



WEST MESA TRAILS PLAN

*Connecting residents of the West Side to the unique landforms
and recreational opportunities of West Mesa public lands*



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The City of Albuquerque and its Open Space system are located on ancestral lands of today's pueblos and tribes in central New Mexico. The significance of these lands extends well beyond, to Indigenous communities in surrounding areas and states. It is recognized that ancestral peoples have lived in the vicinity for thousands of years, since time immemorial. Over the millennia, many groups have traveled through the Rio Grande region and trace their origins or identify places here. Members of other traditional groups such as land grant heirs also have direct connections to numerous important locations. This land acknowledgement extends to all people who recognize the cultural power and importance of these places.

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Introduction

Featuring volcanic landforms and stunning views of the Rio Grande Valley and Sandia Mountains, the City of Albuquerque's West Mesa contains more than 10,000 acres of public land that provide a unique blend of geologic landscapes, recreational trails, and cultural resources.

INTRODUCTION

Featuring unique volcanic landforms and stunning views of the Rio Grande Valley, the City of Albuquerque's West Mesa contains more than 10,000 acres of public land that provide a unique mosaic of geologic landscapes, recreational trails, and cultural resources that are invaluable to both residents and visitors. The majority of this public land is a combination of City-owned Open Space and Petroglyph National Monument (PETR), jointly managed by the City Open Space Division (OSD) and the National Park Service (NPS).

The West Mesa Trails Plan includes an inventory of uses, opportunity and challenge areas, demographic information, and an overview of existing conditions. These help inform recommendations to connect these public lands to surrounding trail networks, neighborhoods, and community facilities via a network of primarily natural surface trails. This plan also provides recommendations for bicycle and pedestrian facilities that—although not under the OSD's jurisdiction—will enhance connectivity to West Mesa public lands through their implementation. Finally, the plan provides recommendations for access points based upon community input, existing access points, and projected growth.

This plan includes City Open Space across the West Mesa, but does not include recommendations within Petroglyph National Monument. However, providing connections and access to PETR was an essential element to this plan.

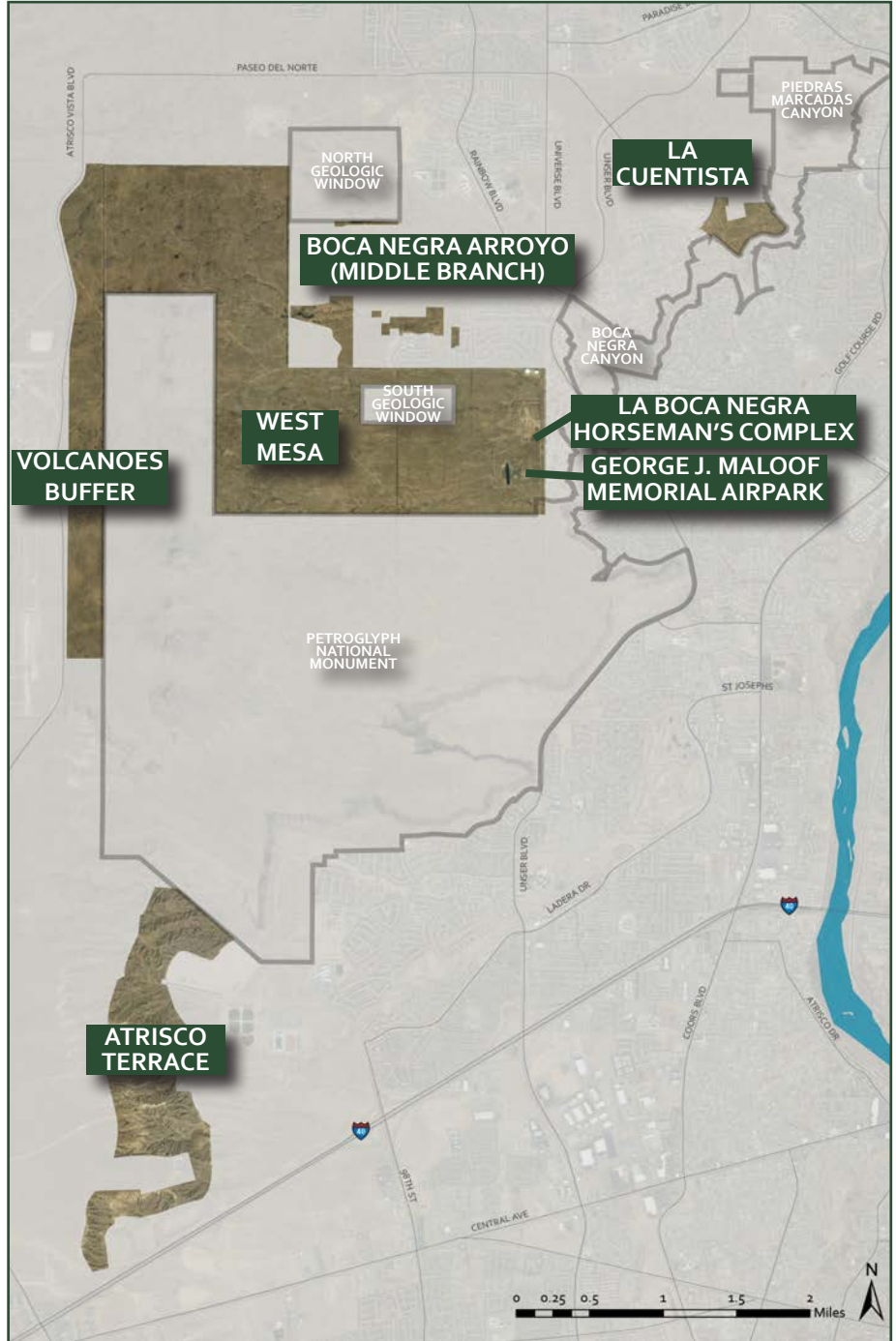


FIGURE 1. EXISTING SITE MAP

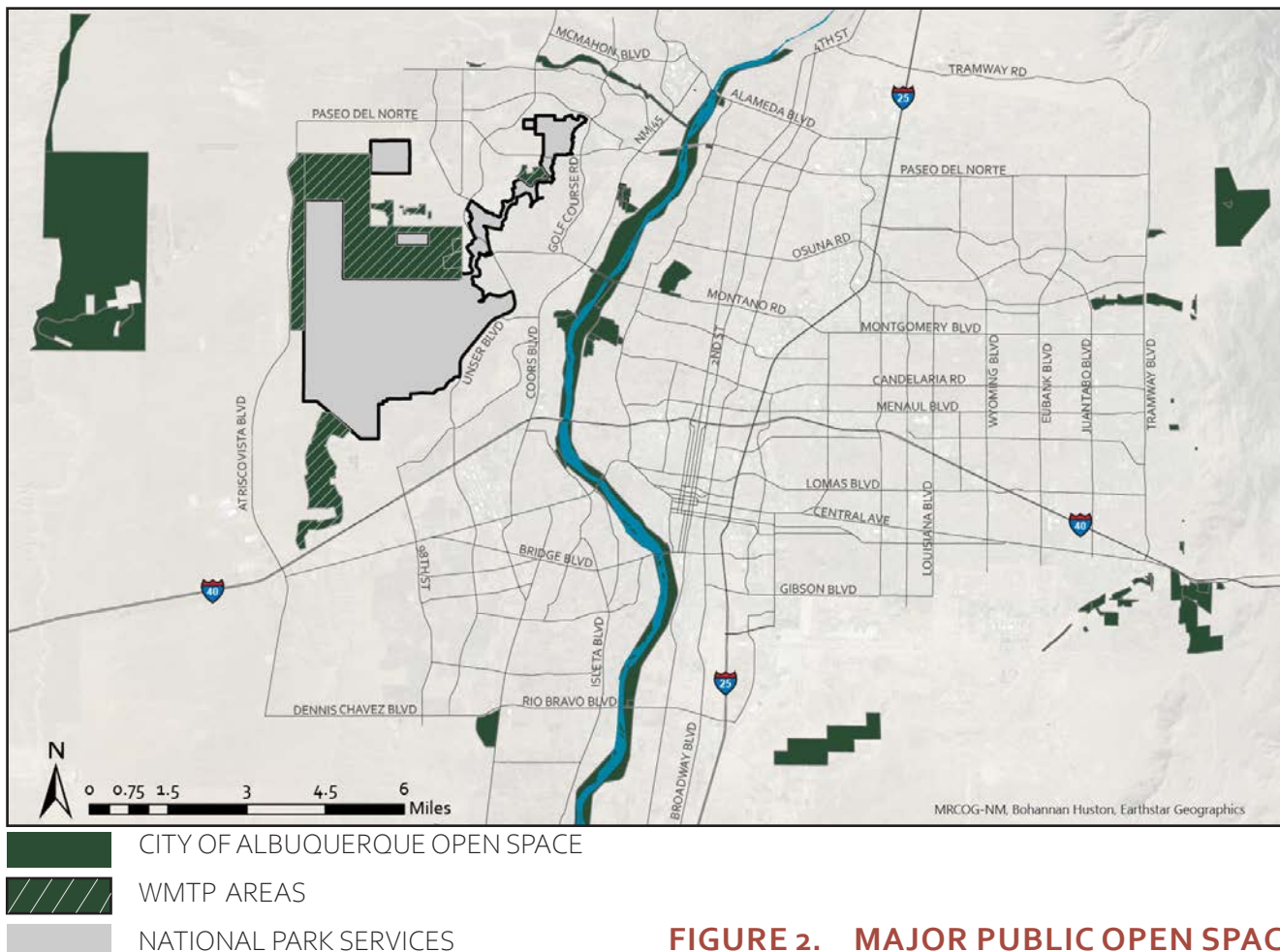
CITY OF ALBUQUERQUE OPEN SPACE

The City of Albuquerque (COA) manages over 30,000 acres of Major Public Open Space (MPOS) across the region, including the Sandia Foothills, Middle Rio Grande Bosque, Tijeras Arroyo, East Mountains, and West Mesa, with the mission of protecting naturally and culturally significant resources while providing low-impact recreation and environmental education. Per the Major Public Open Space Facility Plan (1999), the purposes of MPOS include:

- Conservation of natural resources and environmental features
- Provision of opportunities for low-impact outdoor recreation and education
- Shaping of the urban form

- Conservation of archaeological resources
- Provision of trail corridors
- Protection of the public from natural hazards

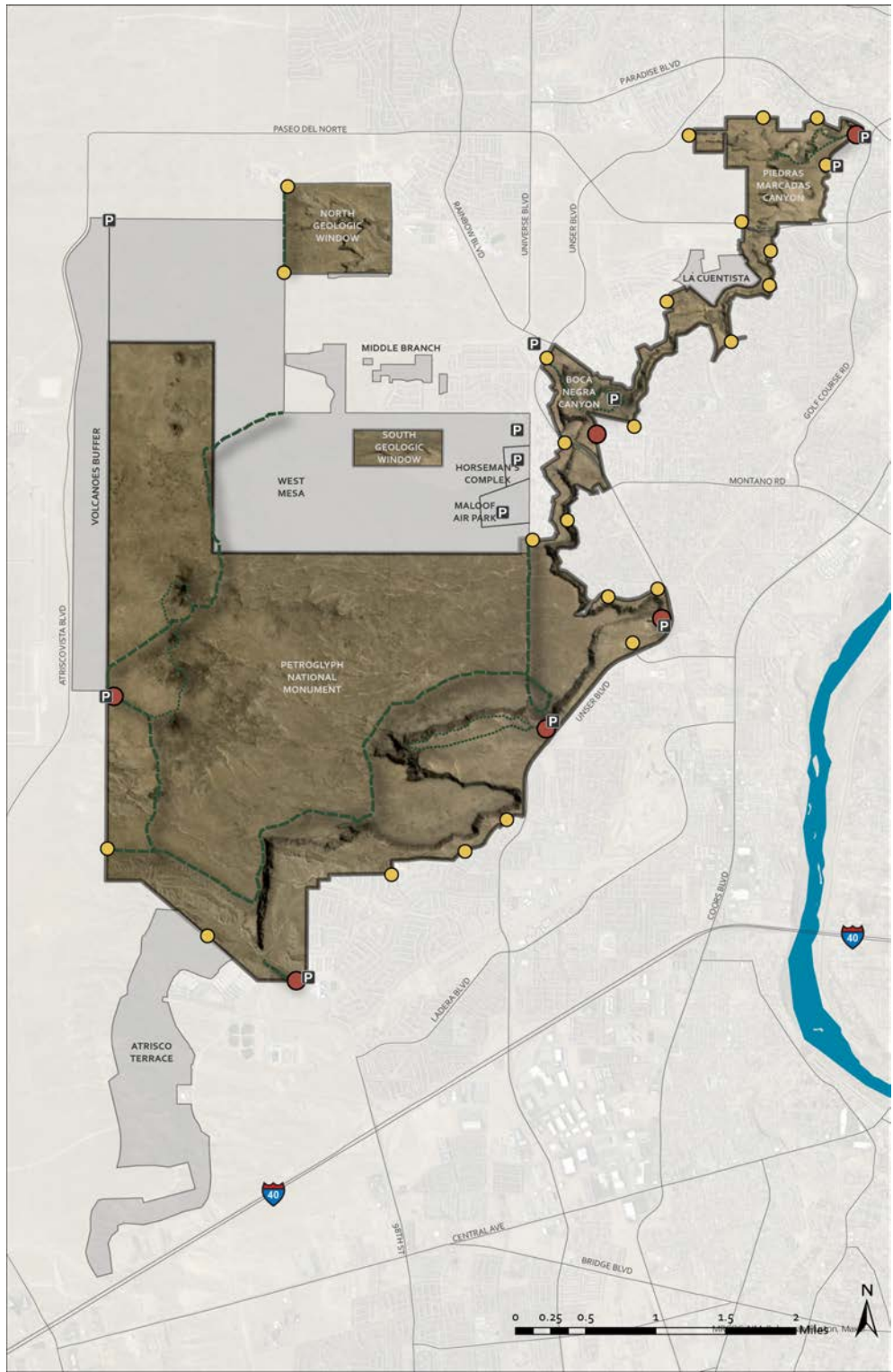
Much of the COA's Open Space is on the mesa in the western half of the City of Albuquerque or in unincorporated Bernalillo County. Open Space properties are dispersed across the West Side, often abutting PETR to both further protect the monument from the effects of adjacent development and supplement recreational opportunities. In addition to land within PETR, OSD also owns thousands of acres of mesa top grassland, rock outcroppings, and culturally significant sites. Existing within these lands is a network of largely unplanned, user-created, natural-surface trails; exceptions are the paved Paseo de la Mesa Trail and two special-use areas, the George J. Maloof Memorial Airpark and La Boca Negra Horseman's Complex.



PARTNERSHIP WITH NATIONAL PARK SERVICE

The City of Albuquerque, propelled by citizen advocacy starting in the late 1960s, purchased several thousand acres on the West Mesa in order to protect the landforms iconic to Albuquerque's western vista. This included sections of the escarpment, petroglyphs, volcanoes, and other significant geologic and cultural resources. A total of 4,200 acres purchased by the COA and State of New Mexico, plus an additional 3,000 acres purchased by the National Park Service (NPS), were designated Petroglyph National Monument in 1990. This successfully protected 7,200 acres of exceptional geologic formations, tens of thousands of petroglyphs, and a cultural landscape that is deeply significant to 29 affiliated Pueblos and Tribes. This has led to a unique partnership between the National Park Service and City of Albuquerque unparalleled elsewhere, in which a local municipality co-owns and co-manages a National Park unit with the federal government.

In order to better manage the interaction of the public with the Monument's cultural and natural resources, and control the proliferation of user-created trails and access points, NPS and OSD staff developed a Visitor Use Management Plan (VUMP), completed in 2018. Through a robust public process, consultation with affiliated Pueblos and Tribes, and an analysis of existing conditions, PETR established desired goals for a trail and access network, visitor experience, and cultural protection. In consideration of Tribal input and the Monument's establishing legislation, it was determined that higher-impact recreational uses like mountain biking and horseback riding were not congruent with the sacred places, experiences, and cultural landscape the Monument was intended to protect; therefore, the VUMP established hiking as the only permitted transportation or recreation mode within its boundaries, except for administrative purposes and a handful of multi-use connector trails.



- PETR Primary Access Point
- PETR Secondary Access Point
- Official trail or administrative road

FIGURE 3. PETROGLYPH NATIONAL MONUMENT ACCESS POINTS AND TRAILS

NEED AND OPPORTUNITY

The West Side is the fastest growing area in Albuquerque, with new residential and business districts proposed across wide swaths of previously undeveloped natural terrain surrounding this public land. Meanwhile, the restriction of bicycle and equestrian use in PETR left what could initially be seen as a large gap in recreational opportunities on the West Mesa.

The OSD recognizes that this creates both an opportunity and a necessity to strategically and proactively plan for exponentially increased public use on the thousands of acres of MPOS that are currently underutilized and largely unplanned relative to other more centralized Open Space lands. Redesigning the existing multi-use trail network would create better connections to Open Space, Petroglyph National Monument, and other amenities; improve sustainability and longevity of the trails; increase opportunities for hikers, cyclists, and equestrians; reroute or revegetate unsustainable trails and those that weave in and out of the Monument; and improve existing facilities and trailheads.

City Council also recognized the need to develop this trail system and unanimously approved Resolution 21-228 in December 2021 directing staff to develop a trail plan for the West Mesa (see Appendix A). Additionally, City Council District 5 provided the funding needed to develop this plan.

Vision

Connect recreationists to the unique landforms, amenities, and other outdoor opportunities on Albuquerque's West Mesa via a natural-surface, interconnected, multi-use trail network.



Goals

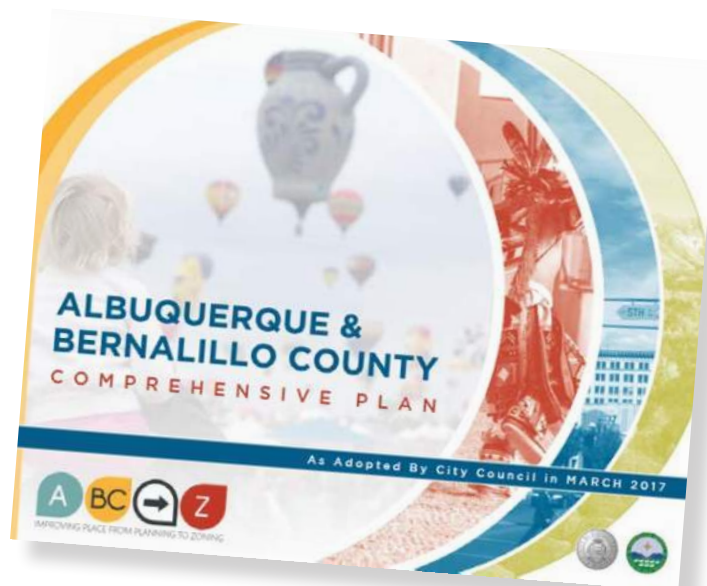
- *Develop a conceptual multi-use, interconnected trail system that links users to existing and planned designations and amenities*
- *Provide recommendations to improve existing and develop new facilities and trailheads*
- *Engage partners and the general public to inform recommendations*



EXISTING PLANS

Albuquerque and Bernalillo County Comprehensive Plan, 2017

The Albuquerque/Bernalillo County (ABC) Comprehensive Plan provides goals and policies for various aspects of the city and county based upon needs. Specific to this planning process, this ABC Comp Plan identifies goals and policies relevant to MPOS and Petroglyph National Monument, 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.



Albuquerque Integrated Development Ordinance (IDO)

The City of Albuquerque's Integrated Development Ordinance provides zoning and subdivision development guidance for the City. The IDO provides specific development guidance based on land use for the entire City. This document informs trail recommendations to ensure they abide by city ordinances.

Open Space Acquisition Priorities List, 2021

City Council approved an Open Space Acquisition Priorities list in 2021 that recommends properties for purchase that are suitable for MPOS goals and purposes. Many of these properties are on the West Side, and their purchase would provide invaluable protection for environmentally and culturally significant resources and greatly enhance recreational opportunities. These include:

- Remaining private parcels in the Middle Branch of the Boca Negra Arroyo; the OSD currently owns several parcels there but without all, the arroyo remains disconnected and underutilized.
- A 70-acre State Land Office parcel adjacent to the Northern Geologic Window
- Cerro Colorado Volcano
- Rio Puerco Escarpment
- Sand Dunes
- Ceja

City of Albuquerque Major Public Open Space Facility Plan, 1999

The City of Albuquerque Major Public Open Space Facility Plan establishes guidelines and policies for City-managed Open Space areas based upon the goals outlined in the Albuquerque/Bernalillo County Comprehensive Plan. This plan highlights Open Space in the West Mesa and provides planning and land use policies to meet the goals of the OSD while working collaboratively with NPS. Relevant policies include providing trail corridors to connect to the bosque and northwest escarpment, developing a master plan for West Mesa Open Space in conjunction with the community, and coordinating trail development with Petroglyph National Monument.

Petroglyph National Monument Visitor User Management Plan, 2018

The Petroglyph National Monument Visitor User Management Plan (VUMP) set the stage for formalization of a trail network on the West Mesa. During its planning process, three management strategy alternatives were identified by staff, stakeholders, and the public. The plan identified appropriate locations for trails and primary and secondary access points, as well as volume and types of visitor use based on present and projected visitation levels and desired conditions.

The document also provides strategic guidance on sustainable trail maintenance and rehabilitation, rerouting trails as needed to protect resources. Management strategies help determine which trails best meet visitor and management needs and which of the over 90 miles of informal and sustainable trails and dozens of access points should be closed.

Consultation with Pueblo and Tribal governance determined that bicycling, horseback riding, and motor vehicle usage was not conducive to the preservation of the cultural landscape. Therefore, the Preferred Alternative permits only pedestrians and dogs on leash, with the few exceptions illustrated in Figure 3.

The plan also makes recommendations for trail management practices including stabilizing existing trails, rerouting trails as needed to protect resources, and utilizing sustainable trail construction techniques to improve stability and reduce erosion impacts.

Connections 2040 Metropolitan Transportation Plan, 2020

Connections 2040 is regional transportation planning document created by the Mid-Region Metropolitan Planning Organization (MRMPO), a subdivision of the Mid-Region Council of Governments (MRCOG) which is an association of local governments and special units in New Mexico's Middle Rio Grande region. This planning document will help guide long-range transportation planning for the region through identifying current network gaps and predicting future growth.

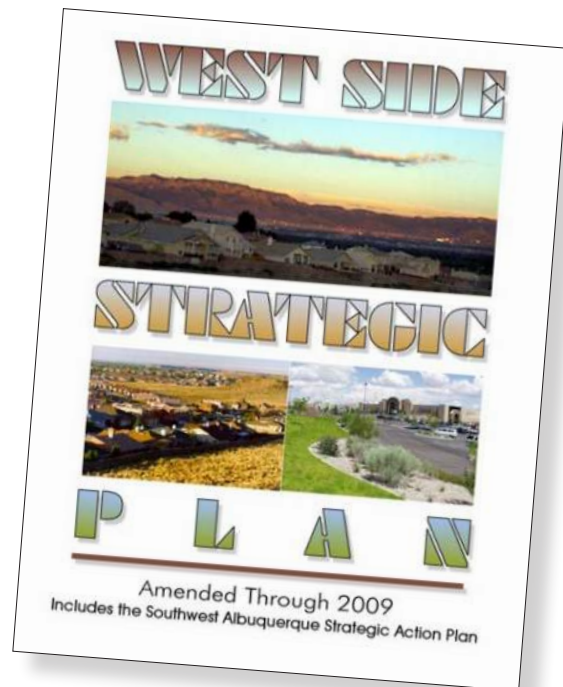
Albuquerque's West Side is identified as one of the major expected high residential growth areas. As a result, projected transportation system is expected to become more congested. The long-range bikeway system also shows the expected growth of the bikeways network around Petroglyph National Monument.

Bikeways & Trails Facilities Plan, 2015

The rank II facility plan is designated under the City of Albuquerque Parks & Recreation Division to ensure the accessibility and safety of all cyclists and pedestrians in Albuquerque. Primary goals include improving and enhancing cycling and pedestrian opportunities, developing a connected facilities network, and increasing the overall awareness and use of bikeways and trails. This plan emphasizes the need to connect to Major Public Open Space and fill facility gaps in the West Mesa and the bike network overall. Trail connections identified in the facility gap analysis section will be included in the West Mesa Trails Plan.

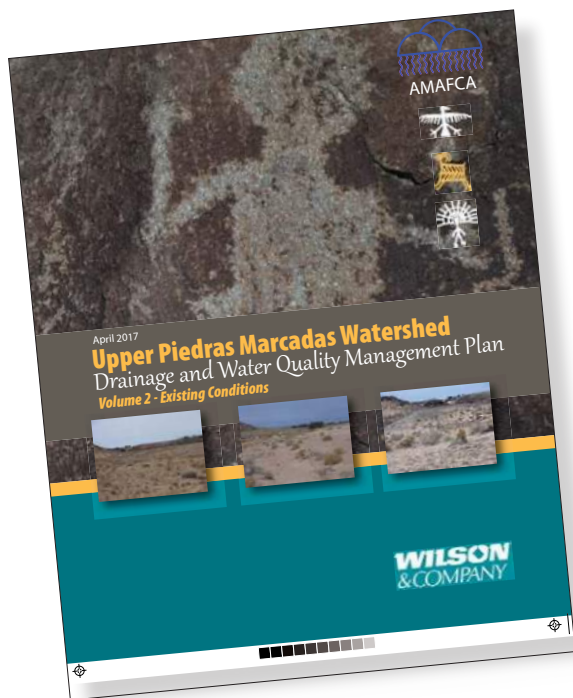
West Side Strategic Plan, 2009

The rapid rate of development on the West Side necessitates smart growth management policies to ensure a high quality of life. This rank II plan “[provides] a framework of strategic policies within which to manage future growth and development on Albuquerque’s West Side.” Open Space is identified as scenic buffers between planned communities and major landforms. The intent of the plan is not to stop, but rather manage growth. Recommendations for trail connectivity and Open Space policy will inform access points and trail alignment recommendations.



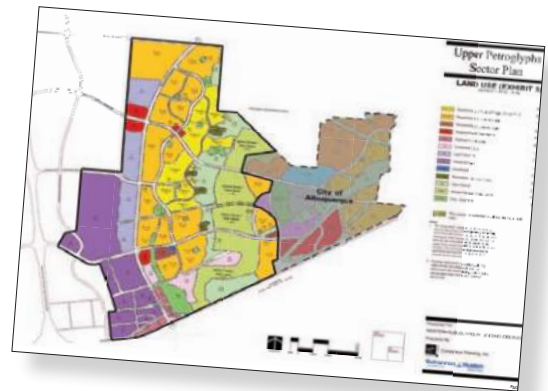
Upper Piedras Marcadas Watershed: Drainage and Water Quality Management Plan, 2022

The Upper Piedras Marcadas Watershed Drainage and Water Quality Management Plan was developed by AMAFCA to identify drainage and stormwater facility needs in the Upper Piedras Marcadas watershed. A section of the watershed is within the scope for the West Mesa Trails Plan. The plan includes a proposed retention pond with the potential for a trailhead colocation which would provide access to PETR.



Upper Petroglyphs Sector Plan, 2021

This rank III sector development plan specifies planning and design for the Upper Petroglyphs Development. This 5,279-acre area on unincorporated county land directly abuts Petroglyph National Monument, Atrisco Terrace Open Space, and Volcanoes Buffer Open Space. Primary considerations relevant to the West Mesa Trails Plan concern land use adjacent to Atrisco Terrace Open Space and the planned roadways bisecting the unit. It also provides trail design recommendations and potential access points from MPOS to Upper Petroglyphs. This plan will incorporate recommended residential connections, road crossing treatments, and an approach to connecting existing and future communities to trail facilities.



WEST MESA TRAILS PLAN OVERVIEW

The West Mesa Trail Plan is divided into five sections described below:

Existing Conditions

This section summarizes existing environmental conditions and population and development trends on the West Side, as well as profiles of MPOS uses and facilities. The existing conditions analysis helps determine opportunities and constraints for the trail network.

Planning and Public Engagement Process

This section details the public and stakeholder engagement process that occurred throughout the planning process including internal meetings, stakeholder meetings, a survey, website, and public and special interest group meetings.

Opportunities & Constraints

Based on the existing conditions analyses, OSD goals, and public input, opportunities and constraints are identified and discussed.

Recommendations

This plan provides recommendations that connect approximately 24 miles of existing, improved, and newly constructed multi-use trails throughout Open Space properties on the West Mesa to surrounding trail networks, neighborhoods, and community facilities. Access points also need improvements, and recommendations for new and improved amenities and trailheads based on existing conditions and projected growth are included. Finally, this plan provides recommendations for external trails and links that would improve connectivity to MPOS and PETR amenities.

Implementation

This section provides phasing, budget, and funding recommendations for the trail network.

Trail Plan Objectives

- *Create a trail network that will accommodate multiple trail user group needs with looping opportunities and differing trail experiences*
- *Ensure trail facilities can adequately accommodate different user groups*
- *Make off-site connections to surrounding neighborhoods and roadways*
- *Ensure trail user groups stay on permitted trails*
- *Highlight the stunning views of the West Mesa, Rio Grande Valley, and City of Albuquerque*
- *Ensure feasibility of the long-term maintenance and management of the trail network*



FIGURE 4. JURISDICTIONS IN STUDY AREA



Existing Conditions

West Mesa Open Space comprises approximately 4,200 acres of high desert grasslands and volcanic rock.

SITE CONTEXT

West Mesa Open Space contain important archaeological, geological, and environmental sites which are threatened by rapid development on the West Side. Harmful activities like off-road vehicle use and illegal dumping threaten these vulnerable areas, underscoring the urgency of their preservation. Responsible recreation is essential to ensuring longevity and protection of these resources for current residents and future generations.

Open Space properties are dispersed across the mesa above the volcanic escarpment on the west side of Albuquerque. Most are located near and adjacent to Petroglyph National Monument, allowing for easy access to the Monument, and mutually enhancing the environmental and recreational benefits of both jurisdictions.

The Albuquerque West Side is one of the most rapidly developing areas in the city, with multiple housing and business developments planned within close proximity to MPOS and the Monument.

Several major, high-volume roadways are located within the area, including Paseo del Norte, Unser Boulevard, Coors Boulevard, and more. The area also has multiple roadway expansion projects planned including Paseo del Norte, Unser Boulevard, and Atrisco Vista Boulevard, with plans to extend some roadways to connect to expanding developments.

The Bikeways and Trails Facilities Plan identifies bicycle and trail construction in conjunction with these major road improvements, including trails along Paseo del Norte and near PETR. Some housing developments also have their own network of multi-use paths along residential roads that connect to the larger city network.



LAND MANAGERS

City of Albuquerque Open Space Division (Parks & Recreation Department)

The City of Albuquerque Open Space Division manages multiple units on the West Side, many of which are included in the West Mesa Trails Plan. In addition to recreation and natural resource protection, Open Space can be used as a tool to assist in smart and sustainable development by managing sprawl and promoting higher density development along established networks.

U.S. Department of Interior

Petroglyph National Monument was established on June 27, 1990, to protect environmental, cultural, and historical resources sacred to dozens of Pueblos and Tribes. The now 7,236-acre monument is co-managed with the City of Albuquerque's Open Space Division. The Monument was founded with the intent of collaborative management between the City and NPS.

New Mexico State Land Office

The New Mexico State Land Office (NMSLO) owns approximately 70 acres of state trust land directly between the Northern Geologic Window and the campuses of three local schools: Tierra Antigua Elementary School, Tony Hillerman Middle School, and Volcano Vista High School. This parcel is currently on the OSD's Priority Acquisition List.

AMAFCA & City of Albuquerque Department of Municipal Development (DMD)

The Albuquerque Metropolitan Arroyo Flood Control District (AMAFCA) manages multiple storm drainage facilities on the West Mesa. Some of this

infrastructure has been collocated in partnership with the OSD to establish trailheads and trails. AMAFCA's primary facilities on the West Mesa include the Boca Negra Dam, Atrisco Storm Drain, and the Ladera Dams. The Boca Negra Dam has a multi-use bike path around its rim that connects PETR's Boca Negra Canyon to adjacent communities via a tunnel under Unser Boulevard. The Atrisco Storm Drain captures and transports stormwater runoff from the Boca Negra Dam along the paved multi-use path to the Boca Negra Arroyo. Finally, the Ladera Dams are a system of 12 dams near Atrisco Terrace which include the Ladera Golf Course. AMAFCA and DMD have partnered to develop several future drainage ponds to accommodate planned development; one potential site would offer a particularly advantageous opportunity to collocate a trailhead, as it is a City-owned parcel with direct access to the Piedras Marcadas Unit of PETR.

Bernalillo County

Land on the West Mesa that is unincorporated falls in Bernalillo County territory, much of which is north of the I-40 corridor surrounding Atrisco Terrace, and northwest of the Northern Geologic Window. Developments in these areas adhere to Bernalillo County development standards and zoning code.

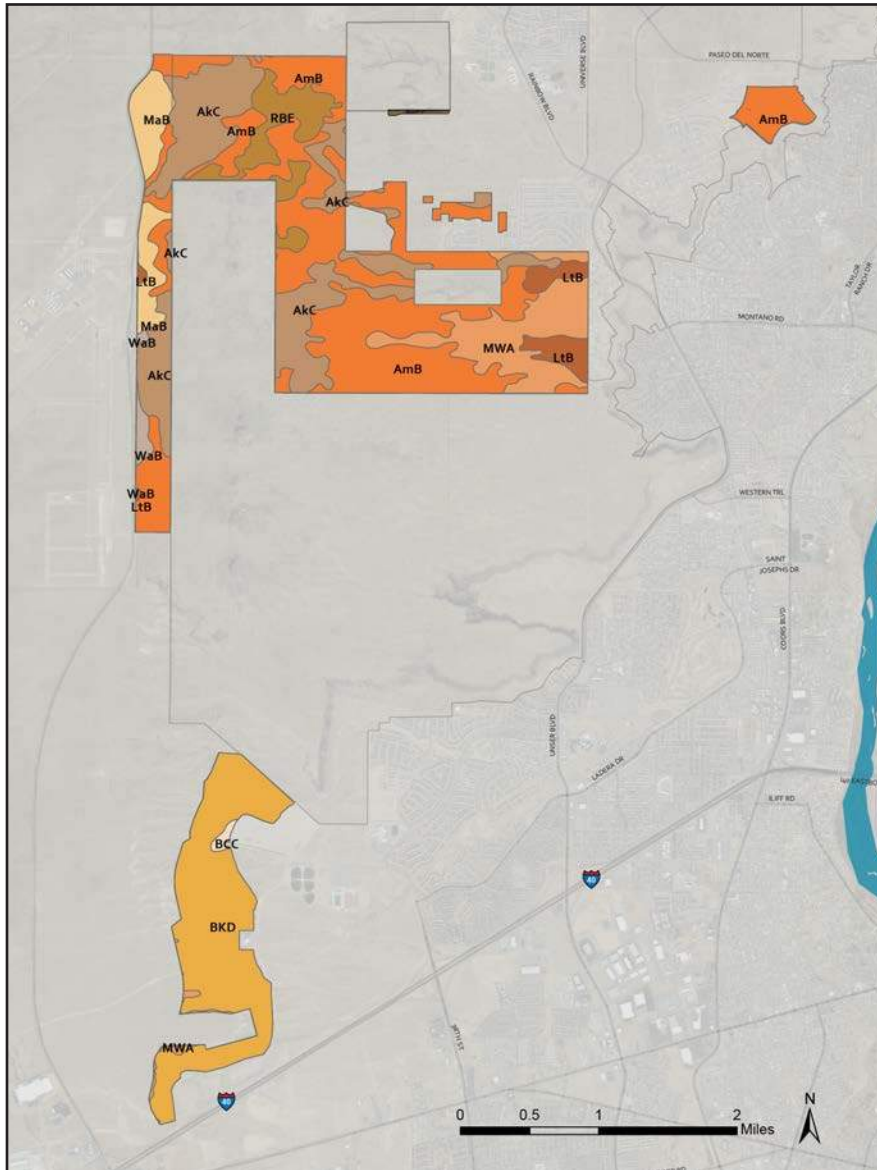
Private Landowners

Most private land on the West Side is used for housing and commercial developments. Rapid development has created conditions where Open Space directly abuts new developments.

Housing and commercial development are essential to a thriving economy in Albuquerque; however, this development must be balanced with natural areas and multi-use recreational opportunities that add to the overall quality of life.

PHYSICAL & ENVIRONMENTAL CONDITIONS

Site Conditions



- AkC, Akela-Rock outcrop complex, 1-9%
- AmB, Alemeda sandy loam, 0-5%
- BCC, Bluepoint loamy fine sand, 1-9%
- BKD, Bluepoint-Kokan association, hilly
- LtB, Latene sandy loam, 1-5%
- MWA, Madurez-Wink Association, gently sloping
- MaB, Madurez Loamy fine sand, 1-5%
- RBE, Rock outcrop-Akela complex, 10-50% slopes
- WaB, Wink fine sandy loam, 0-5% slopes

FIGURE 5. SOIL SURVEY MAP

Characterized by broad vistas, windswept scrubland, and distinctive volcanic escarpments, Albuquerque’s West Mesa sits just over one mile above sea level. As with the larger Albuquerque Basin ecoregion, the climate is semi-arid, with less than ten inches of rain annually. Vegetation comprises largely of high desert scrub and grasslands, which are generally insufficient in cover to successfully resist erosion of underlying soils by wind and water, despite the relatively flat terrain (excluding the volcanic escarpment).

Additional information on environmental conditions can be found in Appendix E: Existing Environmental Conditions Report. Key findings are summarized below.

Soils

Soils are predominantly classified as sandy loam and sandy alluvium which are well-drained and largely unsuitable for agriculture. While the area is mostly flat, the soil survey noted some areas were not suitable for road or trail construction due to steeper slopes, categorized as “hilly” in the 1 to 9 percent slope range. This fairly standard disclaimer generally indicates that engineering analysis and design are recommended when developing these areas.

Flora and Fauna

The study area is characterized by a mix of sand scrub and desert grassland vegetation. Native vegetation includes black grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), mesa dropseed (*Sporobolus flexuosus*), blue grama (*Bouteloua eriopoda*), James' galleta (*Pleuraphis jamesii*), sand sage (*Artemisia filifolia*), alkali sacaton (*Sporobolus airoides*), threeawns (*Aristida* spp.), and scattered yucca (*Yucca* spp.).

The New Mexico Department of Agriculture (NMDA) lists certain species as noxious weeds (NMDA 2020). "Noxious" in this context means plants not native to New Mexico, which are targeted for management and control, and have a negative impact on the economy or environment. Noxious weeds are likely present in developed or disturbed areas, such as parking lots and along roadsides. Noxious weed species, if discovered in the study area, should be subject to further evaluation and possible management measures.

No federally listed species of plants or animals have been identified or are likely to occur within or adjacent to the study area. No critical habitat, either designated or proposed, was identified within two miles of any of the West Mesa Open Space units.

Geology

Extension in this part of the Rio Grande rift began about 26 million years ago. Sediments that eroded from the developing rift-flank highlands accumulated in the Albuquerque Basin. These basin-fill deposits, known as the Santa Fe Group, are over 16,000 feet thick beneath the Albuquerque volcanoes. The Ceja Formation, the uppermost and youngest sand and gravel unit of the Santa Fe Group in this part of the basin, was deposited by streams draining the area to the west and northwest of the monument (Love and Connell 2005). Several episodes of downcutting, aggradation, and renewed incision led to the formation of four terrace deposits along the Rio Grande in the Albuquerque area, including the Los Duranes Formation in the study

area (Connell 2008). Eruptions of basaltic magma along the north-south trending County Dump Fault resulted in 5 large cones and at least 10 small volcanic and spatter cones in the Albuquerque volcanic field. The Volcanoes Open Space includes the JA, Black, and Vulcan Cones (Kelley and Kudo 1978).

About 200,000 years ago, basalt from the Albuquerque volcanoes filled in low spots along the edge of Rio Grande valley. Subsequent downcutting by the Rio Grande has now formed a mesa capped by basalt. Particularly visible in the Atrisco Terrace Open Space, erosion of the soft sediments under the hard basalt has caused large blocks of basalt from the two older flows to tumble down the eastern escarpment of the mesa. Most of the petroglyphs are on these large basalt blocks. The petroglyphs are chiseled into the black, metallic-looking patina on the basalt called desert varnish. This coating forms in arid environments on protected surfaces that are resistant to weathering.

Cultural Resources

Given that the cultural landscape protected by PETR does not terminate at the boundary of the Monument, it is not surprising that numerous cultural resources and artifacts have been identified within and near the West Mesa Open Space units. There has not been a comprehensive cultural inventory of the entire study area; nonetheless, the buffer areas of several recorded sites overlap with proposed routes identified in this plan. Therefore, prior to any construction associated with facilities recommended herein, a more comprehensive archaeological assessment should be undertaken in those locations to prevent impact to the sites.

Drainage and Wetlands

Several named and unnamed drainages cross through the West Mesa Open Space. Named drainages include the Middle and South Branches of the Boca Negra Arroyo and the North San Antonio Arroyo. These drainages are currently considered to be “Waters of the US” for regulatory purposes, and as such are subject to NPDES regulations under Section 404 of the Clean Water Act for any construction activities that disturb more than one acre of land.

No areas of inundation or saturated soils that could be classified as “wetlands” were identified within the study area. Groundwater in this area is generally close to 200 feet below the surface.

Flood Control

Rapid development on the West Side has made flood control structures essential to protecting life and property. City DMD and AMAFCA have a series of existing drainage channels, basins, and dams throughout the West Side to accommodate water runoff during storm events. Some existing facilities, such as Boca Negra Dam, include multi-use trails that connect to surrounding roadways and paths.

Additional planned drainages and dams should be considered for collocated facilities to include recreational amenities and make critical connections between Open Space units, neighborhoods, community facilities, and existing trails.

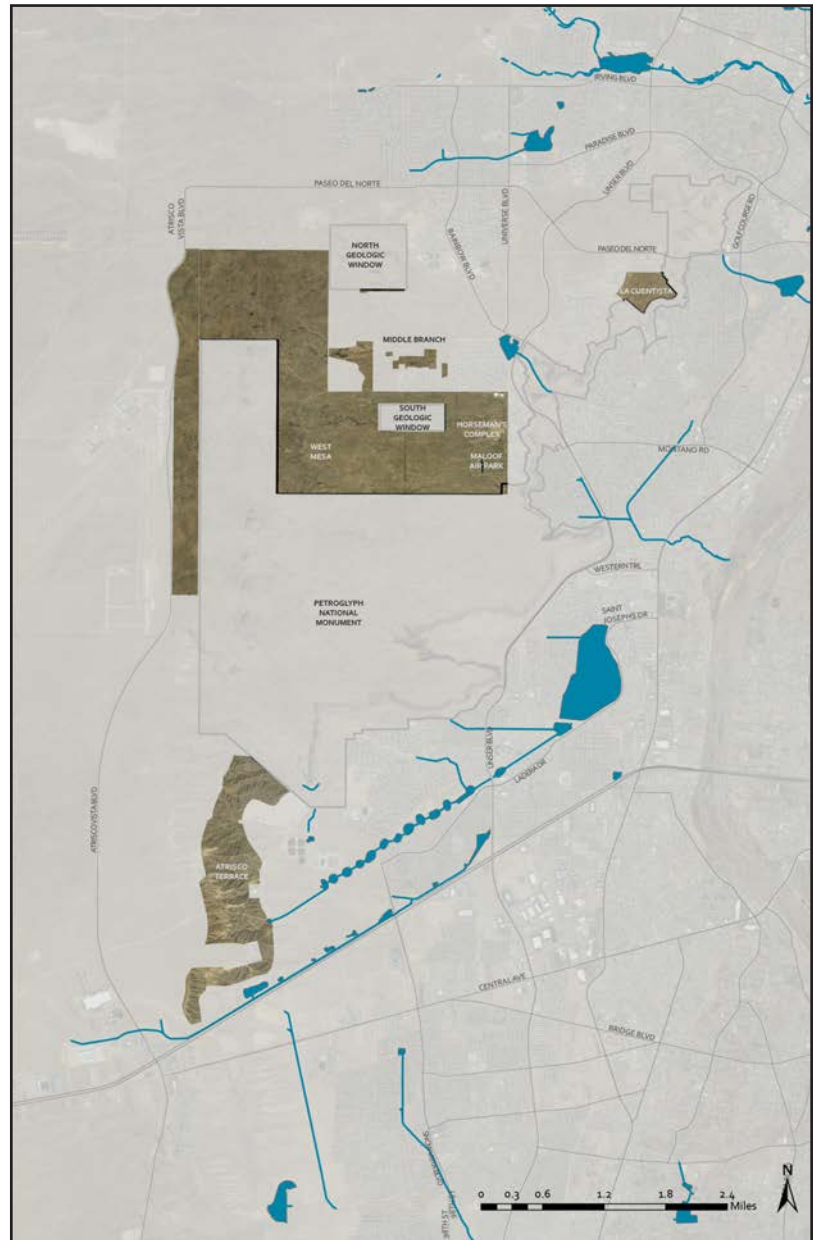


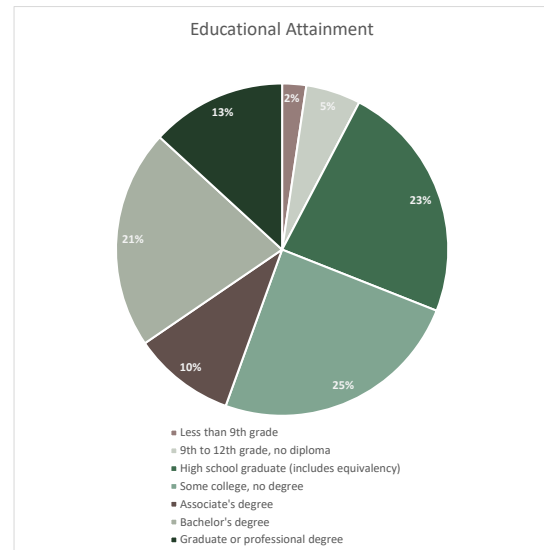
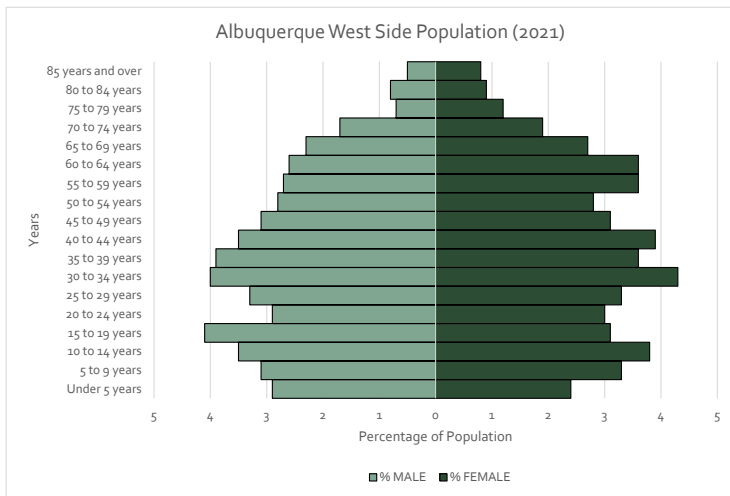
FIGURE 6. AMAFCA STORM DRAIN FACILITIES (SHOWN IN BLUE)

DEMOGRAPHICS

Determining demographic information for the West Mesa Trail involved combining demographic information from 37 different census tracts across the West Side. Demographic information was collected from the U.S. Census 2021 American Community Survey.

Age and sex analysis shows the average age of the population in the area is 38 with the largest age bracket is 30-24 years old with approximately 11,969 people in this bracket. The sex ratio is fairly evenly split in the study area with females (51.5%) having slightly more than males (48.5%).

Education attainment shows that at least a quarter of the population has a high school diploma. Another quarter of the population has a at least some college education. All of these percentages are higher than the Albuquerque and Bernalillo County average.



Finally, median household income in the study area is higher than the median for the City of Albuquerque, the Village of Los Ranchos, and Bernalillo County, but lower than the median household income for the City of Rio Rancho.

LOCATION	MEDIAN HOUSEHOLD INCOME (2021)
STUDY AREA	\$68,942
CITY OF ALBUQUERQUE	\$58,512
BERNALILLO COUNTY	\$59,512
VILLAGE OF LOS RANCHOS	\$64,304
CITY OF RIO RANCHO	\$76,096

DEVELOPMENT

Population Growth

Known for its breath-taking views of the Sandias across the Rio Grande Valley and abundance of newer, relatively affordable housing, the area has grown in attraction for new homeowners. For the purpose of the West Mesa Trails Plan, the team investigated the community context for City of Albuquerque Districts 1 and 5 as shown in the image below. The far northwest side of the planning area, around the Volcano Cliffs neighborhood and extending toward Paseo Del Norte Boulevard and Atrisco Vista Boulevard (Census tracts 9406.01 and

9406.02) has grown in population by nearly 200 percent between 2010 and 2020. To the northeast of Volcano Cliffs is Paradise Hills, which is the second fastest growing community in the planning area, increasing its population by 94 percent between 2010 and 2020. The total population for Districts 1 and 5 has increased from 127,900 residents in 2010 to 147,128 residents in 2020 (an increase of 15 percent overall). A comparison of these population changes by census tracts is shown in the table below and the map to the right.

22

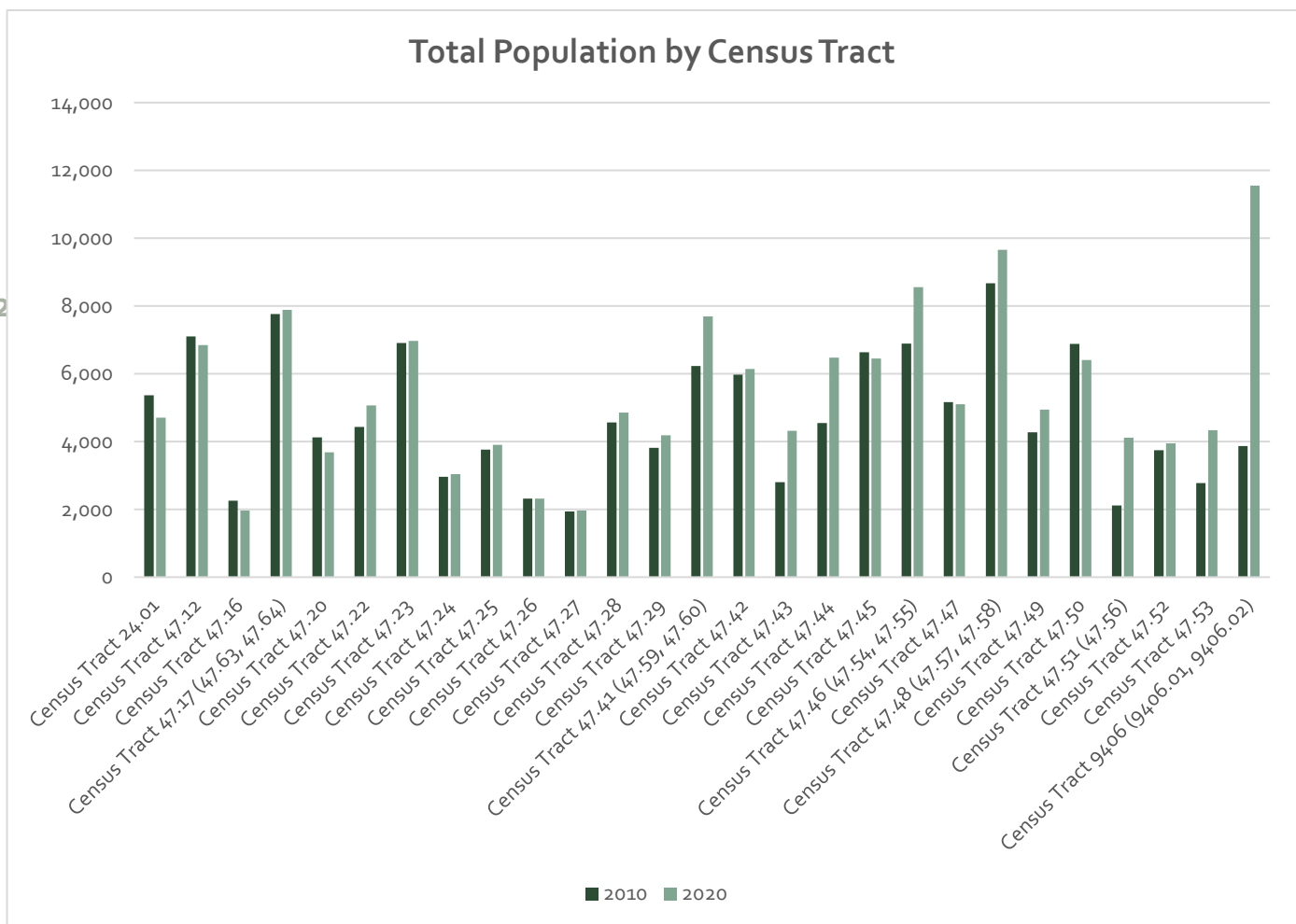
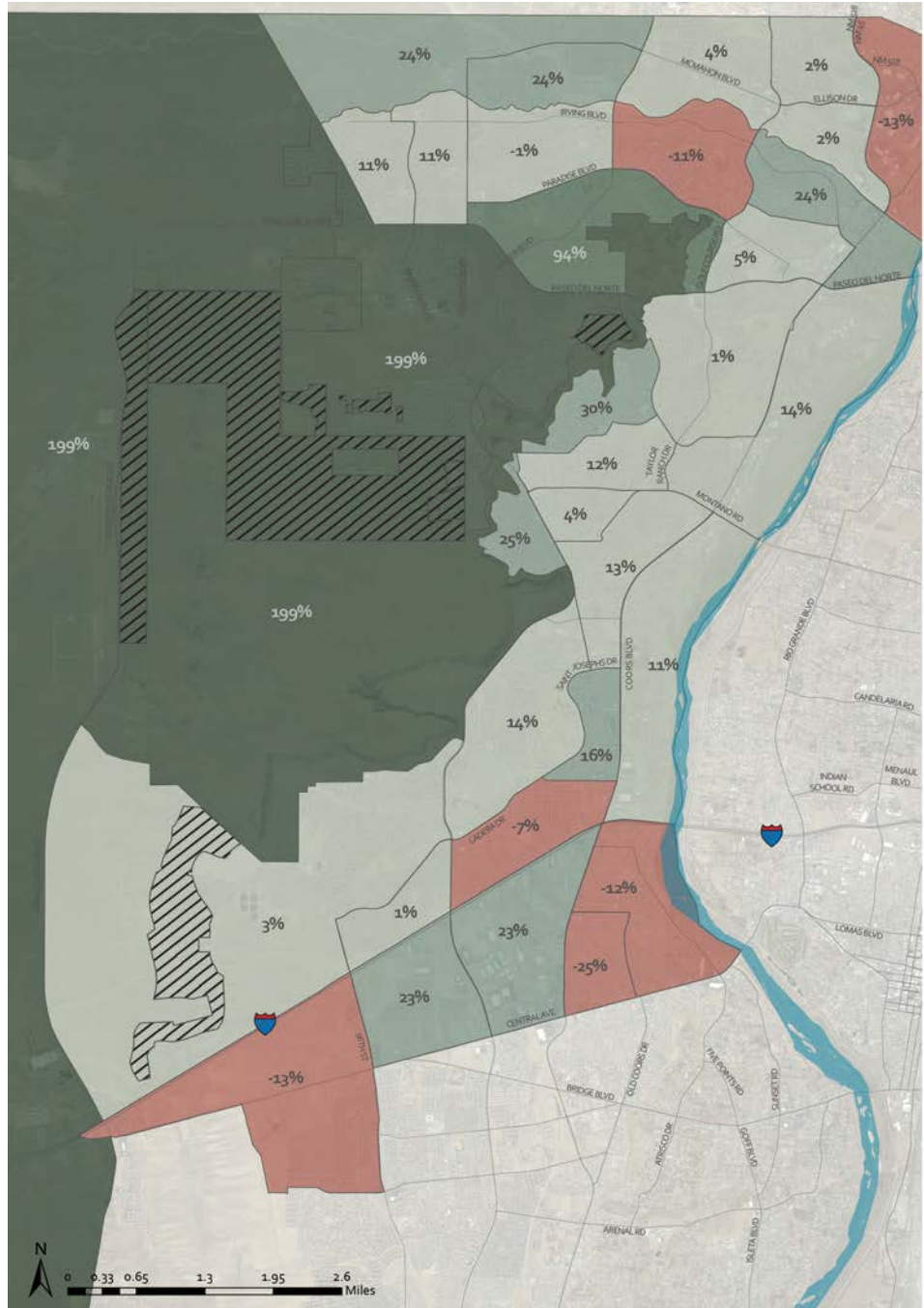


FIGURE 7. TOTAL POPULATION BY CENSUS TRACT IN STUDY AREA



*Percentages are generated using jenkins natural breaks

- Significant population gain (101%-199%)
- Substantial population gain (51%-100%)
- Moderate population gain (16%-50%)
- None or some population gain (0%-15%)
- Population loss (-1%-25%)

FIGURE 8. POPULATION CHANGE 2010-2020

Housing Growth

Corresponding to this population shift, housing development has also increased dramatically on the West Mesa and surrounding areas. Volcano Cliffs has seen nearly 2,400 housing units added to the area, while Paradise Hills has added another 645 units between 2010 and 2020. The Paradise Greens/Eagle Ranch neighborhoods, as well as to the east of Atrisco Terrace Open Space, have also grown their housing units substantially, increasing 48 and 46 percent, respectively.

A complete display of housing units that have changed between 2010 and 2020 in the District 1 and 5 census tracts is shown in table below and map to the right.

These data points help to illustrate the current and potential future demand for dedicated Open Space on the West Mesa. They also highlight areas of potential connection to growing neighborhoods and where dedicated multi-use trails might most benefit the community.

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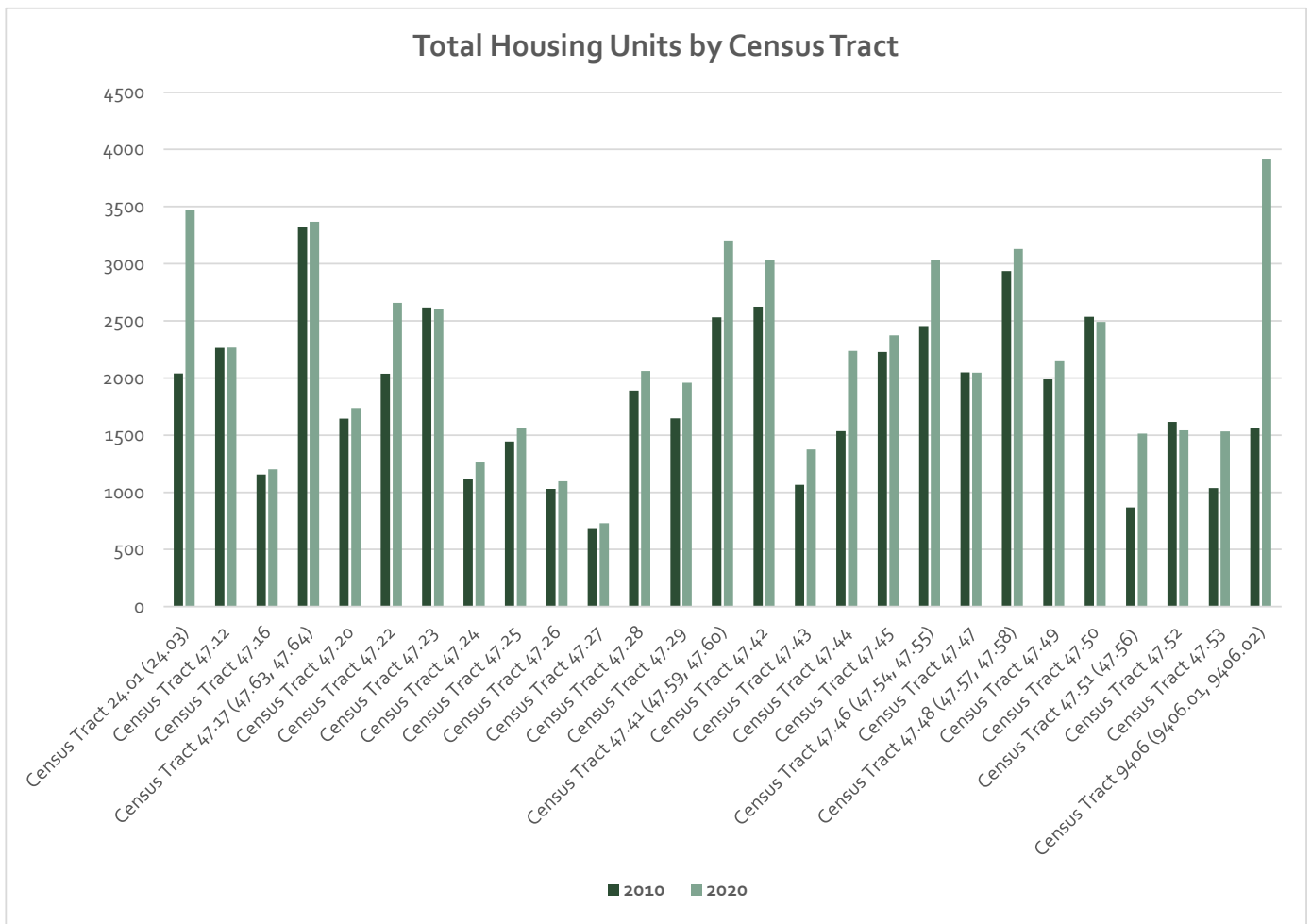
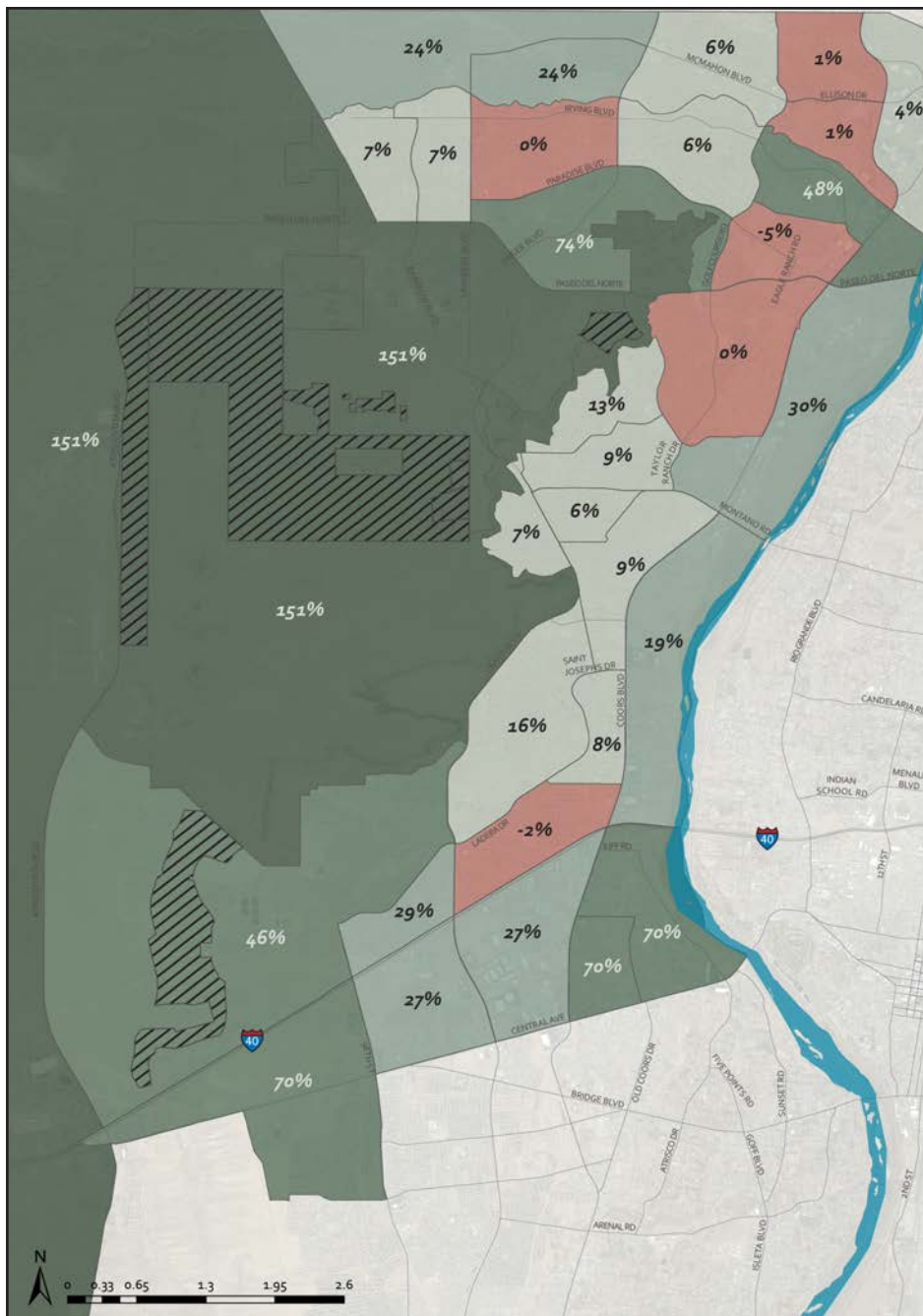


FIGURE 9. HOUSING UNITS BY CENSUS TRACT IN STUDY AREA



*Percentages are generated using jenkins natural breaks

- Significant population gain (76%-151%)
- Substantial population gain (31%-75%)
- Moderate population gain (17%-30%)
- None or some population gain (0%-16%)
- Population loss (-1% - -25%)

FIGURE 10. HOUSING UNIT CHANGE 2010-2020

Housing Development

The West Side is the most rapidly developing area in Albuquerque. Open Space plays an important role to both help manage growth and also provide recreational opportunities. Residential and business developments are planned across the West Side, some of which share significant lengths in boundary with City Open Space units.

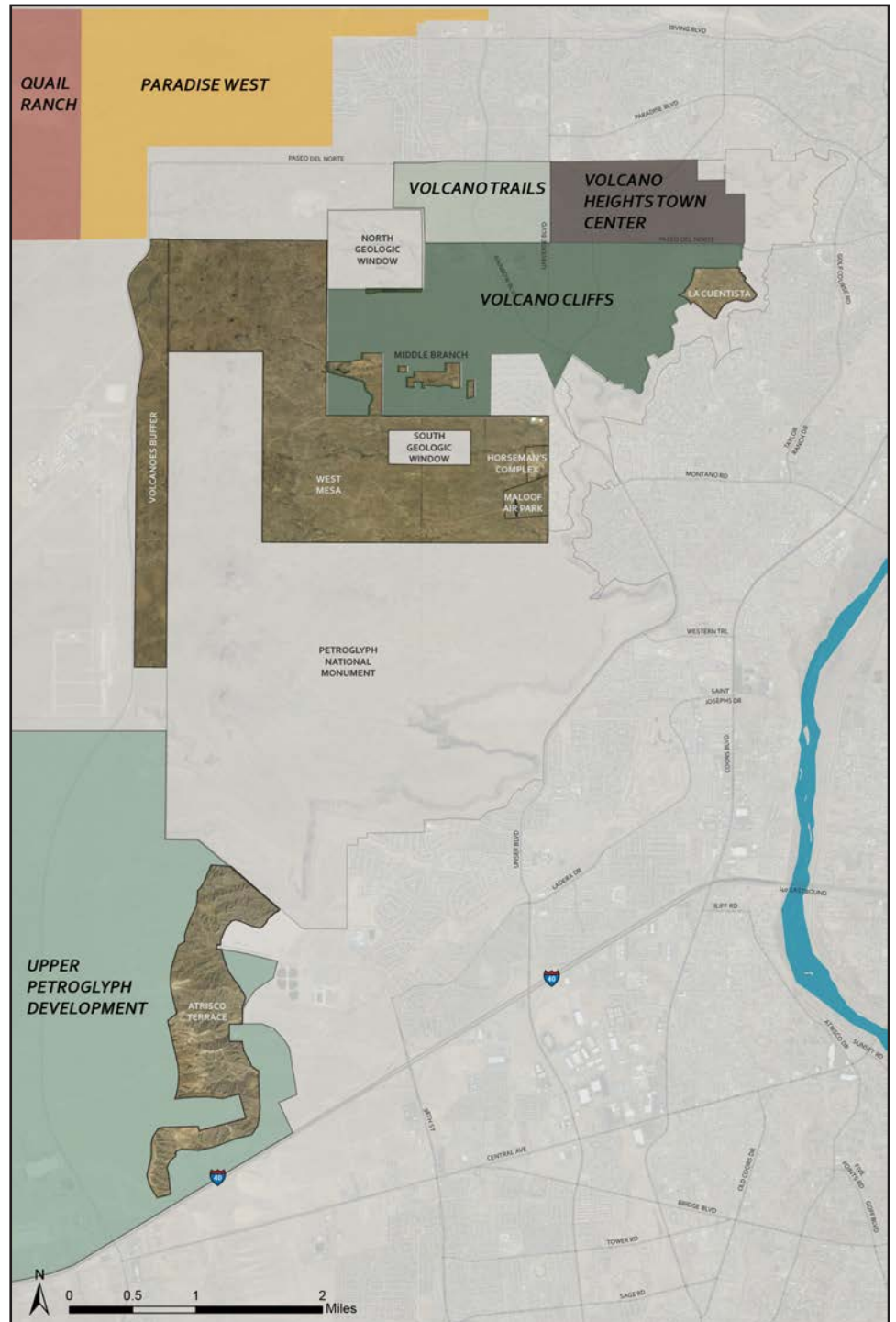


FIGURE 11. PLANNED HOUSING DEVELOPMENTS

Land Use

City of Albuquerque

The West Side includes some of the fastest growing low-density residential housing in the Albuquerque area, with new development planned north and south of Petroglyph National Monument. Other primary land uses in the area include open space, drainage, community, and educational purposes. Commercial corridors are concentrated along the Coors Boulevard corridor, especially near the I-40 interchange. Several major community facilities are sports-related with the Nusenda Community Stadium directly east of Atrisco Terrace and the Ladera Golf Course east of Rinconada Canyon. Other notable land uses in the area include a series of drainage facilities operated by AMAFCA, including the Ladera and Atrisco Dams.

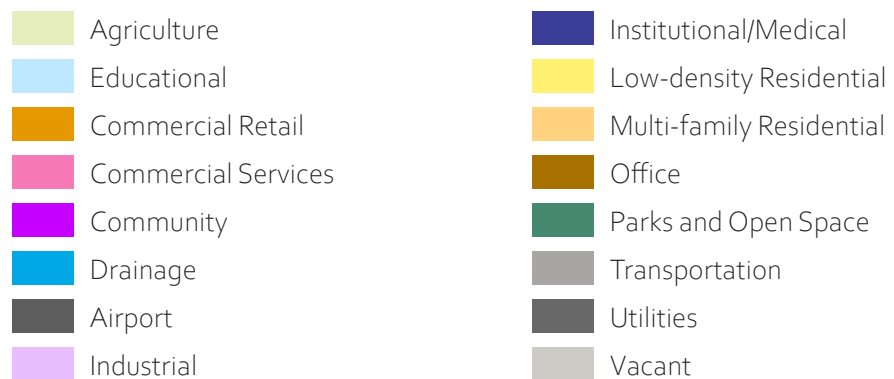
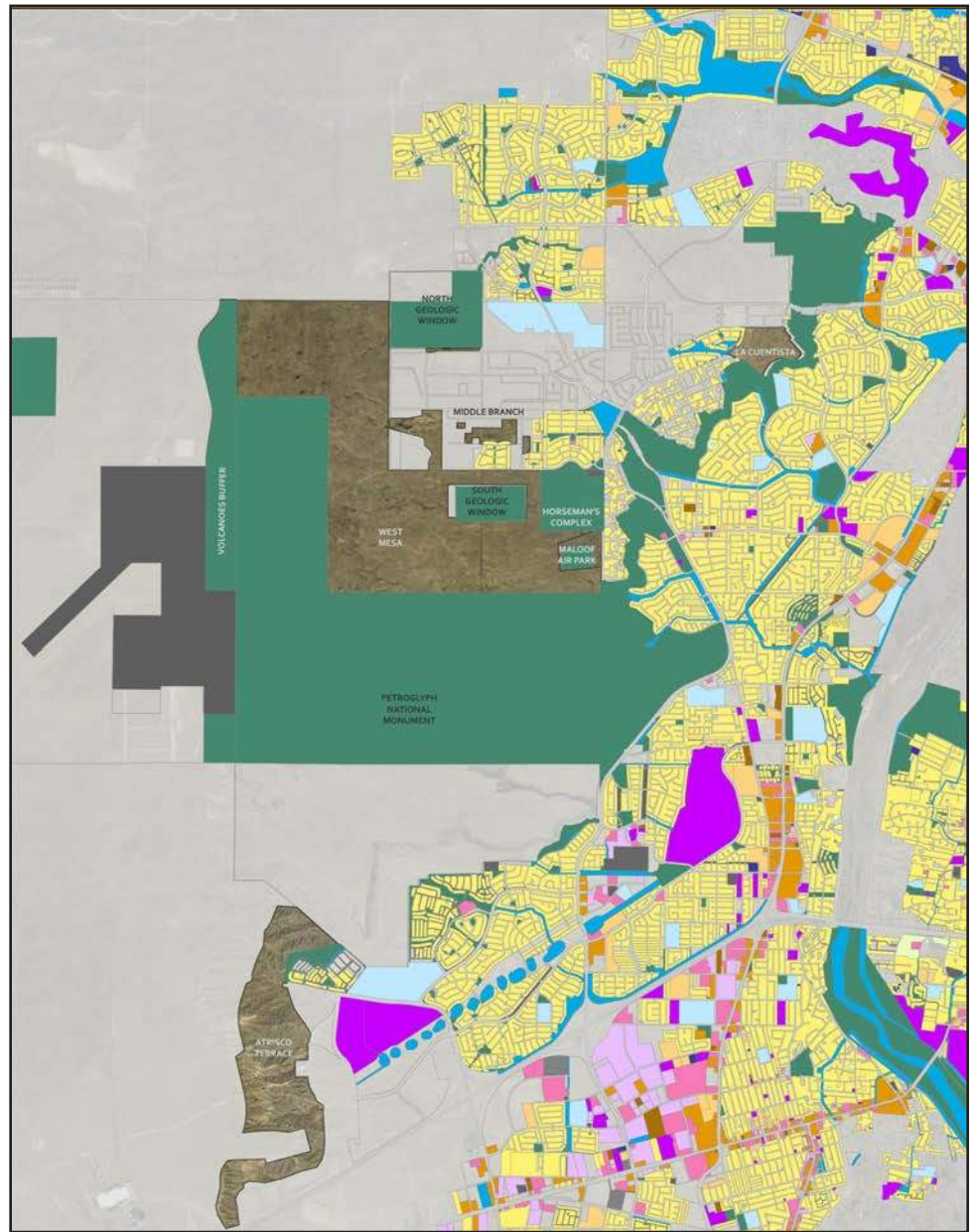


FIGURE 12. CITY OF ALBUQUERQUE LAND USE MAP

Unincorporated Bernalillo County

Located just north of I-40 at the south end of the planning area, Atrisco Terrace is the only Open Space unit included in this plan that is located in unincorporated Bernalillo County. It is a major feature in the Upper Petroglyphs Sector Plan, which provides direction for future land use and development surrounding and directly impacting MPOS.

Most areas to the west and south of Atrisco Terrace are zoned for open space, with smaller, interspersed areas of residential housing and commercial zoning.

The eastern edge is bounded by residential zoning. The private development's open space zone to the west protects the MPOS from development impact and may eventually be transferred to either Bernalillo County or the City to be designated permanent public Open Space. The recreational and activity centers vary between public and private and may include an aquatic center. Most zoning west of Atrisco Vista Boulevard is industrial; this is Phase I of the Upper Petroglyphs development and some of these facilities have already been constructed.

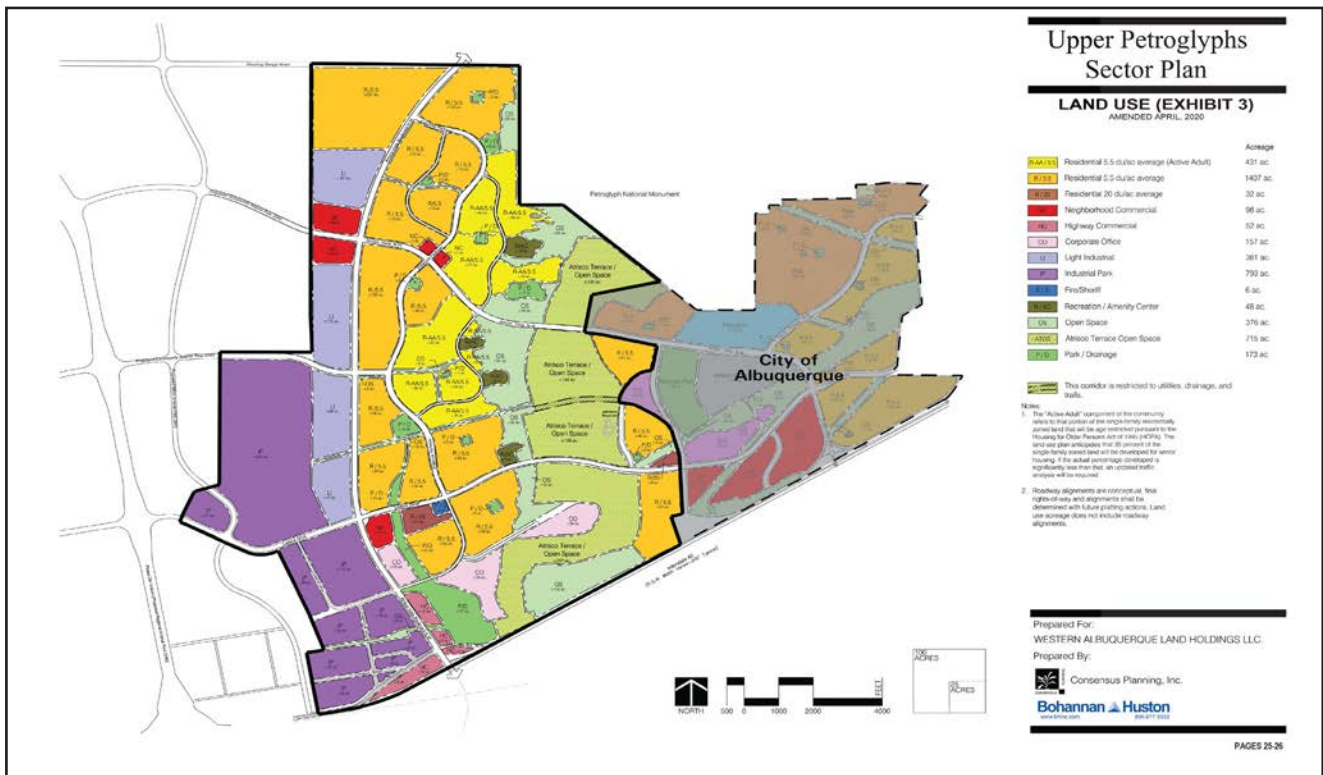


FIGURE 13. UPPER PETROGLYPH SECTOR PLAN LAND USE MAP

TRANSIT & CONNECTIVITY

Existing Roadways

Petroglyph National Monument and most MPOS on the West Mesa are surrounded by multiple high-volume roadways including Paseo del Norte to the north, Atrisco Vista Boulevard to the west, Unser Boulevard to the east and I-40 to the south. Unser Boulevard bisects the Monument at Boca Negra Canyon and—in some areas adjacent to the monument—high-volume traffic presents challenges to bicyclists and pedestrians attempting to cross and use the street. Paseo del Norte also bisects the Monument at Piedras Marcadas Canyon with a land bridge providing pedestrian crossing over the roadway. Existing roadway volume and bicycle and pedestrian facilities are generally not conducive to alternative transportation methods.

Other nearby arterial roadways include Coors Boulevard, Montañó Boulevard, and Ladera Drive.

Roadway Expansion Projects

There are multiple roadway expansion projects planned or currently underway to meet the area's projected vehicular demand. Some of these roadways are directly adjacent to Open Space units in this plan.

Expansions for Paseo del Norte, Unser Boulevard, and Atrisco Vista Boulevard include off-street protected bike lanes. Ladera, Estancia Parkway, and Paseo del Volcan will include sidewalks and on-street bike lanes.

Atrisco Vista Boulevard is a major roadway along the western edge of the city which connects industrial manufacturing, planned developments, the regional Double Eagle II Airport, and multiple open space recreational opportunities. The NMDOT's intent is to expand it from two to four lanes, widen the shoulders between the airport and Paseo del Norte, and add a ten-foot multi-use trail between the airport and Southern Boulevard, the future terminus of Atrisco Vista Boulevard in Rio Rancho. This multi-use trail will be located on the east side of the roadway, directly adjacent to the Volcanoes Buffer.

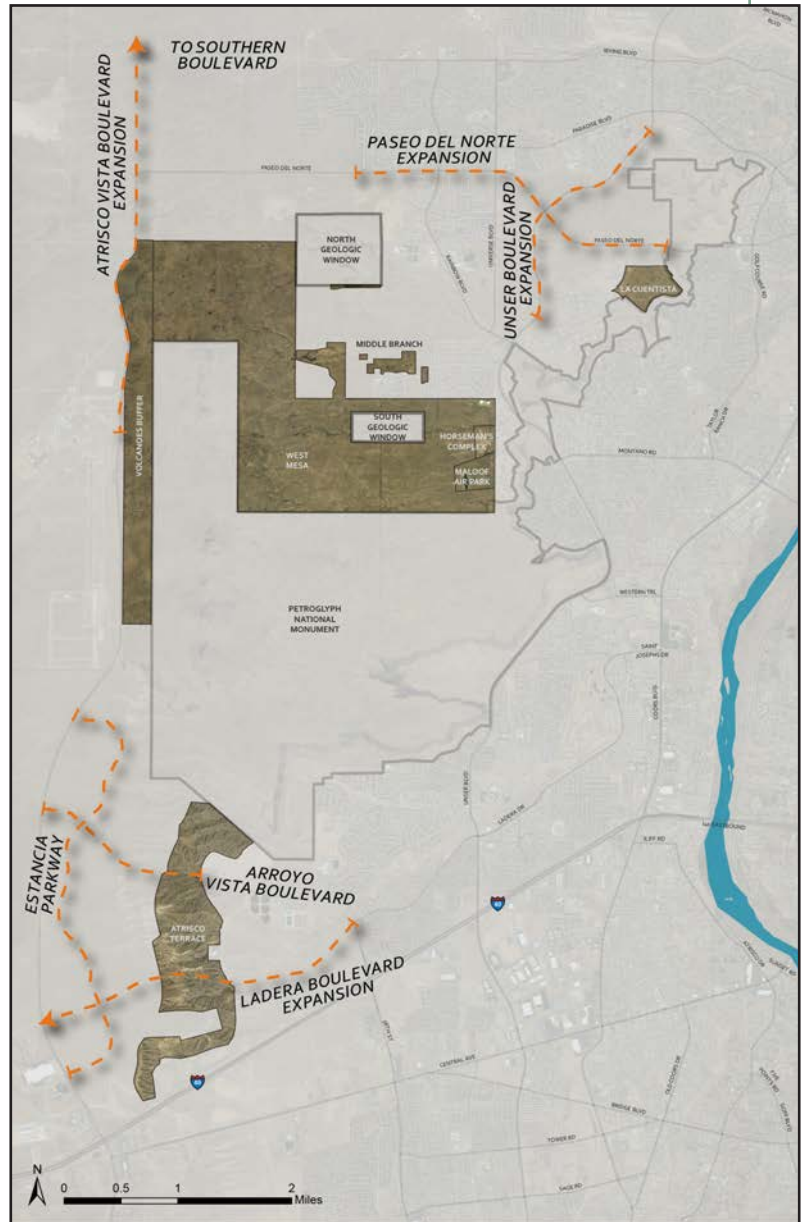


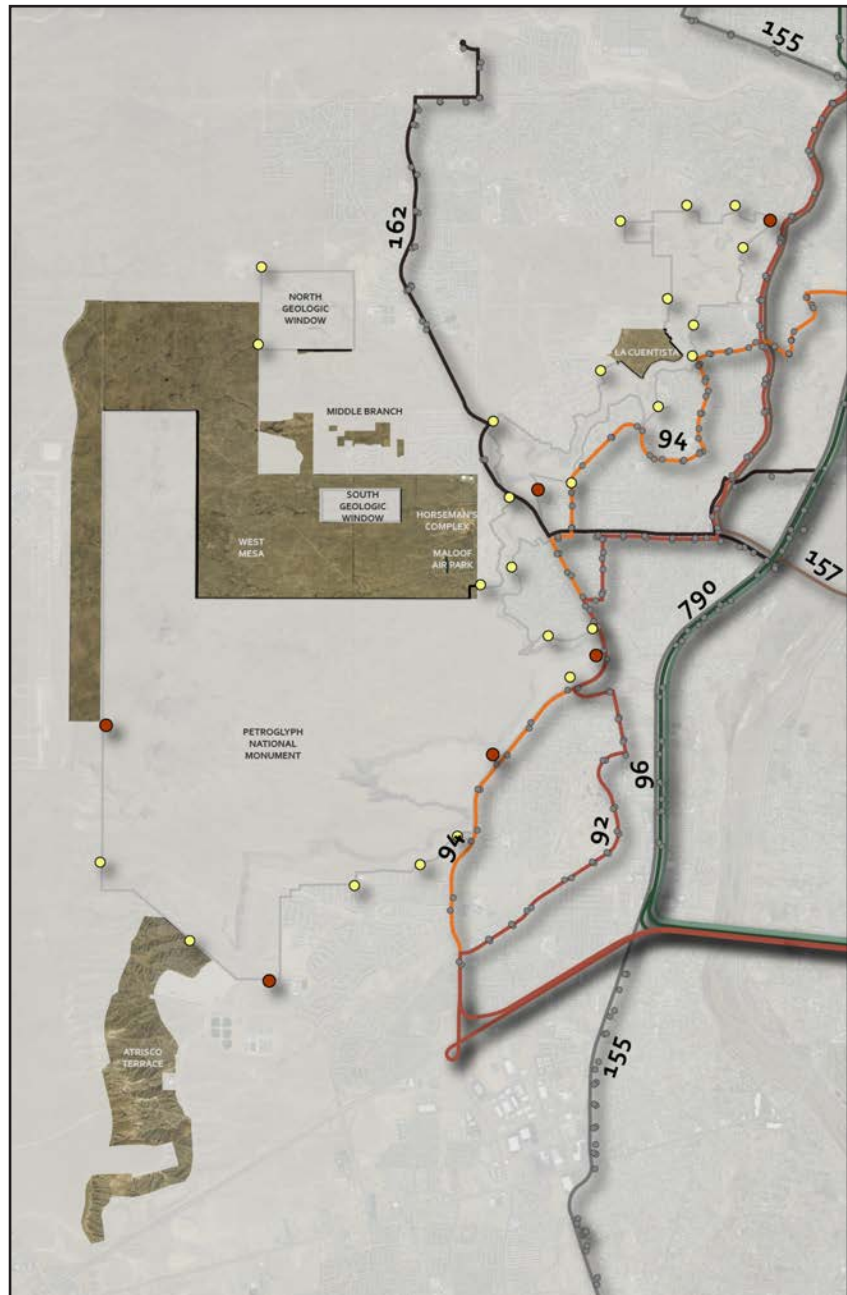
FIGURE 14. ROAD EXPANSION PROJECTS

Name	Progress	Units Effected
Paseo Del Norte Expansion	Engineering and Design	Petroglyph National Monument, La Cuentista, Volcano Buffer,
Unser Boulevard Expansion	Engineering and Design	Petroglyph National Monument, Boca Negra Canyon
Atrisco Vista Boulevard Expansion	Engineering and Design	Volcanoes Buffer, West Mesa, Atrisco Terrace
Ladera Boulevard Expansion	Proposed	Atrisco Terrace
Arroyo Vista Boulevard Expansion	Proposed	Atrisco Terrace
Estancia Parkway	Proposed	Atrisco Terrace
Paseo del Volcan Boulevard	Proposed	Atrisco Terrace

Public Transportation

The City of Albuquerque primarily utilizes Unser Boulevard, Coors Boulevard, and Paseo del Norte (Routes 92, 94, 96, 162, and 157), to provide public transit on the West Side. Albuquerque Rapid Transit (ART) route 790 also runs along Coors Boulevard.

Unfortunately, there are few bus stops within walking distance of MPOS access points, and even fewer during weekends. The closest stop to a trailhead is on Route 162 at the intersection of Unser and Molten Rock and is half a mile from the Paseo de la Mesa East Trailhead on 81st Street. Route 94 provides options for some PETR access points on its eastern edge, which could be used to reach adjacent MPOS like La Cuentista; however, since bicycles aren't permitted on most trails within the Monument and the walking distance may be too long for some, this isn't a feasible option for all users.



- PETR Primary Access Point
- PETR Secondary Access Point
- Bus Stops

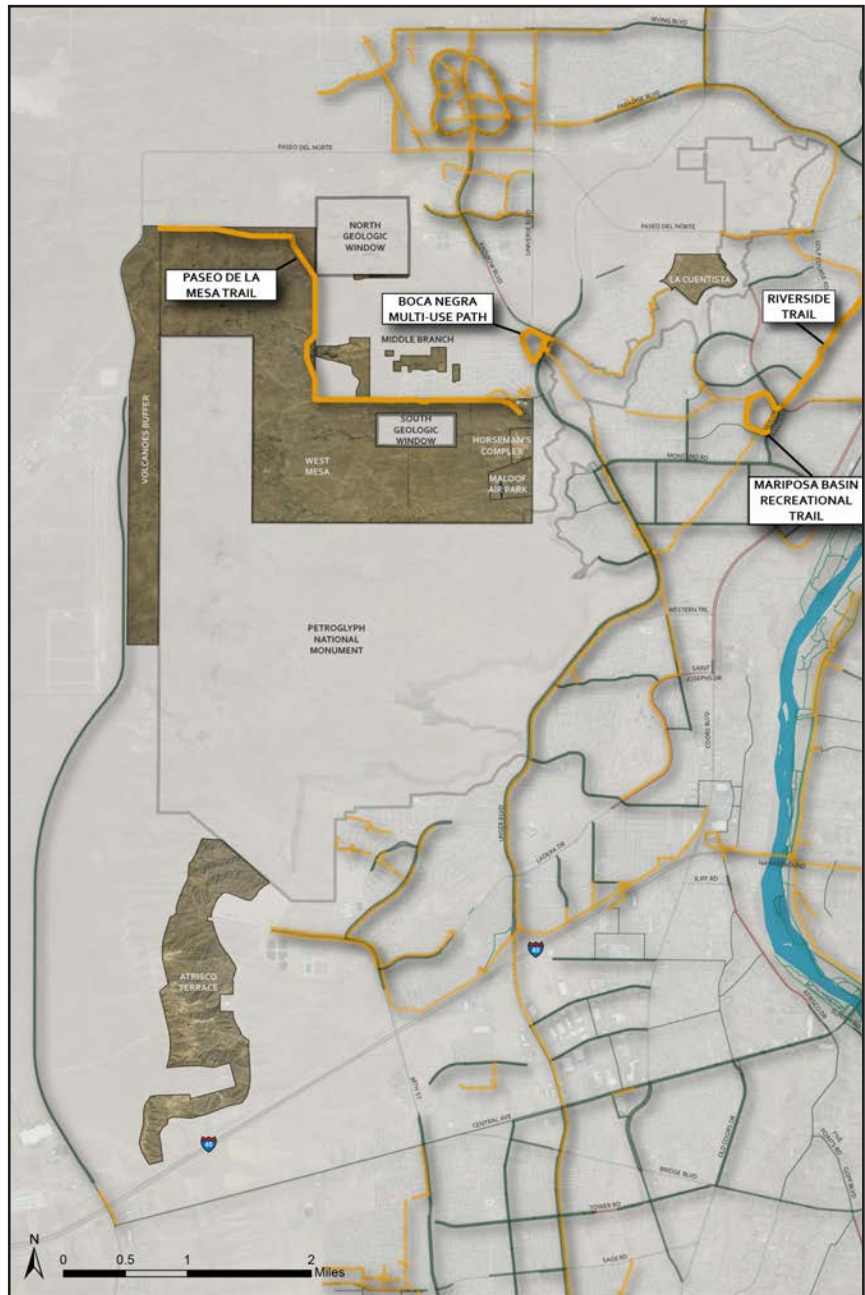
FIGURE 15. BUS ROUTES AND STOPS NEAR WEST MESA

Regional Bikeway Connections

There is an extensive regional bikeway network in the area, but currently few connections to MPOS. The planning area includes a system of on-street bike routes (see green and red lines, right) and off-street multi-use bike paths (see yellow lines, right). Major regional bikeway connections are along Paseo del Norte, Unser Boulevard, and Atrisco Vista Boulevard. High volume and high speed segments of the road can feel unsafe for bicyclists.

Off-road bike paths include the Boca Negra multi-use path, Mariposa Basin Recreational Trail, Riverview Trail and Paseo de la Mesa trail.

Other vital trail connections include those built and maintained by private housing developments, like Ventana Ranch, that are accessible to the general public and connect to the greater Albuquerque bike network.



- ↗ PAVED MULTIPLE USE TRAIL
- ↘ BUFFERED LANE
- ↗ BIKE LANE
- ↘ UNPAVED MULTIPLE USE TRAIL
- ↗ BIKE ROUTE

FIGURE 16. EXISTING BIKEWAYS AND BIKEWAY GAPS

These existing bikeways and proposed connections are included in the Bikeways & Trails and Facilities Plan and the Upper Petroglyphs Sector Plan. Some of these projects are underway and others have yet to begin. Relevant bikeway connections to the West Mesa Trails network (some detailed earlier in the Roadway Expansion Projects section) include:

Type	Name	From	To	Length
Current Projects				
Lane	Paseo del Norte NW	W. City limit	Rainbow Boulevard NW	0.50 mi
Trail	Paseo de la Mesa Trail	Atrisco Vista Boulevard NW	Existing Paseo de la Mesa	.15 mi.
Lane + Trail	Unser Boulevard NW	Dellyne Avenue NW	Montaño Road NW	0.55 mi.
Critical Links Projects				
Bike Lane	Atrisco Drive NW/ Rainbow Boulevard NW	Unser Boulevard NW	Existing bike lanes on Rainbow Boulevard.	0.88 mi.
Bike Lane	Paseo del Norte NW	NW City Limits	Rainbow Boulevard NW	0.74 mi.
Bike Lane	Paseo del Norte NW	Calle Nortena NW	Rainbow Boulevard NW	0.33 mi.
Bike Lane	Paseo del Norte NW	Calle Nortena NW	Rainbow Boulevard NW	1.43 mi.
Lane + Trail	Arroyo Vista Boulevard NW	Tierra Pintada Boulevard NW	Atrisco Vista Boulevard	3 mi.
Lane + Trail	Ladera Drive NW	Arroyo Vista Blvd NW	Atrisco Vista Boulevard	2.2 mi.



Bike riders by the north West Mesa Open Space boundary

PUBLIC PARKS

There are numerous parks in the area, many of which are small neighborhood parks located close to residential housing. In addition, there are several larger parks with more amenities, facilities, and resources. Those larger parks are highlighted below and serve as essential nodes within the regional trail network.



1. Ventana Ranch Park

This park provides tennis courts, playground equipment, shade structures, bathrooms, a large field for soccer, and two baseball fields.

2. Mariposa Basin Park

Mariposa Basin includes four baseball/softball fields, a large grassy area, pond, playground equipment, and a paved trail circling the park. Most major bike trails in the area converge to this park.

3. Santa Fe Village Park

This park includes fields, a playground, and a dog park. The park is also close to the Taylor Ranch Public Library and Library Park.

4. Ladera Golf Course

Ladera Golf Course is an 18-hole municipal course with a driving range, club house, and disc golf course. It is also one of the biggest stormwater retention basins in the area.

5. Nusenda Community Stadium

Nusenda Community Stadium includes a football stadium, track field, and five baseball fields. This stadium hosts sporting events throughout the year.







-  PAVED MULTIPLE USE TRAIL
-  BUFFERED LANE
-  BIKE LANE
-  UNPAVED MULTIPLE USE TRAIL
-  BIKE ROUTE
-  PARKS

FIGURE 17. PARKS WITH BIKE FACILITIES

OPEN SPACE PROFILES

WEST MESA OPEN SPACE

West Mesa Open Space is composed of approximately 4,200 acres of high desert grasslands, mesa-top lava flows, desert arroyos, and distinct volcanic features. Just north of Petroglyph National Monument, West Mesa Open Space is the central Open Space unit in the planning area. It is popular to walkers, runners, and mountain bikers as is evident from the presence of miles of social trails. Users tend to come from the neighboring communities on the West Side

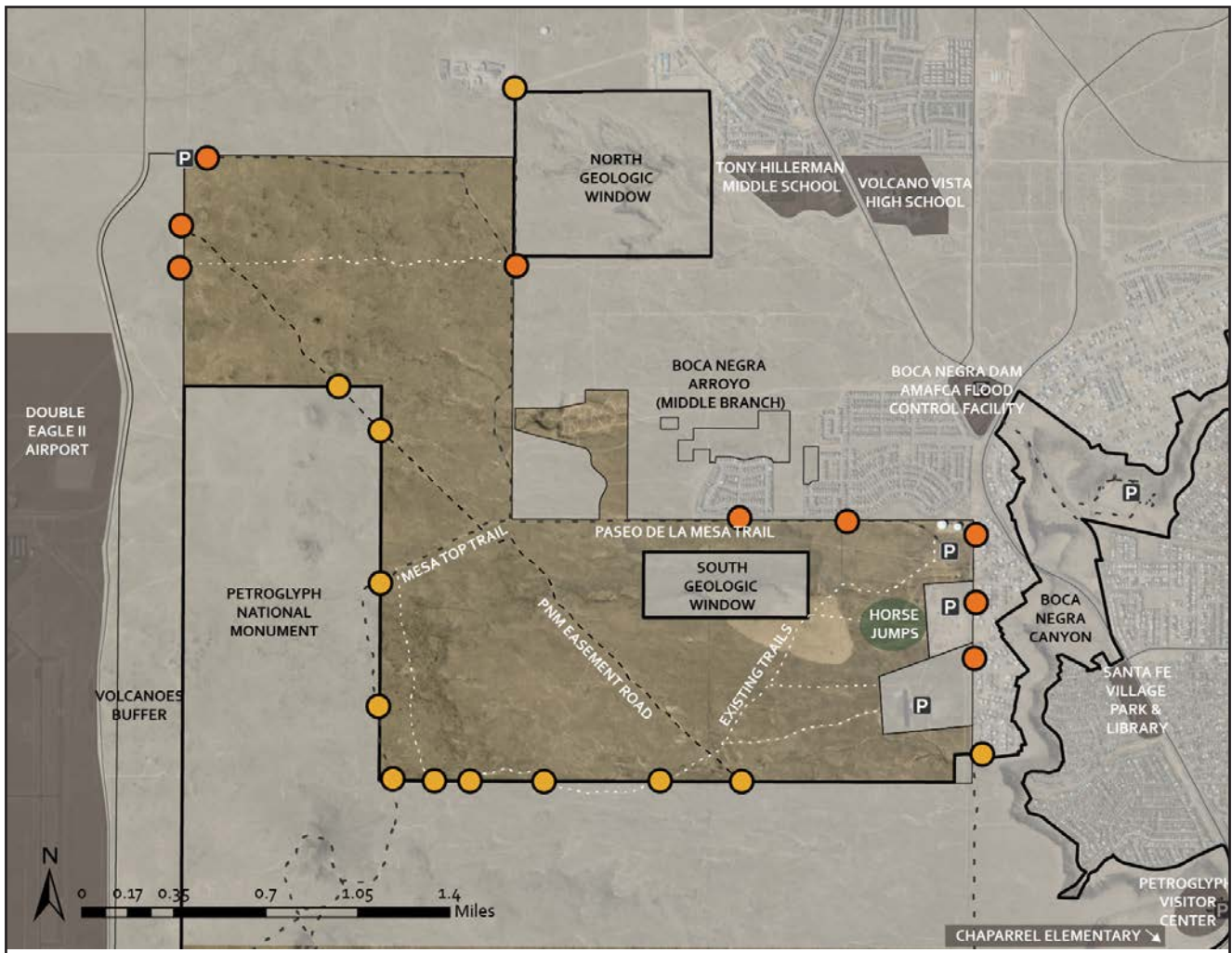


FIGURE 18. WEST MESA OPEN SPACE EXISTING CONDITIONS

- ENTRANCE TO MPOS
- EXISTING ACCESS TO MONUMENT
- EXISTING MPOS TRAILS/ROADS
- MPOS EXISTING FACILITY/ POINT OF INTEREST
- EXISTING COMMUNITY FACILITY
- EXISTING OFF-SITE ADMIN ROADS/TRAILS

Existing Facilities

On-Site

The 4.2-mile paved out-and-back Paseo de la Mesa Trail extends to the east and west boundaries of the West Mesa Open Space and runs along its northern border. It is the only paved multi-use trail in the area. There are trailheads at both ends, on Atrisco Vista Boulevard near Paseo del Norte to the west and off 81st Street to the east.

PNM has a maintenance road that runs diagonally northwest to southeast across the unit which hikers and mountain bike riders use as a trail. This maintenance road runs roughly parallel to three sets of high-voltage power line poles. The two-track road is eroded in places with areas of heavy gravel and rutted tread. Some sections have become

overgrown with vegetation and narrowed to a single track. In addition, the trail cuts across a section of the Monument where bicycles are not permitted.

Other existing formal trails include the Mesa Top multi-use trail segment which is an administrative road originating from Petroglyph National Monument. Informal trails include user-made single- and double- tracks developed primarily by hikers and mountain bike riders, varying in both width and length. Some trails are no longer usable due to erosion, lack of maintenance, and changes to trail user groups in Petroglyph National Monument. However, some trail segments are well established and could be improved or rerouted as part of the permanent trail network.



Paseo de la Mesa Trail



Existing PNM easement roadway

Nearby Community Facilities

There are three Albuquerque Public Schools (APS) in one central location north of the West Mesa Open Space which share a soccer facility: Tierra Antigua Elementary School, Tony Hillerman Middle School, and Volcano Vista High School. There are also multiple parks in the area, many of which are small neighborhood parks in the Ventana Ranch and Volcano Vista neighborhoods. Other notable larger nearby parks include the Santa Fe Village Park and Taylor Ranch Library on Unser Boulevard and Montañero Road, and Mariposa Basin Park on Golf Course Road and Taylor Ranch Road. Both parks provide essential community amenities.



The Mariposa Basin Recreational Trail circling Mariposa Basin Park

Challenges

As the only paved trail in the area, the Paseo de la Mesa Trail experiences high ridership but requires more maintenance at a much higher cost than natural surface trails. Underlying sandy soils result in significant and frequent pavement cracking, making road cycling unpleasant, and creating ongoing management challenges. Limited access points make entry onto the trail a challenge from communities not located near one of the endpoints. The entrance to the western Paseo de la Mesa Trailhead from Atrisco Vista is unpaved, and the trailhead currently provides no amenities.

Natural surface trails are present throughout West Mesa, some of which continue onto the Monument. Some are administrative roads used by NPS and PNM staff; however, many are user-created and not sustainably designed, leading to erosion and vegetation loss.

Topography is a challenge when designing sustainable trails, as the slope of much of the mesatop is too flat to accommodate the side slope necessary to remove water from the trail and prevent trail incision. Arroyos also limit trail alignment locations. The fragile, sandy soils and basalt rock characteristic of the mesa are difficult to maintain and manipulate.

While less common than in nearby areas, the impact of off-road vehicle use and illegal dumping are present in West Mesa Open Space.

Finally, signage and wayfinding are underutilized at this unit. Due to its proximity to PETR, informal trails occasionally go into the Monument where bicycles and equestrians are not permitted. Some of these access points provide no signage showing PETR boundaries, making adherence to policy difficult for unaware trail users.



Some trail sections near Petroglyph National Monument don't have fencing or signage to inform trail users about activities permitted within Monument boundaries.



Illegal dumping is present near one of the trailheads north of the Northern Geologic Window.



Limited access points with few amenities make entry onto the trail difficult.

LA BOCA NEGRA HORSEMAN'S COMPLEX

La Boca Negra Horseman's Complex (Horseman's Complex) is a 29-acre special use Open Space and one of the few equestrian facilities in the country that is open to the public and free of charge. Multiple clubs, organizations, and individual horseback riders use this facility for annual events, training, cross country show jumping, and horse exercising, and one roping organization has an agreement with the City to board a limited number of cattle throughout the year.

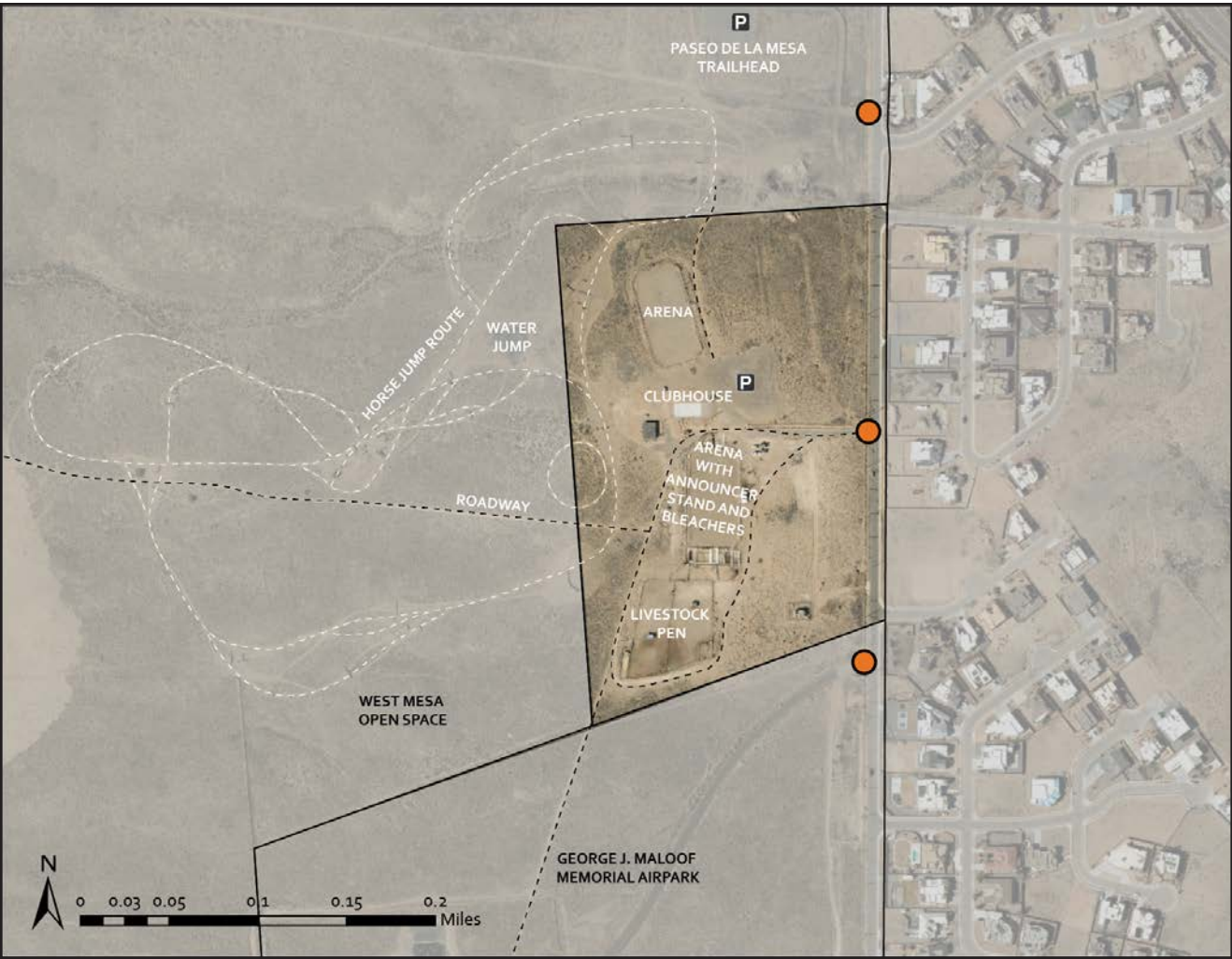





FIGURE 19. LA BOCA NEGRA HORSEMAN'S COMPLEX EXISTING CONDITIONS

-  ENTRANCE TO MPOS
-  EXISTING MPOS TRAILS/ROADS
-  EXISTING OFF-SITE ADMIN ROADS/TRAILS

Existing Facilities

On-Site Facilities

There are two arenas on the site. The primary arena features cattle chutes and an announcer's stand, and is most often used by ropers. In addition, there is a livestock corral attached to the main arena where the ropers board livestock throughout the year. The second arena is an equestrian warm-up and practice area and is not used as frequently as the first due to the footing.

A three-mile cross country horse jumping obstacle course lies to the west of the arenas. This course includes multiple jumps and a water obstacle designed, constructed, and maintained by the Watermelon Pony Club.

The Complex also has a club house with bathroom facilities and a functioning kitchen for a snack bar. Clubs use this for concession during events. There is a new concrete slab that can accommodate a manufactured mobile home or RV trail for potential use as future caretaker premises.

Finally, the Horseman's Complex has a large unpaved parking lot for trailers and vehicles.

Nearby Community Facilities

La Boca Negra Horseman's Complex is in close proximity to other community facilities discussed in the West Mesa Open Space section. Notably, its important to note the unique service the Horseman's Complex is providing for the region as the only public facility of its kind in the entire region.

Challenges

Many of the facility's amenities are old and in need of repair or replacement. The footing in the equestrian warm-up arena is not maintained and the degraded material and presence of rocks make it difficult for equestrians to use. Maintaining footing for horses is a constant need and requires sustained financial resources.

Any trail alignments connecting to the Horseman's Complex must avoid the cross country obstacle course to prevent unsafe interactions with other users. Trail conditions in general can cause difficulties for equestrians due to the presence of rocky volcanic gravel. Finally, interface with other trail users can also present challenges due in large part to the skittish nature of some horses. Because cyclists, hikers, and walkers with dogs use the area, some horseback riders don't feel comfortable sharing trails with other users.



Primary arena with announcer's stand

GEORGE J. MALOOF MEMORIAL AIRPARK

The George J. Maloof Memorial Airpark (Malooof) is a 60-acre special-use Open Space used to operate remote control airplanes, control line airplanes, helicopters, drones, and radio controlled cars. The space is free and open to the public and is one of the oldest public model airplane airstrips in the United States. The space is primarily used by local clubs including the Albuquerque Radio Control Club (ARCC). Aircraft flown at the Airpark must abide by the rules and regulations established by the Academy of Model Aeronautics within the boundaries set by the Federal Aviation Administration (FAA).

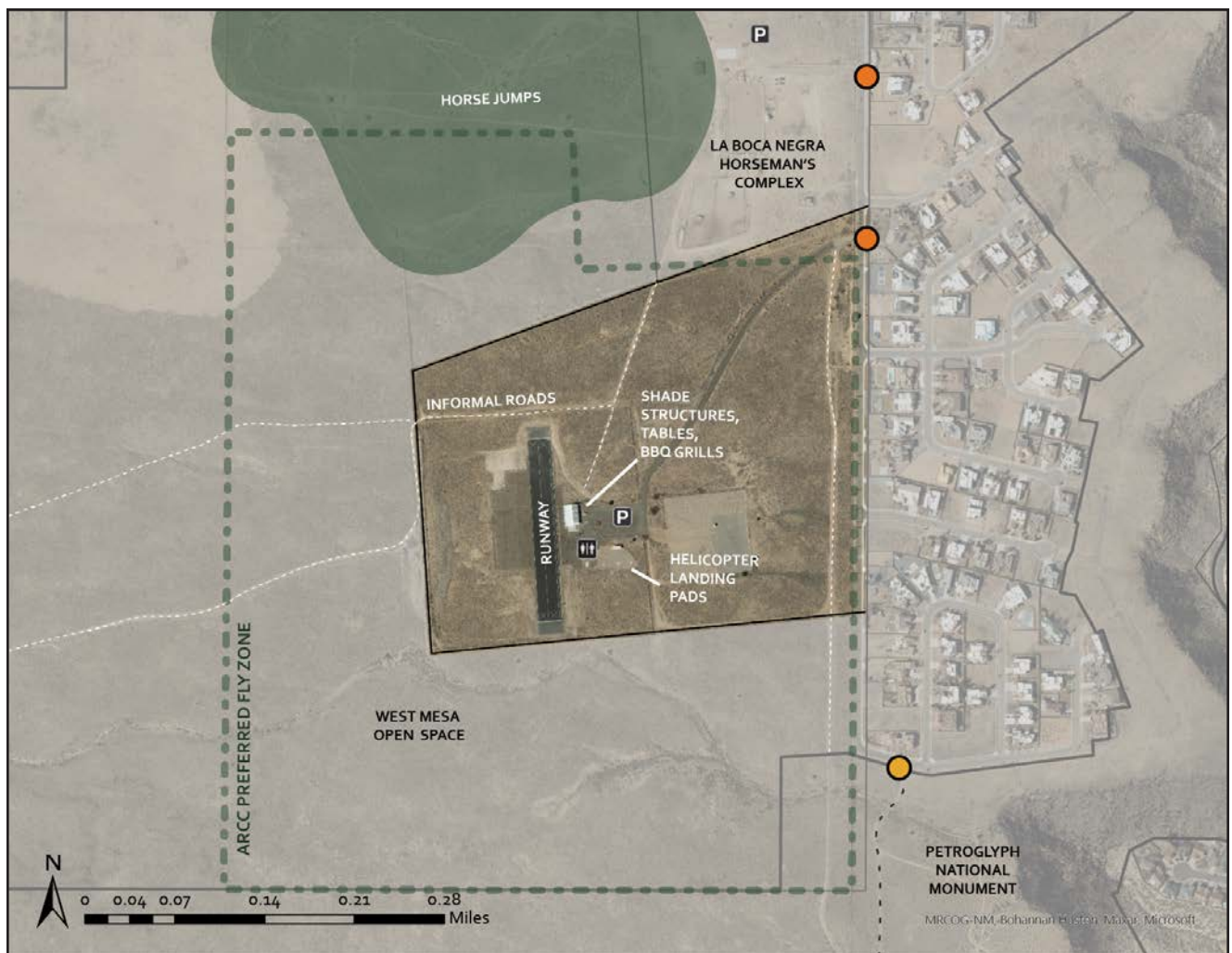


FIGURE 20. GEORGE J. MALOOF MEMORIAL AIRPARK EXISTING CONDITIONS

-  ENTRANCE TO MPOS
-  ENTRANCE TO PETROGLYPH
-  EXISTING MPOS TRAILS
-  MPOS EXISTING FACILITY/ POINT OF INTEREST
-  EXISTING COMMUNITY FACILITY
-  EXISTING OFF-SITE ADMIN ROADS/TRAILS

Existing Facilities

On-Site Facilities

Aircraft facilities include an 800-foot paved runway and helicopter/drone zone with four 10 x 10-foot landing pads. Visitor facilities include a large shade structure with picnic tables (provided by ARCC), barbecue grills, a water spigot, restrooms, bleachers, and a paved parking lot with capacity for over 40 vehicles. A memorial plaque dedicated to George J. Maloof is located in the parking lot.

Nearby Community Facilities

George J. Maloof plays an integral role as one of the few public remote control airplane facilities in the area and acts as a core gathering area for the Albuquerque Radio Control Club. It is located directly south of West Mesa Open Space and La Boca Negra Horseman's Complex.

Challenges

Interface between user groups has been the primary challenge with Maloof. Based on FAA rules, other users are not permitted in the flight path, and ARCC has proposed their preferred no-fly zone perimeter. Because it is adjacent to the Horseman's Complex, it creates an added hurdle to connecting trails to the rest of the system; their proposed no-fly zone also overlaps with the existing equestrian cross country obstacle course. Currently, there are no recommendations to accommodate both uses other than coordination between organizations who regularly use the sites. Aircraft noise and a lack of fencing and signage are other key reasons for user and neighbor conflicts.

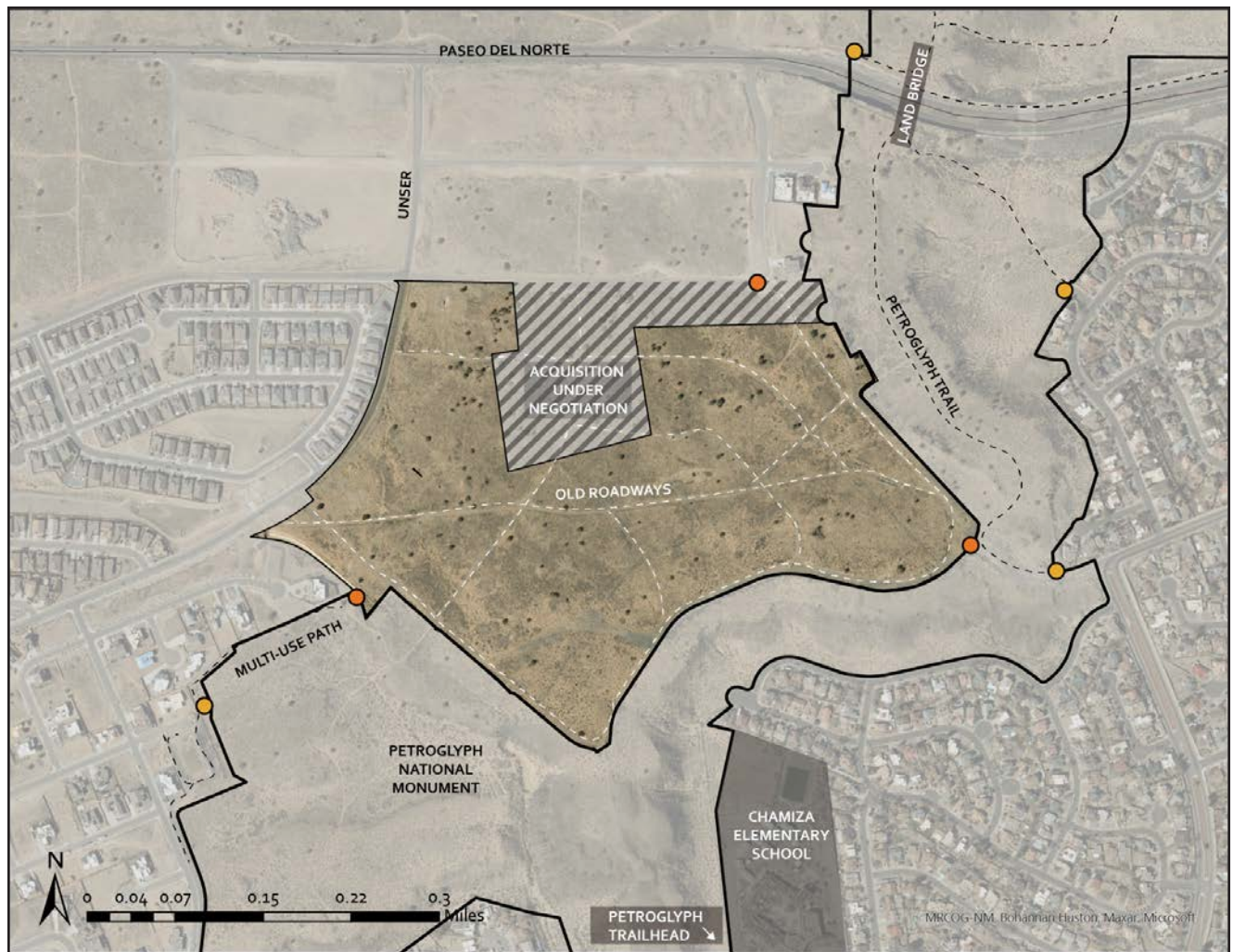
There are no formal trail connections to the Airpark but some informal social trails passing through the park put users directly in the flight path of aircraft or leads them onto the airstrip.



Shade structure and picnic tables at George J. Maloof Memorial Airpark

LA CUENTISTA OPEN SPACE

La Cuentista is one of the OSD's newest acquisitions, with the purchase of the final parcel currently under negotiation. Located south of Paseo del Norte near the La Cuentista neighborhood and adjacent on three sides to PETR, this space provides valuable opportunities for connections between West Mesa Open Space and regional bike facilities planned along Paseo del Norte. It also provides opportunities to make trail connections from the surrounding neighborhood to Petroglyph National Monument. In addition to preservation of the site itself, City ownership of La Cuentista also buffers a narrow strip of the Monument from further degradation caused by adjacent development and illegal off-road vehicle use.



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FIGURE 21. LA CUENTISTA EXISTING CONDITIONS

-  ENTRANCE TO MPOS
-  ENTRANCE TO PETROGLYPH
-  EXISTING MPOS TRAILS
-  MPOS EXISTING FACILITY/ POINT OF INTEREST
-  EXISTING COMMUNITY FACILITY
-  EXISTING OFF-SITE ADMIN ROADS/TRAILS
-  UTILITY EASEMENT

Existing Facilities

On-Site Facilities

Currently, the only facilities located within La Cuentista are two-track roads created by nearby developers and other off-road vehicles prior to Open Space acquisition. There is fencing and signage to help with regulation and wayfinding. Neighbors use this space for recreation and to access the monument.

Nearby Community Facilities

La Cuentista is located close to the Chamiza Elementary School, Petroglyph National Monument trails, and Mariposa Basin Park. Notably, La Cuentista is also located less than 1/6 mile from the Paseo del Norte land bridge which makes crossing the high volume roadway safer for pedestrians. Its location near Petroglyph National Monument and residential housing creates great opportunities for strong connections to existing communities and existing trails.

Challenges

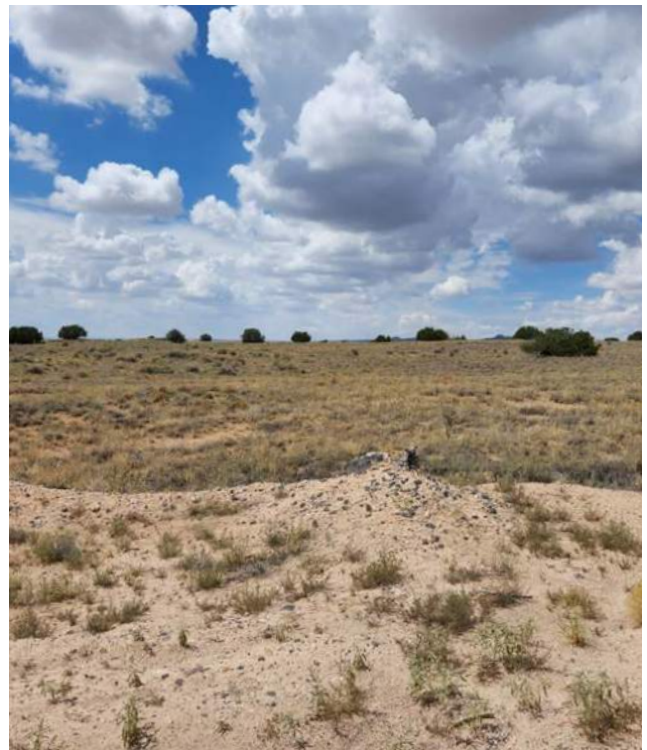
A purchase agreement for the remaining parcel (shown in Figure 21) is under negotiation and the boundaries reflected in this plan are subject to change. A remaining private inholding would impact the recommended trail network and create additional challenges to protecting the natural and cultural resources in the unit.

La Cuentista is isolated from other Open Space units aside from PETR. Connections to other open spaces and trails are limited by surrounding land use and transportation network connections. However, its strategic location adjacent to PETR and close to other nearby trails provides opportunities to make connections.

Remnants of previous activity in the area include existing two-track roads that act as the current trail network and former dumping sites near the east boundary. There is a utility easement along the Calle Nortena trail alignment and needs to be kept for maintenance purposes.



Fencing along northern boundary of La Cuentista Open Space



Terrain at la Cuentista Open Space

BOCA NEGRA ARROYO (MIDDLE BRANCH)

The Middle Branch of the Boca Negra Arroyo is 32.91 acres of multiple somewhat patchwork Open Space parcels located north and east of West Mesa Open Space. This Open Space is essential to protect the arroyo from further development and to define the urban edge of Albuquerque while helping provide an uninterrupted corridor from the West Mesa escarpment to the volcanoes.

While much of the area immediately surrounding the Boca Negra Arroyo Middle Branch is undeveloped, the Montecito Estates adjacent to the south is the first of several planned developments that could potentially impact the arroyo.



FIGURE 22. BOCA NEGRA ARROYO (MIDDLE BRANCH) EXISTING CONDITIONS

-  ENTRANCE TO MPOS
-  MPOS EXISTING FACILITY/ POINT OF INTEREST
-  ENTRANCE TO PETROGLYPH
-  EXISTING COMMUNITY FACILITY

Existing Facilities

On-Site Facilities

There are no existing facilities at the Boca Negro Arroyo Middle Branch except informal trails and two-track roads. It provides excellent views of the volcanoes to the west.

Nearby Community Facilities

The Middle Branch is located close to existing and proposed residential neighborhoods. With its proximity, there are great opportunities to design this section as an open space buffer between neighborhoods and create connections to larger Open Space units in the area. Potential land acquisitions highlighted in Figure 22 can help support these connections.

Challenges

Because the Open Space parcels are currently unfenced and unsigned, they have been subject to off-road vehicle use, illegal dumping, and impacts from adjacent development construction. However, the discontinuous nature as well as the desire to purchase the parcels between makes fencing the currently owned parcels less practical in the short term.

Any trail development in this corridor will have to work around the arroyo and private property and may not have ready connections to other trails or the street.

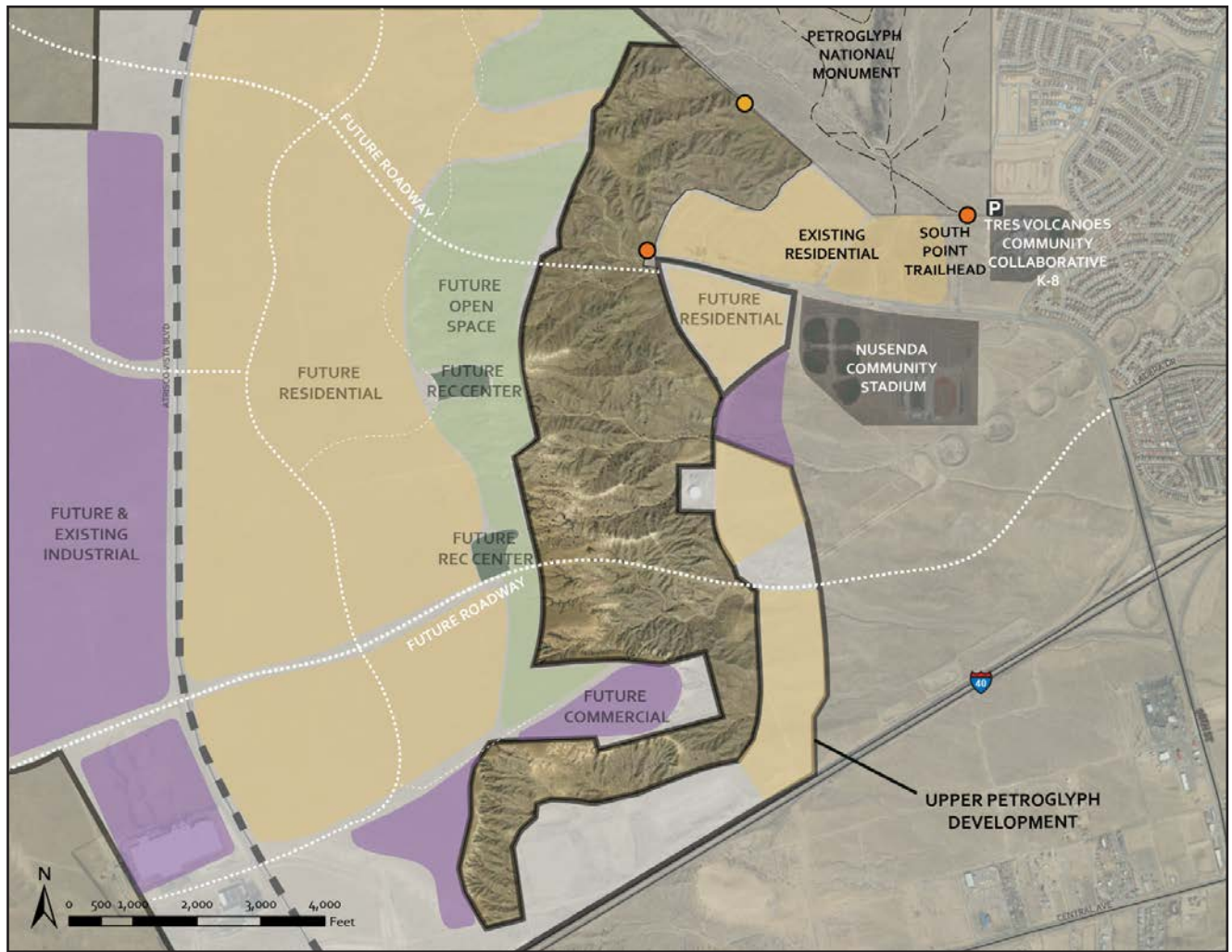
Finally, the public is largely unaware that this area is part of City Open Space.



Middle Branch from a roadway and adjacent development

ATRISCO TERRACE

Located adjacent to Petroglyph National Monument’s southern boundary, this 711.4-acre site features steep rolling hills along the southern edge of the West Mesa escarpment. This area features deeply divided ridges carved by rainfall running down from the gently sloping mesa above. This Open Space will act as an essential recreational opportunity for existing and future development in the surrounding area. Atrisco Terrace is the southernmost open space unit featured in this plan and, as a result, is the most isolated unit in the existing trail network; however, planned adjacent development and a connection to the Monument will provide opportunities for integration.



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FIGURE 23. ATRISCO TERRACE EXISTING CONDITIONS AND PROPOSED DEVELOPMENT

-  ENTRANCE TO MPOS
-  ENTRANCE TO PETROGLYPH
-  EXISTING COMMUNITY FACILITY
-  FUTURE RESIDENTIAL
-  FUTURE COMMERCIAL/INDUSTRIAL
-  FUTURE OPEN SPACE
-  FUTURE RECREATION CENTERS

Existing Facilities

On-Site Facilities

Atrisco Terrace is an undeveloped Open Space unit with no existing facilities on-site.

Nearby Community Facilities

Planned community facilities will provide multiple recreational opportunities including a private recreation center, a public aquatic center, and additional open space. The South Point Trailhead, illustrated in Figure 23, was recently acquired by Petroglyph National Monument from APS. Existing APS facilities provide essential recreation opportunities in the area as well.

Challenges

Currently, the unit is mostly unfenced except the northern boundary with Petroglyph National Monument. The unit is subject to illegal off-road vehicle use, cattle grazing, and dumping. Adjacent construction is ongoing and interrupts the natural landscape. With no official trails, signage, or visitor facilities, this space is largely unrecognized as a City-owned open space, and as a result is unused by the intended audience.

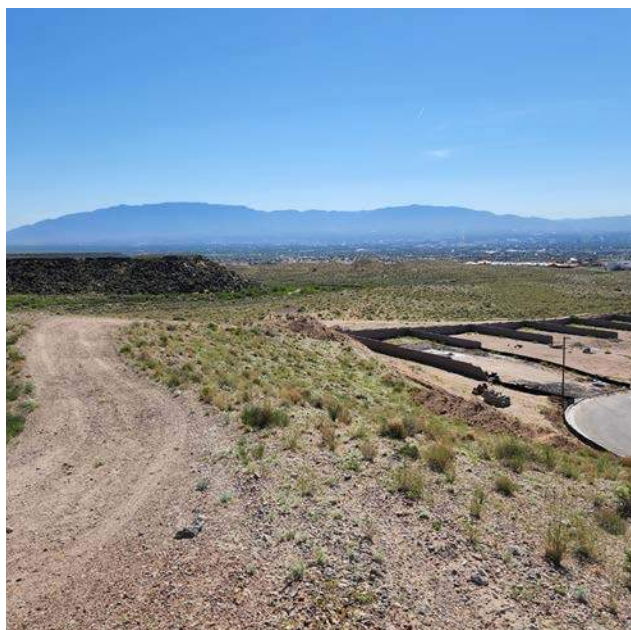
The northern boundary is shared with Petroglyph National Monument where only pedestrian use is permitted.

Steep, hilly topography can present a challenge to sustainable trail design and construction. Trails that are too steep or don't provide enough drainage can wash out during storm events and will require extensive maintenance. Soil characteristics, natural erosion, and tight boundaries will restrict trail alignments.

The Upper Petroglyphs Sector Plan proposes development surrounding this unit to the east and west with plans to expand multiple roadways into the area, two of which will bisect the unit; this will further impede a connected, sustainable trail network and necessitate major street crossings. Specific development plans are still in flux, which makes planning trails and future connections difficult; however, it also offers opportunities to provide guidance to developers to construct trails in desirable locations. Part of this development will include expanding Atrisco Vista Boulevard just west of Atrisco Terrace to a four-lane roadway.



Terrain in Atrisco Terrace Open Space



Atrisco Terrace (left), Petroglyph National Monument (top), and Inspiration housing development (right)

VOLCANOES BUFFER

The Volcanoes Buffer serves as a buffer between the Volcanoes in PETR and Atrisco Vista Boulevard. The 523.1 acres consist of a long, narrow unit running between the western Paseo de la Mesa Trailhead to the north and private property included in the Upper Petroglyphs Sector Development Plan to the south. Currently, there are no developed facilities within this unit, although there is an undeveloped parking area at the north end that serves as a west trailhead for the Paseo de la Mesa Trail. There are several two-track roadways throughout the unit. This site could provide a connection from the Paseo de la Mesa trail to the Volcanoes trailhead, at the southern end of the tract, which is one of the Monument's most popular trailheads.

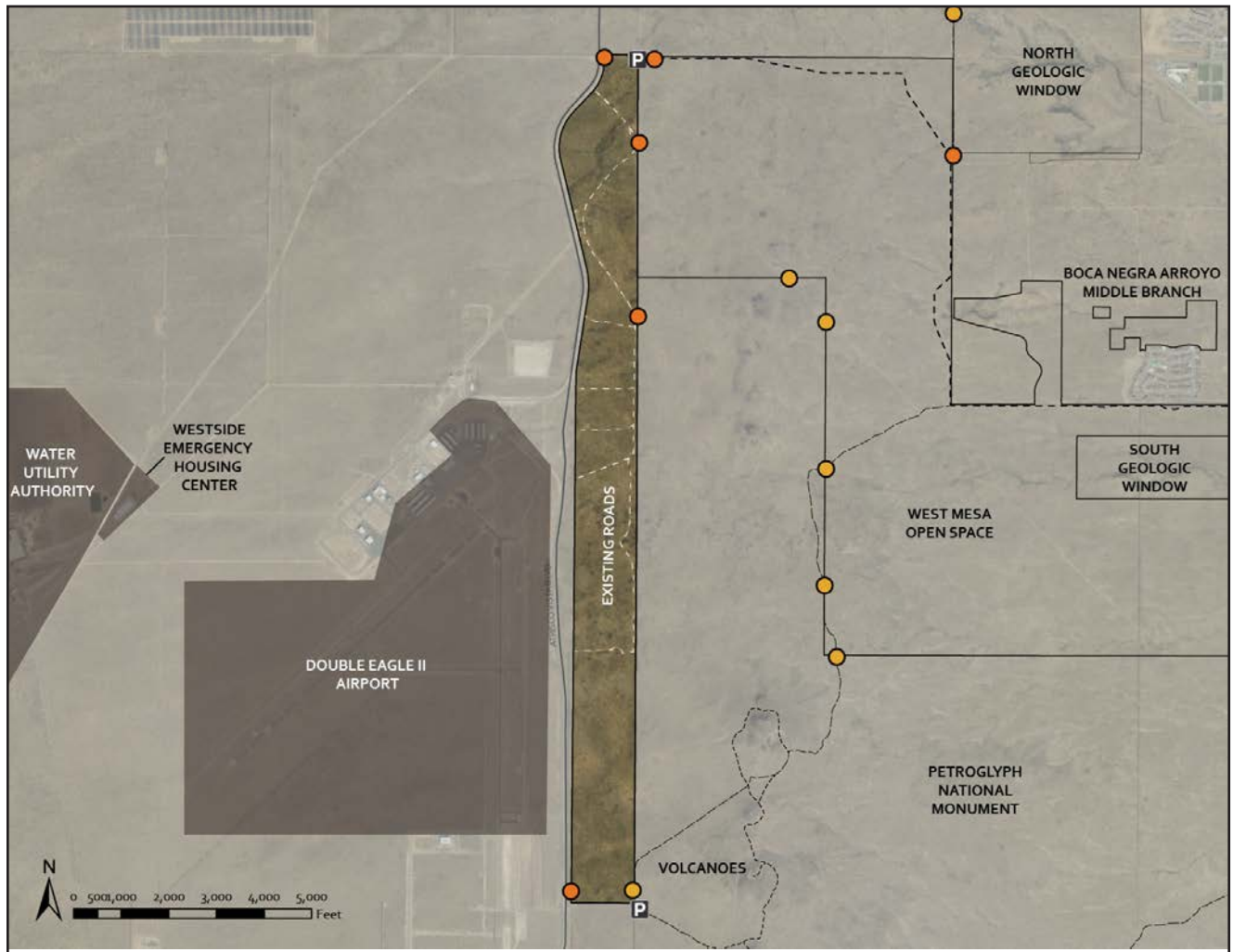


FIGURE 24. VOLCANOES BUFFER EXISTING CONDITIONS

- ENTRANCE TO MPOS
- ENTRANCE TO PETROGLYPH
- MPOS EXISTING FACILITY/POINT OF INTEREST
- COMMUNITY EXISTING FACILITY

Existing Facilities

On-Site Facilities

There are two City-owned parking lots to the north and south of the Open Space unit. The north parking lot provides access to the Paseo de la Mesa Trail. This parking lot is unpaved with a short gravel roadway that connects to Atrisco Vista Boulevard and is not suitable for road bikes. The south parking lot lies directly to the west of the Volcanoes Trailhead and is used when the Volcanoes parking lot is full or closed.

Nearby Community Facilities

Atrisco Vista Boulevard runs along the entire western boundary of the Volcanoes Buffer. This roadway provides access to industrial uses near I-40, the Double Eagle II Airport, the Volcanoes Trailhead, and the the OSD's Shooting Range Park. It currently terminates at Paseo Del Norte to the north, but NMDOT and Bernalillo County plan to extend it to 23rd Avenue in Rio Rancho. Road cyclists utilize its connection to Paseo Del Norte.

As the West Side continues to develop and expand westward, this linear link will provide a key trail connection to the Volcanoes and Open Space properties on the northern and southern boundaries of PETR.

Challenges

Atrisco Vista Boulevard doesn't currently incorporate bike or turning lanes which increases safety concerns for both bicycles and motorists, particularly with the prevalence of speeding vehicles. The primitive, unpaved access road to the Paseo de la Mesa Trailhead is also challenging for road cyclists who often have to walk their bikes the 825 feet to access the trail.

Plans for future development include expanding Atrisco Vista Boulevard to four lanes and providing additional bicycle facilities including a striped bike lane along the entire length of the project, and a ten-foot separated multi-use path from Double Eagle II Airport to Paseo del Norte Boulevard. Once constructed, it will provide an important connection to Paseo del Norte Boulevard and the Paseo de la Mesa Trail.

Open Space, PETR, and PNM staff utilize two-track administrative roads for maintenance purposes, but because there are no fences on the west boundary between the Open Space unit and Atrisco Vista Boulevard, illegal off-road vehicle use is common. Unfettered vehicular access leads to erosion and resource damage, and safety concerns for other users.



Paseo de la Mesa trailhead



Planning & Engagement Process

The planning process involved numerous site visits, meetings, and feedback opportunities with partners and the public to develop a comprehensive, strategic, and implementable plan

PUBLIC ENGAGEMENT STRATEGY

Stakeholder input was essential to the success of this planning process. Engagement occurred through a combination of community and partner meetings, community bike rides, stakeholder site visits, meetings with neighborhood and special user groups, and an online survey. Three public meetings were held over three months across the West Side—one larger kick-off meeting and meetings in both City Council Districts represented in the planning area.

The project kick-off meeting was held at the Open Space Visitor Center where community members were invited to learn about the project, provide input based upon their own experiences in the project area, and voice questions and concerns.

Afterwards, the team used site visits, a community survey available on paper and online, stakeholder conversations, and research to generate initial recommendations for the trail network. Two additional public meetings were then held to gather further input on these options.

In addition to meetings with specific user groups like equestrians, local mountain bikers also led the team on a bike ride through the West Mesa Open Space to discuss challenges, opportunities, and desired conditions.

Finally, a project website was created to provide information on the project and its status.

Description	Date	Location
Kick-off Public Meeting	April 2022	Open Space Visitor Center
Site Visit #1	April 2022	West Mesa, La Cuentista, Piedras Marcadas
Site Visit #2	April 2022	West Mesa, Horseman’s Complex, George J. Maloof, Middle Branch, Atrisco Terrace
Stakeholder Presentation- West Side Coalition Of Neighborhood Associations	May 2022	Zoom
Public Meeting	June 2022	Westgate Community Center
Public Meeting	June 2022	Don Newton-Taylor Ranch Community Center
Stakeholder Presentation- Corrales Equestrian Advisory Committee	June 2022	Village Pizza-Corrales
Community Bike Ride #1	July 2022	West Mesa Open Space
Community Bike Ride #2	July 2022	West Mesa Open Space, Volcanoes Buffer
Site Visit #3	July 2022	West Mesa
Stakeholder Presentation- Watermelon Mountain Pony Club	July 2022	Zoom
Stakeholder Presentation- Albuquerque Mountain Biking Association	July 2022	Zoom
Stakeholder Presentation- Greater Albuquerque Recreational Trails Committee	July 2022	Zoom
Site Visit #4	August 2022	Atrisco Terrace
Community Website	April 2022-July 2023	www.westmesatrails.org
Community Survey	June- July 2022	Survey Monkey and In-Person

PLANNING PROCESS OVERVIEW

AGENCY INPUT

In addition to meeting with the public, the planning team coordinated with a variety of land managers, project partners, and agencies working on projects throughout the area. Partner involvement was crucial in developing a comprehensive and implementable plan.

Agencies involved in the planning process included:

- National Park Service (NPS)
- Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)
- Bernalillo County
- City of Albuquerque Department of Municipal Development (DMD)

OUTREACH TO PUEBLOS AND TRIBES

Because the cultural landscape preserved by Petroglyph National Monument does not end at

its boundaries, the OSD attempted to engage affiliated Pueblos and Tribes through letters to their public contacts explaining the project and inviting questions, concerns, and general input. Unfortunately, the OSD did not receive feedback to that request.

SITE VISITS

The planning team attended four site visits with the City of Albuquerque and National Park Service between March to July, each focusing on a specific segment of the site. The first focused on the northern area, including Piedras Marcadas Canyon, the Paseo del Norte land bridge, and La Cuentista Open Space. The second focused on Boca Negra Canyon, La Boca Negra Horseman's Complex, George J. Maloof Air Park, the Boca Negra Arroyo Middle Branch, and Volcanoes Buffer. The third visit focused primarily on West Mesa Open Space, and the final on Atrisco Terrace.



Site visit to Piedras Marcadas Canyon

PUBLIC ENGAGEMENT

Public Meetings

Three public meetings were held throughout the planning process which included a kick-off meeting held at the Open Space Visitor Center in April, and public meetings at the West Gate Community Center and the Don Newton-Taylor Ranch Community Center, both in June.

Community Groups

In addition to public meetings, planners also presented to multiple neighborhood associations and special interest groups to spread awareness of the project. The organizations included:

- Albuquerque Mountain Biking Association
- Greater Albuquerque Recreational Trails Committee
- Corrales Equestrian Advisory Committee
- Watermelon Mountain Pony Club
- West Side Coalition of Neighborhood Associations (WSCONA)
- City Council Staff—District 1 and 5

Public Survey

A community survey designed to gather further, formalized input from interested parties was posted on the website from mid-June to mid-October (see complete survey results at Appendix D). The survey received 27 responses, mostly from West Side residents; the remaining were from other part of the City and the greater Albuquerque area. Input from the survey helped inform recommendations for connections, trail alignment, and new and improved amenities. The survey solicited input regarding specific Open Space locations as well as how best to make connections to other community amenities using the trail network. The survey also requested demographic information to get a better profile of survey takers.

Key Needs Identified by the Public

- Enhanced connections to neighborhood access points



Community kick-off meeting at the Open Space Visitor Center

- Accommodations for both local neighborhood and city/regional users through a mix of entrance types for each Open Space
- Safe integration of multiple trail user groups
- A variety of low-profile amenities that blend in with the environment
- Coordination with multiple stakeholders on upcoming/ongoing projects to effectively utilize resources, involve interested and engaged residents, and integrate the trail network into the region

Community Profile

While not necessarily indicative of usership as a whole, the community profile provides a base understanding of survey respondents. Overall, most people taking the survey have accessed Petroglyph National Monument. The most-visited Open Space units in the study are the developed facilities in the West Mesa and Volcanoes Buffer Open Spaces. Less than half of survey takers have visited most of the Open Space units in this project.

Over half of survey takers live on the West Side, but residents from other Albuquerque neighborhoods, Rio Rancho, Corrales, and Tijeras, also provided input.

Neighborhoods of Survey Takers

- Albuquerque
- Alvarado Gardens
- Del Webb at Mirehaven
- Four Hills
- Gibson and University
- Golf Course & Paradise Blvd
- La Cuentista
- Netherwood Park
- North Valley
- Northeast Heights
- Paradise Hills
- Paseo del Norte & Universe
- Rio Rancho
- Santa Fe Village
- Taylor Ranch
- Tijeras, NM
- UNM area
- Ventana Ranch
- Villa de Paz
- Village of Corrales
- West Mesa

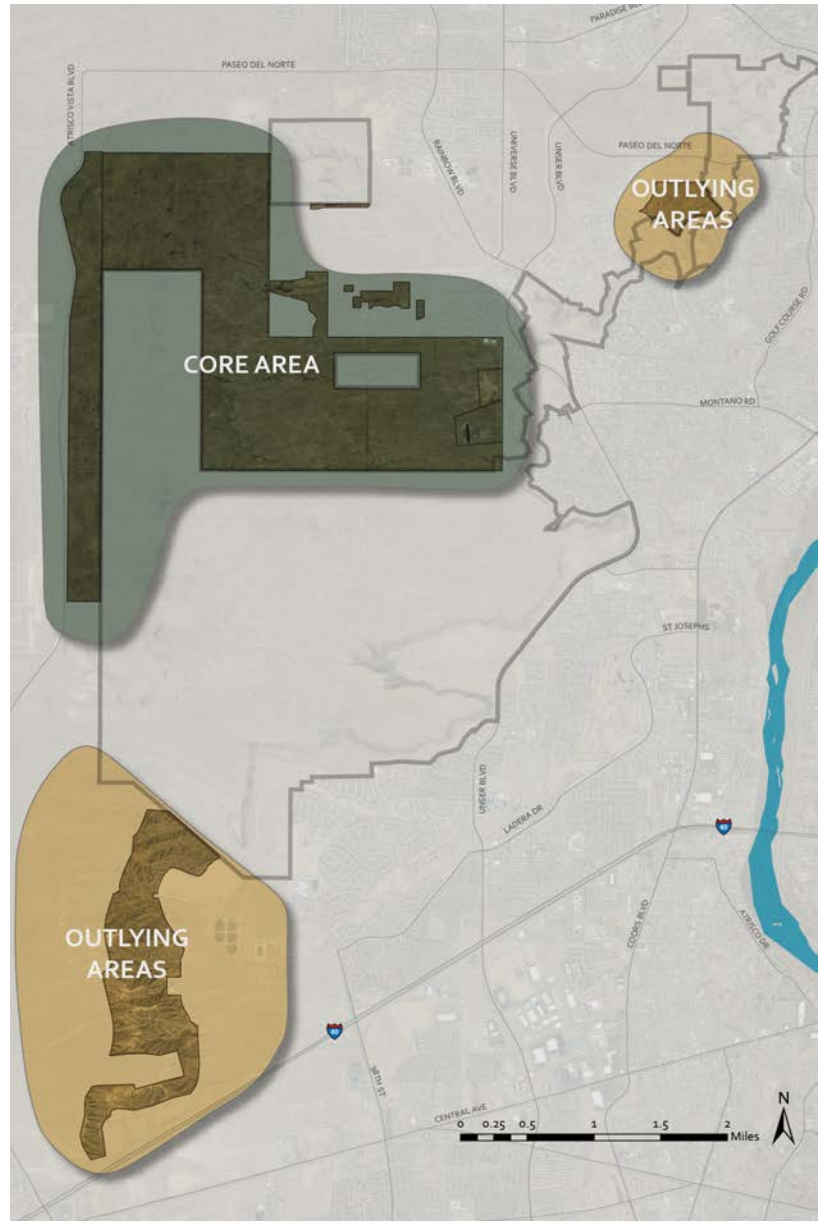
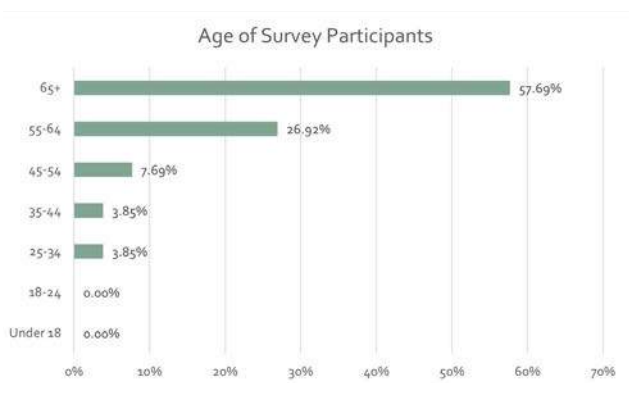
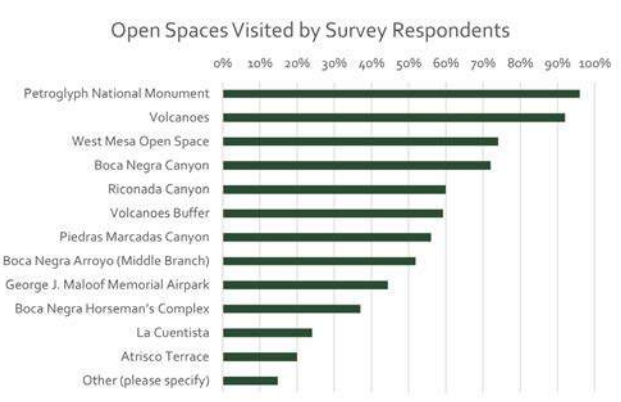


FIGURE 25. OPEN SPACE UNITS BY SURVEY AREA



SURVEY INSIGHTS

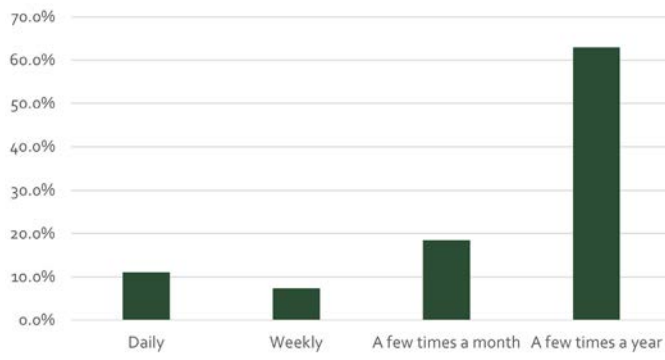
WEST MESA CORE AREA

The majority of Open Space units included in this plan are in the West Mesa core area. These units were grouped because they are physically contiguous. Major insights from this area include current use, duration of stay, types of use, and desired scale of amenities in the area.

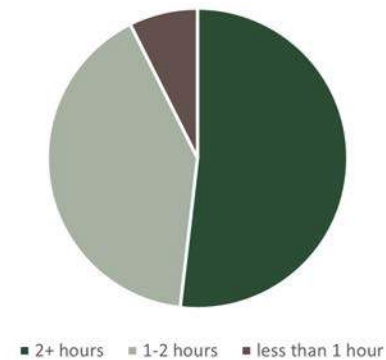
Units Included in this Section

- West Mesa Open Space
- La Boca Negra Horseman's Complex
- La Boca Negra Arroyo (Middle Branch)
- George J. Maloof Memorial Airpark
- Volcanoes Buffer

HOW OFTEN DO YOU ACCESS THESE SITES?

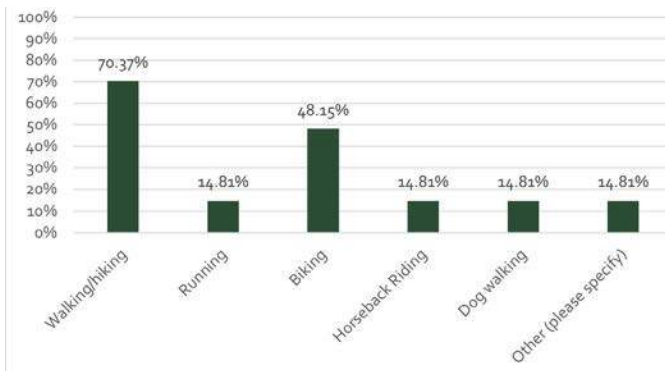


HOW LONG DO YOU STAY AT THESE SITES?

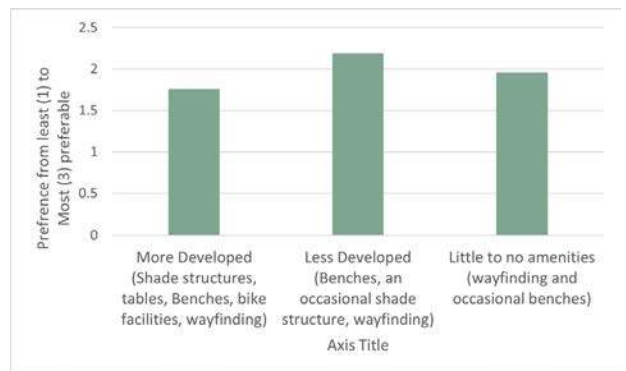


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WHAT KIND OF ACTIVITIES DO YOU DO WHILE AT THESE SITES?



HOW DEVELOPED SHOULD TRAIL AMENITIES BE IN THIS AREA?



Key Insights

- Most survey takers visit a few times a year but there are a few daily and weekly visitors. Lengths of stay are also longer here than other areas in the study, with most visits lasting more than two hours.
- Most visitors use the area to walk/hike or bike while other uses are not as popular.
- Most survey takers would like more amenities in the area, but low-profile and in-kind with the surrounding environment.
- Over half of users access the area by driving, but walking and biking to the units are also popular methods.

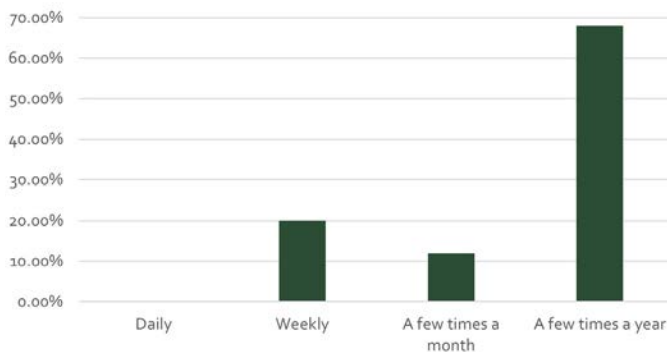
OUTLYING AREAS

Outlying units are outside of the core area and either part of or abutting Petroglyph National Monument. While connections to both PETR and MPOS are included, no projects are recommended inside the Monument due to the existing VUMP and other federal requirements. Because these units are spread out across the West Mesa, multi-use connectivity will be a unique challenge.

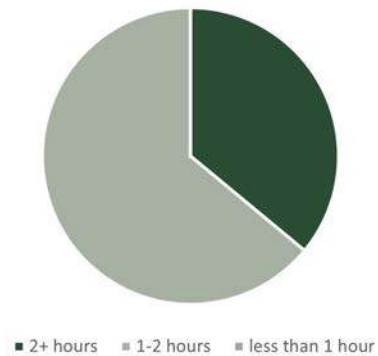
Units Included in this Section

- Atrisco Terrace
- La Cuentista
- Petroglyph National Monument
 - Rinconada Canyon
 - Volcanoes
 - Boca Negra Canyon
 - Piedras Marcadas Canyon

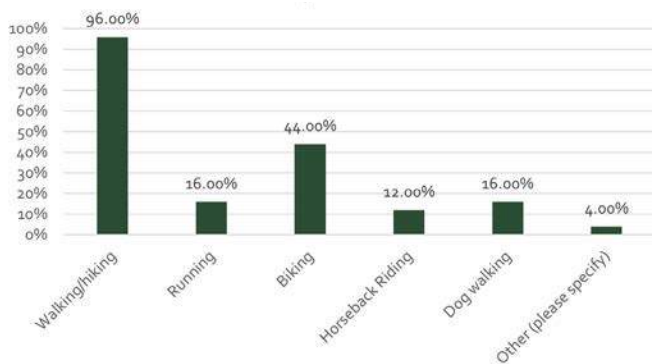
HOW OFTEN DO YOU ACCESS THESE SITES?



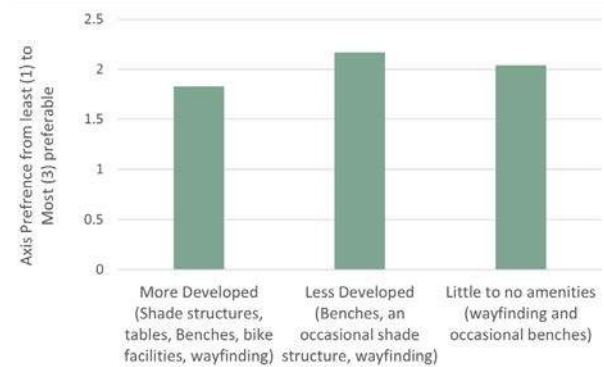
HOW LONG DO YOU STAY AT THESE SITES?



WHAT KIND OF ACTIVITIES DO YOU DO WHILE AT THESE SITES?



HOW DEVELOPED SHOULD TRAIL AMENITIES BE IN THIS AREA?



Key Insights

- There is a slightly higher number of weekly visitors compared to the core area. Most people spend approximately 1-2 hours in these units.
- Most visitors are hiking/walking or biking but petroglyph viewing is a common alternative activity.
- A significantly higher number of visitors access the area by walking, but driving and biking are also common. Public transportation is not typically utilized.
- Survey takers tended to want less development with little to no amenities.

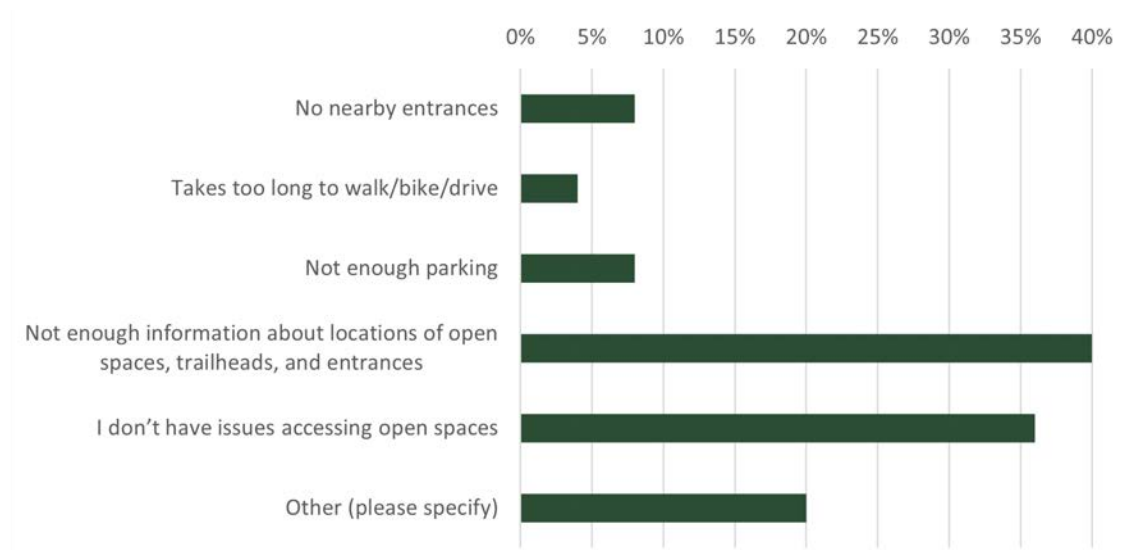
OTHER CHALLENGES AND OPPORTUNITIES

Access was identified as a primary challenge according to the survey. A desire for improved neighborhood connections to Open Space, and through Open Space to the Monument, was identified. Users do not have enough information on where Open Space is located or how to access it. There are opportunities to improve signage

and trailheads and make MPOS more visible and protected through fencing.

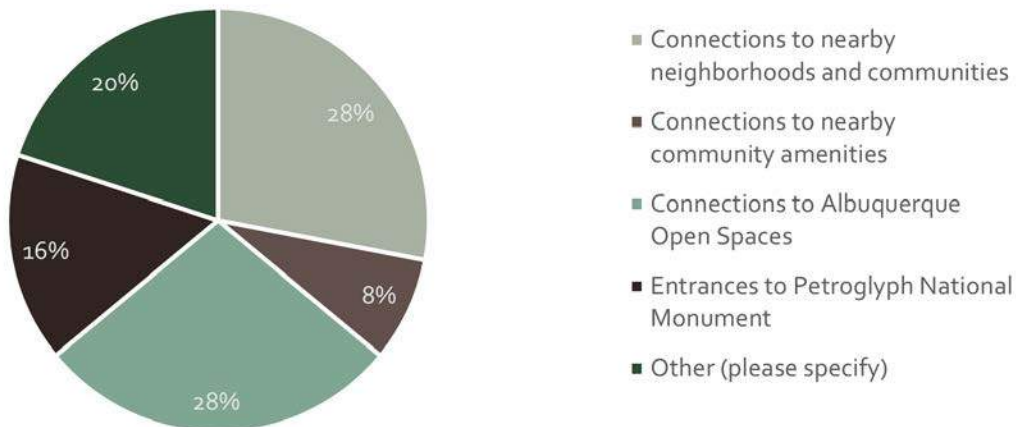
There are also opportunities to improve neglected equestrian facilities and safe connections for bicyclists.

WHAT ARE THE PRIMARY BARRIERS FOR ACCESS FOR THIS TRAIL NETWORK?



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WHAT ARE THE MOST ESSENTIAL COMMUNITY CONNECTIONS FOR THIS TRAIL NETWORK?



Website

A project website was created to provide a project overview, upcoming events, survey link, and plan documents for the public to easily access and provide comments. The website went live in April of 2022 and was active throughout the duration of the planning process.



FIGURE 26. PROJECT WEBSITE HOME PAGE

PUBLIC ENGAGEMENT INSIGHTS

The public engagement process outlined above revealed concerns common to a variety of Open Space users on the West Mesa. These needs, challenges, and opportunities, in conjunction with those identified in the existing and future conditions analyses, will help to guide recommendations, and are discussed in further detail in the following section:

Needs

- Paseo de la Mesa Trail pavement maintenance
- Signage and fencing to differentiate Petroglyph National Monument and external Open Space
- Horse trailer parking at Horseman's Complex
- Lines of sight on trails for hikers, bikers, and horseback riders to prevent user conflict
- Trail amenities and facilities, especially water sources, shade, signage, restrooms, and sufficient parking.

Challenges

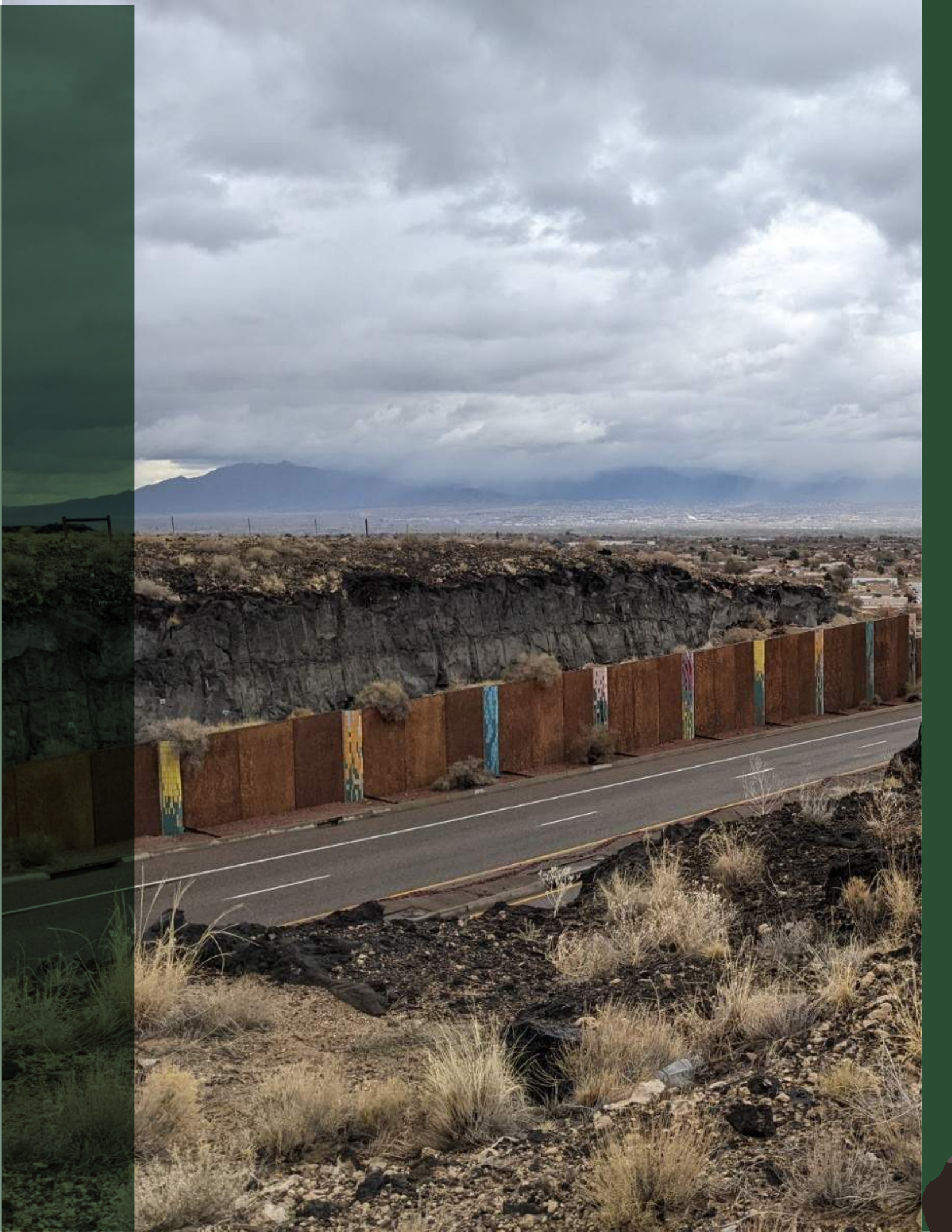
- Existing trails intermittently run into adjacent properties like Petroglyph National Monument and private property
- Petroglyph National Monument boundary can be difficult to locate due to lack of fencing and signage
- Interactions between hikers, bikers, and horseback riders can cause conflict on trails
- Separation of uses in and surrounding special use facilities, including horse jumping course and Maloof
- Unfenced Open Space, which can lead to dumping, illegal off-road vehicle use, and challenges with wayfinding
- Open Space and trail connectivity due to the distance between Open Space parcels

Opportunities

- Existing bathroom facilities at George J. Maloof Memorial Airpark and Horseman's Complex
- PNM easement road cuts across the entire West Mesa Open Space and could make a great connector for the trail network
- Existing trail network meets the needs for many trail users
- Local partnerships and community groups provide maintenance support for existing facilities
- Horseman's complex caretaker house could provide on-site support and staffing
- Adjacent city bike trails and Petroglyph National Monument trails create an extensive interconnected trail network on and off of public lands.

SUMMARY OF COMMUNITY GOALS

- *Create a trail network that will accommodate multiple user group needs with looping opportunities and differing trail experiences*
- *Ensure trail facilities can adequately accommodate different user groups*
- *Make off-site connections to surrounding neighborhoods and roadways*
- *Delineate areas for separation of uses between groups*
- *Highlight the stunning views of the West Mesa, Rio Grande Valley, and City of Albuquerque*
- *Ensure the long-term maintenance and management of the trail network*



Opportunities and Constraints

The West Mesa trail network has numerous challenges but a wealth of opportunities to create a unique trail experience on Albuquerque's West Side

OPPORTUNITIES AND CONSTRAINTS

Community and partner engagement, in conjunction with analyses of existing, future, and desired conditions, were vital tools to identifying opportunities and constraints and developing a robust, implementable plan.

Connectivity

As noted, this plan addresses several Open Space units spread across the West Mesa, interspersed among housing developments, separated by major roadways, and with varying degrees of accessibility. Each unit varies in its intended audience, offering unique experiences and specialized use opportunities, making connectivity between them all the more important. Effectively connecting those 3,800 acres of land will require strategic planning and coordination with multiple landowners and jurisdictions. Connectivity must also address the variety of desired use types, while integrating but also acknowledging access limitations into and through Petroglyph National Monument.

Constraints

The primary constraint to connectivity is the distance between the various Open Space units. The two most isolated units, La Cuentista and Atrisco Terrace, are separated by more than eight miles in straight-line distance. That separation increases to more than ten miles via the shortest traversable route, which involves crossing through Petroglyph National Monument.

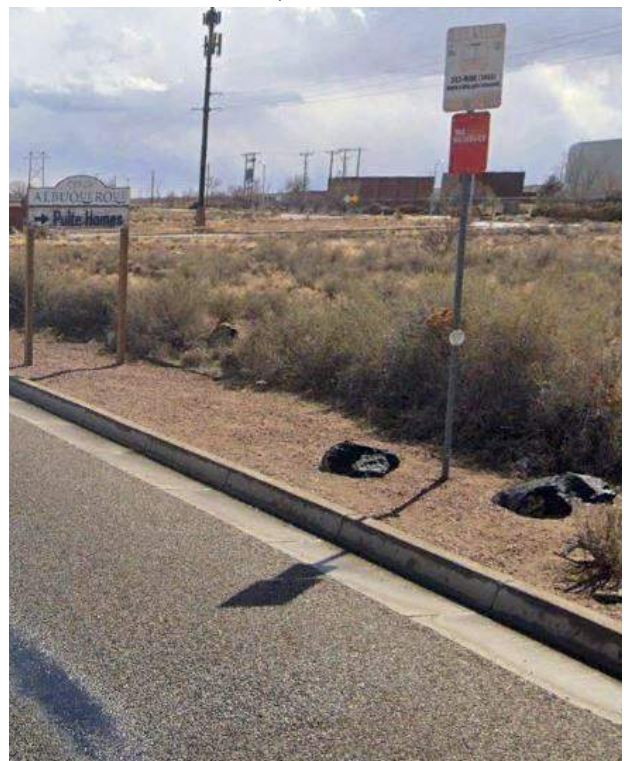
Access points into Petroglyph National Monument are governed by the VUMP, and any new access points must be approved by NPS. Additionally, with few exceptions, trails are limited to pedestrians only; bicycles and horses are prohibited. This makes regional multi-use connections through the monument difficult.

Transit connections to the various Open Space units are currently limited. As shown in Figure 13, there are a few bus stops near entrances to PETR, but only two stops anywhere near Open Space access points – one on Unser Boulevard one-third of a mile from the Paseo de La Mesa Trailhead, and one on Taylor Ranch Road nearly ¼ mile from the eastern tip of La Cuentista. There is no sidewalk at the Unser stop (see photo), and accessing La Cuentista from Taylor Ranch Road entails crossing through PETR.

Any transit improvements would depend on changes made through the City's Transit Department.

Some units are also designated special use, with intended audiences and activities not served at other Open Space. Some like George J Maloof Memorial Airpark and La Boca Negra Horseman's Complex are intended for specific recreation types and require specialized trail connectivity considerations. Safety, connectivity, and utility are important considerations for planning around these spaces.

The West Side is the fastest growing area in Albuquerque, experiencing more residential growth than any other part of the city – largely due to the availability of large blocks of undeveloped land. With this rapid growth comes the challenge of ensuring urban infrastructure and other community facilities keep pace to effectively serve growing populations. The Open Space units on the West Mesa will help meet those needs, but only if constituents can access them. If such access is not included in the planning and development of new roads and subdivisions, crucial connections may be lost.



Opportunities

Because the City's Open Space units are spread across the West Mesa, there may be greater opportunities for local access and engagement with a broad cross section of neighborhoods and user groups. This also means that various user groups have opportunities for unique experiences in each area.

The access limitations imposed by PETR (horses and bicycles only in very limited locations) actually help define the types of trails that can be developed around its perimeter. Perhaps the most heavily used multi-use trail that falls within the Monument is the Boca Negra trail that connects a paved trail around AMAFCA's Boca Negra Dam to Atrisco Drive at Boca Negra Canyon, offering a key east-west connection through the Monument for bicycles, equestrians, and pedestrians. A second leg of that trail follows along the edge of PETR and connects to La Cuentista Open Space to the northwest. Adding a relatively short connection from the AMAFCA dam south to the east edge of the West Mesa unit would complete a 2.3-mile connection between the La Cuentista unit and the Paseo de La Mesa east trailhead, resulting in a total length of 6.5 miles of bike-friendly multi-use trails. In other locations, even though bicycles are not permitted to enter the Monument, local trail connections can be made and bike racks provided to allow cyclists to enter on foot.

Even several of the major roadways that separate the various Open Space units offer opportunities, as they do or in the future will include paved multi-use separated paths which can bring cyclists and

pedestrians to smaller local roads to access the Open Space. While perhaps not as attractive to trail users as separate paths, the growing network of smaller roads offers opportunities to create the final legs of those connections via sidewalks and low-volume streets, through the relatively low-cost addition of wayfinding signage.

Improving trail amenities and renovating older or substandard facilities improves the user experience overall. Signage is an important element of those amenities to assist with wayfinding, and help ensure that user groups stay where they are permitted, especially in areas abutting the Monument.

Signage also offers an opportunity to educate the public on appropriate uses of City Open Space and the adjacent monument, while fostering a better understanding of the fragile ecosystems and aiding conservation efforts.

Finally, while the rapid pace of development can be seen as a challenge, once this plan is adopted it will become easier to work with developers to ensure that they provide the necessary connections to and through any new subdivisions. Several Open Space units, such as Atrisco Terrace, abut private land with long-range subdivision plans that are just beginning the development process. This creates immediate opportunities to identify and plan for needed trail connections in tandem with housing developments to better serve the growing community and the West Side as a whole.



Landscape and Vegetation

Landforms are dominated by the volcanic basalt escarpment and remnant cinder cones that punctuate the City's western skyline within Petroglyph National Monument. With the exception of the rugged terrain that characterizes the Atrisco Terrace unit, the majority of the West Mesa Open Space units are comprised of relatively flat land, as implied by the area's nomenclature. Vegetation in the area is generally characteristic of high desert scrub and grasslands of the northern fringes of the Chihuahuan Desert. The only significant volumes of trees evident in the area are those in nearby residential neighborhoods that continue to expand along the Open Space boundaries.

Constraints

The area's character of the soil and geological composition can make trail construction and maintenance difficult. Despite the relatively flat terrain, sparse vegetative cover results in near constant erosion and displacement of the sandy soils by both wind and rainfall runoff, particularly in areas where vehicular traffic has disturbed what little vegetation exists. Wind-blown sand is a constant nuisance, and sandy soils are typically not well-suited for paved trail construction.

In other locations, underlying basalt formations have been exposed by removal of overlying soils, resulting in rocky terrain that is not well suited for trail development without importing soil to re-cover

the exposed rock. Gravel-heavy trails can be injurious to horses, as small rocks can bruise their hooves and become lodged under horseshoes. While gravelly trails or exposed rock can present a fun challenge to more experienced mountain bikers, those same features can be dangerous to less experienced riders.

As with almost any location in the Southwest, arroyo crossings present potential danger from flash flooding, so care should be taken in siting such crossings, if they are needed. Consideration should also be given to armoring the trail in those locations to minimize erosion and required maintenance.

There are scattered native junipers which provide some tree coverage, but little else in the way of natural shade. Some areas have invasive elms, which if deemed undesirable may need to be managed or removed; however, these also provide rare shade and often survive without supplemental water, so careful consideration may be warranted in determining their value.

There are few locations where water service is available, so irrigation is generally not an option for new plant materials at trailheads or other nodes. As such, plant selections will be limited to those that are extremely drought tolerant, and water harvesting and/or periodic supplemental watering will be critical to their survival.



Native plant vegetation

Opportunities

Since paved trails may be seen by some as incompatible with open space preserves, using alternative materials can alleviate the problems associated with their use on sandy soils. Natural surfacing, such as compacted crusher fines or stabilized native soil, can provide an “accessible” trail surface if properly installed and maintained.

Although rocky terrain presents its own challenges, large rocks and boulders along the edge of the trail corridor can be beneficial and enhance the trail user’s experience by adding visual interest and helping to define a trail’s location and width. Similarly, a soil/gravel mix can also help prevent erosion, provided it is used sparingly or in areas not likely to see equestrian use.

Added shade is a universal demand if summer use is to be appealing. Regionally appropriate trees should be added wherever irrigation is possible. Water harvesting can be utilized to capture runoff and use it to help establish additional vegetation, while reducing erosion from runoff. In other locations, the lack of shade can be offset through the use of manufactured shade structures - particularly in areas where tree plantings are not feasible. Design of any trail-related facilities should include windbreaks or other accommodations for dealing with blowing sand.

There are also opportunities to pair trail construction with revegetation efforts in almost all cases, and invasive species removal in some instances, where necessary.



Each trail has unique amenity needs based upon environmental factors

Resource Management

In addition to recreational value, one of the goals of the Open Space program is to preserve the natural and cultural resources of these lands for future generations, as development continues to surround them. Uncontrolled access in many locations has resulted in numerous informal trails and off-road vehicle tracks – many of which traverse sensitive areas, leading to erosion and degradation of the very resources the Open Space designation is intended to protect. Fencing is needed in many locations to limit or direct access, in combination with trail closures, revegetation efforts, and careful routing of new trail alignments, to protect fragile ecosystems and archaeological sites while accommodating intended user groups.

Constraints

The overarching constraint to effective resource management within the West Mesa Open Space system – and indeed, with most public agencies – relates to the amount of land being managed relative to available staff time, resources, and funding. Careful management and allocation of those internal resources will be necessary to effectively prioritize and implement needed improvements and protection measures.

The fencing needed to limit access and protect

resources in several large areas, including most of the Atrisco Terrace Open Space, is absent. Due to the sheer length of fencing that is required, typical agency budgets do not allow for implementation in a timely manner.

Coupled with the fencing issues, lack of signage is a parallel challenge, as it is often difficult to even identify Open Space boundaries, much less inform residents of appropriate and inappropriate activities on those lands. More signage and informational kiosks are needed to provide needed information to trail users and reduce policing activities by City staff.

Opportunities

As future development occurs near the Open Space, the City may be able to work with developers to provide necessary fencing and access control as part of their site plan approval process. Educational programs that inform the community about the value of preserving vegetation and other resources may also result in longer-term changes in public attitudes and perceptions.

With new trails, facilities, signs, and other amenities, City staff can help further buffer and protect PETR by offering comparable alternative multi-use recreation spaces.



Resource management requires coordination with multiple agencies for a variety of assets like the Boca Negra Dam Trail (above).

Amenities and Facilities

A well-designed trail network will not only provide connectivity and recreational opportunities, but offer amenities and facilities to make trails more comfortable and inviting to trail users. Each trail has unique amenity needs derived from a balance of community input and environmental factors such as desired aesthetic qualities, geographical context, maintenance capabilities, and funding sources. Trail amenities should be unique to each trail and reflect the intended experience through design and placement.

Constraints

The area lacks natural shade for visitors, making outdoor recreational activities somewhat challenging (and potentially dangerous) during the hotter months.

Some of the more developed open spaces have existing facilities of varying quality and age. Some spaces, like the Horseman's Complex, contain facilities that are many years old and in need of replacement, while others have few to no facilities or amenities at all. In either case, substandard or nonexistent amenities do not serve current constituents, and will certainly require

improvements for future users as demand increases.

Ultimately, the largest constraint with new facilities is the cost of installation and maintenance. All amenities will need regular cleaning, maintenance, and eventual replacement at the end of their life cycle. Ensuring that amenities packages chosen for each facility are well suited to this environment will be key to minimizing the overall operations and maintenance costs.

Opportunities

Due to increasing development activity in the area, there is already an existing infrastructure base to build upon for the West Mesa trail network. Shared use of roads and parking lots can provide short-term solutions for trailhead access points, while expansion of nearby utilities will reduce the cost of extending them to serve Open Space facilities, where they may be needed.

Other agencies, including the National Park Service, AMAFCA, and Bernalillo County may also provide similar facilities that can be shared to further improve of the level of service within the trail network.



George J. Maloof Memorial Airpark has multiple facilities for visitors



Piedras Marcadas trailhead near the Paseo del Norte land bridge



Recommendations

Recommendations for a functional and efficient trail network

INTRODUCTION

The intent of this planning process is to provide recommendations for a functional and efficient trail network and identify up to 24 miles of new trails that can be planned and built within the City's West Mesa Open Space units. In order to develop such a network, recommended trail alignments use a combination of existing primitive two-track road corridors, existing multi-use trails, and newly proposed trails to provide maximum connectivity. Trail recommendations presented below are based on multiple community meetings and rides, stakeholder meetings, and site visits held throughout the planning process.

Access points were identified through analysis of existing entrances, proximity to nearby community facilities, potential effects on local traffic, filling gaps in the trail network, and acknowledgment of planned new developments. Proposed access points have been categorized using a three-level hierarchy in order to serve different needs for the trail network and surrounding communities. Each type of access point has a corresponding combination of amenities that is reflective of its place in the system.

Recommendations for trail amenities are similarly based upon community survey input during the public engagement process, as well as maintaining a degree of consistency with amenities at Petroglyph National Monument and other nearby facilities.

CORE AREA

West Mesa, Boca Negra Arroyo, George J. Maloof Memorial Airpark, Boca Negra Horseman's Complex, Volcanoes Buffer

NORTH AREA

La Cuentista

SOUTH AREA

Atrisco Terrace

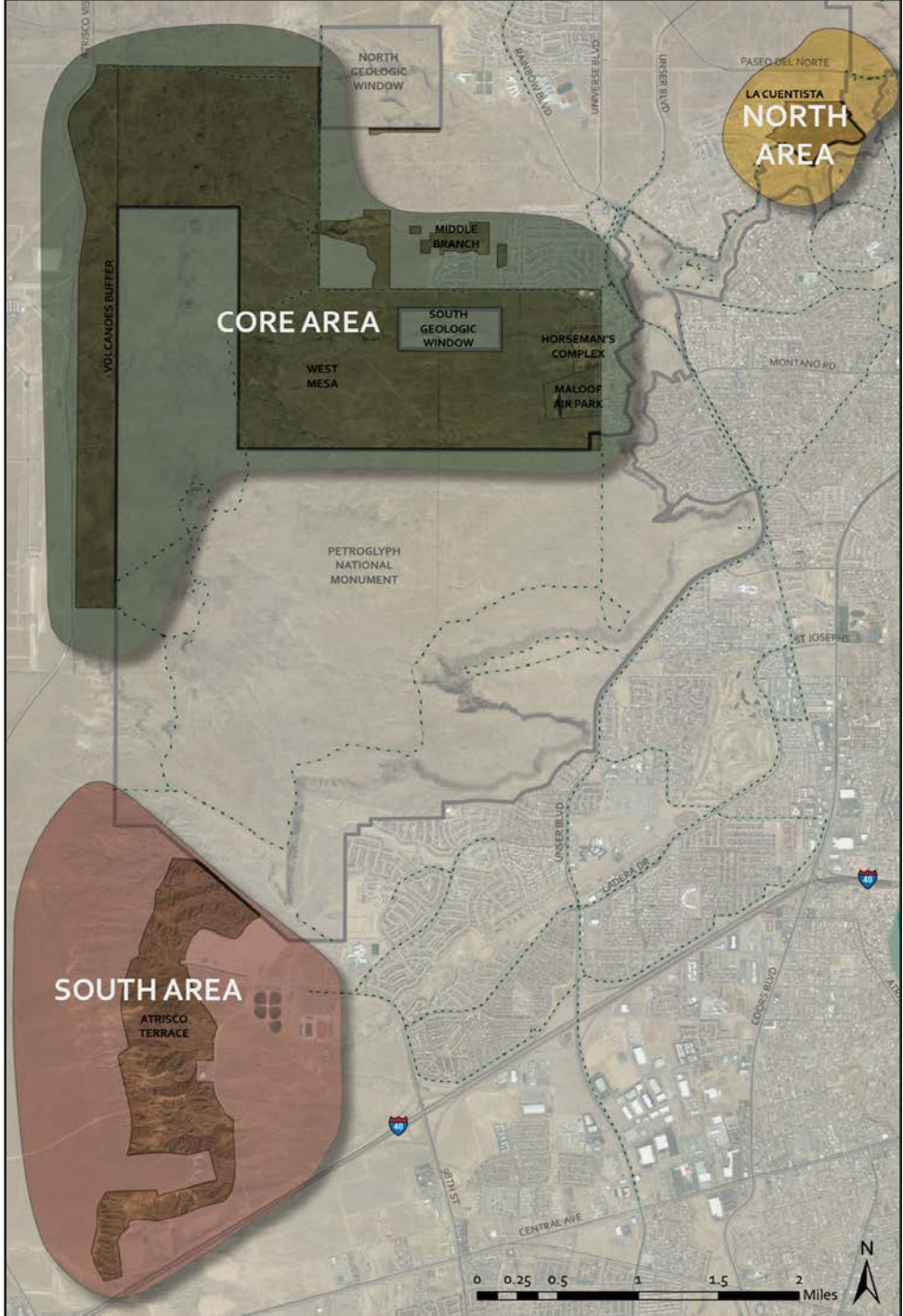
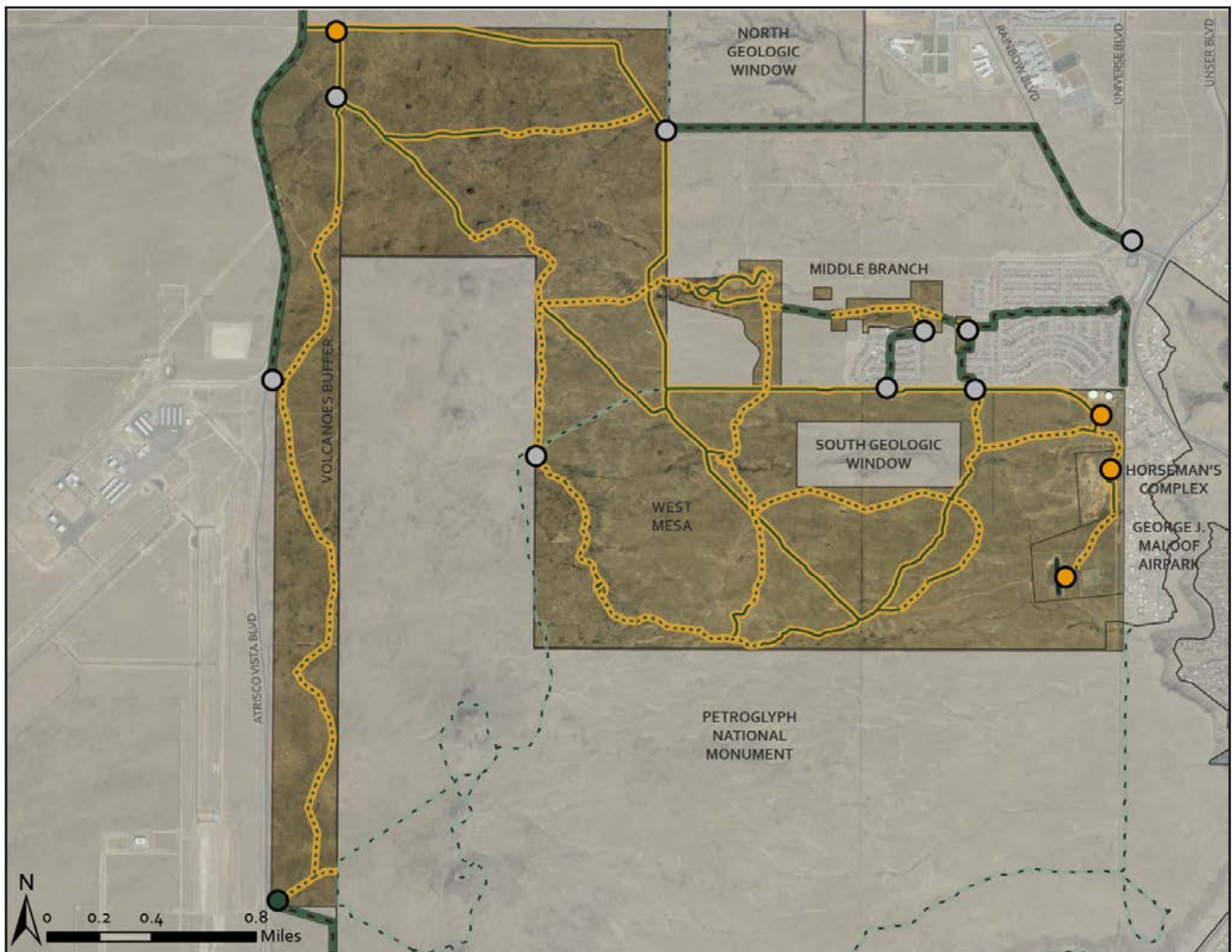


FIGURE 27. TRAIL RECOMMENDATION AREAS

PREFERRED OPEN SPACE ALIGNMENTS

CORE OPEN SPACE UNITS

The four units that comprise the core of the City's open space properties on the West Mesa are mostly contiguous and abut Petroglyph National Monument, resulting in one of the largest areas of preserved, undeveloped land in the metropolitan area. The proposed trail network within in this core utilizes a combination of newly proposed trails in conjunction with existing trails and roadways to make loops and connections to access points.



-  NEW TRAIL
-  REHABILITATE EXISTING TRAIL
-  EXISTING TRAILS
-  OFF-SITE CONNECTIONS
-  MAJOR TRAILHEAD
-  SECONDARY ACCESS POINT
-  NEIGHBORHOOD ACCESS POINT

FIGURE 28. TRAIL ALIGNMENT CORE UNITS

Trail Alignments

The central core of the West Mesa Open Space is laced with informal trails, existing primitive administrative roads, and abandoned dirt roads that formed as a result of decades of uncontrolled access before the area was purchased as public land and protected. While some segments of existing trail will be retained within the overall trail network, other sections will be closed or realigned to make the trail system more sustainable and lessen disturbance.

Although currently not contiguous with the other units in the central area, the City is working to procure additional tracts that will eventually connect Boca Negra Arroyo (Middle Branch) to adjacent MPOS. Trail alignment recommendations are made with potential land acquisitions considered.

Access Points

Parking lots at La Boca Negra Horseman's Complex, the eastern Paseo de la Mesa trailhead, and George J. Maloof Memorial Airpark currently serve as primary trailheads in the area. The western Paseo de la Mesa trailhead is currently unimproved, but has a dirt parking lot accessible via a gravel road off of Atrisco Vista Boulevard. This is proposed as the fourth major trailhead in the core unit, offering connections east to the West Mesa Open Space and south to the Volcanoes Buffer. It is recommended this access road be paved when Atrisco Vista Boulevard is expanded, and that the OSD work with NMDOT to include this in the scope of work for the roadway expansion.

Note that some neighborhood access points access PETR but are categorized as such due to the characteristics of the entrances.

Additional recommended access points for Volcanoes Buffer are based on existing entrances and plans for the future multi-use bike path on Atrisco Vista Boulevard. Additional guidelines for Access Points can be found in Appendix B.



A bike rider on the Paseo de la Mesa Trail

Amenities

Amenities will be provided at each access point and vary based upon the size of the access point and the needs of each area. In the core area, many of the recommended access points already have well established facilities that will not need additional amenities which are as follows:

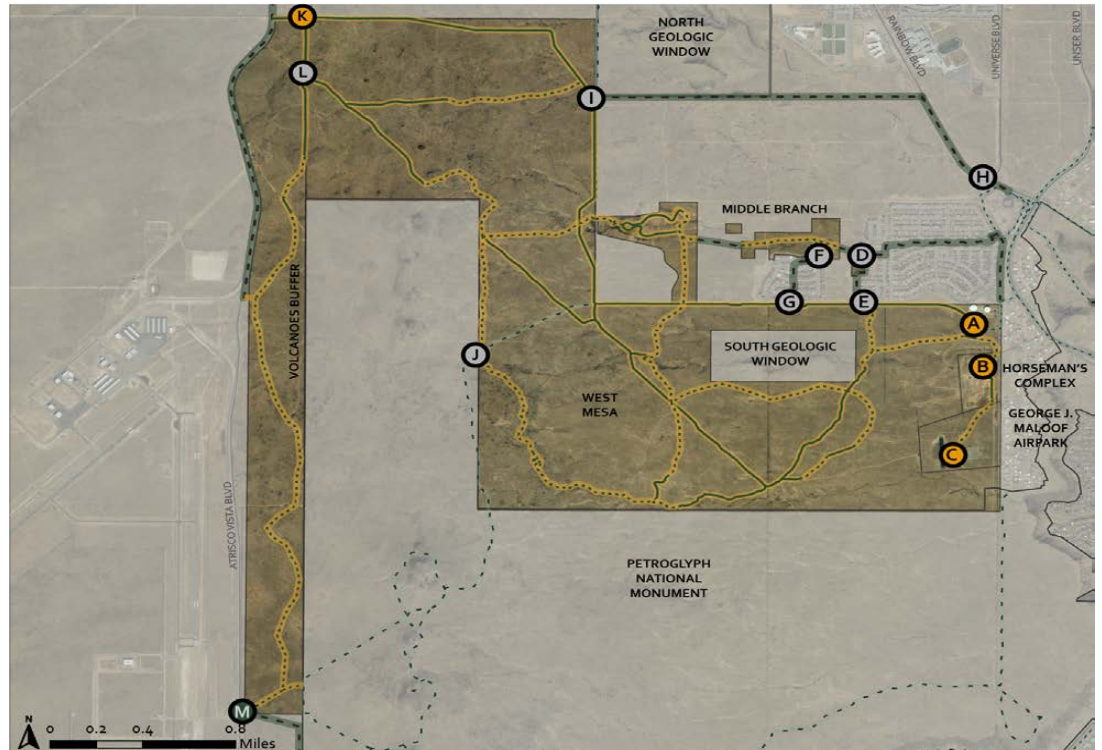


FIGURE 29. CORE AREA TRAIL AMENITIES

	Small Parking Area	Shade Structures	Restrooms	Bicycle Racks	Picnic Tables	Security Gates	Trailhead Entrance/Chicane	Rest Areas and Benches	Dog Stations	Trash Cans	Regulatory Signage**	Interpretive Panels**	Map Kiosk	Art Feature
CORE AREA														
A	E	R		R	R	E	E	R	E	E	E	R	R	
B*	R	R	E		R	E		R	R	R	R	R	R	R
C	E	E	E	R	E	E	R	E	E	E	E	E	R	E
D							R				R			
E							R		E	E	R			
F							R	R			R		R	
G							R		R	R	R			
H							R				R			
I							E				E			
J				R			R	R			R			
K	E	R		R	R	R	E	R		R	R	R	R	
L							R				R			
M	E			R	R	R	R	R		R	R	R	R	

E- Existing

R- Recommended

*Horseman's Complex will be the only trailhead with equestrian specific facilities recommended.

Trail/Road Closures and Reclamation Area

As mentioned above, there are numerous informal trails and old two-track roadways throughout the West Mesa Open Space units, most of which were user-created without considering long-term sustainability. To ensure longevity and prevent additional trail degradation, some trails will need to be closed using appropriate techniques identified below.

Key Closure Recommendations

1. Trails and roadways that enter or come close to Petroglyph National Monument and South Geologic Window
2. OVH trails, particularly those in the West Mesa area near Middle Branch
3. Unnecessary maintenance roads
4. Trails entering George J. Maloof airspace
5. Trails entering the Horseman's complex horse jump area
6. Trails that are severely eroded along and in arroyos

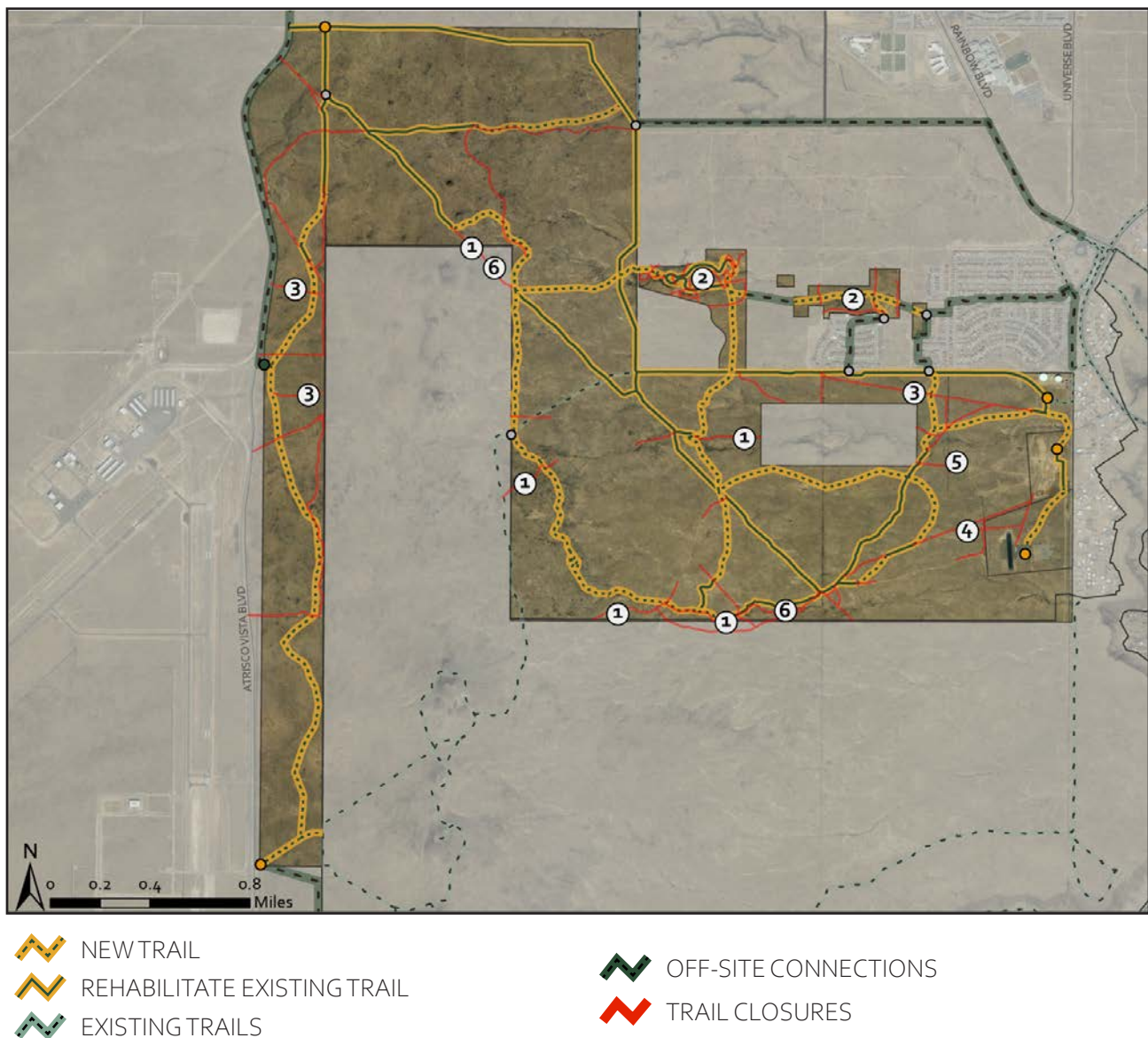


FIGURE 30. TRAIL CLOSURE CORE UNITS

Equestrian Trails

All trails will be multi-use, however some can be constructed to be better suited for equestrian use based upon length, surfacing type, and connection to La Boca Negra Horseman's Complex. A series of trail segments in the network could be used as a primary 4-mile equestrian trail loop starting at La Boca Negra Horseman's Complex. Horse-friendly trail surfacing like mulch-enlaced natural surface could be concentrated on these segments to encourage equestrian use. Although every trail in the Open Space is open to equestrian use, designing one looping trail starting at the Horseman's Complex will set a precedent for other trail users to anticipate horses on these trails specifically.

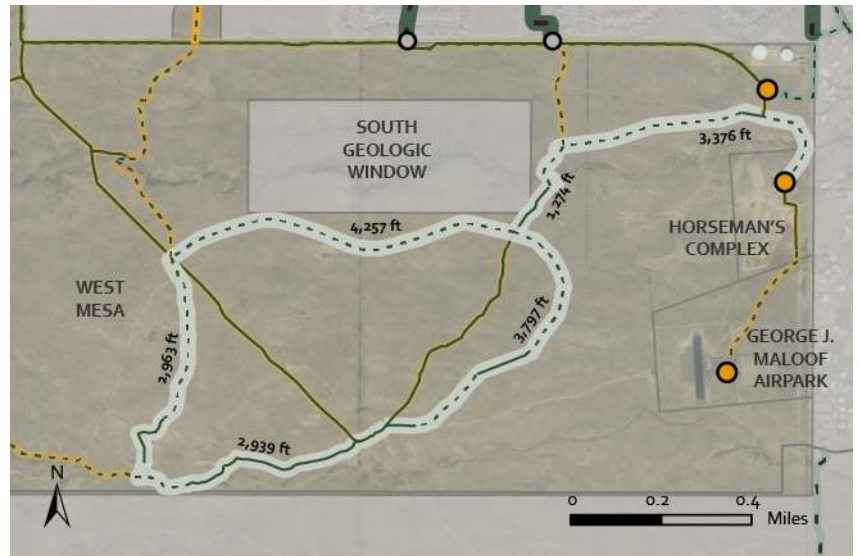


FIGURE 31. PROPOSED EQUESTRIAN TRAIL LOOP



FIGURE 32. TYPICAL EQUESTRIAN TRAIL SECTION

All trails in the West Mesa trail network will be open to equestrians, however, resources can be concentrated on some trail segments to better accommodate horses and create a better trail experience. Widths should be a maximum of three to four feet depending on the topography, and horizontal and vertical clearances become even more important to accommodate both horse and rider. If additional trail surfacing is added, aggregates should be smaller than half an inch to avoid injury to horses' hooves.

Land Acquisitions & Recreation Easements

Land acquisitions will be a key component of an integrated and strong trail network in the West Mesa Open Space. In some locations, land acquisitions and recreation easements can make key connections between open spaces, neighborhoods, and trails. The land acquisitions outlined below were identified based on future trail alignment needs, adjacent connections, and feasibility. These parcels are currently identified in the OSD's Priority Acquisition Book with the exception of the Boca Negra Dam to 81st Street connection.

Boca Negra Arroyo Middle Branch Parcels

There are several parcels that would make a stronger and more cohesive connection between West Mesa and Middle Branch and help protect the arroyo from future development impact. Together, approximately 31.9 acres in six parcels are included in the proposed the land acquisition. These acquisitions will help make a cohesive Open Space corridor, protect natural resources by reducing fragmentation, and provide more Open Space and trail connectivity for existing and future neighborhoods.

State Land Office Parcels

Located east of the Northern Geologic Window is 77.4 acres of land currently owned by the New Mexico State Land Office (see Figure 33 below). This land would help create stronger connections between the trail network and Volcano Vista High School as well as neighborhoods and future neighborhoods to the east. It also includes archaeological sites which could be better protected under local management. The City's attempts to purchase the property have thus far been unsuccessful, but the Open Space Division remains optimistic that a lease the entire parcel or recreation easement with the SLO will be possible in the future.

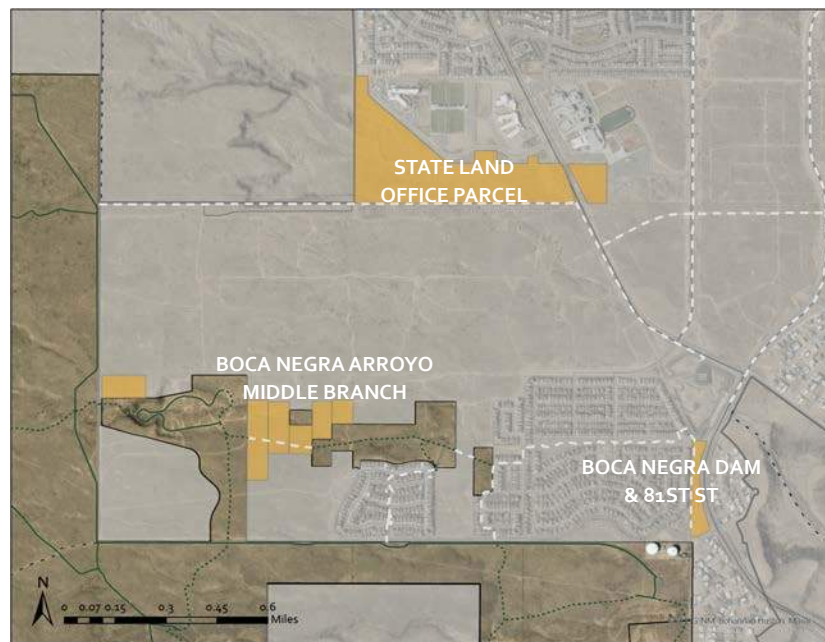


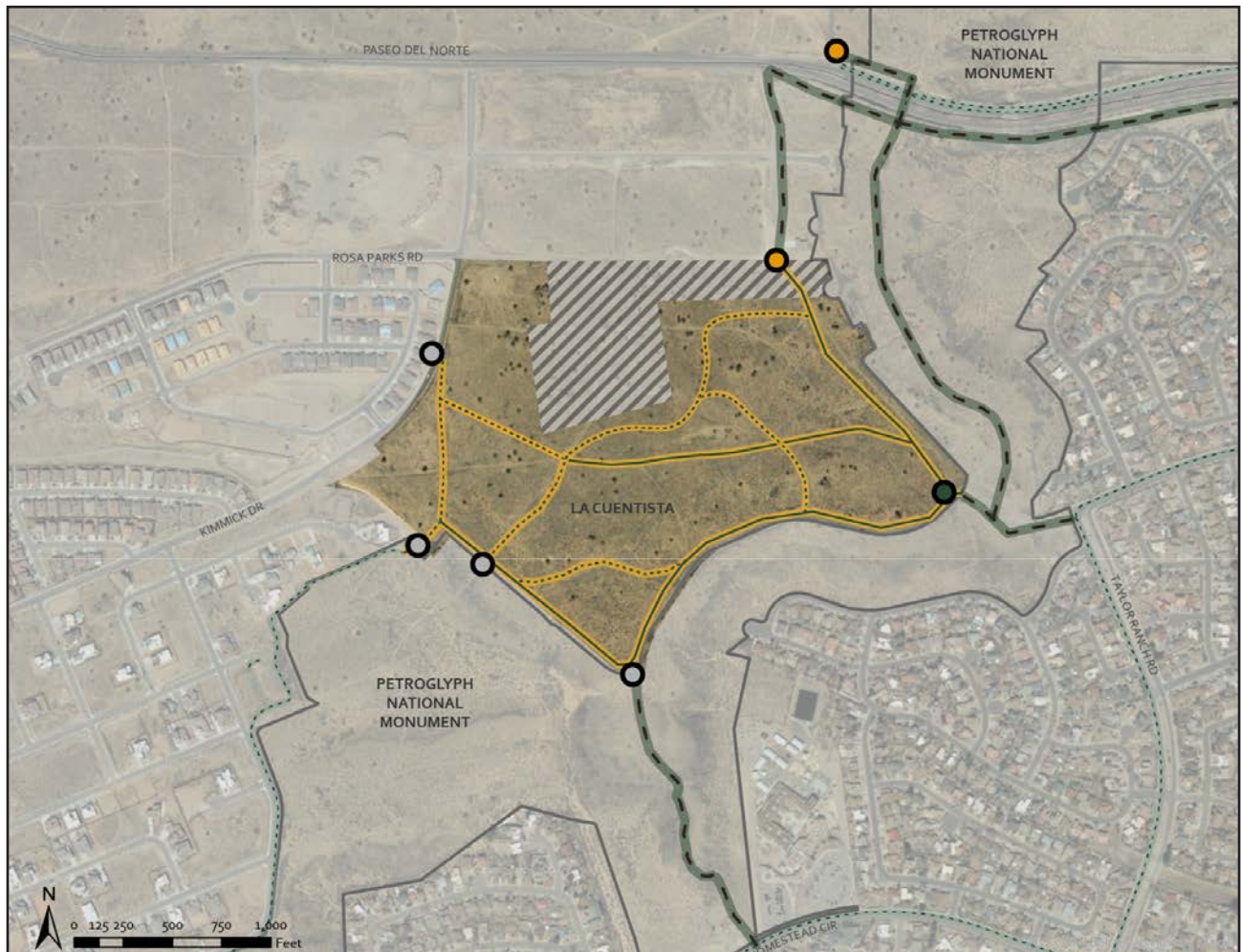
FIGURE 33. PROPOSED LAND ACQUISITIONS AND RECREATION EASEMENTS

Boca Negra Dam to 81st Street Connection

A significant but surmountable off-road trail gap was identified from the Boca Negra Dam south to 81st Street. A linear private parcel, undeveloped except for a PNM easement, is in the ideal location to make such a connection through a recreational easement. This would link the parking lot at the Boca Negra Dam to 81st street facilities including the Paseo de la Mesa Trailhead, the Horseman's Complex, and beyond as noted previously under Opportunities and Constraints.

NORTHERN OPEN SPACE UNIT (LA CUENTISTA)

La Cuentista is physically isolated from the central core of the West Mesa Open Space units connected only by the escarpment trail through adjacent Petroglyph National Monument. However, this unit is very accessible to surrounding residential housing and acts as a key connector to PETR. The Open Space Division is in the process of negotiating acquisition of the final parcel in this unit so the boundary, and thus recommended trail alignment, may change based on the final agreement. Recommendations made here are based upon existing acquisitions while noting acquisition areas under review.



80



-  NEW TRAIL
-  REHABILITATE EXISTING TRAIL
-  EXISTING TRAILS
-  OFF-SITE CONNECTIONS
-  PROPOSED MAJOR TRAILHEAD
-  SECONDARY ACCESS POINT
-  NEIGHBORHOOD ACCESS POINT

FIGURE 34. TRAIL ALIGNMENT NORTH AREA

Trail Alignments

Many existing trails, two-track roads, and existing access points will be utilized for this plan. Trail connectors will be added to better link to existing and planned access points. New trail will connect an existing NPS entrance at the east to a crusher fine trail at the west near Papagayo Road NW cul-de-sac. In addition, a new trail will connect the eastern NPS entrance to a proposed link to the Paseo del Norte land bridge to the north.

Access Points

There are seven access points for La Cuentista—three existing and four proposed points. Access points are noted in the amenities section (following page). Existing access points (A and B) are currently breaks in the fence with some regulatory signage. One existing access point (access point C) needs

improvements to reduce erosion and improve grading. The third existing entrance (F) connects to an existing crusher fine trail that enters the Monument.

Proposed access points are to the north and to the east of La Cuentista. The northern access point (A) will service the Piedras Marcadas unit of PETR and connect to the pedestrian land bridge crossing Paseo del Norte. This will depend upon a colocation agreement with City DMD and AMAFCA as the parcel is slated to become a stormwater runoff pond to accommodate future adjacent development.

Eastern access point G is in proximity to an existing sidewalk entrance to the neighborhood. Access point E will connect to another proposed trail extension by NPS. Detailed information can be found in Appendix B.



Land bridge across Paseo del Norte



Design proposal for major access point at the Paseo del Norte land bridge

Amenities

Due to the large number of new access points, quite a few amenities are recommended for the Northern Unit (La Cuentista). In addition, the area has more direct interaction with PETR entrances and needs to have appropriate signage and fencing to delineate the areas from each other. The amenity needs are as follows:



FIGURE 35. TRAIL AMENITIES NORTH UNIT

	Small Parking Area	Shade Structures	Restrooms	Bicycle Racks	Picnic Tables	Security Gates	Trailhead Entrance/Chicane	Rest Areas and Benches	Dog Stations	Trash Cans	Regulatory Signage**	Interpretive Panels**	Map Kiosk	Art Feature
NORTH AREA														
A	R	R		R	R	R	R	R	R	R	R	R	R	R
B	R	R			R		E	R		R	E	R	R	
C				R			E	R			R		R	
D							R				R			
E							R		R		R			
F							E		R	R	R			
G							R	R	R	R	R			

E- Existing

R- Recommended

Trail/Road Closures and Reclamation Area

The extensive network of existing user trails and two-track roads within La Cuentista can make wayfinding difficult. Closures should be conducted in tandem with new trail construction where feasible to minimize confusion and limit generation of informal trails. Closure of these sections using signage and revegetation is recommended where feasible.

Key Closure Recommendations

1. Trails and roadways that enter or come close to Petroglyph National Monument which do not connect to Monument trails
2. Unnecessary parallel or duplicate trails/two-track roads

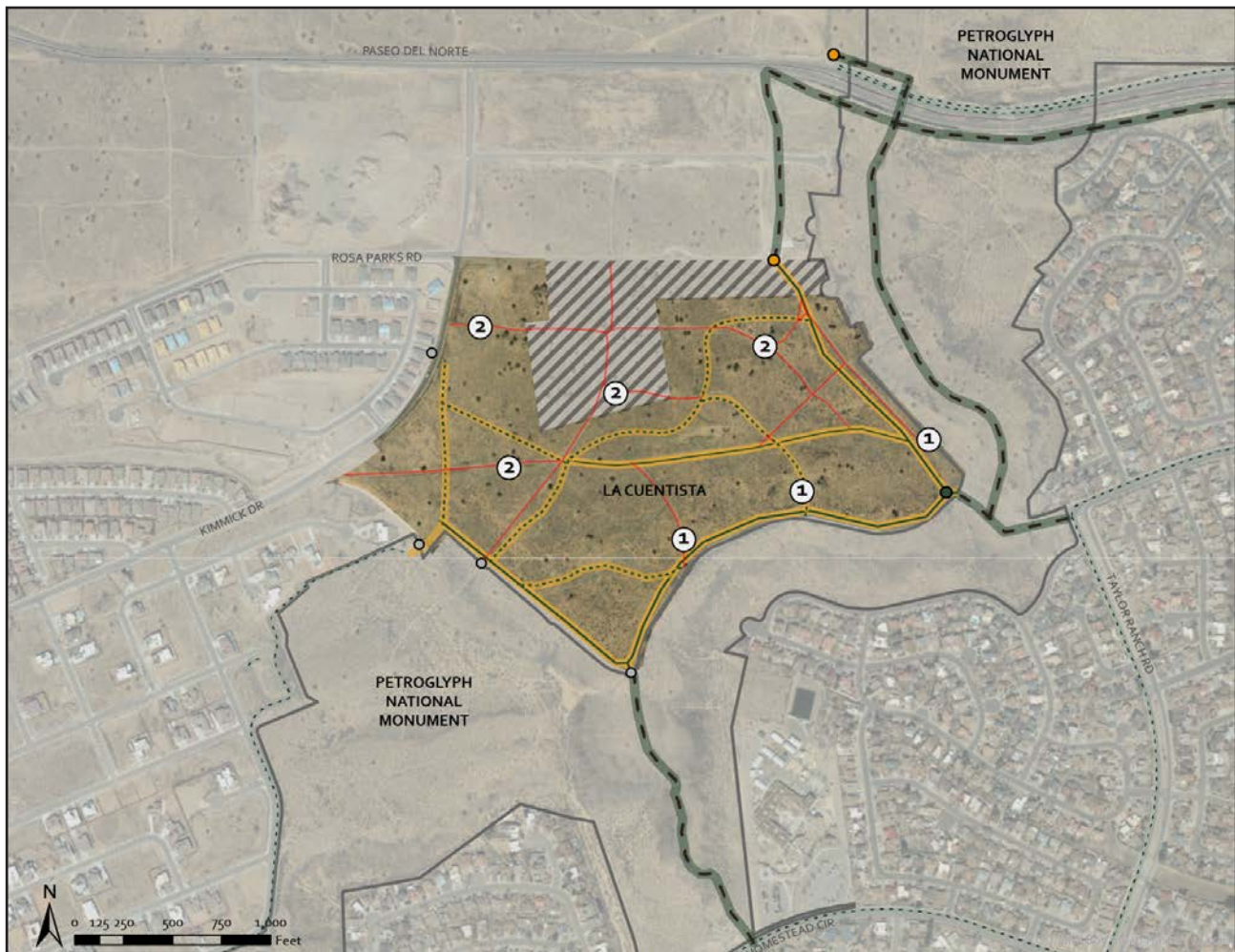
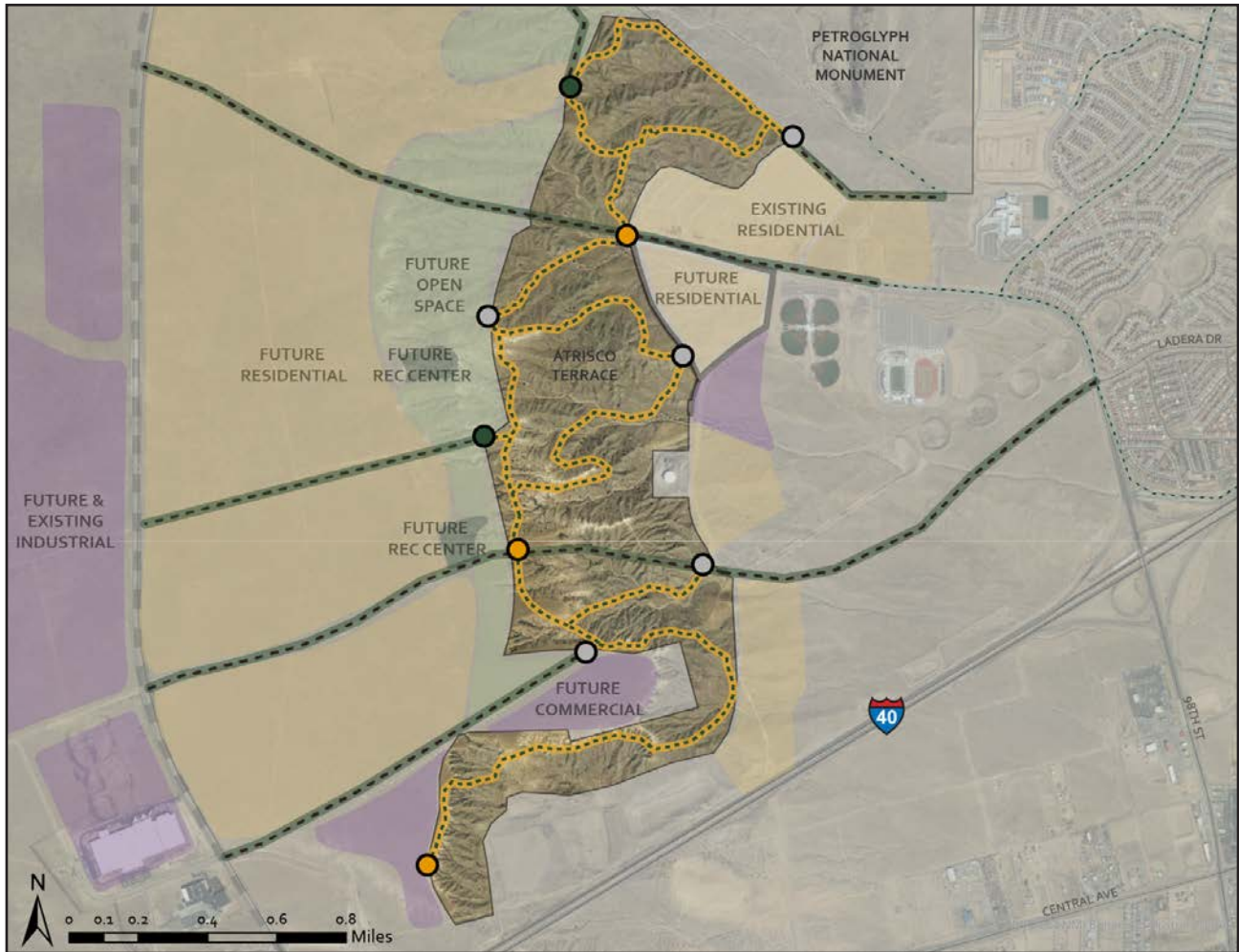


FIGURE 36. TRAIL CLOSURE NORTH UNIT

SOUTHERN OPEN SPACE UNIT (ATRISCO TERRACE)

No existing formal trails fall within this unit. Recommended alignments within Atrisco Terrace consist of new trails that use existing off-road vehicle tracks where possible, planned with consideration for proposed adjacent development and roadway expansion/extension projects. When trail design and construction begin, these alignments may need to be altered to accommodate the topography of Atrisco Terrace.



- | | |
|---|---|
|  NEW TRAIL |  MAJOR TRAILHEAD |
|  REHABILITATE EXISTING TRAIL |  SECONDARY ACCESS POINT |
|  EXISTING TRAILS |  NEIGHBORHOOD ACCESS POINT |
|  OFF-SITE CONNECTIONS | |

FIGURE 37. TRAIL ALIGNMENT SOUTH AREA

Trail Alignments

Trail alignment recommendations emphasize connecting to planned developments and providing looping opportunities while working with the hilly terrain. Trail loops are recommended between planned roadways, with access points located at the roadways and near connections to existing and future recreation facilities. Due to the hilly terrain and shorter loops, this unit will likely be favored by mountain bikers.

Access Points

Access points are located near planned roadway projects, recreation facility nodes, and private open space buffers. These nodes and buffers are included in the Upper Petroglyphs sector plan and will provide community recreational facilities and private open spaces to the surrounding residential development. The private open space between the Upper Petroglyphs development and Atrisco Terrace are proposed to eventually be donated to either Bernalillo County or City of Albuquerque Open Space. Spur trails will likely traverse this open space to connect to adjacent community nodes. Detailed information can be found in Appendix B.



Amenities

Atrisco Terrace will need more new amenities than any other area since very little development has occurred. This segment also has the most major access points which call for more extensive facilities. There are opportunities to share facility installation with Bernalillo County, National Park Service, and developers of the Upper Petroglyphs development.

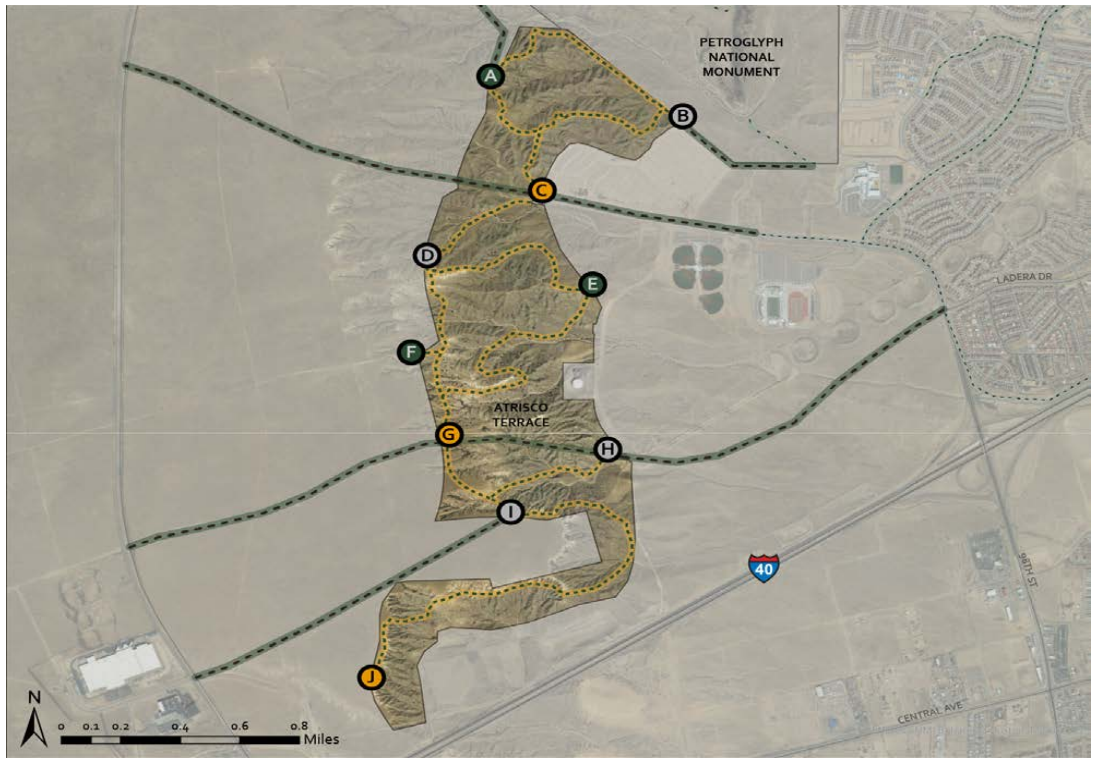


FIGURE 38. TRAIL AMENITIES SOUTH UNIT

	Small Parking Area	Shade Structures	Restrooms	Bicycle Racks	Picnic Tables	Security Gates	Trailhead Entrance/Chicane	Rest Areas and Benches	Dog Stations	Trash Cans	Regulatory Signage**	Interpretive Panels**	Map Kiosk	Art Feature
SOUTH AREA														
A		R		R	R		R	R	R	R	R	R	R	
B							R				R			
C	R	R		R	R	R	R	R	R	R	R	R	R	
D							R				R			
E					R		R	R	R	R	R			
F							R		R	R	R		R	R
G	R	R			R	R	R	R	R	R	R		R	
H							R		R	R	R			
I							R		R	R	R			
J							R		R	R	R		R	

E- Existing
R-Recommended

Trail/Road Closures and Reclamation Area

Currently, there are no formal trails in Atrisco Terrace; however, there are numerous two-track roads and informal trails over steep terrain. Some two-track roads are located within arroyos or along steep inclines, which presents the potential for further erosion. Closure of these sections using signage and revegetation is recommended where feasible.

Key Closure Recommendations

1. Trails and roadways that enter or come close to Petroglyph National Monument which do not connect to Monument trails
2. Trails with unsustainable grade or risk for further degradation
3. Informal trails running through arroyos
4. Two-track roads that are too steep to be sustainable

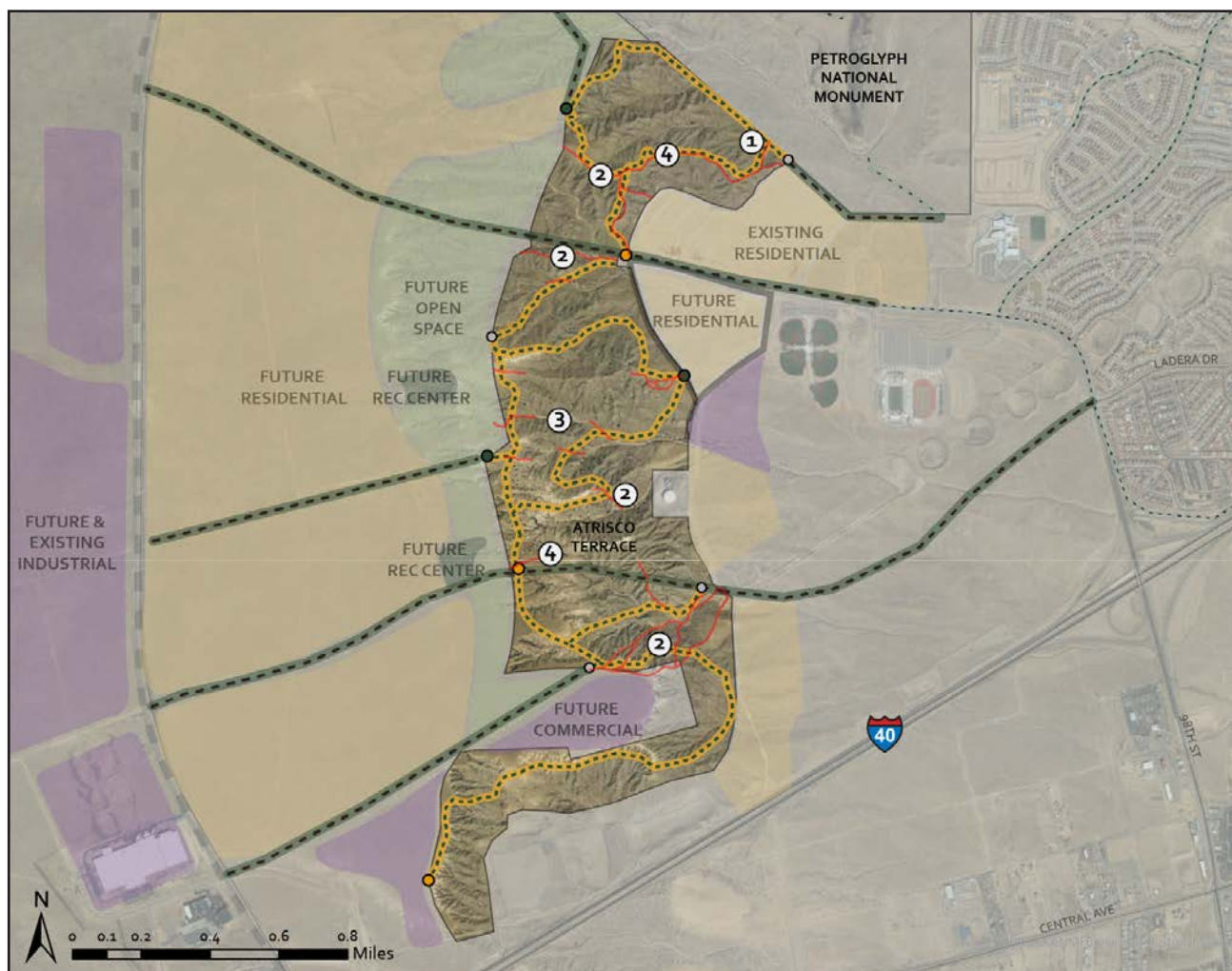


FIGURE 39. TRAIL CLOSURE SOUTH AREA

Land Acquisitions & Recreation Easements

Atrisco Terrace

The Upper Petroglyph Sector Plan outlines parcels set aside for private open space which, once constructed, may be transferred to either the City or County and maintained as public Open Space. It is recommended that the City add these parcels to their Priority Acquisition Book. However, if acquired by the County, the City of Albuquerque should pursue a partnership managing this area in order to provide seamless transitions to Atrisco Terrace trails and a cohesive network. Currently, there is an existing two-track road that can be formalized into a trail to make this connection. However, more evaluation of this section would be needed to develop a sustainable trail.

The entire trail network would also greatly benefit from a recreational easement through the linear area identified as private open space around the southwestern border of PETR if it is not included in the potential transfer to public land. If the topography allows for a sustainable trail, this would create a connection between Atrisco Terrace Open Space and the core West Mesa units via the Volcanoes Buffer.

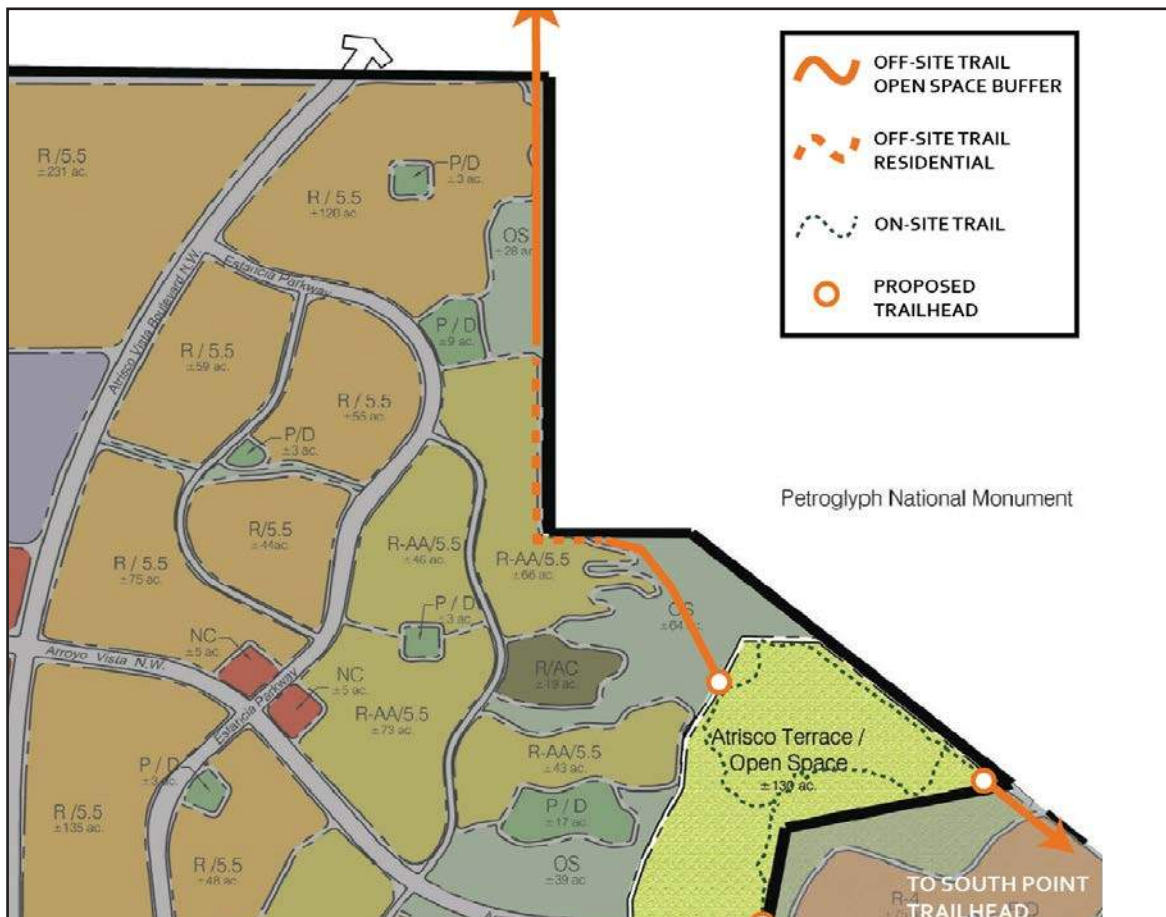


FIGURE 40. UPPER PETROGLYPHS PRELIMINARY DEVELOPMENT CONCEPT

TRAIL TYPES AND SURFACING

To accommodate a wide range of user types and levels of mobility, and to respond to the surrounding conditions, a variety of trail types may be used throughout the West Mesa Open Space network. Trails implemented under this plan should be sized to accommodate anticipated levels of use and surfaced with durable materials to maximize accessibility and reduce maintenance. Suggested parameters for each type of trail are described in the following sections. However, it should be noted that these are only guidelines, and may be adjusted, as necessary, during design. Trail designers are also encouraged to refer to the current version of the AASHTO Guide for the Design of Bicycle Facilities for guidelines on relevant facilities.

Shared-Use Trail / Hiking Trail / Natural Surface

Open Space trails typically consist of natural surfaces. Depending on the underlying ground type, surfacing materials may be desirable to improve stability and reduce erosion. Exact locations of natural surface trails are subject to adjustment pending field conditions including the presence of artifacts, slope, and other sustainable trail design guidelines as defined by the International Mountain Bicycling Association.

In cases where the OSD determines that an ADA accessible trail is feasible, a surface of stabilized or compacted small aggregates such as decomposed

granite or gravel screenings/crusher fines will provide a durable surface that can be used by a variety of users, including maintenance equipment, without causing damage to the surface. The addition of stabilizers to these materials will help them meet accessibility requirements and resist erosion.

Selected existing informal trails will be rehabilitated to meet new trail standards and integrated into the trail network. Some of these trails will need to be widened and compacted while others will need to be narrowed or closed completely.



FIGURE 4.1. SHARED-USE NATURAL SURFACE TRAIL SECTION

New Trail Considerations

New trails may be proposed by Open Space staff or members of the public. Proposals will be evaluated by Open Space staff for feasibility with the following criteria in mind:

- Sustainability
- Connectivity
- Impact on archaeological resources
- Impact on wildlife
- Impact on native plants
- Proximity to private property

The Open Space Superintendent has the authority to approve or deny the proposed trail.

Reasons to Consider New Trails

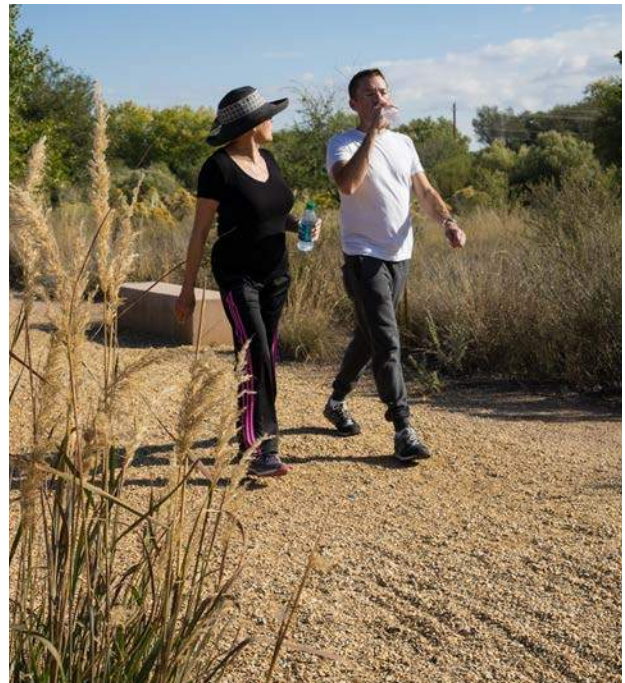
- Disperse visitor use – when trail systems become crowded, new trails may alleviate the congestion.
- Add points of interest (scenic overlooks, interpretive opportunities)
- Improve flow of trail system

Trail Reroute Considerations

A trail reroute is a new section of trail that replaces an existing section of trail. Existing trails may be rerouted for a variety of reasons including:

- The trail is too steep and erosion is present
- There is poor drainage and the trail is turning into a rut that conveys water
- The trail frequent requires maintenance
- Maintaining the existing trail involves more work than building a new sustainable trail
- The trail is damaging, or in danger of damaging an archaeological site
- Poor line of site which leads to user conflict
- The trail is too close to private property

Trail reroute proposals will be evaluated using the same criteria for evaluating a new trail and can be approved or denied by the Open Space Superintendent.



Sustainable Trails

The National Park Service defines a sustainable trail as a trail that:

- Supports current and future use with minimal impact to the area's natural system
- Produces negligible soil loss or movement while allowing vegetation to inhabit the area
- Recognizes that pruning or removal of certain plants may be necessary for proper maintenance
- Does not adversely affect the area's animal life
- Accommodates existing use while allowing only appropriate future use
- Requires little rerouting and minimal long-term maintenance

To summarize, a sustainable trail is a trail that is designed and built to minimize erosion and maintenance, while accommodating the appropriate visitor use.

Creating Sustainable Trails

The Open Space Division has adopted trail design standards developed by the International Mountain Bicycling Association. These standards have also been recognized by the United States Forest Service and can be found in many trail building reference books. Some elements of sustainable trails include:

The Half Rule. The half rule states that the grade of a trail should be no more than half the grade of the hillside that it is being built on. If a trail is built on a hillside with a 10 % side slope, then the maximum grade of the trail should be 5% or less.

Outslope. The trail tread should be outsloped. That is, the uphill side of the trail tread should be higher than the downhill side of the trail to encourage sheet flow across the trail and off the tread. If a trail is in-sloped, u-shaped or v-shaped water will run down the middle of the trail and cause erosion. To help maintain an outslope, and proper drainage, a trail should be located on a side slope of hill.

Avoid building in flat areas. Trails located in flat areas will become lower than either edge of the trail tread. This means water cannot drain off the trail and will collect and convey water and the trail will turn into a rut.

Avoid fall line trails. Fall line trails often follow the shortest route down a hill. This is essentially the path of least resistance for water. Once water starts channeling down the trail, the trail will begin turning into a rut.

Managing Sustainable Trails

It is impossible to turn an eroded, unsustainable trail into a sustainable trail. The only way to accomplish this is to reroute the trail and follow sustainable trail design standards. It is possible to turn an unsustainable trail into a maintainable trail through the use of drain dips, also known as grade reversals; however these features require time and effort to build and also require regular maintenance. The amount of work needed to build the required amount of drain dips and the amount of work to needed maintain the drain dips should be weighed against the amount of time, effort and impact needed to build a sustainable reroute and close and reclaim the eroded section of trail.

Shared-Use Trail / High-Traffic Areas / Administration Roads

Two-track administrative roads exist throughout the West Mesa Open Space units. Many are PNM easements, the most prominent of which run diagonally across the West Mesa unit and PETR. Some of these roads must be maintained for administrative purposes but many can be closed and revegetated. Along road corridors where high levels of use are anticipated, trails should be monitored and regraded when needed. In order to facilitate

multi-use, grading and check dams should be used to slow and capture drainage water. In select areas where the condition of the roadway is too eroded for trail users, an adjacent secondary trail can be constructed. This adjacent trail will be a primitive single-track and will be used sparingly along this alignment.

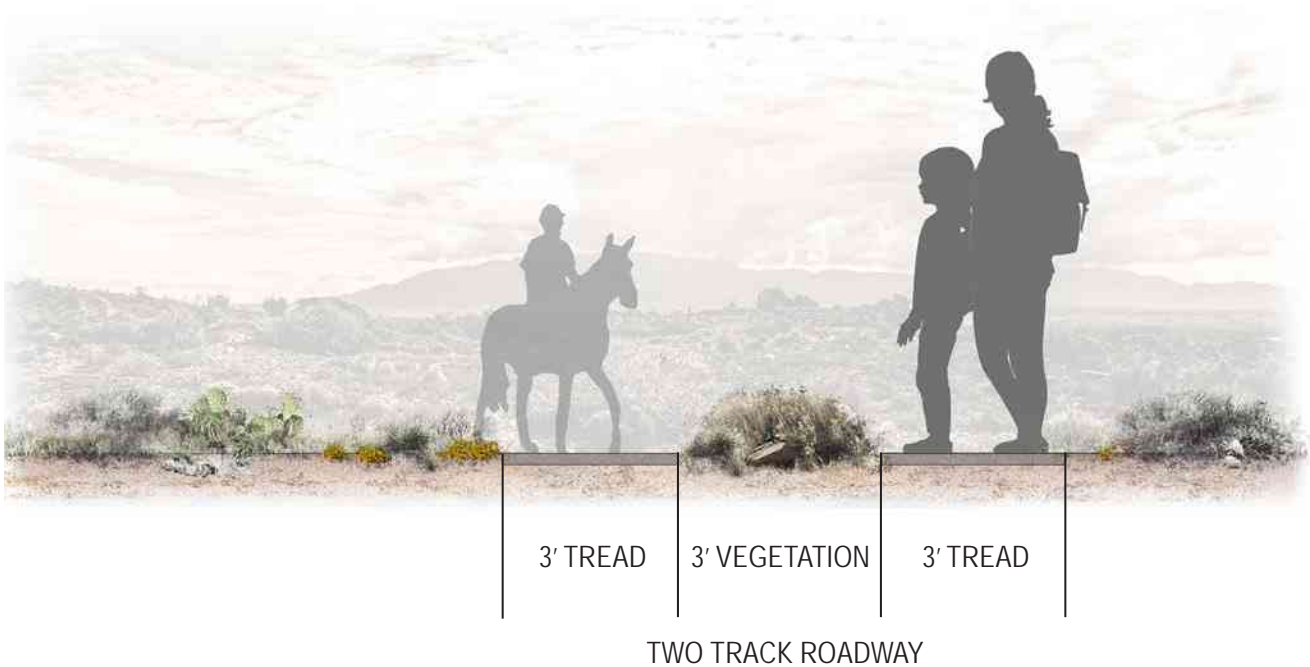


FIGURE 42. SHARED-USE ADMINISTRATION ROAD TRAIL SECTION

On-Street Surfacing

Where connections are needed through existing neighborhoods or other areas where existing development precludes the implementation of separate shared-use trail facilities, on-street connections may be the only option. By combining safe bicycle facilities with functional, ADA-accessible sidewalks and clear wayfinding signage, such routes can accommodate nearly all users (with the exception of equestrians) and provide an effective connection between Open Space units and to other facilities. For low-volume residential streets, few improvements beyond wayfinding signage may be required, while for busier collector streets, the addition of bike lanes will help to better define the route.



An example of on-street signage to guide people to trailheads and access points

OFF-SITE CONNECTIVITY RECOMMENDATIONS

As noted above, to create an effective trail network that connects the discontinuous Open Space units, the system will require off-site improvements. This section highlights off-site trail sections identified during the engagement process, research, and regional plan review.

Roadway and Bikeway Connections

These connections include currently planned bike lane and path construction, new trails along existing road corridors where sufficient width exists, and recommended on-street bike improvements and/or enhanced sidewalk connections in neighborhoods where trail construction is not feasible.



This map shows off-site connections that are in the planning process now (solid lines) and off-site connections that are recommended but either not in existing plans or are in transportation plans not yet in the implementation process (dashed lines).

- EXISTING TRAILS
- PLANNED OFF-SITE CONNECTIONS
- PROPOSED OFF-SITE CONNECTIONS

FIGURE 43. PROPOSED ROADWAY AND BIKEWAY CONNECTIONS

CONNECTIONS TO CORE AREA

Paseo del Norte Expansion and North Geologic Window

Paseo del Norte is a primary cycling roadway that lacks on-road bicycle facilities west of Calle Nortena. Extending off-street bicycle facilities to connect to Atrisco Vista Boulevard would greatly improve the overall safety and connectivity of the City of Albuquerque bicycle network. This expansion is partially included in the Unser Boulevard widening project east of Paseo del Norte.

In addition, improvements to the unpaved roadway connecting Paseo del Norte to the Northern Geologic Window trailhead is greatly needed. Extensive cleanup of a dumping site, roadway improvements, and trail amenities are needed to make the Northern Geologic Window multi-use trail more easily accessed by the public and managed by PETR.



West Mesa & Northern Geologic Window to Rainbow Boulevard

This proposed roadway would provide connectivity to the West Mesa Open Space and Northern Geologic Window from Rainbow Boulevard and the Boca Negra Dam trail. This trail connection is a long-term goal and may need adjustment as housing development trends south of the Northern Geologic Window.



Montecito Community to Middle Branch

A mixture of on-site and off-site trails and sidewalks could create stronger connections between West Mesa, Middle Branch, and the Montecito neighborhood. Signage, trail amenities, and four neighborhood access points are needed to create these connections.



-  PROFILED OFF-SITE CONNECTION
-  ADJACENT OFF-SITE CONNECTIONS

CONNECTIONS TO NORTH AREA

La Cuentista to Paseo del Norte Land Bridge

Adding a roughly 1,000-foot trail connection from Paseo del Norte to Calle Nortena Drive would leverage several other existing and proposed facilities to create an effective network of trail connections into and through the La Cuentista unit. Connections through PETR are pedestrian only. There are multiple needed connections, some existing and some proposed through the Monument. As shown at right, connection (A) will link Homestead Circle to La Cuentista through Petroglyph National Monument. Another segment (B) will connect from an existing entrance and go east of La Cuentista through the Monument, connecting to Paseo del Norte. Finally, expansion of the paved trail 400-foot trail along Paseo del Norte (C) from its current terminus will connect to a proposed trailhead near the Paseo del Norte land bridge.



-  PROFILED OFF-SITE CONNECTION
-  ADJACENT OFF-SITE CONNECTIONS

Rosa Parks Road

The City of Albuquerque's Bikeways and Trails Facilities Plan identifies bike lane construction as a requirement at full build-out along the length of Rosa Parks Road. The proposed bike lane will connect La Cuentista to Unser Boulevard through the upcoming residential neighborhood. Rosa Parks is a key connector between the proposed major trailhead to West Mesa Open Space.

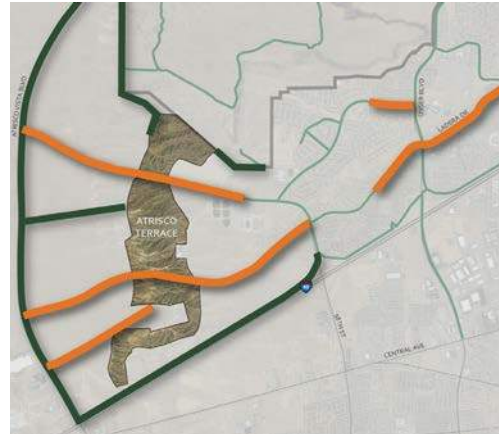
Unser Boulevard

The City's Santo Domingo Trail exists as a nicely separated multi-use path along Unser Blvd from Vulcan Road to Atrisco Drive, just north of Montano, where it turns off and continues to Mojave Street. Expanding this path along Unser north to Rio Rancho would provide numerous connections, including to the Calabacillas Arroyo Open Space, and create a stronger bikeway network on the west side. Additional road treatments, such as pavement markings, signage, and/or physical delineation (curbs or post markers) could make the existing wide shoulders more bike-friendly.

CONNECTIONS TO SOUTH AREA

Atrisco Terrace Roadways

Approximately 6.5 miles of planned roadways will go through Atrisco Terrace from east to west, some of which are extensions of existing roadways. Arroyo Vista NW and Ladera Boulevard are the primary roadway expansion projects that could provide access to the surrounding trail network to adjacent neighborhoods. Roadway projects should include on-street/off-street bike facilities and road crossings. Expansion of these roadways will provide an opportunity to develop trailheads during their construction.



Volcanoes Buffer to Atrisco Terrace

Approximately two miles of trail through Upper Petroglyph’s private open space would complete the connection between Volcanoes Buffer and Atrisco Terrace Open Space. This connection would run along the southwest boundary of Petroglyph National Monument to the east and north and require few, if any, road crossings. This could be accomplished either through a transfer of land to OSD, or via a new facility developed as part of the subdivision improvements.



Atrisco Vista Boulevard Expansion

NMDOT plans to expand approximately 3.5 miles of Atrisco Vista Boulevard from two to four lanes with additional bicycle facilities. The first segment of the project from I-40 to the Double Eagle II Airport entrance road will feature the 4-lane expansion and an on-road striped bike lane. The second segment between the Double Eagle II Airport to its northern terminus at Southern Boulevard will also include an off-road 10-foot bike trail in addition to the bike lane. These bike facilities will provide a safer experience and potential connections to the West Mesa trail network and should be considered in tandem. Amenities, access points, and trail connections are included in the on-site recommendations with the intention of connecting to this roadway project.



-  PROFILED OFF-SITE CONNECTION
-  ADJACENT OFF-SITE CONNECTIONS

PETROGLYPH NATIONAL MONUMENT CONNECTIONS

These recommendations will provide better connections to and through Petroglyph National Monument from the West Mesa trail network while preventing access by unauthorized user groups.

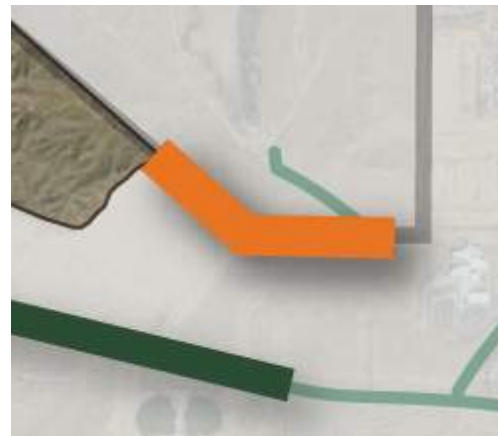
Boca Negra Canyon Trail Connector

Two thousand feet of paved trail are needed to connect the Boca Negra trail, located south of Boca Negra Canyon to the Mariposa Basin Recreational Trail. Currently, there is a social trail that runs north of neighborhood homes which acts as an informal connector. Paving this small section will provide a key connection for both the recreation and transportation trail network. This is within Petroglyph boundaries and was identified by NPS as a potential connector trail.



Atrisco Terrace to South Point

Constructing 2,700 feet of trail between Atrisco Terrace and PETR's South Point trailhead would make another strong connection for the Inspiration and other nearby neighborhoods to Atrisco Terrace. This connection could potentially be made using the open space buffer between the housing development and Petroglyph National Monument as a trail corridor. Sidewalks with signage could also guide residents to the trailheads.



La Cuentista to Petroglyph National Monument to Cimarron Hill/Homestead Hills

1,600 feet of natural surface trail is needed to connect La Cuentista to the Chamiza Elementary School through Petroglyph National Monument. This connection will provide access to the adjacent community and school through the Monument. This trail connection is also mentioned above as a north area trail connection.



-  PROFILED OFF-SITE CONNECTION
-  ADJACENT OFF-SITE CONNECTIONS

ROAD CROSSINGS

Trail recommendations within City Open Spaces can be further strengthened by connections to adjacent neighborhoods, open spaces, and community facilities using existing roadways and trails. Some road crossings will need improvements to ensure safety for all users using the trail network.

Crossing recommendations on the following pages are made based upon location and anticipated traffic volumes. Criteria for road treatments are based on Federal Highway Administration guidelines, including the Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, *STEP: Improving Visibility at Trail Crossings*, and the City of Albuquerque Development Process Manual. These resources help provide recommended roadway treatments to facilitate a safe and welcoming crossing for pedestrians.



○ ROAD CROSSINGS **—** RECOMMENDED OFF-SITE CONNECTIONS

FIGURE 44. ROAD CROSSING LOCATIONS

There are two types of road intersections on the roadways—low volume and moderate/high volume crossings. The crossings are as follows:

No.	Road	Crossing Type	Unit Accessed	Potential Roadway Treatment
1	Vista Vieja Ave NW at Mete Sol Dr NW	Low volume	West Mesa	At-grade crosswalk with signage; raised crosswalk;
2	Molten Rock Rd NW at 81st St	Low volume	West Mesa	At-grade crosswalk with signage; raised crosswalk;
3	Arroyo Vista Blvd	Moderate/High volume	Atrisco Terrace	At-grade crosswalk with signage; raised crosswalk; median refuge island; rectangular rapid flashing beacon; or pedestrian hybrid beacon crossing
4	Ladera Dr NW	Moderate/High volume	Atrisco Terrace	At-grade crosswalk with signage; raised crosswalk; median refuge island; rectangular rapid flashing beacon; or pedestrian hybrid beacon crossing
5	Paseo del Norte at Calle Nortena	Moderate/High volume	Piedras Marcadas Canyon	Full traffic signal crossing; grade separated crossing

Low Volume

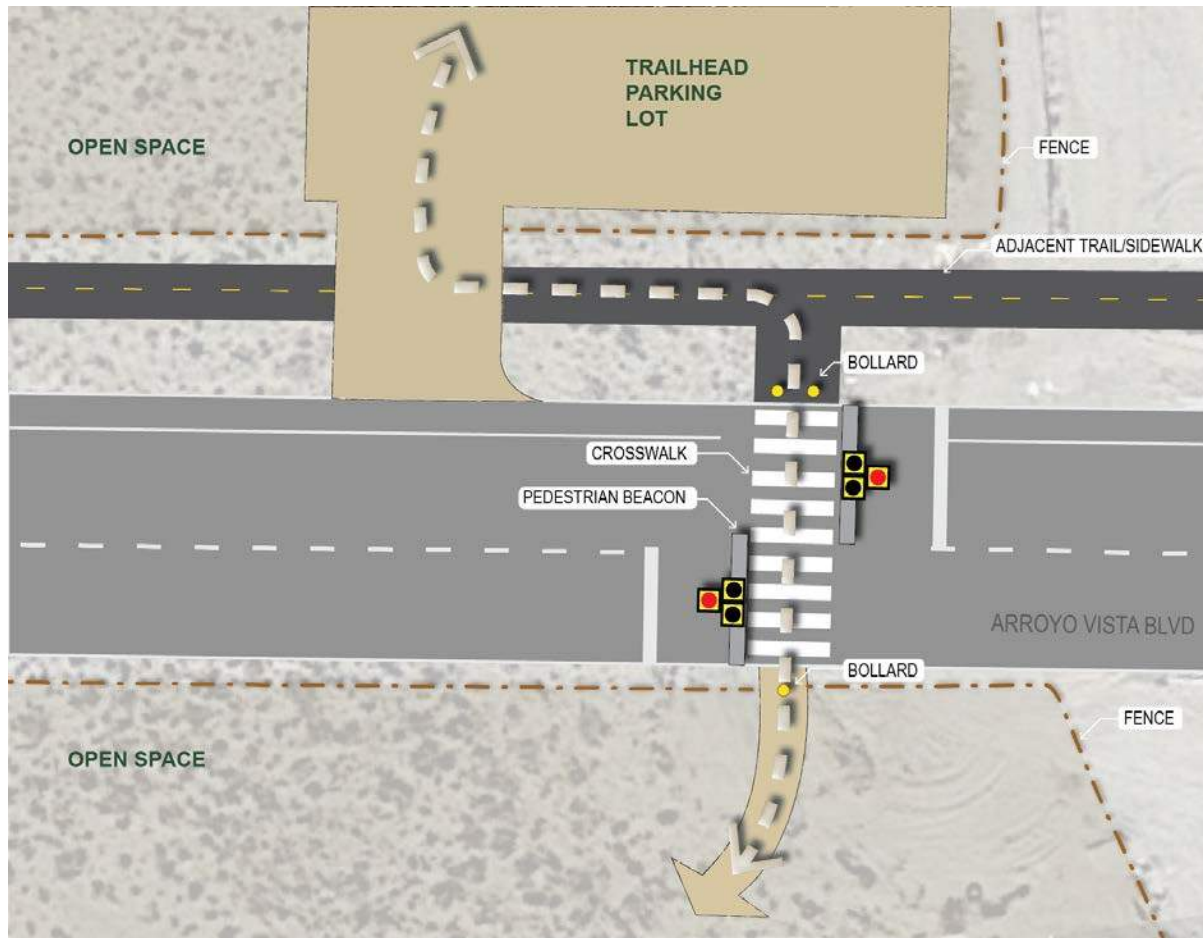
Low volume local roads will not need extensive treatments but could benefit from additional signage and crosswalk striping to increase visibility for pedestrians and bicyclists. These recommendations apply to crossings at Vista Vieja Avenue and Molten Rock Road which both access West Mesa Open Space.



FIGURE 45. ROAD CROSSING AT VIEJA VISTA AVE

High/Moderate Volume

Major Urban Collectors and Minor Urban Arterials can both expect higher traffic volumes than local roads and therefore could benefit from additional bike/pedestrian facilities. In addition to signs, these crossings could utilize several types of traffic control treatments. Some options include marked crosswalks with signage, raised crosswalks, median refuge islands, rectangular rapid flashing beacons, or pedestrian hybrid beacon crossings. These recommendations apply to crossings at Arroyo Vista Boulevard and Ladera Drive.



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FIGURE 46. ROAD CROSSING AT ARROYO VISTA BLVD

PEDESTRIAN BRIDGE CROSSINGS

In some instances with high traffic volume, additional roadway treatments could include a full traffic signal crossing, a grade separated crossing, or a complete reroute to cross at a nearby lower volume roadway. Fortunately, the only crossing this applies to is at Paseo del Norte Boulevard which already has a pedestrian bridge in place at Calle Nortena to make safe crossings. Trail users will be directed to this roadway crossing via trail connections through Petroglyph National Monument and sidewalks along Calle Nortena.



TRAILHEADS AND ACCESS POINTS

Major Trailheads

Major trailheads will be the primary entrance points for the West Mesa trail network. These trailheads will provide the most amenities and facilities to support a high volume of visitors and a variety of user groups. Some major trailhead entrances currently exist but many are in need of upgrades, additional amenities, and spur trail connections to the expanded trail network. Of the nine identified major trailheads, four are newly proposed trailheads and five are existing.

One such facility is a detention basin proposed on a DMD parcel on the north side of Paseo del Norte and Calle Norteña, just above the escarpment and adjacent to the west of Piedras Marcadas in the Monument.

This City-owned tract has also been identified as a potential trailhead and access point to PETR, and a joint development is recommended.

-  EXISTING ACCESS POINT
-  PROPOSED ACCESS POINT

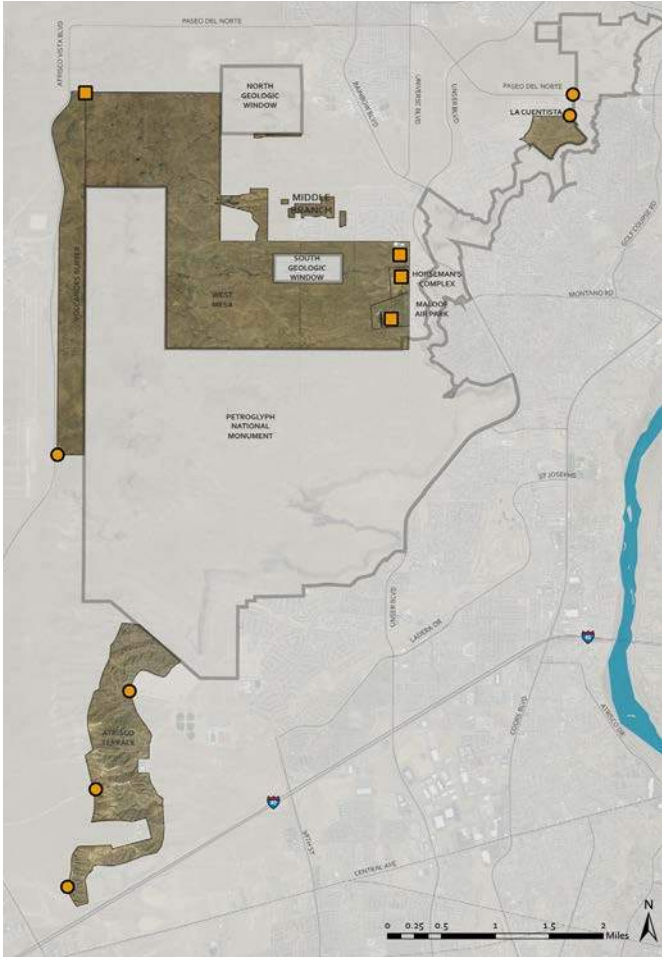


FIGURE 47. MAJOR TRAILHEADS

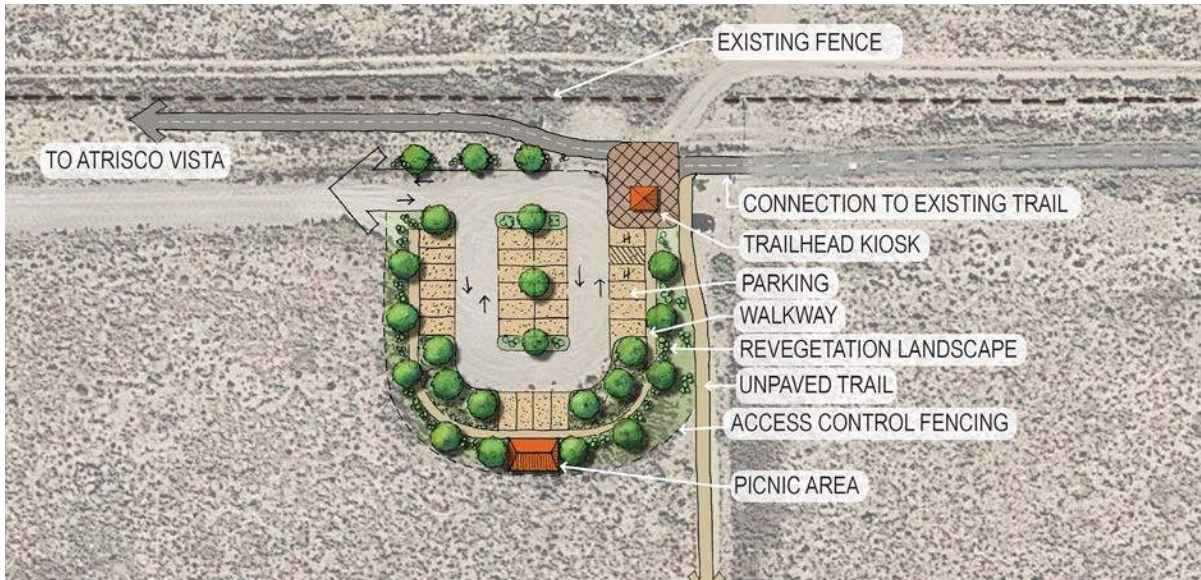




FIGURE 48. EXAMPLE MAJOR TRAILHEAD

Secondary Access Points

Secondary access points are smaller and do not have as many amenities and facilities as major trailheads. Some already exist and may simply need additional services or renovations. These secondary access points typically don't include parking lots but would have more amenities and potential for interpretation panels than neighborhood access points. For more information, refer to Appendix B.

-  EXISTING ACCESS POINT
-  PROPOSED ACCESS POINT

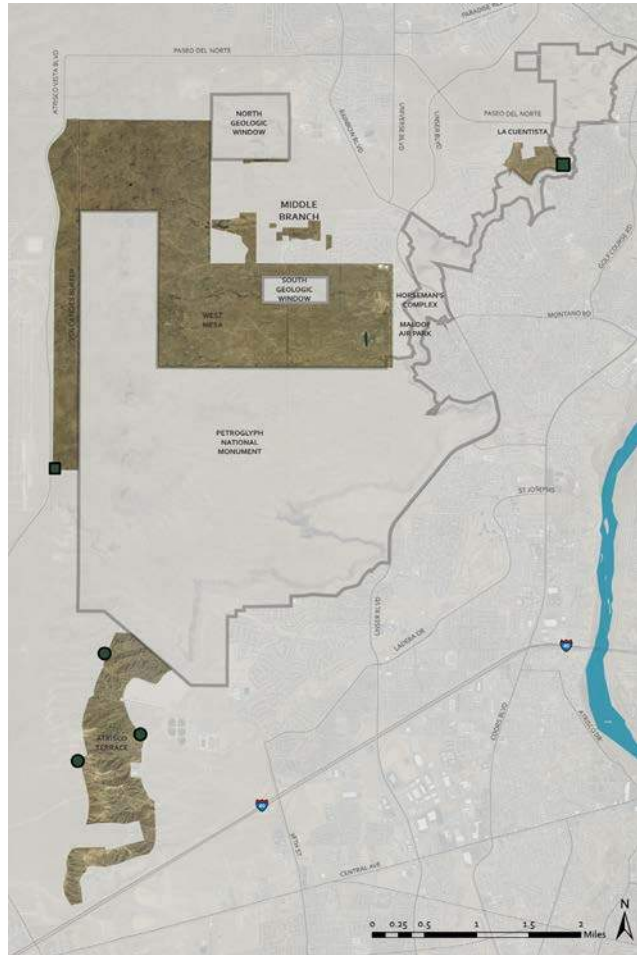


FIGURE 49. SECONDARY ACCESS POINTS

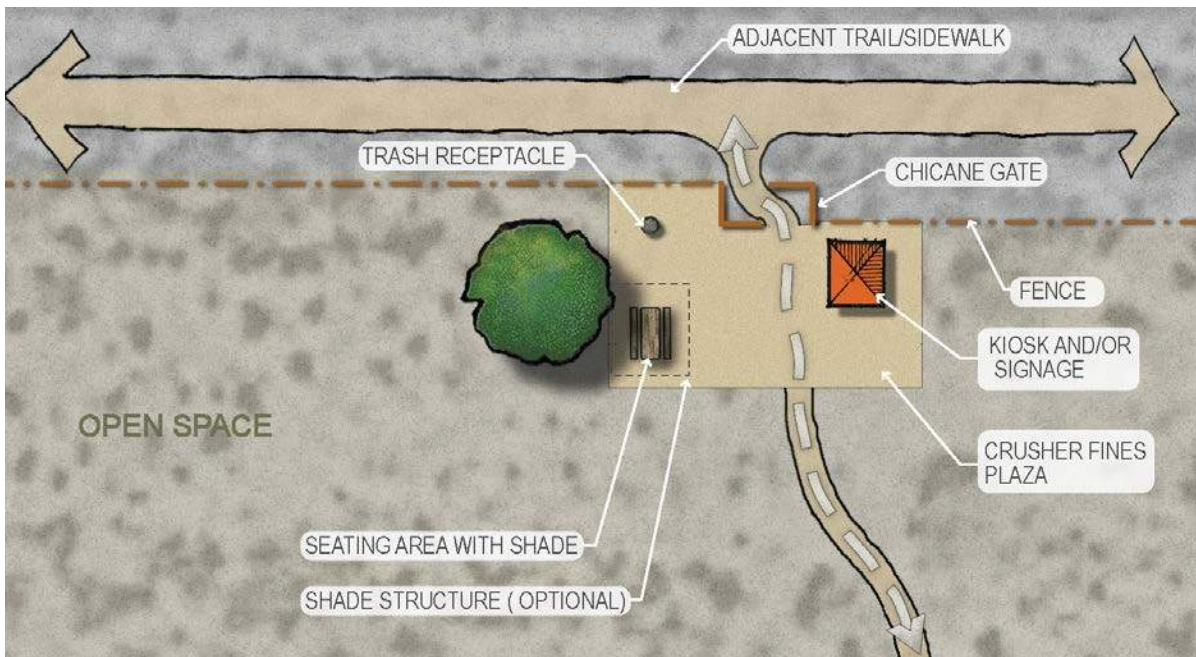
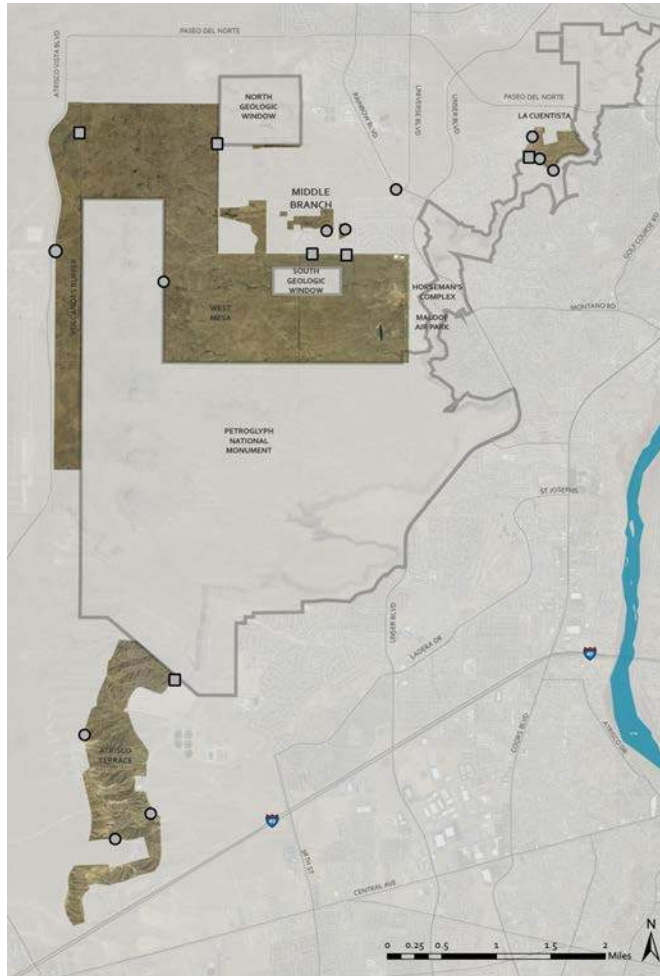


FIGURE 50. EXAMPLE SECONDARY ACCESS POINT

Neighborhood Access Point

Neighborhood access points are the most prevalent and require the least amount of amenities and infrastructure. These entrances will primarily only require a break in the fence and proper signage. Some entrances may need additional fencing and gates to ensure the intended users are able to access these trails.



- EXISTING ACCESS POINT
- PROPOSED ACCESS POINT

FIGURE 51. NEIGHBORHOOD ACCESS POINTS



Existing neighborhood access point

FENCING NEEDS

Because the West Mesa Open Space covers a large area, fencing every unit presents a challenge for OSD. Fencing priorities should focus on areas where it will be most effective and will meet the land management goals of Open Space and NPS. Below are guidelines to help identify areas in need of fencing and some specific areas where fencing may be needed. Note this is not a comprehensive list and some areas not identified below may be identified in future field assessments. Coordinate with NPS, Bernalillo County, and other land management agencies where feasible.

Fencing Guidelines

Fencing should be considered for areas:

- Directly adjacent to Petroglyph National Monument where trails and visitor facilities are present to prevent unauthorized user groups from entering the Monument
- Where off-road vehicle useage and illegal dumping are present
- Near residential developments which do not have their own fencing or walls
- Where roadways terminate near Open Space boundaries
- Near commercial areas
- Near high volume roadways

Core Area

- West Mesa where trails and visitor facilities interface with Petroglyph National Monument
- Volcanoes Buffer when Atrisco Vista Boulevard is expanded. Coordinate with NMDOT to include fencing in project scope.
- Boca Negra Middle Branch near residential areas when constructed

North Area (La Cuentista)

- Where the Open Space directly interfaces with PETR
- Where residential development doesn't have existing fencing or walls
- Directly adjacent to roadways

South Area (Atrisco Terrace)

- Maintain fencing on northern boundary with Petroglyph National Monument
- Reconsider fencing needs as Upper Petroglyph development builds out
- Directly adjacent to roadways



Example existing fencing on boundary with PETR

AMENITIES

Trail amenities are essential to creating comfortable and welcoming environments on trails offering shade, information, places to rest and potentially even public art features. Well-designed trails are a primary draw to natural recreational areas and these additional enhancements increase the positive user experience through improved access and protection from the sun, among other benefits. These recommendations are based on input received from the community and general regional guidelines for trail amenities.

Construction Materials

Amenities selected for the West Mesa need to be resilient to the harsh conditions of the high desert while staying low-profile and in-kind with the surrounding environment. As such, outdoor amenities should be constructed with naturally durable materials like native basalt stone and lightly pigmented concrete which both blend in with the surrounding environment and are long lasting in the area's climate and weather conditions. Materials such as wood and some plastics are not recommended as they have shorter lifespans in the exposed environment. However, some modern recycled plastic furniture will stand up well in desert conditions. Color palette should match the surrounding environment with light browns, sage greens and grays to not distract from the natural beauty of the area and limit heat retention. Rusted steel can also present a more rustic appearance, and is easy to maintain. Shade structures, restrooms, and other facilities should use similar natural materials and color palette choices.

Fencing and access control devices should be prioritized to ensure that informal trails can be properly closed off and rehabilitated. Security gates for access points near roadways and trailhead entrances/chicanes should be used to ensure off-road vehicles can't access Open Space. These fences and gates should be steel for strength and longevity. Wood and concrete can be used to construct chicanes for neighborhood access points where feasible.

Parking lots will generally be small and use natural permeable aggregate surfacing where feasible. Due to the shifting sand prevalent on the west mesa, use of asphalt should be limited to avoid cracking and expensive ongoing maintenance.

The following pages show examples of appropriate designs and materials for various amenities.

Shade Structures



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Benches



Public Art



Bicycle Racks



Trash Receptacles



REVEGETATION AND LANDSCAPING

Given the generally harsh conditions typical of the West Mesa, any surface disturbances are magnified and can have detrimental effects that last for years without intervention. Damage to, or removal of, the fragile vegetative cover that holds the sandy soils in place results in increased exposure to the erosional forces of wind and water. Those forces, in turn, make it more difficult for new vegetation to become established. Such disturbances result from both sanctioned and unsanctioned activities.

Necessary interventions can take several forms. 'Revegetation' consists primarily of reseeding disturbed areas with native, naturalized, or other appropriate drought-tolerant grasses, wildflowers, and shrubs. 'Reclamation,' as described herein expands upon basic revegetation and can include various techniques to help restore damaged sites to their pre-disturbance condition. 'Landscaping' involves more deliberate planting of shrubs and trees, usually with supplemental irrigation systems, but can also include a revegetation component.

Any revegetation or landscaping efforts should also be coupled with water harvesting techniques, wherever possible, to take advantage of the limited rainfall the area receives. Also known as 'green stormwater infrastructure' or GSI, these techniques can take many forms, but in general all seek to eliminate runoff through slowing or collecting water flows and encouraging infiltration. Several of the most appropriate and applicable techniques are described on the following pages.

Landscaping and revegetation will help to control dust, erosion, and drainage issues while at the same time providing shade and a more environmentally friendly landscape. All plant materials will be native or naturalized, and appropriate in well-draining sandy soils, intense sunlight, and drought conditions. While shade is important, large shade trees should be used infrequently at most and only where harvested water can help to sustain tree needs. Smaller more drought tolerant trees are more appropriate on the West Mesa. These trees are for the most part small-leaved to resist burn and transpire less water, and include desert willow and mesquites.



Trail closure example, Albuquerque NM

Revegetation and Reclamation

Revegetation can help restore previously damaged lands, as well as any impacted by new development. Damaged areas include those disturbed by unauthorized vehicular use, gravel mining, dumping – either before or after designation as Open Space, or erosion from wind and/or water. Reclamation implies a greater degree of effort, which could include some degree of physical interventions to bring disturbed areas back closer to their pre-disturbance condition.

Reseeding

As policy, revegetation should always follow any soil disturbance due to construction or other human activities. As much as possible revegetation activities should include late spring to early fall seeding and planting; reclamation techniques like disking to loosen soils, soil roughening, seeding and hay crimping, etc.; and the use of native seed mixes, in accordance with the City of Albuquerque's most recent seeding specifications.

Because of the arid environment combined with climate change and mega drought conditions in the desert southwest, any landscape and revegetation solution should be paired with green stormwater infrastructure and water harvesting methodologies. These could include utilizing check dams in arroyos and drainageways to slow water and allow it to infiltrate; the use of contour swales on hillsides to spread water collection and distribute it evenly; use of soil imprinting on flatter areas; and generally, manage stormwater to store runoff in smaller (and many) ponding areas instead of highly engineered and large stormwater ponds. These techniques and others will take advantage of rainwater where the OSD is unable to provide irrigation.

Trail Closures

Where trails are to be re-routed or closed, trail treads should be obliterated and blended back into the natural terrain using these techniques, as appropriate:

- Stone check dams to slow water, reduce erosion, and encourage sediment deposition to fill eroded trail treads.
- Re-leveling soil where it may have been mounded up, due to sharp curves in mountain bike trails, or other disturbance.
- Placing rocks, brush piles, cacti, or other

physical barriers at ends of closed sections and periodically along the old alignment to discourage continued use.

- Grading alternating depressions and ridges across well-worn trails will both discourage continued use, and create water-holding cells that provide supplemental water to encourage seed germination. These depressions will ultimately fill in with blow sand, eventually returning the disturbed path to its original grade.
- Revegetation seeding using native grasses, wildflowers, and shrubs.

Disturbed Lands

- If the disturbed areas have not been subject to excavation or other grading modifications, simple revegetation should be sufficient, in the form of reseeding and possibly replanting.
- Areas that have been subject to grading work or other more serious disturbances may be filled or leveled, as appropriate, if sufficient borrow material is available nearby. Otherwise, disturbed area should be blended into adjacent grades as much as possible by tapering or rounding cut slopes and flattening mounded dirt or rubble piles.
- Any trash or debris should be removed to an approved landfill.
- Water harvesting and conservation techniques (outlined below) may be applied to assist in vegetation germination and survivability.
- Disturbances caused by new construction should be remediated in similar fashion to those outlined above.
- Clearing and grubbing should be limited to the footprint of the new trail or other constructed features, to the extent possible. Parallel haul roads are discouraged.

Landscape Enhancements

In certain areas, such as trailheads and special use areas, enhanced landscaping may be appropriate, in the form of added shade trees and larger native or drought-resistant shrubs and accent plants.

- In locations where utilities exist in nearby roads or subdivisions, landscape irrigation systems will increase the survival and health of such plantings.
- Where supplemental water systems are not an

option, water harvesting techniques may allow for plantings of very xeric small trees, such as desert willows and mesquite varieties, which can provide some shade in relatively harsh environments.

Water Harvesting Techniques

Given the aridity of our local climate, and the West Mesa in particular, any supplemental water that can be collected and applied to revegetation sites and planting beds will help increase the success of vulnerable new plantings, as well as their long-term viability. These could include utilizing check dams in eroding drainages to slow water and allow it to infiltrate; the use of contour swales on hillsides to spread water collection and distribute it evenly; use of soil imprinting on flatter areas; and generally, manage stormwater to store runoff in smaller (and many) ponding areas instead of highly engineered and large stormwater ponds. These techniques and others will take advantage of rainwater where to OSD is unable to provide irrigation.

Mulches and Soil Amendments

Adding even a small amount of organic matter to planting soils and seed beds will help retain subsurface moisture and add nutrients, while a thin layer of durable surface mulches such as gravel or straw will also preserve soil moisture and provide cover for newly germinating seeds. Larger gravel and cobblestone can also help reduce erosion runoff when placed in swales and drainage cuts. (Image: Straw Mulch)

Wicks and Subsurface Reservoirs

Straw bales and scoria wicks can be buried within planting beds near young trees or shrub groupings to provide a delayed-release water source. These wicks collect water during rainfall events, and release it slowly for use by nearby plants. In dry times, and especially for the first growing season, supplemental water may be added to these wicks via a tanker truck on a weekly basis.



Straw Mulch

Contour Swales, Check Dams, and Stone Plating

Various surface treatments have been proven to be successful in capturing and increasing infiltration of surface water flows, as well as reducing erosion.

- Contour swales are shallow trenches cut across the slope, or along the contour of the land. These interrupt surface flows, collecting and spreading runoff across the landscape, and providing a protected pocket of moist soil that will support a higher concentration of plants than untreated areas. Mulching and soil amendments added to contour swales can increase their success even more.
- Check dams of rock, brush, or gabions can help stop erosion within drainage channels and erosion scars by slowing runoff and depositing sediment, rather than continuing to scour the channel. This results in a building-up of the channel, rather than continued downcutting.
- Stone plating slows and spreads water before it has a chance to erode slopes. Known in various forms as one-rock dams, media lunas, or simply slope protection, a single layer of large gravel, small rock, or cobblestone is applied on top of the ground in varying configurations to capture and direct water for beneficial use, before it becomes “runoff.”

Soil Roughening and Imprinting

On a broader scale, simply roughening the land surface or creating a series of indentations helps capture water on a micro-catchment scale, encouraging infiltration rather than allowing water to flow over the surface. These indentations also capture native seeds and provide a favorable location for them to germinate.



Contour Swale



Cobble Check dam



One Rock Dam



Soil Imprinting

SIGNAGE

Signage is essential to trail network planning as a means to regulate, educate, engage, and support proper usage of the trail network. Different types of signage will accomplish different goals identified in this plan.

Overall Goals

- Provide location and regulatory information
- Ensure that visitors understand which uses are permitted where
- Encourage trail etiquette between user groups
- Educate the public about the natural, archaeological, and cultural significance of the West Mesa
- Assist trail users in wayfinding on the trail network
- Provide guidance for trail users connecting to external facilities
- Develop signs that are in-kind with the surrounding signs
- Provide navigation and distance information to help trail users make informed decisions

Materials

Signs can be mounted on different materials chosen based upon environmental factors, maintenance, and cost. Aluminum is often used for standard roadway signs and wayfinding signage. Other natural materials like wood and stone can be used for placemaking elements like branding signage, memorial and dedication markers, and mile markers. Sign faces can also take many forms. Vinyl is often the least expensive, and is available in many colors and configurations; however, it is not as long-lasting as other materials in our bright sun and summer heat. Simple messages, such as site names and directional information, can be cut out of steel or aluminum panels for a relatively permanent signage option. Composite laminates, in contrast, are capable of reproducing full-color and intricate details for educational exhibits and other similar uses. These usually have an expected lifespan that is much higher than vinyl, but less than that of engraved or cut metal panels. Other options may be available for special instances, as signage and graphic technologies are constantly evolving. Sturdy sign material that can hold up to high sun exposure, wind, and wear is highly recommended. Metal or steel are the recommended material for West Mesa.



Trail Marker using stone and steel



Interpretive Signage at High Desert in Albuquerque

Sign Plan

Different signs fill a different need based upon location and information to be provided. As the name implies, regulatory signs provide rules and regulations for trail users, while informational signs provide interpretive or educational elements. This sign plan includes recommendations for regulatory signage, directional wayfinding, and educational or interpretive signage. Information kiosks will be standardized OSD signage currently being implemented throughout all Open Space units.

Regulatory Signage

Regulatory signage is most often associated with roadway signage, but is also applicable for trail systems and open space areas. In addition to providing rules for use of a facility, they can also provide safety information. Regulatory signage should be concentrated along access points, road crossings, and adjacent roadways where deemed appropriate.

The most critical regulatory sign needs will be near boundaries and access points to Petroglyph National Monument. These signs are essential to keeping non-permitted trail users out of the monument. Signs should be placed strategically in conjunction with trail closure techniques. Signs should also be placed near the George J. Maloof and Horseman's Complex riding course to prevent conflict between trail users and other recreationists.

Trail user interface signs are needed to create a positive multi-user trail experience. "Share the Trail" signs will help trail users understand what to do when approaching other users on the trail network.

Finally, emergency location signs are recommended throughout the trail network. Many of the trails are located in remote areas where explaining location to emergency responders could be difficult. Emergency location signs could make it easier for trail users to describe where they are located so aid could be directed quickly and efficiently.



FIGURE 52. TRAILHEAD SIGNAGE EXAMPLES

Trailhead Signs

Trailheads will have larger, more elaborate signs to help trail users orient themselves, find information about the Open Space, and act as a gateway element for the trail network. Trailhead markers are good for placemaking and branding for the site. Trailhead signs will be placed at major trailheads with the name of the trail on the sign. Trail maps will be placed in both major trailheads and secondary access points. They will provide a map for the region, provide rules and regulations for the network, and contact information for Albuquerque Open Space and Parks and Recreation staff. Trail maps can also be placed at neighborhood access points where deemed necessary.

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FIGURE 53. TRAIL MAP KIOSK

Directional Signs

Two types of directional signs are included in this plan: trail directional signs and trail blazers located on Open Space lands, and on-street directional signs located on adjacent neighborhood streets connecting to nearby trailheads. Directional signs are placed at junctions to help trail users navigate the trail and trail blazers are distributed along a trail to provide distance, direction, and some regulatory information. Some trail blazers also have specific location information to help emergency response if needed.

Trail blazers can be used throughout the trail network as mile markers or wayfinding at trail intersections. Both signs will have distance, direction, and trail name. Both directional signs and trail blazers will have emergency location information in different forms to help with potential emergency response needs. Trail blazers will have icons which denote permitted trail users.

On-street directional signs could be placed in neighborhoods adjacent to trailheads and provide information on direction, distance, and permitted users on nearby trails.

It is recommended these trails use fiberglass or 'carsonite' for their flexible and durable qualities. Recycled plastic timbers for mile markers and directional signage can also be used.



FIGURE 54. DIRECTIONAL SIGNAGE

Interpretive Signs

There are a number of opportunities to provide interpretation of significant environmental and cultural resources. Interpretative panels are often larger format signage located near significant sites and provide information for the specific area and the site overall. Large interpretative panels can be placed at major trailheads and at some primary entrances. Smaller panels can be placed throughout the interior of the trail network near significant landforms, cultural sites, and viewpoints. These smaller panels should be used sparingly to minimize maintenance needs.



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LARGE
INTERPRETATION PANEL

MEDIUM
INTERPRETATION PANEL

FIGURE 55. INTERPRETATION SIGNAGE



FIGURE 56. COLLECTIVE SIGN PLAN

RECOMMENDATIONS SUMMARY

Overall, approximately 20 miles of new trail were recommended in addition to 13 miles of rehabilitated trails, for a total of 33 miles of trail in the network. Most of these trails are primitive, single-track trails or two-track roads and will need some improvement to serve as a functional network. Approximately 3.4 miles of trail have been identified for consideration for closure and revegetation.

On-Site Connections

Unit	New Trail	Rehabilitated Trail	Roadway/Trail Closure
West Mesa	7.5 mi	10.2 mi	1.75 mi
George J. Maloof Airpark	0.2 mi	0 ft	0.1 mi
La Boca Negra Horseman's Complex	0.1 mi	0.2 mi	0 ft
Volcanoes Buffer	3.1 mi	0.9 mi	0.6 mi
Boca Negra Arroyo (Middle Branch)	0.9 mi	0.4 mi	0.1 mi
La Cuentista	2.7 mi	1.3 mi	0.25 mi
Atrisco Terrace	5.9 mi	0 ft	0.6 mi
Total	20.4 mi	13 mi	3.4 mi

Off-Site Connections

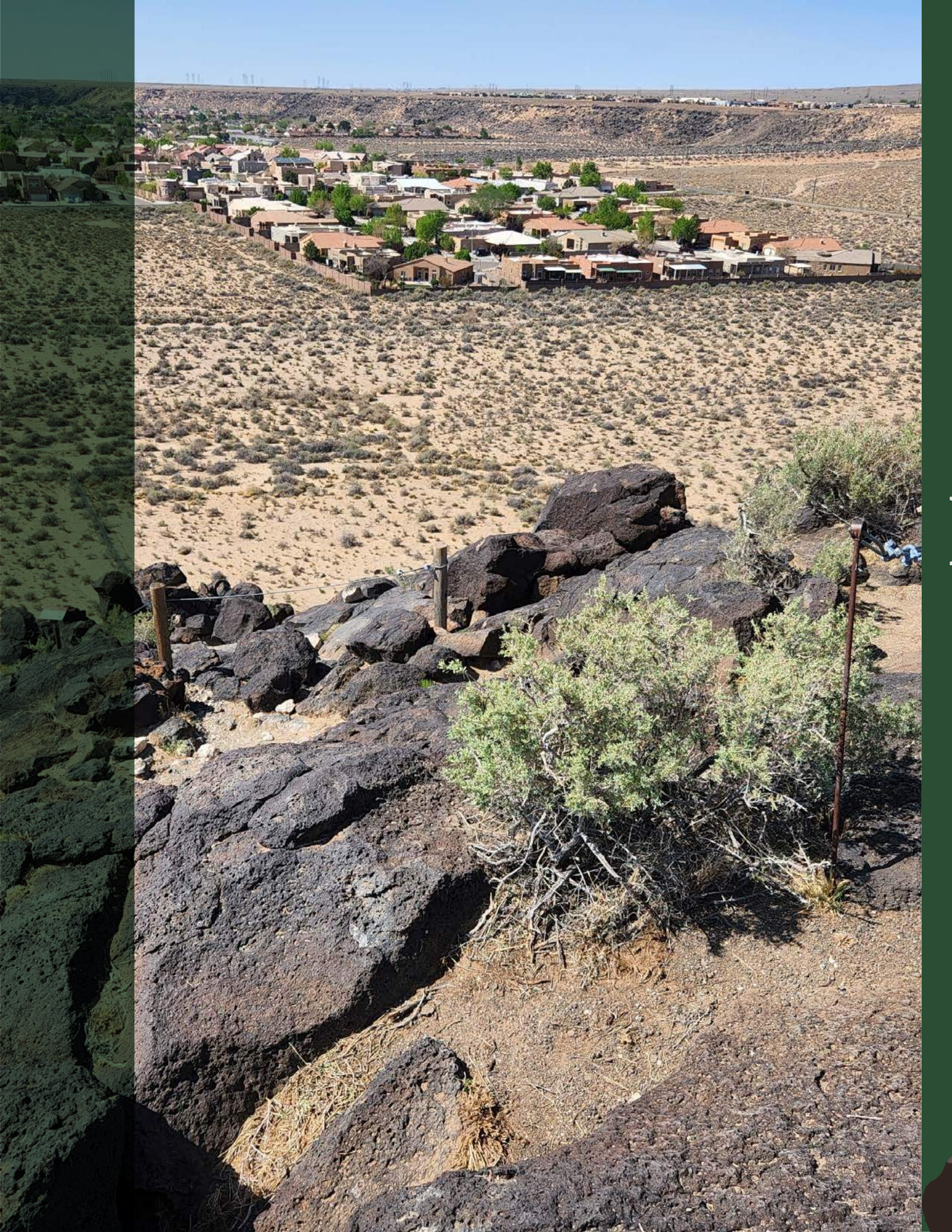
Unit	New Trail	
	Ft	Mi
Roadway Connections*	155,580	29.5
Petroglyph National Monument	9,790	1.8
Total Connections	165,370	31.3

*Roadway connections calculate the entire length of the needed connections however, some segments already have existing supporting infrastructure. This includes the entire length of the Atrisco Terrace roadways to connect to proposed access points.

Access Points

Access points prioritize connecting adjacent neighborhoods, trails, and PETR entrances. Emphasis is also placed on establishing and upgrading entrances based upon anticipated use in the trail network.

Type	Status		Total
	Existing	Proposed	
Major Trailhead	4	6	10
Secondary Access Point	1	4	5
Neighborhood Access Point	6	10	16



Implementation

*Implementation of a trail network of this magnitude
requires a strategic phased implementation*

Implementation of a trail network of this magnitude requires a strategic phased implementation that maximizes funding and staff capacities. This will require several years of project planning, seeking funding, construction, and collaboration and coordination with multiple agencies.

MAINTENANCE, OPERATIONS, AND MANAGEMENT RECOMMENDATIONS

Agreements And Partnerships

Co-Management Agreements

Improvements at some key sites could be cooperatively developed between City Open Space and National Park Service. Projects would involve some coordination with NPS based on boundaries and resources. Partnership with the National Park Service can also assist in getting funding through the Federal Lands Access Program (FLAP).

Other key coordination partners include Bernalillo County, DMD, AMAFCA, PNM, and adjacent private developers, each helpful in different areas of the site. Bernalillo County coordination will be most beneficial in the southern section around Atrisco Terrace and Volcanoes Buffer. The County has agreed to work with the City if they are granted ownership of the open space identified in the Upper Petroglyphs Sector Plan. PNM will be involved during construction and maintenance of their powerline access road. Roadway rehabilitation on the trail will affect maintenance needs for the roadway.

Key coordination needs include:

- Fencing construction and maintenance
- Signage and mapping
- Trail maintenance and upkeep
- Trail observation and reporting

Community Groups & Volunteers

Community coordination and stewardship will be crucial to developing and maintaining this trail network. Volunteer groups will be essential to constructing, maintaining, and monitoring the trail network. They will also be fundamental in working with the City to develop programming and events throughout the year in addition to generating excitement for the project to keep the public engaged throughout the planning and construction process.

Foster Stewardship

- Start a friends group or an Adopt-a-Trail program to provide regular maintenance and report issues to City Staff
- Community clean-up days to help with regular maintenance and keep the community engaged
- Include trails in the Prescription trails program to help the community find trails nearest to them, make connections to other trails, and promote connections to their neighborhood

Potential Community Groups

- Open Space Trail Watch Volunteers
- Equestrian groups (i.e. Watermelon Mountain Pony Club)
- Mountain Biking groups (i.e. Albuquerque Mountain Bike Association)
- Recreational Trails Groups (i.e. Latino Outdoors, Greater Albuquerque Recreational Trails Committee)
- Youth Corps (i.e. Rocky Mountain Youth Corps, Ancestral Lands)
- Neighborhood Associations
- Prescription Trails Program
- Neighboring Schools
- PNM and APS

Public and Private Partnerships

Public-Private partnerships will be essential in making connections to existing and future housing developments nearby. This could involve creating trail easements to connect different Open Space units through private property, and working with developers to connect sidewalks and roadways to planned trailheads.

This will be most needed to make connections to the Upper Petroglyphs Sector Development and near the Paseo del Norte land bridge. As development continues throughout the West Side, coordination with private developers and land owners will become more essential to the success of this trail network.

Management Recommendations

Trail User Interface

While multi-use trails can provide recreational opportunities for a wider range of trail users, it also can enable conflict between them. Therefore techniques to lessen conflict between trail users is essential to ensure the trail network works for everyone. Some techniques involve adequate signage throughout the network with additional information at trailheads and specific junctions. Trail "yield-to" diagrams should be placed consistently on trail blazers and trailheads. Entrances to PETR should especially be targeted for additional signage to ensure only hikers on foot enter the Monument from Albuquerque Open Space.

Further, education and outreach to trail organizations throughout the process will be essential to educate the public on regulations and proper trail etiquette.

Finally, although some trails can be closed outright to specific uses, it may be more effective to highly encourage certain trail users to use some trails over others. For example, equestrian loops advertised as such will help set an expectation for a higher volume of horses than other trails which may heighten awareness for other trail users and discourage some from using said trail. Signage and outreach is essential to the success of this approach.



Community Maintenance Trail Volunteers - photo courtesy of NM Volunteers for the Outdoors

RECOMMENDED PROJECT PHASING

Phase 1- West Mesa, George J. Maloof Airpark, Horseman's Complex

The core West Mesa and adjacent Open Space units are prioritized for initial implementation because they are the most popular and serve the most user groups.

This phase emphasizes rehabilitation and revegetation with a focus on pairing new trail construction with trail closure activities. These sections could involve volunteer or youth corps assistance in closing informal trails and constructing new trails. Existing trails can be assessed and rehabilitated based upon need.

Most access points already exist but some may need additional resources. Rehabilitation of major trailheads is the main priority for this phase, particularly the Horseman's Complex and both Paseo de la Mesa trailheads. Other proposed access points should be constructed in conjunction with connector trails.

Potential Projects

Project	Unit	Type	Costs
Horseman's Complex trailhead renovation	Horseman's Complex	Renovation	High
Paseo de la Mesa east trailhead	Volcanoes Buffer/West Mesa	New Construction	High
Trail signage near PETR, special use areas	West Mesa	New Construction	Low
Equestrian loop trail	West Mesa	New Construction	Medium
New trails off PNM easement road	West Mesa	New Construction	Medium
Clean trailhead at North Geologic Window	North Geologic Window	Renovation	Low

Phase 2- La Cuentista

La Cuentista provides great opportunities to connect the Monument to surrounding neighborhoods. Creating connections and access points to the most utilized public Open Space in this area, PETR, and providing space for multi-use trails, will strengthen and enhance the trail network despite La Cuentista's isolation from other City Open Space.

Old road closure must occur in conjunction with new trail construction. Roadway closure is recommended where the trail intersects existing primitive roads. Dumped building materials from nearby development should be removed and the area rehabilitated as needed.

Access points should be implemented with close partnership with the National Park Service. Neighborhood access points can be installed first to connect to new trails. Larger installations can be explored based on funding and continued nearby development.

Potential Projects

Project	Unit	Type	Costs
Secondary Access Point renovation	La Cuentista	Renovation	Medium
New trails interior	La Cuentista	New Construction	Medium
Fencing near Petroglyph, south boundary	La Cuentista	New Construction	Low
Neighborhood access point construction	La Cuentista	New Construction	Low
Major trailhead construction	La Cuentista	New Construction	High

Phase 3- Boca Negra Arroyo Middle Branch, Volcanoes Buffer

While these projects are considered lower priority because they will have a relatively lower impact on the surrounding community, implementation can occur whenever resources become available.

When constructing new trails, primitive roads slated for closure should also be rehabilitated to prevent continued use. Identify where existing roadways intersect with future trail alignment and use road closure methods at these intersecting points. Identify areas where new fencing is needed.

Trailheads in Volcanoes Buffer and Middle Branch should be fenced to prevent unauthorized motorized vehicle access. Street connections from access points in the Volcanoes Buffer, particularly the Paseo de la Mesa West Trailhead, may be contingent on Atrisco Vista Boulevard expansion. The trailheads themselves can be constructed prior to paving the entrance. Access points for Middle Branch should be provided at the same time as trail construction.

Potential Projects

Project	Unit	Type	Costs
Social trail closures	Middle Branch	Renovation	Low
Fencing	Middle Branch	Renovation	Medium
New trail construction	Middle Branch	New Construction	Low
Social trail closure	Volcanoes Buffer	New Construction	Low
New trail construction	Volcanoes Buffer	New Construction	Low

Phase 4- Atrisco Terrace

Atrisco Terrace is the final implementation phase, as construction of adjacent development and through-roads are slated for several years in the future. Once construction plans are finalized and specific connection needs identified, trails can be planned directly on-site. Since trail alignments will consist of loops separated by roadways, they can be constructed as development progresses, likely beginning at the southern end to coincide with Upper Petroglyphs planned implementation.

Trail from development can be further phased based upon these looping trails. South to north phases include a southern loop between Ladera Drive and I-40, a central loop between Arroyo Vista Boulevard and Ladera Drive, and a northern loop between Ladera Drive and Petroglyph National Monument. The northern loop could potentially be completed first to provide trail loops for the Inspiration neighborhood while delaying construction of additional public access points until Upper Petroglyphs is planned and constructed.

Potential Projects

Project	Unit	Type	Costs
Fencing near existing informal roads	Atrisco Terrace	Renovation	Medium
Close social roadways	Atrisco Terrace	Renovation	Medium
Construct trailheads at roadways	Atrisco Terrace	New Construction	High
New trail construction	Atrisco Terrace	New Construction	Medium

ESTIMATED PROJECT COSTS

Cost estimates reflect project phasing, separated by unit. Cost estimate totals include New Mexico Gross Receipt Taxes. See detailed cost estimate in Appendix C.

PHASE 1 WEST MESA, GEORGE J. MALOOF AIRPARK, HORSEMAN'S COMPLEX

TRAIL REHABILITATION/CONSTRUCTION	\$3,250,000
TRAIL/ROAD CLOSURES	\$105,000
TRAILHEADS	\$1,330,000
ROADWAY CROSSINGS	\$50,000
TOTAL (WITH NMGR)	\$5,131,556.25

PHASE 2- LA CUENTISTA

TRAIL REHABILITATION/CONSTRUCTION	\$790,000
TRAIL/ROAD CLOSURES	\$20,000
TRAILHEADS	\$686,000
ROADWAY CROSSINGS	\$0
TOTAL (WITH NMGR)	\$1,621,290.00

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PHASE 3- MIDDLE BRANCH, VOLCANOES BUFFER

TRAIL REHABILITATION/CONSTRUCTION	\$380,000
TRAIL/ROAD CLOSURES	\$50,000
TRAILHEADS	\$,1097,000
ROADWAY CROSSINGS	\$50,000
TOTAL (WITH NMGR)	\$1,709,073.75

PHASE 4- ATRISCO TERRACE

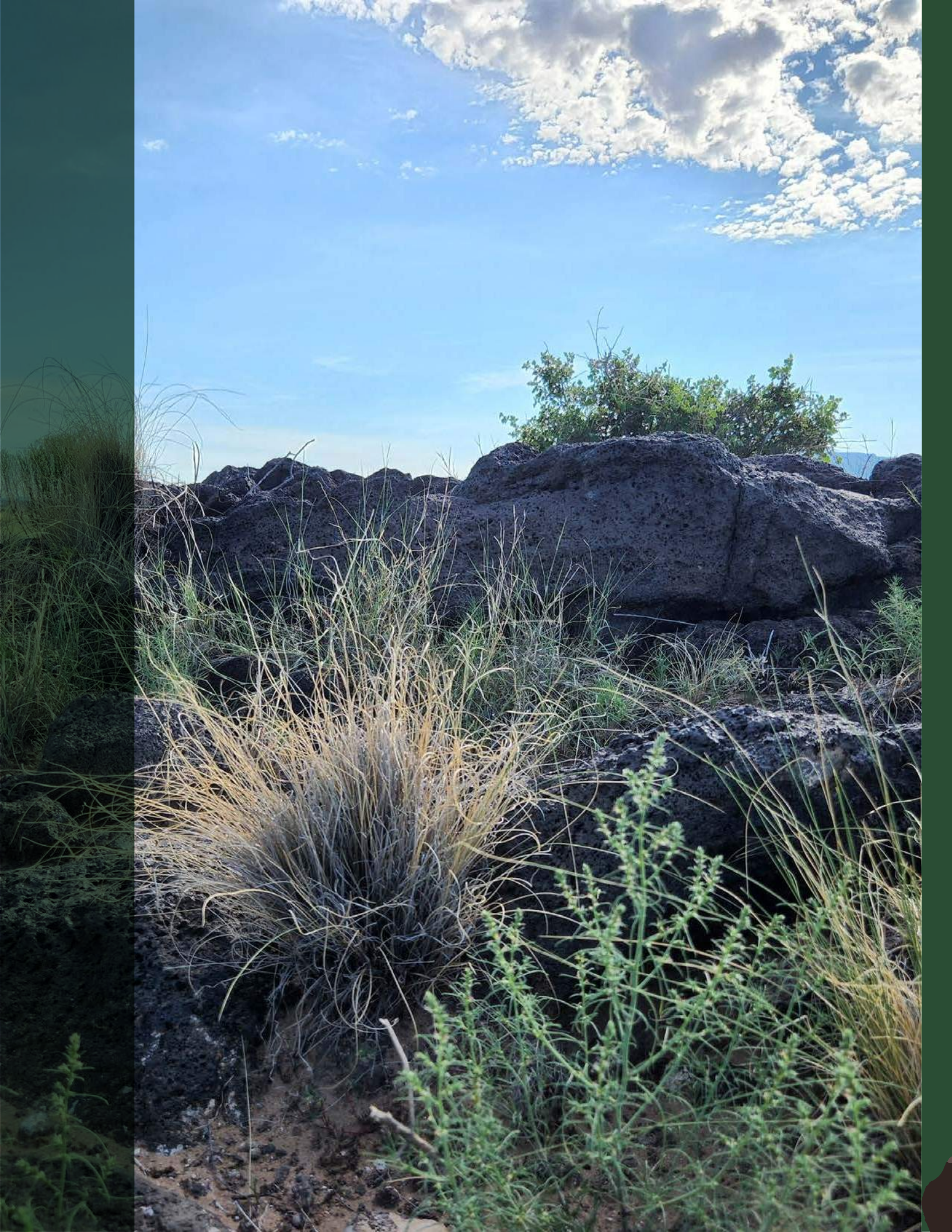
TRAIL REHABILITATION/CONSTRUCTION	\$590,000
TRAIL/ROAD CLOSURES	\$45,000
TRAILHEADS	\$1,938,000
ROADWAY CROSSINGS	\$100,000
TOTAL (WITH NMGR)	\$2,896,863.75

FUNDING SOURCES

	Name	Description	Source	Match	Project Size	Time	Eligible Trail Activities
NMDOT Active Transportation Program	Recreational Trails Program	The Recreational Trails Program (RTP) provides funding to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Funds are administered by their respective states and requirements vary. Projects must be listed within the Statewide Transportation Improvement Plan (STIP) to qualify. 30% non-motorized, 30% motorized, and 40% diverse trails.	FHWA through NMDOT	14.56% match with 5% required to come from a non-Federal match	\$5,000-\$100,000 per project, \$1.4 mil available annually	Varies	Construction, maintenance, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation.
	Transportation Alternatives Program (TAP)	The Transportation Alternatives (TA) Set-Aside from the Surface Transportation Block Grant (STBG) Program provides funding for a variety of generally smaller-scale transportation projects such as pedestrian and bicycle facilities; construction of turnouts, overlooks, and viewing areas; community improvements such as historic preservation and vegetation management; environmental mitigation related to stormwater and habitat connectivity; recreational trails; safe routes to school projects; and vulnerable road user safety assessments.	FHWA through NMDOT	14.56%	Varies; range from \$10,000-\$1 mil per project	Annual	Planning, design, and construction of on-road and off-road trail facilities for pedestrian, bicyclists and other non-motorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related transportation projects

	Name	Description	Source	Match	Project Size	Time	Eligible Trail Activities
Federal Funding Sources	Federal Lands Access Program (FLAP)	This program provides funds for projects to improve transportation facilities that provide access to, are adjacent to, or are located within federal lands. This can include public roads, bridges, paved trails, or transit systems that are owned and/or maintained by the state, or local government, but does not include federally-owned facilities.	FHWA through NPS	Not required but recommended, 17% previously	Varies, projects recommended to be over \$500,000	Call for projects every 4 years	Transportation planning, research, preventive maintenance, engineering, rehabilitation, restoration, construction, and reconstruction of lands connecting to and on federal lands
	Safe Routes to School	Safe Routes to School (SRTS) programs encourages children to walk and/or bicycle to and from school safely on a daily basis. New Mexico has a statewide program that provides funding, technical assistance, training opportunities and other resources. Funding available for infrastructure projects within 2 miles of a school	FHWA through NMDOT	No match requirement	Infrastructure projects up to \$250 K; Non-infrastructure activities up to \$25 K	Varies	Infrastructure, planning, engineering, and construction
	Congestion Mitigation and Air Quality Improvement Program (CMAQ)	The CMAQ program provides funding for projects, programs, and operational strategies that reduce vehicle congestion and air pollutants regulated by the Environmental Protection Agency (EPA). Eligible projects could include transit vehicle replacement, facility development, multi-use trails, and bicycle sharing programs.	FHWA through NMDOT	14.56%	Varies, \$500,000 available annually	Annual	Projects that improve air quality, including on- and off-street bikeways that help reduce vehicle trips for transportation. Other eligible projects include planning, intersection improvements, roundabouts, park and ride facilities.
	The Outdoor Recreation Trails+ Grant	The Outdoor Recreation Trails+ (formerly known as the Special Projects and Infrastructure Fund) is a grant program that supports projects enhancing community outdoor recreation opportunities. This grant funds shovel-ready projects that directly provide access to parks, rivers, trails, outdoor recreation opportunities, and wildlife viewing opportunities.	NMEDD	50%	\$7 mil allocated in 2022	Annual	Design, engineering plans, and construction, of shovel-ready structures and other infrastructure that enhances public nature-based outdoor recreation in a community. Projects that take a regional approach (i.e a trail that connects to a broader system) will be weighed more heavily.

	Name	Description	Source	Match	Project Size	Time	Eligible Trail Activities
	Capital Outlay	Capital outlay funds are used to build, improve, or equip physical property that will be used by the public. In NM, state capital outlay is authorized by the Legislature and generally is nonrecurring—one-time--money	NMDFA	Can serve as matching funds for Federal programs	Varies; \$99,713,878 allocated in Bernalillo County in 2021	Annual	Trails, facilities, amenities, and structures open to the public.
	Local/ Private Funding	Funding provided by local municipalities and private entities. This includes GO Bonds.	City/ County/ Private	Can serve as matching funds for Federal programs	Varies; County has a 5% bond set aside for GO Bonds	Varies	Infrastructure, planning, engineering, and construction



Appendix



APPENDIX A: CITY COUNCIL RESOLUTION R-21-228

CITY of ALBUQUERQUE TWENTY FOURTH COUNCIL

COUNCIL BILL NO. R-21-228 ENACTMENT NO. R-2022-003

SPONSORED BY: Cynthia D. Borrego and Lan Sena

1 RESOLUTION

2 THE CITY OF ALBUQUERQUE EXPRESSES ITS APPRECIATION FOR THE
3 ACQUISITION OF THE LA CUENTISTA OPEN SPACE, ENCOURAGES THE
4 CONSERVATION OF THE SITE AND DIRECTS THE ADMINISTRATION TO
5 PREPARE A WEST MESA OPEN SPACE TRAILS PLAN.

6 WHEREAS, the City of Albuquerque created one of the most successful
7 open space programs in the United States; and

8 WHEREAS, a foremost success of the program is the Petroglyph National
9 Monument, a joint effort between the City of Albuquerque Open Space
10 Program and the National Park Service, and co-managed by both agencies;
11 and

12 WHEREAS, La Cuentista is a sixty-acre open space area that is part of the
13 complex of volcanic rocks that are adorned with petroglyphs, and form the
14 volcanic escarpment on the Northwest Mesa; and

15 WHEREAS, La Cuentista Open Space provides a buffer between nearby
16 residential development and the Petroglyph National Monument; and

17 WHEREAS, the City Council adopted O-16-13, which designates La
18 Cuentista a priority to purchase and place into the Open Space Inventory. The
19 City Parks and Recreation Department subsequently acquired the site and will
20 complete the final payment on the title in early 2022; and

21 WHEREAS, the Parks and Recreation Department conducted a site analysis
22 and identified the measures that will conserve and protect La Cuentista and
23 open these lands to beneficial public use; and

24 WHEREAS, the National Park Service eliminated nearly all mountain biking
25 and horseback riding within Petroglyph National Monument in 2019 as an

1 outcome of the Petroglyph National Monument Visitor Use Management Plan
2 and there is now a need for pedestrian, mountain biking and equestrian trails
3 on the West Mesa; and

4 WHEREAS, the City of Albuquerque owns and manages 4,200 acres of
5 Major Public Open Space land on the West Mesa of Albuquerque, in addition
6 to the Petroglyph National Monument; and

7 WHEREAS, these open spaces encompass vast expanses of mesa-top lava
8 flows, volcanic features, archaeological sites, arroyo courses and wide vistas,
9 including the Atrisco Terrace, areas west and northeast of the volcanoes,
10 Boca Negra Arroyo Middle Branch and the newly acquired La Cuentista open
11 space; and

12 WHEREAS, the City of Albuquerque desires to plan a sustainable and
13 accessible trail system throughout the West Mesa Open Space properties. The
14 Trail system would connect the Petroglyph National Monument, Rio Grande
15 Valley State Park and other “Windows” or points of interests throughout the
16 West Mesa area, and would support low-impact activities, including mountain
17 biking, horseback riding, hiking, walking and nature studies; and

18 WHEREAS, an accessible trail system throughout the West Mesa Open
19 Spaces will be an amenity to visitors who desire to further experience the
20 beauty and vistas of the West Mesa. The trail system would serve a growing
21 local population with a cohesive and well-planned trail system to support a
22 variety of outdoor recreation activities and will result in up to twenty-four
23 miles of new trails on the West Mesa; and

24 WHEREAS, this plan coincides with the development of the Northwest
25 Mesa Windows Plan Report, that will be completed in December of 2021. The
26 report will identify the physical features and potential open-air improvements
27 of the Northwest Mesa, including the open space lands on the volcanic
28 escarpment, that provide a unique and aesthetic experience of this area of
29 Albuquerque. The report will provide a framework to highlight these features
30 and connect them by pedestrian and bike trails, which could be integrated
31 with an open space trail network.

32 BE IT RESOLVED BY THE COUNCIL, THE GOVERNING BODY OF THE CITY OF
33 ALBUQUERQUE:

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1 SECTION 1. The Council expresses its enduring appreciation to the many
2 citizen proponents and members of the Open Space Advisory Board who
3 advocated for the purchase of La Cuentista Open Space and to the City staff
4 who worked diligently to acquire the property.

5 SECTION 2. The Council recommends that the Administration move
6 forward with implementing improvements to La Cuentista that conserve and
7 protect the open space and make it accessible to beneficial public use.

8 SECTION 3. The Administration shall proceed with development of an
9 Open Space Trails Plan for the Open Space lands located on the volcanic
10 escarpment. To fund the plan the City Council reserves \$75,000 from Council
11 Set Aside General Obligation Bonds for Parks and Recreation from City
12 Council District One and City Council District Five.

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1 PASSED AND ADOPTED THIS 20th DAY OF December, 2021
2 BY A VOTE OF: 8 FOR 0 AGAINST.


3

4 Excused: Gibson

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Cynthia D. Borrego, President
City Council

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13 APPROVED THIS 30 DAY OF December, 2021

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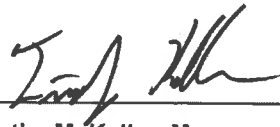
16 Bill No. R-21-228

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Timothy M. Keller, Mayor
City of Albuquerque

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27 ATTEST:

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Ethan Watson, City Clerk

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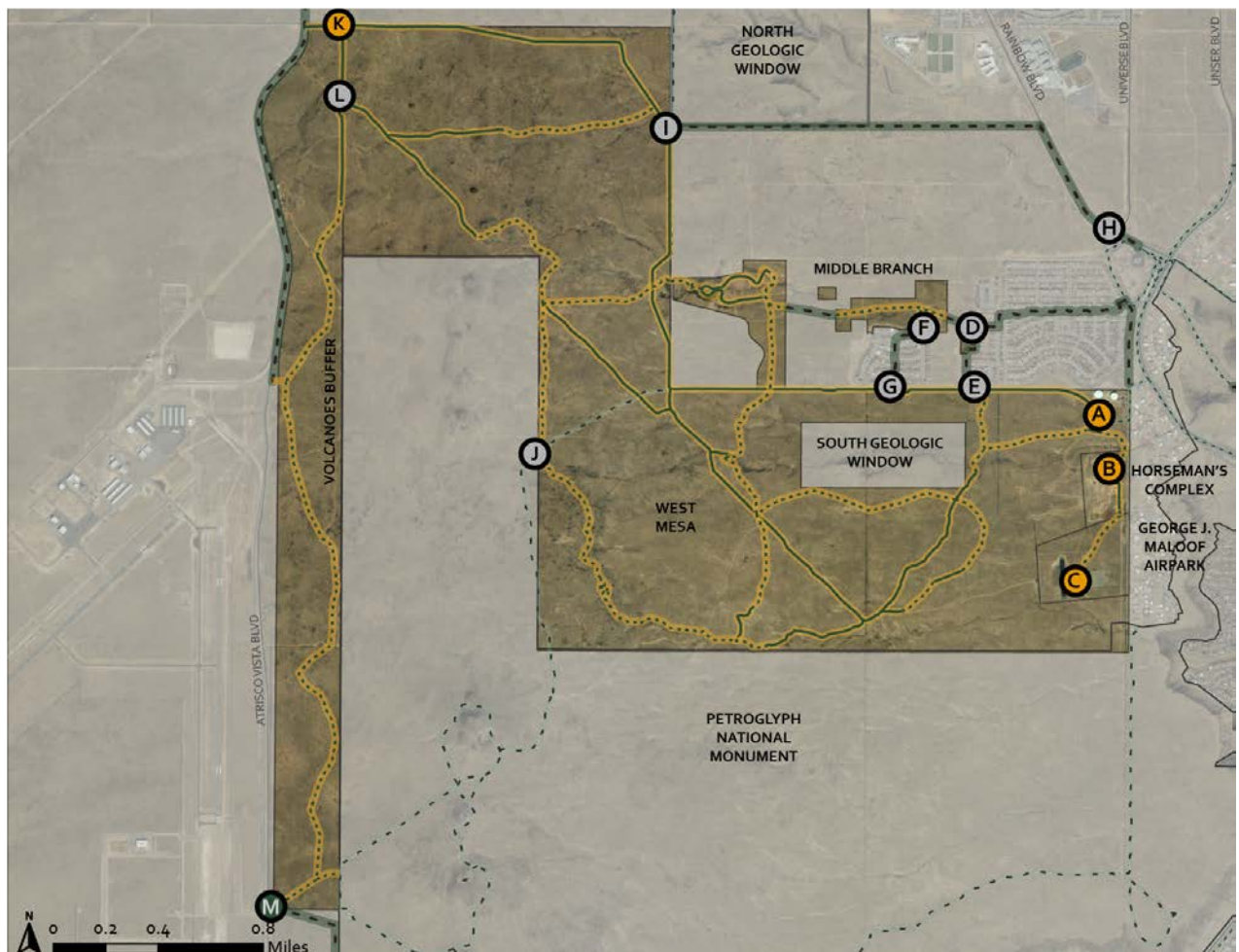
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APPENDIX B: ACCESS POINTS

ACCESS POINTS: CORE AREA



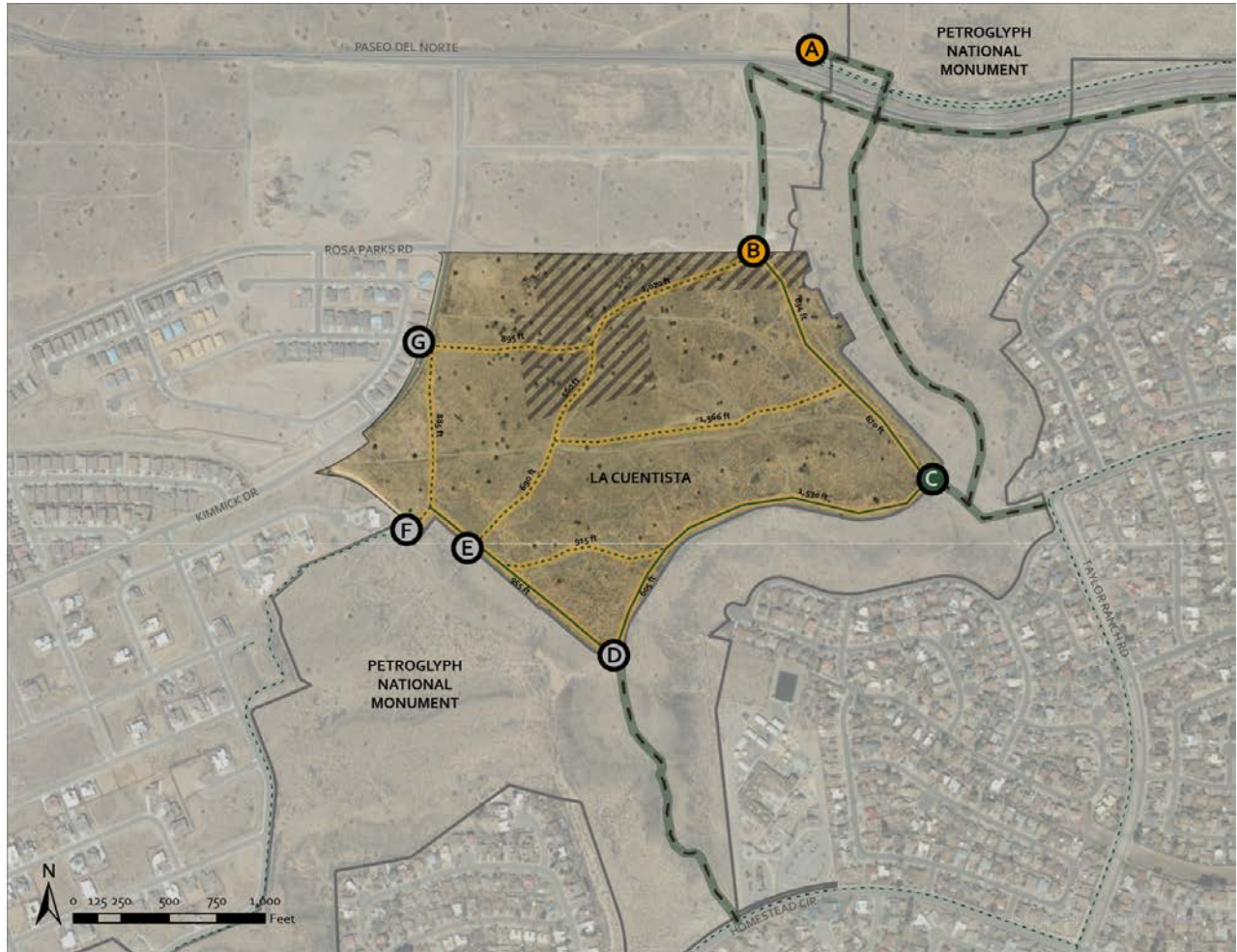
- MAJOR TRAILHEAD
- SECONDARY ACCESS POINT
- NEIGHBORHOOD ACCESS POINT

Additional guidelines for Access Points are described in the table below.



	Unit	Status	Description	Needed Improvements
A	West Mesa	Existing	Paseo de la Mesa east Trailhead	<ul style="list-style-type: none"> Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
B	Horseman's Complex	Existing	Neighborhood access point to both Atrisco Terrace and Petroglyph National Monument.	<ul style="list-style-type: none"> Improved parking lot Shade structure Map kiosk Interpretive signage
C	Maloof Airpark	Existing	George J. Maloof Airpark parking lot	<ul style="list-style-type: none"> No improvements needed
D	Middle Branch	Proposed	Access point off Piedra Lumbre Rd and Largo	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
F	West Mesa	Proposed	Brake in the fence at Vista Vieja Ave and Mete Sol Dr	<ul style="list-style-type: none"> No improvements needed
G	Middle Branch	Proposed	Access point off Retablo Rd and Vista Lucas St	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
H	Off-site	Proposed	Entrance from Rainbow Blvd to connect existing school and future housing development.	<ul style="list-style-type: none"> Wayfinding signage
I	West Mesa	Existing	Trail gate at North Geologic Window boundary	<ul style="list-style-type: none"> Wayfinding signage Entrance gate
J	West Mesa	Proposed	Entrance to Petroglyph National Monument and convergence of multiple trails	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
K	Volcanoes Buffer	Existing	Paseo de la Mesa Trailhead	<ul style="list-style-type: none"> Parking lot improvements Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
L	Volcanoes Buffer	Existing	Existing gate into West Mesa	<ul style="list-style-type: none"> No improvements needed
M	Volcanoes Buffer	Existing	Overflow parking for Petroglyph National Monument, volcanoes unit	<ul style="list-style-type: none"> Shade structure Benches Map kiosk Dog waste station Trash can

ACCESS POINTS: NORTH AREA



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MAJOR TRAILHEAD



PRIMARY ACCESS



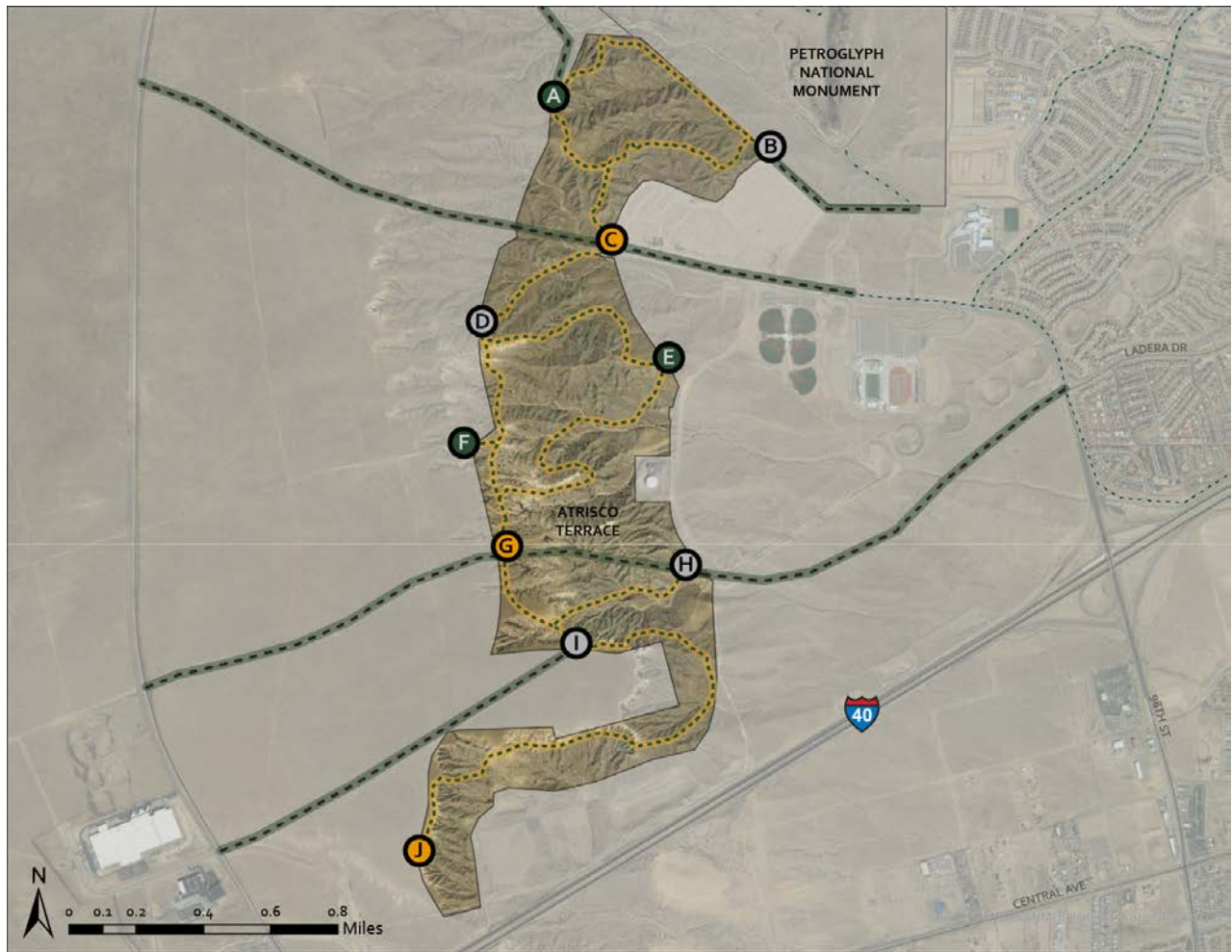
SECONDARY ACCESS

Additional guidelines for Access Points are described in the table below.

 MAJOR TRAILHEAD
  PRIMARY ACCESS
  SECONDARY ACCESS

	Unit	Status	Description	Needed Improvements
	La Cuentista	Proposed	Trailhead entrance near Paseo del Norte land bridge	<ul style="list-style-type: none"> • Parking lot • Landscaping • Shade structure • Benches • Interpretive signage • Map kiosk • Dog waste station • Trash can
	La Cuentista	Existing	Entrance connecting to surrounding neighborhood through Petroglyph National Monument	<ul style="list-style-type: none"> • Parking lot improvements • Shade structure • Benches • Interpretive signage • Map kiosk • Dog waste station • Trash can
	La Cuentista	Existing	Entrance to adjacent neighborhood	<ul style="list-style-type: none"> • Wayfinding signage • Map Kiosk • Bench • Entrance gate • Dog waste station
	La Cuentista	Proposed	Entrance to adjacent neighborhood	<ul style="list-style-type: none"> • Wayfinding signage • Entrance gate • Dog waste station
	La Cuentista	Proposed	Entrance to adjacent neighborhood	<ul style="list-style-type: none"> • Wayfinding signage • Entrance gate
	La Cuentista	Proposed	Entrance to adjacent neighborhood	<ul style="list-style-type: none"> • Wayfinding signage • Entrance gate • Dog waste station
	La Cuentista	Proposed	Entrance to adjacent neighborhood through Petroglyph National Monument	<ul style="list-style-type: none"> • Wayfinding signage • Entrance gate • Dog waste station

ACCESS POINTS: SOUTH AREA



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-  MAJOR TRAILHEAD
-  PRIMARY ACCESS
-  SECONDARY ACCESS



	Unit	Status	Description	Needed Improvements
A	Atrisco Terrace	Proposed	Entrance for neighborhood. This space has been identified for its viewsheds and proximity to future developments.	<ul style="list-style-type: none"> Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
B	Atrisco Terrace	Proposed	Neighborhood access point to both Atrisco Terrace and Petroglyph National Monument.	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
C	Atrisco Terrace	Proposed	Entrance located along major roadway.	<ul style="list-style-type: none"> Parking lot improvements Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
D	Atrisco Terrace	Proposed	Entrance to connect to future development.	<ul style="list-style-type: none"> Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
E	Atrisco Terrace	Proposed	Entrance to connect to future development.	<ul style="list-style-type: none"> Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
F	Atrisco Terrace	Proposed	Entrance located along major roadway.	<ul style="list-style-type: none"> Parking lot improvements Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can
G	Atrisco Terrace	Proposed	Entrance to connect to future development.	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
H	Atrisco Terrace	Proposed	Entrance located along major roadway.	<ul style="list-style-type: none"> Wayfinding signage Entrance gate Dog waste station
I	Atrisco Terrace	Proposed	Entrance located along major roadway.	<ul style="list-style-type: none"> Parking lot improvements Shade structure Benches Interpretive signage Map kiosk Dog waste station Trash can

APPENDIX C: COST ESTIMATE BREAKDOWN

PHASE 1: WEST MESA, GEORGE J. MALOOF AIRPARK, HORSEMAN'S COMPLEX

ITEM #	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	Total
Paseo de La Mesa East Trailhead					
1	Mobilization, Testing, Surveying, SWPP, Misc.	LS	1	\$35,000.00	\$35,000.00
2	Site Preparation	LS	1	\$10,000.00	\$10,000.00
3	Parking Lot Modifications	LS	1	\$15,000.00	\$15,000.00
4	Shelter, Signage, Site Furnishings	LS	1	\$35,000.00	\$35,000.00
5	Solar Lighting	LS	1	\$20,000.00	\$20,000.00
6	Landscaping and Revegetation	LS	1	\$50,000.00	\$50,000.00
Subtotal					\$165,000.00
NMGR					\$13,000.00
TOTAL					\$178,000.00
Paseo de La Mesa West Trailhead					
1	Mobilization, Testing, Surveying, SWPP, Misc.	LS	1	\$70,000.00	\$70,000.00
2	Site Preparation	LS	1	\$25,000.00	\$25,000.00
3	Parking Lot Improvements	LS	1	\$65,000.00	\$65,000.00
4	Shelter, Signage, Site Furnishings	LS	1	\$35,000.00	\$35,000.00
5	Fencing and Access Control	LS	1	\$30,000.00	\$30,000.00
6	Solar Lighting	LS	1	\$20,000.00	\$20,000.00
7	Landscaping and Revegetation	LS	1	\$150,000.00	\$150,000.00
Subtotal					\$395,000.00
NMGR					\$31,000.00
TOTAL					\$426,000.00
Paseo del Norte/Land Bridge Trailhead					
1	Mobilization, Testing, Surveying, SWPP, Misc.	LS	1	\$35,000.00	\$35,000.00
2	Site Preparation	LS	1	\$12,000.00	\$12,000.00
3	Parking Lot and Plaza Paving	LS	1	\$35,000.00	\$35,000.00
4	Shelter, Signage, Site Furnishings	LS	1	\$30,000.00	\$30,000.00
5	Gates/Access Control	LS	1	\$10,000.00	\$10,000.00
6	Landscaping and Revegetation	LS	1	\$150,000.00	\$150,000.00
Subtotal					\$272,000.00
NMGR					\$22,000.00
TOTAL					\$294,000.00

Equestrian Complex

1	Mobilization, Testing, Surveying, SWPP, Misc.	LS	1	\$70,000.00	\$70,000.00
2	Site Preparation	LS	1	\$20,000.00	\$20,000.00
3	Parking Lot Improvements	LS	1	\$75,000.00	\$75,000.00
4	Shelter, Signage, Site Furnishings	LS	1	\$35,000.00	\$35,000.00
5	Fencing and Access Control	LS	1	\$20,000.00	\$20,000.00
6	Lighting	LS	1	\$25,000.00	\$25,000.00
7	Landscaping and Revegetation	LS	1	\$100,000.00	\$100,000.00
				Subtotal	\$345,000.00
				NMGRT	\$27,000.00
				TOTAL	\$372,000.00

Trail and Related Improvements

1	Paved Multi-Use Trail, per mile (10-12' width)	MI	2	\$800,000.00	\$1,600,000.00
2	Unpaved Multi-Use Trail, per mile (6-8' width)	MI	0	\$400,000.00	\$0.00
3	Unsurfaced Equestrian Trail, per mile (4-6' width)	MI	17	\$100,000.00	\$1,650,000.00
4	On-street Trail Connections (wayfinding, ADA improvements)	MI		\$50,000.00	\$0.00
5	Major Trailhead (from previous)	LS	0.0	\$0.00	\$1,270,000.00
6	Secondary Access Point	LS	0.0	\$200,000.00	\$0.00
7	Neighborhood Access Point	LS	4	\$15,000.00	\$60,000.00
8	Collector Road Crossing (raised crosswalk, striping, signage, RRFB)	LS		\$50,000.00	\$0.00
9	Local Road Crossing (speed humps, striping, signage)	LS	2	\$25,000.00	\$50,000.00
10	Concrete Sidewalk/Trail Slab, 4" thick	SY		\$80.00	\$0.00
11	Concrete Curb Ramps, Raised Crosswalks, 6" thick	SY		\$125.00	\$0.00
12	Trail Closure/Reclamation	AC	2	\$50,000.00	\$105,000.00
				Subtotal	\$4,735,000.00
				NMGRT	\$396,556.25
				TOTAL	\$5,131,556.25

PHASE 2: LA CUENTISTA

Trail and Related Improvements					
1	Paved Multi-Use Trail, per mile (10-12' width)	MI	0	\$800,000.00	\$0.00
2	Unpaved Multi-Use Trail, per mile (6-8' width)	MI	1	\$400,000.00	\$520,000.00
3	Unsurfaced Equestrian Trail, per mile (4-6' width)	MI	3	\$100,000.00	\$270,000.00
4	On-street Trail Connections (wayfinding, ADA improvements)	MI	0.0	\$50,000.00	\$0.00
5	Major Trailhead	LS	1.0	\$426,000.00	\$426,000.00
6	Secondary Access Point	LS	1.0	\$200,000.00	\$200,000.00
7	Neighborhood Access Point	LS	4	\$15,000.00	\$60,000.00
8	Collector Road Crossing (raised crosswalk, striping, signage, RRFB)	LS	0	\$50,000.00	\$0.00
9	Local Road Crossing (speed humps, striping, signage)	LS	0	\$25,000.00	\$0.00
10	Concrete Sidewalk/Trail Slab, 4" thick	SY	0	\$80.00	\$0.00
11	Concrete Curb Ramps, Raised Crosswalks, 6" thick	SY	0	\$125.00	\$0.00
12	Trail Closure/Reclamation	AC	0	\$50,000.00	\$20,000.00
				Subtotal	\$1,496,000.00
				NMGRT	\$125,290.00
				TOTAL	\$1,621,290.00

PHASE 3: MIDDLE BRANCH, VOLCANOES BUFFER

Trail and Related Improvements					
1	Paved Multi-Use Trail, per mile (10-12' width)	MI	0	\$800,000.00	\$0.00
2	Unpaved Multi-Use Trail, per mile (6-8' width)	MI	0	\$400,000.00	\$40,000.00
3	Unsurfaced Equestrian Trail, per mile (4-6' width)	MI	3	\$100,000.00	\$340,000.00
4	On-street Trail Connections (wayfinding, ADA improvements)	MI	0.0	\$50,000.00	\$0.00
5	Major Trailhead	LS	2.0	\$426,000.00	\$852,000.00
6	Secondary Access Point	LS	1.0	\$200,000.00	\$200,000.00
7	Neighborhood Access Point	LS	3	\$15,000.00	\$45,000.00
8	Collector Road Crossing (raised crosswalk, striping, signage, RRFB)	LS	0	\$50,000.00	\$0.00
9	Local Road Crossing (speed humps, striping, signage)	LS	2	\$25,000.00	\$50,000.00
10	Concrete Sidewalk/Trail Slab, 4" thick	SY		\$80.00	\$0.00
11	Concrete Curb Ramps, Raised Crosswalks, 6" thick	SY		\$125.00	\$0.00
12	Trail Closure/Reclamation	AC	1	\$50,000.00	\$50,000.00
				Subtotal	\$1,577,000.00
				NMGRT	\$132,073.75
				TOTAL	\$1,709,073.75

PHASE 4: ATRISCO TERRACE

Trail and Related Improvements					
1	Paved Multi-Use Trail, per mile (10-12' width)	MI	0	\$800,000.00	\$0.00
2	Unpaved Multi-Use Trail, per mile (6-8' width)	MI	0	\$400,000.00	\$0.00
3	Unsurfaced Equestrian Trail, per mile (4-6' width)	MI	6	\$100,000.00	\$590,000.00
4	On-street Trail Connections (wayfinding, ADA improvements)	MI	0.0	\$50,000.00	\$0.00
5	Major Trailhead	LS	3.0	\$426,000.00	\$1,278,000.00
6	Secondary Access Point	LS	3.0	\$200,000.00	\$600,000.00
7	Neighborhood Access Point	LS	4	\$15,000.00	\$60,000.00
8	Collector Road Crossing (raised crosswalk, striping, signage, RRFB)	LS	2	\$50,000.00	\$100,000.00
9	Local Road Crossing (speed humps, striping, signage)	LS	0	\$25,000.00	\$0.00
10	Concrete Sidewalk/Trail Slab, 4" thick	SY	0	\$80.00	\$0.00
11	Concrete Curb Ramps, Raised Crosswalks, 6" thick	SY	0	\$125.00	\$0.00
12	Trail Closure/Reclamation	AC	1	\$50,000.00	\$45,000.00
				Subtotal	\$2,673,000.00
				NMGRT	\$223,863.75
				TOTAL	\$2,896,863.75

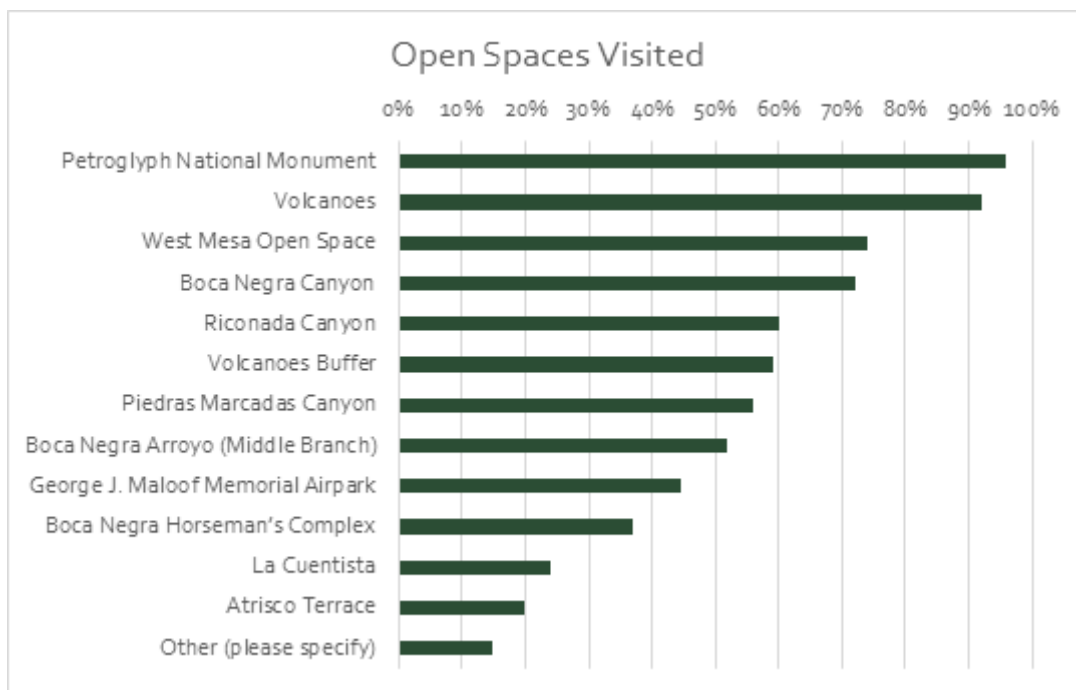
APPENDIX D: SURVEY

A community survey was conducted for the West Mesa Trail plan which was open from Mid-June to Mid-October. The survey received 27 responses, mostly from residents from the Westside and in the Albuquerque area. Input from the survey helped inform recommendations for connections, trail alignment, and provided amenities. The first half of the survey included questions specific to the West Mesa Core area and north/south areas.

In order to cover each unit equally, the survey is separated into West Mesa and North/South Area. Questions for the West Mesa area included input for Boca Negra Horseman's Complex, Boca Negra Arroyo (Middle Branch), George J. Maloof Memorial Airpark, West Mesa Open Space, and Volcanoes Buffer. North/South Area included input for Atrisco Terrace, Petroglyph National Monument, Riconada Canyon, Volcanoes, Boca Negra Canyon, La Cuentista, and Piedras Marcadas Canyon, and other. They both included a map to help residents orient themselves to each open space unit.

Next, the second half of the survey considered community connections and how best to make those connections using the trail network. Finally, the survey concluded with demographic information to get a better understanding of the survey takers.

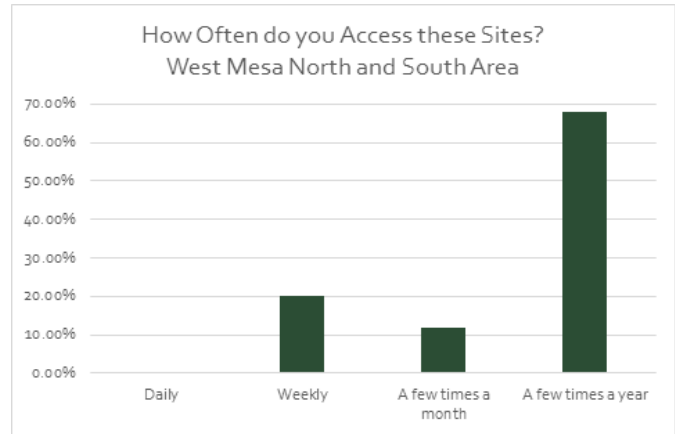
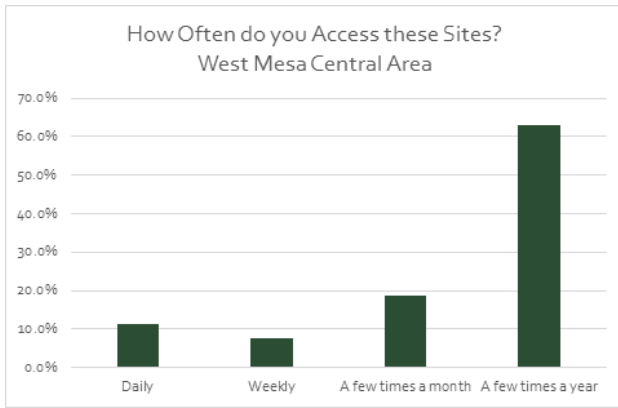
Have you visited any of the following open spaces shown on the map? Please check all that apply.



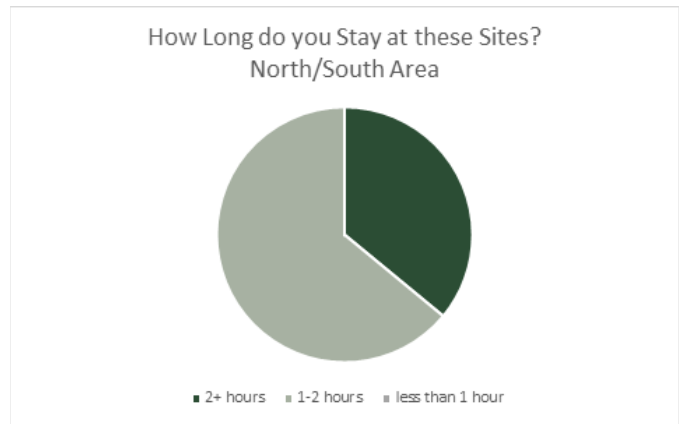
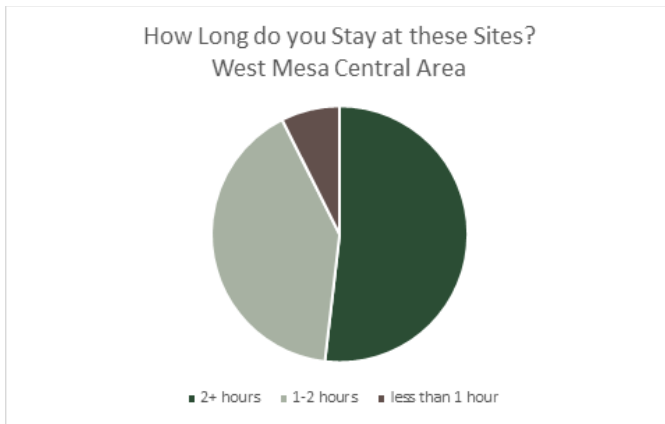
Other:

- Trail west of airpark that goes to the volcanoes. was an old service road.
- Arris o Terrace
- By car. I'd like to ride there but not sure of a SAFE way to do that from the North Diversion Channel Alameda parking lot
- Petroglyph National Monument

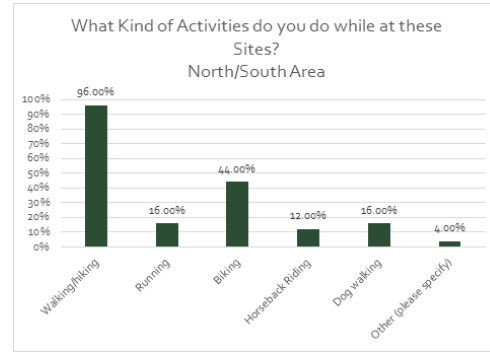
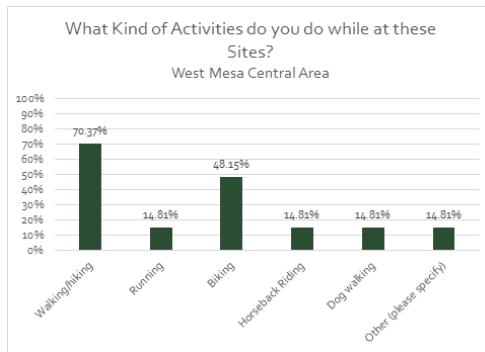
How often do you access these sites?



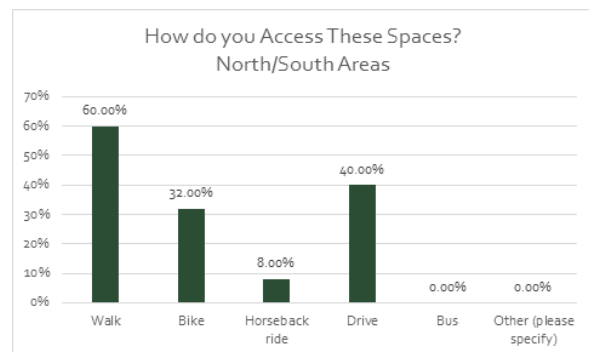
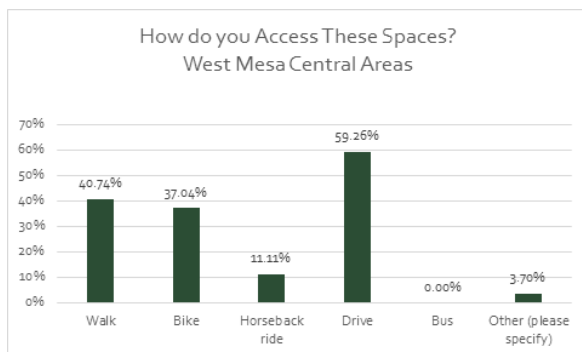
How long do you stay at these sites?



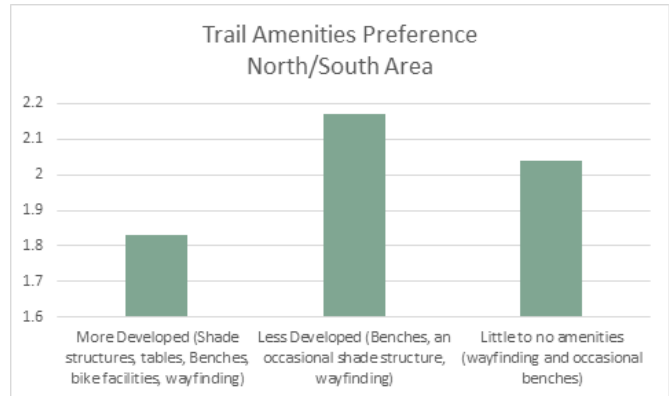
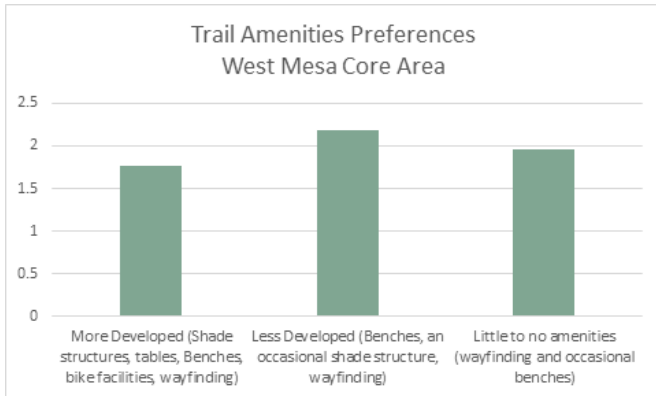
What kind of activities do you do while at these sites?



How do you access these spaces?

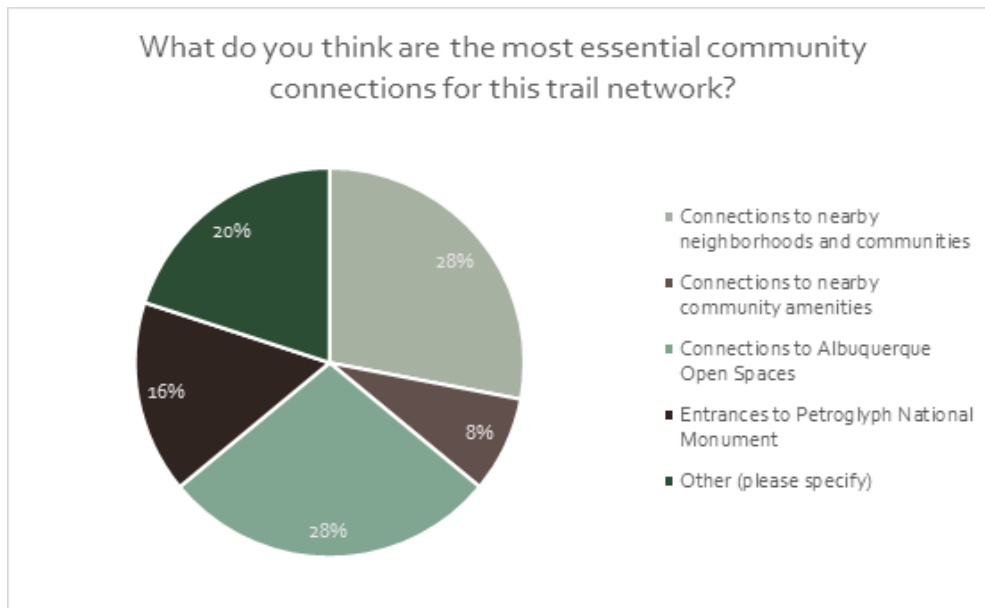


Please rank from most preferable (1) to least preferable (3) the extent of trail amenities you would like to see on the trail network.



Community Connections

What do you think are the most essential community connections for this trail network?



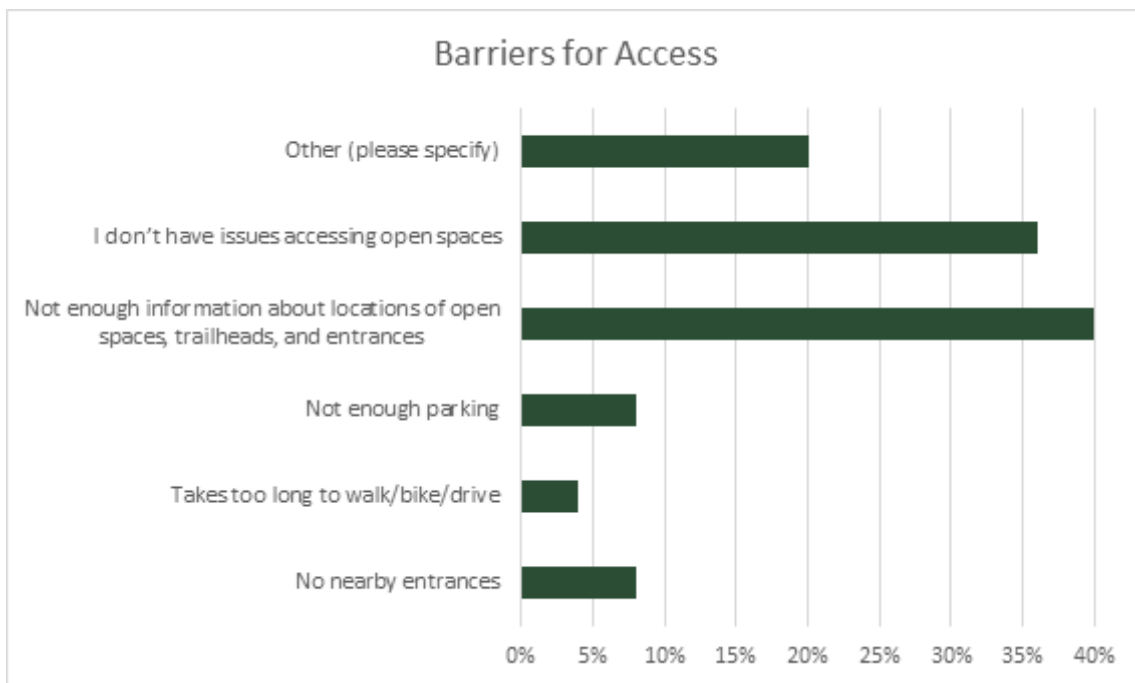
Other (please specify):

- all
- while connections to nearby neighborhoods and communities are important, remember that these open spaces are enjoyed residents of other parts of the city/county/region
- Connection to Boca Negra horseman’s complex
- Keep All Trails at least 400 yards from north or south end of Maloof Runway
- Connections to the east (e.g. Unser) to avoid having to drive around to Paseo de la Mesa trailhead

What neighborhood do you live in? If you do not know, what is the closest major intersection to where you live?

- Paradise Hills
- Ventana Ranch
- Sante Fe Village
- Netherwood Park
- Village of Corrales
- Alvarado Gardens
- Gibson and University
- north valley
- 528 and Northern, Rio Rancho
- Taylor Ranch
- La Cuentista
- Tijeras NM
- W
- Live near UNM
- Del Webb at Mirehaven
- Villa de Paz (Atrisco NW, south of St. Joseph's)
- Four Hills
- Northeast Heights, at Wyoming and San Antonio

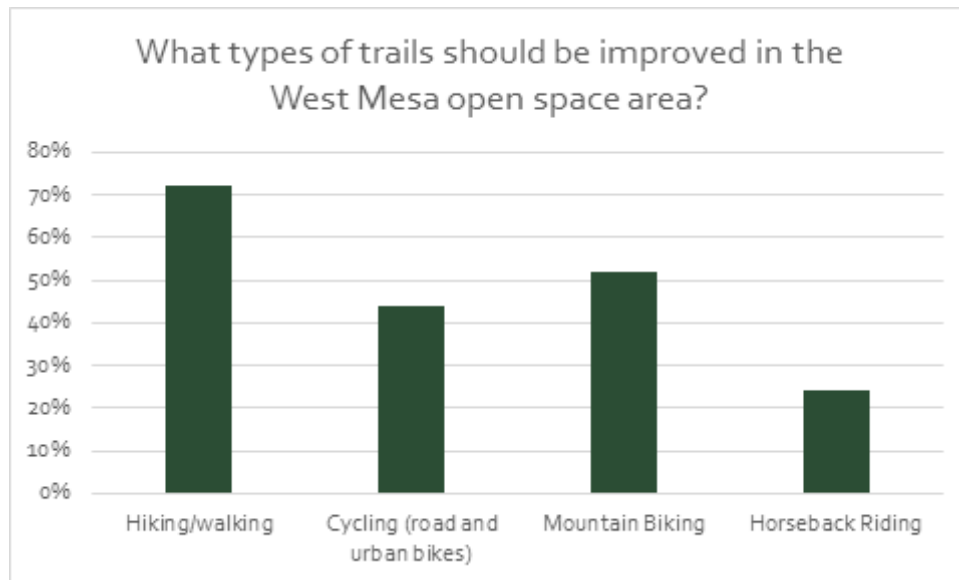
What are the biggest barriers for you to accessing these open spaces? Check all that apply.



Comments:

- No horse trailer parking
- Facilities accepting equestrians
- Academy and Ventura
- Access to Open Spaces thru NPS North Geo Window (bike)
- Not sure how to get there (safely) by bike from the Alameda parking lot which I can ride to.

What types of trails should be improved in the West Mesa open space area? Check all that apply

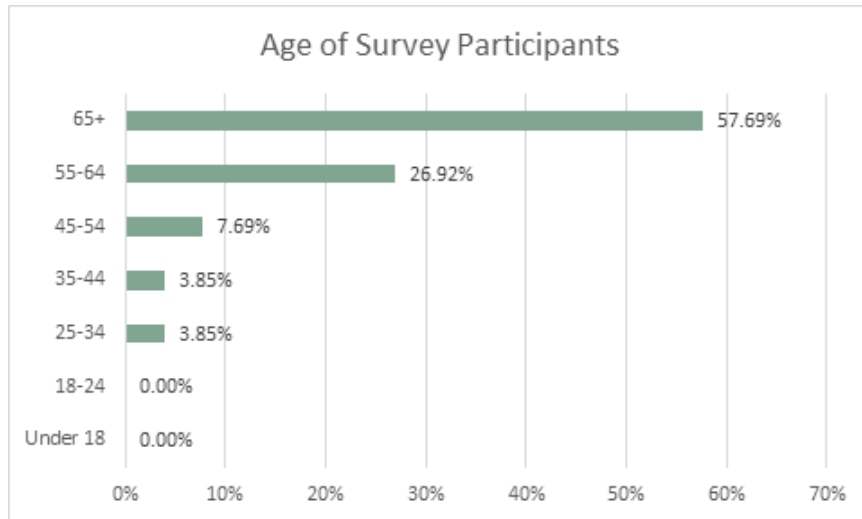


What are the most important considerations for this trail network? Please rank the options from most important consideration (1) to least important consideration (4).

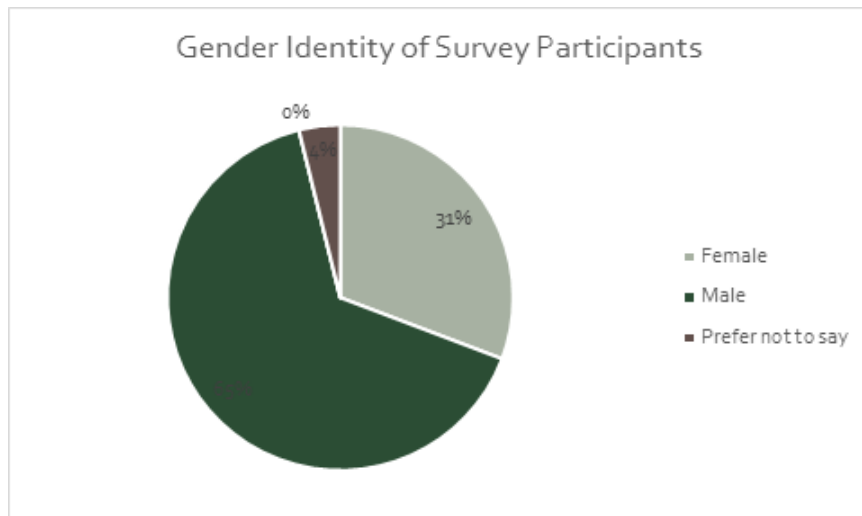
1. New Experiences
2. Safety
3. Connectivity
4. Recreation

Demographic Information

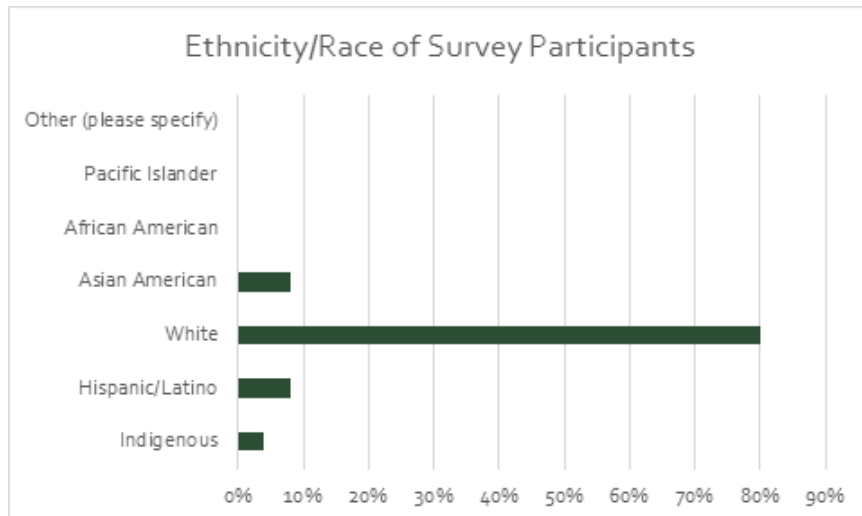
What is your age?



What is your gender identity?



What is your ethnicity/race identity?



Are there other people (individuals, organizations, businesses) we should reach out to better understand the area's needs for trails?

- Teachers
- Santa Fe Village Neighborhood Association
- schools, environmental organizations (e.g. Sierra Club - Rio Grande Chapter)
- CHAMPS
- organizations serving the elderly and the disabled
- Albuquerque Radio Control Club
- "Santa Fe Village Neighborhood Association
- West Side Coalition of Neighborhood Association (WSCONA)"
- Friends of the Sandias
- Bikethruburque.org and also abqciqlovia.org, local bike shops: story riders.
- ARCC model aviation club
- Friends of the Sandias probably

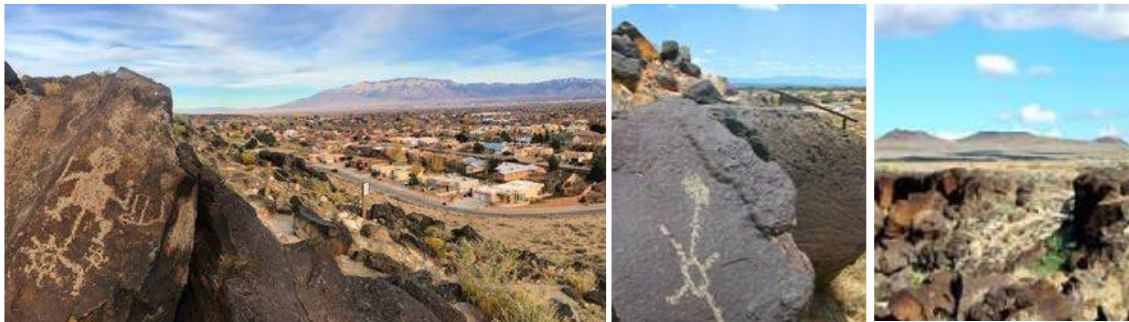
Do you have any other thoughts or comments on the West Mesa Trails Plan project?

- Include in city bike map
- Keep development lowkey and limit disturbance to the landscape
- Need better signage for connections to surrounding trails
- Don't overdevelop the area
- Do not allow e-bikes
- General excitement for the trail network

APPENDIX E: EXISTING ENVIRONMENTAL CONDITIONS REPORT

September 2022

West Mesa Open Space Trails Project Existing Environmental Conditions Report Bernalillo County, New Mexico



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Prepared for:

Sites Southwest
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Prepared by:

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Durango, CO
Pagosa Springs, CO
Albuquerque, NM
Farmington, NM

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Abbreviations and Acronyms

APE	Area of Potential Effects
BISON-M	Biota Information System of New Mexico
City	City of Albuquerque
CO	carbon monoxide
CWA	Clean Water Act
EMNRD	Energy Mineral and Natural Resources Department
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HU	hydrologic unit
HUC	hydrologic unit code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
USFWS	US Fish and Wildlife Service
WRCC	Western Regional Climate Center
WUS	waters of the US

1. Introduction

This report provides a review of existing environmental conditions and is intended to identify sensitive resources that may influence the development of a trails master plan for the West Mesa Open Space, land owned and managed by the City of Albuquerque (City). This land surrounds the Petroglyph National Monument and includes Bernalillo County jurisdictions identified in Figure 1-1. The report was developed from existing data, previous reports, and desktop sources. Although the analysis considers a full range of social, economic, and environmental conditions, it focuses primarily on those topics most relevant to the study area.

The study area comprises seven designated open spaces totaling 3,635 acres: West Mesa, Atrisco Terrace, George J. Maloof Memorial Air Park, Boca Negra Horseman’s Complex, Volcanoes, Boca Negra Arroyo (Middle Branch), and La Cuentista (Figure 1-1). In addition to City-owned land, the study area includes land managed by the New Mexico State Land Office and the National Park Service (Figure 1-1).

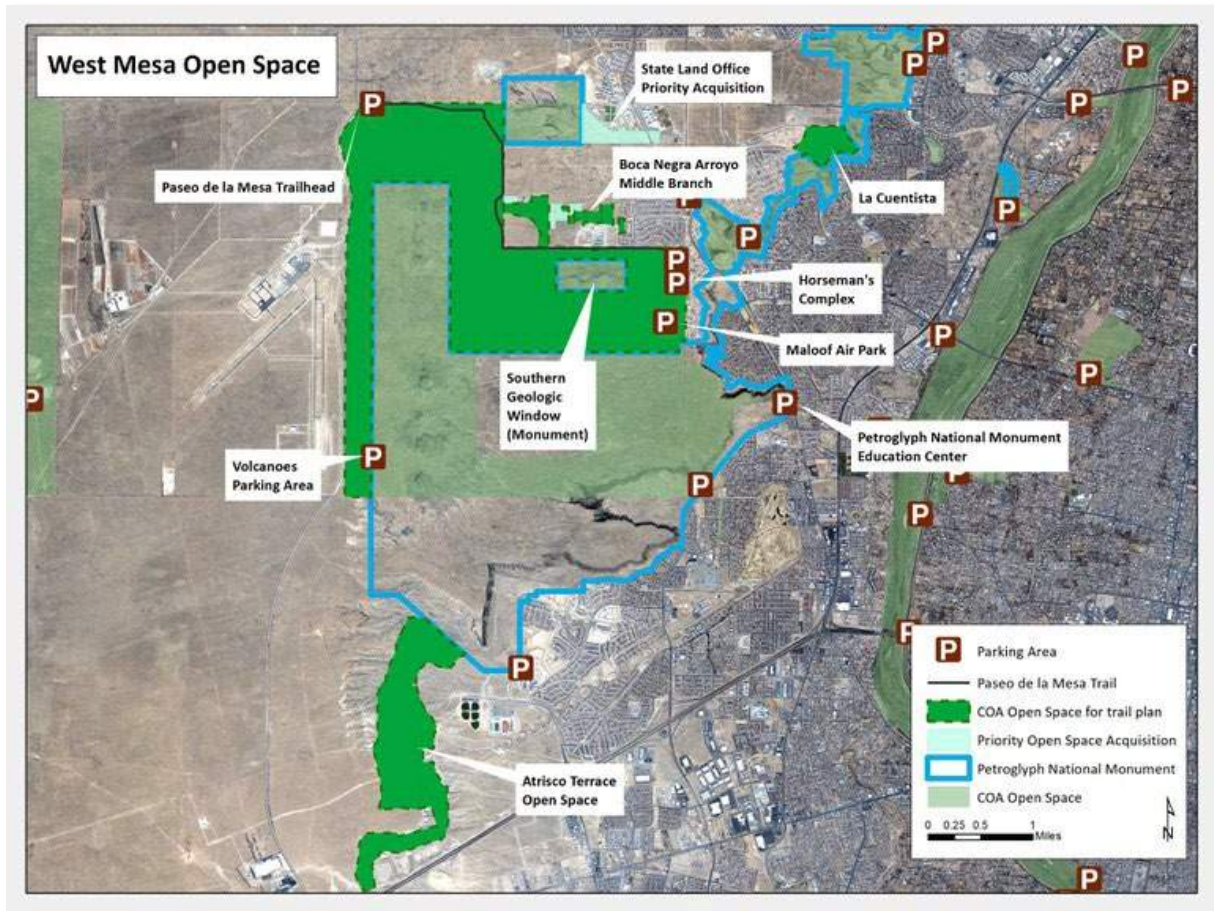


Figure 1-1. West Mesa Open Space Study Area Overview

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West Mesa Open Space Trails Project

Ecosphere Environmental Services, Inc.

2. Natural Resources

The natural resources described in this section consist of the physical and biological components of the study area. Each of these is described in detail in the sections below.

2.1 Physiography

The study area is in the western Albuquerque Basin of the Rio Grande rift in central New Mexico, which is locally characterized by a terrace (Ceja Mesa) adjacent to the Rio Grande overlain by basaltic flows that erupted from a series of volcanoes about 210,000 to 155,000 years ago (Peate et al. 1996, Smith et al. 1999). This region belongs to the Albuquerque Basin ecoregion of the Arizona/New Mexico Plateau, which is lower in elevation, drier, and warmer than surrounding ecoregions to the north, east, and west (Griffith et al. 2006). Elevation in the study area ranges from 5,256 feet at La Cuentista Open Space to 5,842 feet in Volcanoes Open Space.

2.2 Climate

The Albuquerque Basin ecoregion has a semi-arid climate, with large areas that count as desert. From 1994 to 2016, annual high temperatures at Petroglyph National Monument averaged 73.9 degrees Fahrenheit, and annual low temperatures averaged 43.1 degrees Fahrenheit (WRCC 2022). Precipitation averaged 9.43 inches per year with the highest average precipitation of 1.72 inches per month in August, during the summer monsoon season. On average, approximately 4.9 inches of snow fall at Petroglyph National Monument (WRCC 2022).

2.3 Geology

Extension in this part of the Rio Grande rift began about 26 million years ago. Sediments that eroded from the developing rift-flank highlands accumulated in the Albuquerque Basin. These basin-fill deposits, known as the Santa Fe Group, are over 16,000 feet thick beneath the Albuquerque volcanoes. The Ceja Formation, the uppermost and youngest sand and gravel unit of the Santa Fe Group in this part of the basin, was deposited by streams draining the area to the west and northwest of the monument (Love and Connell 2005). Several episodes of downcutting, aggradation, and renewed incision led to the formation of four terrace deposits along the Rio Grande in the Albuquerque area, including the Los Duranes Formation in the study area (Connell 2008). Eruptions of basaltic magma along the north-south trending County Dump Fault resulted in 5 large cones and at least 10 small volcanic and spatter cones in the Albuquerque volcanic field. The Volcanoes Open Space includes the JA, Black, and Vulcan Cones (Kelley and Kudo 1978).

About 200,000 years ago, basalt from the Albuquerque volcanoes filled in low spots along the edge of Rio Grande valley. Subsequent downcutting by the Rio Grande has now formed a mesa capped by basalt. Particularly visible in the Atrisco Terrace Open Space, erosion of the soft sediments under the hard basalt has caused large blocks of basalt from the two older flows to tumble down the eastern escarpment of the mesa. Most of the petroglyphs are on these large basalt blocks. The petroglyphs are chiseled into the black, metallic-

looking patina on the basalt called desert varnish. This coating forms in arid environments on protected surfaces that are resistant to weathering.

2.4 Soils

Soil units mapped in the study area primarily consist of Alemeda sandy loam, 0 to 5 percent slopes, which are eolian soils derived from igneous and sedimentary rock deposited on top of basaltic flows; Akela-Rock outcrop complex, which represents the basaltic volcanic surface; and Bluepoint-Kokan association soils composed of sandy alluvium and/or eolian sands (Natural Resources Conservation Service 2022; Table 2-1). These soil units are all well-drained, have a low to very low potential for runoff, and are non- to slightly saline. None of the soil units in the study area are considered hydric nor are they classified as prime farmland or farmland of statewide importance.

Table 2-1. Soil Types Mapped in the Study Area

Map Unit Name	Acres in Study Area	Percent of Study Area
Alemeda sandy loam, 0 to 5 percent slopes	1,373.7	37.8
Akela-Rock outcrop complex, 1 to 9 percent slopes	701.2	19.3
Bluepoint-Kokan association, hilly	686.3	18.9
Madurez-Wink association, gently sloping	351.5	9.7
Rock outcrop-Akela complex, 10 to 50 percent slopes	202.1	5.6
Madurez loamy fine sand, 1 to 5 percent slopes	176.8	4.8
Latene sandy loam, 1 to 5 percent slopes	103.9	2.0
Wink fine sandy loam, 0 to 5 percent slopes	28.5	0.8
Bluepoint loamy fine sand, 1 to 9 percent slopes	11.2	0.3
Totals:	3,635.2	100.0

2.5 Water Resources

2.5.1 Surface Water

The study area is located in the hydrologic units (HUs) of the City of Paradise Hills-Rio Grande (hydrologic unit code [HUC] 12: 130202030108), Rinconada Canyon-Rio Grande (HUC 12: 130202030303), and the City of Armijo-Rio Grande (HUC 12: 130202030305). Most of the project open spaces are in the City of Paradise Hills HU. The Volcanoes Open Space is bisected by the City of Paradise Hills and Rinconada Canyon HUs, and the Atrisco Terrace Open Space is bisected by the Rinconada Canyon and City of Armijo HUs. Combined, these watersheds drain 94,844.19 acres of land into the Rio Grande, which flows south through New Mexico and Texas toward the Gulf of Mexico.

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Several named and unnamed ephemeral drainages cross all of the open spaces in the study area except for La Cuentista. Named drainages include the Boca Negra Arroyo (Middle Branch), which crosses the open space of the same name as well as a portion of the West Mesa Open Space. South Boca Negra Arroyo and North San Antonio Arroyo cross the southern portion of the West Mesa Open Space (Appendix A, Map A-3 through Map A-5). Currently, ephemeral, intermittent, and perennial waterways are regulated as waters of the US (WUS) under Section 404 of the Clean Water Act (CWA) (33 United States Code 1344), which is administered and enforced by the US Army Corps of Engineers. Section 404 of the CWA provides for the permitting of activities that discharge dredged or fill material into WUS. Construction of the trails project in these ephemeral drainages may require a 404 permit and would likely qualify under a Nationwide Permit. Surface water quality in the state is regulated through Sections 401 and 402 of the CWA by the New Mexico Environment Department (NMED) Surface Water Quality Bureau and the US Environmental Protection Agency. A National Pollutant Discharge Elimination System Construction General Permit for stormwater discharges may be required as a condition of construction to prevent soil erosion and sedimentation of waterways. This requirement would be necessary if more than 1 acre of total land area is disturbed by future construction activities.

2.5.2 Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation adapted for life in saturated soil conditions. Identification of wetlands is dependent upon the presence of hydric soil, wetland vegetation, and hydrology indicators. According to the National Wetlands Inventory Wetlands Mapper (US Fish and Wildlife Service [USFWS] 2022a), only riverine environments associated with the study area waterways are present; no mapped wetlands have been identified in the study area (Appendix A, Map A-3 through Map A-5).

2.5.3 Groundwater

Post-Santa Fe Group valley-fill sediments generally are less than about 130 feet thick. These sediments provide a connection between the surface-water system and the underlying Santa Fe Group deposits. Hawley and Haase (1992) defined broad lower, middle, and upper parts of the Santa Fe Group on the basis of both the timing and environment of deposition. Sediments of the lower Santa Fe Group, which may be up to 3,500 feet thick in places, include extensive basin-floor playa deposits with low hydraulic conductivity. The middle Santa Fe Group ranges from about 250 to 9,000 feet thick and consists largely of basin-floor fluvial deposits in the north and fine-grained playa deposits in the south. The upper unit is generally less than about 1,000 feet thick, except in some areas near Albuquerque, and was deposited during development of the ancestral Rio Grande system (about 1 to 5 million years ago). The axial-channel deposits of this high-energy, fluvial system include thick zones of well-sorted sand and gravel that constitute the most productive aquifer materials in the basin (Bexfield 2010). Most public-supply wells in the study area are completed in the middle and/or lower units west of the river. Depths to groundwater, as measured from wells within 2 miles of the study area open spaces, average 189.4 feet below the ground surface (New Mexico Office of the State Engineer 2022). Construction of the West Mesa Open Space Trails Project will have no effect on groundwater in the study area.

2.5.4 Floodplains

According to the Federal Emergency Management Agency's (FEMA's) online Flood Insurance Rate Maps (FIRMs) of the study area (FEMA 2008a-e, 2012a-b, 2016a-b; Table 2-2), mapped flood hazard areas occur in association with the Boca Negra Arroyo (Middle Branch), which crosses the open space of the same name as well as a portion of the West Mesa Open Space; a tributary of the Boca Negra Arroyo (Middle Branch), which crosses the northern boundary of the Volcanoes Open Space; the South Boca Negra Arroyo and the North San Antonio Arroyo, which cross the southern portion of the West Mesa Open Space; and four unnamed drainages that cross the Atrisco Terrace Open Space.

Table 2-2. FEMA Flood Insurance Rate Maps (FIRMs) of the Study Area

FIRM Number	Effective Date
35001C0095H	8/16/2012
35001C0092G	9/26/2008
35001C0094G	9/26/2008
35001C0111G	9/26/2008
35001C0113G	9/26/2008
35001C0112G	9/26/2008
35001C0307H	8/16/2012
35001C0308H	11/4/2016
35001C0309H	11/4/2016

Note: Presented in order from west to east, then north to south.

Approximately 2,000 feet of the Boca Negra Arroyo (Middle Branch) is in a FEMA-designated Zone AE Floodway (FEMA 2008a and 2008c; Appendix A, Map A-3 through Map A-5). The Zone AE Floodway designation indicates a channel of a stream and any adjacent floodplain areas—whose base flood elevations have been determined—that must be kept free of encroachment so a 100-year flood can be carried without substantial increases in flood heights. The remainder of the FEMA-designated Floodways in the study area are in Zone A (areas with a 1 percent annual chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage). Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown in these zones. Construction of the West Mesa Open Space Trails Project are not likely to be encroached upon or substantially change flood patterns in the study area.

2.6 Biological Resources

2.6.1 Vegetation

The study area is characterized by a mix of sand scrub and desert grassland vegetation. Native vegetation includes black grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), mesa dropseed (*Sporobolus*

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flexuosus), blue grama (*Bouteloua eriopoda*), James' galleta (*Pleuraphis jamesii*), sand sage (*Artemisia filifolia*), alkali sacaton (*Sporobolus airoides*), threeawns (*Aristida* spp.), and scattered yucca (*Yucca* spp.).

The New Mexico Department of Agriculture (NMDA) lists certain species as noxious weeds (NMDA 2020). "Noxious" in this context means plants not native to New Mexico, which are targeted for management and control, and have a negative impact on the economy or environment. Class C listed weeds are common, widespread species that are typically well established in the state. Class B weeds are considered common, but not widespread in certain regions of the state. Class A weeds have limited distributions in the state. Noxious weeds are likely present in developed areas of the study area, such as parking areas and along roadsides. Noxious weed species, if discovered in the study area, should be subject to further evaluation and possible management measures.

2.6.2 Wildlife

Common wildlife species that may use the study area include songbirds, hawks, turkey vulture, and game birds (e.g., dove and quail). Potential nesting habitat is present in trees and shrubs, as well as any culverts, bridge structures, cliff faces, and rock crevices that may be present. Small mammals such as coyotes, foxes, squirrels, rabbits, and mice may occupy the study area; mule deer, pronghorn, elk, and black bear may pass through the study area during seasonal or diurnal migrations or to access resources or seasonal habitats.

The Migratory Bird Treaty Act protects migratory bird species, their parts, eggs, and occupied nests in the United States and its territories. If trees, large shrubs, bridges, or culverts need to be removed to accommodate construction, it is recommended that work be done between October 1 and February 28, outside of the nesting season. This would eliminate potential take of migratory birds. If construction activities take place during the breeding season, it will be necessary to conduct nest surveys prior to work. If active nests are found, permitting or coordination with the USFWS may be needed.

2.6.3 Special Status Species

The USFWS is responsible for implementing the Endangered Species Act, including listing species as threatened or endangered, and protecting these species. The State of New Mexico also lists and protects plants and animals. Lists of federal- and state-protected plant and animal species for Santa Fe County were obtained from the USFWS (USFWS 2022b); New Mexico Department of Game and Fish (NMDGF) Biota Information System of New Mexico (BISON-M) (NMDGF 2022); and New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) Forestry Division (EMNRD 2022). According to the USFWS (2022b), seven threatened, endangered, or candidate species have the potential to occur in Bernalillo County, New Mexico. NMDGF lists 10 species with the potential to occur in Bernalillo County. Four of the state-listed species are also federally listed (Table 2-3).

Table 2-3. Special Status Species in Bernalillo County, New Mexico

Common Name (<i>Scientific Name</i>)	Conservation Status
Spotted bat (<i>Euderma maculatum</i>)	State Threatened

Common Name (<i>Scientific Name</i>)	Conservation Status
New Mexico meadow jumping mouse (<i>Zapus luteus luteus</i>)	Federal Endangered, State Endangered
Yellow-billed cuckoo (western population) (<i>Coccyzus americanus occidentalis</i>)	Federal Threatened
Broad-billed hummingbird (<i>Cynanthus latirostris</i>)	State Threatened
White-eared hummingbird (<i>Basilinna leucotis</i>)	State Threatened
Least tern (<i>Sternula antillarum</i>)	State Endangered
Neotropic cormorant (<i>Phalacrocorax brasilianus</i>)	State Threatened
Brown pelican (<i>Pelecanus occidentalis</i>)	State Endangered
Bald eagle (<i>Haliaeetus leucocephalus</i>)	State Threatened
Common black hawk (<i>Buteogallus anthracinus</i>)	State Threatened
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Federal Threatened
Aplomado falcon (<i>Falco femoralis</i>)	Federal Endangered, State Endangered
Peregrine falcon (<i>Falco peregrinus</i>)	State Threatened
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Federal Endangered, State Endangered
Bell's vireo (<i>Vireo bellii</i>)	State Threatened
Gray vireo (<i>Vireo vicinior</i>)	State Threatened
Baird's sparrow (<i>Centronyx bairdii</i>)	State Threatened
Rio Grande silvery minnow (<i>Hybognathus amarus</i>)	Federal Endangered, State Endangered
Monarch butterfly (<i>Danaus plexippus</i>)	Federal Candidate

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No designated or proposed critical habitat for federally protected species occurs within 2 miles of the study area (USFWS 2022b) and no federally listed species are likely to occur in or directly adjacent to the study area.

2.7 Farmland

No soils classified as prime farmland are present at the study area. No conversion of currently cultivated land is expected as part of likely improvements.

2.8 Air Quality

The Clean Air Act, as amended, establishes National Ambient Air Quality Standards for several criteria pollutants, including carbon monoxide (CO), nitrogen dioxide, particulate matter less than 10 microns in diameter, particulate matter less than 2.5 microns in diameter, ozone, sulfur dioxide, and lead. Emissions from a region's road network are related to the total vehicle miles of travel, speed, and operating characteristics. Generally, emissions of CO and carbon dioxide, a greenhouse gas, decline as speeds increase; the highest emissions occur under congested idling conditions and decrease up to about 45 to 50 miles per hour, at which point they increase as speeds increase. Bernalillo County is in attainment for federal and state NMED Air Quality Bureau standards (NMED 2022). Construction of the proposed West Mesa Open Space Trails Project is not expected to have air quality impacts.

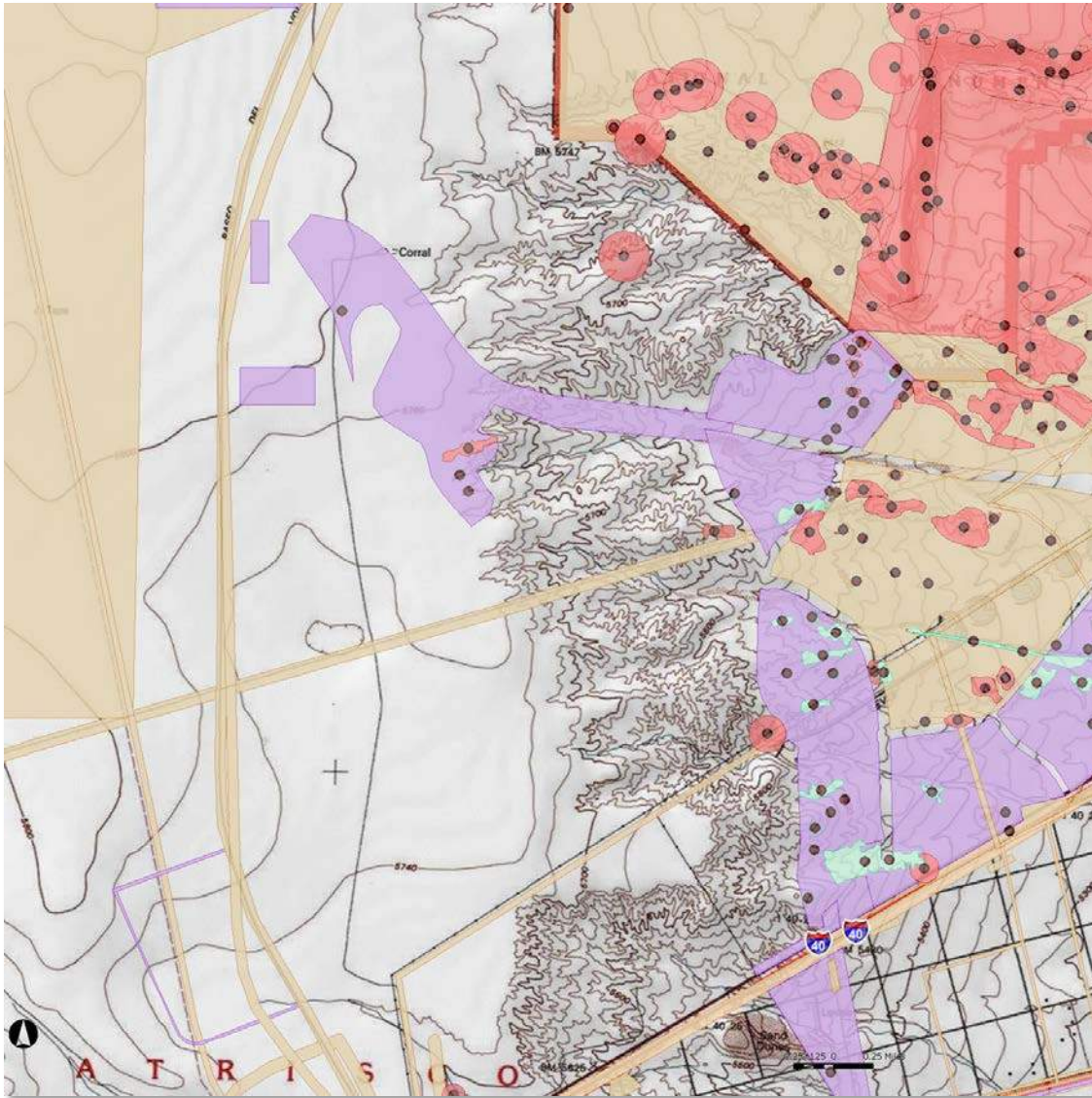
3. Archaeological, Cultural, and Historic Resources

The purpose of this desktop review is to identify the location of known cultural resources in the project vicinity, determine whether significant portions of the study area have been previously inventoried, derive expectations regarding the nature and frequency of resources that could be impacted by the proposed trail construction project, and ultimately assist the project proponents with their agency and stakeholder consultation or general project planning. The primary findings of the literature review are summarized below.

- Although several previous investigations intersect or overlap the proposed trail alignments, there has never been a systematic cultural inventory of the entire study area, particularly the southernmost area (Figure 3-1). Further, these surveys occurred more than 10 years ago and may be considered invalid for current project certification needs.
- Known resources in and near the proposed trail alignment consist primarily of prehistoric and historic archaeological sites. No historic buildings or acequias are anticipated.
- The proposed trail alignments appear to partially overlap with S.R. No. 1234 the "Las Imagines: Albuquerque West Mesa Archaeological District (N.R. No.86003142)." Potential direct or indirect effects on the listed property may need to be evaluated.
- The study area is in and adjacent to Petroglyph National Monument, administered by the National Park Service. Potential direct and indirect effects on the Monument and its resources may need to be evaluated.

- The high archaeological site density in the study area and vicinity indicates that numerous archaeological sites will be discovered during a Class III survey that will require trail design changes and reroutes to avoid impacts to these resources (Figure 3-2).

Prior to construction, the project’s cultural resource contractors should consult with appropriate agencies to define the Area of Potential Effects (APE) and determine the required level of effort for any required cultural resource compliance studies.

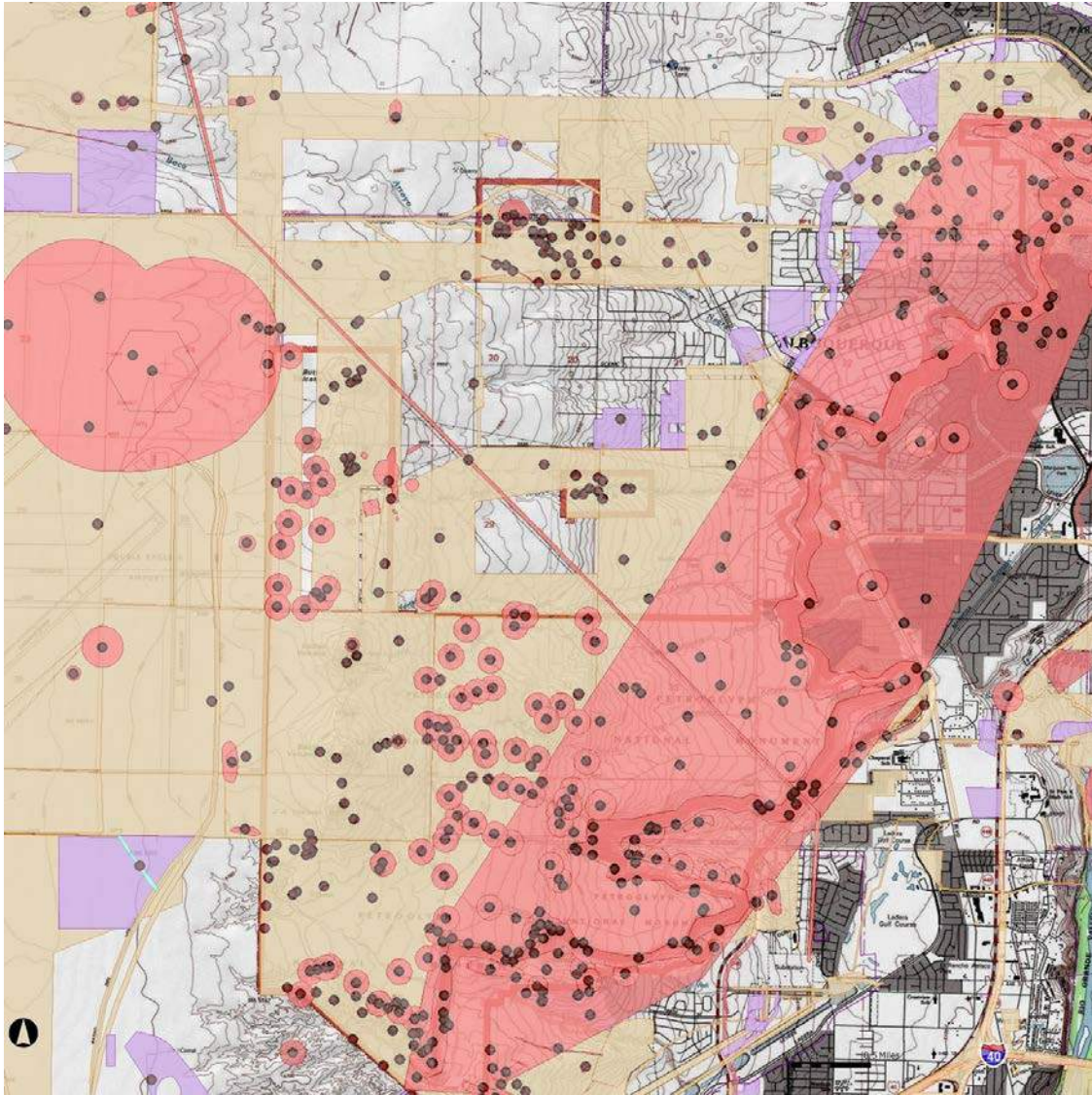


Note the lack of adequate survey coverage for the majority of the proposed trail alignment here and the relatively high site density for adjacent areas. Red indicates archaeological sites; purple and yellow indicate previous surveys.

Figure 3-1. Southern Area

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Note existence of several previous surveys and the high density of cultural resources.

Figure 3-2. Northern Area

4. Other Resources

4.1 Hazardous Materials

The presence of hazardous materials in soil or groundwater is a concern for construction safety, the potential to further spread or disperse contamination, and the liability associated with possible right-of-way acquisition.

Investigations for hazardous materials are not yet underway for the current study area but will be completed if earth-disturbing improvements or right-of-way acquisitions in the study corridor are recommended.

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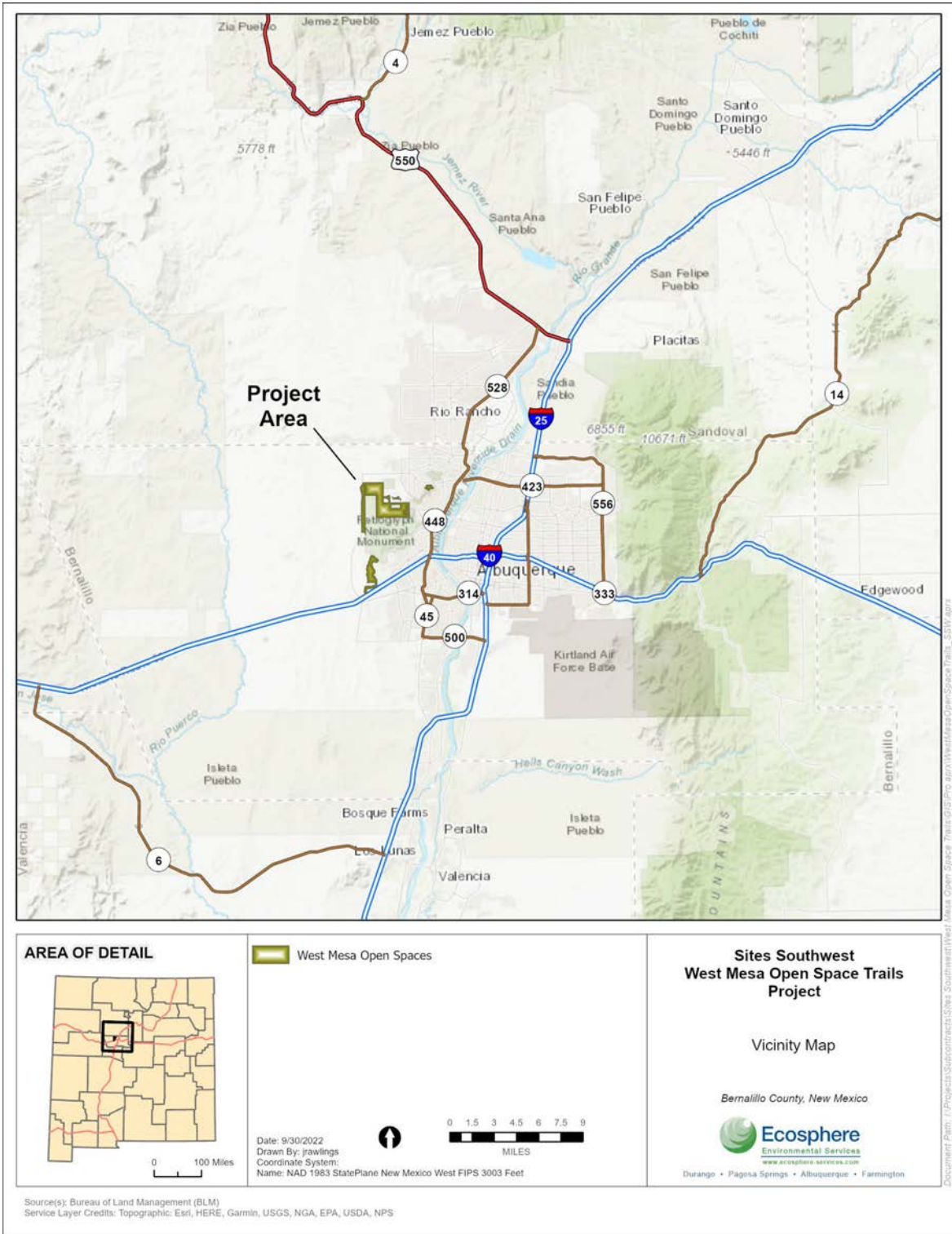
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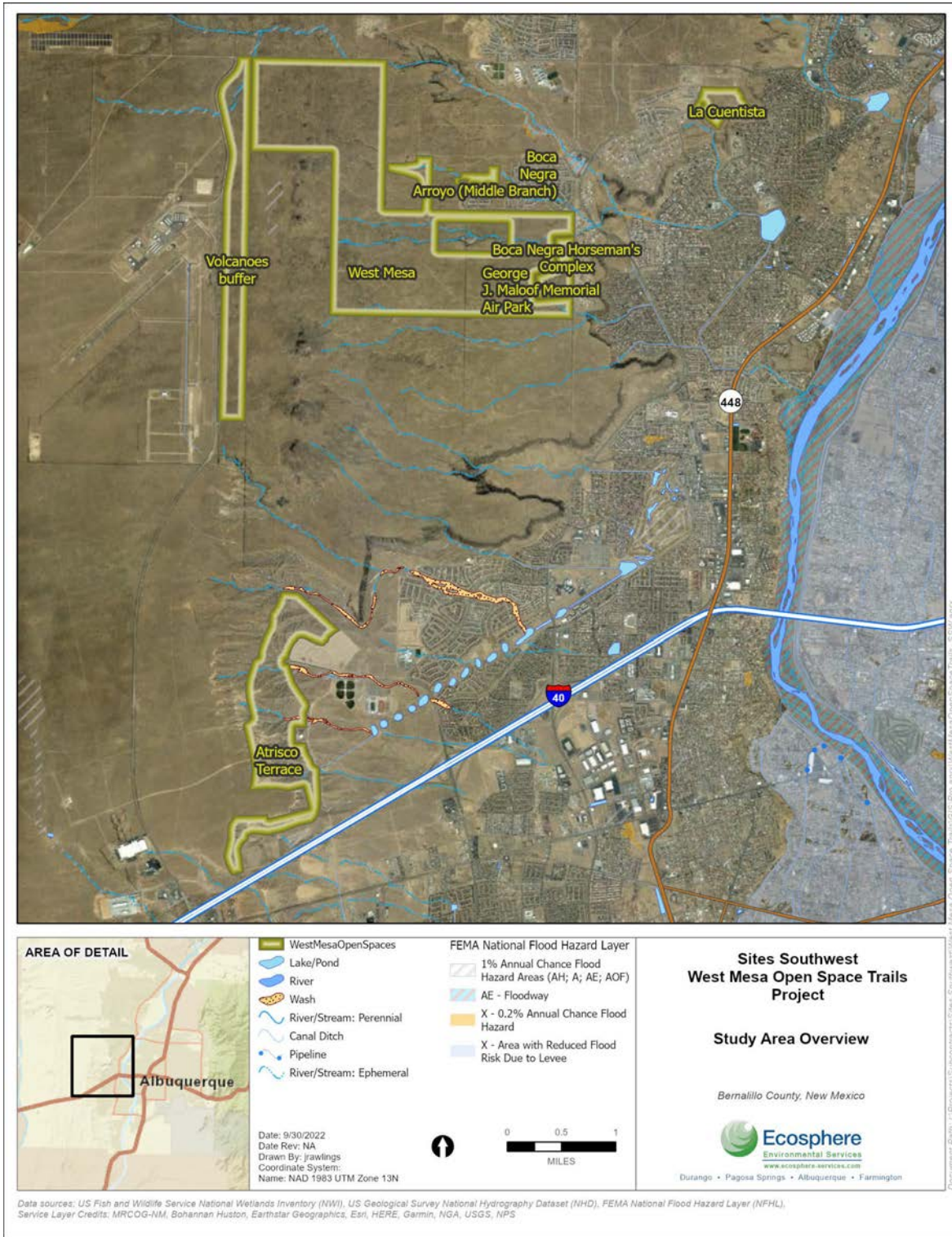
Appendix A – Maps

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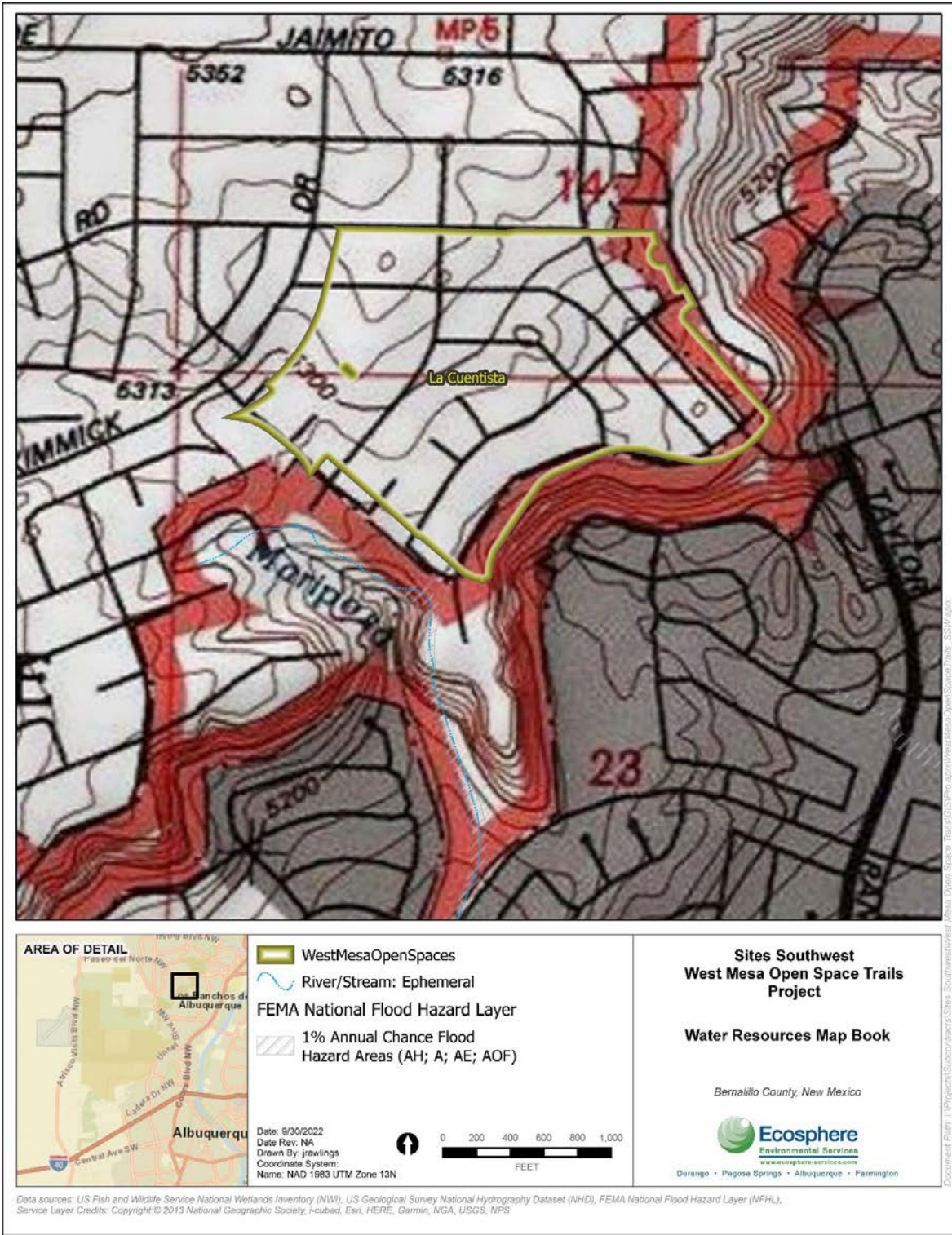
Map A-1. Vicinity Map



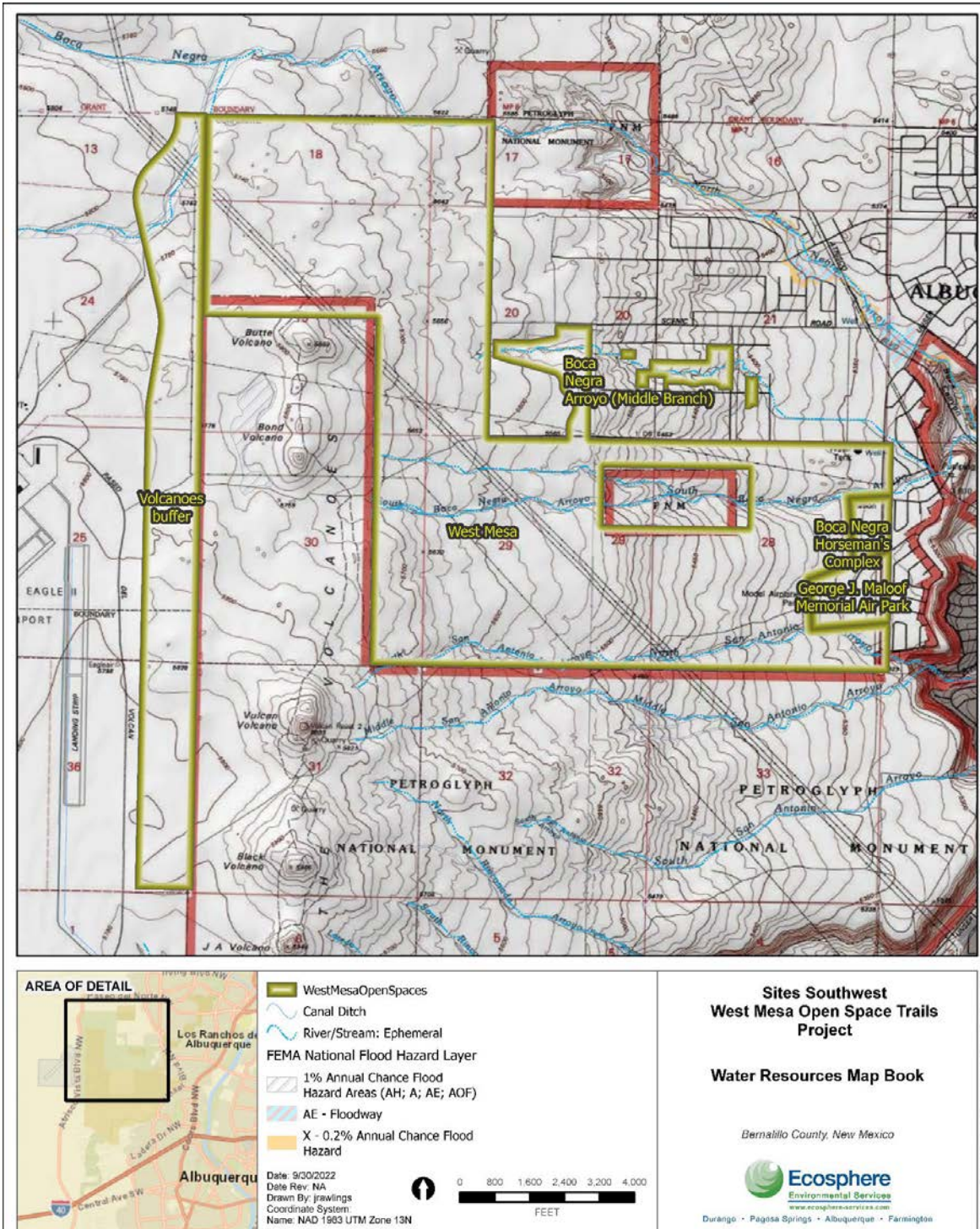
Map A-2. Study Area Overview

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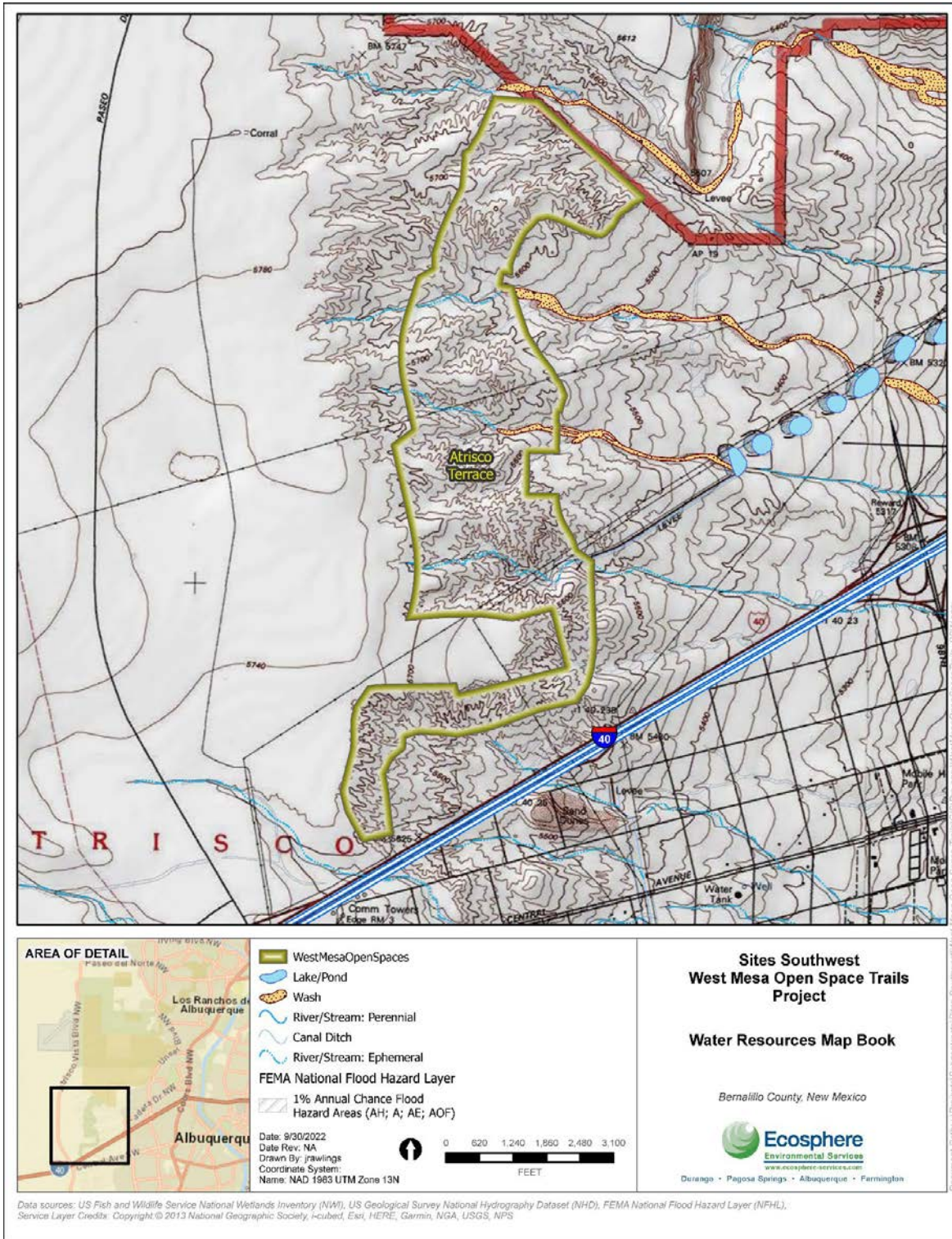
Map A-3. Hydrology Map Book, Page 1



Map A-4. Hydrology Map Book, Page 2

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Map A-5. Hydrology Map Book, Page 3