

TIJERAS CANYON/CARNUEL PLAN 2007



Adopted by the Board of County Commissioners on August 28, 2007

ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

Acknowledgements	2
Community Participants	4
I. BACKGROUND	5
Plan Area	5
Plan Process	6
Area History	6
Plan Area Map	7
II. MAIN ISSUES	8
Discussion	8
Needs	9
Service Priority Map	10
Solutions	11
III. CONDITIONS	13
Infrastructure	13
Water	13
Wastewater	14
Transportation	15
Other Public Utilities	16
Natural Resources	16
Soils	16
Elevation	17
Slopes, Drainage and Surface Water	17
Vegetation and Wildlife	17
Cultural Resources	18
Land Use	19
Residential Uses	19
Commercial Uses	20
Open Space/Recreation	20
Cultural Uses	21
Carnuel Land Grant	21
IV. PLAN POLICIES	23
1.0 Residential Uses	23
2.0 Commercial Uses	23
3.0 Infrastructure	23
4.0 Roads and Transportation	24
5.0 Open Space/Recreation	24
Definitions	25
Appendix A: Planning Session Notes	27
Appendix B: Subareas Map	31
Appendix C: Transportation Map	32

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I. BACKGROUND

The Tijeras Canyon/Carnuel Plan serves as a community scale plan providing Bernalillo County with guidance in the planning of this area. The plan is consistent with the East Mountain Area Plan (EMAP) and examines this particular community's concerns regarding future residential and commercial development, specifically focusing on the need for water and wastewater infrastructure.

Plan Area

The Tijeras Canyon/Carnuel Plan area encompasses the greater Carnuel community, Echo Canyon Estates, North Echo Canyon, Monticello, the Coyote Springs Master Plan area, Coyote Springs Neighborhood (developed), and Western Tijeras Canyon (West Tijeras Canyon Estates and Office Park, Four Hills Partnership et. al. properties, Caballo de Fuerza Neighborhood, Rabadi property, Herrera Road Neighborhood, Silver Hills Neighborhood) area including the undeveloped tracts of land in the western portion of Carnuel and just east of the municipal limits of Albuquerque (See Appendix B, p. 30). The plan area is bounded on the west by the east boundary of the City of Albuquerque, to the east by the underpass of Highway 333 at I-40 (colloquially known as Dead Man's Curve), to the south by the U.S. Forest Service lands near Coyote Springs and to the north by the Sandia Wilderness (See Map on page 7).

According to the 2000 US Census Bureau, the Tijeras Canyon/Carnuel Plan area consists of approximately 1,210 residents. There are an estimated 518 occupied and 37 vacant houses. The population in households is 1,197. Among the households, 1,031 people live in owner-occupied housing while 166 are renters. Since 2000, there was very little new construction in the plan area. The median age in the plan area is 42.5. The Hispanic population within the plan area makes up approximately 53% of the total population of the study area. (*Source:* U.S. Census Bureau 2000 estimates for Carnuel CDP; Block Group 38.07, Group 1, Blocks 1024-1027; and Block Group 7.10, Group 2, Blocks 2000-2013, 2031-2032, 2050.)



Community Planning Session, January 7, 2006.
Photo by James M. Aranda

Since the early 1990s, new development has taken place in the southwest portions of the plan area. Subdivisions have also been platted and developed on the western portion of the plan boundary referred to as Western Tijeras Canyon. The plan area also has a few large tracts of undeveloped land south of the Interstate 40 frontage and Carnuel and in the Western Tijeras Canyon area. Small-scale commercial uses are sparsely spread along Historic Route 66. Today, the neighborhoods within the plan area continue to enjoy a rural atmosphere despite encroachment of urban development.

TIJERAS CANYON/CARNUEL PLAN 2007

Plan Process

The Tijeras Canyon/Carnuel Plan process began in October 2005 and included several community meetings. These two meetings were held on October 26 and December 6 at Los Vecinos Community Center. The purpose and intent of the plan was presented to community members and existing conditions of the plan area were discussed.

The basis of the plan was developed in an all day planning session on January 7, 2006. This session included participation from approximately forty residents and County staff from the Planning, Environmental Health and Public Works Offices who identified the development issues, goals and recommendations used to draft this plan. Additional public meetings were held on November 13, 2006 and January 23, 2007 to offer neighbors the opportunity to comment on the plan draft.

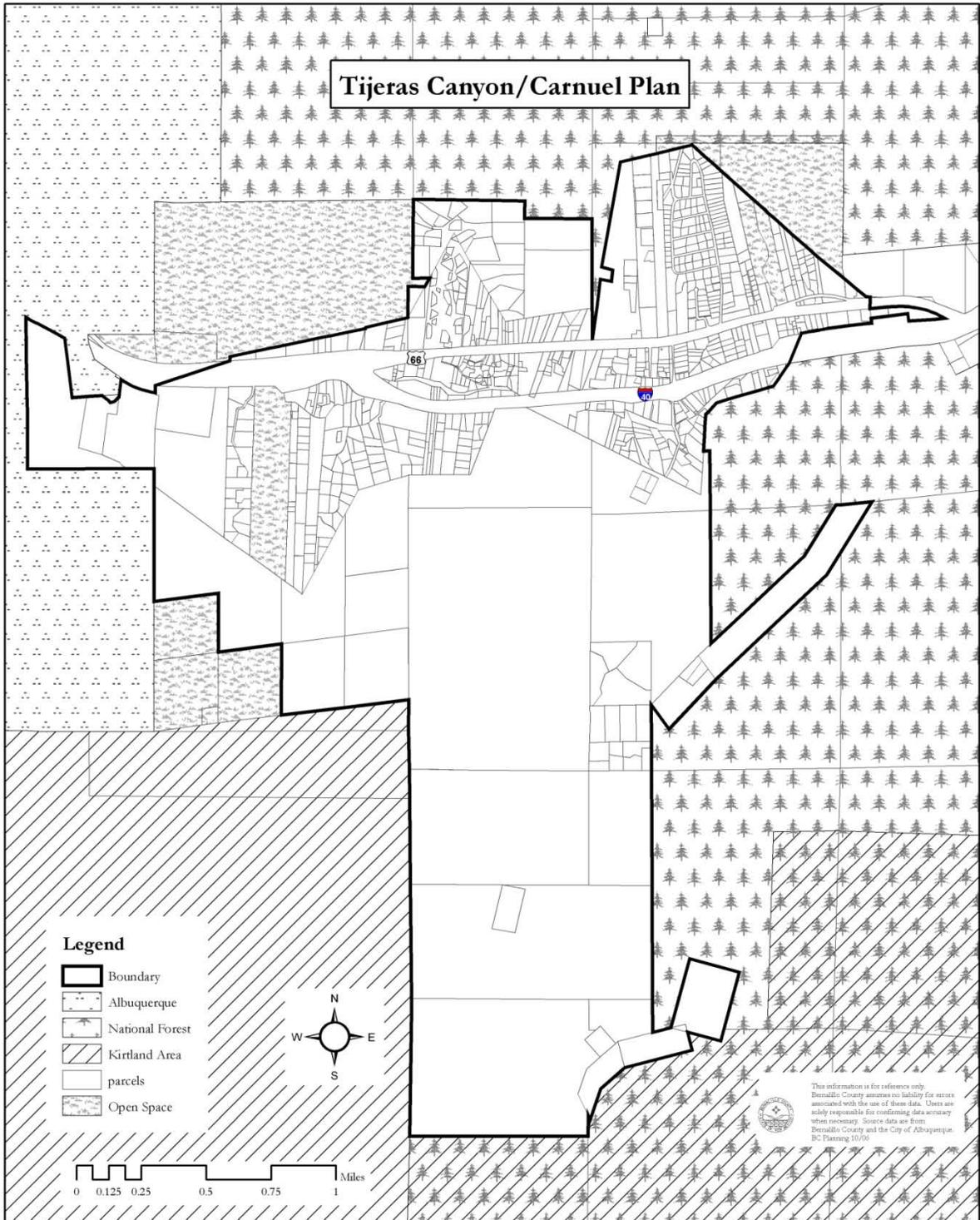
Area History

In 1763, Spanish colonial governor of New Mexico Tomás Velez Gachupín ordered that a permanent settlement be established in the Sandia Mountains east of the Villa de Albuquerque for the purpose of developing a defensive buffer between the Spanish settlement and nomadic tribes. In the early 1700s, the Pueblo and Hispanic settlements of the valley had experienced frequent attacks by nomadic bands of Native Americans. A plan was developed to move landless *genizaros* (Hispanicized Indians) and mestizos (Spanish and Native parentage) to the canyon in the mountains for land distribution and defense. Due to continued attacks, the settlement was difficult to sustain and experienced periods of abandonment and resettlement. The communities in the Carnue Land Grant are the oldest continually inhabited communities in the Sandia Mountain range. In 1817, the children and grandchildren of the area's original settlers, and other landless mestizos and mixed-castes (social order) were allowed to return to the Cañon de Carnue to build permanent settlements and reorganize farm plots and communal land holdings. In 1819, the Cañon de Carnue was re-issued as a community land grant known as San Miguel de Laredo de Carnue. The village included a defensible plaza and various acequias throughout the study area (U.S. Forest Ranger District, Heritage Report No.2002-03-008).

After the Treaty of Guadalupe Hidalgo was signed between the United States and Mexico, ending the U.S. - Mexican War, the United States was obligated to establish courts in which to adjudicate the lands held by Mexican citizens. After a 40-year court proceeding, the U.S. court issued an order reducing the 90,000 acre claim of the Carnue Land Grant to 2,000 acres which excluded the historical communal lands and reduced the community's size to only the private tracts allotted to individual families.

For much of the early 1900s, the built environment was primarily typified by rock and adobe single family housing structures with high-density family compounds surrounded by corrals and small gardens. The dominant land use within the land grant's common lands was goat herding. This land use pattern continued until the 1940s when the increase in commercial use along Historic Route 66 led to the development of a number of roadside hotels and gas stations. In this same decade, new residential developments were built, known as Echo Canyon Estates and the Monticello neighborhood, further transforming the historic community. The construction of I-40 in the 1970s significantly fragmented the community. The interstate's presence increased traffic through Tijeras Canyon and split the north side of Carnuel, Monticello, and Echo Canyon from the south side of Carnuel and from Coyote Springs.

TIJERAS CANYON/CARNUEL PLAN 2007



II. MAIN ISSUES

Discussion

Major environmental concerns identified in the planning process were water quality and wastewater issues. Needs and solutions to these problems dominated the discussions at public meetings.

There are a number of residents, particularly within the Carnuel community, whose well water is not potable due to contamination of well water sources. The land use patterns in the Carnuel area, including Santo Niño and Acequia Madre, can be defined as a high-density traditional Hispanic community development on lots less than one acre in size. This district primarily includes residential manufactured housing on the south side of I-40 as well as site built housing in newly developed subdivisions directly south of the Santo Niño church. At the January 2006 public planning session, a focus group convened and identified the *Traditional Community District* as an area within the Carnuel Land Grant boundary where Hispanic community members have lived for many generations between Old Route 66 and I-40 and south of I-40 around the Santo Niño Church and the Acequia Madre neighborhood (see Subareas Map, Appendix B, p.28). The designation acknowledges the small lot size and clustering nature of this historic area. Historically, higher density housing was centered around plazas, as in the case of the abandoned San Miguel Plaza or the placement of family home clusters known as *plazuelas*. Participants felt that the creation of this designation could be a catalyst for the future development of strategies for protecting residential land use here.

Many of the contaminated wells in the area result from septic waste (including from septic tanks and cesspools) that has made its way into the wells through the cracked rock formations. Compounding this problem is the difficulty in replacing existing liquid waste disposal systems. The small lot sizes, located primarily in Carnuel, limit the space in which septic tanks and disposal fields can be placed thus impeding the possibility of meeting current wastewater ordinances.

Future development has the potential to worsen the existing situation. In total, there are 12 lots of undeveloped land zoned A-1, totaling approximately 592 acres located in Western Tijeras Canyon. A major constraint to development on the vacant Western Tijeras Canyon properties is the lack of water and sewer service which should be considered to avoid further contamination. Landowners of undeveloped lots in Western Tijeras Canyon would like to see water and sewer service available in order for development to be possible. Road access is another issue to be resolved prior to development in this area.

The Coyote Springs Master Plan for 135 lots was reviewed by the Bernalillo County Planning Commission in June 1998. To date there has been no development at this site.

In May 2004, the Board of County Commissioners approved a Special Use Permit for a Planned Development Area for a 164-acre site called West Tijeras Canyon. Included were 103 1-acre lots, an approximately 4.1-acre office space, and 12.1 acres of private open space.

There are presumably other landowners who may be submitting applications in the future for major (6 lots or more) and minor (5 lots or less) subdivisions. Landowners and developers project this area will be developed at A-1 densities and homes built in this area may be similar to that of neighboring Four Hills.

TIJERAS CANYON/CARNUEL PLAN 2007

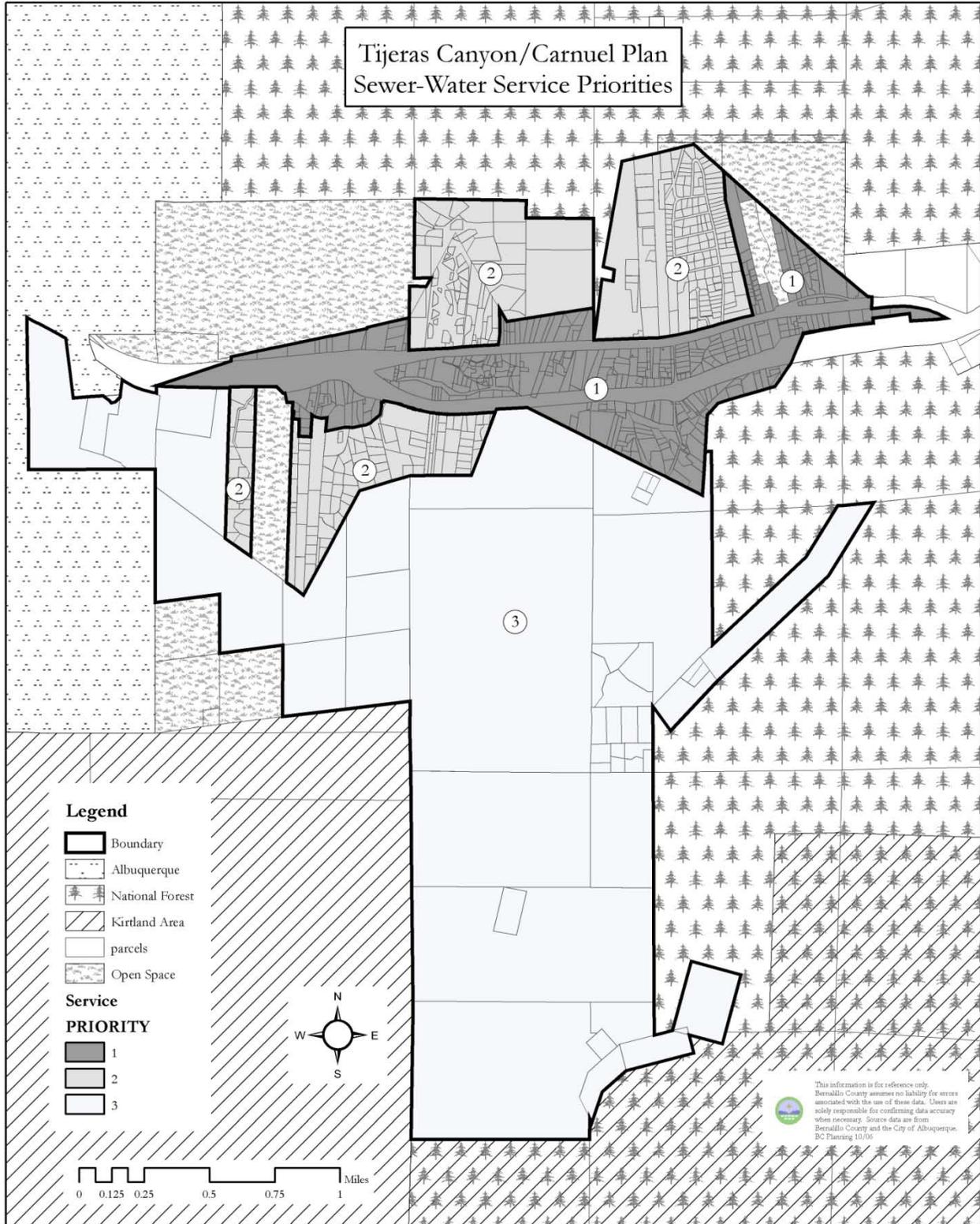
Needs

The existing residences in the Carnuel community must be connected to water and sewer systems in order to stop future contamination of natural resources in the area. Infrastructure must be put in place if further development is going to occur particularly on properties adjacent to Highway 333/Old Route 66. It has also become clear that to solve existing problems, sewer and water utilities must be established simultaneously. Furthermore, this is consistent with the Albuquerque Bernalillo County Ground-Water Protection Policy and Action Plan.

During the January 7, 2006 work session, many participants agreed that the Carnuel Mutual Domestic should be the water utility servicing the existing development in the area. Western Tijeras Canyon landowners expressed interest in having the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) service water infrastructure to any future development. West Tijeras landowners will continue to work with the ABCWUA to plan water utility service for the West Tijeras area.

The wastewater strategy identified by work session participants was to ultimately provide a sanitary sewer system for the entire plan area. Community members had questions about the feasibility of allowing homes and businesses in the plan area to connect to the existing sanitary sewer force main that runs from A. Montoya Elementary School in Tijeras through Carnuel that connects with the Albuquerque/Bernalillo County sewer system at Tramway Boulevard. This would mean transitioning from the use of individual septic systems to using the existing eight-inch force main sewer line that runs from the Village of Tijeras to the City of Albuquerque at Tramway and Central. This could eventually lead to a developed sewer network for the plan area. Other major components include determining the financial feasibility and administrative responsibility of such an effort. In terms of phasing the conversion to sewer service for the plan area, the immediate priority should be the *Traditional Community District*, where a majority of homes are located on lots less than ½ acre in size. The next phase could target existing homes on lots larger than ½-acre. However, the properties in Coyote Springs Master Plan area and Coyote Springs Neighborhood have a different topography and soils than Carnuel and thus do not face the same degree of severity with wastewater issues. Therefore, some residents of Coyote Springs Neighborhood may not favor a conversion to a sewer system.

TIJERAS CANYON/CARNUEL PLAN 2007



Solutions

Albuquerque Bernalillo County Water Utility Authority

The Albuquerque Bernalillo County Water Utility Authority (ABCWUA) is a joint City of Albuquerque and Bernalillo County agency that is responsible for administering the water and wastewater utility throughout much of Albuquerque and Bernalillo County. The agency strives to provide reliable, safe drinking water while protecting groundwater.

According to the ABCWUA, the existing eight inch force main that is located through the plan area along Highway 333 has a capacity of 450,000 gallons per day. This service line is at 1% capacity with only six connections to the sewer line. The sewer line has the potential to service up to 1500 homes in the plan area. There are currently about 555 homes in the plan area. The ABCWUA is aware of the public health issues related to failing septic tanks in the study area (Information Session with ABCWUA members; April 20, 2006). Although capacity of serving the plan area with sewer service by the ABCWUA is possible, some outstanding issues must be addressed. The ABCWUA has stated that in order to begin to allow sewer connections for existing homes, the following improvements would need to be implemented to the existing line for the general Carnuel area:

- Construction of a pump station on line that can lift wastewater at full capacity.
- Placement of a connection line on the south side of Highway 333.
- Placement of a connection along Highway 333, which would allow for gravity flow through the sewer line.

The following are the challenges in providing sewer service in Plan Area:

- Ability of individuals and community groups to recruit funding for engineered plans and facilities that must be constructed in order to connect to the existing force main.
- The natural geography of the plan area will increase construction cost so State capital project money as well as Federal assistance will be needed to begin service connection to the existing residential area.
- The placement of service lines to specific residential neighborhoods will have to address slope and soil conditions that may be more challenging in the construction of lines and facilities related to sewer infrastructure.
- Due to the amount of private roads, dedications of easements for the placement of sewer lines will be a challenge in some locations within the study area.

Furthermore, in order for the ABCWUA to provide sewer service to future development in the West Tijeras portion of the study area, service agreements would have to be completed between the user and provider. New development would finance the cost of connecting to the sewer line along Old Route 66.

Carnuel Mutual Domestic

In 2002, area residents, the Carnuel Acequia Association, and the Carnue Land Grant collaborated to form the Carnuel Mutual Domestic Water Users Association (Carnuel Mutual Domestic) for the purpose of establishing a community-owned water utility to address water quality issues. The Carnuel Mutual Domestic currently has over 200 members, all of whom are from the Echo Canyon, Monticello, and Carnuel neighborhoods. By the end of 2006, the Carnuel Mutual Domestic was able to secure \$2.6 million for the design and construction of a water supply well, water storage tank, and a transmission

TIJERAS CANYON/CARNUEL PLAN 2007

line initially planned to run along Highway 333 to eastbound Exit 170. Although a fill station has been designed, funding is still needed as the estimated cost for an entire community water system is \$15 million. The source of funding included Legislative, EPA, USDA Rural Development, and the Water Trust Board grants as well as a loan from USDA Rural Development. During this time, the Carnuel Mutual Domestic has worked with the New Mexico Environment Department, Rural Communities Assistance Corporation, New Mexico Office of the State Engineer, and the Albuquerque Bernalillo County Water Utility Authority to study the feasibility of implementing a community water system. Souder, Miller, and Associates was hired by the Carnuel Mutual Domestic to conduct research, write technical reports, and produce designs of the system. By the beginning of 2007, this firm had completed a Preliminary Engineering Report, a Geohydrology Report, and an Environmental Information Document. Construction of the water supply well (70gpm) had been completed and is located in Tijeras on Carnue Land Grant Board property between the A. Montoya Elementary School and the cement plant. The Carnuel Mutual Domestic has also approved Souder, Miller, and Assoc.'s design of the 140,000 gallon storage tank, pump house, and electric controls and preliminary design of a transmission line and fill station. It is possible that over the next two years, approximately 180 households could be connected to the system. The long-term plan for the Carnuel Mutual Domestic is to service the entire Tijeras Canyon/Carnuel area. The immediate focus is on existing homes in Carnuel, Monticello and Echo Canyon, which number about 900.

Carnuel Mutual Domestic as a Customer of the Water Utility Authority

For the Carnuel community, the discussion of water provision is not a new one. Despite years of conversations on connecting to a municipal water source, a concerted effort to establish utilities has only been in effect since 2005. In December 2006, the Carnuel Mutual Domestic submitted a proposal to the Albuquerque Bernalillo County Water Utility Authority to work together to provide water for the aforementioned households. More specifically, the letter requested the possibility of either leasing water rights from the Water Utility Authority or establishing a connection from the utility's water to the Carnuel Mutual Domestic's water station. In a subsequent meeting, held in January 2007 between these two entities, it was decided that the best way to move toward a community water system would be for the Water Utility Authority to allow a connection and provision of water to the Carnuel Mutual Domestic's water storage tank. The next step is for the Water Utility Authority and the Carnuel Mutual Domestic to sign a Development Agreement. This would allow the Carnuel Mutual Domestic to become a customer of and purchase water directly from the Water Utility Authority, then make it available to its members. Another requirement of the Water Utility Authority to provide service to the area is for Carnuel Mutual Domestic to present a Land Use plan and a long-term (utilities) plan indicating the establishment of a sewer system.

III. CONDITIONS

INFRASTRUCTURE

Water

Water supply for domestic use is a major priority for residents in the plan area. Currently, all residents in the Tijeras Canyon/Carnuel area depend on individual wells for domestic water. The production of wells is dependent on the geological formation into which the wells are drilled and the water production characteristics of that formation. For example, wells in Carnuel range from around 60 feet in depth for older homes located near the creek to wells nearly 400 feet deep in homes located at higher elevations. The production of wells varies throughout the study area with some wells producing just a couple of gallons a minute to wells that produce close to 10 gallons a minute. In recent years, many older shallow wells have gone dry and have been replaced by wells that are drilled deeper into the water table.

Water quality for domestic use is very poor in some parts of the study area. Naturally occurring minerals such as arsenic and fluoride are abundant in ground water sources. The Carnuel area has a significant groundwater quality issue and may be the most difficult water quality problem to resolve within Bernalillo County. The area has an overwhelming number of non-compliant wastewater systems contributing to seepage into wells resulting in high levels of nitrates and other pollution in the ground water.

A location of documented contamination is the site of the former Gulton Industries facility, now known as the *Gulton Site*, located at the western boundary of the Tijeras Canyon/Carnuel Plan area immediately south of Old Route 66 and east of the Albuquerque municipal limits. Previous activities on the site have created a plume of approximately 70 acres and of unknown depth containing ground water contaminants including trichloroethylene (TCE), vinyl chloride and other volatile organic compounds (VOCs). Approximately 20 monitoring wells have been drilled to investigate the plume and help determine its horizontal and vertical extent. The contaminants found there could pose a cancer risk and therefore may qualify the Gulton Site as a superfund site once the plume investigation is complete. It is indicated that wells located 200 feet or more away from the 70-acre plume are in no danger. Future development of drinking water wells near this plume may not be approved by the State Engineer's Office, the New Mexico Environment Department or the Bernalillo County Office of Environmental Health. New wells have the potential to tap into the plume or reshape and move the plume in an unknown manner. Future development of the area may require offsite water supply.

Existing Data

In 1998, the City of Albuquerque commissioned Boyle Engineering Corporation to prepare the *Water Master Plan 1998 supplement/Part A-Tijeras Canyon Water Service Extension*. The purpose of the document was to present information about the "transmission and distribution lines and water storage reservoir requirements if the City of Albuquerque water system service area extends east into Tijeras Canyon." (P.1). It was assumed that there

TIJERAS CANYON/CARNUEL PLAN 2007

would be residential as well as commercial water use. The master plan area covers the same areas as this Tijeras Canyon/Carnuel Plan. The existing Escondido Reservoir is located in the Manzano/Four Hills Open Space (City of Albuquerque) almost at the western boundary of the Four Hills Partnership property. A new Escondido Pump Station and a new reservoir, referred to as 12E Reservoir, would be added as well as several lines in order for water to be transported from the existing reservoir to the east side of the plan boundary (Dead Man's Curve). The master plan would include a new Escondido Pump Station, 12-inch and 16-inch diameter 8E trunk lines from Escondido Reservoir to the east boundary of the master plan area, 12-inch and 16-inch diameter trunk lines from 12E Reservoir to Zone 12E north of Interstate 40 (Monticello), a 10-inch diameter transmission line from the pump station to the 12E Reservoir, the 12E Reservoir, and the 8ER PRV Station. The new 12E Reservoir would be built approximately 1/3-mile southeast of Silver Hills Lane, at the border with Coyote Springs Master Plan area. Subdivision plans and legally granted accesses would dictate where facilities are placed.

In 2000, under the direction of Bernalillo County Public Works Division, Parson-Brinkerhoff completed the *Update on the Feasibility of Sanitary Sewer/Water Systems for the West Tijeras Canyon Area*, as an update to the 1996 West Tijeras Canyon study. The study provided estimated construction cost as well as recommended that further study be undertaken and public meetings be held to understand the need for water and wastewater services.

Wastewater

A major concern for the Carnuel community is that wastewater systems and shallow wells do not comply with current County ordinances. Residents who participated in the planning process believe that foremost attention should be given to resolving these problems within existing development. These properties need to comply with new water and wastewater ordinances. New Mexico Environment Department and Bernalillo County Environmental Health's regulations require $\frac{3}{4}$ of an acre and adequate site conditions to place a standard wastewater system. However, a number of these lots are smaller than $\frac{3}{4}$ of an acre. Many Carnuel residents are concerned about remaining in Carnuel in the future because they are unable to afford bringing current septic systems up to current standards. In public meetings, there was strong support for connecting residents in higher density areas to sewer service.

Existing Data

In 1998, the City of Albuquerque drafted a *Wastewater Master Plan* along with a *Supplement for the Tijeras Canyon Area*. This plan recognized the infrastructure issues of the area and proposed a means of establishing wastewater service in Tijeras Canyon. According to this plan, a new conveyance system could be located on the south side of I-40 connecting to the existing Tijeras Interceptor but would not include collector sewers. It would be able to accept sewage from existing developments and potential new developments, and include connections to those developments not adjacent to the main conveyance route. Each development would be responsible for delivering the sewage to a

TIJERAS CANYON/CARNUEL PLAN 2007

point of connection to the conveyance system. The existing 8" force main has pumping facilities and serves six connections in Tijeras Village. This force main connects to the City of Albuquerque's Tijeras 5-A Interceptor at manhole L23-671. A new 6" force main could be established to connect to this same interceptor and could extend east into Coyote Springs for 1100 feet, east of the Coyote Springs access road. Subdivision access could include direct connections of the Chant property and West Tijeras Canyon Estates to existing L23-671 manhole or a new manhole and it would not be necessary to pump into the force main. Developers of the Coyote Springs Master Plan area and other nearby subdivisions would have to install gravity collection systems to get wastewater flow to a lift station that would take the entire flow to the new force main. Another lift station (also serving as an injection station) could be installed below the east side of the Frontage Rd. bridge crossing to receive wastewater from Four Hills Associates properties and other sites south of I-40.

Transportation

The main transportation routes in the plan area are Interstate 40 (I-40) and NM 333 (Old Route 66), to which private easements and subdivision roads link, creating a network (See Appendix C, p. 31).

Old Route 66 (NM 333) is the primary road used by the local community to travel to and from their residences, businesses, Albuquerque, and the greater East Mountain Area. This historic route was an original portion of the famous Turquoise Trail. Today, its significance continues to be recognized by residents and government agencies. The New Mexico Department of Transportation (NMDOT) and the United States Department of Transportation-Federal Highway Administration have designated this alignment of Route 66/NM 333 as a Scenic Byway under the National Scenic Byways Program. This road is also part of the National Park Service's Route 66 Corridor Preservation Program. Grant funding and support may be available through these agencies to aid in the protection of the cultural and historic elements of the corridor.

In general, Bernalillo County recognizes roads as either public or private, regardless of size or current condition. Public roads are maintained by government agencies, whereas private roads are the responsibility of property owners (individually or collectively). The Bernalillo County Public Works Division keeps data and maps verifying road ownership and maintenance responsibilities. Although current roads, including numerous dirt roads, exist in varying conditions, all new roads, whether public or private, must meet Bernalillo County ordinances and standards. Any road being newly built, used, and or acquired must include a fire apparatus access road that should never be obstructed.

By and large, the wider, heavily accessed roads are categorized as public roads. These include, for example, Coyote Springs Road in Carnuel and the bridge, maintained by Bernalillo County; I-40 and Frontage Road, maintained by New Mexico Department of Transportation. The priority for Bernalillo County is to eventually pave all the roads under its jurisdiction.

Smaller, less frequently accessed roads are likely to be privately owned. These are typically easements and internal roads within subdivisions that ultimately connect to public roads. Non-complying private roads may be steep and unpaved, and prone to erosion. Residents who use these roads and are responsible for their maintenance must take extra precautions when roads become eroded. Examples of improved private roads can be found in Monticello, Silver Hills Neighborhood, and Caballo de Fuerza Neighborhood. The size, condition, and signage of these roads facilitate access for large delivery truck and emergency vehicles.

Other Public Utilities

Throughout the planning process, there was little discussion of concerns regarding the improvements for cable, phone, or electricity utility services in the plan area. However, concern was expressed for improving the availability of natural gas service in the planning area. Although gas utilities already exist in the plan area, many of the study area's residents are on individual propane tanks. Despite the significant rise in costs of these fuels, residents support the extension of natural gas utilities throughout the planning area.

NATURAL RESOURCES

The following section provides general information about the environment and natural resource conditions in the Tijeras Canyon/Carnuel Plan area.

Soils

Soils include the alluvium of Tijeras Arroyo that contains beds comprised of sandstone, gneiss, limestone, and granite. Much of the areas soils derived from Tijeras Canyon, but areas of bedrock and resulting weathered gravel also exist throughout the plan area. These areas, also known as Orthids soils typically occur where bedrock materials are limestone, sandstone, or schist and have been exposed at the surface. These soils are typically thin to very thin, and contain large amounts of oversized materials. There is little to no vegetation with this soil type. Where soils are recognizably present, they are generally classified as Tijeras sandy loam. Major and minor faults dissect the area, and resultant fracturing allows water to flow through the bedrock formations. These fractures, as well as overlying alluvium in the valleys, are the water source for the wells in the area. Many septic systems were placed before the promulgation of any wastewater ordinances by Bernalillo County in 1973. Soil limitations in the study area have contributed to groundwater contamination resulting from individual septic disposal systems. These issues by and large plague the Carnuel community in which most conventional septic systems were placed by carving into rock openings. The location of these systems does not allow water discharge into the soil and septic system discharge flows down fractures into water sources. The elimination of individual wells and septic tanks in high density development in favor of centralized infrastructure is a priority recommendation of the residents who participated in the planning process.

TIJERAS CANYON/CARNUEL PLAN 2007

Elevation

The elevation in the plan area ranges from approximately 5,600 feet to approximately 6,600 feet. The planning area's lowest point is at the Tijeras Creek located within the Tijeras Watershed. This watershed begins at the top of the east slope of south Sandia Peak and has an elevation of 9,782 feet. Tijeras Canyon, located in the plan area, contributes to the drastic changes in elevation. For example, the change in elevation from the north edge of Echo Canyon to the bottom of the Tijeras Creek is approximately 1,000 feet.

Slopes, Drainage, and Surface Water

The study area ranges in slopes from about 5% to 20%. However, in specific portions of the study area there are locations with steep slopes greater than 20% such as the undeveloped areas in Coyote Springs and the area just north of Highway 333 and I-40 (Dead Man's Curve). The terracing of home sites is a dominant development feature in the study area. Even though the Carnuel area has developed by carving out home sites into the hillsides, there are very few roads that are paved. For the most part, the study area does not have significant drainage issues except in specific locations such as the creek crossing on Land Grant land in south Carnuel, including near the Santo Niño Church.

The single most important drainage feature of the study area is the Tijeras Creek, an intermittent stream. The creek is the major drainage outlet for the study area and in the second half of the last century has seen degradation of the native riparian habitat. The major impact to the Tijeras Creek is the runoff from Highway 333 and I-40. The Carnue Land Grant Board along with the Tijeras Safe Passage Coalition have both been active in working with the New Mexico Department of Transportation in mitigating highway drainage and the negative impacts associated with runoff flow. From the planning session (Jan. 7, 2006), it was clear that many Carnuel community members wanted to see the restoration of the Tijeras Creek in the Carnuel area. The Tijeras Arroyo and some tributaries are also floodplains mapped by the Federal Emergency Management Agency (FEMA). The eastern portion of Tijeras Canyon has been identified as an "Urban Area" by the United States Census. As a result, The Tijeras Canyon Arroyo must meet water quality requirements under the National Pollutant Discharge Elimination System (NPDES) Phase II regulations that are part of the National Clean Water Act.

Vegetation and Wildlife

The vegetation primarily consists of piñon, juniper, cactus, chamisa, and yucca sparsely located along the hillsides. Unlike other areas in the East Mountains, the native landscape along the hillsides has not been heavily impacted by human settlement. The riparian zone along the Tijeras Creek is dominated by cottonwood and willow. Over recent decades, the riparian area



Silva Historical Site. Photo by James M. Aranda

TIJERAS CANYON/CARNUEL PLAN 2007

has been negatively impacted by invasive species such as Russian olives, salt cedars, and elm trees. Other invasive plants such as nap weed and Russian thistle have also negatively impacted the native landscape.

Within the plan area is a corridor for wildlife crossing from the Sandia Wilderness to the Manzano Mountains. The area also serves as a water source for wildlife. The New Mexico Game and Fish Department and the Tijeras Safe Passage Coalition have been working together to develop solutions to reduce the number of bear and deer killed by automobiles along I-40 and Highway 333. Some recommendations developed by these entities include the redesign of culverts and overpasses to allow wildlife to move without restrictive barriers such as I-40. These groups have also recommended barriers such as walls and fences along the Interstate as a way to funnel wildlife into designated safe-passage areas (New Mexico Department of Transportation, Tijeras Safe Passage Feasibility Study, July 2005).

Over the years, the increased noise from highway traffic has become a nuisance. Since the plan area is located in a narrow canyon, the noise generated from high traffic volumes plagues the residents living nearest the highways with a constant “hum” of automobile movement. The community advocated mitigation of this noise pollution by the construction of a sound barrier on I-40. If planned in conjunction with improved wildlife crossings on the interstate, the barrier could serve to reduce noise and improve movement of wildlife through the canyon. The consideration for such a buffer would have to be examined by the New Mexico Department of Transportation, which has jurisdiction over I-40.

Cultural Resources

There are several cultural resource areas that have archeological and cultural significance for residents of the study area. The Silva Site which is located along Highway 333 directly west of the Santo Niño Church contains pueblo ruins and is believed to be the original site of the San Miguel Village. Among the other identified cultural resources are the existing cemetery of the Carnue Land Grant, the Santo Niño Church, and Santo Niño Road along the church down to the Tijeras Creek. Santo Niño Road and the land directly east of the church are used for the Feast Days of San Miguel on September 29th and Santo Niño on May 3rd. The sites and designated areas are important for ceremonial dances such as those performed by Matachines (dance in which participants dressed in regalia honor culturally significant dates or sites).

Another major cultural resource of the plan area is the Acequia Madre de Carnuel, the historic irrigation ditch in Carnuel. Following the destruction of most of the acequia system by the construction of I-40 in the 1970s, residents have worked throughout the years to restore the acequia. Currently, the acequia in the south Carnuel area is restored and in use. Restoration is being planned for the north side of I-40 in order to provide Carnue Land Grant with irrigated land along the Tijeras Creek.

LAND USE

The following section presents existing land use conditions in the Tijeras Canyon/Carnuel Plan area.

Residential Uses

The primary land use in the study area is residential. The majority of the housing is single-family dwelling units. The existing zoning is comprised of A-1, A-2, M-H, and R-1. Some lots are smaller than the minimum required by the zoning designation and because they existed as such prior to the establishment of the Bernalillo County Zoning Ordinance, they have been “grandfathered” in. Most of Western Tijeras Canyon and some parcels directly north of Echo Canyon are zoned A-1. The A-1 designation allows for one single-family dwelling unit or a HUD zone code II manufactured home on a minimum lot size of one acre. A portion of the plan area is zoned A-2 which is located in the Monticello Neighborhood, Coyote Springs Master Plan area, and Coyote Springs Neighborhood (see Sub Area Map, Appendix B, p. 30). The A-2 zoning designation allows either a single-family dwelling unit, a HUD zone code II manufactured home, or mobile home on a minimum lot size of two acres. The land use conditions of the study area are unique in comparison to other communities in the East Mountains due to the overwhelming number of legally recognized non-conforming lots in the Carnuel area. In most of the Carnuel community and in Echo Canyon the zoning is designated as M-H. M-H zoning allows the placement of a mobile home at least 40 feet in length, HUD zone code II manufactured home, or a single-family dwelling unit on a minimum lot size of $\frac{3}{4}$ of an acre. A number of mobile homes are located in Carnuel on the south side of I-40 and north side of I-40 along Highway 333. There is also a group of R-1 zoned properties around Juan Road in Monticello. R-1 zoning allows a single-family dwelling unit or a HUD zone code II manufactured home on a minimum lot size of $\frac{3}{4}$ an acre. Lots in the developed Coyote Springs neighborhood begin at two acres in size. The majority of existing residential development in Monticello and Echo Canyon is on lots averaging $\frac{1}{2}$ acre in size, whereas in Carnuel, there are several lots that measure approximately $\frac{1}{4}$ acre in size.

Since the early 1990s, new development has taken place in the southwest portions of the plan area. Subdivisions have also been platted and developed on the western portion of the plan boundary referred to as Western Tijeras Canyon. The plan area also has a few large tracts of undeveloped land south of the Interstate I-40 frontage and Carnuel and in Western Tijeras Canyon. Small-scale commercial uses are sparsely spread along Historic Route 66. Today, the neighborhoods within the plan area continue to enjoy a rural atmosphere despite encroachment of urban development.

The majority of residential uses in Carnuel occurred before significant development regulations were created and applied to the planning area. This area is characterized by the older residential housing on lots that are well below the minimum lot size required by the zoning code. Many of the lots average approximately $\frac{1}{4}$ acre in size, a result of subdivisions by multiple generations of family members. Since the lot arrangements in this fashion were established before the development of a zoning code for Bernalillo County

they are recognized as lots of record by the County. Some of these lots contain single-family dwelling units as well as additional structures.

Commercial Uses

A small number of businesses within the plan area are located along Highway 333 (Old Route 66). There currently exist approximately fifteen special use permits which allow the operation of commercial activities in the plan area. These include a horse stable, an auto repair shop, and several contractors' yards. In the community work sessions, the participants recognized the need to maintain Carnuel's rural character by limiting the extent and scale of commercial uses to be located only along Highway 333. Businesses proposed in the future should only be allowed to be located on a limited number of properties along the corridor and should be small in size.

The constraints faced by commercial uses and their location are the small size and physical aspects of parcels located along the highway corridor. Along this highway corridor, there are very few parcels that are larger than one acre in size limiting the potential for large scale use. In addition, most vacant tracts of land along the highway corridor have a steep slope and are not at grade with Highway 333.

Nevertheless, there are also a number of sites that are adequate for small-scale commercial uses. The Old Route 66 corridor should serve as the employment and commercial resource for the plan area and any non-residential uses will be focused in this area. Any future commercial uses should be small-scale and should address night lighting, drainage, and safe access. Existing commercial uses along Highway 333 should be allowed but any expansion in size or use should consider the area's character and must meet current Bernalillo County regulations.

Open Space/Recreation

The plan area is bordered to the north by the Cibola National Forest and to the south and east by the Manzanita Mountains, which are managed by the United States Forest Service (USFS) and Kirtland Air Force Base for the USFS Withdrawal area. In addition, there are tracts of designated Open Space owned by the State of New Mexico, and the City of Albuquerque.

One of the critical issues raised by work session participants is the need to connect existing open space lands with open space corridors for the purpose of developing wildlife corridors as well as to provide natural open space buffers. The Rabadi property (see Appendix B), sometimes referred to as the Silva Site, was recommended for acquisition but was not accomplished due to local residents' objections to City Open Space ownership of the property. The subsequent evaluation for purchase was made by the County Open Space Advisory Committee in 2003. In September 2006, the City of Albuquerque purchased the 63-acre Hawkwatch property adjacent to Tres Pistolas Open Space. It will be maintained as a wildlife habitat and open space. Participants also raised concerns about the development of the remaining large tracts of land, zoned A-1 and A-2.

TIJERAS CANYON/CARNUEL PLAN 2007

The natural beauty and accessible open space make the planning area a recreational destination. Currently, many people utilize the area's open space for off-trail biking, horseback riding, hiking, and ATV use. Many bicyclists also use Historic Route 66 through Carnuel to the Sandia Crest. Along with the recognition of open space uses on public land by participants in the planning process, another identified a need to restrict access along the Tres Pistolas Open Space Area (City of Albuquerque) to reduce negative impacts such as erosion and litter as well as to mitigate potential conflicts between local residents and recreational users.

Many participants of this planning process, recognize the need for increased coordination and participation by the various land owners for the purpose of improving open space corridors, scenic views, and improving overall environmental conditions. Due to increased development and physical barriers to wildlife passages along I-40, Tijeras Canyon has been recognized as a federal priority for improvement of wildlife passages. A major consideration for preserving and improving open space corridors is to create a less restrictive passage for wildlife. Work session participants recommended improving connections between open space areas, placing limits on development along critical passage areas, and pursuing the acquisition of land owned by Hawk Watch to improve open space conditions and recreation opportunities for residents as well as improve conditions for wildlife. Some of these goals are already being met through the implementation of the Bernalillo County Parks, Open Space, and Trails Master Plan and the East Mountain Trails and Bikeways Master Plan.

Cultural Uses

The Santo Niño Church and the old Carnuel cemetery located directly south of the Santo Niño Church and the areas surrounding Santo Niño Road are cultural resources that should be protected. This entire area is used for processions and ceremonial dances in observation of San Miguel Feast Day and the Santo Niño Feast Day. The new Cañon de Carnue Land Grant Cemetery was developed in 2005 and is located south of I-40 along the frontage road. In addition to the large cross located directly north of I-40 near exit 170, there are also various *descansos* (highway crosses) located throughout the community along roadways. Many of the crosses along the hillsides throughout the plan area delineate the historic markers of land grant common lands.

Carnuel Land Grant

In July 2004, the State of New Mexico granted most land grants the authority to establish zoning and land use regulations on communally held land¹. The Board of Directors of the Cañon de Carnue Land Grant has drafted and adopted the Cañon de Carnue Land Grant Comprehensive Plan and will implement the Comprehensive Plan through a land use planner. The Comprehensive Plan is intended to guide the land use process on common

¹State of New Mexico Statutes, Chapter 49-Land Grants, Article 1-General Provisions, Section 49-1-3 Board of trustees; management of grant; powers, J. determine zoning of the common lands of the land grant-merced pursuant to a comprehensive plan approved by the local government division of the department of finance and administration that considers the health, safety and general welfare of the residents. The department of finance and administration shall act as arbitrator for zoning conflicts between land grants-mercedes and neighboring municipalities and counties.

TIJERAS CANYON/CARNUEL PLAN 2007

land, including zoning, capital improvements, residential development and economic development. The New Mexico Local Government Division of the Department of Finance and Administration (DFA) is charged with reviewing and approving the Comprehensive Plan. The Department of Finance and Administration is also authorized to be involved in settlement of conflicts between land grants and neighboring municipalities and counties. The Land Grant Board's jurisdictional powers will only come into effect upon DFA's approval of their Comprehensive Plan. At that time, those properties owned by the Land Grant Board of Directors will no longer be governed by the Bernalillo County Zoning Ordinance.

IV. PLAN POLICY

This section of the Tijeras Canyon/Carnuel Plan provides specific policies for residential land uses, commercial uses, infrastructure, roads and transportation and open space/recreation. These policies are intended to preserve the plan area's rural and environmental qualities.

1.0 Residential Uses

- 1.1 Residential development shall conform to existing zoning.
- 1.2 Emphasize development that consists primarily of ranches, farms, and large-lot (minimum net lot size of two acres) single-family residential.

2.0 Commercial Uses

- 2.1 Maintain existing commercial and industrial uses along Old Route 66 that are in compliance with current regulations.
- 2.2 Cancel Special Use Permits that are in violation or no longer in use.
- 2.3 Establish Old Route 66 as a neighborhood commercial corridor that may be based on C-N zoning and uphold the Scenic Byways Designation.
- 2.4 Encourage small businesses within the area that maintain rural character and preserve visual aspects of Old Route 66.

Implementation:

Future special use permits and development applications should be considered for approval or denial based on the type and compatibility of commercial activities to existing neighborhoods.

3.0 Infrastructure

- 3.1 Provide water and sewer service in the planning area through an existing water system.
- 3.2 Existing residents shall be given priority for service provision.
- 3.3 Water service shall only be provided in conjunction with sewer service if connected to a public system.

Implementation:

Bernalillo County and the ABCWUA should collaboratively develop the appropriate resources to begin working with property owners to establish water and wastewater services. The Carnuel Mutual Domestic Water Association is currently developing its capacity to provide domestic water infrastructure with the anticipated goal of providing water to existing houses in the plan area within five years.

4.0 Roads and Transportation

- 4.1 Improve bicycle safety along the Old Route 66 corridor.
- 4.2 Meet with City of Albuquerque to consider the establishment of a park-and-ride location in the area for commuters into the metro area.
- 4.3 Continue communicating with the New Mexico Department of Transportation and the Tijeras Safe Passage Coalition on strategies for reducing the number of bear and deer killed by automobiles along I-40 and Highway 333.

Implementation:

Policy 4.1 can be achieved through implementation of the Bernalillo County Bikeways and Trails Master Plan and working with New Mexico Department of Transportation (NMDOT) to install emergency phones along Old Route 66. Policy 4.2 requires continued meetings with City of Albuquerque Transit Department to determine the feasibility of establishing a park-and-ride stop.

5.0 Open Space/Recreation

- 5.1 Follow the Open Space nomination process which is integrated with that for County Capital Planning. This process mirrors the public process for other capital improvements (e.g. roads and parks), and provides a more efficient means for the public to request land for Open Space.

Implementation:

The implementation of Policy 5.1 should be addressed by the public submitting a Capital Improvement Program (CIP) form during the County's regular CIP process. This is conducted by Bernalillo County every two years.

DEFINITIONS

Acequia Madre de Carnuel- A community irrigation canal used for watering agricultural farm plots. The irrigation network is located in southeast Carnuel.

Caballo de Fuerza Neighborhood – Properties in Western Tijeras Canyon between West Tijeras Canyon Estates and the Rabadi property (Silva Site).

(Cañon de) Carnue Land Grant- A political entity made up of the descendants of the founders of the Carnuel Community that manage and own land in common ownership on behalf of land grant members.

Commercial Corridor- A passageway along which commercial activities, such as businesses and industries, are located.

Commercial Node- An area designated for commercial activity and or commercially zoned properties adjacent to one another.

Coyote Springs developed properties- Developed lots accessed from Coyote Springs Road but not part of the Coyote Springs Master Plan, zoned A-2.

Coyote Springs Master Plan - Large undeveloped tracts of land in the study area located directly south of the Carnuel Acequia Madre neighborhood, zoned A-2.

Echo Canyon - A neighborhood located in the northeastern portion of the plan area, immediately north of Old Route 66, zoned M-H.

North Echo Canyon Estates - A neighborhood located in the north eastern portion of the plan area above Echo Canyon, north of Old Route 66, zoned A-1.

Historic Plaza- Village center for historic Indo-Hispano communities.

Manufactured Home- A manufactured home or modular home that is a single-family dwelling with a heated area of at least 36 by 24 feet and at least 864 square feet, constructed in a factory to the standards of the United States Department of Housing and Urban Development, the National Manufactured Housing Construction and Safety Standards Act of 1974 (42 USC 5401 et seq.) and the Housing and Urban Development Zone Code II or the Uniform Building Code, as amended to the date of the unit's construction, and installed consistent with the Manufactured Housing Act (NMSA 1978, § 60-14-1 et seq.) and with the regulations made pursuant thereto relating to ground level installation and ground anchors.

Mobile Home- A vehicle without motive power, designed to be drawn by a motor vehicle and to be used as a temporary or permanent human habitation, including trailer coach, trailer home, and house trailer but not including Manufactured Home or Recreational Vehicle, whether the same be with or without wheels, and whether or not attached to or incorporated in a building and that part of any self-propelled vehicle, whether the same be with or without wheels, and whether or not attached to or

TIJERAS CANYON/CARNUEL PLAN 2007

incorporated in a building. Skirting is required in addition to a storage building of sufficient size to accommodate all outside storage.

Monticello – Neighborhood north of Old Route 66 and bound to the east by Tres Pistolas Open Space (City of Albuquerque) and to the northwest by the Cibola National Forest.

Nonconforming- Any building or structure or portion thereof, or use of a building or land which does not conform to the zoning regulations and which lawfully existed on the effective date of those regulations with which it does not conform.

Traditional Community District- A geographic area located near the Santo Nino Catholic Church and along the Carnue Creek encompassing the existing homes located between Old Route 66 and I-40 and including the Acequia Madre neighborhood. This particular community is referred to in this document as the Carnue area, traditional area, or the historic community.

Site-Built Housing- Housing that is constructed on the site where it is located.

Silver Hills Neighborhood – Neighborhood in the Western Tijeras Canyon area, between the Rabadi property (Silva Site) and the Coyote Springs Master Plan area, zoned A-1.

Western Tijeras Canyon - The developed and undeveloped lots on the westernmost portion of the study area including West Tijeras subdivision, Chant property, Four Hills Partnership property, Rabadi property (Silva Site) Silver Hills Neighborhood, Caballo de Fuerza Neighborhood,

APPENDIX A

The following notes are from public input gathered at the Community Planning Session held on January 7th, 2006.

Infrastructure and Utilities

Issues and Concerns

- *Maintain control of system*
- *Maintain autonomy from City/County*
- *Fix threats to health and safety*
- *Provide water and sewer service to all in area*
- *Encourage membership in Mutual Domestic*

Short Term Goals

- *Identify problem areas*
- *Develop a water/sewer master plan*
- *Evaluate phasing of expansion of system*
- *Provide water/sewer to existing houses*

Long Term Goals

- *Provide water/sewer throughout Tijeras Canyon/Carnuel area*
- *Address health and safety issues regarding lack of infrastructure and utilities*
- *Prevent future sprawl development in area*

Priorities

1. *Correct current health and safety problems*
2. *Evaluate problems*
3. *Develop water/sewer master plan*
4. *Extend services to existing homes*
5. *Provide capacity for future expansion*
6. *Maintain local control of system*

Land Use/Commercial Use

Issues and Concerns

- *Do not want more intense commercial uses in the Tijeras Canyon/Carnuel area that already exist*
- *Want to maintain rural quality of area*
- *Do not want existing businesses to be affected by new master plan*

Short Term Goals

- *Ensure that new master plan will not affect existing zoning and commercial uses*
- *Maintain existing commercial uses and intensity on Rt. 66*

Long Term Goals

- *Smaller profile businesses*
- *Promote the requirement of landscaped buffers for new businesses*
- *Maintain current commercial intensity*
- *Preserve visual aspects of Rt. 66*
- *Maintain area's rural character of area*

Priorities

1. *Grandfather in existing commercial uses on Rt. 66*
2. *Create zoning requirements that prohibit more intense commercial uses than currently exist*

Traditional Community Spaces

Issues and Concerns

- *Lack of sewer/water services*
- *Noise coming from I-40*
- *Changes in zoning regulations may affect traditional community spaces negatively*
- *Future development and continued development of expensive homes will gentrify the area*

Short Term Goals

- *Installation of sewer/water service*
- *Ensure that traditional community areas are up to code* *Ensure affordability of homes*

Long Term Goals

- *Maintain traditional community spaces*
- *Build a sound wall to reduce noise from I-40*
- *Tougher zoning regulations for future developments and expansion of current businesses*

Priorities

1. *Address health and safety concerns*
2. *Extend sewer/water service to most affected areas*
3. *Ensure that traditional community members are not negatively affected by new zoning regulations*

Roads and Transportation

Issues and Concerns

- *Dead man's Curve should be expanded to 4 lanes*
- *Frontage Road in front of Monticello is not maintained*
- *Speed limits for Rt. 66 between Tramway and Exit 170*
- *Safety concerns for bikes and cars along Rt. 66*
- *Dirt Roads (Silver Hills Road) needs to be paved or graded*
- *Wildlife crossing I-40 and Rt. 66 causes safety concerns for both wildlife and car traffic*

TIJERAS CANYON/CARNUEL PLAN 2007

Short Term Goals

- *Provide access to area during I-40 bad-weather closures*
- *Construct sound walls*
- *Could also serve as deterrent for wildlife*
- *Provide public transportation such as a park and ride for commuters*

Long Term Goals

- *Install emergency telephones on Rt. 66 for bicyclists/commuters*
- *Transform Rt. 66 into a tourist attraction*
- *Construct and/or improve bike trails along Rt. 66*

Priorities

1. *Do necessary paving and/or grading on area's roads*
2. *Address safety concerns for both bicyclists and car traffic*
3. *Construct sound walls for I-40*
4. *Establish a Park and Ride for commuters*
5. *Designate which roads are county, federal and/or land grant*

Open Space

Issues and Concerns

- *Hawk-Watch Lands may go up for sale*
- *Trails are needed to connect open spaces*
- *Safe passages are needed for wildlife*
- *Assessment maps used by County are inaccurate*
- *3 wells on West Arroyo from Tres Pistolas Springs need capping*
- *Unrestricted access of south and East borders of Tres Pistolas creates negative impacts on open space areas*
- *Plan a field trip to examine open Space areas*

Short Term Goals

- *Cap aforementioned wells*
- *Protect Hawk-Watch lands*
- *Coordinate management of Open Space with National Forest Service*
- *Establish a stewardship committee*
- *Put gates up at Tres Pistolas*
- *Obtain accurate maps from County*

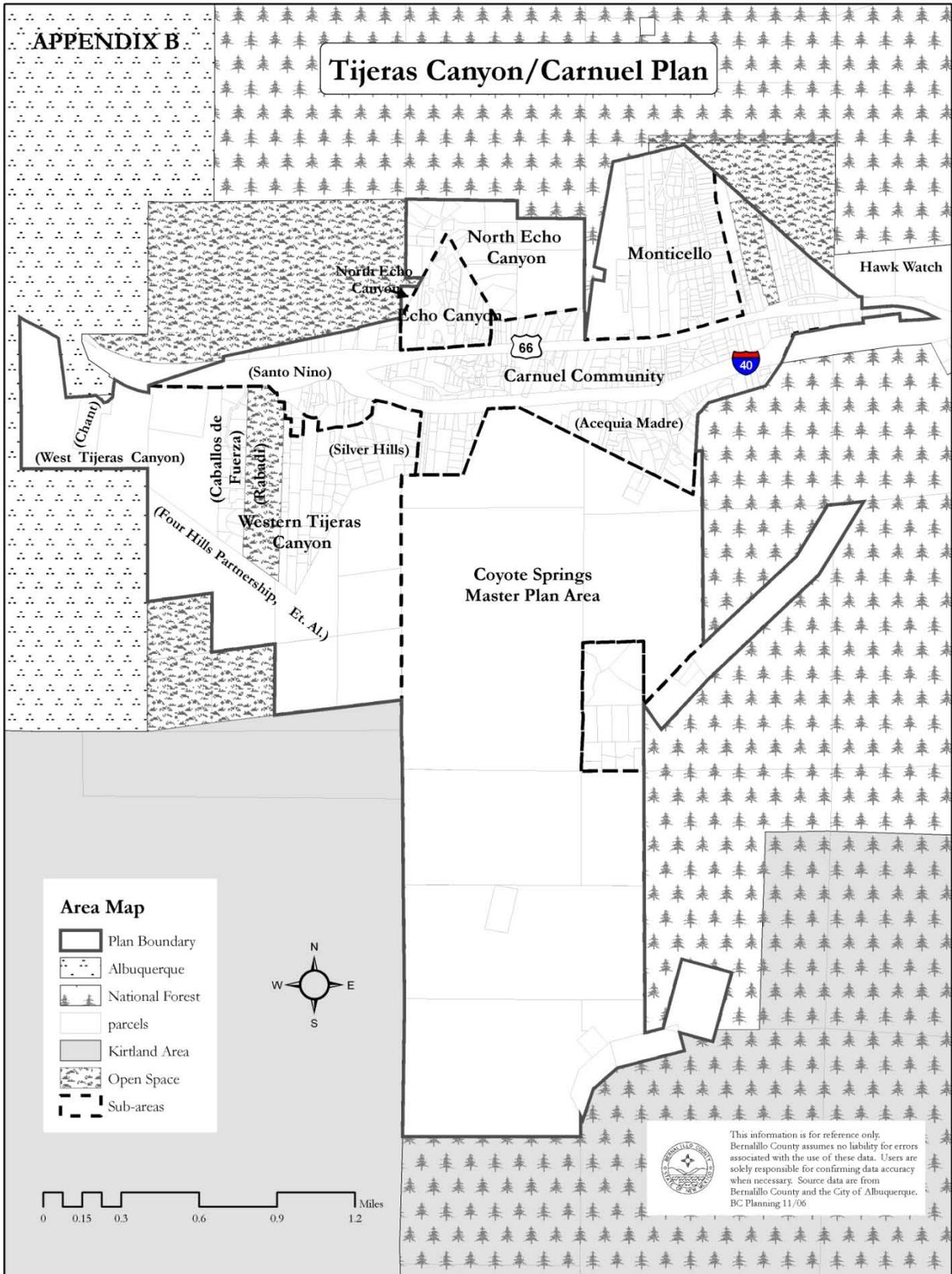
Long Term Goals

- *Purchase more land for Open Space in coyote Springs area*
- *Connect Open Space pieces through trail ways*
- *Protect Open Space from overuse of ATVs*
- *Adopt a Trail= Protection of land*

Priorities

- 1. Acquire Hawk-watch Lands-prevent them from being developed*
- 2. Provide safe passages for wildlife*
- 3. Cap aforementioned wells*
- 4. Connect Open Space areas*
- 5. Limit ATV access to Open Space areas*

TIJERAS CANYON/CARNUEL PLAN 2007



APPENDIX C – Transportation Map