



# Long Mountain Area Plan

**Re-adopted December 18, 2006**

**Revised: February 8, 2007**

## Executive Summary

The purpose of the Long Mountain Area Plan, or the Area Plan, is to recognize the unique character of the Long Mountain Area and to encourage land use patterns that are consistent with the goals of the General Plan, the residents and the property owners.

The Long Mountain Area Plan, a component of the General Plan, covers approximately 61 square miles of unincorporated land in Mohave County. The Area Plan, like the General Plan, is a flexible guide for land use and development for decision-makers. It is a statement of community values, ideals and aspirations about the best management of the natural and built environments. In addition to defining the County's view of the future, the Area Plan describes actions to be taken to achieve a desired future. The Area Plan uses text and diagrams to establish policies and programs to address those issues facing the Long Mountain area. The Area Plan is, thus, a tool for managing community change to achieve the desired quality of life.

In order to provide an overall guiding principle to develop the Area Plan, a vision statement was produced to read as follows:

*“Maintain current air quality by controlling dust, improving roads, and limiting population density to prevent degradation from ‘Class I’ like air quality.”*

*“Water, essential to the lifestyle of current and future residents, will be protected through conservation and reasonable growth measures in order to maintain safe yield which will be determined by the best available science from Arizona Department of Water Resources and/or United States Geologic Survey.”*

*“Roadways will be sized to accommodate planned traffic, provide for multi-modal and non-vehicular travel and constructed to County standards to be eligible for regular maintenance at the time of project approval. In addition, the developer or land owner will provide roadways improvements in proportion to the demand created by the new development, including the improvement of off-site roadways such as arterials, major collectors, and feeders.”*

*“New residential development proposals will be similar to existing residential densities, shall promote neighborhood stability, and protect and sustain existing lifestyles.”*

The Area Plan includes three major sections. **Section I** introduces the Area Plan's purpose, content and effect, and describes the process used in preparing the Area Plan. Section I also presents the vision statement, and summarizes past, existing and anticipated conditions, including population growth trends affecting Long Mountain.

**Section II**, the essence of the Area Plan, establishes goals, policies and implementation techniques for the three major elements:

1. Natural Resources
2. Water Resources
3. Land Use, Housing and Economic Development
4. Transportation and Circulation
5. Public Safety

Each Area Plan Element begins with a statement summarizing the most important information gleaned from the base study research, public meetings with the Area Plan Committee, and other sources and is combined with the key planning issues relating to the Element.

The **Natural Resources Element** looks to preserve the natural resources in Long Mountain. Key goals of the Natural Resources Element are as follows:

- ◆ Preserve native vegetation with emphasis along the base of the mountains, foothills, slopes and the washes.
- ◆ Preserve the natural and aesthetic value of hillsides.
- ◆ Maintain “Class I-like” air quality.
- ◆ Establish part of Stockton Hill Road between the Fountain Hills Road and Vock Canyon Road as a Scenic Route and preserve scenic vistas
- ◆ Preserve the night sky for stargazing and enjoyment.
- ◆ Preserve a sense of privacy and quiet enjoyment
- ◆ Promote the use of Renewable Energy

The **Water Resources Element** looks to preserve the water supplies in Long Mountain to comply with Growing Smarter Plus laws (ARS 11-821). Key goals of the Water Resources Element are as follows:

- ◆ Limit water consumption to the aquifer’s natural or enhanced rate of recharge to achieve safe-yield.
- ◆ Preserve groundwater quality.
- ◆ Conserve groundwater resources.

The **Land Use Element** seeks to preserve a rural community atmosphere by maintaining the natural amenities that have attracted many buyers to Long Mountain. Goals are as follows:

- ◆ Maintain an Environment for Small Ranch Properties.
- ◆ Provide higher density residential development in areas that are experiencing growth pressure in the southern part of the Planning Area.
- ◆ Reserve Public Lands for Recreation, Public Purposes & Mountain Preserves.
- ◆ Establish neighborhood commercial services to promote community independence and balance, and make the population less dependent upon Kingman for basic necessities.
- ◆ Encourage the construction of quality, affordable housing.

Providing easy access to public facilities and private properties is the key to the **Transportation/Circulation Element**. The low population density makes use of the private automobile the primary means of transportation. Goals are as follows:

- ◆ Maintain reasonable free-flow of traffic (Level of Service “B”) along Stockton Hill Road.
- ◆ Reduce automobile dependency for short trips under one mile.

Ensuring for adequate public services and mitigating fire and flood hazards is the focus of the **Public Safety Element**. Goals are as follows:

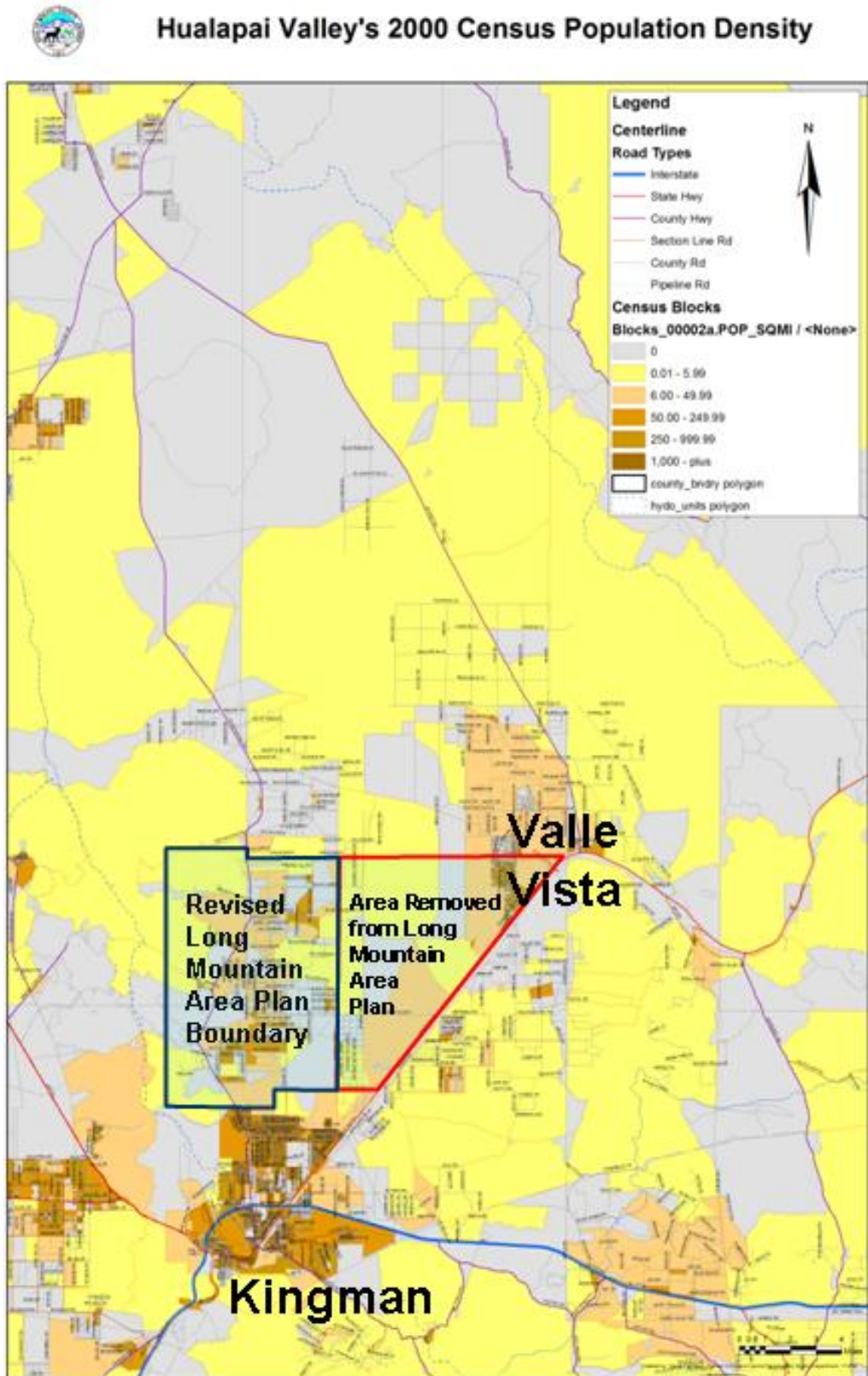
- ◆ Provide adequate sheriff and fire protection to all residents within the planning area.
- ◆ Decrease emergency response times.
- ◆ Improve Roadway Safety and Drivability.
- ◆ Preserve natural floodways and floodplains.
- ◆ Create usable building sites.

**Section III** provides, in tabular form, a brief overview of the key tools that can be used to implement this plan. This section is intended to give citizens and public officials a single reference source for information about the tools available to the County and other agencies in carrying out the plan.

The Area Plan is a guide to action. It is not, in itself, an implementation tool. By ensuring that individual County actions are consistent with the policies of the Area Plan, the community can effectively achieve its goals. For example, the Planning and Zoning Commission and Board of Supervisors will use the Plan’s policies and Land Use Diagram to decide whether to approve a proposed rezoning or zoning use permit.

The Area Plan should be used to prepare road improvement plans, and other facilities and improvements. The Plan should be a dynamic document, subject to periodic modification when conditions within Long Mountain change significantly. Periodic review and amendment of the Plan will be needed to ensure that it continues to address the needs of the community.

# Vicinity Map



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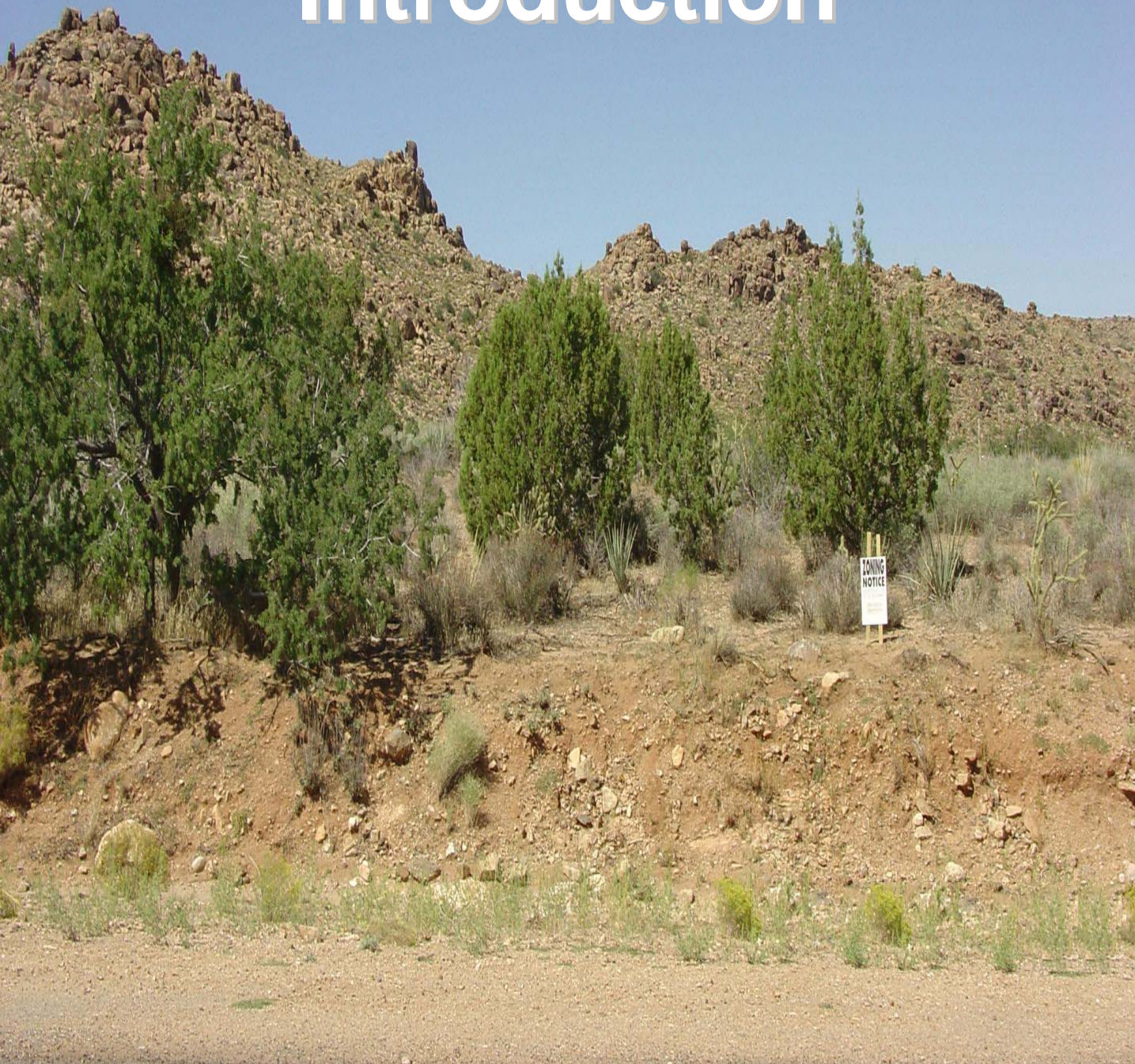
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# Introduction



# **Introduction to Long Mountain Area Plan**

## **Purpose**

The purpose of the Long Mountain Area Plan is to recognize the distinct character of Long Mountain and to encourage land use patterns that are consistent with the goals of the General Plan, the residents, and property owners. The need to update the original 1992 Long Mountain Area Plan has been acknowledged for the past several years and was formerly recognized when the Mohave County Board of Supervisors, under advice from the Planning and Zoning Commission, approved an area plan prioritization list in May of 2000. One of the goals of the update is to reconcile the Area Plan and General Plan land use diagrams which depict conflicting land uses. This conflict has caused one plan or the other to be amended over time to allow various types of residential development. In 2005, the General Plan Update Committee reaffirmed the need to update the Long Mountain Area Plan given the recent accelerated growth in the planning area and the County as a whole.

During the 2005 Update several major amendments, seeking urban development densities, were proposed in the southern part of the planning area. These proposals, including a golf course, hotel resort, condominium, and RV park covering 640 acres, were recommended by the Board of Supervisors to be “continued” and be addressed as part of the update to the Long Mountain Area Plan, after considerable objection from the residents in the neighborhood.

In the course of the Area Plan update, the ad-hoc Update Committee decreased the size of the planning area by removing Valle Vista and adjacent lands, reducing the size to approximately 61 square miles. This reduction in size reflects a “community of interest,” separate from Valle Vista, and creates a more manageable plan in the process.

The Area Plan, a component of the General Plan, is a flexible guide for land use and development for decision makers. It is a statement of community values, ideals, and aspirations about the best management of the natural and built environments. In addition to defining the area’s view of the future, the Area Plan describes actions to be taken to achieve a desired future. The Area Plan uses text and diagrams to establish policies and programs to address those issues facing the Long Mountain area. The Area Plan is a tool for managing community change to achieve the desired quality of life.

## **Contents and Organization**

The Area Plan includes three major sections. Section I introduces the Area Plan’s purpose, content and effect, and describes the process used in preparing the Area Plan. Section I also presents the vision statement, and summarizes past, existing, and anticipated conditions, including population growth trends affecting Long Mountain.

Section II, the essence of the Area Plan, establishes goals, policies, and implementation techniques for the five major elements:

1. Natural Resources

2. Water Resources
3. Land Use, Housing and Economic Development
4. Transportation and Circulation
5. Public Safety

Each Area Plan Element begins with a statement summarizing the most important information gleaned from the base study research, public meetings with the Area Plan Update Committee, and other sources to uncover key planning issues relating to the Element. This introduction gives the reader an understanding of the basis of the goals and policies which will be used by the County in making decisions on development approvals, public infrastructure financing, and other issues.

Section III provides, in tabular form, a brief overview of the key tools that can be used to implement this plan. This section is intended to give citizens and public officials a single reference source for information about the Area Plan's implementation process. (to be developed)

### **Effect**

Planning is an on-going process, involving various players in the County, and does not “end” with the adoption of a particular document. As conditions change, the Area Plan may be requested to be amended to take advantage of new opportunities as well as deal with new risks arising in Long Mountain. The Area Plan is not intended to be a static document, but a dynamic guide to help citizens shape the future of the community; however, any amendment must be in accord with guiding vision as described in Section E (see below) and further developed elsewhere in the planning document.

Goals are used to describe a desired state of affairs in the future. They provide a broad statement to which policies and programs may be directed and need not be tied to specific time lines. Goals in the Area Plan have been written to finish the sentence “Our goal is . . .”

Policies are statements of intent against which individual actions and decisions are evaluated. Policies are phrased as a sentence, with the agency responsible for implementing the policy clearly identified. The Mohave County Departments of Planning and Zoning and Public Works are the main implementing agencies unless otherwise specified. The wording of policies conveys the intended level of commitment to action. For example, policies which use the word “shall” are mandatory directives, while those using “should” are statements to be followed unless there are compelling reasons to do otherwise.

Implementation techniques are actions recommended to carry out policies and procedures. They are not exhaustive, but give the Area Plan an initial agenda and means of implementation. The County will need to adopt future budgets, consider new ordinances, and provide staff resources to implement some of the Area Plan’s goals.

The Area Plan is a guide to action. It is not a direct implementation tool such as an ordinance or regulation. The Area Plan should be used in evaluating rezoning and zoning use permit cases by staff, the Planning and Zoning Commission, and the Board of Supervisors, and to prepare road improvement plans and other facilities and improvements which can be created with a general

improvement district, if any. The Area Plan should be a dynamic document, subject to periodic modification when conditions within Long Mountain change. Periodic review and amendment of the Plan will be needed to ensure that it continues to address the needs of the community.

## **Area Plan Development**

Notification letters were initially sent to over 220 hundred randomly selected landowners in the 100-plus-square mile notification area.<sup>1</sup> Additional public notification was performed through the local newspaper in the form of display advertisements and special articles. Posters, noticing the first meeting, were placed along major thoroughfares. The first meeting was held in October, 2005, at the Kingman Campus of Mohave Community College where over 60 members of the public attended. An Area Plan Committee was tentatively formed at this time. Committee members met at least once a month for the next eight months to discuss the issues faced in Long Mountain and to develop the Area Plan. During this time, meeting minutes were mailed or e-mailed to interested individuals, most of whom were landowners. Meetings were typically attended by County officials, Arizona Department of Water Resources representatives, realtors, residents, and those owning property within the study area. Committee meetings were held on weeknights at Mohave Community College, with one meeting conducted at the new Hualapai Valley Fire Station located within the planning area.

## **Vision for the Future**

In order to provide an overall set of guiding principles to develop the Area Plan, a four-part vision statement was produced to read as follows:

*“Maintain current air quality by controlling dust, improving roads, and limiting population density to prevent degradation from ‘Class I’ type air quality.”*

*“Water, essential to the lifestyle of current and future residents, will be protected through conservation and reasonable growth measures in order to maintain safe yield which will be determined by the best available science from Arizona Department of Water Resources and/or United States Geologic Survey.”*

*“Roadways will be sized to accommodate planned traffic, provide for multi-modal and non-vehicular travel and constructed to County standards to be eligible for regular maintenance at the time of project approval. In addition, the developer or land owner will provide roadways improvements in proportion to the demand created by the new development, including the improvement of off-site roadways such as arterials, major collectors, and feeders.”*

*“New residential development proposals will be similar to existing residential densities, shall promote neighborhood stability, and protect and sustain existing lifestyles.”*

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<sup>1</sup> A three percent sample was randomly selected from 7,412 Assessor parcels within the survey area.

The vision statement was debated and contemplated over three meetings by the Area Plan Committee. Each goal in the Area Plan should be in harmony with the vision statement.

## **The 1992 Area Plan**

In 1992, an Area Plan was approved for Long Mountain to conserve natural resources, ensure efficient expenditure of public funds, and promote the health, safety, convenience and general welfare of the residents. This action was due to the increased number of parcel splits observed at the time. Even though the Kingman-area population growth rate in the early 1990s was considered stable, the need for an area plan to establish land uses compatible with existing residents and to regulate the growth pattern by establishing primary growth areas was identified as necessary. This effort represented the first attempt at providing a separate plan for a largely rural area north of the City of Kingman. At that time, several basic goals were developed to address the basic infrastructure needs within Long Mountain. Several of these goals have been implemented. The plan also recognized the severe impact of unregulated, “wildcat” subdivisions upon the landscape and infrastructure. The combination of inadequate infrastructure and the increasing number of land divisions sparked amongst the 1992 citizen committee the “overwhelming desire to keep this area at the current rural density.” The updated Area Plan follows up on the original goals and provides new goals to reflect the changes that have occurred in the community in the past 15 years.

### Original Goals:

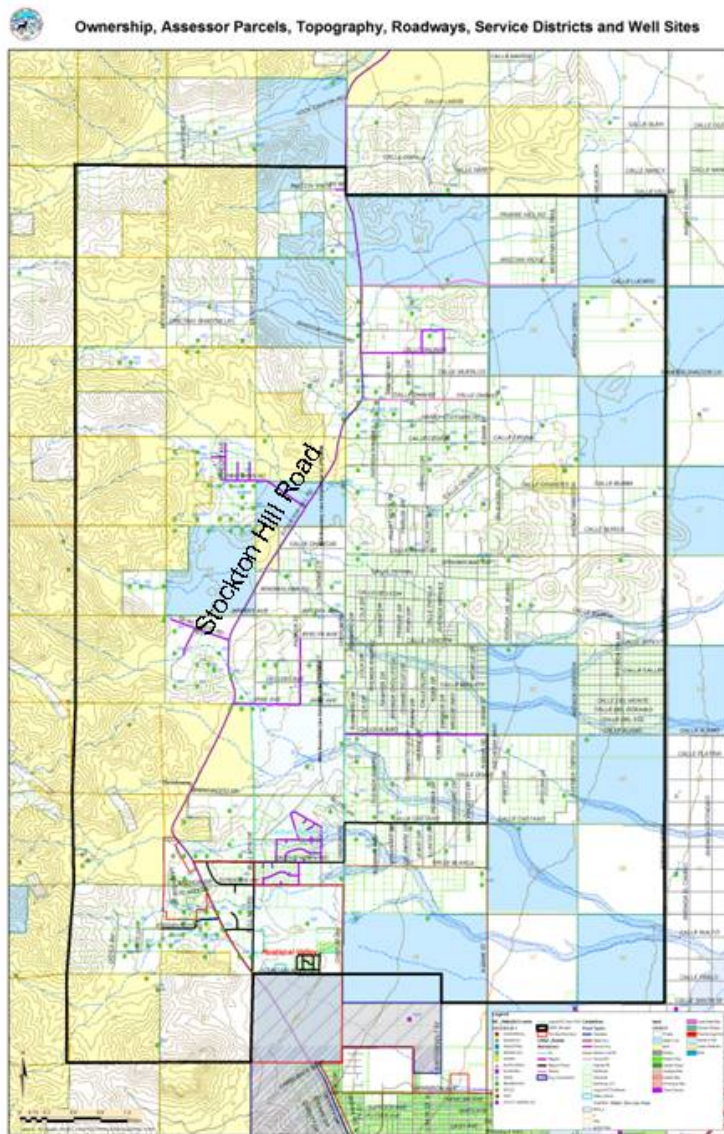
1. *Densities of the existing subdivisions shall not increase without an area plan amendment.*
2. *Parcels within “wildcat” subdivisions shall be allowed to be further divided only if the Area Plan indicates higher densities or with a plan amendment.*
3. *The Area Plan’s open space shall be designated as Mountain Preserves or parks.*
4. *Major interior roadways shall be designated with 84-foot rights-of-way and major County Highways shall be designated with 100-foot rights-of-way.*
5. *Minor interior arterials will be designated as outlined in the Mohave County Subdivision (Land) Division Regulations.*

## **Natural Setting**

The Planning Area covers the sediment filled basin of the Hualapai Valley, typical of the Basin and Range province, and the foothills of the Cerbat Mountains to the west. The elevation ranges from 3,200 to over 5,200 feet above sea level. Mohave Desert scrub, canotia-holocantha, pinion-juniper and numerous grasses grow in these semi-arid and arid soils, respectively.

Winters are relatively mild with daytime high temperatures typically over 40 degrees F., helping the area to have up to 280 frost-free days at lower elevations. Summer high temperatures typically are 90 degrees or more with low humidity. Annual rainfall varies from 10" to 18" with most rain occurring during the winter months. The summer monsoon storms tend to produce sudden and violent bursts of rainfall that can lead to flash flooding. Wind plays a significant role in the local weather pattern and can cause dust storms, typically in the afternoons, as wind speeds increase to 20 mph or more from the south in summer and from the north in winter.

## Community Background



area, with BLM lands to the west and State Trust land to the east (see diagram). Electric and telephone service is being extended to most lots in the central part of the planning area. Small neighborhood serving businesses have been, or are in the process of being established along Stockton Hill, the only major north-south running transportation corridor in planning area and the only roadway which is completely paved.

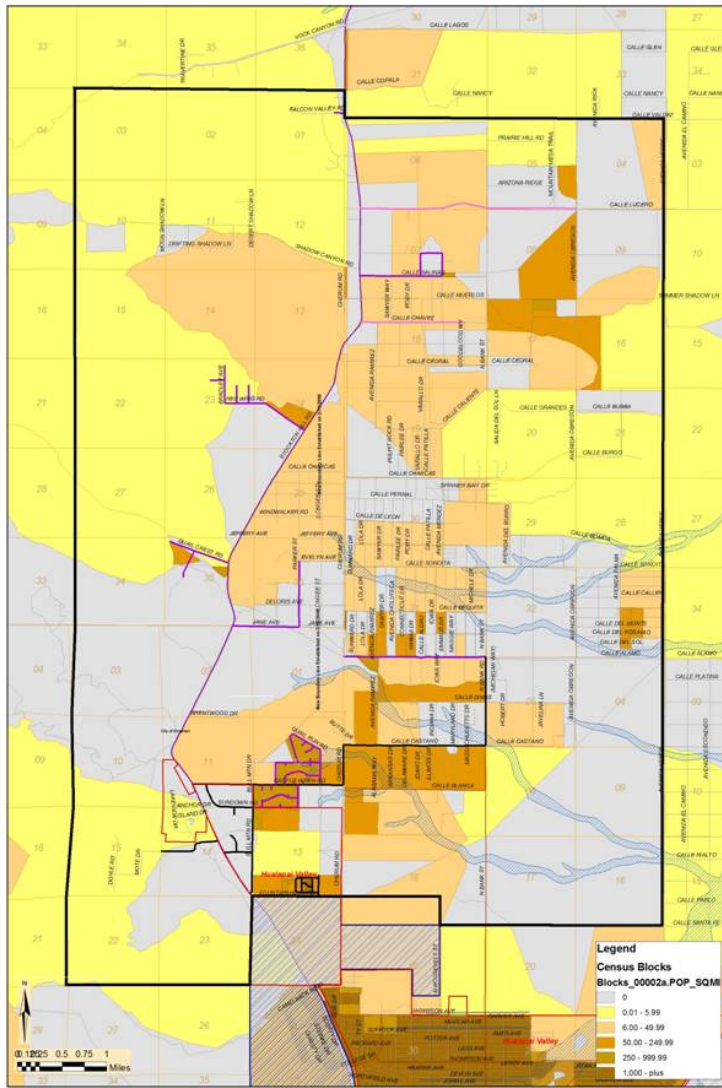
Long Mountain, a place name taken from a small mountain range lying between the Cerbat and Music Mountains, began as a large ranch holding operated by the Neal family in the late 19<sup>th</sup> Century. Post-war development began the 1950s with breaking up and selling off of various ranch properties closer to Kingman. These parcels were then divided into a series of unimproved subdivision lots, notably various units Sunward Ho! Ranchos and Stockton Hill Ranches. These lots were marketed to the general public as investment opportunities and potential retirement home sites.

The land tenure is divided between public, i.e. BLM (20%), State Trust (20%) and private (60%), with most of the later being held in small parcels. The median parcel size from the above mentioned random sample was 2.14 acres. Thirteen acres was the average parcel size owing to several large, 1,000-acre plus private holdings.

The State Trust/public/private checkerboard land ownership pattern is found throughout the planning



### 2000 Population Density by Census Block

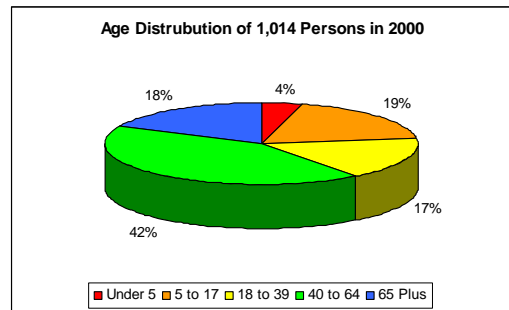


To illustrate basic demographic and housing characteristics for the planning area, several variables have been displayed from the 2000 Census. The total population within the planning area was 1,014 with most persons living in the southern and central part of the planning area near or directly adjacent to Stockton Hill Road (see diagram). assuming a six percent annual growth since that since that time, some 1,440 persons most likely reside within the 61 square mile planning area.

Of these 1,014 persons, nearly 91% identified a non-Hispanic white, with approximately 5.5% claiming Hispanic heritage. Native American, Asian and Pacific Islander, and black populations accounted for less than one percent each of the populace.

The dominate age group consisted of adults between 40 and 64 years of age with 42 percent of the population (see chart). Seniors 65 years of age and over represented significant cohort with 18 percent of the population. This percentage is likely to increase as more people, particularly the so-called “baby-boomers” begin to retire

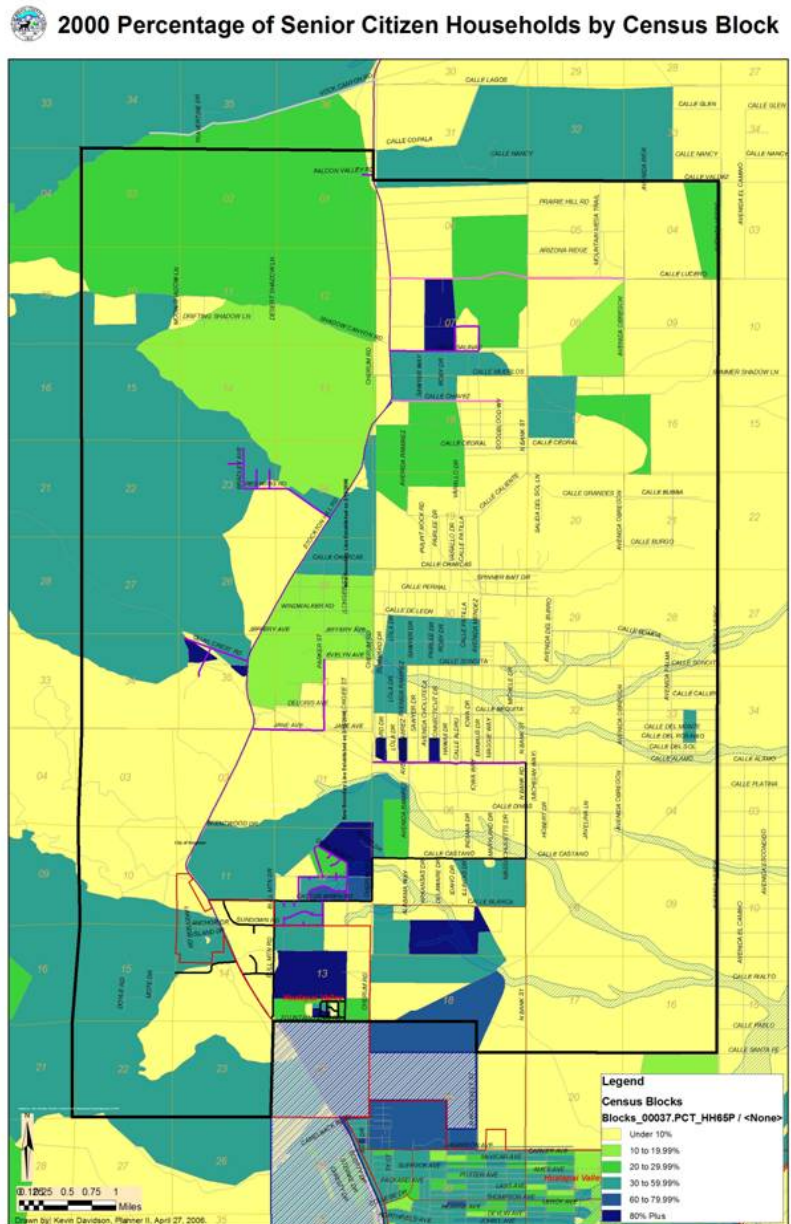
in large numbers stating in the year 2010. Those aged 18 to 39 are somewhat less numerous in the planning area at 17 percent. This low percentage may be indicative of younger adults leaving Kingman, if not Mohave County – still a rural county - to seek better employment opportunities in the fast-growing metropolitan areas surrounding such as Las Vegas and Phoenix. This diaspora is reflected in the small percentage of children under five years of age.



A cursory review of housing tenure indicates over 80% of the 407 occupied homes in the planning area were owner-occupied. Average household size was 2.49 persons, just above the County average of 2.45 persons per household. Renter housing accounted for a mere seven percent of all homes with more being classified as vacant (12%). The vacancy rate in the rental housing market was just over ten percent; however, with only 35 homes in the sample this

number may not be the most reliable indicator of true vacancy rates and demand for rental housing.

Given the presence of an increasingly senior and dependant population in the future, the location of these households should offer convenient access to services to those who dwell within them and be easily accessed by fire and life-safety responders. In 2000, several census blocks indicated senior-headed household made up over 80% of all households within the census block (see diagram). These high-percentage census blocks were located, for the most part, in the southern part of the planning area, south of Jane Avenue. At that time, however, very few were within a fire district, with fewer still living adjacent to a paved or even a County-maintained native material road. Since that time, the Hualapai Valley Fire District has annexed several square miles and the County's road maintenance has been extended. With the advent of new development, mostly in the areas adjacent to Kingman, pavement has been extended in the higher residential density portion of the planning area.



A landscape photograph of a valley with mountains and a blue sky with clouds. The foreground is a grassy field with some rocks. The middle ground shows a valley with scattered trees and a large, flat-topped mountain. The background features more mountains under a bright blue sky with scattered white clouds.

# **Draft Natural Resources Element**

## Natural Resources Element

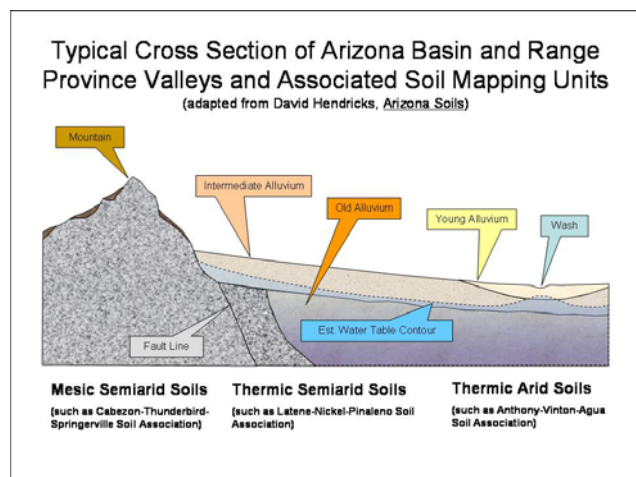
The Natural Resources Element addresses issues relating to the southern Hualapai Valley's physical environment and includes sections on soils and terrain, native plants, air quality, noise, scenic resources and renewable energy. Each section includes an overview of existing conditions, trends, goals and policies to guide the community's approach to maintain or improve their environment and a list of implementation techniques assigning tasks to various groups and/or government agencies.

### Soils and Terrain

*Soils are among the most important state natural resources. Soils provide sustenance for animals and man and support buildings and highways, while contributing to the economies of our cities, the productivity of our farms and rangelands, and the vitality of our wildlife and wilderness areas.*

*David Hendricks, Arizona Soils*

Soils within the planning area fall in two broad categories. The first soil category is composed of semi-arid soils along the foothills of the Cerbat Mountains. These soils are shallow to deep, gravelly, cobbly and stony, fine-textured, nearly level to very steep soils on basaltic plains, mesas and hills. Soil temperatures are between 47° to 59° F with annual rainfall from 10 to 18 inches. This association consists of well-drained soils on plains, mesas, hills and very steep escarpments in scattered areas throughout. The soils support the pinion-juniper and cedar plant communities found in the western third of the area plan. The principal factors limiting the potential of these soils for development of home sites and recreation sites are high shrink-swell rates, clay textures, slow to very slow permeability and excessive rock fragments on the surface. The second and dominant soil is the warmer (thermic) type found in the flatter areas east of the Cerbat Mountains. They are similar in nature to the semi-arid soils but receive less rainfall. Factors limiting the potential of these areas for urban development are the excessive slope and high gravel content and high lime content in the lower horizons of all major soils. These limitations have been partially overcome or compensated for by proper engineering design and construction techniques.



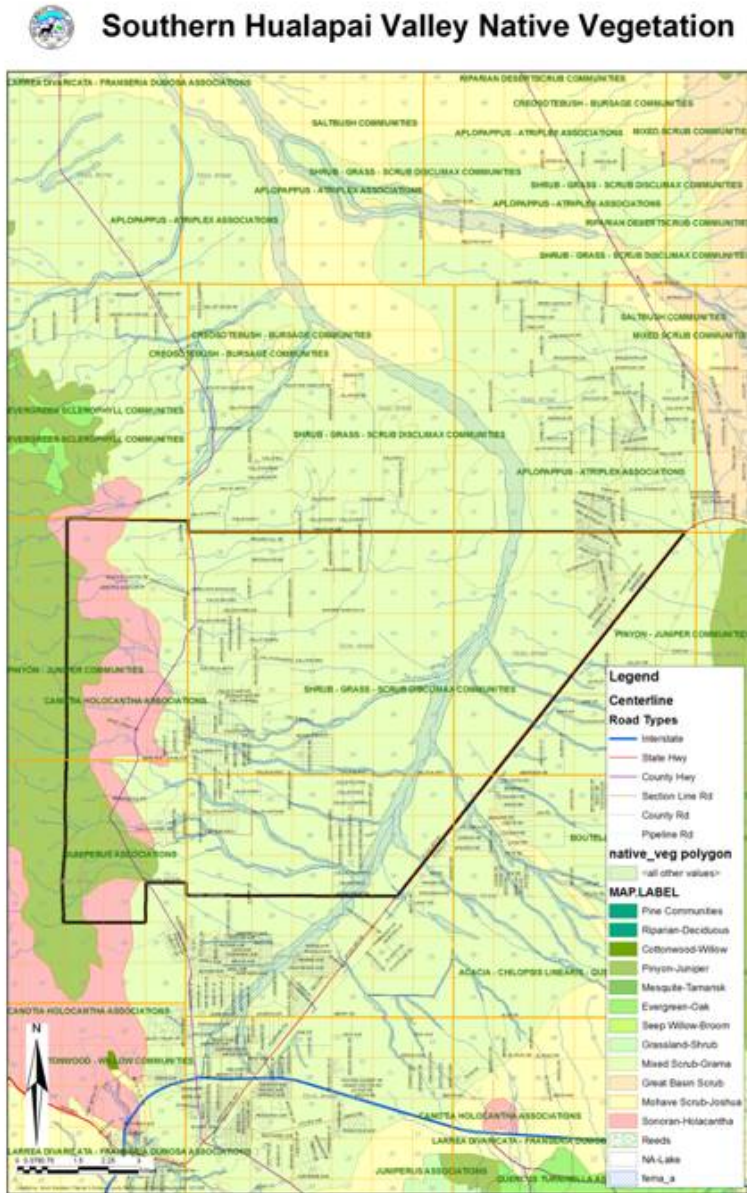
The Bureau of Land Management's suggested management practice on these soils is to retain the site's natural vegetation as much as possible to sustain wildlife and also prevent erosion. Recognizing that all-terrain vehicles (ATVs) will be used in the desert, the BLM also suggests that certain zones and trails be designated as "sacrifice areas" with the remaining landscape left undisturbed.

A cross-section of a typical basin and range hydrogeologic structure shows the mountain front and alluvial fill where the aquifer's lie (see diagram). The critical area for recharge is at the base of the mountains where they intersect

the alluvium (D. Hendricks, 1990). The washes also provide good recharge areas and serve as places for habitat to cluster since the vegetation is typically more intense along the wash edges than elsewhere.

### Native Plants and Animals

The western edge of the area plan boundary, along the Stockton Hill Road corridor proceeding upward to the Cerbat Mountains, contain the Pinion-Juniper, Cedar and Holacantha associations. The balance of the area consists of salt bush, grama grass, creosote and bursage (see map). This mixed scrub regime is in a disclimax state due to overgrazing and historic fire suppression



methods causing in some instance the encroachment of junipers into traditional grasslands. Identifying these areas is critical in determining the type of development density and design guidelines, such as conventional subdivisions or cluster development, to preserve the landscape and protect habitat. Washes are also important life-zones and should be preserved and incorporated into the subdivision design. In addition, roadways, having positive crowns, allow the water to run-off to the shoulders and create additional strips of plant life flanking the otherwise barren travel surface.

The Hualapai Valley marks the transition between the Mohave Desert and the Colorado Plateau. There are a handful of distinct plant communities in the Hualapai Valley as follows:<sup>2</sup>

*Arizona interior chaparral* - turbinella oak, paint-leaf manzanita and silk tassel bush compose this evergreen shrub community found between the 4,000' - 6,000' elevation.

Coverage ranges from 40% to 70% per acre. Annual rainfall is from 13" and 17". This plant population is found at the higher elevations in the Cerbat Mountains and provides a visual and

<sup>2</sup> These passages have been taken from Arizona Soils, David M. Hendricks, University of Arizona, 1990.

recreational resource. When a chaparral area is prevented from undergoing burns the accumulated biomass is so great that when the fire eventually occurs it is hot enough to destroy the underground plant structures that would otherwise guarantee the chaparral's succession by more chaparral. Grasslands will become the dominant community if the previously chaparral-covered area burns many times without any chance for re-growth

*Pinion-juniper* - these two trees are found mostly in the northern half of Arizona are mixed together and co-dominate their habitat which ranges in elevation from 4,500' - 7,500'. Precipitation ranges from 9" to 12", annually. This habitat is found along Stockton Hill Road especially in the southern portion of the area plan where they constitute a small forest unique to elevations below 4,500 feet. Tree densities have increased, and junipers and pinion pines have expanded upslope into ponderosa pine forests and downslope into grass and shrub communities.

Pinions dominate at higher elevations, commonly including a significant shrub component of oaks and alderleaf, mountain mahogany and limited grasses. Juniper tends to grow at lower elevations and in more arid areas. Juniper-dominated woodlands tend to include open savannas of scattered trees without a significant shrub component, except in areas where big sagebrush has become dominant as a consequence of overgrazing. There are relatively few vertebrates endemic to pinion-juniper woodlands, but there are significant levels of biodiversity in vegetation and soil organisms.

This habitat includes sagebrush, goldenbush, wildflowers such as Indian paintbrush, and Mojave prickly pear cactus. Scrub jays--blue but not crested--and antelope ground squirrels. Also in the high elevations, bighorn can be found.

*Canotia holacantha* - is a small tree that is more convergent in appearance with foothill palo verde than with the other crucifixion thorns. It is common on hillsides in central Arizona south of the Mogollon Rim. This plant community provides a transition zone between the pinion-juniper plant community along the eastern foot of the Cerbat Mountains and the mixed scrub and grasslands located generally east of Stockton Hill Road.

*Mohave Desert Scrub* - desert scrub is usually between about 1,000 and 4,000 ft elevation. Average annual precipitation is 5 to 11 in, most of which falls in the winter. Mohave sage and woolly-fruited bursage are near-endemic shrubby species. Although the Mohave Desert is shrub-dominated, several large plants such as the Joshua tree and Mohave yucca are endemic; catclaw and mesquite grow along washes. Creosote bush and/or white bursage often dominate extensive areas. Making a clear distinction between desert scrub and grassland vegetation zones is difficult because of the invasion of the grasslands by desert scrub vegetation. Before immigrant settlement of the Southwest, fires were frequent and widespread and may have restricted shrub invasion.

Other plants within the Mohave Desert include desert mallow, brittlebush, and hedgehog cactus. There are several types of cholla, diamond (pencil), silver and teddy bear to name a few. Roadrunners nest in this type of scrub. This also is the home of the desert tortoise, which dig burrows in the sandy soil. Designated an endangered species, desert tortoises and their habitat are protected by federal law.<sup>3</sup>

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<sup>3</sup> The Sonoran desert tortoise is considered a sensitive species by both the BLM and Arizona Game and Fish Department (AGFD) and was a Category II candidate under the Endangered Species Act. The tortoise's primary

*Shrub-Grass-Scrub Disclimax Communities* - Communities that are considered disclimax are thought to be recently disturbed and may include several species which, though they may be abundant at this time, will eventually be excluded as the climax species takes over the site. Until the late 1800s and the coming of the railroad and the cattle industry, the only large animals to graze these lands were pronghorn antelope. It took only 10-15 years of overgrazing by cattle near the end of the last century to extensively alter these ecosystems. The native bunchgrasses, not generally tolerant of grazing, sustained high mortality when grazed heavily in spring. Wildfires, once common in these grasslands, are far less frequent today as grazing has left less residual grass to carry fires and land management agencies maintain fire suppression policies. Both grazing and fire suppression favored shrub species over grasses and accelerated soil erosion. Site conditions have been permanently altered, and Eurasian annual grass species such as cheatgrass have aggressively colonized vast areas.

*Riparian Scrub* - This habitat traverses all other plant communities within the study area and can be found in narrow, linear paths within washes. This riparian community in the Hualapai Valley is considered to be Xeroriparian because it does not depend upon free flowing water in the soil. Washes generally flow intermittently after heavy rains and create specific plant communities. Plant life in washes is lush and deep-rooted. Plants range from shrubs such as the catclaw acacia, four-wing saltbush, to taller trees such as desert willow and cottonwood. Birds, including migratory finches, orioles, and tanagers, as well as animals such as the blacktail jackrabbit and red-spotted toad are attracted to these life zones. Roadside water runoff can also create a miniature habitat of its own. The sacred datura (thorn apple) thrives in this water runoff, making it stand out along roads. Riparian communities are similar to the adjacent plant community but have increased coverage and greater diversity.

#### *Arizona Native Plant Law*

The Arizona Department of Agriculture is responsible for enforcing the State's native plant law (ARS §3-903). The protected plant groups include any native plant growing wild on any property, public or private; manmade landscapes are exempt. Native plants include all cacti, ocotillo, yucca, Ironwood, Palo Verde and Mesquite and 16 other federally listed threatened or endangered species. Under Arizona State law it may be illegal to destroy these plants without following the necessary notice procedures.

### **Natural Landscape Conservation**

Preserving the beauty of foothills, rock outcrops, and the desert environment are methods to maintain the aesthetic appeal of the Cerbat Mountains and the Hualapai Valley. These attributes have led many people to purchase property in this part of Mohave County. Policies designed to prevent clearing the entire site of its plant material and preserving portions of the property in a natural state will help maintain this unique desert environment.

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habitat includes the creosote-white bursage, Joshua tree-mixed shrub, Joshua tree-juniper and paloverde-mixed cactus plant communities

**Goal 1      Preserve native vegetation with emphasis along the base of the mountains, foothills, slopes and the washes.**

*Policy 1.1      Maintain native vegetation, except to the extent necessary to accommodate site access, parking areas, fire breaks, and structural improvements during the development of new housing tracts and businesses requiring rezone actions.*

*Policy 1.2      Provide conservation easements on newly created lots and parcels where native habitat and unique plants have been identified for preservation.*

*Policy 1.3      Conservation design practices, such as greenway dedication and conservation subdivisions, will be required of new developments proposed in areas designated for preservation and shall be tailored to minimize the alteration of natural landforms and native vegetation and to enhance distinctive natural features. Green-beltting shall also be used to buffer adjoining development.*

*Policy 1.4      Flood plains and riparian areas shall be incorporated into public open space and greenway systems for all new developments. Structures for human habitation shall be located on the portions of property outside of delineated floodplains.*

*Policy 1.5      Encourage the BLM and Arizona State Trust to designate lands for conservation and possible acquisition as permanent open-space.*

**Implementation**

Maintaining native plant material will be done under the guidance of each new development's private C.C.& R.s. Mohave County does not possess a landscape ordinance or hillside development ordinance at this time. Until such time as the County sees fit to adopt these ordinances, the Area Plan will be used to guide development that requires rezone action. Cluster development practices will also be used to preserve native habitat and landscape. In the event that the site is overly encumbered, the developer will have the option of transferring development rights to another location per ARS 11-821.03 (*see below for guidelines on implementation*). The County will adopt such procedures, methods and standards as prescribed by Statute to enable these transfers. Conservation easements will be asked for with any rezoning action approved by Mohave County based on the "Conservation" map.

**Goal 2      Preserve the natural and aesthetic value of hillsides.**

*Policy 2.1      Based upon the land use diagram's designation, divided parcel sizes for residential use shall be based on the site's average cross-slope as follows:*

- a)      Where the average cross slope is up to 10%, parcel size may be less than 1 acre;*
- b)      Where the average cross slope is 10.1% to 15%, parcel size shall be at least 1 acre;*

- c) *Where the average cross slope is 15.1% to 20%, parcel size shall be at least 2.5 acres;*
- d) *Where the average cross slope is 20.1% to 25%, parcel size shall be at least 5 acres;*
- e) *Where the average cross slope is 25.1% to 28%, parcel size shall be at least 10 acres;*
- f) *Where the average cross slope is 28.1% to 31%, parcel size shall be at least 20 acres;*
- g) *Where the average cross slope exceeds 31%, parcel size shall be at least 36 acres.*

*Policy 2.2 The total amount of grading, based upon a percent of the total parcel area, where the average cross slope is 15% or greater<sup>4</sup>, shall be as follows:*

- a) *15% for the first 2.5 acres, or 10% of the entire property, whichever is greater, for sites with 2.5 to 4.99 acres;*
- b) *10% for the first 5 acres, or 7% of the entire property, whichever is greater, for sites with 5 to 14.99 acres;*
- c) *7% for the first 15 acres, or 5% of the entire property, whichever is greater, for sites with 15 to 35.99 acres;*
- d) *5% for the first 36 acres, or 3% of the entire property, whichever is greater, for sites with 36 acres or more.*
- e) *For sites with less than 15% average cross-slope, grading shall be limited to one third of the entire property for single-family homes and two-thirds of the entire site for non-residential or subdivision development where engineered grading is required.*

*Policy 2.3 Rock outcrops shall be integrated into site design and left undisturbed.*

*Policy 2.4 Non-residential land uses established by a zoning use permit or rezoning shall be limited to sites where the average cross slope is not greater than 15%.*

*Policy 2.5 Primary structures placed on hillsides, ridge lines or mountain peaks shall be finished with a neutral color scheme which blends with the natural desert colors.*

## Implementation

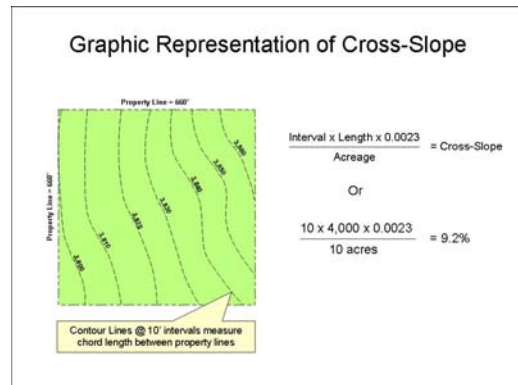
Cross-slope and grading criteria will be adopted in a “Policy and Procedure Memorandum” by the Planning and Zoning Department or placed into a new hillside development ordinance (Guidelines on cross-slope calculations and grading amounts have been taken from Pima County’s Hillside Development Ordinance – see exhibit). All properties requiring a rezoning or zoning use permit will be reviewed in respect to cross-slope by the Planning and Zoning Department with the assistance of the Department of Public Works, as necessary. Applicants will provide an accurate map of the subject property for this review. Grading permits are typically required by the Building Division when grading exceeds 100 cubic yards. Grading plans will be reviewed according to these guidelines. Clearing and grubbing a site may require

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<sup>4</sup> For sites with less than 15% average cross-slope, grading shall be limited to one third of the entire property for single family homes and two-thirds of the entire site for non-residential or subdivision development.

notification to the State to comply with the Arizona Native Plant Law. Each new development's private C.C.& R.s should address the clearing and grubbing of a site.

Mohave County does not have an aesthetic design review section in its Zoning Ordinance. However, the County does condition zoning use permit or rezone approvals for public utility assets, such as water tanks, with a neutral color scheme to blend in with the natural setting. This condition should be placed in all applicable rezoning and zoning use permit resolutions granted by Mohave County. Color schemes may also be regulated by private C.C.& R.s for new developments.



A transfer of development rights ordinance applied to the Long Mountain Area Plan will develop guidelines as follows:

1. Transfer of development rights (TDR) shall only occur for lands within the planning area with rights not transferable from lands beyond the area plan boundary.
2. A transfer of development rights shall not increase the development potential or density of a single property by more than 33 percent as measured by an increase in lot count or building square footage.
3. Developments rights shall not be transferred from otherwise uneconomical or unbuildable land as defined in the Natural Resources Element.

## Air Quality

Part of the vision for the Area Plan reads as follows: *"Maintain current air quality by controlling dust, improving roads, and limiting population density to prevent degradation from 'Class I - like' air quality."* The Hualapai Valley, currently within a Class II air shed, enjoys Class I-type air quality and seeks to maintain this air quality at the upper range of the Class II designation.<sup>5</sup> Both Phoenix and Las Vegas are within Class II air sheds and are occasionally are in violation. This lower designation has allowed the air quality in these cities to be degraded to an arguably unhealthful level. The Hualapai Tribe is trying to expand the Class I air shed, currently on the surrounding national park lands, so it too can be protected. New industry would have use best available control technology (BACT) to filter emissions. The local economy has a significant tourism sector and clean air is one of the contributing assets. Clear, clean air also attracts new residents; however, growing populations typically lead to degraded air quality. Dust is the major contributor to airborne particulates in rural parts of Mohave County. At high concentrations these particulates can pose health problems. Even small amounts in the air can cause visibility-reducing haze. If proactive land use policies are prescribed, then area residents may never have to deal with costly remediation programs, such as auto-emission testing, to make up for pollution created by other sources.

<sup>5</sup> See Title I, Part C - Prevention of Significant Deterioration of Air Quality, Clean Air Act.

Dust from unpaved roads is not only a nuisance but creates a safety hazard by reducing the driver's visibility. Dust also affects the health of road users and increases wear-and-tear on vehicles. Fine particles, including dust, act to help hold the surface of unpaved roads together. With a loss of fine particles from the roadway, there is an increase in roadway surface raveling and maintenance costs. These fines are smaller than what the eye can see and pass through the 75 µm (No. 200) sieve. Since the fines act as a binder that holds the surface of the unpaved road together, removing them is not a good option.<sup>6</sup>

**Goal 3      Maintain “Class I-like” air quality.**

*Policy 3.1      Require Best Available Control Technology for new industry to keep the air quality in “Class I-like” condition.*

*Policy 3.2      Mitigate dust on unpaved roads, at construction sites and at sand and non-exempt gravel mining operations with the appropriate dust palliative.*

*Policy 3.3      Re-vegetation of disturbed areas with native plant material shall be required.*

*Policy 3.4      Where appropriate, in the approval of new construction permits, the County will encourage the installation of low-emission producing wood burning stoves.*

*Policy 3.5      Limit grading on individual parcels, except to the extent necessary to accommodate site access, parking areas, fire breaks, and structural improvements during the development of new housing tracts and businesses requiring rezone actions.*

*Policy 3.6      Limit the clearing of vegetation on individual parcels, except to the extent necessary to accommodate site access, parking areas, fire breaks, and structural improvements during the development of new housing tracts and businesses requiring rezone actions.*

*Policy 3.7      Mohave County shall encourage the use of alternate electric power generation*

*Policy 3.8      Maintain natural “desert pavement” and native plant material. Lots and parcels should not be graded/grubbed until construction is ready to proceed.*

*Policy 3.9      Limit new land divisions accessing off of unpaved roadways.*

**Implementation**

Grading permits are typically required by the Building Division when grading exceeds 100 cubic yards. Grading plans will be reviewed according to these guidelines. Grading permits (specify cu. yd. amount) will be accompanied with a dust mitigation plan based upon the International

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<sup>6</sup> Dust Palliative Selection and Application Guide, USDA, 1999.

Building Code guidelines. The Arizona Ambient Air Quality Guidelines will be referenced by staff during development approval process. Clearing and grubbing a site may require notification to the State to comply with the Arizona Native Plant Law. Each new development's private C.C. & R.s should also address the clearing and grubbing of a site.

## Visual Resources

The Visual Resource Management Classes depicted in the BLM's 1993 Resource Management Plan (see map), indicates the piñon-juniper and holocantha native plant communities are nearly identical to the outlines of the Class II and Class III view resources. These are less than the Class I view resources found in the Mt. Tipton Wilderness Area, but do indicate a visual resource which should be protected with a sensitive hillside development policy.

In addition, vast open spaces, attributed the public lands, ranching activity and limited development have lessened the human impact on panoramic vistas. Future development should be designed to enhance these resources rather than detract from them.

### **Goal 4      Establish part of Stockton Hill Road between the Fountain Hills Road and Vock Canyon Road as a Scenic Route.**

*Policy 4.1      Petition the Mohave County Planning & Zoning Commission and Board of Supervisors to amend Exhibit V.7 of the Mohave County General Plan to include this portion of Stockton Hill Road as a Scenic Route.*

*Policy 4.2      Provide appropriate signage indicating scenic routes and vistas.*

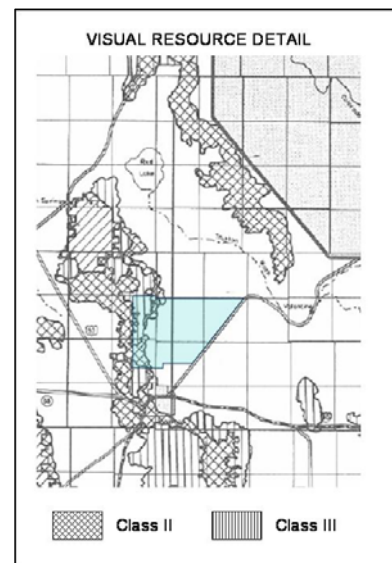
### **Goal 5      Preserve the scenic vistas and the hillsides**

*Policy 5.1      Limit housing development on hillsides by placing development on the site's lower elevations and on more gentle slopes.*

*Policy 5.2      Encourage development practices which integrate building footprints and facades with the site's natural terrain and color pallet.*

*Policy 5.3      Require new housing proposals to place conservation easements over open space reserved for hillsides to prevent future land division and development.*

*Policy 5.4      Encourage land owners to use conservation land trusts to acquire developments rights to preserve hillsides from development*



## Implementation

Scenic routes can be adopted by Mohave County after research has been done. Neighborhood groups, using the help of the Planning and Zoning Department, will petition the Board of Supervisors for additional roadway and scenic vistas. Signs designating scenic roadways and vistas will be processed through the Department of Public Works or the developer, depending upon the status of the roadway. These signs will be funded by the private sector. The impact of new buildings on scenic vistas and hillsides can be addressed through the Zoning Ordinance and Land Division Regulations when new housing developments and master planned communities are reviewed and approved by the County.

The night sky is also a resource making country lifestyle attractive. Increasing urbanization in the Hualapai Valley is slowly degrading the darkness of the night sky. Even though the darkness of the night sky is also impacted by adjacent city development, the ambient glow of outside lighting placed in the public and private domain within the planning area should be mitigated.

**Goal 6      Preserve the night sky for stargazing and enjoyment.**

*Policy 6.1      Limit outside lighting in non-residential developments to 0.2 foot candles in parking areas and walkways.*

*Policy 6.2      Spotlights shall not be taller than the on-site structures and shall face into the property, illuminating the structures and not the adjoining properties.*

*Policy 6.3      Any future street lighting district will limit the mounting height of the fixtures to 20' above the road surface. Street lights may only be placed at intersections and at areas with high volume traffic.*

*Policy 6.4      The use of yard lights, operating with motion detectors from dusk to dawn, in lieu of street lights in new developments shall be encouraged.*

**Implementation**

Mohave County currently uses Ordinance 87-1 to preserve “dark sky.” This ordinance is designed to protect astronomical observatories rather than residents. Non-single-family residential development will require a site plan review by County staff. Lighting will be evaluated prior to approval. Regulations of lighting for individual residents can be accomplished with private C.C.& R.s. An improvement district, if formed, will design and regulate the operation of any street lighting district.

**Quiet Enjoyment & Privacy**

Maintaining the peace and sense of privacy is critical in perpetuating a rural atmosphere and allows one to become connected with the natural environment without distractions which pervade an otherwise technologically advanced culture. Many recent land purchasers have bought property to “get away” from the big city “hustle and bustle” and plan to build a home one day, usually upon retirement. Rather than lose this potential increase to the County’s tax base when future homebuilders realize that the community they bought into 10 to 20 years earlier is

less than what they expected, several goals and policies, if begun today, should help preserve the rural feel of the planning area and ensure future investment. Noise criteria is based on Exhibit V.6 of the Mohave County General Plan

**Goal 7**      **Limit daytime noise emissions between new residential subdivisions and existing residential lots to 60 dBA at the fence line and nighttime noise emissions to 55 dBA.**

*Policy 7.1*      *Provide screening (solid fences, walls, plantings, berms) between new and existing residential uses.*

**Goal 8**      **Limit daytime noise emissions from new non-residential land uses and both new and existing residential lots to 65 dBA at the fence line and nighttime noise emissions to 60 dBA.**

*Policy 8.1*      *Provide screening (solid fences, walls, plantings, berms) between non-residential and residential uses.*

#### Implementation

Most noise emissions from a 36-acre-plus residential parcel will be muffled to meet the 60-65 dBA criteria measured at the property line. Smaller parcels may require screening to some extent. These noise criteria would also tend to encourage home builders to place their homes in the center of the property. Developers of non-residential sites will have their properties rezoned and subsequent site plans reviewed by County staff prior to construction. The appropriate buffers will be required at that time. Screening will be constructed by new development.

**Goal 9**      **Maintain the sense of privacy between residential properties.**

*Policy 9.1*      *Provide conservation easements along the perimeter of lots when parcels are divided by a rezone action to preserve native plant screening where occurs. Conservation easements should be at least 20' wide along roadways.*

*Policy 9.2*      *All open lot storage should be enclosed by some type of vegetative or constructed screening.*

#### Implementation

Developers of 36-acre plus properties are encouraged to provide building setback dimensions within their C.C.& R.s beyond the County's minimum as prescribed in the Zoning Ordinance. Conservation easements will be asked for by the Planning and Zoning Department when rezoning action occur on environmentally sensitive lands with natural vegetative screening.

## Renewable Energy

With the re-adoption the Mohave County General Plan in 2005, it is the intent of the County to promote the use of an alternative to fossil-fuel-generated electrical power. This policy directive supports the Environmental Portfolio Standard adopted by the Arizona Corporation Commission in 2001, currently subject to revision, which would increase the 1.1 percent requirement of total retail electric sales from environmentally-friendly resources such as wind and solar by 2007 to 15% of all retail electric sales by 2025. Distributed generation, such as that installed by individuals at their home and small businesses, is a portion of the annual renewable energy requirement that must be at least 30% after 2010.

The County will also review the energy demand of structures to achieve a building which needs less energy by design with the goal of creating a Zero-Energy Home. The philosophy of such an approach combines site layout, envelope design, building materials and distributed generation to create a building which produces as much energy, in this case electricity, as it consumes annually.

**Goal 10**      **Through distributed renewable energy resources, reduce the consumption of conventional energy resources that would otherwise be used to provide electricity to the customer.**

*Policy 10.1*      *Encourage the use of distributed generation in master-planned communities or in subdivisions with 200 or more lots by orienting lots and/or homes for southern exposure.*

*Policy 10.2*      *Encourage the use of renewable energy in master-planned communities or in subdivisions with 200 or more lots by requiring CC&Rs to not discriminate against distributed generation applications such as solar and wind energy when lots are at least 20,000 feet in size for the latter.*

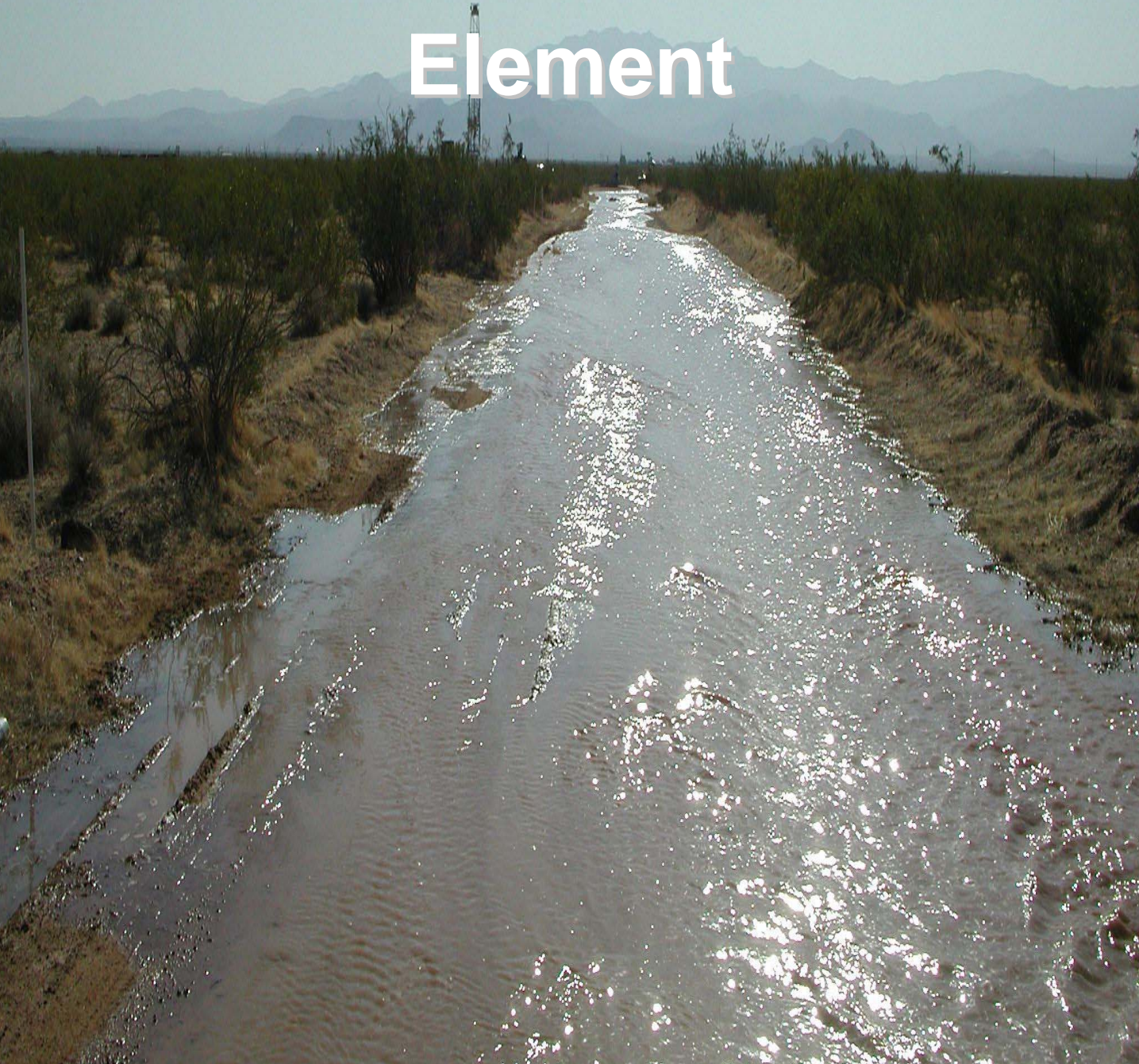
*Policy 10.3*      *Homebuilders with subdivisions of 200 or more lots will construct at least 10% of the new homes to meet EPA Energy Star standards.*

*Policy 10.4*      *Require master planned communities and subdivisions with “model homes” to have at least one model home designed as a Zero-Energy Home.*

### Implementation

Distributed generation, Energy Star standards and Zero-Energy Homes can be prescribed through the Zoning Ordinance, the Building Code and development agreements when new development projects are approved by the County. The Mohave County Planning and Zoning Department will provide assistance, via technical specifications, for those persons wanting to install alternate power generation equipment.

# Draft Water Resources Element



## Water Resources Element

Water is scarce in the semiarid southwestern United States. Mohave County's Hualapai Valley is no exception, with only ephemeral streams flowing in the otherwise dry washes during the rainy seasons. Water supplies in arid and desert environments usually come from groundwater stores (40% of the State's water supply) that have been accumulating for several million years. The General Plan emphasizes this point by noting:

*There appears to be enough water to meet anticipated demands in the rapidly urbanizing parts of the County for the next 40 to 50 years, long term water planning throughout the County will require better information than is currently available. Development of a County-wide water budget that identifies water supplies and demands for identified groundwater basin sub-areas will enable the County to use its water resources most efficiently.*

None of Mohave County's groundwater basins are within an Active Management Area (AMA), where new development must provide proof of a 100-year assured water supply.<sup>7</sup>

Seeing water as a finite resource, the State of Arizona has adopted a proactive policy that requires municipal and county governments to develop a water element for their general plans. As part of Growing Smarter Plus approved in 2000, counties must develop a water element for the General Plan that addresses, a) the known legally and physically available surface water, groundwater and effluent supplies, b) the demand for water that will result from future growth projected in the county plan, added to existing uses, and c) An analysis of how the demand for water that will result from future growth projected in the comprehensive plan will be served by the water supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies. Conservation is one way to increase supply, reducing demand is another. The statute does not mention the 100-year supply, required in an AMA, and simply asks how future growth will be served by the identified water supplies. The Area Plan will develop a water element and also offer a water budget in accordance with Implementation Measure WQ2 to prevent the mining or, in some cases, further mining of groundwater.

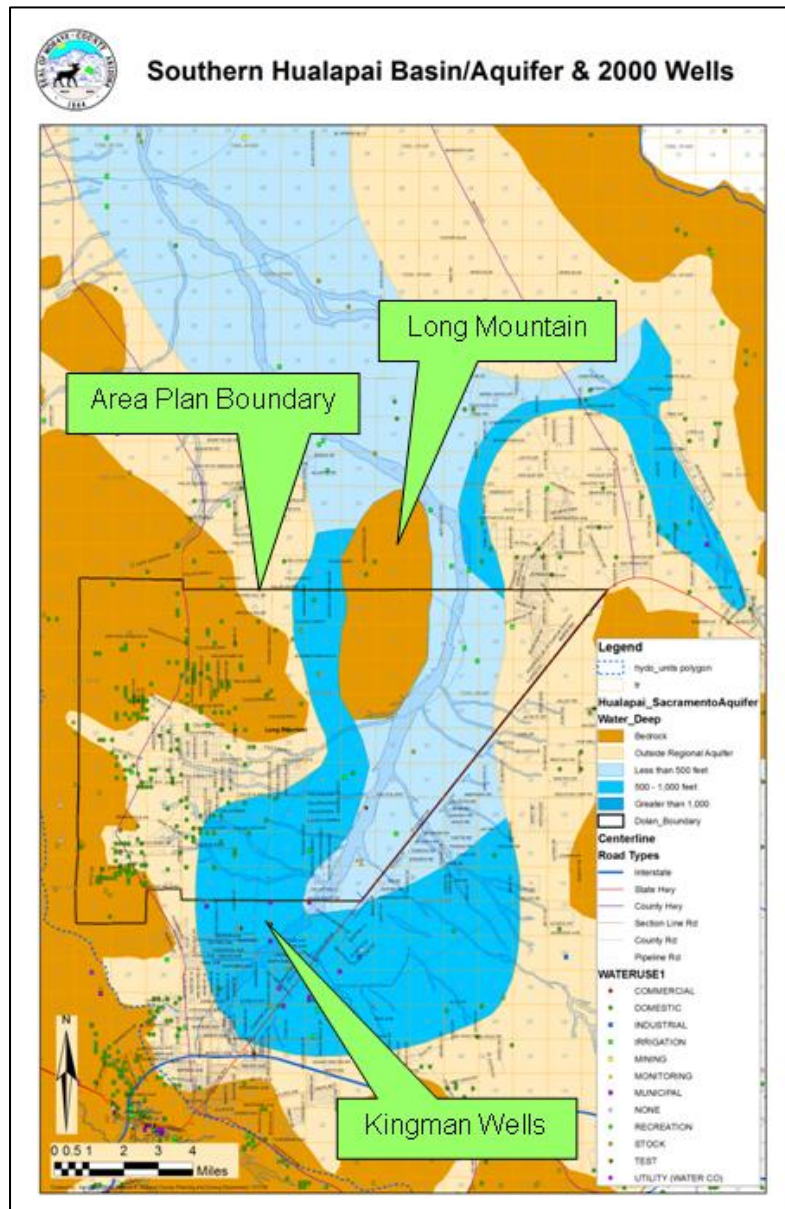
The Hualapai Valley Basin, covering some 1,820 square miles provides water to ranchers, industry, individuals with private wells and to the City of Kingman's primary well field (see map). In addition, two new cities consisting of over 57,000 housing units, proposed by Rhodes Homes, will draw approximately one half of the water in storage over the next 100 years. How will this affect the water supplies of the existing residents? How much water can be allocated for future industrial and residential use? The Area Plan Committee's concern is reflected in the vision statement as follows: "*Water, essential to the lifestyle of current and future residents, will be protected through conservation and reasonable growth measures in order to maintain safe yield which will be determined by the best available science from ADWR and/or USGS.*" The Water Element will focus on these issues and develop a conservation strategy. Given the growth forces beyond the areal extent of the planning area, a basin wide approach to water planning is needed.

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<sup>7</sup> Approximately a dozen entities in Mohave County have Colorado River allocations from the Bureau of Reclamation. The City of Kingman has sold their 18,500 annual allocation to users along the river in return for the development of their groundwater resources in the Hualapai and Sacramento drainage basins.

*Hydrogeology:*

Rainfall and water from melting snow pack infiltrates into the basin's aquifer through mountain fronts and washes, with some water being trapped in granite fissures. Wells, especially those for municipal use will create "cones of depression" due to high pumping volumes. Contaminants, percolating into the soil, and the groundwater, are also an issue and should be mitigated. The key to an aquifer's yield is the saturation of its sand and gravel. Coarse material typically holds more air and water than finer silts and clays.



The Hualapai Valley basin-fill sediments range to as much as 6,400 feet thick (Oppenheimer and Sumner, 1980), and have been divided into three separate units: a younger alluvium, an intermediate alluvium, and an older alluvium (Gillespie and Bentley, 1971). Groundwater moves from the mountain fronts towards the center of the valley, then flows north and exits the basin as underflow to Lake Mead (Gillespie and Bentley, 1971). The younger alluvium yields small amounts of water to stock and domestic wells in mountain canyons. The bedrock is generally non-water bearing. However, fractured and weathered zones in the bedrock do provide some water to low-yield wells, and numerous springs and seeps. In the central part of the valley, the younger and intermediate alluvium are above the water table, and therefore, dry. The intermediate alluvium is a dependable aquifer only along the valley margins where the unit intersects the water table. The older alluvium is the main aquifer in the Hualapai Valley basin.

Volcanic rocks are interbedded with the older alluvium in the southern part of Hualapai Valley and form a secondary system (Cella Barr Associates, 1990). The older alluvium can store and transmit large amounts of water; well yields up to 1,500 gallons per minute have been reported (Remick, 1981). Depth to water ranges from 500 to 900 feet below land surface in the central

and southern parts of the basin and to 300 feet below land surface near Red Lake (Remick, 1981).

Recharge to the valley aquifers is from streambed infiltration. Recharge from precipitation on the valley floor is negligible due to high evapotranspiration rates. Freethey and Anderson (1986) estimate that recharge is 4,000 acre-feet per year in the Hualapai Valley basin. Approximately 1,000 acre-feet of that total are underflow from the Hackberry area, and 3,000 acre-feet are from streambed infiltration (Freethey and Anderson, 1986; Gillespie and Bentley, 1971). However, the Truxton Canyon Water Company's well field may be intercepting most of the underflow from the Hackberry area (Remick, 1981). Actual net recharge into the basin may be only 3,000 acre-feet per year. Given the importance of natural recharge areas, the General Plan recommends "key recharge areas in the mountains and bajadas should be protected from development activities that degrade water quality. The effects of urban runoff and septic systems effluent on groundwater quality should be minimized."

The Arcadis hydrological survey from 2002 found the Kingman well field has created a sufficient "cone of depression" to alter the subsurface flow in the southern part of the Hualapai Basin. It was assumed, prior to municipal water withdrawal, the subsurface flow was northward to Red Lake. The cone of depression may have lowered the water table sufficiently to prevent the sub-surface flow from traversing the bedrock highpoint at the base of Long Mountain. This bedrock highpoint occurs along the northern boundary of the Area Plan, possibly dividing the basin into two separate aquifers, the second being in the Red Lake area.

Recently, the U.S. Geological Survey began a five-year study of several groundwater basins within Mohave County including the Hualapai Basin. The study, part of the Rural Watershed Initiative, will estimate the total water in storage in the ground-water system on the basis of the geometry of the hydrologic units, estimates of hydraulic conductivity and storage properties the hydrologic units. Water budgets will also be updated at this stage to include "subsurface inflow and outflow, ground-water pumpage, evapotranspiration of shallow ground water (if any), discharge from springs in the basin fill (if any), and recharge originating from precipitation and runoff within the basin." When complete, the Area Plan's water budget will be revisited

#### *Quality:*

The chemical quality of water from the older alluvium aquifer in the Hualapai valley generally is good. Total dissolved solids range from 210 to 1,100 milligrams per liter (mg/l); however, in some areas in or near the mountains groundwater is highly mineralized. Total dissolved solids in these areas ranges from 1,430 to 2,365 mg/l (Gillespie and Bentley, 1971). The recommended secondary maximum contaminant level for total dissolved solids in drinking water is 500 mg/l (U.S. Environmental Protection Agency, 1988). Fluoride concentrations in water ranged from 0.1 to 6.5 mg/l (Remick, 1981). High concentrations of sodium chloride may occur in wells near the salt deposit in the area of Red Lake.<sup>8</sup>

#### *Water in Storage:*

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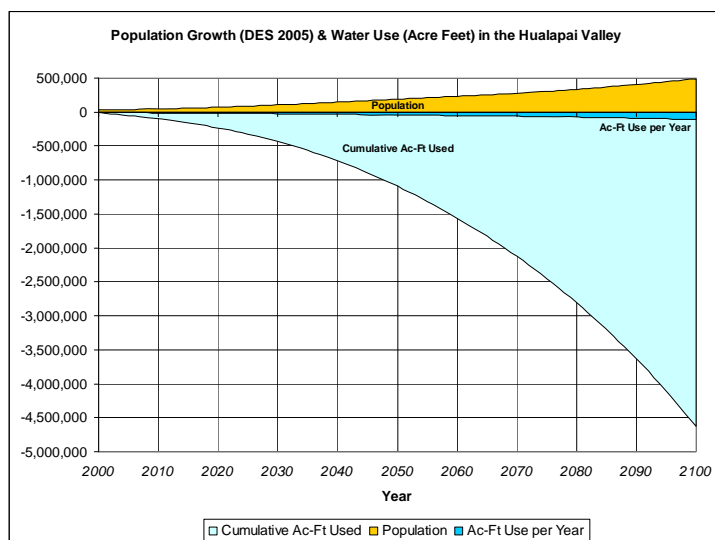
<sup>8</sup> The Arcadis study found the water north of Red Lake, being down gradient from the salt mass, becomes increasingly saline at greater depths. Salinity begins to be noticeable at approximately 1,000 below the ground surface and could limit the water's potability.

Total groundwater availability to 1,200 feet below land surface in the basin is estimated to be 5,000,000 acre-feet (Freethy and Anderson, 1986; Arizona Department of Water Resources, 1988). In the 1980s it was assumed the Hualapai Valley was probably in a state of limited groundwater depletion. The average water level decline rate for the basin is 1.4 feet per year (Arizona Department of Water Resources, 1994). The Arcadis study estimated the Hualapai Valley contains approximately 15 million acre feet of fresh groundwater. The estimate of 15 million acre-feet of fresh water in storage has not been verified by ADWR; however, the estimate does include water below 1,200 feet below the land surface which may be recoverable, but at additional cost.

Provisional data from a University of Arizona “Carbon 14” age analysis of water taken from one well site in the Hualapai Valley, near DW Ranch and I-40, being some 615 feet deep, with water level at 460 feet, indicates this water to be approximately 13,000 years old. Additional studies will be needed to estimate the rate of recharge to the aquifer.

*Demand:*

A 2000 Census block analysis indicated 31,765 persons resided within the basin. The population in the Hualapai Valley has increased by several thousand since that time. The Kingman water service area serves some 40,000 persons, with a small population in the Sacramento Valley. Annual municipal well field declines are still in the 1-2 foot range. Growth projections from a 1997 Department of Economic Security estimate placed some 105,000 persons in the Kingman area by 2100.<sup>9</sup> These annual growth rates are in the two percent range. Assuming a 0.22 acre-foot per capita rate of water consumption, the population would have consumed 1,600,000 acre-feet in this time frame.



With the exponential growth promised by “new cities” and the general boom in the real estate industry nation-wide, DES revised the population estimates upward to the four percent range in 2005. The population estimate has now nearly increased five-fold to 500,000 persons by 2100 with a cumulative water consumption of 4,600,000 acre-feet (see graph). It should be noted that committed demand (the number of lots already platted) is estimated at 50,000 lots, many of which are vacant and could support additional population with minimal permit review.

*Wells:*

<sup>9</sup> DES estimates for Mohave County projected population to 2050. These annual growth rates, logarithmic in nature, have been applied to the Hualapai Valley and then extended to 2100. The same technique has been used with the 2005 growth estimates.

In 2000, 880 wells were registered by ADWR in the Hualapai Valley having an average depth of 432 feet and water level of 271 feet. The average draw-down on these wells under pump stress was 17 feet. These values were somewhat greater than the drawdown of other wells found in other drainage basins, perhaps do to more drilling activity. Private, domestic wells serving individual homeowners and small businesses comprised 64 percent of these wells. Private, domestic wells are typically not as deep or large as those serving commercial, industrial of municipal applications. For example, the typical private, domestic well in the County is only 100 feet deeper than the water level. Commercial wells are some 408 feet deeper than the water table. Municipal wells are some 300 feet lower than the water table. This extra depth assures the wells will not be out-competed by most other wells in the area. For example, the City of Kingman's well field, comprised of 12-inch plus casings and powered by turbine pumps, are some 400 feet deeper than the water table, with many descending to 1,000 feet below the land surface.

At the end of 2005, ADWR had registered some 1,100 wells in the Hualapai Valley, a 25% increase in five years, of which 800 were private, domestic wells. The private, domestic well type now represents 73% of all wells the Hualapai Valley and an increasingly at-risk cohort of users.

*Water Budget:*

Based upon known water in storage and estimated annual water consumption from a 2001 analysis of water use by the City of Kingman, an accounting of the groundwater within the Hualapai Valley can be surmised. From the 2001 analysis, the annual per capita water consumption within the City of Kingman's water service area was 0.22 acre feet. Given a population of 35,000, 7,700 acre feet of water would be withdrawn per year (see table). Assuming the recharge is roughly equal to subsurface outflow, and most wells are over-drafting the aquifer, there is still enough water to support this population for some 650 years.

<b>Water Supply w/ Aquifer Recharge equal to Sub-surface Outflow</b>				
Population*	Ac_Feet_Available	AcFt_percapita_Yr	AcFt_Use_Yr	Years_Supply
35,000	5,000,000	0.22	7,700	649
50,000	5,000,000	0.22	11,000	455
100,000	5,000,000	0.22	22,000	227
250,000	5,000,000	0.22	55,000	91
500,000	5,000,000	0.22	110,000	45
1,000,000	5,000,000	0.22	220,000	23
1,500,000	5,000,000	0.22	330,000	15

\* Does not include downtown Kingman since it is part of the Sacramento Basin

<b>Water Supply w/ 4,000 ac-ft annual natural recharge &amp; 10% artificial recharge</b>				
Population*	Ac_Feet_Available	AcFt_percapita_Yr	Net_AcFt_Use_Yr	Years_Supply
35,000	5,000,000	0.22	2,930	1,706
50,000	5,000,000	0.22	5,900	847
100,000	5,000,000	0.22	15,800	316
250,000	5,000,000	0.22	45,500	110
500,000	5,000,000	0.22	95,000	53
1,000,000	5,000,000	0.22	194,000	26
1,500,000	5,000,000	0.22	293,000	17

\* Does not include downtown Kingman since it is part of the Sacramento Basin

Assuming that growth occurs as predicted and 500,00 people will be living within the Hualapai Valley within the next 100 years, then their water supply would be sufficient for 53 years. Trimming the per-capita water consumption to 0.15 acre-feet would extend this time line by about 50% (79 years). Assuming that recharge exceeds sub-surface outflow by 4,000 acre feet per year and an additional 400 acre-feet is artificially recharged, an additional eight years of water supply is available to the half-million residents.

It is estimated that only one percent of rainfall is actually recharged to the groundwater, with the balance being lost to soil moisture and evapotranspiration. Just sequestering an extra few percent of the total rainfall would be a significant gain to recharge. The on-going drought should also be considered when increasing the development density beyond existing water service boundaries and when approving additional development in areas located on bedrock which typically have a water supply which is less robust or drought-sensitive.

The question before the area plan update committee, and, to a larger extent, the Southwest, is should water be viewed as an endowment or an annuity, the former lasting in perpetuity and the latter designed to last just for the life of the person, or in this case culture, based upon an actuarial-like table, before the resource is totally consumed? Arizona's 100-year Assured and Adequate Water Supply program, derived from the landmark Groundwater Management Act of 1980 was revolutionary at the time. The program covers all development within an AMA and may deny development's which cannot prove or secure water supplies. However, in non-AMA areas, where notice of 100-year water inadequacy is only required to be given to would-be land buyers prior to sale, and may not deny new subdivisions, the State may be unwittingly encouraging "managed depletion."

From the previously mentioned hydrological studies, safe-yield within the basin was surpassed in the 1980s. Given this assumption, and until proven otherwise by additional hydrological studies, several goals and policies have been crafted to balance a landowner's investment-backed expectations in the face of future, and seemingly exponential, growth while attempting to reduce stress on the groundwater system without placing an extraordinary burden on existing and future landowners.

**Goal 1      Limit water consumption to the aquifer's natural or enhanced rate of recharge to achieve safe-yield.**

*Policy 1.1      Limit the increase in residential density when new development is proposed on bedrock or outside the regional aquifer unless the development is served by a water company with an ADWR certified 100-year supply.*

*Policy 1.2      New development proposals served by a public water system which seek higher residential densities within the range of the existing Urban or Suburban Development Area, as shown on the land use diagram, in which they are proposed will be limited to the estimated water use for landscaping from the lowest density prescribed in the respective Development Area.<sup>10</sup>*

*Policy 1.3      Require new development to use mechanisms such as catch basins and flood control devices along washes and mountain fronts to increase aquifer recharge and reduce runoff and loss of surface water through evaporation.*

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<sup>10</sup> For example, within the Suburban Development Area, residential lots range from one to five acres in size. Newly created lots less than five acres in size would be limited to outdoor water consumption to that of the five acre parent parcel from which they were created.

Implementation Measures:

- WR 1.1 Hydrologic studies will be required for developments in Urban and Suburban Development Areas. These studies should be available with the initial proposal. In lieu of a formal hydrological analysis, County staff will prepare a water budget using the ADWR-supplied generic demand calculator.
- WR 1.2 Developments with housing densities with more than one unit per acre will be required to treat effluent to A+ Standard (per ADEQ Rule R18-11-303, Class A+ Reclaimed Water) provide a non-potable water system for landscaping and common greenspaces throughout the development.
- WR 1.3 New homes and small businesses will construct water conservation devices such as gray-water recycling and/or rainwater harvesting systems, in addition low-flow plumbing fixtures, to comply with Policy 1.2
- WR 1.4 When subdivision and parcel plats are recorded, note their geographic location in relation to the regional aquifer and not if they are outside the regional aquifer or on bedrock.
- WR 1.5 Petition the State to create an Active Management Area in the Hualapai Valley.

**Goal 2 Preserve groundwater quality.**

- Policy 2.1 Limit development along mountain fronts and washes to prevent recharge areas from being covered and to protect these areas from point-source and non-point source pollution.*
- Policy 2.2 Limit land divisions in flood plains.*
- Policy 2.3 Preserve washes as open-space within planned residential developments.*
- Policy 2.4 Allow only low intensity agricultural-residential use or recreational activities adjacent to or within washes.*
- Policy 2.5 Maintain natural “desert pavement” and native plant material.*

Implementation Measures:

- WR 2.1 The Mohave County Planning and Zoning Department, in association with the Mohave County Flood Control Department, will review rezone and plat submittals to ensure that future residential and non-residential building sites will be designed to avoid flood hazards and preserve washes as open space.

WR 2.2 The Planning and Zoning Department (Building Division) will review grading permits with consideration on preserving as much of the site's natural landscaping as possible.

WR 2.3 The Planning and Zoning Department will continue to make available to the public Arizona's Native Plant Law brochure.

**Goal 3 Conserve groundwater resources.**

*Policy 3.1 Encourage the use of effluent, grey water and rainwater harvesting in new housing and commercial developments.*

*Policy 3.2 Attract new businesses that do not require water as a main part of their production process.*

*Policy 3.3 Encourage rainwater harvesting and recycling of grey water for on-site irrigation of landscaping and other non-potable uses.*

*Policy 3.4 Limit turf on new housing developments to less than 50% of the rear yard area and supplement with xeriscaping.*

*Policy 3.5 Monitor water table depths, through well reporting, and evaluate use vs. supply on an annual basis.*

**Implementation Measures:**

WR 3.1 When existing wells are adversely affected, such as going dry, by new water systems serving subdivisions of six or more lots, the new water system will provide the existing well users with water from the new water system.

WR 3.2 The Mohave County Planning and Zoning Department and County economic development authorities will only encourage non-water-intensive businesses to the Hualapai Valley.

WR 3.3 The Planning and Zoning Department (Building Division) will review and permit the use of grey water recycling for on-site irrigation.

WR 3.4 The Planning and Zoning Department, in association with monitoring data supplied by ADWR and the USGS, will track well depths.

WR 3.5 The Planning and Zoning Department will adopt a landscape ordinance with emphasis on xeriscape requirements.

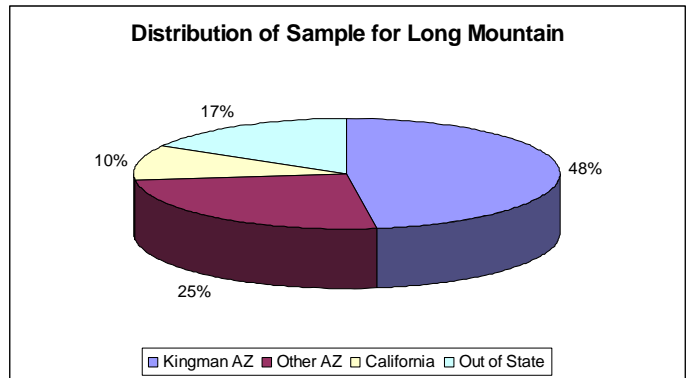
A scenic view of a paved path leading through a park. The path is made of reddish-brown bricks and curves through the scene. On the left, there are several trees with green and yellow leaves. On the right, a large tree with dark, bare branches stands prominently. In the background, a brick building is visible under a blue sky with light clouds. The overall atmosphere is bright and clear.

# Draft Land Use, Housing and Economic Development Elements

## Land Use Element

### Overview

The built environment of the Long Mountain Area Plan is most readily described in its land uses and how these uses are placed on individual sites. Topography, access to roadways and utilities, and the desires of the individual owner determine what types of uses are constructed on each site. Long Mountain is mostly undeveloped, vacant land owned by myriad small-holders spread throughout the United States and foreign countries (see chart). For example, some 2,400 assessors parcel yielded only 464 homes and 1,014 residents in 2000 over the 61 square-mile planning area. Assuming five percent annual growth since 2000, some 1,300 people resided within the planning area in 2005.<sup>11</sup> The nature of Long Mountain is primarily residential, a combination of conventional site built homes and mobile homes placed on 1-acre-plus lots. Commercial buildings comprise only a small fraction of land uses located along Stockton Hill Road. These businesses are designed to serve local residents.



The Long Mountain Area Plan, adopted in 1992, is also superimposed by the Mohave County General Plan, adopted in 1995 and recently re-adopted in 2005. This unusual situation has led to a conflict in both the land use diagrams and development philosophy. Because of the conflict in land use designations between the Area Plan and the General Plan, numerous amendments to the land use diagrams have been processed over the years to bring both plans into conformance with one another. The primary goal of the Area Plan Update Committee is to reconcile these two plans. It should be noted the goals, policies and land use designations for the Area Plan take precedence over the General Plan. This will be kept in mind during the creation of goals and policies for this element and others.

### The Division of Land

Most land buyers purchase their lots and parcels from others who have divided larger holdings into smaller parcels. This division of land into small parcels for residential purposes is uniquely a part of the development of the United States and enables most to own land rather than rent. The division of land into multiple parcels is one of the most permanent and irreversible actions in our society. The type of land pattern that is established today will affect the rate and direction of growth and nature of land development of the Hualapai Valley for decades to come.

In the past, in other areas, and in many places in Arizona at present, parcelization occurs only on “paper.” For example, roadways can be depicted but not put in place by the developer. In selling a “home site,” community services accepted as a necessity to our modern standard of living are typically not provided. And yet, when the County approves the parcelization of a property they are recording a group of potential home sites. The County is, in effect, assuring

<sup>11</sup> An aggressive 10% annual growth rate would yield 1,800 persons by 2005.

the purchasers that what is shown on the recorded parcel map is true, regardless of other State assurances or disclaimers.

## Area Plan and General Plan Land Use Inventories

### A. Commercial

Stockton Hill Road has three areas with small amounts of commercially designated properties, the first being at the northwest corner of Stockton Hill Road and Bull Mountain Road. A real estate office was located on this site but has been removed in past few years but the property retains C-2H (General Commercial, Highway Frontage) . The second commercial area is located further north on Stockton Hill Road near Jane Avenue and remains undeveloped. A third node is located at Calle Chavez were a small tack and feed store and fire station currently are located at or near this intersection and provide a logical basis for a future commercial node.



### B. Residential

1 Rural Development Areas (RDA) and Rural Residential (RR): Most residential parcels developed outside of platted subdivisions contain 5 or more acres each. These parcels derive from parent parcels that originally contained 36-plus acres. These large lot developments, exempt from County subdivision regulations requiring developers to build infrastructure up-



front, have seen improvements only by chance or when the land owners have invested time and money to extend utility lines or, in some cases, form a water company. These larger parcels are routinely divided, via a rezone (from AR/36A to AR/5A<sup>12</sup>, for example) into smaller lots without improvements because land divisions that create fewer than six lots also do not require improvements to be provided by the developer. The General Plan allows for the creation of 5-acre minimum lots in Rural Development Area regardless of how they are developed. This policy has created de-facto subdivisions over time and that remain unimproved in many instances.<sup>13</sup> Rural Development Areas generally occur outside of water service areas, along the perimeter of higher density Suburban and Urban Development Areas. The existing RDA contains over 14,500 acres. Running parallel to the General Plan's RDA designation is the Long Mountain Area Plan's land use designation of Rural Residential (RR). This designation ranges from RR/5A to RR/10A and then to AR/36A for the

<sup>12</sup> "A" = acre, e.g. RR/5A limits lot sizes to 5-acre minimum lot sizes.

<sup>13</sup> The exception being Cedar Ridge Estates, located between Stockton Hill, Cactus Wren and Bull Mountain Roads.

largest Agricultural Residential land uses typically located on public lands and range land. Rural Residential is a land pattern of choice due to the community's overwhelming desire to preserve a rural atmosphere within the planning area. Some 34,400 acres are designated RR/5A, RR10/A and AR/36A and comprise 88% of the planning area (see land use diagrams for Area Plan and General Plan following sub-section 3).

2. Suburban Development Areas (SDA) other Rural Residential: Lots and parcels in this category are spread throughout the real estate market in Long Mountain. Various units of Sunward Ho! Acres and Stockton Hill Ranches, typically contain 2-acre lots, and typically cover one or more sections of land. The roadway grid divides the section into equally sized rectangular blocks. These lots were created before 1965, prior to the County's review of subdivision activity, hence developers were not required to construct infrastructure. However, road rights-of-way were dedicated to the County when these subdivisions were recorded. Suburban Development Areas currently cover some 24,000 acres of the Area Plan. The majority of the land use conflict between the two planning documents occurs between the Area Plan's RR/5A and General Plan's SDA land use designations. For areas not in conflict, Rural Residential, ranging from RR1/A to RR/4A, is the companion land use designation to Suburban Development Areas, but without the infrastructure provisions now required by the General Plan. The Long Mountain Area Plan also defines areas for "high density." These high density areas were originally applied to the legacy lots created before the adoption of County regulations. However, this land use has also been applied to accommodate higher density development such as Lake Juniper and Fountain Hills Estates, for lack of a more definitive land designation. Only about 11% of the planning area is designated with these land uses. The "high density" designation is a relative term given the rural nature of the planning area in 1992. Also, "high density" areas prohibit future land divisions, i.e. rezones, from occurring. This land use has also been applied to several one-acre housing developments straddling Cactus Wren Road, near Bull Mountain Road and may be re-designated RR1/A.

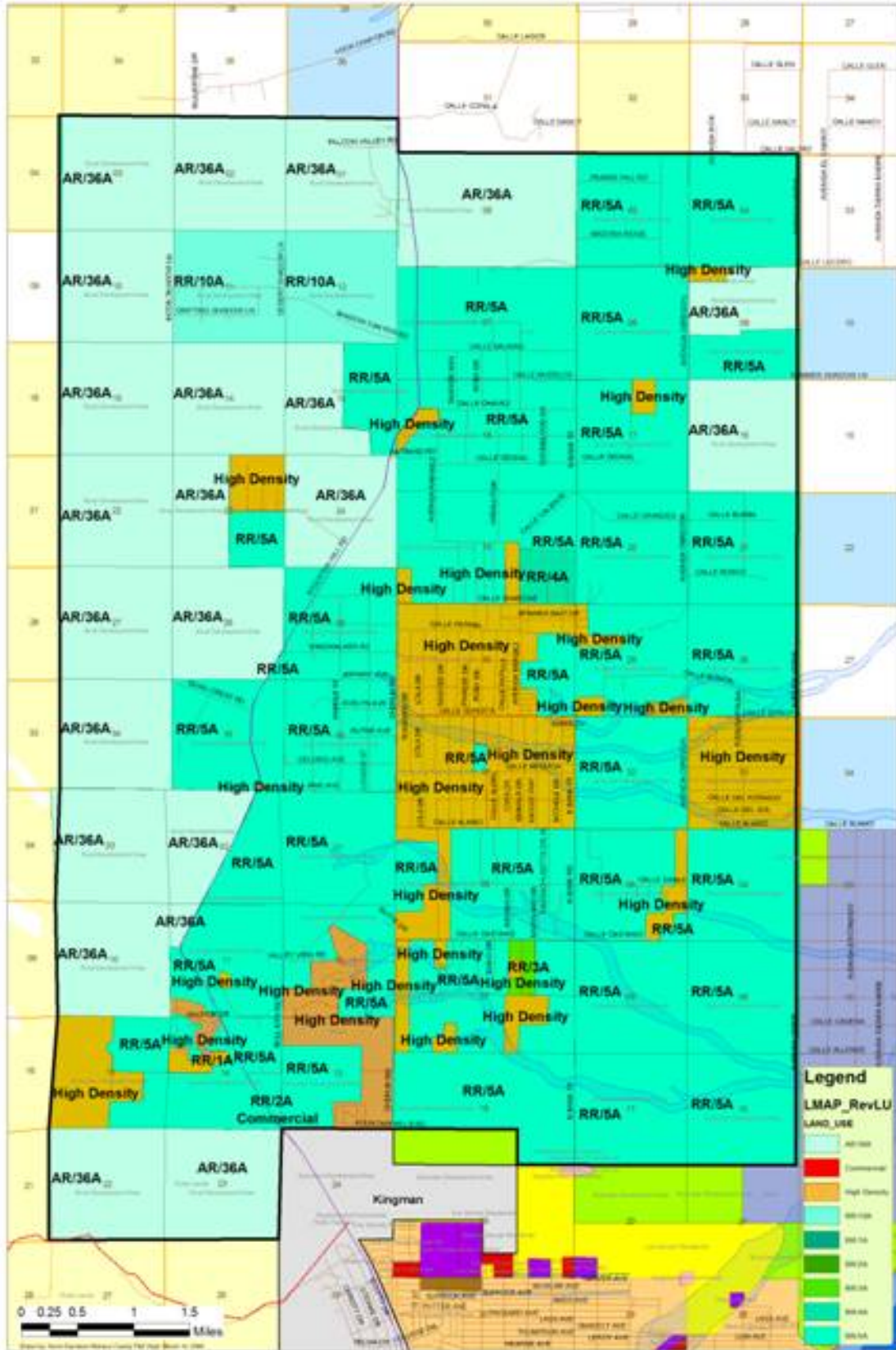
3. Urban Development Areas (UDA): Fountain Hills Estates (66 lots), Lake Juniper Estates (74 lots) and Desert Fountain Estates (60 lots to date) are three examples of sub-one-acre subdivisions in Long Mountain. These tracts have been recorded sporadically over the 20 years, with additional units of Desert Fountain planned in the coming years. The land use designation comprises 732 acres of the planning area. The demand for sub-one acre lots in Long Mountain appears limited to the southern end of the Area



Plan, near the City of Kingman's corporate limits and water service area. These developments make up just over 300 acres of land. The Long Mountain Area Plan designates some 300 acres for sub-one-acre development. Additional sub-one acre development may be appropriate elsewhere in the planning area but must meet the stringent criteria set forth in the area plan.



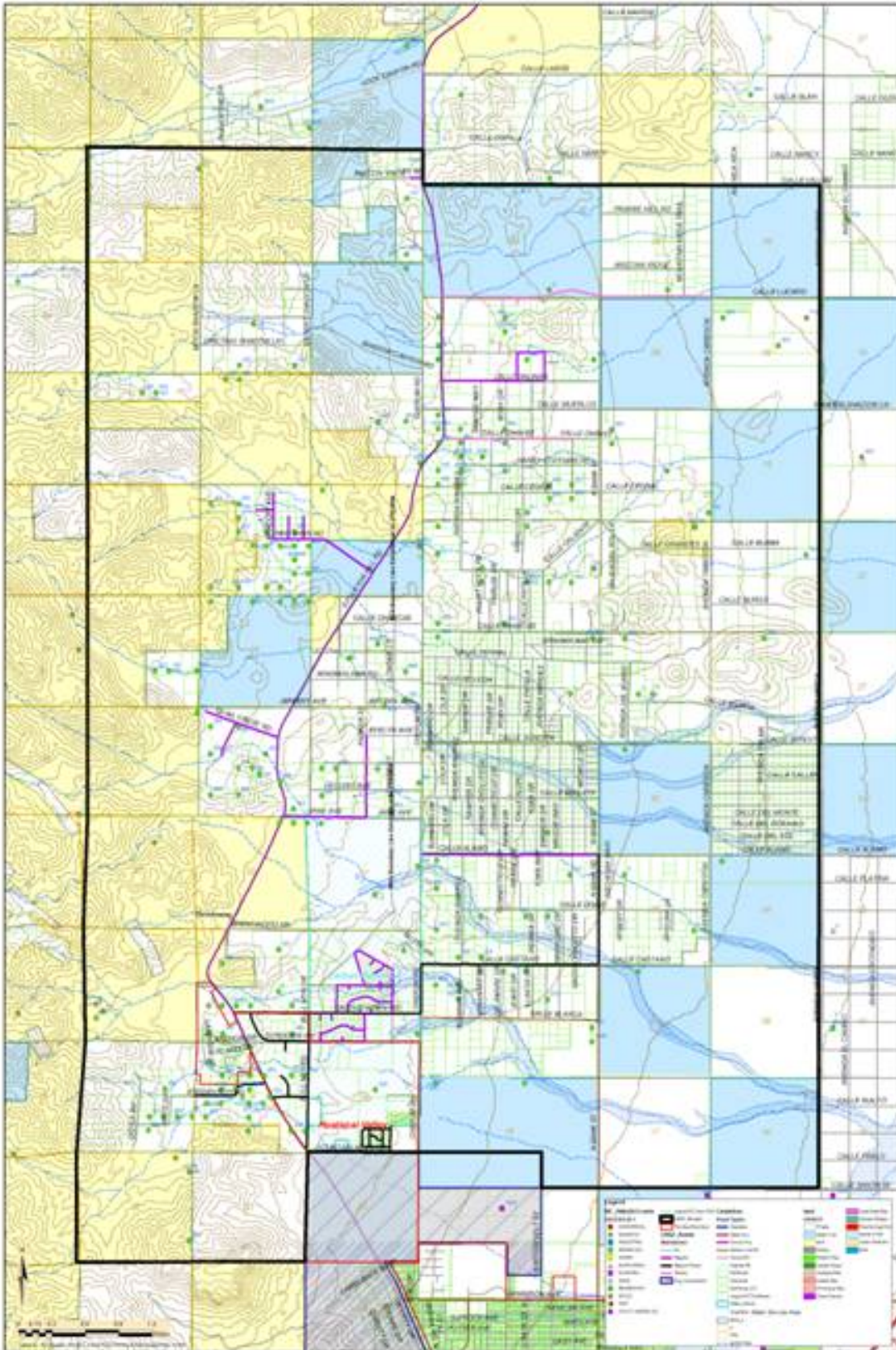
# Existing Long Mountain Area Plan Land Use Designations







# Ownership, Assessor Parcels, Topography, Roadways, Service Districts and Well Sites



C. Public Facilities

Aside from the nascent Inland Valley Fire service, no public facilities exist within the planning area.

D. Vacant Land

1. Bureau of Land Management and Arizona State Trust: The Area Plan contains several sections and quarter sections of land under government control, with BLM holdings (7,805 acres) predominantly west of Stockton Hill Road, proceeding up into the Cerbat Mountains. State Trust lands, comprising 8,069 acres, occur primarily east of Stockton Hill Road. Some of these large holdings may be appropriate to acquire for resource conservation either through land exchange or purchase.

2. Open space: Long Mountain has an abundance of undeveloped land which serves as de facto open space. Most of the planning area consists of unimproved land. One reason for this is the early, speculative land divisions and marketing plans which dispersed the ownership of myriad lots throughout the country. These properties were purchased mostly for investment or retirement purposes by the owners. Over the years, these "lots" have been used for open space, hiking, horse back riding, off-road driving and, unfortunately, wildcat trash dumping.

With fragmented ownership, Long Mountain has not seen large tracts of land consolidated under a single owner for residential or commercial development. However, this has recently changed with several master planned, urban density developments proposed in 2005. Given the tremendous impact of the proposals on adjacent properties and the population in general, the County has proceeded with the update of the Long Mountain Area Plan to incorporate these designs, if possible, into the community.

The following tables represent the build out projections for each land use category in both the Area Plan and the General Plan.

<b>Existing Long Mountain Area Plan Land Use Designations</b>				
<b>Land Use</b>	<b>Asumptions</b>	<b>Acres</b>	<b>Percent</b>	<b>Potential Dwellings</b>
Commercial		3	0.01%	NA
High Density (pre 1992)	1.5 ac avg lot size	4,150	10.60%	3,113
High Density (post 1992)	0.25 ac avg lot size	331	0.85%	1,324
RR/1A		2	0.01%	2
RR/2A		21	0.05%	11
RR/3A		61	0.16%	20
RR/4A		156	0.40%	39
RR/5A		20,445	52.20%	4,089
RR/10A		1,275	3.26%	128
AR/36A		12,719	32.48%	353
<b>Total</b>		<b>39,163</b>		<b>9,078</b>

Existing General Plan Land Use Designations within Long Mountain Area Plan				
Land Use	Asumptions	Acres	Percent	Potential Dwellings
Neighborhood Commercial		25	0.06%	NA
Urban (pre -1992)	No further splits	401	1.02%	401
Urban (post -1992)	0.25 ac avg lot size	331	0.85%	1,324
Suburban Development Area	1.5 ac avg lot size	23,873	60.96%	15,915
Rural Development Area	6 ac avg lot size	14,533	37.11%	2,422
<b>Total Area</b>		<b>39,163</b>		<b>20,063</b>

Under the current Area Plan, build out potential, mostly from “legacy lots,” is less than fifty percent of the General Plan’s growth potential. The following tables place the growth potential of both plans in some perspective.

Area Plan Population	
Persons/household*	2.45
9078 households	22,241
* 2000 Census for Mohave County	
Households	9,078

General Plan Population	
Persons/household*	2.45
20199 households	49,488
* 2000 Census for Mohave County	
Households	20,199

Area Plan Daily Vehicle Trips	
Trips per SFDU*	9.55
Trips per 9078 SFDU	86,695
* ITE Trip Generation, 7th Edition	

General Plan Daily Vehicle Trips	
Trips per SFDU*	9.55
Trips per 20199 SFDU	192,900
* ITE Trip Generation, 7th Edition	

Area Plan Water Use	
AcFt/percapita/year*	0.22
Persons/Household	2.45
AcFt/perhousehold/year	0.539
AcFt/per9078HH/yr	4,893
* Est. City of Kingman Average	

General Plan Water Use	
AcFt/percapita/year*	0.22
Persons/Household	2.45
AcFt/perhousehold/year	0.539
AcFt/per20199HH/yr	10,887
* Est. City of Kingman Average	

Regardless of which density regime is chosen, the impact on local businesses and services (including schools and emergency service responders), roadways and the aquifer will be significant. Additional development which increases density must pay its own way and be sensitive to use of natural resources, especially water.

### Development Area Definitions:

The following definitions have been selected from the General Plan and represent all land uses which are planned for Long Mountain or are shown adjacent to the planning area on the land use diagrams.

**Rural Development Area (RDA)** - This is an area where residents presently enjoy a rural lifestyle, wide-open spaces and few neighbors. Properties in these areas are generally at least five (5) acres in size and many are much larger than this.

Uses include:

Rural Residential (RR): All RDAs are designated Rural Residential, permitting single-family development on lots of five (5) or more acres. Larger lot sizes may be appropriate to address environmental concerns (such as steep slopes and washes). The existing rural/agriculture character of these areas should be maintained. Residents in these areas are able to keep their own livestock. Land uses may be served by septic systems, wells and other services planned at rural levels such as native material roadways.

Non-residential uses may be permitted in Rural Residential areas through the rezoning process. These include Public Parks, Public Lands used for open space.

Public Parks (PP): Local, State and National Parks that are publicly owned and managed for the benefit of the general public are included in this category.

Public Lands (PL): This category is used to indicate land in rural areas that is owned by a public agency, but is not primarily devoted to parks and recreational use. Lands owned by the BLM, BoR and Arizona State Land Department are included in this category.

**Suburban Development Area (SDA)** - This is an area intended for development of lower density residential neighborhoods, but with many of the amenities of urban areas. Suburban lot sizes range from one to five acres in size with a typical lot size of 2.5 acres. Neighborhood commercial uses will be permitted at appropriate locations where they are compatible with adjacent uses and infrastructure.

Uses Include:

Suburban Estates (SE): This suburban land use is characterized by single-family lots ranging from two (2) to five (5) acres in size. Non-residential land uses are not the primary uses in a Suburban Estate area. Septic systems will be the primary means of wastewater disposal. Many lots will use well water, but this will vary based on groundwater conditions and proximity to existing organized water systems.

Suburban Residential (SR): This is the highest density, non-urban land use category, with densities ranging from less than one-half dwelling unit per acre to a maximum density of one dwelling unit per acre. These densities result in lot sizes of one to two acres. While Suburban Residential areas will be mostly single-family, some neighborhood commercial development will be permitted as part of a planned development. Suburban service requirements generally will be lower than in urban areas, but will vary as dictated by site conditions. Septic tanks will generally be permitted, but soil conditions, groundwater quality concerns, proximity to existing utilities and other factors may create the need for urban sewer systems. Minimum road or water system improvement requirements may also vary from one site to the next.

Non-residential uses may be permitted in SDAs through the rezoning process. These include Public Parks, Public Lands used for open space and Public Facilities/Institutions.

Public Facilities (PF): This category includes such public and quasi-public institutional uses as schools, colleges, fire stations, libraries, government buildings and hospitals.

Other non-residential land use categories which may be consistent with this planning area, depending on the location e.g. proximity to improved roadways, natural features and surrounding land uses include:

Neighborhood Commercial,  
Commercial Recreation,

**Urban Development Area (UDA)** - This area is intended to provide for more intense residential and non-residential development near cities and in outlying communities. While residential densities typically will range from two to five per acre, high density development of up to 25 units per acre may be permitted. Urban services and facilities will be required for both residential and non-residential development in this area.

Residential Uses Include:

**Low Density Residential (LR):** This is the lowest density residential development planned within urban areas. It is designed to reflect development between one and five units per acre. This category is used only in UDAs. Since the lot sizes are less than one acre, community sewer or ADEQ approved on-site sewage disposal and water systems are needed, as are other urban services. Low density residential areas will be developed exclusively with single family homes, except where planned developments permitting neighborhood commercial uses are approved.

Non-Residential Uses Include:

**Neighborhood Commercial (NC):** Neighborhood Commercial uses area those that meet the needs of residents in the adjacent neighborhood. Small-scale retail and service establishments, as well as small office buildings, will be permitted in this land use category.

**General Commercial (GC):** This land use category is used to indicate locations for retail, service and office uses that serve an entire community or region. Major retail centers, fast food restaurants, service stations, multi-story office buildings and other intensive commercial uses should be located in areas designated for general commercial uses. *The Area Plan Committee seeks to limit these more intense commercial uses such as gasoline stations and fast-food restaurants.*

**Commercial Recreation (CR):** This land use category encompasses a broad range of privately owned or leased facilities for active recreation, where the primary activity occurs outside of buildings. Uses include golf courses, equestrian centers, small and large-scale amusement parks, as well as recreational vehicle parks and campgrounds providing sites for temporary habitation.

Other residential land use categories which may be consistent with this planning area, depending on the location, natural features and surrounding land uses include:

Rural Residential,  
Suburban Estates, and  
Suburban Residential.

The Long Mountain Area Plan has adopted the corresponding General Plan Land Use designation classification to prevent further confusion between the land use categories used in both plans. For example, “High Density,” for those lots being developed after the original adoption of the Long Mountain Area Plan in 1992, would be designated Urban Development Low Density Residential, to reflect the current development regime in places like Desert Fountain Estates and Fountain Hills Estates. For those areas designated “High Density” by the original Area Plan and that consist of one to two acre lots, a Suburban Development Area, Suburban Residential and Suburban Estate land use designation has been applied, respectively. Both plans use Rural Residential for lots and parcels five acres and above in size, with the exception of AR/36A which is now considered RR/36A under General Plan’s identification.

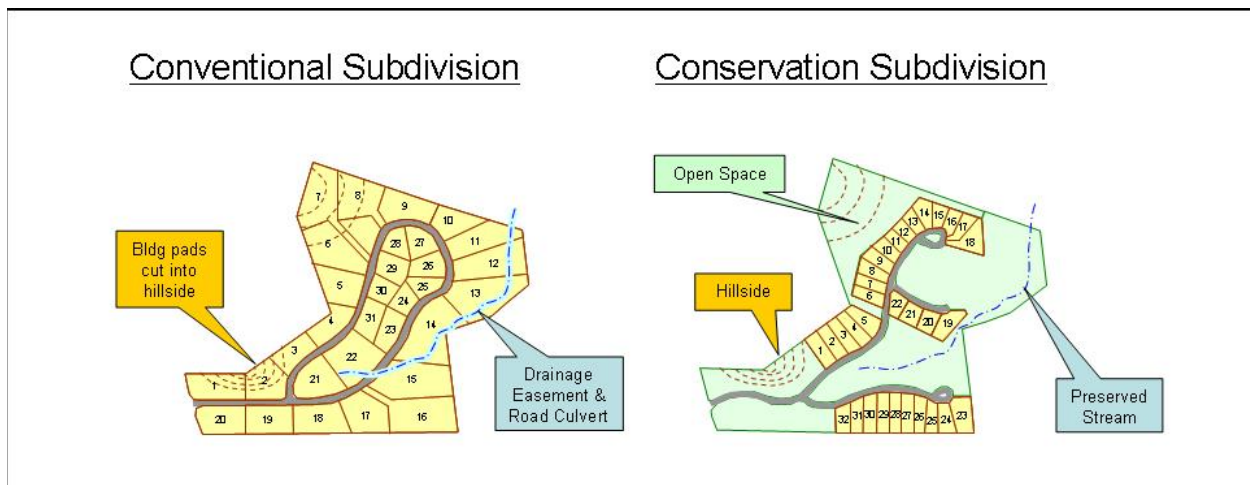
## **Goals for Land Use**

During the Area Plan Update process, several vision statements were developed including one for land use as follows: “New residential development proposals will be similar to existing residential densities, shall promote neighborhood stability and protect and sustain existing lifestyles.” This vision seeks out and promotes new land developments which are both harmonious and contextual with the existing community. Several goals and policies (to be developed) to achieve this end have been divided by land use in the paragraphs to follow.

### Planned Unit Developments vs. Conservation Subdivisions

Planned Area Developments (PAD) were discussed extensively during the Area Plan Update and determined to be inappropriate for the planning area because they bring higher residential density, urban-type land uses such as resort hotels, golf courses and RV parks, encourage leap-frog development and contribute to the loss of the planning area’s rural atmosphere.

However, there may be an opportunity to utilize a conservation subdivision within the planning area. A conservation subdivision, similar to PAD, achieves the same density of a conventional single-family subdivision by placing housing on one portion of the property, leaving the rest undisturbed and held in joint ownership, preferably under the protection of conservation easement that will prevent construction or other type disturbance of the site (see diagram). This type of development would provide a housing opportunity not available elsewhere in the planning area and would be placed in locations designated for Low Density Residential (UDA). Conservation subdivisions may be appropriate in for certain Suburban Estate and Suburban Residential land uses but will not be considered in areas designated Rural Residential. Areas for rights-of-way, utility easements, drainage channels, steep slopes (over 35%) and rock outcrops, preserved as part of the traditional subdivision process, shall not be counted in the density calculation



## Rural Development

Maintaining an environment for the small ranch property is important in Mohave County's real estate market. Not all Mohave County residents can afford a 36-acre-plus home site. Large parcels may also become unmanageable for those owners who plan to live on their property during their retirement years. Dividing land may also become a necessity when properties are inherited by the estate's heirs. Having the option to divide property is an important aspect for a significant number of landowners in Mohave County. Dividing property, of course, creates the potential for more density, the over-extension of County services, loss of rural atmosphere, and may possibly thwart the investment-backed expectations of those who plan to live in a rural environment upon retirement. This balancing act of keeping parcel sizes flexible, while maintaining the same attractive environment which the investor bought into, is the challenge.

### ***Goal 1 Maintain an Environment for Small Ranch Properties***

*Policy 1.1 Designate lands as Rural Residential having at least five acres.*

*Policy 1.2 Discourage the increase in density, the over-extension of County services, and loss of rural atmosphere during development review.*

*Policy 1.3 Maintain the attractiveness of the rural environment which the landowner bought into by preventing encroachment of dissimilar uses, including mobile home parks and RV parks, within or immediately adjacent to Rural Residential areas.*

## Suburban Development

This intermediate housing development density, typically consisting of homes built on one to five acre lots, are scattered throughout the planning but occur most often in the southern part of the planning, east of Stockton Hill Road and close to Cactus Wren. These homeowners have the greatest need to see a stable neighborhood because their properties are not large enough to provide the natural buffer of distance as a parcel containing some 30-40 acres, nor is the parcel small enough to be considered "urban" where the developer has constructed some type of buffer and other amenities into the project to mitigate against the impacts of urbanization. These

mitigation measures can range from simple screening to reduce noise and glare to a water system which will not be greatly affected by additional wells which may cause harm to existing, private domestic wells.

**Goal 2**      ***Preserve the Rural to semi-Rural lifestyle for homes on smaller lots and parcels***

*Policy 2.1 Create Suburban Development Areas to preserve integrity of “legacy” subdivisions.*

*Policy 2.2 Establish Suburban Development Areas as a buffer between Urban and Rural Development Areas. Conservation subdivisions may be employed to utilize the open space set-aside as a buffer.*

*Policy 2.3 Require a layering of lot sizes when adjacent to lower density development on the periphery allowing similar lots to front each other while placing smaller lots in the center of the development.*

*Policy 2.4 Designate Suburban Development Areas only where adequate facilities and infrastructure occur or will be provided.*

*Policy 2.5 Maintain the attractiveness of the rural and semi-rural environment which the landowner bought into by preventing encroachment of dissimilar uses, including mobile home parks and RV parks, within or immediately adjacent to areas designated Suburban Estate or Suburban Residential.*

Urban Development

Urban development areas such as Fountain Hills and Desert Fountain Estates are located in the southern portion of the planning area where the foothills give way to the gently sloping Hualapai Valley, adjacent to the City of Kingman. Further expansion of this development pattern eastward will be in agreement with the City’s general plan and provide additional demand for any proposed commercial development along Bank Street.

**Goal 3**      ***Establish Urban Development Areas which are logical extensions of the Kingman metropolitan area.***

*Policy 3.1 Designate Low Density Residential only where adequate facilities and infrastructure occur or will be provided.*

*Policy 3.2 Establish the Low Density Residential land use as a buffer between Suburban Development Areas and proposed Commercial areas along major arterials within the Urban Development Area. Conservation subdivisions may be employed to utilize the open space set-aside as a buffer.*

*Policy 3.3 Require a layering of lot sizes when adjacent to lower density development on the periphery allowing similar lots to front each other while placing smaller lots in the center of the development.*

*Policy 3.4 Residential lots shall contain at least 10,000 square feet (four per acre gross).*

*Policy 3.5 Create Low Density Residential adjacent to existing similarly designated land uses within the City of Kingman Planning Area.*

#### Implementation

LU1 Individual landowners will apply with the Mohave County Planning and Zoning Department for building permits, and rezone/zoning use permits (if needed) to establish residential uses.

LU2 Developers wishing to subdivide their lands will be provided with list of requirements from the Long Mountain Area Plan at any pre-application meeting prior to submitting a subdivision plat to the County and appropriate State agencies for review and approval.

LU3 Requests for Recreation Vehicle Parks and Mobile Home via Zoning Use Permits with Rural Residential, Suburban Estate, or Suburban Residential land use designations will be recommended for denial, unless given extraordinary circumstances such as emergency situations.

LU4 Develop a graphic guide depicting the “layering of lot sizes when adjacent to lower density development on the periphery allowing similar lots to front each other while placing smaller lots in the center of the development,” as described in Policies 2.3 and 3.3.

LU5 The Planning and Zoning Department will develop a “policy a procedure” memorandum highlighting the key aspects of the Land Use Element to use when evaluate zoning use permit, minor land division and subdivision proposals.

#### Public Facilities and Services

To create a quality community, the Area Plan should look at establishing a diversity of uses on public purpose lands throughout the planning area and seek dedication of land for such uses during the subdivision plat process from developers.

#### **Goal 4        *Establish Sufficient Public Facilities to Serve the Community***

*Policy 4.1 Identify locations for Schools when new housing developments are proposed.*

*Policy 4.2 Identify locations for Fire Stations within or near new housing developments.*

*Policy 4.3 Identify locations for County Offices (Sheriff) within or near new housing developments.*

#### **Goal 5        *Reserve Public Lands for Recreation, Public Purposes & Mountain Preserves***

*Policy 5.1 Coordinate with BLM and State Land Department to identify appropriate public lands along Stockton Hill Road for Recreation & Public Purpose sites including parks, schools, and libraries, but not landfills, gravel pits or other similar activities.*

*Policy 5.2 Coordinate with BLM and State Land Department to designate appropriate public lands along the base of the Cerbat Mountains for a Mountain Preserve.*

## **Goal 6        *Infrastructure Concurrency in all Development Areas***

*Policy 6.1 Each new development proposal must have adequate infrastructure, namely, but not limited to roadways, either in place or provided by the developer.*

## **Implementation**

LU6        Developers wishing to subdivide their lands will be provided with list of requirements from the Long Mountain Area Plan at any pre-application meeting prior to submitting a subdivision plat to the County and appropriate State agencies for review and approval.

LU7        Public purpose uses are allowed under the current zoning district, hence only an administrative review of the development is required. Each proposal will be reviewed by the County for site design, including drainage, grading, septic disposal, etc. Each structure will also be reviewed by the County in accordance with the Building Codes. The need for these facilities will be determined by the Mohave County Sheriff's Department, the fire district, the Kingman Unified School District and the Mohave County Parks Department, respectively.

LU8        Deleted

## **Economic Development**

### Neighborhood and General Commercial

As the population in Long Mountain grows over the next several decades, neighborhood commercial services should be available for those not wanting to commute to Kingman. This will provide community independence and balance, and make the population less dependent on Kingman for the basic necessities. Policies used to site these businesses will create small nodes of urbanization and leave the rest of the area in its rural state.

The Area Plan Committee members feel that economic development, beyond small business ventures needed to serve the residents, is not in keeping with the residents and property owner's desires to preserve Long Mountain as a largely rural community. Several sites within the

planning have been designated for General Commercial use. This reflects the underlying zoning district. General Commercial zoning has recently been granted along Stockton Hill Road at Calle Chavez. The uses planned are in keeping with the neighborhood-serving aspect of the Area Plan. General Commercial zoning also occurs further south along Stockton Hill Road at the intersection of Bull Mountain Road. Limiting future commercial activity to neighborhood uses at this site, to avoid additional congestion on Stockton Hill Road, may be problematic.

**Goal 7      Establish neighborhood commercial services to promote community independence and balance, and make the population less dependent upon Kingman for basic necessities.**

*Policy 7.1    Create small nodes containing a diversity of neighborhood commercial services where existing land use pattern has begun to develop commercially.*

*Policy 7.2    New subdivision development of 200 or more homes will be encouraged to establish a neighborhood commercial component.*

*Policy 7.3    Designate a new neighborhood commercial center along Bank Street at the southeastern corner of the area plan to serve both the neighborhood and the community.*

*Policy 7.4    New commercial establishments will be encouraged to adopt an appropriate design palette reflective of the traditional building southwestern vernacular.*

**Implementation**

LU9            Developers wishing to subdivide their lands will be provided with list of requirements from the Long Mountain Area Plan at any pre-application meeting prior to submitting a subdivision plat to the County and appropriate State agencies for review and approval.

LU10          Individual landowners will coordinate site plan review with the Mohave County Public Works Department in designing the access to their site in accordance with any adopted Access Management Plan.

**Commercial Guest Ranches & Other Recreational Activities**

Given the remoteness and undeveloped nature of the area, Long Mountain offers an ideal setting for the commercial guest ranch, a.k.a. “dude ranch.” These recreational opportunities should take advantage of the rugged terrain that the desert has to offer. In addition, other commercial recreational uses may be suitable for the area. Such activities, if requiring a rezone or area plan amendment, prior to permitting, will be subject to review by members of the Area Plan Update Committee, in addition to County staff.

## **Housing**

Between 1990 and 2000, Mohave County's population increased by nearly 65% from 93,500 persons to an estimated 155,000 persons, one of the fastest growth rates in the State. The Department of Economic Security (DES) estimates that Mohave County's population will grow to well over 200,000 by 2010. The County's population is somewhat older than the State's average with 46% of the population 45 years of age or older. Over 50% of the labor force is comprised of production, maintenance, materials handling and service sector jobs. Many of the service sector jobs are generated by the hotel/casino industry in Laughlin, Nevada. These jobs are generally low-paying. Median household income in 2000 was \$31,500

In 2000, the County's median home value was \$95,300, with median monthly rent at \$560. Rental housing is considered affordable if it does not consume more than 30% of gross annual household income. Most households can afford rental units in Mohave County. However, purchasing a home may be problematic for the average resident. With the recent "boom" in the real estate market, beginning in 2003, housing prices have easily doubled in Mohave County.

Moving from an urban setting to a rural environment in seek of lower home prices may also bring hidden costs. A private well, possibly 700-feet or more deep, an alternate septic system, a new solar powered electric system with backup generator and other country accouterments may make building a home in the countryside as expensive as one constructed on an urban lot.

The desert southwest has seen experimentation in many types of non-conventional housing types almost since its first settlement. These homes typically do not conform to a preset "plan" and are as unique as the people who live in them. The Area Plan encourages a diversity of housing types to serve all its residents. Housing should be safe, decent, energy efficient and affordable to help maintain and promote the quality of life that new and existing residents require and make the southwest attractive to residents. Land owners in Long Mountain have expressed a desire for various types of housing, ranging from the conventional mobile home to non-conventional forms of construction including earthships. Single-family housing may be developed on all private property throughout the planning area.

### Affordable Housing

Modular housing and homes constructed by owner-builders outside of formal subdivisions will most likely be the affordable home of choice for those living in rural parts of the planning area.

#### **Goal 8      Encourage the construction of quality, affordable housing**

*Policy 8.1    Extend the Building Overlay Zone for code inspection of homes built within Urban and Suburban Development Areas.*

*Policy 8.2    Encourage the adoption of the Energy Code.*

## Implementation

- LU11 The Mohave County Building Division shall provide technical assistance to the public for non-conventional housing and provide a trained staff versed in non-conventional building techniques to help owner/builders construct their homes.
- LU12 Remove language from proposed CC&Rs requiring a minimum of 1,500 or more square feet for new homes in proposed subdivisions.

## Land Use Diagram and its Creation

To implement many of the goals and policies, the Land Use Diagram has been updated (see exhibit). The existing Area Plan land use diagram has the potential to create over 9,000 dwellings. The current General Plan land use diagram would allow for approximately 20,000 dwellings. The proposed hybrid land use land diagram would allow some 17,000 dwellings (see table). The caveat to this is the location of the proposed dwellings with 8,240 housing units concentrated in Sections 16, 17 and 18, east of Desert Fountain and Fountains Hills Estates and north of the New Kingman/Butler area. The urbanization of these sections, being the closest to the City of Kingman, will likely have less impact on the rural feel of the community than if they were located further north and west in the center of the area plan, adjacent to Stockton Hill Road.

<b>Hybrid Long Mountain Area Plan Land Use Designations</b>				
<b>Land Use</b>	<b>Assumptions</b>	<b>Acres</b>	<b>Percent</b>	<b>Potential Dwellings</b>
Low Density Residential	0.25 acre typ lot size	2,370	6.05%	9,480
Suburban Residential	1.5 acre typ lot size	3,601	9.19%	2,401
Suburban Estate	2.5 acre typ lot size	7,081	18.08%	2,832
Rural Residential/5A	5 acre min lot size	6,518	16.64%	1,304
Rural Residential/10A	10 acre min lot size	8,448	21.57%	845
Rural Residential/20A	20 acre min lot size	1,367	3.49%	68
Rural Residential/36A	40 acre min lot size	2,561	6.54%	64
General Commercial	NA	35	0.09%	NA
Neighborhood Commercial	NA	51	0.13%	NA
Commercial Recreation	NA	37	0.09%	NA
Public Facilities	NA	93	0.24%	NA
Public Lands	NA	7,001	17.88%	NA
<b>Total</b>		<b>39,163</b>		<b>16,994</b>

The hybrid land use diagram is molded on the vision statement that declares “new residential development proposals will be similar to existing residential densities, shall promote neighborhood stability and protect and sustain existing lifestyles.” Also used in formulating land use diagram are the concepts of: 1) economic use of the land; in other words, would someone contest a taking of property value due to excessive government regulation, 2) investment-backed expectations when the property was purchased, for example, what our my neighbors doing with their property and can I do something similar, and 3) furthering a legitimate government interest through regulation. The concerns of individuals in items one and two are balanced against the role of government in item three as defined by the Area Plan Committee as follows:

- a. Preserving hillsides, washes and native vegetation,
- b. Minimizing the impact of additional trips on Stockton Hill Road,
- c. Preserving ground water resources by limiting residential density outside of water district or when located on bedrock, and
- d. Following the “current pattern of development” to maintain neighborhood stability and lifestyles was aided by several overlay maps as follows:
  - a) topographic contours, b) FEMA flood hazard zones, c) surface hydrology, d) native vegetation, e) existing and planned roadways, f) geohydrology, g) well sites, h) service districts, i) cadastral – Assessor’s tax maps, j) digital orthographic aerial photography, and k) existing land use and zoning.

To help understand what a land buyer might anticipate as part of the “investment-backed expectations,” the County’s zoning map, overlaid with aerial photography, was consulted to

determine the existing development pattern of neighboring parcels. For example, if adjacent lots had seen significant rezoning to a higher density, then the land use density was adjusted to meet the expectations. However, properties located on hillsides, within washes or otherwise encumbered, such as being on bedrock were assigned a lower density land use designation.

Using the concept of maintaining proposed land uses “similar to existing residential densities,” the hybrid diagram radiates land use densities from highest to lowest densities and attempts to avoid the juxtaposition of disparate uses. This radial or layering technique has been used in the region of a developing commercial node at Stockton Hill Road and Calle Chavez where Suburban Estate-sized lots (2-5 acres in size) lie between Neighborhood Commercial and the Rural Residential/5A and then Rural Residential 10/A. The radiant or layering of land uses also is based on distance from the City of Kingman, with housing densities gradually reducing further north in the planning area. This can be seen along the eastern edge of the area plan with land uses transitioning from Low Density Residential (UDA) to Suburban Residential (SDA) to Suburban Estate (SDA) to Rural Residential varying from 5 to 10 to 20-Acre minimum lots size.

Bureau of Land Management lands west of Stockton Hill have been designated as Public Lands based upon the General Plan’s definition. These lands occur on the generally steep slopes of the Cerbat Mountains and foothills. For State Trust lands, the policy of the State Land Department is to have a similar land use applied to their holdings as those adjacent and not be solely identified as open space.

Legacy plats have been generally designated Suburban Estate to preserve the integrity of the original development pattern and not overburden the supporting and usually underdeveloped infrastructure.

Additional non-residential land uses include the above mentioned commercial node at Calle Chavez with an additional commercial land use at Jane Avenue and a third node at the intersection of Fountain Hills, Bull Mountain and Stockton Hill Roads were commercial zoning has existed since 1994. A school site has been located in Section 18, west of Bank Street to serve the expected growth north of Kingman. A Recreation and Public Purpose site has been designated for the W ½ NW ¼ of Section 25. This isolated BLM site, divided by Stockton Hill Road, may serve as a location for additional public uses, possibly an interpretive center.

It should be noted that the land use diagram represents the ultimate development density for the life of the plan – some 10 to 20 years. To achieve the maximum density on the land use diagram, each proposal must meet a series of performance criteria. For example, several sections have been designated for Suburban Residential which allow for lot sizes of one acre, comparable to Cerbat Ranches. To achieve this density from a 640-acre parent parcel the developer must provide infrastructure for paved roadways to each lot, including off-site roadway improvements as required by the County Engineer, water service to each lot, fire hydrants, electricity to each lot, and be annexed into fire district. Conventional septic systems may be allowed if soil conditions allow, based upon ADEQ findings.



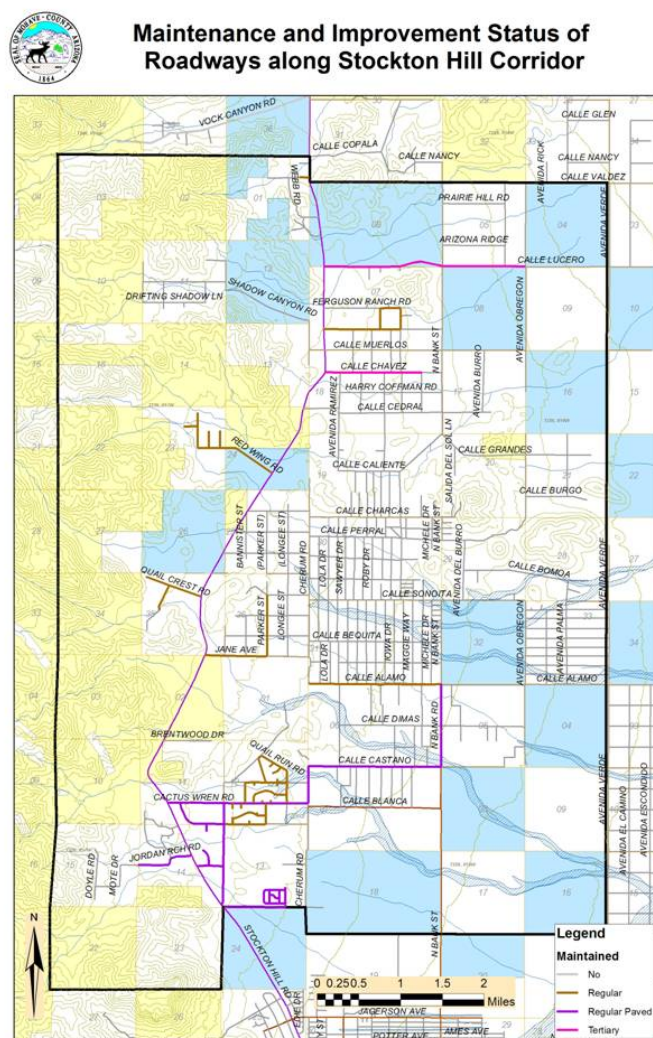
# Draft Transportation Element



## Transportation Element

Providing easy access to public facilities and private properties is the key to a Transportation Element. Given the expected low to medium population densities of the planning area<sup>14</sup>, access to Long Mountain is expected to be from private automobiles, supporting the anticipated rural and semi-rural lifestyles. Given historic development patterns, arterials and collectors will be paved by developers of higher density housing to mitigate the anticipated increase in traffic. These developer-funded roadway improvements will generally occur in the south eastern part of the planning area where housing densities will reflect those found within the City of Kingman. Elsewhere, roadways will be constructed to a gravel (unpaved) standard or remain in their existing unimproved condition.

### Design of Existing Roadway System



The roadways make up a set of east-west and north-south running arterials spaced one mile apart along section lines and collector roads spaced one-half mile apart on mid-section lines. Sub-collectors, or local roads, generally occur at 1/8 mile intervals between collectors. Due to the semi-mountainness and hilly terrain, the roadway grid is not continuous and interrupted by rock outcrops, hills and washes, especially within the western side of the planning area. West of Stockton Hill Road, the roadway grid gives way to a more organic, terrain-following street system with roadways following along major drainage-ways up into the foothills of the Cerbat Mountains (see Stockton Hill Corridor diagram). Although the roadways have been platted, with many dedicated to the County, only a small fraction have been constructed to a County standard, with the balance being little more “two-track” trails, paths used by local residents, or unimproved. Roadways are classified as follows: 1) Arterials - higher mobility & low degree of access, 2) Collectors - balance between mobility and access, 3) Locals - lower mobility & high degree of access.

<sup>14</sup> The majority of the planning area is designated for one-acre to five-acre-minimum lot sizes. Those areas, east of Bank Street and south of Cactus Wren Road may provide higher densities akin to those seen in Fountain Hills and Desert Fountain subdivisions.

Even though the subdivisions show legal access to all parcels, physical access may not be readily available. The vast majorities of the roadways within the planning area were dedicated to the County before 1965, prior to the County's subdivision and roadway design review process, and are the legacy of the speculative land transactions prevalent in Arizona during the 1950s and 1960s. Because little attention was paid to natural terrain, roadways extend up steep slopes, mainly on the west side of the planning area, and traverse dry washes throughout. A vast majority of these roadways were not constructed when the subdivision plats were recorded because the County did not have subdivision design and construction standards until 1976. Roadways that were constructed were most likely used to sell land and have not been maintained. Over time, a significant number of these roadways have been improved for access to individual properties; however, this has led to a piecemeal construction process, with many roads stopping after they reach a developed property, hillside or wash. In most cases, the section-line roadways are continuous and serve as the main access routes. Unfortunately, not all of these subdivision plats are contiguous creating a checkerboard pattern of roads. Intervening State Trust lands also contribute to breaks in the roadway grid. This leaves spaces, at times a mile or longer in the right-of-way. Sometimes easements fill these spaces.

Tying these roadways together and serving as the main north-south running transportation route is Stockton Hill Road. This two-lane roadway, which began as a modest ranch access and mining haul route in the late 19<sup>th</sup> Century, transitioning to a rural collector as paving was extended north of the Kingman City limits in the 1980s, and is now today taken the role of an arterial road serving most all traffic flows coming into Kingman from as far away as Meadview. Traffic is projected to further increase as the last remaining section of the 48-mile alignment is paved by 2008 (?), allowing residents in Meadview, eastern Dolan Springs and visitors to Grand Canyon West and Pierce Ferry to traverse the road with confidence. Given the roadway's early beginnings, and not being an artifact of the speculative subdivision, where roadways were created without regard to terrain as noted above, Stockton Hill Road follows the more organic path of least resistance, with minimal road cuts and relatively gentle grades. However, as traffic flows and speeds have increased along the roadway, several stress points have become apparent. For example, between mile posts eight and nine, a major wash and a blind curve on a significant incline have impeded traffic flow during flood events and, in the later case, caused several fatalities. Stockton Hill Road is still being treated as a collector status roadway with nearly unlimited access to adjoining property owners and intersecting roadways.

Additional north-south running arterials and major collectors are clearly needed to relieve the pressure on Stockton Hill Road. Roadway alignments such as Cherum Road and Bank Street and Avenidas Obregon and Verde may serve this function and will be called upon to do so as the eastern parts of the planning area are developed. Another growth-inducing factor is the construction of Grace Neal Parkway. This roadway will extend between Stockton Hill Road and Route 66 and provide access to new development planned north of the Kingman City limits. As development occurs around the alignment, developers will be required to build their portion of the road. When the Parkway is complete, Bank Street and other major north-south roadways will become a true alternative to Stockton Hill Road.

## Roadway Inventory

There are some 184 miles of County recognized roadways within the Long Mountain Area Plan's boundaries. These roads are of several types and in various states of maintenance. Nearly 87% of these roadways are unsurfaced. Unsurfaced roads are roadways that typically have not been improved to gravel (native material) or paved County standards. Approximately 20 miles of

<b>Roadways within the Long Mountain Planning Area</b>			
<b>Road Name</b>	<b>Maintained</b>	<b>Paved</b>	<b>Mileage</b>
Stockton Hill Road	Yes	Yes	10.00
Bull Mountain Road	Yes	Yes	1.22
Cactus Wren Road	Yes	Yes	1.68
Calle Castano	Yes	Yes	1.59
Cherum Road	Yes	Yes	0.45
Fountain Hills Road	Yes	Yes	0.74
Jordan Ranch Road	Yes	Yes	0.67
North Bank Street	Yes	Yes	0.99
Various New Subdivisions	Yes	Yes	2.64
Various Old Subdivisions	Yes	No	13.16
Various Old Subdivisions	No	No	150.51
Total Maintained Paved			10.88% 19.99
Total Maintained Unpaved			7.16% 13.16
Total UnMaintained			81.95% 150.51
<b>Total Roadway Mileage</b>			<b>183.66</b>

roadways have conventional asphalt paving (see table). These occur mainly on County Highways such as Stockton Hill Road. Including gravel roadways, County-improved roadways make up just 13% of the roadways in Long Mountain.

When a roadway is designated a County Highway, the Board of Supervisors may incur costs to improve or maintain it. Stockton Hill Road is a County Highway and represents approximately five percent (10 miles) of the roadways but 50 percent of all

paved roadways. The maintained portions of Calle Castano, Cherum Road and North Bank Street have also been designated County Highways. Only two percent (3.5 miles) of the roadways have been accepted for tertiary maintenance or have courtesy maintenance. Roads with tertiary maintenance receive minimal maintenance to keep the driving surface and drainage ditches in some state of repair. The County maintains roadways accepted for maintenance with Highway User Funds (HURF). Those roadways without HURF monies allocated to them are not maintained by the County. It should be noted that only roads built to County standards can be accepted for regular maintenance. There are exceptions to this rule and maintenance is provided by the County to certain roads that were not built to standards, but were accepted for regular maintenance prior to 1975. Those roads which do not meet minimum design standards, but meet certain reduced criteria may be accepted by the BOS for "tertiary" maintenance.

Given the above funding constraints and the preponderance of pre-regulation sub-division plats which were not exacted for roadway improvements at the time of their creation, due to insufficient county regulatory authority, improving existing roadways may be problematic for local residents. Facing a similar problem in the 1980s, residents of Golden Valley, west of Teddy Roosevelt Road, formed a general improvement district to pave roadways and to also create a water system. This funding option is also open to the residents of Long Mountain.

## Traffic Volumes

Traffic congestion occurs as a result of traffic demand (i.e. volume) exceeding available roadway capacity for any period of time. Capacity varies based on numerous roadway characteristics,

LOS	Description
A	Free flow with low volumes and high speeds.
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions.
C	In stable flow zone, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow; drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages
F	Unacceptable congestion; stop-and-go; forced flow.

including lane/shoulder width, free flow speed, traffic composition, and other side friction factors (e.g., roadside obstructions, on-street parking, etc.). The concept of level of service (LOS) has been

widely adopted as a means of quantifying the operational performance of any roadway type. The LOS “grading system” designates the letter A to represent best performance or least congestion and the letter F to represent worst performance or highest congestion (see table). Ideally, Mohave County roadways operate in the range of LOS B to C or better. The Mohave County Standards for the Preparation and Evaluation of Traffic Impact Analyses, applicable to land divisions and developments, includes the following provision: Mohave County roadway facilities found to operate at a Level of Service B or better under the condition – future traffic without development for each horizon year – shall be mitigated to a Level of Service B. Mitigation to a Level of Service C may be acceptable at the discretion of the County Engineer.

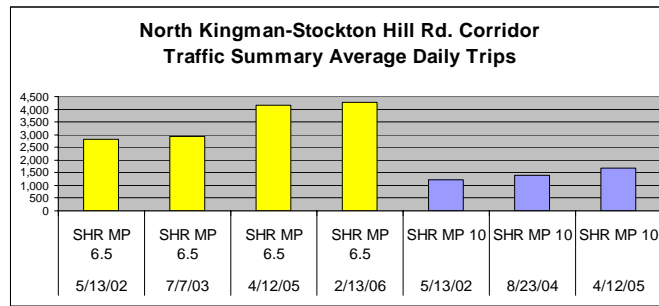
National guidelines have established an appropriate or preferred design level of service for a range of highway functional classifications and terrain type (see table). For instance, Stockton Hill Road, representing an arterial traversing level to rolling terrain, should operate under a LOS B or better. Rural collector roadways may be designed to operate at a LOS C or better as is appropriate for paved roads such as Cactus Wren Road.

Highway Type	Type of Area and Appropriate Level of Service			
	Rural Level	Rural Rolling	Rural Mountainous	Urban and Suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

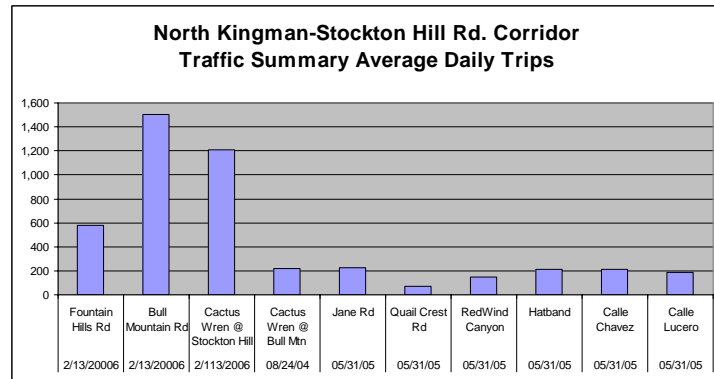
The Mohave County Public Works Department considers roadways for pavement when ADT exceeds 200 vehicles per day. Local roadways, such as Storm Cloud located in Fountain Hills Estates, have a design-year LOS D attributed to low design speed (25-30 mph) and nearly unlimited access points attributed to private driveways. Roadways programmed for new construction or reconstruction typically have an assigned design level of service that influences the design cross-section of the roadway, such as number/width of lanes.

Stockton Hill Road traffic volumes, based on machine count data collected at Mile Post 6.5 (Fountain Hills Road intersection) and at Mile Post 10 (Jane Avenue intersection), have increased approximately 50% between 2002 and 2005 (see chart). A more accurate means of estimating level of service and associated congestion level involves the study of the weekday morning and afternoon peak flow of commuter traffic. On Stockton Hill Road, the level of peak hour traffic at Mile Post 6.5 totals approximately 330 vehicles per hour in both directions. By comparison, the maximum capacity of Stockton Hill Road for maintaining a LOS C operation is

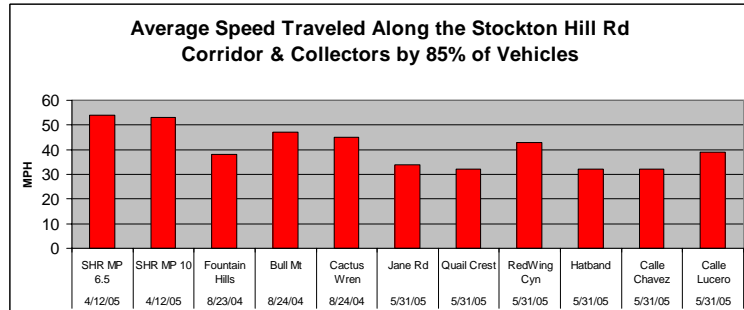
approximately 500 vehicles per hour or 5,500 vehicles per day in both directions. The maximum roadway capacity for maintaining a LOS E operation is approximately 1,800 vehicles per hour or 20,000 vehicles per day in both directions. Present traffic volume data indicates Stockton Hill Road likely operates under a LOS B.



Traffic counts along the collector or feeder roads that intersect Stockton Hill Road are typically at 200 or more trips per day, with the exception Bull Mountain Road. Bull Mountain Road serves as a bypass for residents using Cactus Wren Road who seek a shorter route to Kingman than afforded by Stockton Hill Road. Some 1,350 ADT currently occur on Bull Mountain Road (see chart).



Bull Mountain Road, being a straight section-line road also provides an opportunity for straight line acceleration for one-mile with 85% of the traffic volume averaging over 45 mph (see chart). Providing some type of traffic control to reduce speed would be appropriate on this and other local roads serving as collectors. Stockton Hill Road, where 85% of the traffic averages 53 mph between mile post 6.5 and mile post 10, could also benefit from speed management techniques.



### Additional Roadway and Trail Issues

Rural Roads – As noted above, many rural roads are unimproved, with many not even appearing on the ground (paper roads). County-maintained gravel roadways allow for increased traffic and increased speeds, which creates an increased demand for maintenance and generates extra dust. Dust is the primary source of visible air pollution in Long Mountain. Much of this dust comes from traffic on gravel or unimproved roads and is intensified by windy conditions. After a rain, these roads can be dangerous to traverse. Aside from the aesthetics and physical stress of driving these roads, increased automobile maintenance is also another negative externality.

Trails - Horse riding, hiking and nature walking are activities which lend themselves to the rural environment and have been cited as reasons why people want to visit or live in Long Mountain. Most walking trails and paths in Long Mountain follow existing roadways and/or traverse

privately owned, unimproved land, much of which is controlled by out-of-town owners. These trails will be interrupted when roadways are constructed or the private lands are developed. Rather than have these pathways located in roadways, a trail system, comprised of easements, can be established as properties are developed. These easements will be placed adjacent to roadways, but will not be subject to roadway improvements which tend to scarify the land.

Need for Access Management Plan – Ideally arterials provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. Collectors provide a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials. Local roads consists of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement. Presently, Stockton Hill operates at Level of Service A/B within the planning area. The level of service is projected to degrade somewhat to B/C by 2020 (?). Given the increased speeds along the roadway, an access management plan may be pursued by the County. The main benefit to access management is providing safe and efficient travel for all users while providing access to private land. Frequent access points impede this flow and cause safety hazards. These access points include both signalized and uncontrolled intersections, and driveways. Ten additional access points per mile will reduce the travel speed by 2½ mph. A three-fold increase in access points per mile will increase the accident rate by nearly 100%. Accident rates are highest between mileposts 8-9.

### **Growth Implications**

Presently there are some 2,400 assessor parcels within the planning area. Assuming each property is developed with a single-family residence, average daily trips to and from the area could be as high as 23,000. This assumes that the average number of trips generated from a single-family residence is 9.55 per day (ITE, p. 257). This value is based upon an urban environment where households typically contain school-age children and their associated activities. Long Mountain development will probably increasingly cater to an older, if not seasonal resident, given the anticipated impact of the so-called “baby-boom” generation’s relocation to southwest upon retirement. Trips per day from these types of households will probably be considerably less and may average between two and four. Assuming half of these homes have a lower trip generation, some 18,000 trips may still flow in an out of the community. Clearly, Stockton Hill Road will require some type of relief. New, large-scale and higher density developments will have to mitigate traffic impact by either contributing to the expansion of the existing roadways and/or the construction of alternate routes.

As part of the vision statement, “Roadways will be sized to accommodate planned traffic, provide for multi-modal and non-vehicular travel and constructed to County standards to be eligible for regular maintenance at the time of project approval. In addition, the developer or land owner will provide roadways improvements in proportion to the demand created by the new development, including the improvement of off-site roadways such as arterials, major collectors and feeders.”

### **Goals for Transportation**

**Goal 1      Maintain reasonable free-flow of traffic (Level of Service “B”) along Stockton Hill Road.**

*Policy 1.1 Reduce trip generation by limiting lot divisions (rezones) in the planning area where the developer is exempted from roadway exactions.*

*Policy 1.2 The developer or land owner will provide roadway improvements in proportion to the demand created by the new, non-exempt development, including the improvement of off-site roadways such as arterials, major collectors and feeders.*

*Policy 1.3 Designate additional section-line roadways for improvement within the planning area, including those adjoining State Trust land, to remove local traffic from Stockton Hill Road.*

*Policy 1.4 Establish commercial and other non-residential uses within the planning area to reduce the need for travel to Kingman.*

**Goal 2 Reduce automobile dependency for short trips under one mile**

*Policy 2.1 Incorporate trail systems into the design of new subdivisions and work with existing property owners to preserve existing trails with easements when crossing private lands*

*Policy 2.2 Expand shoulder widths on paved roadways to accommodate bicycle and pedestrian traffic.*

**Implementation**

T1 Prepare an Access Management Plan for Stockton Hill Road with a focus on requiring traffic impact analysis for new development accessing Stockton Hill Road.

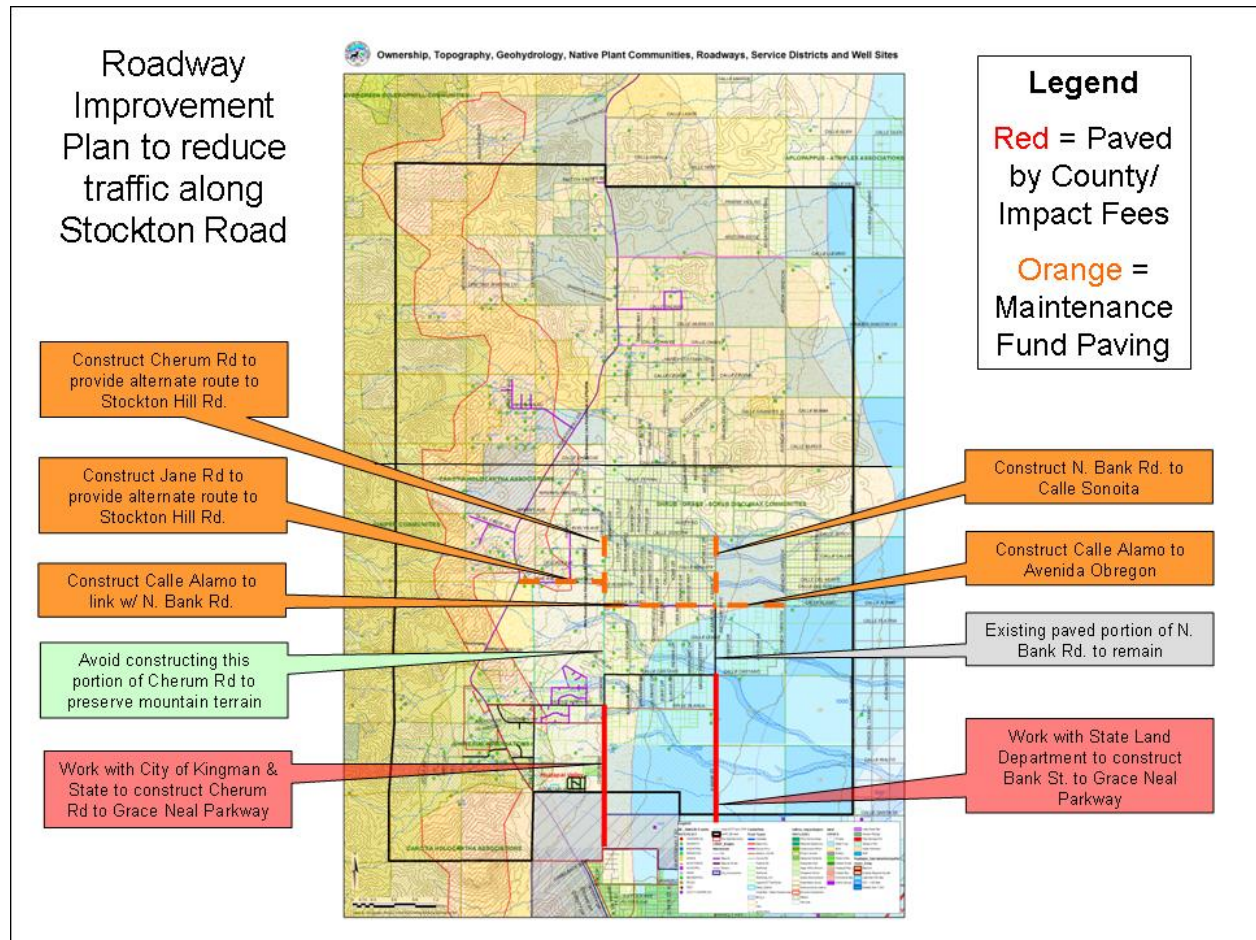
T2 Use an improved soil stabilization technique as part of the maintenance program for native material roadways accepted by the County.

T3 Establish a Traffic Impact Fee program that uses a clear procedure, accepted input data for each type of land use, and a straightforward equation and decision criteria to determine the cost per number of new, site-generated trips attributed to a proposed development.

T4 The Mohave County Trails Assoc. should contact existing land owners and ask for conservation easements.

T5 Plan for new trails within newly proposed subdivisions by providing for easements and/or open space.

# Roadway Improvement Plan



A photograph of a brick building with a fountain in the foreground and bare trees in the background. The building is made of red brick and has a central entrance with a dark door. To the left of the entrance, there is a small arched structure. In the foreground, there is a large, ornate fountain with a tiered base. The sky is overcast, and the trees are without leaves, suggesting a late autumn or winter setting. The text "Draft Public Safety Element" is overlaid in white on the upper part of the image.

# Draft Public Safety Element

## Public Safety Element

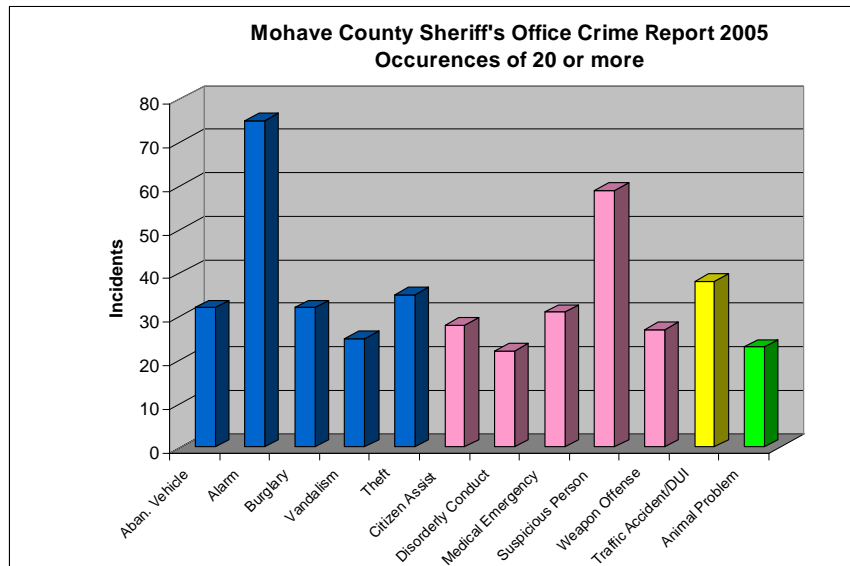
Planning for public safety should take into consideration of existing conditions within the community ranging from crime rates to traffic hazards to natural occurrences such as fires and flood hazards. These hazards are generally anthropogenic in nature in that the human presence causes or exacerbates the hazards. The goals and polices presented should mitigate to a reasonable extent the imprint of society's impact upon the landscape.

### Mohave County Sheriff's Office



Crime and Incident reports for 2005 in the area north of New Kingman/Butler in the Central Hualapai Valley, not including Valle Vista, included 681 cases in 75 different categories (see appendix). Some 256 incidents dealt with property crimes, crimes against people, vehicular accident and traffic violations. No homicides were reported however two dead bodies were found and fifteen domestic violence reports were made.

Several incidents with 20 or more occurrences have been depicted (see exhibit) to uncover where community issues are most likely to be found. For example, abandoned vehicles, typically recovered in the right-of-way, are the responsibility of the Sheriff's Office to remove; however, such abandonment may be caused by vehicular failure or disposal after theft. Crimes against property such as burglary, vandalism and theft account for 86 crimes and may be indicative of rural isolation where patrols are less frequent giving perpetrators a sense of free reign. This may also be seen by the large number of alarms reported, possibly aborted attempts at burglary. In line with incidents regarding property crimes and alarms is the large number of suspicious persons reported (58). Citizens are also likely to assist in arrests with 27 cases. There were 30 medical emergencies



requiring Sheriff's support and most likely other emergency responders such as the Hualapai Valley Fire Department and/or the Inland Valley Fire Agency. Disorderly conduct and weapons offense accounted for 45 instances, possibly indicating levels of intoxication. Of the 38 traffic related reports, however, only two were DUI related. Over one third of traffic related reports involved accidents on roadways with significant vehicular damage and passenger injury. Animal issues related mostly to noise and other problems, probably trespassing dogs. From these statistics, sufficient and safe access is necessary to aid in emergency response times and possibly the establishment of a Sheriff's substation to provide a stronger community presence.

The Sheriff's coverage for the Hualapai Valley, north of New Kingman/Butler is sparse. Ideally, coverage should be 3 deputies per 1,000 residents according to the Sheriff's Department. Response times in the planning are approximately 15 minutes. This waiting period would be reduced about 50% with a staffed substation in the area. However, the cost of a fully functional station, requiring at least seven people, is prohibitive. The substation would most likely be centrally located along Stockton Hill Road, possibly on a recreation and public purpose (R&PP) parcel in Section 25, near Calle Charcas.

### **Fire Protection – Hualapai Valley Fire Department and Inland Valley Fire Agency**



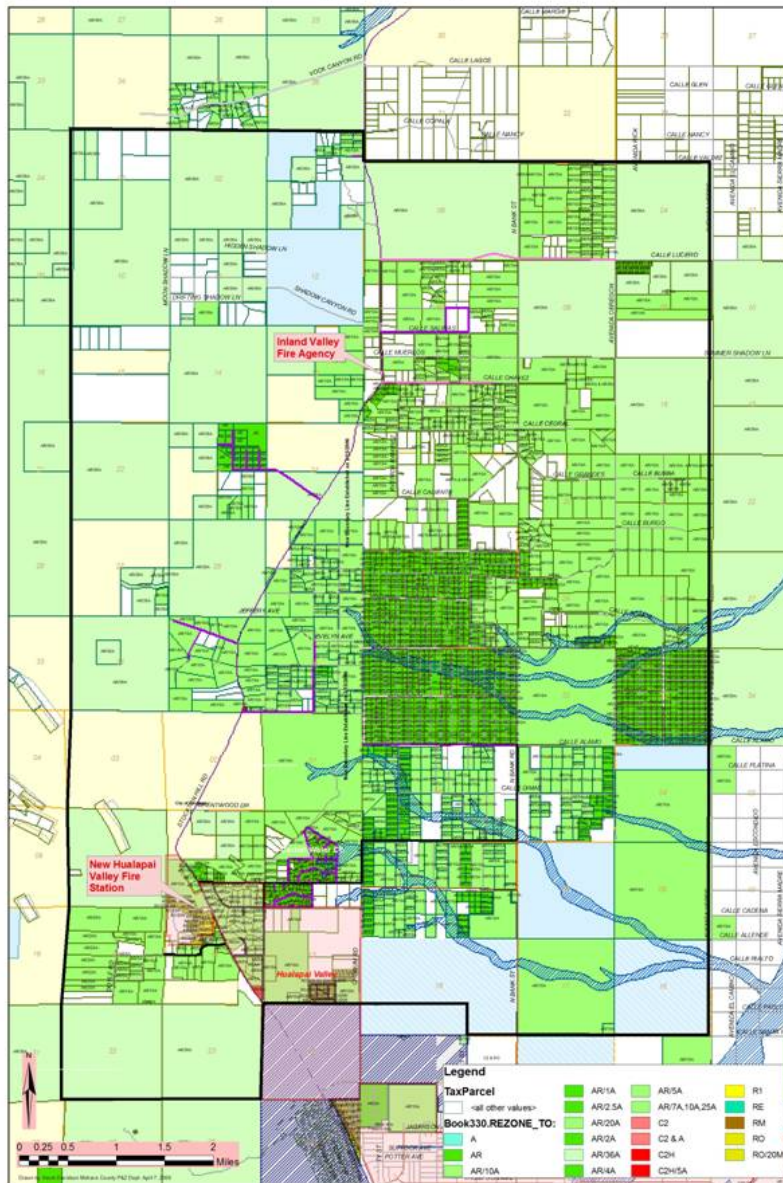
There are fewer provisions for public safety in rural environments than are typically found in urban areas. For example, fire hydrants are generally non-existent. Response times may take an hour or more in some of the more remote parts of the planning area, assuming roadways are well marked. This is due in part to the majority of the planning area being outside of the Hualapai Valley Fire District. In the case of fire or medical emergency, the Hualapai Valley Fire Department may respond if it is not responding to another call within its fire district. Response times may be less with the presence of the Inland Valley Fire Agency providing emergency service to the area but this is a subscription service and not a public entity. Inland Valley has proposed a fire district to cover those lands north of Jane Avenue, but has yet to be successful in forming a district.

The Hualapai Valley Fire District covers approximately two square miles, just five percent of all lands within the planning area and includes the urban subdivisions of Fountain Hills (66 lots) and Desert Fountain Estates (42 lots) in Section 13. Additional coverage is provided for Cedar Ridge Estates (38 lots), a five-acre rural subdivision along Stockton Hill Road, and Lake Juniper Estates (73 lots), immediately west of Stockton Hill Road. Approximately 220 residential lots are within the fire district, with plans for an additional 300 lots with the completion of future phases of Desert Fountain Estates. A new 3,750 square foot fire station is being built adjacent to Lake Juniper Estates with easy access to Stockton Hill Road.

Most of the residences in the planning area are outside of the fire district and accessed by native material roadways that increase response times. This is especially true when local roadways are flooded and alternate routes must be taken. Heavy equipment, such as tanker trucks, may also have a difficult time traversing semi-maintained native material roadways, regardless of weather conditions, without suffering damage. Response times would likely decrease if all-weather roads are constructed throughout the planning area. This is especially critical in rural areas of the County because structure fires usually exhaust themselves before a fire department can respond. The planning area, although sparsely populated, does have a significant numbers of older modular or mobile homes, many predating HUD standards. Such structures are little more than "tinder boxes" given the dry climate and age of the structure. In addition, the Insurance Services Office (ISO) penalizes insured properties if not located on "all weather roads." The majority roads within the Long Mountain Area Plan do not meet the definition of All Weather Roads and property insurance will suffer with increased premiums even if located within a fire district. (HVFD).



### Fire District Overlay on Zoning District Classifications



Access by law enforcement, fire department personnel, and emergency medical services (EMS) should be a high priority for local government to ensure. Providing adequate street signs, addresses, landmarks and way-finding for responding personnel, as well as roadways designed for proper weight distribution and turning radius of large apparatus is critical. (HVFD)

Additional fire hazards include the desire to build amongst the pinion-junipers, fires started by off-road vehicles and occasionally by campers and arsonists. As the Southwest enters the tenth year of what is considered to be a multi-decade drought, the drying out of the fuel load (trees and underbrush) will only exacerbate the problem of human encroachment. Areas with higher density vegetation should be preserved as passive open space with lower-density development occurring only if need be such as in the case where the property has been previously subdivided. Homes built in these areas should have adequate fire protection either available though

a fire district or on-site

### Goals for Public Safety

**Goal 1 Provide adequate sheriff and fire protection to all residents within the planning area.**

*Policy 1.1 Place new Sheriff's sub-stations and fire stations on R&PP sites or on parcels set aside by developers.*

*Policy 1.2 New developments will be required to be annexed to the exiting fire district or create a new fire district.*

*Policy 1.3 Residents in the planning area living outside of a fire district will either form their own fire district or have their community annexed into an existing fire district when 2,000 persons reside within the Area Plan's boundary.*

*Policy 1.4 Provide a defensible space around buildings as suggested by the fire district.*

*Policy 1.5 Structures built outside of fire districts will be required to have adequate on-site fire suppression.*

Implementation:

PS1 The Mohave County Sheriff's Department will look at the feasibility of extending patrols within the planning area and increasing its presence in general via the construction of substation within the boundary of the planning area.

PS2 Each new development will be reviewed with the provision of adequate fire protection as required by the Mohave County Land Division Regulation. Fire sprinklers and/or polymer gel coat fire retardant systems may be utilized depending upon the level of fire threat.

PS3 Population figures from the latest Census will be used to determine the resident population within the planning area.

PS4 Annexation by the Hualapai Valley Fire District or the creation of a new fire district will require a signed petition from a majority of the property owners in the planning area. A fire district formation or annexation committee should be formed to facilitate this process and other duties required when establishing or enlarging a fire district.

**Goal 2 Decrease emergency response times.**

*Policy 2.1 Place new Sheriff's sub-stations and fire stations on R&PP sites.*

*Policy 2.2 Encourage new housing developments to set aside parcels for fire stations and/or Sheriff's sub-stations during the subdivision review process where there is a demonstrated need from the public safety provider.*

*Policy 2.3 Extend additional Sheriff patrols*

*Policy 2.4 Provide all-weather access roads*

Implementation:

PS5 Capital improvement plans developed by the Sheriff's Department should prioritize public facility improvements in the planning area.

- PS6 Support the Sheriff’s “Override” when it appears on the ballot.
- PS7 “All-weather roadways” will be constructed via developer exactions, building permit impact fees, or through HURF monies, provided the roadways are designated County Highways.

## **Road Hazards**

Auto accidents require specialized equipment for rescue and treatment of patients, as well as access, and provision for transportation of patients via helicopter in some instances. The area plan should include provisions for obtaining fire and rescue apparatus and equipment capable of handling these incidents through developer exactions. As some of these roads are not protected by a recognized fire district, this becomes more critical.

As mentioned above and within the Transportation Element, unimproved roadways are an impediment to speed. While possibly seen as a way to limit growth by not improving roadways, an increasing number of people are nonetheless traversing these roadways to their properties on a daily basis. When emergencies do occur, the quaint roadways are not able to support swift response and human life may be forfeit.

Other roadway safety issues include excessive speed on paved roadways which also have unlimited access. Numerous tire skid marks can be found along Stockton Hill Road near intersections and occasionally near private driveways. Additional signage warning people of cross traffic and possibly left and right hand turn lanes may be appropriate at some locations.

During the public discussion of the Area Plan Update, the incline curve and descent into a low water crossing for south-bound motorists traveling along Stockton Hill Road near mile post eight was a topic of great concern. This one-two punch needs some form of mitigation. Discussion ranged from re-engineering the section, constructing a bridge and providing better signage and guardrails.

## **Goals for Roadway Safety**

### **Goal 3 Improve Roadway Safety and Drivability**

*Policy 3.1 Bridge existing low-water crossings on Stockton Hill Road*

*Policy 3.2 Provide better signage on high-speed curves*

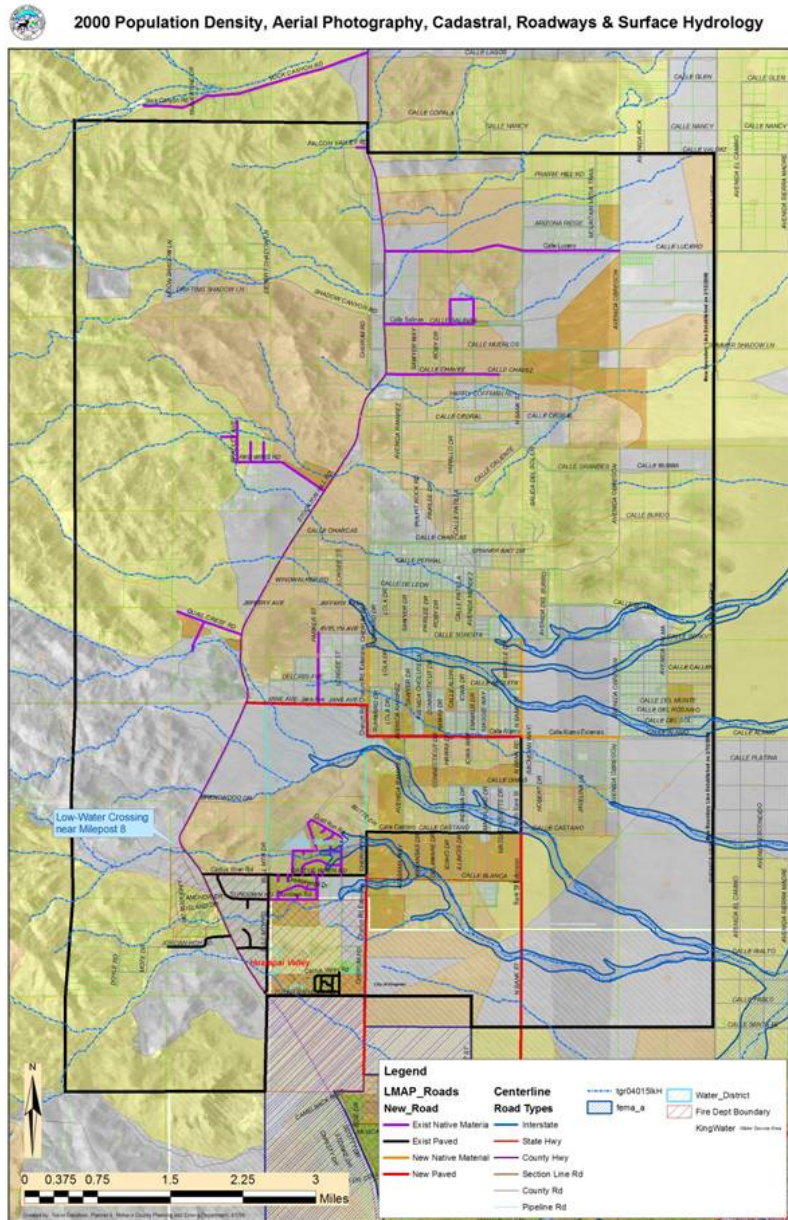
*Policy 3.3 Widen roadways at selected intersections for left-hand turn lanes.*

Implementation:

- PS8 Perform traffic study for the Stockton Hill Road Corridor between Northern Avenue to Vock Canyon (and beyond) as a building block for an access management plan for the Corridor that will include recommendations for improved traffic control

signage, roadway geometry, intersection design, acceleration and deceleration lanes and bridge work at washes where roadway is regularly flooded (at least once per year).

## Flood Hazards



Several factors contribute to flash flooding. The two key elements are rainfall intensity and duration. Intensity is the rate of rainfall, and duration is how long the rain lasts. Topography, soil conditions, and ground cover also play an important role. Soils with low permeability and those that have been saturated by previous storm events are prone to flash flooding.

Most flash flooding is caused by slow-moving thunderstorms, thunderstorms repeatedly moving over the same area for several hours, or only after a few minutes from heavy rains generated by monsoon storms. Flash floods can roll boulders, tear out trees, destroy buildings and bridges, and scour out new channels. Rapidly rising water can reach several feet above grade level. Furthermore, flash flood-producing rains can also trigger catastrophic mudslides. Most flood deaths are due to flash flooding. Occasionally, floating debris can accumulate at a natural or man-made obstruction and restrict the flow of water. Water temporarily

impounded by a debris dam can cause flooding upstream. Subsequent flash flooding can occur downstream if the obstruction should suddenly release (National Oceanic and Atmospheric Administration).

The Planning area is traversed by multiple washes that flow in a generally easterly direction toward the Mohave Wash, and then northward to Red Lake (see Aerial Photograph). Although few washes in the western part off the planning area are designated within the FEMA flood

hazard, they do have considerable flows. Washes in this area were last studied by FEMA in 1982 and do not cover the full extent of the flood hazard, largely because of the sparse population effected did not justify additional funding.

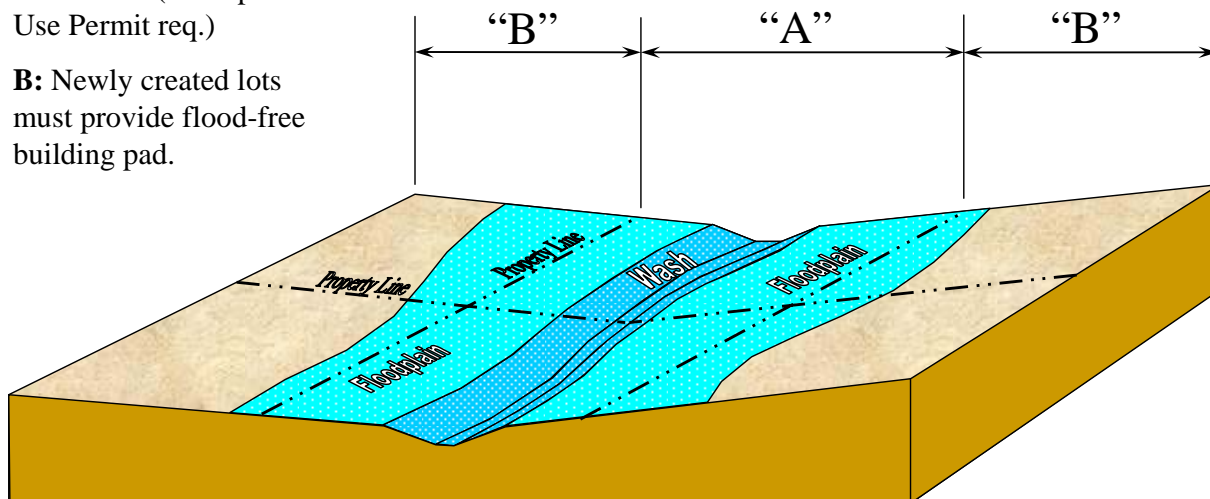
Throughout Mohave County, many buildings and mobile homes rest on non-elevated concrete slabs or lots. This circumstance makes these structures prone to damage from comparatively shallow flows (Mohave County Flood Insurance Study, p.15). New construction should be placed outside of floodplains or elevated to avoid flood damage to private property both on-site and downstream. After a review of aerial photography, several hundred homes have been constructed in the flood plain.

## Cross-Section of FEMA Flood Hazard Zone

Limit of 100-Year Flood

**A:** Development limited in this area (Floodplain Use Permit req.)

**B:** Newly created lots must provide flood-free building pad.



Notes:

- 1) New lots should not be encumbered by floodplain restrictions, including high costs of insurance which may actually prohibit development. New lots should have at least 50% of the lot, or one acre, outside of the floodplain. This should provide enough area for a building pad, a well site, and a conventional septic system (Title 18, Chapter 9, ADEQ Water Pollution Control).
- 2) Easements should be granted to cover the wash (floodway) and portions of the floodplain deemed a hazard by the County Engineer when development is approved by the Board of Supervisors.

Reasons for developing goals and policies for flood prone areas are as follows:

- 1) Reduce flood hazards (minimize property loss, and promote health, safety and welfare).
- 2) Reduce cost of homeownership by eliminating the need for flood insurance.
- 3) Reduce building construction costs.
- 4) Prevent the need for the community to fund multi-million dollar flood control systems.
- 5) Enhance standing in FEMA's Community Rating System could reduce flood insurance premiums by five percent county-wide.
- 6) Create marketable land and prevent fraudulent transactions.
- 7) Leave natural aquifer recharge areas open to absorb rainwater run-off.

- 8) Keep septic systems away from permeable soils and reduce the chance of ground water contamination.
- 9) Reduce flood blight.
- 10) Provide open space.
- 11) Maintain a rural feel by keeping densities low.

The Cross-Section of the FEMA Flood Hazard Zone shows a typical wash, with the extent of the floodway and flood plain (see above). Goals and policies are designed to preserve floodways and floodplains, prevent property loss from flooding and create usable building sites that are not completely within a flood hazard zone.

### **Goals for Mitigating of Flood Hazards**

#### **Goal 4 Preserve natural floodways and flood plains.**

*Policy 4.1 Utilize flood plains for open space, passive recreation and trail systems.*

*Policy 4.2 Locate building sites outside of the flood hazard areas.*

*Policy 4.3 Elevate roadways above floodways which are subject to significant flooding.*

Implementation Measure:

PS9 The County may consider development clustering and open space design as part of the subdivision, minor land division and site plan review process.

PS10 Identify low-water crossings which should be elevated based upon storm event nuisance flows which place sediment in the road and temporarily impede traffic.

New lots, created by subdivision plat or minor land division, should not be encumbered by floodplain restrictions, including the high costs of insurance that may actually prohibit development. New lots should have enough flood-free land area to provide for a building pad, a well site, and a conventional septic system (Title 18, Chapter 9, ADEQ Water Pollution Control) in Rural Development Areas. Where individual wells and/or septic tanks are less likely to occur, and where water and sewer systems are available, notably in Suburban and Urban Development Areas, sufficient flood-free areas should be set aside on each lot for a building pad.

#### **Goal 5 Create usable building sites.**

*Policy 5.1 New lots created in Rural Development Areas or in areas without public water and sewer service shall have at least one acre outside of the flood plain.*

*Policy 5.2 New lots created in Urban or Suburban Development Areas that have access to public water and sewer systems shall have a sufficient flood-free area on each lot created to construct a residence.*

*Policy 5.3 Drainage easements should be granted, or dedicated, depending upon rate of flow and capacity, on individual lots to cover any wash (floodway) and those portions of the flood plain deemed a hazard by the County.*

Implementation Measure:

- PS11 The County Planning and Zoning Department, with assistance from the Mohave County Flood Control District, shall review subdivision and minor land division rezone requests to ensure that each lot or parcel created has an appropriate area designated as a building site.
- PS12 New building sites without sufficient flood-free areas set aside for building pads, and which are not encumbered by on-site wells or septic systems, shall be elevated above the base flood height per Mohave County Flood Control District requirements.
- PS13 The need for drainage easements shall be evaluated as part of the subdivision and minor land division rezone review process.
- PS14 Initiate and complete a comprehensive flood hazard analysis along the Stockton Hill Corridor.

# **Section III**

<b>Natural Resources Element</b>		
<b>Goals</b>	<b>Implementation Technique</b>	<b>Responsibility</b>
1	Building Permit, Rezone, Subdivision Plat, Landscape Ordinance & BLM designation	Mohave County Planning and Zoning Dept, Mohave County Public Works, Mohave County Flood Control District & BLM
2	Grading Permit (Hillside Ordinance), Zoning Use Permit & Building Permit	Mohave County Planning and Zoning Dept
3	Building Permit, Grading Permit, Rezone (matrix) & Minor Source Permit	Mohave County Planning and Zoning Dept, Mohave County Public Works & ADEQ.
4	Board Resolution & Capital Improvement Road Program	Mohave County Planning and Zoning Dept & Mohave County Public Works
5	Building Permit, Rezone, Subdivision Plat, Hillside Ordinance, Landscape Ordinance & Conservation Land Trusts	Mohave County Planning and Zoning Dept, Mohave County Public Works & Property Owners
6	Dark Sky Ordinance & Building Permit	Mohave County Planning and Zoning Dept
7	Building Permit	Mohave County Planning and Zoning Dept
8	Building Permit	Mohave County Planning and Zoning Dept
9	Building Permit, Rezone & Granting	Mohave County Planning and Zoning Dept
10	Building Permit, Rezone, Subdivision Plat & Zoning Use Permit	Mohave County Planning and Zoning Dept

<b>Water Resources Element</b>		
<b>Goals</b>	<b>Implementation Technique</b>	<b>Responsibility</b>
1	Building Permit, Rezone, & Subdivision Plat	Mohave County Planning and Zoning Dept., ADWR and ADEQ.
2	Rezone, Subdivision Plat, Grading Permit & Building Permit	Mohave County Planning and Zoning Dept., Mohave County Public Works & Mohave County Flood Control District
3	Building Permit & Landscape Ordinance	Mohave County Planning and Zoning Dept, Mohave County Public Works, Mohave County Environmental Health Dept. & ADWR.

<b>Land Use Element</b>		
<b>Goals</b>	<b>Implementation Technique</b>	<b>Responsibility</b>
1	Land Use Diagram, Rezone, Subdivision Plat, Building Permit & Zoning Use Permit	Mohave County Planning and Zoning Dept., & Mohave County Public Works.
2	Land Use Diagram, Rezone, Subdivision Plat, Building Permit, Zoning Use Permit & Conservation Land Trusts	Mohave County Planning and Zoning Dept., & Mohave County Public Works.
3	Land Use Diagram, Rezone, Subdivision Plat, Building Permit, Zoning Use Permit & Conservation Land Trusts	Mohave County Planning and Zoning Dept., & Mohave County Public Works.
4	Land Use Diagram, Rezone Board Resolution, Capital Improvement Program & BLM designation	Mohave County Planning and Zoning Dept & Mohave County Public Works, School Districts, Fire Districts, & Sheriff's Office.
5	Board Resolution, BLM & State Land Dept. designation	Mohave County Planning and Zoning Dept, BLM & State Land Department
6	Rezone (see "matrix" for minor land divisions), Subdivision Plat, Building Permit, Site Plan Review & Zoning Use Permit.	Mohave County Planning and Zoning Dept., Mohave County Public Works & Mohave County Flood Control District
7	Land Use Diagram, Rezone, Subdivision Plat, Site Plan Review & Building Permit	Mohave County Planning and Zoning Dept
8	Building Permit	Mohave County Planning and Zoning Dept

<b>Transportation Element</b>		
<b>Goals</b>	<b>Implementation Technique</b>	<b>Responsibility</b>
1	Rezone, Subdivision Plat, Exactions, & Capital Improvement Road Program	Mohave County Planning and Zoning Dept., & Mohave County Public Works.
2	Rezone, Subdivision Plat, Granting/Dedication & Capital Improvement Road Program	Mohave County Planning and Zoning Dept., Mohave County Public Works & Mohave County Trails Association

<b>Public Facilities &amp; Public Safety Element</b>		
<b>Goals</b>	<b>Implementation Technique</b>	<b>Responsibility</b>
1	Building Permit, Dedication, Annexation, Incorporation & Landscape Ordinance	Mohave County Planning and Zoning Dept., Fire Departments, BLM and Land Owners.
2	Dedication, General Fund & Capital Improvement Road Program.	Mohave County Sheriff's Office, Mohave County Planning and Zoning Dept. & Mohave County Public Works.
3	Capital Improvement Road Program.	Mohave County Public Works.
4	Rezone, Subdivision Plat Building permits & Site Plan Review.	Mohave County Planning and Zoning Dept., Mohave County Public Works & Mohave County Flood Control District.
5	Building Permits, Rezone, Subdivision Plat & Granting/Dedication	Mohave County Planning and Zoning Dept., Mohave County Public Works & Mohave County Flood Control District.