has also expressed interest in working in BCOS and could potentially use this trail reroute for their annual trail building workshop.



*Priority Project Two:
Trail Reroute*

Description. The OSD’s second priority trail project for Bear Canyon Open Space is the reroute of a trail at the far eastern boundary of BCE, which connects two areas of the HD HOA private open space. The current alignment of the trail runs directly adjacent to several neighbors’ fences, and a request was made to move it further west from the boundary. The OSD prefers to collaborate with adjacent residents who are directly affected on issues like this, and considers this to be a reasonable request. Precedence for this “good neighbor” approach has been set by the OSD with multiple similar reroutes, specifically in the northeast corner of Via Posada, in the Foothills just south of Comanche, at Golden Open Space along the San Pedro Creek Estates, and at several locations in Milne/Gutierrez Canyon just north of the Sierra Vista neighborhood.



Anticipated Timeline/Projects. The OSD anticipates beginning work on this trail in summer/fall 2020, after completion of the Priority One trail realignment. Work will likely be conducted by a combination of OSD staff and the Rocky Mountain Youth Corps.

Note: Trail conditions for the following Projects Three, Four, and Five will be evaluated after the first two priority trail projects are complete, likely in 2021. Conditions at that time will determine which of these projects will take precedence.

Priority Project Three: Redundant Trail Closures

Description. The OSD will evaluate a number of user trails in various areas of BCOS for redundancy and sustainability, and then determine whether they will be closed or fine-tuned and formalized. The areas identified in Priority Project Three will be the initial focus of this evaluation. These include the numerous trails surrounding the bear statue just west of Tramway Boulevard, and redundant north to south connections between the official, arterial, east-west trails on either side of Tramway. Because this phase of implementation is expected to begin two years from the adoption of this plan, the OSD anticipates there will be numerous changes to the unofficial trail network in these areas and so have not identified specific trails for closure at this time.

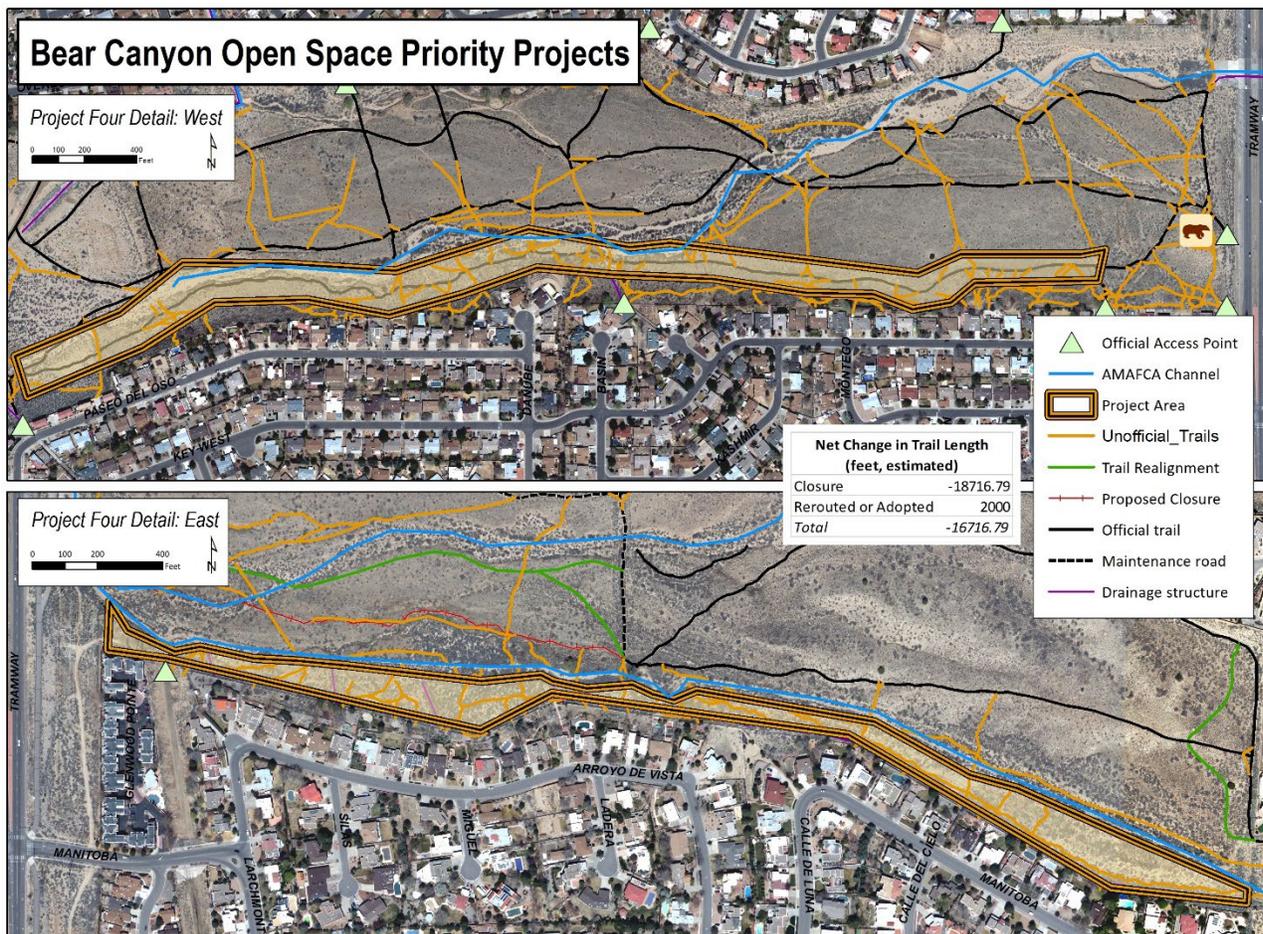
Anticipated Timeline/Projects. These trail projects will begin after Priority Trail Projects One and Two are complete, likely in 2021; however, this will be an ongoing maintenance issue as new user-created trails form in different areas. The OSD anticipates that closures will be a combination of volunteer days and Rocky Mountain Youth Corps trail projects.



Priority Project Four: Reduce User-Made Trails from Unofficial Access Points

Description. User-created trails dominate the southern boundary of BCOS. This is due to the high number of unofficial private access points from neighbors’ properties. This goal’s intent is to reduce the high occurrence of these trails to just a few sustainable connections to the arroyo and other main arterials. Reducing redundant trails allows vegetation to recover and improves the overall health of the trail system and habitat. Because this phase of implementation is scheduled to begin two years from the adoption of this plan, the OSD anticipates there will be numerous changes to the unofficial trail network in these areas and so have not identified specific trails for closure at this time.

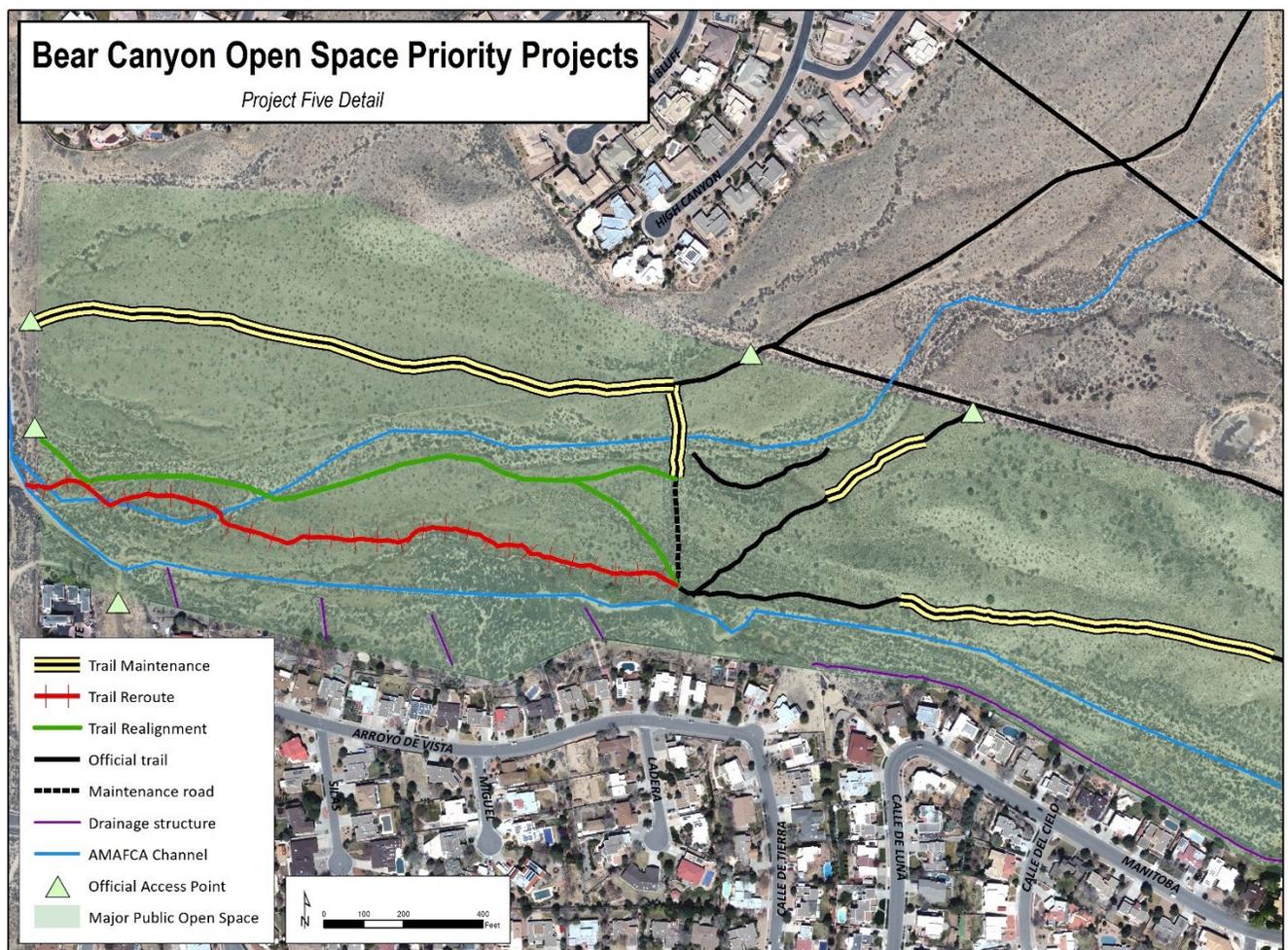
Anticipated Timeline/Projects. At the time of this series of projects the OSD will survey existing trails for sustainability and redundancy, as well as determine appropriate locations for collectors. The OSD will determine if any trails will be formalized or closed and conduct volunteer days or youth corps projects to construct and rehabilitate. Depending on trail conditions at the time of the project, this project may take precedence over or coincide with Project Three.



Priority Project Five: Trail Maintenance

Description. Priority Trail Project Five is maintenance on existing official roads and trails. The areas identified on the map are current needs, but more may be identified in the future. The maintenance road will require ongoing maintenance because of its location. This will primarily consist of repairing drain dips and revegetating when necessary. Other sections of the trails identified for maintenance, particularly the shorter section identified on the map just south of the private open space may be slightly rerouted to take advantage of a larger side slope on a nearby hill.

Anticipated Timeline/Projects. Like Projects Three and Four, Project Five will be evaluated after the top two priorities are complete. Sections will likely require ongoing maintenance, primarily drain dips, which will be constructed by volunteers or youth corps teams overseen by OSD staff. Due to its width and conduciveness to vehicle access, maintenance on the maintenance road may be conducted with small pieces of equipment.



Signage

While official access points are signed with Open Space information and regulations, official trails need to be designated through signage to direct visitors toward appropriate trails. These trail signs have been installed on other MPOS properties and include trail names, distances, and allowable uses. The OSD will begin installation at BCOS at the time of official trail reroutes.

Vegetation Management

According to the *Facility Plan for Arroyos* (p. 113), “arroyo courses should be left to the natural encroachment of local species. If that is not desirable, the following shrub and grass species could be encouraged...

Shrub species

1. Rabbitbrush (*Chrysothamnus*)
2. Snakeweed (*Gutierrezia*)
3. Indigobush (*Dalea*)
4. Desertwillow (*Chilopsis*)
5. Brickellia (*Brickellia*)

Grass species

1. Little Blue Stem (*Andropogon scoparius*)
2. Poverty Threeawn (*Aristida divaricata*)
3. Red Threeawn (*Aristida longiseta*)
4. Sixweeks Gramma (*Bouteloua barbata*)
5. Burrograss (*Scleropogon brevifolius*)”

There are currently healthy communities of a majority of these species in BCOS, as well as other desirable native species like blue gramma, black gramma, sideoats gramma, cholla and prickly pear. The OSD has no current plans to revegetate any areas except trail closures; those will primarily consist of cuttings from cacti found in the immediate area, and potentially reseeding with a native seed mix (see page 28 for more information).

Several invasive species are also present, primarily horehound and false tarragon, but also Siberian Elm, Tree of Heaven, and Russian thistle. Ideally, Bear Canyon Open Space will support a biodiverse wildlife and native plant habitat with invasive species completely eradicated. However, the realities make this scenario impractical at best. After weighing the benefits and costs of different invasive species removal strategies, the OSD determined that the amount of disturbance wholesale removal would cause far outweighs the benefits of complete eradication, especially considering the ease with which they could again take hold when they

are uncontrolled on neighboring properties. The disturbance of the vegetation in the area would encourage establishment of even more opportunistic and invasive species. And finally, as mentioned earlier, there has been negative feedback from neighbors concerning the removal of plants like mature Siberian Elms as they provide shade and habitat.

The OSD will proceed with the following strategies based on existing conditions and constraints in BCOS and surrounding properties and available resources. Rather than remove invasive species all at once and cause massive disturbance, the OSD plans to:

- Annually remove immature Siberian Elms; seeds dropped by the mature Siberian Elms that are allowed to remain will inevitably grow new sprouts, so continued removal will be necessary. Mature elms are primarily located in the arroyo in south central BCE and northeastern BCW.
- Implement a new effort called “Weed Warriors” to assist in the removal of younger, less established plants. The purpose of adding this new facet to the Open Space volunteer program is to recruit and educate local volunteers with a passion for maintaining the public lands they regularly use on proper low-impact invasive species removal, with a focus on identification, removal by hand, and disposal.
- Utilize youth corps and inmate crews to remove dead tumbleweed as it accumulates. The focus area for removal is southwestern BCE between Tramway Boulevard and the stand of mature elms in the arroyo.

Unofficial Access Points

The OSD typically does not permit private access points into publicly owned City Open Space. Private access points encourage unsustainable and redundant user trails, which decrease vegetation and wildlife habitat and increase erosion and disturbance; they also create unequitable access to a public asset. In areas where private access points become problematic, the OSD typically requires the adjacent landowners to desist in using those gates. At this time, the OSD does not plan to require property owners with private gates into BCOS to stop using them. However, should the network of user trails adjacent to private entrances persist, the OSD will consider fencing these areas to direct users to sanctioned access points. The National Park Service recently implemented a similar trail reduction strategy in the 2018 Visitor Use Management Plan by identifying 27 access points appropriate for closure, reducing the total from 57 to 30.

Other Maintenance Needs

The OSD will continue to perform maintenance as needed. Needs beyond trail and vegetation management primarily include fence and gate repair (with the exception of fencing at the

private open space boundary, which is maintained by HD HOA), sign replacement, and litter control. Fence maintenance is essential to reducing user-created trails and preventing unauthorized vehicle entry and damage to soils and native vegetation. General maintenance needs will continue to be assessed through a combination of staff inspection and volunteer and public reporting.

Costs and Funding Sources

The five detailed proposed projects will improve current conditions rather than construct additional facilities and will capitalize on OSD staff and volunteer time; therefore, the cost of implementation is minor.

Trail design and construction will be conducted by hand by OSD staff and volunteers, and potentially the RMYC, and will not require any construction materials beyond what is available on-site: dirt, large rocks, cacti, and vegetation debris. Should the OSD choose to reseed with its typical “Foothills” mix (Blue Grama, Western Wheatgrass, Sideoats Grama, Galleta, Little Bluestem, and Fourwing Saltbush), the custom seed mixture would like cost less than \$100. The necessary tools are already purchased and owned by the OSD, so the total cost will consist of staff salaries and will be paid for with OSD’s Annual Operating Budget. The RMYC is currently funded by the Mayor’s Youth Initiative. The OSD is dependent on this type of funding to provide necessary labor as well as meaningful outdoor work experiences for youth.

Funding necessary for OSD’s staff time and maintenance and supplies will come from the OSD’s Annual Operating Budget. Additional events that may occur including restoration demonstrations and educational hikes will be funded by a combination of the Annual Operating Budget; the Open Space Alliance, a non-profit group dedicated to assisting the OSD with funding for outreach and education; grants from the State or outdoor recreation promoters like REI as they become available; and by volunteer organizations.

The cost of repairing or replacing damaged fencing and signage will be negligible; the materials and tools needed are part of OSD’s regular inventory and no special purchases are anticipated. Costs related to construction and installation of both will come from the OSD’s Annual Operating Budget.

However, larger costs will potentially be incurred should the OSD decide to fence the areas adjacent to private property owners, the cost will increase significantly. At approximately \$7.00 per linear foot, the cost of high tensile fencing for an estimated 14,000 feet would be \$98,000. Likewise, should the timing of trail construction prove critical and the OSD need to hire contractors to perform all anticipated trail construction, costs are estimated at about \$25,700.

ANTICIPATED COST SUMMARY ESTIMATES

	Per Unit	Unit	Anticipated Amount	Total Cost
Foothills Seed Mix	\$78	Acre	1.2	\$94
Trail Signs	\$21.47	Sign	20	\$429
4x4 Sign Posts	\$5.21	Post	20	\$104
RMYC	\$2,000.00	Week	2	\$4,000
			<i>Total</i>	<i>\$4,627</i>
<i>Other Potential Costs</i>				
Trail Construction by Contractor	\$4.87	Linear Foot	6386	\$31,100
Fencing per foot	\$7	Linear Foot	14000	\$98,000
			<i>Alternative Total</i>	<i>\$133,727</i>

6. Appendix

Definitions

ADA: Americans with Disabilities Act of 1990 (Public Law 101-336). This law sets guidelines for accessibility to places of public accommodation and commercial facilities by individuals with disabilities. (Major Public Open Space Facility Plan)

Arroyo: a small steep-sided watercourse or gulch with a nearly flat floor: usually dry except after heavy rains (chiefly found in the southwest United States), also referred to as a “wash” or “gulch” (Facility Plan for Arroyos)

Corridor: A usually linear area of land, within which an existing public right-of-way or easement exists. Examples of corridors include, but are not limited to, utilities, the movement of people, vehicles, storm water and possibly wildlife. (Major Public Open Space Facility Plan)

Invasive Species/Vegetation: Vegetation that does not occur naturally in the area and was introduced by people

Low Impact: Facility development or public use which does not significantly degrade the natural character of an area (Major Public Open Space Facility Plan)

Major Public Open Space: Publicly-owned spaces managed by the Open Space Division of the City Parks and Recreation Department, including the Rio Grande State Park (i.e. the Bosque), Petroglyph National Monument, and Sandia foothills. These are typically greater than 5 acres and may include natural and cultural resources, preserves, low-impact recreational facilities, dedicated lands, arroyos, or trail corridors. (Integrated Development Ordinance)

Multi-use trail: A separate pathway designated by sign for use by non-motorized traffic only, including pedestrians, bicyclists, equestrians and people who use wheelchairs. Not all trails may accommodate all of these uses. Trails may either be hard or soft surfaced, but all trails within BCOS are primitive, unenhanced dirt paths. (Major Public Open Space Facility Plan)

Native Species/Vegetation: Vegetation that occurs naturally in the Southwest. Native vegetation has not been introduced by people (Major Public Open Space Facility Plan)

Private open space: Open space for passive or active recreation that is owned, managed, and maintained privately in its natural state and accessible either to the public or to the residents of a subdivision and zoned NR-PO-C (Integrated Development Ordinance)

Protected, Undeveloped Open Space: Significant undeveloped or conserved area with outstanding natural features or scenic qualities suitable for passive recreational activities with no substantial facilities or improvements (Major Public Open Space Facility Plan)

Semi-natural arroyo: an arroyo that has been stabilized with naturalistic channel treatments described in the Facility Plan for Arroyos, designed to blend visually with adjacent open space lands. Appropriate channel stabilization treatments include: ungrouted riprap, gabions, gabion weirs, tinted concrete and soil cement.

Sustainable trail: Recreation or transportation path designed to create minimum impact on the surrounding area and require minimal maintenance by following specific slope, width, and curve guidelines. The OSD follows International Mountain Bicycling sustainable trail guidelines.

Unofficial/user-created trail: Path not sustainably designed or formalized by the Open Space Division

References

City of Albuquerque.

Albuquerque/Bernalillo County Comprehensive Plan. 2017. www.abc-zone.com.

Bear Canyon Arroyo Trail Corridor Plan. 1991. www.cabq.gov/planning/plans-publications.

Bikeways & Trails Facilities Plan. 2015. www.cabq.gov/planning/plans-publications.

Facility Plan for Arroyos. 1986. www.cabq.gov/planning/plans-publications.

Integrated Development Ordinance. 2018. www.abc-zone.com.

Major Public Open Space Facility Plan. 1999. www.cabq.gov/planning/plans-publications.

International Mountain Bicycling Association. Trail Solutions: IMBA's Guide to Building Sweet Singletrack. 2004. www.imba.com/resource/trail-solutions.

State of New Mexico. Sandia-Manzanita Mountains Land Use and Recreation Master Plan. 1978.