

VI. RESOURCES ELEMENT



CA/KB

OVERVIEW

The Resources Element, one of nine elements of the General Plan, contains official County policies on the conservation and management of resources.

The Resources Element is comprised of six components:

- Natural Resources
- Energy Resources
- Water Resources
- Air Resources

- Open Space
- Cultural-Historical

For each resource component, specific goals, objectives and policies are identified. In addition, each component includes implementation programs to address identified constraints.

PURPOSE OF THE ELEMENT

The Resources Element sets forth a comprehensive strategy for the development,

management, preservation, and conservation of resources that are necessary to meet Orange County's existing and future demands. This strategy is expressed as an integrated framework of resource goals, policies, and programs.

The goals of the Element are consistent with state requirements and are primarily based on quantified objectives, an assessment of resource needs, and identification of problems impeding the development, management, preservation, or conservation of County resources.

The policies and programs of the Resources Element form an effective implementation plan to meet the established goals. Consequently, the Resources Element serves to guide and direct local government decision-making in resource-related matters and also facilitates coordination with regional, state, and federal resource policies and programs.

As the County continues to grow, the pressure on local resources will increase. Urbanization affects agriculture, parkland, wildlife habitat and natural vegetation most directly, since these resources often compete with development for the same land. All resources will experience increasing demand as the urbanized area expands, but the methods employed to meet these demands will vary.

For example, an adequate supply of land resources for parks already exists in the unincorporated areas, but it is necessary that

affirmative steps be taken to set aside parks and recreation areas during the planning and development review process.

The demand for some other resources, such as energy and water, cannot be met entirely within the borders of Orange County. The County must ultimately depend on other agencies for the provision of an adequate supply of these resources.

One of the major purposes of the Resources Element is to provide a clear statement of County policy so that timely steps can be taken to ensure that an adequate supply of all necessary resources will be available to meet the County's growth needs.

CONSTRAINTS AND OPPORTUNITIES

The following identifies existing and potential constraints to and opportunities for satisfying the projected resource demands for Orange County. While these constraints do not always represent absolute barriers, they may inhibit the timely achievement of key resource supply or conservation objectives. These constraints and opportunities have been categorized below into four categories: environmental, governmental, economic and market, and legal.

Constraints

- ***Environmental Constraints***

AIR QUALITY

One of the most confining of all constraints to meeting future resource demands are the statutory requirements protecting air quality and minimizing the impact of air pollution on human health. In Southern California, the local air quality district adds more stringent limitations because of the regional topography and meteorology which intensify pollution problems. Air quality standards limit the choice of energy sources for power plants and other energy production activities. The use of coal, for example, for power generation is virtually eliminated by air quality standards.

LOCAL WATER AVAILABILITY

Water supply has always been a critical issue for Southern California, with local sources of water providing less than half of the area's water needs. Existing water supply limitations and the anticipated loss of imported water from other regions (e.g., Colorado River entitlement) may constrain the production and utilization (e.g., petroleum and mineral extraction) of other resources.

WATER QUALITY

In the Orange County region, the protection of water quality is a major concern. The need to maintain safe water quality may constrain the development of energy resources, from methane (landfills) and geothermal

sources. At a minimum, water quality concerns will need to be considered during the process of developing these resources and water intensive resources such as agriculture.

Development of land and the increase in population density has also created new sources of non-stormwater discharges and pollutants in stormwater discharges.

The San Diego and Santa Ana Regional Water Quality Control Boards require that water quality and watershed protection principles are considered as part of land use planning and development review.

AVAILABILITY OF LOCAL RESOURCES

The limited availability of local resources is the basis for many resource planning activities contained in the components. This condition must be considered as a constraint for the County. Aside from its diminishing supply of petroleum resources, the County lacks enough other natural resources such as water to meet its own needs. The direct implications of this deficiency of resources is that the County has become more dependent on imported resources and, as a consequence, is increasingly vulnerable to actions and policies which it cannot directly influence (e.g., imported oil supply allocations).

- ***Governmental Constraints***



FISCAL CONSTRAINTS

The loss of revenue resulting from Proposition 13 and other factors, and rising public service costs due to growth and inflation, will continue to exist in Orange County. The projected costs of

management activities such as cultural-historic resources programs and resource inventory and mapping efforts could be significantly impaired. Thus, many innovative Resource Element implementation programs may be limited by the County's future fiscal status.

COMPETING OBJECTIVE AND PRIORITIES

Competing public needs can result in conflicting priorities and programs. An issue of increasing public concern which may constrain resource conservation programs is the high cost

serving future development are not balanced with revenues. Certain public services may have to be curtailed or eliminated in the future because of budget shortfalls.

Fiscal resources for future resource

of housing.

For example, since most of the costs associated with alternative energy systems and other conservation measures are up-front capital and installation costs, they may increase the costs of construction and, subsequently, the price of housing. Therefore, the need to achieve affordable housing objectives could constrain efforts to reduce future resource demands.

- ***Economic and Market Constraints***

Resource conservation programs, like

most other investments, are extremely sensitive to interest rate levels. The finance markets, however, are experiencing difficult times. The availability of a steady supply of credit at a reasonable interest rate is necessary to supplement existing utility and government financing programs for energy, water, and other conservation measures and, consequently, achieve resource conservation objectives.

- ***Legal Constraints***

While the County has considerable control of land use in the unincorporated areas, there are certain limits to stringent regulatory action by the County with respect to resource conservation. Many conservation mandates infringe upon the rights of individuals or firms.

Actions requiring mandatory compliance (e.g., open space dedication) must be supported by identified public benefit (e.g., Resources Element) or urgency situation. Although these actions have usually been upheld as valid exercises of police power, there are limits to the enforcement of resource conservation measures.

Opportunities

- ***Environmental Opportunities***

REGIONAL AND STATE

RESOURCES

In most cases where the County is deficient in local resource supplies, abundant supplies exist in the region or elsewhere in the State. A good example of such an instance is Statewide water supplies. California has a significant amount of high quality water, primarily in the northern one-third of the State. The continued and potentially expanded access to these supplies represents a key opportunity to meeting Orange County's long-term water resource needs.

AMOUNT OF UNDEVELOPED LAND

The amount of undeveloped land in Orange County, particularly in the unincorporated area, provides a unique opportunity to consider and address resource concerns through innovative land use planning. Although significant portions of the undeveloped area are already planned for urban land uses, the existing land use plans provide for sound resource management as these areas develop.

- ***Governmental Opportunities***

BALANCED COMMUNITY OBJECTIVES

The planned community concept embraced by Orange County encourages the development of balanced land use plans in the unincorporated area. Such balanced

land uses serve to address concerns in the areas of air quality and energy conservation and promote the efficient use of other resource (e.g., water).

ORANGE COUNTY GOVERNMENT

Orange County government has historically encouraged the conservation of resources through both financial support and regulatory actions. The County, however, has also promoted and supported the involvement of private and community organizations in the management of resources. This is especially true in the area of historic resources where the efforts of private and non-profit organizations compliment and enhance County programs. It is such support of private efforts that fosters meaningful and efficient resource management which, in most instances, exceeds the capabilities of local government.

- ***Economic and Market Opportunities***

The existence of large-scale landholdings in the southern portions of the County has facilitated innovative land use planning in Orange County. Further, the investment potential of the area and the prudent financial practices of the development industry have allowed for the provision of amenities in new developments in excess of what is found in comparable developments in other counties. These amenities and

innovative planning practices have served to conserve and preserve the natural features and resources of Orange County such as creek corridors and ridgelines.

- ***Legal Opportunities***

The County has considerable flexibility to provide incentives for resource conservation efforts provided that no threat to the public or safety results from its actions. This flexibility, coupled with increasing tax incentives for historic preservation and other conservation activities, can create a positive environment for resource management efforts, both public and private

NATURAL RESOURCES COMPONENT

Orange County has many natural resources, many scenic areas including ridgelines and hillsides, a pleasant climate, farmlands, native vegetation and wildlife, and mineral resources. The Natural Resources Component contains policies and programs which are designed to protect and conserve these areas not only because they have economic value, but also because they are necessary to sustain the quality of life in Orange County.

As used in this component, conservation is the planned management, preservation, and wise utilization of natural resources. Its

objective is to prevent the wasteful exploration or destruction of natural resources. For over 100 years, conservation activities have focused on major rural natural resources, such as redwood forests, and areas of unique scenic quality. In the past decade, however, conservation has become a major concern in urban areas, including Orange County.

This component provides a basis for programs which serve to implement natural resource conservation goals and policies and establish a framework for additional inventory and resource planning efforts.

The principal natural resource concerns addressed in this component of the

3) vegetation and wildlife habitat, and 4) landforms. Coastal resource (e.g., wetlands) policies and plans are contained in the Local Coastal Programs for each specific coastal area in Orange County.

AGRICULTURAL RESOURCES

Introduction

Orange County, once a rural county supported primarily by an agricultural economy, has long been a notable agricultural community of statewide and national significance. Fruits and vegetables grown in the County were shipped throughout the United States and abroad.

The County's agricultural communities have



Resources Element are: 1) agricultural resources, 2) mineral resources,

experienced tremendous growth and decline over the years. These communities are presently experiencing urban growth.

Major crops grown during the early 1900s included oranges, apricots, and walnuts.

Also important were peaches, apples, sugar beets, beans, alfalfa, olives, potatoes, and peppers. Agriculture was the County's number one industry, and by 1925, Orange County was number six in the state on the basis of crop value.

The 1930s and 1940s were marked by radical agricultural change. Apricot and walnut production decreased drastically as did the acreage devoted to sugar beets.

However, citrus production reached a peak



of over 75,000 acres. Steadily increasing in importance were truck crops and nursery products. This same period marked the temporary rise of cattle and poultry production.

strawberries grew dramatically both in acreage and dollar value. In the 1960s and 1970s, Orange County experienced rapid suburbanization further reducing the County's agricultural land.

Significant amounts of agricultural land have been converted to urban development. Still, agriculture, from a dollar value standpoint, has done remarkably well on less than one-third the acreage cultivated twenty years ago. In 1997, 13 crop categories were million dollar enterprises. Further, Orange County agricultural products ranked 25th in dollar value among California's 58 counties.

Current Conditions

Agriculture's decline, which began in the mid-1940s, was stemmed briefly during the 1950s. Though citrus production fell drastically, truck crops, nursery stock, and

There are several unique features that have contributed to the County's continued agricultural successes. The predominately Mediterranean climate is a major asset. This climate is characterized by modest amounts of precipitation and mild temperatures in the winter; little precipitation and warm to hot temperatures in the summers; and, nearly year-round sunshine.

Further, this climate permits a longer growing season and enables county farmers to plant two or more crops a year on the same field as well as to harvest and ship their produce when other regions are dormant.

The other major County agriculture attribute

is soil fertility. In 1997, over 45,000 acres were crop-producing. This figure is down approximately 12,000 acres from 1987. In 1997, specialty crops such as strawberries, bell peppers, tomatoes, and avocados were approximately 26,000 acres were included in the land inventory and monitoring program maintained by the State Department of Conservation. This agency classifies important farmland by four categories: prime farmland, unique farmland, farmland of statewide importance and farmland of local importance. (See Figure VI-1.) Through this process, the State can assist in the maintenance of these valuable resources.

Following are the definitions of these four farmland categories.

- 1) **Prime farmland** is land best suited for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops. Production should occur economically when the land is treated and managed (including water management) according to modern farming methods. Estimates show nearly 11,100 acres of prime farmland existed in 1998.
- 2) **Unique farmland** is land other than prime farmland and farmland of statewide importance that is currently used for the production of specific high value food and fiber crops. It has the special combination of soil quality location, growing season, and moisture

prominent. Other important crops included sweet corn, asparagus, cauliflower, green beans, cucumbers, lettuce, and parsley.

Of the 45,000 crop acres farmed in 1997, supply needed to produce sustained high yields and/or high quality yields of a specific crop when treated and managed according to modern farming methods. Examples of such crops are citrus, olives, strawberries, avocados, fruit, and vegetables. In 1998, approximately 6,200 acres of unique farmland existed.

- 3) **Farmland of statewide importance** is land other than prime farmland that has a good combination of suitable physical terrain and soil for producing foods, feed, forage, fiber, and oilseed crops. The land must be available for use as cropland, pastureland, range land, and forest land. In 1998, nearly 842 acres of this type of farmland existed.
- 4) In some local areas there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. These lands are to be identified by a local committee made up of concerned agencies called together by the State Department of Conservation. The local committee reviews the lands under this category on a five-year basis. In 1998, no **farmland of local importance** existed in the County.

Future Prospects

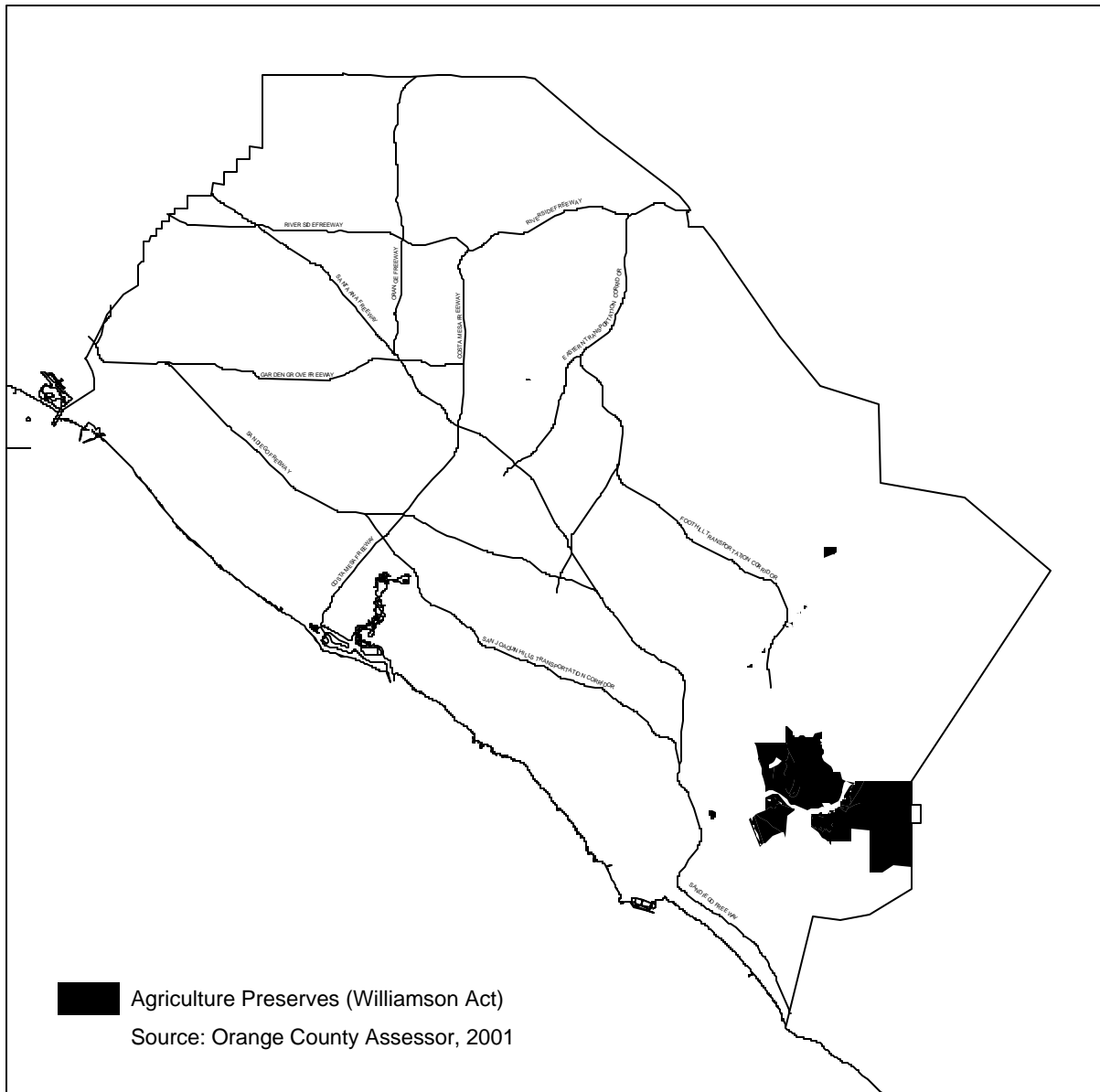
Urban areas encroach on agricultural lands throughout the county creating pressure to convert farmland to urban uses. The rising

costs of irrigation water, agricultural land tax rates, labor costs, and damage from vandalism have increased production costs making it more difficult to have a successful agricultural operation.

Figure VI-1

Figure VI-2

Figure VI-2



ORANGE COUNTY AGRICULTURAL PRESERVES

Generalized

The State enacted the Williamson Act in 1965 in response to increasing land taxes which were forcing agricultural land into more intensive uses. The act assesses agricultural land at a lower rate than non-agricultural land. In exchange, landowners enter an agreement with the local jurisdiction to limit the uses on the contracted land for at least 10 years.

Two major landowners, the Irvine Company and Rancho Mission Viejo, have historically held the majority of property within agricultural preserves under the Williamson Act. In 1987, the Irvine Company filed notice of non-renewal on all of their remaining properties (approximately 19,000 acres) from their contract. Withdrawal of the Irvine Company properties from the agricultural preserve is a ten-year process which was to be completed in 1999. Rancho Mission Viejo currently holds approximately 22,000 acres in agricultural preserves. Figure VI-2 shows the land areas currently held in agricultural preserves.

Growth projections through 2020 indicate the continued urbanization of the County. This urban development will continue to convert agricultural acreage to more intensive land uses. However, objectives and policies presented in the Natural Resources Component of the Resources Element identify opportunities for the preservation and maintenance of agricultural acreage. These policies will assist in the preservation of agricultural land in areas where infrastructure has not yet been provided for more intensive activities.

MINERAL RESOURCES

Introduction

Orange County is blessed with significant amounts of mineral resources. Of particular importance are those mineral resources necessary to meet the County's existing and future development needs, such as construction aggregate.

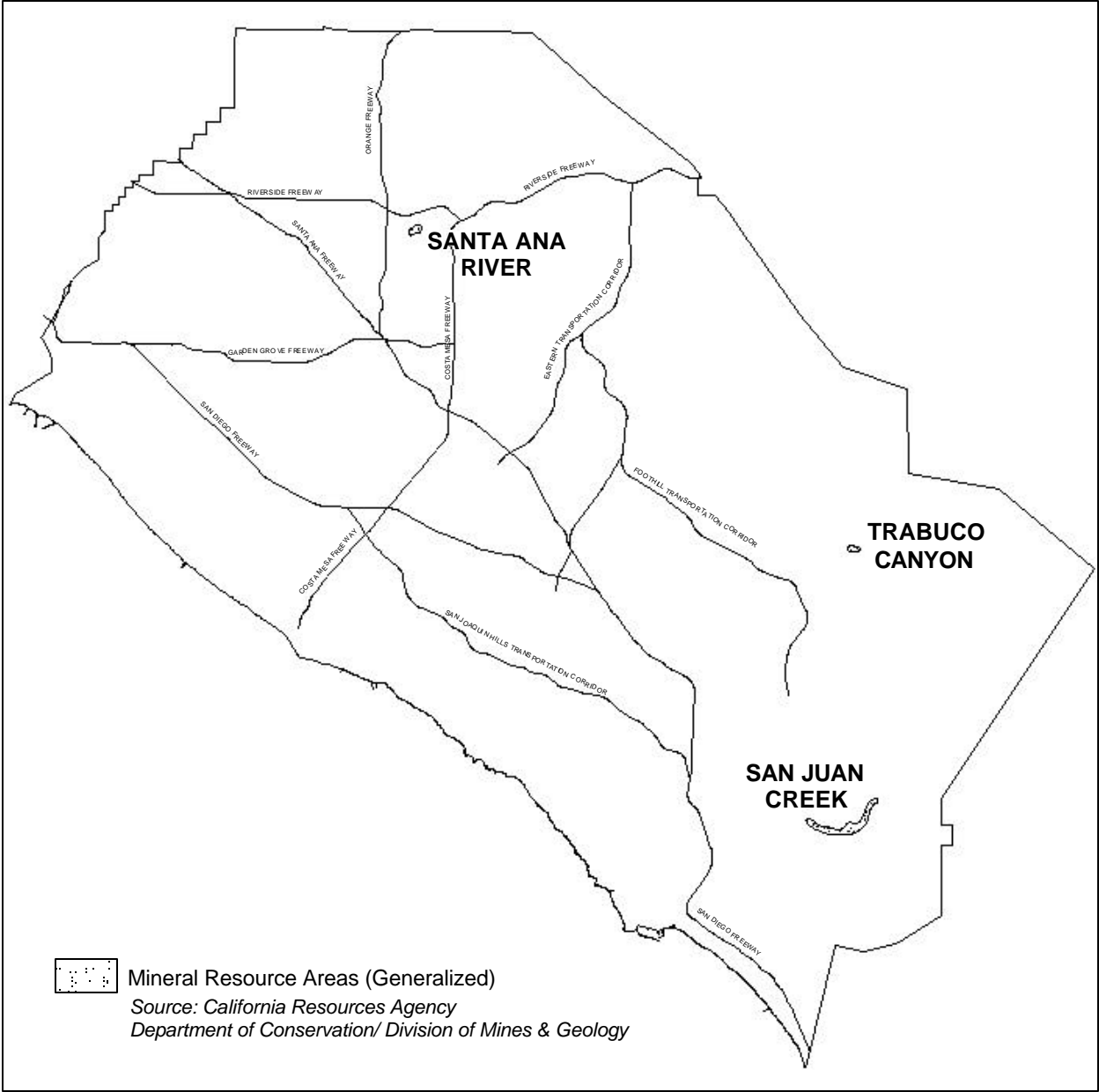
Construction aggregate resources are the focus of this section of the Resources Element. Although other mineral resources are important to the County's future growth, they are categorized by their ultimate application (e.g., petroleum resources in the Energy Resources Component) in other sections of this Element. Much of the information utilized for the assessment of county mineral resources is based on the State of California's Mineral Land Classification/Designation Program, described in greater detail below.

State Mineral Land Classification/Designation Program

In 1975, the State adopted the Surface Mining and Reclamation Act (SMARA). The primary objectives of (SMARA) are the assurance of adequate supplies of mineral resources important to California's economy and the reclamation of mined lands. These objectives are implemented through land use planning and regulatory programs administered by local government with the assistance of the State. The Department of Conservation, Division of Mines and

Figure VI-3

Figure VI-3



ORANGE COUNTY MINERAL RESOURCES
Generalized

TABLE VI-1.

AGGREGATE RESOURCES OF THE ORANGE COUNTY REGION	
Resource Area	Million Short Tons
Santa Ana River	42
Lower Santiago Creek	187
Upper Santiago Creek	26
San Juan Creek	120
Arroyo Trabuco	78
<i>GRAND TOTAL</i>	<i>453</i>

* Includes reserves as well as all potentially usable aggregate materials that may be mined in the future.

TABLE VI-2.

PROJECTED AGGREGATE CONSUMPTION ORANGE COUNTY REGION	
Year	(Million Tons) Aggregate Consumption
1994-1999	84
2000-2004	73
2005-2009	75
2010-2014	76
2015-2019	77
2020-2024	78
2025-2029	79
2030-2034	79
2035-3039	80
2040-2044	80

Source: California Division of Mines and Geology Special Report 143, 1994.



Geology, and the State Mining and Geology Board are the agencies responsible for administering this program at the State level. The act's mineral resource conservation objective is achieved through a mineral inventory and land use planning process termed classification/designation, which jointly involves the Division of Mines and Geology, the State Mining and Geology Board, and local government. Information on the location of important mineral deposits is developed by the Division through a process of mineral land classification. In turn, the classification report is used by the Board in designating deposits that are of economic significance to a region, the state, or the nation.

Location and Availability of Mineral Resources

In 1982, the State Mining and Geology Board adopted the Classification Report for Orange County. The designation of mineral lands of regional significance occurred in

April of 1983. Since that time, however, some of the identified aggregate resources have become unavailable due to urban development. About 20 percent of the aggregate resources in designated areas have undergone land use changes that preclude mining. Most of the areas urbanized were developed for housing and industrial parks.

In 1994, the California Department of Conservation, Division of Mines and Geology, published an updated report identifying significant sand and gravel resources for the Orange County region. These resource areas are located in portions of the Santa Ana River, Santiago Creek, San Juan Creek, Arroyo Trabuco and other areas. (See Figure VI-3.) The 1994 Update provides the basis for the resource inventory and analysis that follows.

The location of the areas classified and designated as deposits containing significant sand and gravel resources are identified in

California Division of Mines and Geology Special Report 143, Parts III and IV, for the Orange County Region. In the Orange County Region, resource areas are located in portions of the Santa Ana River, Santiago Creek, San Juan Creek, Arroyo Trabuco, and other areas. (See Figure VI-3.)

The depiction of mineral resource areas in this text is not intended to represent a commitment to mineral extraction for these areas. Rather, the following exhibits respond to SMARA's mandate to recognize these mineral resource areas in the General Plan. Any mineral extraction proposals would be reviewed on a project-by-project basis, and require approval of a zone change to the (SG) "Sand and Gravel Extraction" Zoning District and compliance with CEQA.

The specific mineral areas classified and designated are indicated as "resource sectors." Based upon guidelines developed by the State Mining and Geology Board and the State Geologist, a resource sector is an area judged to contain a significant deposit of construction-quality aggregate that is available, from a general land use perspective, to meet the future needs of the Production-Consumption (P-C) region. The boundaries of each resource sector generally encompass fairly uniform deposits. For example, sector boundaries would be established between that part of a natural deposit formed on an alluvial fan and that part within the confines of an adjacent modern stream channel and its floodplain. The use of these resource sectors provides a reliable method of estimating the tonnage of

material available in each mineral deposit.

Table VI-1 describes the existing amount of aggregate resources in the Orange County region. Resources include reserves as well as all potentially usable aggregate materials that may be mined in the future, but for which no permits allowing mining have been granted or for which marketability has not been established.

Existing and Projected Mineral Resource Consumption

Using a variety of data, such as regional population projections and historic aggregate production estimates, the State Mining and Geology Board calculated the 50-year demand for aggregate resources for the Orange County region. (See Table VI-2.)

VEGETATION & WILDLIFE HABITATS

Introduction

Wildlife habitat often refers to both vegetation and wildlife. The term relates to the natural environment and to those plant and animal species that inhabit it. Orange County's climate and topography have created an environment that sustains a wide range of plant and animal life. The County rises over 5,000 feet in elevation from the coast to the crest of the Santa Ana Mountains, offering habitat for eight major vegetation communities and wildlife species. Figure VI-4 presents a generalized depiction

of the County's wildlife habitat areas.

County shoreline is a special resource for which the County has prepared Local Coastal Programs in response to the requirements of the Coastal Act of 1976. Further, the coastline is marked by several special coastal marine life refuges and ecological reserves. (See Figure VI-5, the Open Space/Conservation Program Map.) Important among these features are the Bolsa Chica Ecological Reserve, the San Joaquin Marsh, and the Upper Newport Bay Ecological Reserve. South from Newport Harbor are seven other marine life refuges.

Inland, wildlife habitat is protected through the continued existence and operation of wildlife sanctuaries such as the Audubon Society's Starr Ranch Wildlife Sanctuary and the Tucker Wildlife Sanctuary, owned and operated by California State University, Fullerton. The Cleveland National Forest also provides an extensive wildlife and vegetation habitat under federal control.

The County's regional parks and open space corridor network of open space corridors shown on the Open Space/Conservation Program Map, Figure VI-5, provide further wildlife protection. The regional parks provide permanent habitat, while the various open space and conservation corridors represent opportunities for permanent wildlife protection and conservation.

Existing Conditions

On December 11, 1992, a report titled

"Methods Used to Survey the Vegetation of Orange County Parks and Open Space Areas and The Irvine Company Property" was completed to provide uniform field survey methods to identify and map vegetation types and subtypes. The document included field survey methods, habitat classification guidelines, multiple habitat categories, habitat and land cover descriptions. It also included a dichotomous key to scrub and chaparral habitats for use by field biologists.

The habitat classification system now contains 16 primary habitat and land cover types including dune; scrub; chaparral; grassland; seasonal wetlands; marsh habitats; riparian; woodland; forest; cliff and rock; marine and estuarine; lakes, reservoirs, and basins; watercourses; agriculture; developed; and disturbed. The habitat types are further subdivided into subtypes.

Field vegetation survey mapping was conducted by qualified biologists. The survey data was then digitized using the County's Geographic Information System (GIS) technologies.

COMPARISONS TO HISTORIC CONDITIONS

The vegetation of Orange County and surrounding counties in Southern California was originally surveyed and mapped on USGS quadrangle maps from 1930-1934 under the direction of A. E. Wieslander.

Figure VI-4

These early vegetation surveys, referred to as the “Wieslander Maps,” provide a general description of not only the distribution of vegetation in the 1930s but also the character of development in Orange County during that period that are comparable to the habitat and land cover conditions that exist today.

In the 1930s, the Wieslander map graphically portrayed large portions of the County of Orange as “cultivated” and “urban uses.” The mapping also identified areas containing shrub vegetation types (i.e., sagebrush, chamise chaparral and chaparral) and woodland vegetation types (i.e., sycamore and conifer).

The most significant change in land cover since the 1930s has been the conversion of “cultivated” to urban uses (i.e., residential, industrial and commercial). Much of the areas containing coastal sage scrub, chaparral, woodland and grassland remain unchanged today.

NATURAL COMMUNITY CONSERVATION PLANNING PROGRAM (NCCP)

The Federal Endangered Species Act (FESA) and the State Endangered Species Act (SESA) were created to prevent plant and animal species from becoming rare, endangered or threatened with extinction.

In September of 1990, a petition to list the California gnatcatcher as an “endangered species” was filed with the U.S. Department

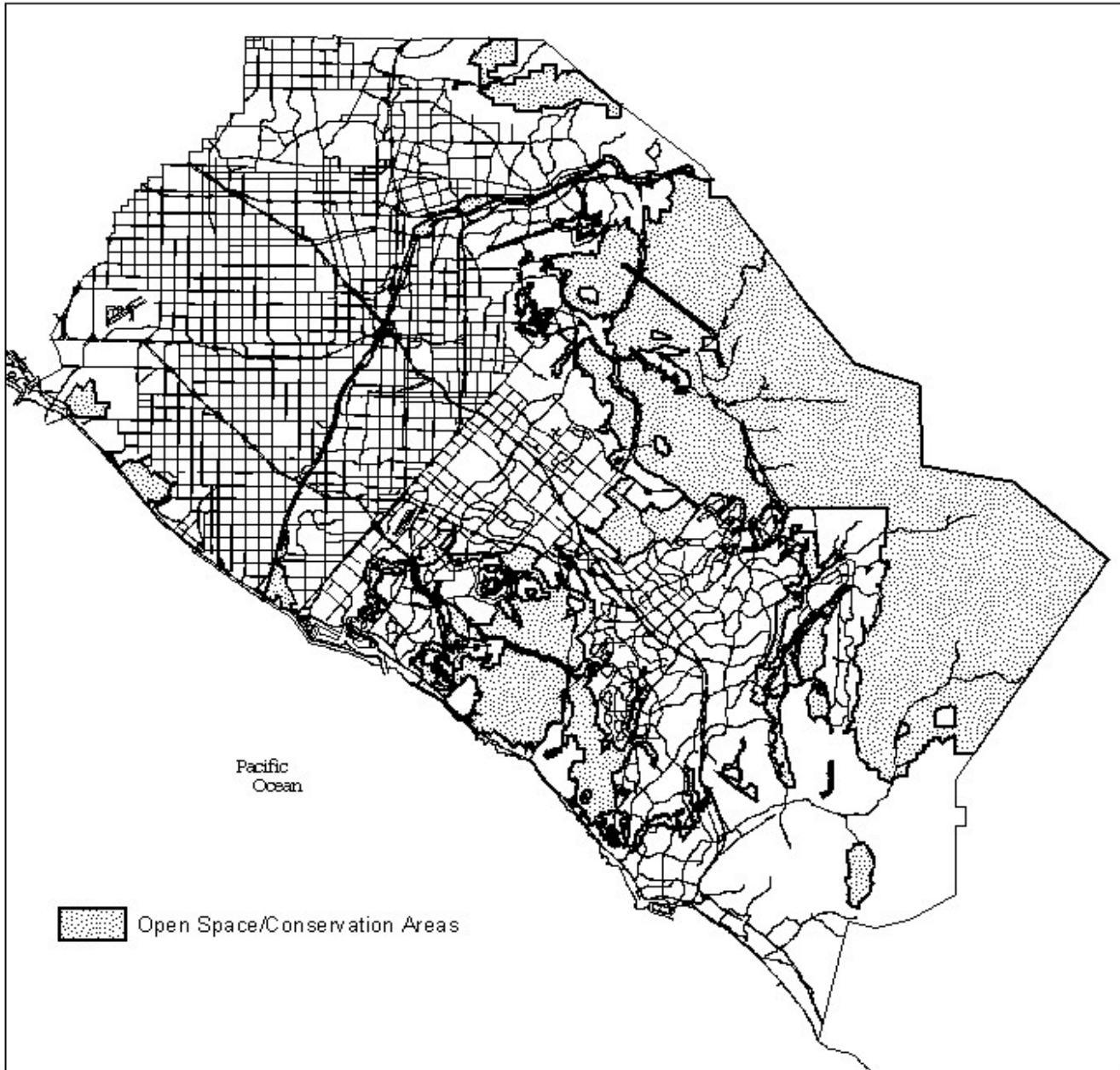
of the Interior by the National Resources Defense Council (NRDC) and the Manomet Bird Observatory, Inc. (MBO). In February 1991, the NRDC and MBO also filed a petition to list the California gnatcatcher as an “endangered species” with the State Fish and Game Commission.

In anticipation of these potential listings, the Planning and Development Services Department conducted California gnatcatcher surveys over County-owned properties containing coastal sage scrub (CSS) habitat including 12 regional parks and the Foothill-Trabuco Specific Plan area to present to the State Fish and Game Commission at their hearing in August of 1991.

On August 30, 1991, the State Fish and Game Commission considered the listing petition, including the results of the County’s gnatcatcher survey data, and decided not to list the California gnatcatcher in lieu of Governor Wilson’s proposed Natural Community Conservation Planning (NCCP) program for coastal sage scrub as described in Assembly Bill 2172. The bill was drafted in recognition of the fact that individual species protection programs prepared and implemented under the FESA and/or SESA were costly and ineffective in protecting and/or preventing extinction of a plant or animal species, and that habitat-based, multi-species or ecosystem-based management and preservation approach has a greater potential for long-term success.

Figure VI-5

Figure VI-5



OPEN SPACE/CONSERVATION PROGRAM MAP

CHAPTER VI. RESOURCES ELEMENT



AB 2172 (Natural Community Conservation Planning Act) was formally signed by Governor Wilson in September of 1991. It provided enabling legislation authorizing the California Department of Fish and Game (CDFG) to enter into agreements with any person, for the purpose of preparing and implementing Natural Community Conservation Plans (NCCP). The NCCP Act also provided the regulatory framework for the preparation of conservation guidelines for the development and implementation of NCCPs. In addition, the act also authorized NCCPs to be undertaken by local, state or federal agencies independently or in cooperation with other persons.

Subsequent to the passage of the NCCP Act, process guidelines were prepared and adopted for the Southern California NCCP Coastal Sage Scrub program to assist in the preparation of NCCPs at a subregion level as well as define the process of authorizing

interim loss of CSS habitat and incidental take of the California gnatcatcher.

On September 17, 1991, the U.S. Fish and Wildlife Service (USFWS) published the proposed rule in the Federal Register indicating its intent to list the California gnatcatcher as an “endangered species”.

On March 30, 1993, the California gnatcatcher was listed as a “threatened species” under the provisions of the Federal Endangered Species Act. The listing of the gnatcatcher under the Special 4(d) Rule also allowed for interim loss of CSS habitat and incidental take of California gnatcatcher during the preparation of the NCCP programs under specific circumstances. That is, the interim loss of CSS habitat could be granted if the loss of CSS habitat was performed as part of a lawful activity, the loss did not exceed five percent of the total known occurrence of CSS habitat, and did not preclude the preparation of an effective

NCCP program reserve system design.

Central-Coastal and Southern NCCP Subregions

The County of Orange established two distinct study areas; the Central-Coastal Sub-region NCCP and Southern NCCP Sub-region. The Matrix area was also identified in the northern portion of the County. However, no NCCP planning effort for the Matrix area is contemplated at this time. The Central-Coastal Subregional NCCP is one of eleven NCCP subregions that has been initiated within the five-county Southern California area and includes a Central Subarea and a Coastal Subarea.

The Orange County Board of Supervisors approved the Central-Coastal NCCP/Habitat Conservation Plan (HCP) on April 16, 1996 along with the certification of EIR/EIS No. 553. On July 17, 1996 an implementation agreement was executed by the Chairman of the Orange County Board of Supervisors, the State Resources Agency, Department of the Interior, the Transportation Corridor Agencies, Southern California Edison, the Irvine Company and other participating landowners and utility companies. The approval of the NCCP/HCP established the following:

1. Habitat Reserve System (Nature Reserve of Orange County):

The establishment of a 38,000 acre habitat reserve system includes all habitats found in the County of Orange. The Reserve currently includes

approximately 18,831 acres of CSS; 7,300 acres of chaparral; 6,100 acres of grassland; 1,800 acres of riparian; 950 acres of woodland; 200 acres of forest; and significant portions of six other native habitat types (see Central-Coastal Habitat Reserve System/Nature Reserve of Orange County).

2. Species and Habitat Covered Under the Approved NCCP/HCP:

The focus of the NCCP/HCP Reserve System is to protect designated “target species”: California gnatcatcher, coastal cactus wren and orange-throated whiptail lizard. However, the program also provides regulatory coverage of 35 species (9 plant and 28 animal species), conditional coverage of 7 animal species, and coverage of oak woodlands, Tecate cypress forest, cliff and rock, and chaparral (Coastal Subarea only) habitats

3. Coastal Sage Scrub Take Authorization:

7,395 acres of Coastal Sage Scrub (CSS) “take authorization” (removal) was established without regard to whether this habitat is occupied by the California gnatcatcher or other covered species inside and outside of the habitat reserve system. All participating landowners received a 10(a) Permit from the USFWS that authorized the removal and/or disturbance of specific CSS acreage amounts and subsequent take of the California gnatcatcher as well as covered and conditionally

covered species. The permit also authorized the removal of other specific habitat types within the Coastal and Central subareas of the reserve system.

4. **"Mutual Assurances" provisions:**

Mutual Assurances provisions are contained within the Implementing Agreement (IA) guaranteeing that the state and federal resource agencies shall not seek additional mitigation resulting from impacts to coastal sage scrub and other covered habitats and covered species authorized to be removed in accordance with a lawfully approved activity.

5. **Adaptive Management Programs:**

The approved NCCP/HCP requires the preparation of adaptive management programs addressing annual biological resources monitoring; restoration and enhancement; short and long-term fire management; grazing management; public access and recreation use; and interim management of privately-owned lands prior to their transfer to the public reserve manager.

6. **Funding for Reserve Creation and Habitat Management:**

An endowment in the amount of approximately \$10,000,000 was created through commitments from the Transportation Corridor Agencies, Irvine Ranch Water District, Chandis-Sherman Properties, Metropolitan Water District, Santiago County Water District, Southern California Edison,

and the County of Orange (using federal pass-through funds). The endowment is to be used on a "non-wasting" basis. That is, the principal would be protected and only interest earned from this endowment may be used in accordance with a budget approved by the nonprofit corporation for management and acquisition of reserve system lands.

7. **Nonprofit Corporation:**

The approved NCCP/HCP also provided the foundation for the creation of a nonprofit corporation, the entity responsible for the administration of the reserve system including properties owned and operated by a number of public agencies as well as those properties currently owned by private landowners but scheduled to be dedicated to a public agency for inclusion into the reserve system.

The Nature Reserve of Orange County (NROC) was created in December of 1996 as the nonprofit corporation to administer the reserve system with regularly scheduled meetings occurring each quarter.

The NROC membership currently includes 13 directors representing participating landowners, public agencies and utility companies, the state and federal resource agencies and three at-large directors and three ex-officio directors.

In addition, the NROC created a

technical advisory committee headed by the Nature Conservancy that includes nine technical members/ scientists responsible for assisting in establishing the long-term monitoring requirements for the management of the reserve system and reviewing proposed adaptive management programs and/or any project affecting the reserve system.

The NCCP/HCP also includes an executed IA which defines and establishes the roles and responsibilities of all participating landowners, the county and cities with the county and all other signatories to the agreement.

LANDFORMS

Introduction

The natural setting of Orange County provides a diverse combination of mountains, hills, flatlands, and shoreline. These landforms and associated major canyons, ridgelines, and coastal areas, all contribute to the diversity of Orange County's environment.

Landforms are distinctive natural topographic features of the Orange County area. Major landforms, few in number, must be considered natural as well as aesthetic resources. Land uses which do not use the available land to its best advantage or which alter the topography can detract from the County's appearance, deplete its stock of resources, and contribute to erosion and sedimentation.

The following sections identify the county's topographic resources and describe existing efforts to preserve and protect these resources.

Inventory of Landform Resources

Orange County, a somewhat rectangular land mass trending approximately 40 miles along the coast of the Pacific Ocean and extending inland approximately 20 miles, covers 798 square miles.

It is predominantly an alluvial plain, generally under 300 feet in elevation in the west and central section. Several low-lying mesas interrupt the plain along the northern coast. The plain is semi-enclosed by the Santiago Foothills and the Santa Ana Mountains which rise to 5,600 feet on the east, the Puente and Chino Hills in the north, and the San Joaquin Hills to the south.

Geologic hazards in the form of faults, landslides, and unstable formations occur frequently throughout the hillside area. These hazards are discussed in greater detail in the Safety Element. Specific sub-areas of the County and their associated landform resources are described below.

COASTAL FEATURES

North Coast:

North of the Santa Ana River, the shoreline is characterized by broad sandy beaches extending into shallow



offshore waters. Behind the coastal strand extensive saltwater marshes once

existed. Those at the Santa Ana River mouth and Huntington Beach have been drained.

The Bolsa marshlands, at one time with an outlet to the ocean at Warner Avenue now connected to Sunset-Anaheim Bay, have been considerably altered by tidal gates and berms for access to oil wells that are scattered throughout the sloughs. Seven-hundred acres of relatively unaltered marshland (some oil extraction also occurs here) exist as a federal wildlife sanctuary on the Seal Beach Naval Weapons Station. Anaheim Bay, the outlet for the inland saltwater ways, has been developed as a port to service the naval base.

South Coast:

South of the Santa Ana River, the coastal bluffs of the Newport mesa and uplifted marine terraces extend to the San Diego County line. Beaches vary in width from broad sandy beaches at

Newport Beach and from Doheny Beach southward to rocky cobble or

headlands and sandy coves along the coast from Laguna Beach to Dana Point. Some are wave cut, forming scenic wave terraces, caves, arches, and seawalls; others are set back from the immediate waterline and are of materials that are weak and easily eroded.

Streams draining the interior hills and valleys of the South County area create irregularities in the coastal bluffs as they descend to sea level. San Juan Creek, the largest of these, enters the ocean at Doheny State Beach Park near the Dana Point Marina.

Shoreline:

The National Shoreline Study of the U.S. Corps of Engineers indicates that along the 42-mile shoreline there are 33.4 miles of sandy beaches, 0.8 miles of gravel and cobble beach, 6 miles of rocky headlands, and 1.8 miles of additional stretches without effective beach. The shoreline has experienced

critical erosion for 12.5 miles from Anaheim Bay to Newport Beach Pier requiring periodic sand replenishment to maintain the beaches for recreation.

A 2-mile stretch along Capistrano Beach is also classified as critically eroding. Only 1.6 miles of the county coast is classified as non-eroding; the remaining 26.1 miles is classified as non-critically eroding. An additional shoreline feature, the Newport Submarine Canyon, is thought to capture beach sands that would normally redeposit on the coast. This situation heightens the need for beach sand replenishment activities.

Newport Bay:

One of the most remarkable features of the coast is Newport Bay. Really two distinct forms, Lower and Upper Newport Bay are also dissimilar in development. Lower Newport Bay, a product of vast quantities of sand deposited by the Santa Ana River in the last century, parallels the coast for about 3 miles. It contains several large and small islands, is extensively bulkheaded to protect property from tidal fluctuations, and is one of the largest small craft harbors in the world, with anchorage for over 8,000 boats.

Upper Newport Bay, a three-mile expanse, is an incised valley of the San Diego Creek drainage system, predating the pleistocene epoch. The surrounding 40 feet to 100 feet bluffs are well

developed with residential neighborhoods. The lower part of the estuary is also developed with marina facilities, an aquatic park and other land uses. Most of it, however, remains in a relatively natural state with three large marshy islands and extensive mudflats. This portion of the bay is part of an ecological reserve at the point where San Diego Creek enters the bay.

COASTAL PLAIN, HILLS, AND MOUNTAINS

The low coastal plain, devoid of interesting landforms except for the coastal area and the Santa Ana River, contrasts with the adjoining hills, mountains, and canyons. "Saddleback," the twin-peaked heights of the Santa Ana mountains, is the signature landmark of Orange County.

Besides the dominant ridgeline of the Santa Ana Mountains, major ridgelines occur in the Lomas de Santiago and the San Joaquin Hills. Numerous canyons and valleys of great beauty occur, including the Santa Ana Canyon, Capistrano Valley, Laguna, Aliso, Wood, Moro, San Juan, Trabuco, Santiago, Modjeska, Silverado, Limestone, and Black Star Canyons, to name just a few. Rock outcroppings as in the Laguna Canyon and geologic formations such as the Sinks and Fremont Canyon add interest to the relatively undeveloped landscape.

WATERSHED, WATERCOURSES, AND FLOODPLAINS

Watershed:

Watershed is defined as the area drained by a given stream. Beginning at the sea outlet and working back upstream, the divides between major watersheds can be derived. Some natural watershed areas in Orange County have been altered to drain elsewhere through the use of flood control projects.

The Santa Ana River watershed is the most extensive in Orange County, running through a three-county area from its headwaters in the San Bernardino Mountains to its outlet in the Pacific Ocean. Santiago Creek and its tributaries form a major tributary to this watershed. Surprisingly, most of western Orange County is not drained by the Santa Ana River but by a series of flood control channels which empty into Coyote Creek, the San Gabriel River, or the estuaries and coastal waters. Two other large watershed areas are San Juan Creek with its tributary, Trabuco Creek and San Diego Creek which drains a major portion of central Orange County into Upper Newport Bay. The Aliso Creek watershed, though extending for nine miles, is relatively confined in area. The Laguna Canyon watershed and others along the coast are still smaller.

Watercourses:

Dendritic in appearance, county watercourses range from the merest trickling stream to the Santa Ana River. Nearly all are intermittent, flowing mostly in the rainy winter months. Deep in the Cleveland National Forest there are a few springs that run year round; there is generally a trickle in the Santa Ana River in summer in its upper reaches.

Many County watercourses have been altered, most notably the Santa Ana River which was given a definite and direct outlet to the sea in 1920 instead of its meandering outlets which have ranged from Anaheim Bay to Lower Newport Bay. Many watercourses have been straightened and fortified with sand levees or concrete channels for flood control purposes. Most of the larger watercourses have been left with unlined stream bottoms to maintain the capacity for water absorption (groundwater recharge) or aesthetic values.

Along the upper reaches of many streams, reservoirs and dams have been constructed among the largest Irvine Lake, Villa Park, Carbon Canyon, Fullerton, and Brea Dams. Other alterations include the extraction of sand and gravel, which have resulted in large open pits in need of rehabilitation.

Floodplains:

It is normal for watercourses to periodically overflow their stream beds, and, in Orange County, historical records show flooding over substantial portions of low-lying Western Orange County by the Santa Ana River.

Following the construction of Prado Dam, destructive floods with loss of life and severe damage, such as occurred in 1938, have been prevented.

In spite of numerous improvements to the Santa Ana River Channel and a network of flood control facilities, the floodplain of the Santa Ana River remains the same and can expect to be subject to a standard project flood (statistically occurring approximately every 200 years) that will inundate the cities sited on the floodplain.

Other floodplains less extensive in size and confined by topography, present a potential for causing property damage under flood conditions. These floodplains include Santiago Creek; Modjeska and Silverado Canyons; San Diego Creek; Peters Canyon Wash; Laguna, Aliso, Brea, Tonner and Carbon Canyons; and San Juan, Oso and Trabuco Creeks.

Future Prospects

Landforms, simply by their nature, continually undergo alteration by natural or man-made forces. Though no formal landform management program exists, many

programs do provide management, conservation, protection, and preservation of the natural environment in the public interest.

HILLSIDES

The County's Grading Ordinance strictly regulates hillside grading with regard to soil stability. Cut and fill slopes are generally limited to a ratio of two horizontal to one vertical. It provides for erosion control measures at the time of development.

Through the Flood Control District, drainage requirements are assessed in a number of Master Plans of Local Drainage. Grading and drainage requirements for streets and highways are the responsibility of the County and the California Department of Transportation (CalTrans).

At the County level, hillsides and other landform resources (e.g. watercourses) are addressed through community and corridor planning activities. These efforts are conducted at a scale appropriate for each resource concern, such as the Aliso Creek Corridor Specific Plan which encompasses the creek's entire watershed.



shoreline issues.

SHORELINE

Approximately two-thirds of the County shoreline is in public ownership with the prospect of additional miles of beach frontage being placed in public ownership in the near future. The Coastal Act, implemented in Orange County through Local Coastal Programs (LCPs), establishes resource management plans and programs for the County's shoreline. LCPs also regulate private development near and along the shoreline in accordance with Coastal Act objectives. The U.S. Army Corps of Engineers also participates in shoreline facility construction and management efforts and studies beach erosion and other

WATERCOURSES, FLOODPLAINS, AND WATERSHED

The Orange County Flood Control District is empowered to control the flood and storm waters of the district and to conserve water for beneficial use. Since its formation in 1927, the powers of the Flood Control District have been enlarged by the State legislature. These additions now empower the district to utilize its works for recreation purposes, to acquire additional lands for environmental enhancement, to test and monitor the quality of water in its work, and to purchase and reclaim water for beneficial

use.

The County's watershed projects utilize a partnership effort between local agencies and the U.S. Army Corps of Engineers (the "Corps") through a three phase watershed program. The County has entered into agreements with the Corps for three watersheds: Aliso Creek, San Juan Creek and the Newport Bay-San Diego Creek. In the first phase (or the "Reconnaissance"), information about the subject stream is collected by the Corps to determine if further study is in the federal interest. This phase is 100% funded by the Corps of Engineers.

The second "Feasibility" phase identifies what additional study information is required to respond to perceived problems in the watershed. Specific products include a programmatic Environmental Impact Statement and a proposed Watershed Management Plan. This phase is cost-shared with the federal government paying half and the local agencies paying half of the total cost.

The third "Project" phase delivers the watershed improvements and includes supplemental environmental documentation, plans and specifications, facility congressional approval and also cost-shared with the federal government paying 65% and the local agencies paying 35%.

In addition, the County participates in two watershed study projects on the Upper Santa Ana River as part of its interests in water

supply and water quality of the river and the operations of Seven Oaks Dam and Prado Dam.

SCENIC AREAS

Orange County, with its varied topography and proximity to the ocean, abounds in scenic areas. From its signature landmark, Saddleback in the Santa Ana Mountains, to its ocean view of Santa Catalina Island, the County offers a variety of unique visual opportunities. The development of state, regional, and local parks to take advantage of these opportunities is continuing.

The County also applies sign restriction zoning in most of its planned communities and on its major arterials to assure that scenic views are maintained. The Scenic Highways Component of the Transportation Element also provides preservation measures to assure scenic views.

The ocean views from state highways also require special consideration in Local Coastal Programs. However, the preservation of scenic vantage points (visual access) has been limited to a few turnouts, along Ortega Highway, Chapman Avenue, and Santiago Canyon Road, and parks on the coastal bluffs at San Clemente and Corona Del Mar State Beach Parks, Dana Point, and Laguna Beach.

GOALS, OBJECTIVES & POLICIES: *Natural Resources Component*

Goals & Objectives

Goal 1

Protect wildlife and vegetation resources and promote development that preserves these resources.

- ***Objective***

- 1.1 To prevent the elimination of significant wildlife and vegetation through resource inventory and management strategies.

Goal 2

Promote the wise management of agricultural and mineral resources in order to protect these resources for existing and future needs.

- ***Objectives***

- 2.1 To reduce dependence on imported resources through sound management of local mineral lands.
- 2.2 To enhance the conservation of agricultural resources through sound management of local agricultural lands.

Goal 3

Manage and utilize wisely the County's landform resources.

- ***Objective***

- 3.1 To minimize to the extent feasible the disruption of significant natural

landforms in Orange County.

Policies

1. WILDLIFE AND VEGETATION

To identify and preserve the significant wildlife and vegetation habitats of the County.

2. AGRICULTURE

To encourage to the extent feasible the preservation and utilization of agricultural resources as a natural resource and economic asset.

3. MINERAL RESOURCES

To ensure the efficient use of all mineral lands consistent with sound resource management practices.

4. MINERAL EXTRACTION

To ensure opportunities for the extraction of minerals in the County and to protect the environment during and after these minerals are being extracted.

5. LANDFORMS

To protect the unique variety of significant landforms in Orange County through environmental review procedures and community and corridor planning activities.

IMPLEMENTATION

PROGRAMS: *Natural Resources*

Component

The Natural Resources Component is closely related to the Energy Resources, Water Resources, and Open Space Components contained in this Element. An important relationship exists between the conservation of energy and water resources and the efforts to reduce air pollution. The conservation and protection of natural resources has a direct effect upon the open space pattern in Orange County. Because of the interrelationships, the implementation programs found in this component are intended to complement other County resource management policies and programs relating to unique and vital air and land resources.

Taken as a whole, the implementation programs within this component and other Resources Element components provide a comprehensive resource management strategy for Orange County.

1. SURFACE MINING AND RECLAMATION ACT (SMARA) IMPLEMENTATION

Action:

Implementation of SMARA through policy, regulatory, and administrative action.

Discussion:

SMARA, enacted in 1975 by the State of California, provides for mineral resource management activities at the local level. The act establishes mining

operation and reclamation requirements and a statewide resource inventory and classification process (See Mineral Resources).

Implementation of SMARA promotes both the conservation and sensitive development of mineral resources particularly sand and gravel resources, within Orange County.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- State Department of Conservation

Source of Funds:

- County General Fund (including development fees)
- State of California

2. AGRICULTURAL PRESERVATION PROGRAM

Action:

Evaluate the establishment of an Agricultural Preservation Program to mitigate the long-term impact of agricultural preserve contract cancellations and to provide economic and technical assistance to County agricultural activities. Specifically, the program would establish a trust which could be used for grants, loans, research, and other appropriate items related to agricultural resources. The trust would be funded by contributions from agricultural preserve contract



cancellation proponents. Tentatively, the proposed preservation program

This trust would be augmented by any available Federal and State assistance.

Discussion:

The proposed Agricultural Preservation Program provides an excellent mitigation to the adverse impact of agricultural preserve contract cancellations upon County agricultural activities. In addition, one of the required findings for cancellation approval is that the cancellation is not inconsistent with the purposes of the Williamson Act. Proponent contributions to an agricultural preservation program has clearly assisted in supporting this finding on recent cancellations.

would require between \$25 to \$30 per acre of agricultural preserve cancelled.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- 1) Establishing Program: RDMD
County Agricultural Commissioner,
State Dept. of Conservation,
Federal Soil Conservation Services
Farm Bureau.
- 2) Program Implementation: RDMD;
or committee with landowner,
County and farming interest
representation.

Source of Funds:

- 1) Landowner Fees
- 2) State and Federal Funds

3. AGRICULTURAL PRESERVE MANAGEMENT

Action:

Continue maintenance of existing agricultural preserve contracts between

landowners and the County of Orange.

Discussion:

As discussed in the Agricultural Resources section, a substantial amount of land within Orange County is in agricultural preserve status. The amount of land under contract, however, will continue to decrease in the future because of non-renewal actions by landowners and city annexations.

Unless there is a policy change as a result of the study of agricultural preserves required by the County Housing Element or other actions (e.g., to provide surplus land for housing or other needs), this program focuses on the maintenance of existing agricultural preserve contracts.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds: County General Fund

4. OAK RESOURCES MANAGEMENT PROGRAM

Action:

Evaluate a resources management program for the preservation and maintenance of valuable oak woodland resources in Orange County.

Discussion:

Native oaks constitute a significant natural resource in Orange County.

Significant commitment has been made towards preserving valuable oak woodland areas through regional park and open space acquisitions. This program involves the examination of additional mechanisms to preserve and maintain oak resources.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency:

- RDMD

Source of Funds:

- Harbors, Beaches and Parks District
- County General Fund

5. NATURAL COMMUNITIES CONSERVATION PLANNING PROGRAM (See Chapter III, Land Use Element, Implementation Program No. 5)

ENERGY RESOURCES COMPONENT

Introduction

The importance of energy resources has been made clear in recent years as a result of increases in the price of energy, the state and national interests in reducing dependence on

foreign energy sources, and increasing concern with the environmental impacts associated with traditional energy sources such as coal. In response to these factors, energy conservation through both reductions in energy use and the development of energy efficient technology has emerged as an important substitute for energy resource supplies. In this section, an overview of the county's energy resource supply and consumption trends is provided through:

- 1) An identification of County energy resources;
- 2) A description of existing and future Countywide energy consumption characteristics; and
- 3) A description of energy consumption by sector (e.g., residential).

In general, there is a projected decrease in supply of and a projected increase in demand for traditional energy resources for Orange County. The fundamental factors underlying the projected decrease of traditional energy supply sources are of national and statewide scope; however, there are also significant contributions which can be made by local government.

Alternative energy sources, which can provide for at least part of the County's future sources, which can provide for at least part of the County's future needs should be investigated and developed. Since unlimited supply and availability can no longer be assumed, energy considerations now need to be evaluated along with the other factors that enter into the formulation of County policies

and decisions and the development of resource conservation implementation programs contained in this Element.

County Energy Resources

Although Orange County does not have sufficient energy resources to meet its own needs, the County does have significant existing and potential energy resources within its boundaries. The County's energy resources, illustrated in Figure VI-6, are divided into two major categories: petroleum resources and renewable resources.

Economic deposits of other energy-producing minerals such as uranium and coal have not been identified in Orange County.

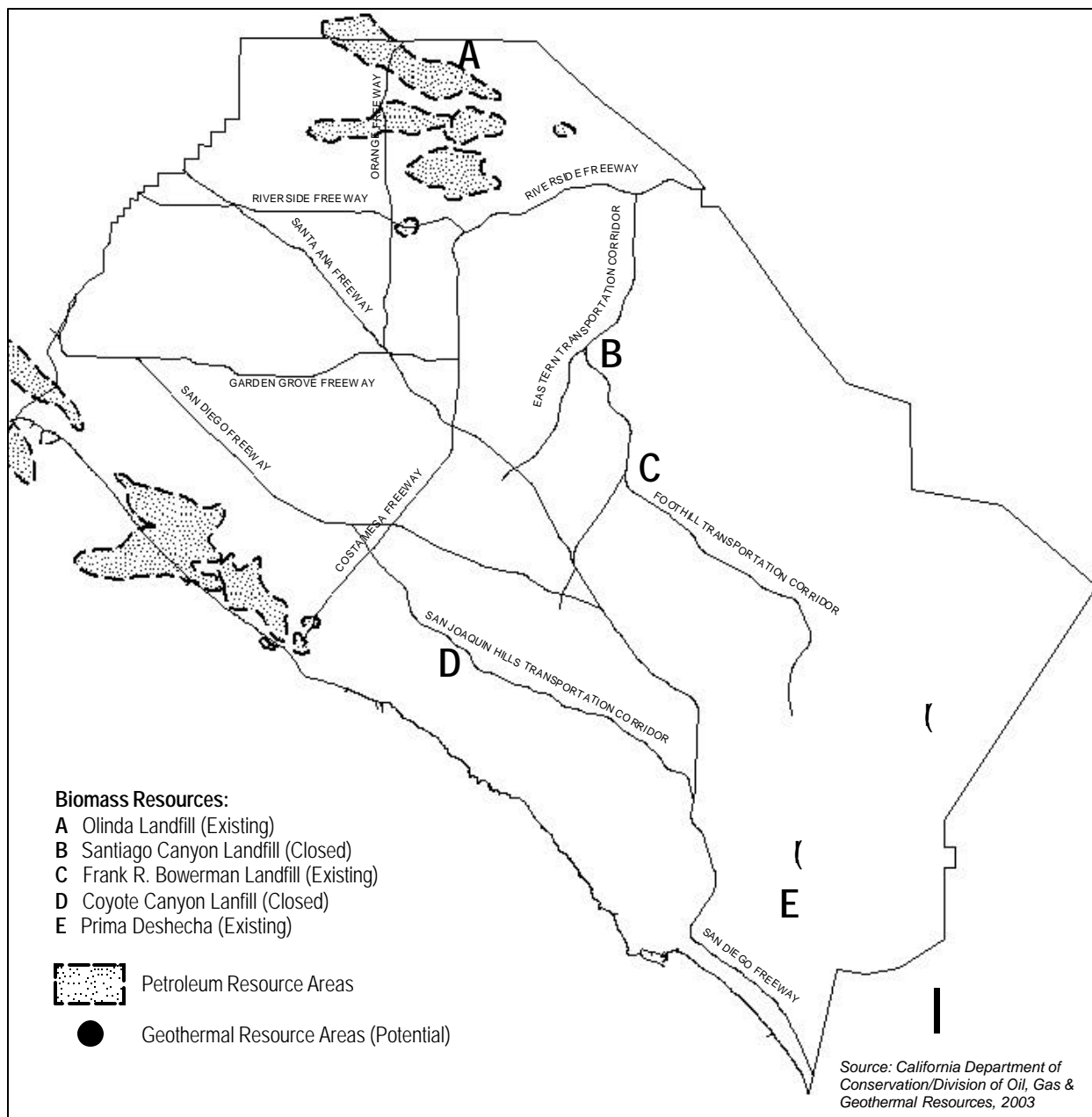
PETROLEUM RESOURCES

Orange County's petroleum resources are in the form of oil and natural gas deposits. These two non-renewable resources are formed through a slow geologic process and are found at various sites throughout Orange County. The primary petroleum resource areas of the county are Huntington Beach, Newport Beach, Seal Beach and the Brea/La Habra foothill regions.

Figure VI-6

CHAPTER VI. RESOURCES ELEMENT

Figure VI-6



ORANGE COUNTY ENERGY RESOURCES Generalized

Oil and gas in Orange County are associated with a number of sub-surface geologic structures in the Los Angeles sedimentary basin. The on-shore fields are aligned with the Newport-Inglewood and Whittier fault zones which have facilitated the entrapment of petroleum resources.

Oil extractions which began in 1897 in Orange County, have been declining on the whole over the past decade due to depletion of the fields. A secondary recovery phase is underway in most fields where production is stimulated by a waterflooding program.

This secondary phase is expected to last 10 years, during which annual production will be similar to that of the initial phase. At the end of that phase, when production is no longer economically feasible, it has been estimated that as much as 50 percent of the resource may still be unrecovered. Within the next 10 years, technological advances may make additional recovery phases economically feasible.

There are presently four major categories of petroleum operations in Orange County. They are:

- 1) *On-shore - Conventional:* vertical wells, distributed evenly about the field, each well equipped with certain treatment facilities, storage or shipment lines, pumping units.
- 2) *On-shore - Directional:* wells grouped into drill sites for economy, physical and land use restrictions, engineering

considerations; equipment concentrated in relatively small areas leaving surface available for other use; more expensive to drill than vertical hole; limitations to degree of deflection but may extend a mile horizontally from surface site.

- 3) *Off-shore - Man-made Island:* fill islands in shallow water (up to 45 feet) with directionally drilled wells, connected to shore with submarine production and supply lines, mobile drilling rigs.
- 4) *Off-shore - Fixed Platform:* in relatively shallow water (up to 300 feet) for economic reasons, directionally drilled wells, production and maintenance facilities on platform, submarine production and supply lines.

Petroleum resource development is regulated by numerous federal, state, and local regulations. In general, federal agencies are concerned with petroleum operations on federal lands. The State of California is concerned with coastal areas and environmental protection (e.g., water quality), and the County enforces the local Oil and Zoning Codes which regulate oil and gas production operations. However, since federal and state laws are constantly evolving in the area of petroleum resources, a detailed discussion of appropriate statutes and regulations regarding petroleum resources would quickly become outdated. Therefore, such laws and regulations are monitored and implemented by County staff on an ongoing basis (rather than defined

within this text).

RENEWABLE RESOURCES

This category of energy resources includes solar, wind, biomass, and geothermal resources. At the present time, these resources do not comprise a significant portion of the County's energy supply. These energy resources, however, have considerable potential and can be developed as both substitutes for oil, natural gas, and other energy supplies used for electricity generation and to reduce consumption of these supplies.

Solar Energy

Solar radiation in the form of sunlight can be utilized for energy production in two ways. The first method, active solar systems, involves the use of mechanical devices to convert solar energy to heat or electricity. The second, passive solar systems, utilizes natural heating and cooling from the sun through proper orientation and building design. For the purposes of the following discussion, it is assumed that the amount and quality of solar radiation received by the county will be adequate for the use of solar technologies.

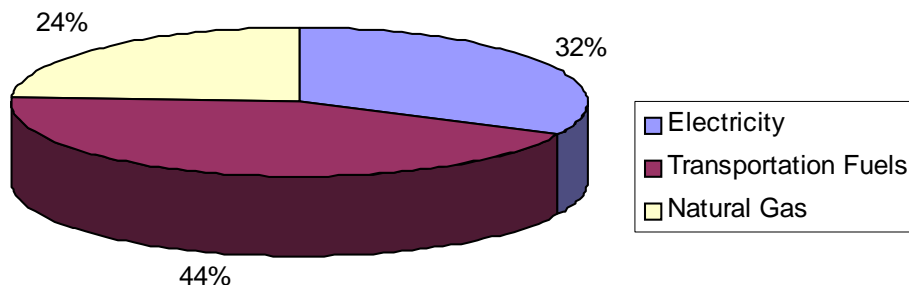
Active Solar Energy Systems:

- **Solar Water Heating:** Solar water heating systems involve the use of solar collectors and storage tanks to heat domestic water. Solar water heating systems can provide 60 to 80 percent of the hot water demands for a household

and are generally supplemented with a natural gas or electric system. Water heating is one of the more common uses of solar energy.

- **Solar Space Heating:** Solar space heating is most commonly used in new residential dwelling units, although some retrofitting of existing structures has occurred. Generally, space heating systems utilize solar collectors to collect heat which is then stored in a rockbed. Heated air is then drawn into the existing gas furnace, as necessary.
- **Solar Swimming Pool Heaters:** Solar heating systems are utilized for pool heating either singly or in conjunction with natural gas pool heaters. The technology is very similar to solar water heating except that, because of the lower heat requirements, simpler and, consequently, less expensive solar collectors are utilized.
- **Photovoltaic Systems:** Photovoltaic (PV) solar systems convert sunlight to electric energy through the use of a solar cell array. PV systems can be utilized for either small scale applications (residential structure) or for centralized power generation. The primary emphasis at this time, however, is to continue research and development programs which are intended to make PV costs competitive with other energy supplies.

**CHART VI-1:
Countywide Energy Consumption**



* The electricity category includes the consumption and loss of energy resources by the conversion and transmission process.

Source: California Energy Commission

Passive Solar Energy Systems:

- ***Swimming Pool Covers:*** A plastic or fiberglass cover placed over a swimming pool surface can reduce heat loss. Studies have shown that pool covers can result in a 91 percent reduction in natural gas use when utilized in conjunction with solar pool heaters.
- ***Passive Heating and Cooling:*** Passive space heating systems are generally comprised of two features. First, southern exposure and glazing of the structure is provided. Second, storage device, such as rock beds, are utilized to store heat.

Passive cooling is generally the result of proper shading strategies. Roof overhangs and insulated shutters and drapes protect a structure from excess heat absorption while vents provide natural cooling through day and night breezes.

Wind Energy:

Like solar energy, wind energy has been used for centuries to provide for many human needs. For electricity generation, the wind's energy drives a rotor which then powers an electric generator. Rotors are generally constructed of two or three blades mounted on a tower.

CHAPTER VI. RESOURCES ELEMENT

Geothermal Resources:

Geothermal fuels can replace conventional fuels in many space heating and cooling and agricultural applications as a direct use energy resource. Geothermal resources can also produce electricity through the use of geothermal steam to run turbines. Because of this versatility, geothermal resources can play an important role in meeting future energy demands.

California has numerous sites which have been identified as geothermal resource areas. In Orange County, the only potential geothermal sites are in Huntington Beach and at the hot springs in Trabuco Canyon. Presently, none of these areas are being utilized for geothermal extraction activities.

Biomass Resources:

Biomass resources refers to organic materials, either wastes, residues, or specific crops, which can be converted to an energy resource. Biomass can be converted to an energy fuel to replace conventional sources or directly used in combustion processes. Several local sources of biomass exist in Orange County. These include:

- Solid waste
- Existing landfills
- Certain high yield agricultural crops
- Agricultural and wood residues

These sources can produce gaseous fuel, heat/steam process electricity, and liquid fuels through either a microbiological or thermochemical conversion process. As

stated above a variety of energy fuels can be provided from biomass. The specific products are described below:

- Methane gas
- Ethanol and methanol (alcohol fuels)
- Steam and high temperature heat through direct combustion
- Oil and natural gas through pyrolysis
- Synthetic fuels

Existing and Projected Consumption Patterns

The following section describes the general consumption patterns for the three major categories of energy supplies in Orange County:

- 1) Electricity
- 2) Natural gas
- 3) Transportation fuels

Both existing patterns and projected consumption estimates are provided for each energy supply category. A general breakdown of countywide energy consumption in these three areas is provided in Chart VI-1.

ELECTRICITY

The Southern California Edison Company (SCE) provides electricity to most of Orange County, with San Diego Gas and Electric (SDG&E) providing electric service to about six percent of the households in the southern portion of the County (Capistrano Valley/San Clemente Foothill region).



The California Energy Commission (CEC), in their “1998 Baseline Energy Outlook”, estimated that in 1997 Orange County consumed approximately 19,110 gigawatt hours of electricity. Additionally, the CEC forecasted electricity consumption to grow at an average annual rate of 1.58 percent, reaching 22,128 gigawatt hours in 2007.

Electric generation located in Orange County is owned by Southern California Edison, Los Angeles Department of Water and Power, the City of Anaheim, and various smaller producers who sell their power back to Edison. Future electrical demand will require an expansion in the present electrical system capacity to meet the projected demand.

In contrast to other county energy supplies such as natural gas, electricity is produced through the consumption of other primary resources. Since almost two-thirds of the energy input is lost in the transmission or

production process, electricity is also a major consumer of energy in addition to providing energy. This is an important consideration in examining future supply sources for electricity generation.

NATURAL GAS

The only supplier of natural gas in Orange County is the Southern California Gas Company (SCG). SCG currently receives over 90 percent of its supply from out-of-state sources.

Existing supply considerations are complicated by the fact that natural gas is distributed according to priorities established by the State Public Utilities Commission. The highest priority is residential use with utility steam generating plants being the lowest priority. Thus, in many ways, the County's natural gas supply is a function of pricing and distribution regulations and not production rates. However, the diminishing supply of natural gas in the state is an

important consideration in examining future demand.

TRANSPORTATION FUELS

Petroleum (crude oil) is the primary source for Orange County's transportation fuel supply. Transportation fuels are generally refined in the Southern California area. Of each barrel of crude oil refined, 43 percent is converted to gasoline while 5 percent is used for diesel fuel. The remainder is used for commercial and industrial petroleum products.

Southern California refineries process about one million barrels of crude oil each day (SCAG, 1982). The major sources of the local supply are Alaska and California (including Orange County) oil fields. Although oil reserves in both of these states provide an adequate supply for Orange County's needs, the existing transportation fuel supply must be considered in the context of international, federal, and state supply conditions. Any disruption of international or domestic oil supplies would eventually affect the availability of oil to California and, subsequently, Orange County.

Energy Resource Utilization by Sector

A discussion of energy utilization by each sector of Orange County's economy is provided below. The following discussion provides the context for analyzing specific energy consumption patterns and evaluating conservation opportunities within each

sector.

Residential Sector:

The residential sector comprises almost 90 percent of all electrical customers in the County but consumes only 33 percent of the total County energy demand. Residential electrical consumption increased 1 percent annually from 1990 through 1998 despite increased energy conservation efforts.

Like electrical consumption patterns, over 90 percent of all natural gas customers are in the residential sector. In contrast to electricity consumption, however, the residential sector accounted for over half of the total natural gas consumption for Orange County in 1998. Most of the residential natural gas demand is for space heating, although water heating and cooking are also important.

Commercial Sector:

The commercial sector includes retail activities, office/professional uses, government activities, and agricultural production. Although the commercial sector comprises approximately 11 percent of all electrical customers in the County, it consumes over 53 percent of the total electrical demand. Commercial sector electrical demand increased at an average rate of 2.4 percent annually from 1990 through 1998. Most of the electrical use in the commercial sector is devoted to office lighting and cooling.



The commercial sector comprises less than 5 percent of the natural gas customers in

Orange

County. This sector, however, accounts for over 15 percent of existing natural gas consumption with total consumption increasing at an annual average rate of 1.4 percent per year. As with the residential sector, space heating is the largest natural gas end-use for the commercial sector.

Industrial Sector:

The industrial sector comprises only about one percent of electrical customers in the County. In contrast, the industrial sector consumes almost 15 percent of all the electricity used within the County. Consequently, the industrial sector has the highest electrical demand per customer of the three stationary sectors (which excludes transportation).

This sector comprises less than one percent of all natural gas customers yet consumes 15

percent of the total amount used. Industrial sector natural gas consumption has been declining annually since 1990.

Transportation Sector:

The two major users of transportation fuels in Orange County are private automobiles and commercial vehicles. Gasoline consumption has increased at a 9.7 percent annual rate since 1990 as a result of the increase of vehicle miles traveled (VMT) within the county.

GOALS, OBJECTIVES AND POLICIES: *Energy Resources Component*

This section presents three general goals for Orange County energy resource planning and management efforts. These goals and their objectives provide guidance for the

specific policies and implementation programs. Certain recommended policies and programs are based upon existing resource management activities (i.e., AQMP) which are referenced when appropriate.

Goals and Objectives

Goal 1

Maximize the conservation and wise use of energy resources in all residences, businesses, public institutions, and industries in Orange County.

- ***Objective***

- 1.1 Achieve a reduction in projected per capita energy demand and consumption by the year 2005.

Goal 2

Encourage the utilization of existing energy resources to their highest potential and the development of alternative energy sources consistent with sound energy conservation practices and techniques to meet the County's future energy demand.

- ***Objective***

- 2.1 Encourage the efficient development of local energy resources to supply a portion of the County's energy demand through the year 2005 in a manner which protects the environment.

Goal 3

Maximize the conservation of energy resources in all future land use and transportation planning decisions.

- ***Objectives***

- 3.1 To achieve target residential densities along transportation corridors and in urban activity centers as set forth in the Air Quality Management Plan (AQMP).
- 3.2 To reduce transportation demand by establishing balanced communities that provide housing, employment, recreational, and cultural opportunities for all segments of the population.
- 3.3 To maintain a community leadership role with respect to conservation of nonrenewable resources and assist existing utility conservation programs.

Policies

1. LAND USE

To plan urban land uses with a balance of residential, industrial, commercial, and public land uses as set forth in the Land Use Element.

2. ENERGY RESOURCE DEVELOPMENT

To encourage and actively support the efficient use and optimum development

of energy resources in the County consistent with sound resource management practices.

3. **ENERGY CONSERVATION**

To encourage and actively support the utilization of energy conservation measures in all new and existing structures in the County.

4. **TRANSPORTATION**

To provide incentives for transportation system management programs and support regional public transportation programs that reduce energy consumption.

5. **ENERGY FINANCING**

To examine the benefits of local government financing programs that promote energy conservation and development through cooperative public/private efforts.

6. **ALTERNATIVE ENERGY SYSTEMS**

To encourage the use of alternative energy systems and, to the extent feasible, remove the regulatory barriers to their implementation.

7. **SOLAR ACCESS**

To support and encourage voluntary efforts to provide solar access opportunities in new developments.

IMPLEMENTATION

PROGRAMS: *Energy Resources Component*

The following section identifies existing and potential energy resource programs for Orange County. These programs range from the continuation or refinement of existing programs to the establishment of new programs.

Since adoption of any of these programs requires that implementation considerations are addressed and implementation responsibilities are identified, the remainder of this section focuses on a description of each program and the delineation of responsible agencies. This provides a sound basis for the future implementation of energy resource programs.

1. COUNTY FACILITIES ENERGY MANAGEMENT

Action:

Continue and expand the existing energy conservation program for County buildings and facilities.

Discussion:

The County has derived significant cost savings from its in-house energy management efforts. This program would support these existing efforts and support additional activities, including energy audits and installation of energy

CHAPTER VI. RESOURCES ELEMENT

saving features for County buildings.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency:

- RDMD

Source of Funds:

- County General Fund
- Utilities

2. ENERGY SHORTAGE CONTINGENCY PLANNING

Action:

Continue efforts to monitor energy supply trends and develop a plan which promotes an orderly response to energy shortages.

Discussion:

This program involves the preparation of a plan to deal with any sudden or unforeseen disruptions in energy supplies (e.g., oil embargo).

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency:

- County Executive Office

Source of Funds:

- County General Fund
- State Energy Commission

3. COUNTY ENERGY MANAGEMENT PLAN

Action:

Improve existing County energy resources management efforts through the development of a comprehensive energy management plan that provides a long-term strategy for meeting the County's future energy needs.

Discussion:

Although existing County energy conservation programs are effective, they are generally limited or narrow in scope and do not provide an integrated, consistent energy strategy. In order to be effective, an energy management plan must be developed in cooperation with utilities and other interested parties and would consist of the following components:

- 1) **Energy Resource Development:** A more detailed evaluation of energy resources and their potential will be undertaken along with a development program.
- 2) **Commercial and Industrial Sector Programs:** An evaluation of co-generation and other energy conservation opportunities will be undertaken for potential application to the commercial and industrial sections, including County facilities. This evaluation will be conducted in cooperation with utilities and local businesses.
- 3) **Residential Sector Programs:** Since the existing State building

energy standards ensure energy savings in new residences, this component would focus on existing residential buildings and the opportunities for increased energy savings within these residences.

- 4) *Transportation Sector:* This program would involve a cooperative evaluation of transportation system management opportunities in the County.
- 5) *Energy Conservation Financing:*
An evaluation of the various financing alternatives available for energy conservation and resource development.
- 6) *Implementation Plan:* A comprehensive implementation plan for energy management would be developed. This implementation plan would support and augment existing utility energy management activities and emphasize voluntary conservation measures and the development of local energy resource supplies.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- County General Fund
- Community Development Block Grant Fund

- County Waste Enterprise Fund
- State Energy Commission

4. COMMUNITY ENERGY EDUCATION

Action:

Support the community energy education efforts of utilities and other agencies through public information activities.

Discussion:

This program is intended to increase the community's awareness of the need for energy conservation and provide educational assistance to residences and businesses.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- County General Fund
- Utilities
- State Energy Commission

WATER RESOURCES COMPONENT

Introduction

Orange County's economy and quality of life are dependent upon an adequate and dependable supply of water. The increasing demand, coupled with limited availability

CHAPTER VI. RESOURCES ELEMENT

and declining water quality, has made the planning and management of water resources indispensable.

The interrelationship of water resource supply and use is complicated by natural forces as well as the multitude of agencies that have been formed to develop and protect this essential resource.

County Water Resources

Prior to the turn of the century, precipitation, the Santa Ana River, and shallow supplementary wells were the principal sources of water for the County. The extensive tapping of groundwater resources in order to support irrigated agriculture and population growth permitted saltwater intrusion in some coastal areas which prompted the need for imported water supplies. The County is now dependent on a water resource network comprised of both local and imported supplies. The general relationship between precipitation and local and imported water sources is illustrated in Figure VI-7 and described more fully below.

Throughout this section, the term acre-feet of water will be used as a unit of measurement for water resources. An acre-foot of water, abbreviated AF, is that quantity of water that would cover an acre of land to the depth of one foot. Table VI-3 provides additional comparative water volume data.

TABLE VI-3

1 acre-foot	= 43,560 cubic feet or 325,900 gallons
1 million gallons	= 3.07 acre-feet
1 million gallons/day (MGD)	= 1,120 acre-feet/year

Local Resources

A large portion of northern Orange County is underlain by a groundwater basin (or aquifer) which is primarily supplied by the Santa Ana River watershed as depicted in Figure VI-8. The groundwater basin acts as a huge water storage facility. When water is available, it is percolated or directly injected into the aquifer. When water is needed, it is pumped out and piped to various destinations. The Santa Ana River channel between Katella Avenue and Imperial Highway is typically a wide, sandy bed. This reach is the principal groundwater recharge area for the Basin.

Other Orange County streams provide some additional water supply. Santiago Creek, San Diego Creek, San Juan Creek, and Aliso Creek drainage systems have permeability and percolation rates that vary widely, although they are significantly smaller in scale than the basin underlying the Santa Ana River.

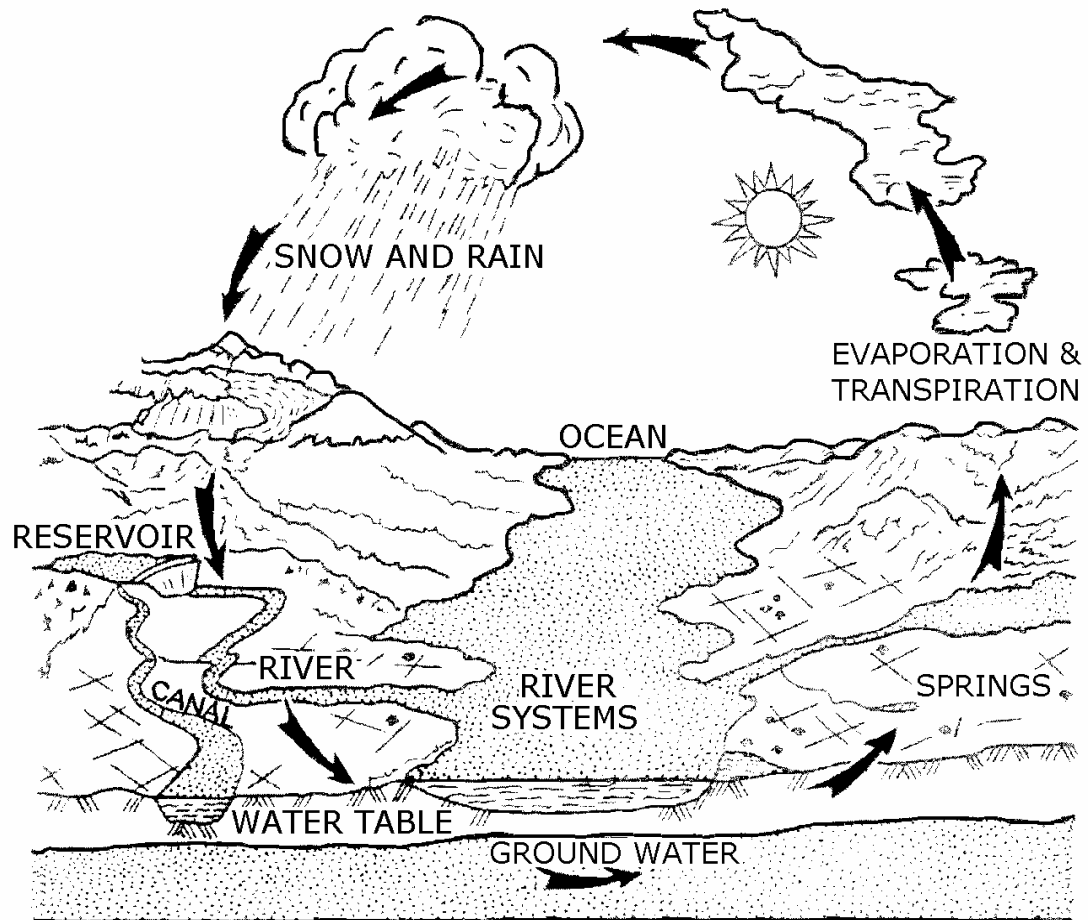
Management of a groundwater basin is a complex and expensive task. The Orange County Water District (OCWD) is responsible for the management of the Orange County Groundwater Basin. By capturing natural Santa Ana River flows,

intermittent storm run-off, reclaiming treated wastewater and purchasing imported water, OCWD protects the quantity and quality of the natural underground reserves.

With respect to other groundwater basin development opportunities, the San Juan

Figure VI-7

Figure VI-7



ORANGE COUNTY WATER RESOURCE SOURCES
Hydrology Cycle

Creek depicted in Figure VI-8 is also a valuable asset to local water resources. The natural safe yield of its groundwater basin is about 15,000 AF per year with the potential for additional groundwater storage. Programs for additional utilization of the San Juan Creek Basin are being implemented and developed by the San Juan Basin Authority, a joint powers agency created in 1971 to manage the groundwater basin.

It is important to note that local water resources are made up of a combination of groundwater and imported supplies combination of Colorado River water and water from northern California. Dependence on imported supplies can be reduced however, by augmenting local water resources with cost-effective local development projects such as water reclamation. The use of reclaimed water on large greenbelt areas (parks, golf courses, cemeteries, street medians, etc.) reduces the need for limited and costly imported potable supplies.

Water efficiency programs will play an increasing role in the future of Orange County. Through improvements in landscaping technology combined with new in-home low-flow products and a greater public awareness of water as a scarce resource, the quality of life in the County can be maintained while the per capita water demand is reduced.

Imported Resources

Viewed as a unit, Orange County is heavily dependent upon imported water. Just 44 percent of the county's Municipal and Industrial (M&I) demand is currently met by local resources. This fits into a pattern of increasing reliance upon imported water. For this reason, the County's supplies will, in the foreseeable future, continue to be tied to those of the Metropolitan Water District of Southern California (MWD), the master wholesaling water agency for imported water supplies. MWD supplies the imported water demands of most of its member agencies from two sources: the Colorado River and State Water Project.

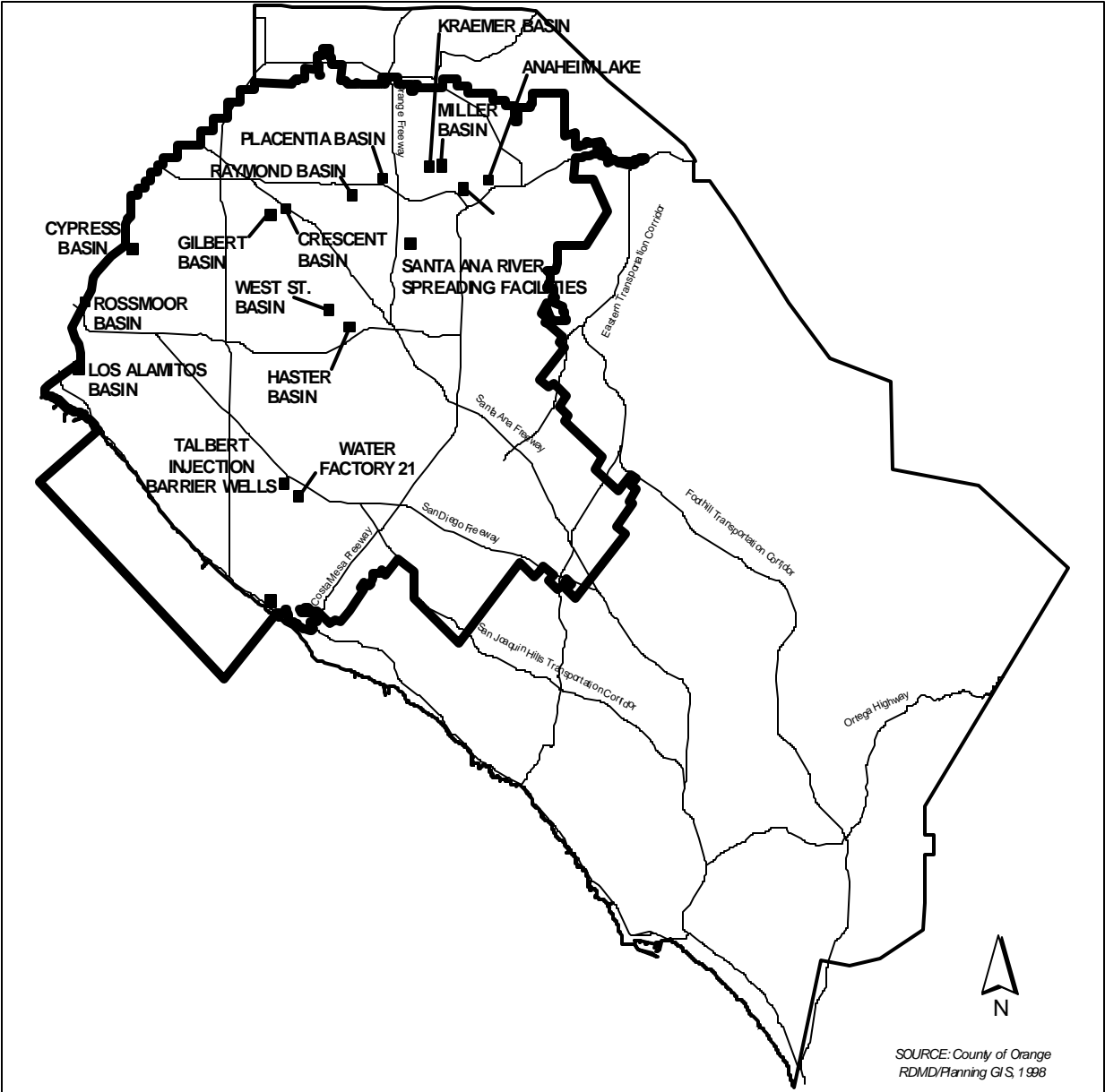
However, due to cutbacks on the Colorado River, the State Water Project, along with Federal and State water policies in disarray, could experience a shortfall exceeding 100,000 acre-feet per year. Fifty six percent of Orange County's water supply comes from outside the County. One-third of Orange County's water agencies are 100% dependent on imported water. Orange County no longer has the dependability we once had to provide the needed imported water supply and is increasing efforts at local water augmentation programs.

THE COLORADO RIVER SYSTEM

The Colorado River has been described as both the most controlled and litigated river system in the United States. It yields an average of 15.1 million acre feet (maf) annually. This amount is divided by law and agreements among the states of the Colorado

Figure VI-8

Figure VI-8



ORANGE COUNTY GROUNDWATER BASIN

River Basin and Mexico as per the Colorado River Compact of 1922. California's share is set at 4.4 maf/year; the MWD service area has often had 1.2 maf available to it until 1990. There is now some variability to this annual share as Arizona increases its allocation. MWD's Colorado River Aqueduct, which brings the water most of the way to Orange County, went into service in 1941. Because storage capacity on the Colorado River exceeds six years' required deliveries, MWD's allotment can be considered secure over a dry period of up to fifteen years.

THE SACRAMENTO RIVER SYSTEM AND STATE WATER PROJECT

The Sacramento River system is the most important freshwater resource in the state, with an unimpaired annual run-off of about 18.9 maf on its four main tributaries. However, the system is subject to drought. As compared to the Colorado River, there is very little carry-over storage on the Sacramento River system. Years with less than 10.2 maf are termed "critical" by the State Water Resources Control Board.

The federal government moved first to develop the Sacramento River System. It began construction of the Central Valley Project (CVP) in the 1930s. During a recent four year period, the CVP delivered an annual average of 6.67 maf for agricultural, municipal, and industrial uses in the Sacramento Valley.

The Burns-Porter Act of 1960 authorized

construction of the State Water Project (SWP). That legislation called for about 4.2 maf of the state's water resources (primarily the Sacramento River and its tributaries) to be incrementally developed so as to make water available for use in more arid parts of the state while maintaining water quality in the Sacramento River Delta. Operated by the State Department of Water Resources in coordination with federal operation in the Central Valley Project, the SWP made its first deliveries to MWD in 1971 via the California Aqueduct.

The population growth trends around the San Francisco Bay area and the Los Angeles metropolitan area have created some new partnerships over water issues between both urban areas. This is a change from past alliances which have emphasized the northern versus southern regions of the state.

New water policy concepts have become increasingly relevant as the cost estimates for constructing new water storage and transfer facilities have jumped at a time when state and federal budgets are facing drastic shortfalls. The present yield of the SWP is estimated to be 2.3 MAF, of which about one-half is allocable to MWD. The fiscal benefits to urban water users may be dramatic if the implementation of planned SWP storage facilities and agricultural conservation technologies were in broad use. It should be noted that additional facilities (e.g., off-stream storage reservoirs) will still be required in order to complete the State Water Project.

Water Resources Management

WATER SUPPLY

MWD distributes imported water resources from the State Water Project and the Colorado River to its member agencies in Orange County. These local agencies then utilize the imported resources to augment their local resource supplies. In general, the southern and northeastern portions of the county are dependent on imported water supplies while the central portion of the county is served primarily by the groundwater basin. Chart VI-2 depicts the Groundwater Basin and its operational history.

In addition to MWD, key agencies involved in the supply and distribution of water are the Municipal Water District of Orange County and Coastal Municipal Water District, which wholesales imported water to many local retail agencies and the Orange County Water District (OCWD), the groundwater management agency for the County's primary groundwater basin.

The Municipal Water District of Orange County (MWDOC) represents most Orange County water providers in matters with the Metropolitan Water District (MWD) for imported water allocations. The MWDOC staff also maintains watch over issues of water quality, conservation, and legislation.

The OCWD, like most water districts, is a Special District and functions as an independent agency in the County. The facilities of the Orange County Flood

Control District and the U.S. Corps of Engineers, although intended primarily for flood control, also assist to conserve stormwater run-off for replenishment of the County's groundwater basin.

In addition to the District's mission to ensure the quantity of water in the Basin, the OCWD also utilizes reverse-osmosis membrane treatment and injection process to create a hydraulic barrier so that saltwater does not enter and contaminate the Basin. Seasonal water storage at Prado Dam conserves high quality storm flows for recharging the groundwater basin. The U.S. Army Corps of Engineers works with OCWD to implement this program and offers improved water quality, energy savings from reduced importation of water, and greater insurance against shortages.

Water Quality

An important consideration in the management of both the local and imported water resources described above is water quality. Water quality is defined in terms of the physical, chemical, and biological properties of water pertinent to the use under consideration.

The groundwater quality in the Orange County Basin has been deteriorating over the years due to the infiltration of chemicals and salts from agricultural operations, saltwater intrusion, land outfalls, the poor quality water flowing into the county via the Santa Ana River and the poor quality of Colorado River water use to recharge the

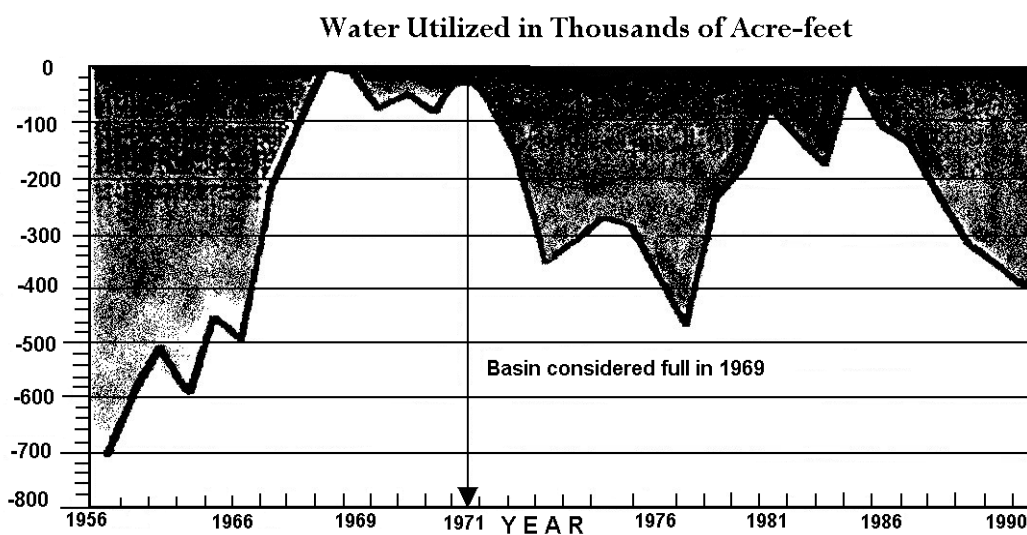
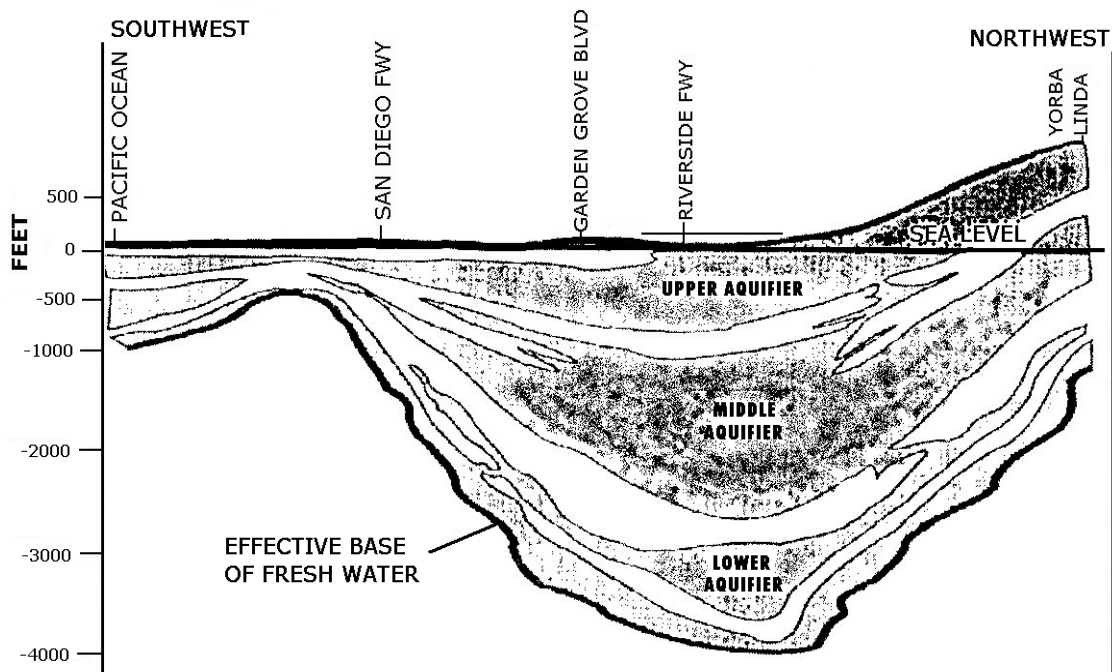
CHAPTER VI. RESOURCES ELEMENT

groundwater

Chart VI-2

CHAPTER VI. RESOURCES ELEMENT

Chart VI-2



GROUND WATER BASIN AND OPERATIONAL HISTORY In Orange County

CHAPTER VI. RESOURCES ELEMENT

basin. Colorado River water, with more than 700 parts per million of total dissolved solids (TDS), is also delivered directly to both urban and agricultural users. This issue is most prevalent in the South County area which is very dependent on imported water.

With respect to imported water supplies, an important fact is that the U.S. Public Health Standard of 500 ppm TDS for drinking water is exceeded by the imported Colorado River water. While blending of groundwater and imported water has helped somewhat, substantial portions of the County groundwater basin have in excess of 600 ppm TDS.

The importation of SWP water which has 230 ppm TDS for groundwater recharge and direct delivery has improved the water quality situation somewhat but increasing demands on the SWP as well as drought may limit future availability. To reduce the TDS, a number of de-nitrification plants have been put into operation, and two groundwater desalters are in advanced design.

During the 1960s, the State legislature recognized the interrelatedness of water supply and water quality and assigned responsibility for both water rights and water quality control to a single agency, the State Water Resources Control Board, and its nine regional boards. Additionally, federal laws relating to water quality and federal water projects affect Orange County's water resources.

The water pollution control program in

California has been conducted through regional water quality control boards for 30 years. In 1967, the State Water Rights Board and Water Pollution Control Board were merged into the State Water Resources Control Board (SWRCB). Two years later, the enactment of the Porter-Cologne Water Quality Control Act greatly strengthened the powers of the SWRCB and provided a strong legal framework for a State program of water pollution control. The Porter-Cologne Water Quality Control Act, administered in the County through the Santa Ana and San Diego Regional Water Quality Control Boards, establishes and enforces wastewater discharge requirements.

The County Health Care Agency enforces the State health standards for swimming and related water contact sports and other water-oriented activities. The Orange County Water District (OCWD) and the Municipal Water District of Orange County are both concerned with the quality of imported water.

Water quality monitoring is performed by several agencies including the State Water Resources Control Board, the Regional Water Control Board - Santa Ana Region, the Department of Health Services, and Orange County.

As a result of the 1987 Amendments (Water Quality Act) to the Clean Water Act of 1972, the Environmental Protection Agency developed a plan to monitor and control non-point source pollution.

This plan, which is administered at the local level by the Regional Water Quality Control Boards, requires operators of municipal stormdrain systems to obtain stormwater and urban runoff permits. The requirements of the permit include water quality monitoring and the development/ implementation/ monitoring of the effectiveness of Best Management Practices (BMP's) to reduce the contamination of receiving waters from stormwater runoff. As a result of the 1987 Amendments (Water Quality Act) to the Clean Water Act of 1972, the Environmental Protection Agency established the National Pollutant Discharge Elimination System (NPDES) to monitor and control non-point source pollution.

The NPDES program, which is administered at the local level by the Regional Water Quality Control Boards, requires operators of municipal separate storm sewer systems (MS4s) to obtain permits to discharge. NPDES permits include requirements to effectively prohibit non-stormwater discharges into MS4s and to require controls to reduce the discharge of pollutants in stormwater to the maximum extent practicable. NPDES permits identify specific monitoring and reporting requirements, including the implementation of pollution prevention, source control, and treatment control Best Management Practices (BMPs) to reduce the contamination of receiving waters from stormwater runoff.

In 2002 and 2009, the Santa Ana and San Diego Water Quality Control Boards issued orders that mandated additional

requirements for the NPDES program.

These requirements added to the review process for new development and re-development planning applications to protect surface water resources. Development and redevelopment applications are now given more scrutiny to assure compliance with MS4 permit requirements. Increased oversight of construction activities as well as increased inspection frequencies are also being implemented. New or modified requirements in order to improve efforts to reduce the discharge of pollutants in stormwater runoff to the maximum extent practicable and achieve water quality standards have also been included. These new or modified requirements have been designed to address high priority water quality problems and existing program deficiencies.

In 2013, the San Diego Water Quality Control Board issued a single Regional MS4 Permit covering the entire San Diego Region instead of by county political boundaries in order to uniformly regulate all three counties, as well as maximize efficiency and economy of resources. The Regional MS4 permit will be applicable to the area of the County within the San Diego Water Quality Control Board upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740.

Water Use in Orange County

In order to describe future water consumption, it is important to determine the current major areas of water usage. Water demands within the county can be

categorized into two types of uses: municipal and industrial (M&I) and agriculture. M&I demand includes water for residential, commercial, industrial, institutional, and park/greenbelt irrigation purposes and unaccounted for water uses. The following sections describe the water use characteristics of each M&I category.

RESIDENTIAL WATER DEMAND

Residential demands account for approximately 61 percent of the water use in Orange County. Within the residential category, approximately 58 percent is for interior use with the remaining 42 percent used for landscape irrigation purposes and other outdoor uses.

RESIDENTIAL LAND USE CATEGORY

Previous estimates of water demand by land use type have identified the relationship between land use and water demand throughout the County.

- Low density residential development requires the most water per dwelling unit, mainly because of the large amount of water needed for outdoor uses.
- Medium high (townhomes and condominiums) and high density residential (apartment complexes and mid-rise) require less indoor use than other densities and very little outdoor water per dwelling unit.

- High density development has a greater potential for conservation than low density development. High density development generally has a centrally controlled and separately metered irrigation system and a single entity controls the application of water for a large area. Low density development has individual, small, and usually manual systems with a different operator at every home and are metered with domestic uses.

NON-RESIDENTIAL WATER DEMANDS

The per acre water demands of most of the non-residential land use categories are relatively equal, but some interesting differences do appear:

- The majority of industrial and commercial water demand is for indoor uses. Reclaimed water is increasingly being utilized for outdoor landscaping uses for new non-residential developments.
- Irrigated agriculture approximates medium density residential use demands.
- The water demand of institutional uses (schools, libraries, etc.) is typically balanced between indoor and outdoor.

EXISTING AND PROJECTED WATER RESOURCE DEMANDS

Per capita water demands may decrease as a

result of three general trends:

- 1) Higher density development;
- 2) Water availability and price increases; and
- 3) Public awareness

However, for planning purposes it is conservatively assumed that per capita water demand for all M&I purposes will remain close to 1990 levels for the period 1991-2010. Therefore, it seems likely that the County's future demands will have to be met by either additional water supplies developed or managed by MWD and local water agencies, increased efficiency in water use (conservation), or a combination of both. The Water Resources Implementation Programs outline several potential programs to support these efforts.

GOALS, OBJECTIVES AND POLICIES: *Water Resources Component*

The use, supply, and conservation of water are critical issues in Orange County. Since almost every urban activity is dependent on water to some extent, it is in the best interests of the general public that the County's water resources are properly planned and managed.

Goal & Objectives

Goal 1

Ensure an adequate dependable supply of water of acceptable quality for all reasonable uses.

• *Objectives*

- 1.1 To maintain the adequacy and dependability of imported water supplies.
- 1.2 To achieve a reduction in per capita water consumption by the year 2020.
- 1.3 To reduce dependence on imported water supplies through both conservation and local water resource development.

Policies

1. *WATER SUPPLY*

To ensure the adequacy of water supply necessary to serve existing and future development as defined by the General Plan.

2. *CONSERVATION*

To reduce per capita and total water consumption through conservation and reclamation programs and the support of new technologies.

3. *GROUNDWATER RESOURCES*

To support groundwater management efforts that are conducted by County water agencies.

4. *SHORTAGE PLANNING*

To ensure that Orange County will not be severely impaired by any potential

future water shortages.

5. **WATER QUALITY**

Protect and improve water quality through continued management, enforcement, and reporting requirements.

Encourage an integrated water resources approach for stormwater management that considers water supply, water quality, flood control, open space, and native habitats.

Promote coordination between the County, cities, and other stakeholders in the identification and implementation of watershed protection and Low Impact Development (LID) principles.

Consider implementation of LID principles to conserve natural features (trees, wetlands, streams, etc.), hydrology, drainage patterns, topography, and soils.

Encourage the creation, restoration, and preservation of riparian corridors, wetlands, and buffer zones.

Continue to educate the public about protecting water resources.

Additional water quality policies are

also provided in the Land Use Element.

6. **INTERGOVERNMENTAL COORDINATION**

To encourage and support a cooperative effort among all agencies towards the resolution of problems and the utilization of opportunities in the planning management and protection of water resources, including water quality.

IMPLEMENTATION PROGRAMS: *Water Resources Component*

Because Orange County must rely so heavily on imported water supplies, the implementation programs within this section are directed toward ensuring future imported water supplies, eliminating water waste, and conservation of existing supplies. The further development of local water resources is also included in these implementation programs.

In addition, since the management of water resources is complicated by the great many agencies involved with different aspects of management increased efforts towards intergovernmental coordination and cooperation are identified as an implementation program.



1. COUNTY WATER CONSERVATION DEVELOPMENT PROGRAM

Action:

Develop and implement a program for the conservation and development of the County's water resources.

Discussion:

On June 15, 1983, the Board of Supervisors authorized development of a work program for a County Water Conservation/ Development Program. This program would focus on:

- Cost-effective water conservation measures (particularly for County facilities)
- Water shortage contingency planning
- Local resource development

The program is to be carried out in cooperation with local water purveying

agencies.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency:

- RDMD

Source of Funds:

- County General Fund
- Water Districts

2. INTERGOVERNMENTAL COORDINATION

Action:

Continue and expand existing intergovernmental activities towards achieving County water resource goals and objectives.

Discussion:

Increased coordination on the part of the county and local/regional water agencies serves to ensure effective

CHAPTER VI. RESOURCES ELEMENT

communication and cooperation on the water supply and water quality issues. On July 15, 1983, the Board of Supervisors authorized the Environmental Management Agency to establish regular liaison with the water agencies of Orange County towards achieving this end.

In addition to the County/water agency liaison program, ongoing coordination with the federal and state government on water resource programs is essential. Such activities include legislative review and development and intergovernmental water planning and management efforts to increase the adequacy and dependability of imported water supplies.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency:

- RDMD

Source of Funds:

- County General Fund

3. COUNTY WATER PLAN

Action:

Continue County Water Plan work effort and related activities.

Discussion:

The County Water Plan is a multi-phase study. The objective is to ensure to the

maximum extent possible an adequate, dependable water supply for all reasonable uses.

The Phase I County Water Plan outlined the county's water supply future under various supply scenarios. The Phase II report examined immediate and near-term water supply concerns and presented measures to address these concerns.

The Third Phase involves an update to the information collected in Phases I and II and will also identify regional water supply issues for review by the Board of Supervisors.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- County Executive Office
- Water Agencies

Source of Funds:

- County General Fund
- Water Agencies

4. WATER QUALITY MANAGEMENT

Action:

Continue existing water quality monitoring and management efforts.

Discussion:

Water quality is as significant a

resource management issue as water quantity, particularly in Orange County where the opportunity for developing additional local supplies is limited.

This program focuses on the maintenance and enhancement of the water quality of both imported and local resources. Current activities include the implementation of the Regional Water Quality Control Plans (208 Plans) and enforcement of the County Industrial Waste Ordinance.

New or Existing: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- Health Care Agency
- Water Agencies
- State Agencies
- Federal Agencies

Source of Funds: Numerous Funding Sources

5. PUBLIC EDUCATION/INFORMATION

Action:

Support the water conservation efforts of county water districts and other

agencies through public information and education activities.

Discussion:

This program is intended to increase the community's awareness of the need for water conservation and provide educational assistance to residences and businesses.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- Water Agencies
- RDMD

Source of Funds:

- County General Fund
- Water Agencies
- California Department of Water Resources

AIR RESOURCES COMPONENT

Introduction

Historically, Southern California has been home to some of the fastest-growing local economies in the United States and the currently strong population growth is expected to continue through 2020. This growth has manifested itself in three regional problems which are closely related: rapid growth, transportation, and air quality. Population growth means more traffic and more businesses, and each of these has adverse effects on air quality.

No single national resource has such a direct bearing on the public health, safety, and welfare as air. It is one of the basic

ingredients of the environment, essential to all forms of life. Unlike other resources it has no substitutes, cannot be imported when local supplies are deteriorated, and allows no reduced-use conservation measures. However, like other resources, urbanization has deteriorated its quality.

Orange County lies within one of the most severely air polluted regions of the country. An adverse combination of heavy pollutant emissions, meteorology, topography, and air chemistry result in an ideal smog factory. However, over the last five years, despite an enormous increase in population and cars, air quality levels have shown significant improvement.

Historical Background

In 1970, Congress passed the Clean Air Act (CAA). It requires the administrator of the United States Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for six major pollutants: carbon monoxide, hydrocarbons, oxides of nitrogen and sulfur, particulates, and photochemical oxidants.

The Act requires each state to attain and maintain federal standards through the development of State Implementation Plans (SIPs). Each state is to develop a plan and submit it to the U.S. EPA for approval. State Implementation Plans require emission restrictions and timetables for compliance, inspections, air monitoring systems, and adequate staff and funding. In cases where a state does not draft a satisfactory SIP, the

U.S. EPA is required to supply one.

In 1977, Congress amended the CAA. The new law placed additional requirements on SIPs from non-attainment areas. A non-attainment area was defined as one unable to demonstrate attainment of the NAAQS for oxidants and carbon monoxide by December 31, 1982 after implementation of all reasonably available control measures.

The South Coast Air Basin (SCAB) is designated as such a non-attainment area. The 1977 Amendment required non-attainment areas to prepare a SIP in 1982 outlining additional standards designed to meet NAAQS by 1987. It also required the adoption and implementation of a motor vehicle inspection and maintenance (I/M) program as part of the 1979 SIP.

In November 1990, Congress enacted a series of amendments to the CAA intended to intensify air pollution control efforts across the nation. One of the primary goals of the 1990 Clean Air Act Amendments was an overhaul of the planning provisions for those areas not currently meeting NAAQS.

The CAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and an attainment demonstration, and incorporates more stringent sanctions for failure to attain or to meet interim milestones.

The California Legislature, recognizing that air quality was a regional problem in

Southern California, enacted the Lewis Air Quality Management Act of 1976. The Act reorganized the Southern California Air Pollution Control District into the South Coast Air Quality Management District (SCAQMD) with authority to regulate stationary sources of air pollutants in the region.

The SCAQMD in conjunction with the Southern California Association of Governments (SCAG) is charged with developing a comprehensive plan for attaining and maintaining state ambient air quality standards. The Air Quality Management Plan (AQMP) is to be adopted by SCAG and SCAQMD and submitted to the California Air Resources Board.

The AQMP is then to be included in the SIP for the U.S. EPA's approval. The Act further requires continuous implementation monitoring and updates of the original plan every two years.

The California Clean Air Act (CCAA) was signed into law on September 30, 1988, and was amended in 1992 and 1997. The CCAA established a legal mandate to achieve

health-based state air quality standards at the earliest practicable date.

The AQMP must also contain deadlines for compliance with all state ambient air quality standards and the federally mandated primary ambient air quality standards.

Through its many requirements, the CCAA serves as the centerpiece of the air basin's attainment planning efforts since it is generally more stringent than the federal Clean Air Act.

Air Quality Overview

REGIONAL PERSPECTIVE

Overall air quality in the South Coast Air Basin has shown improvement in recent years. In 1998 there were only 12 Stage 1 ozone episodes. An increase from 1997 due to that year's El Nino weather pattern but still a decline on a three-year average basis. In addition, Nitrogen dioxide levels have fallen, qualifying the air basin for redesignation to attainment for that pollutant. Further, annual average particulate matter levels are nearly 25 percent lower than a decade ago.



Even though recent years have been the cleanest on record, the Basin still experiences exceedances of health-based standards for ozone, carbon monoxide, and particulate matter under ten microns (PM10).

In May 1996, the boundaries of the SCAB were changed by ARB to encompass the four-county region including Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties, including the Beaumont-Banning area.

The SCAB covers approximately 12,000 square miles and is home to more than 14 million people and over 10 million motor vehicles. The Basin consists of the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange County. Its area is approximately 6,600 square miles.

The topography and climate of Southern California combine to make the Basin an

area of high air pollution potential and constrain efforts to achieve clean air. As a result, increasingly stringent pollution controls have been placed on industrial sources in Los Angeles County since the late '40s and in the other three Basin counties since the '50s. In addition, California was the first state in the country to require controls on motor vehicles.

ORANGE COUNTY CLIMATE

Climate is probably the most important factor in the growth of Orange County. Implications for the health and well-being of County residents as well as the environmental quality are such that it is essential that we know more about the weather and climate, and the relationship between land use, transportation, and air quality. Such characteristics as temperature, rainfall, winds, humidity, and cloud coverage affect our energy needs, recreation activities, air quality, water resources, fire protection programs, flood control, airport

management, agricultural crops, native vegetation, and much more.

Weather in the County, and in the South Coast Air Basin as a whole, is a function of a semi-permanent high-pressure zone over the eastern Pacific Ocean. The resulting climate is mild, typified by warm temperature and light winds; the dominant wind pattern being a daytime sea breeze (on-shore) and a nighttime land breeze (off-shore). This prevailing condition of alternate light winds tends to carry pollutants inland during the day, and drift them back toward their point of origin during the evening.

The topography of the area creates local distortions in the prevailing meteorological pattern. Air currents are directed by advection through mountain passes or deflected aloft by a "chimney effect" produced by the solar heating of mountain slopes. The most significant effect of this general topographic distortion in the Orange County area is a predominant daytime air mass transport across the Long Beach/San Pedro area, through northern Orange County, and into the San Bernardino/Riverside vicinity.

The average monthly temperatures range from about 52 degrees F. in the coastal areas in January to 72 degrees F. in the inland areas of the coastal plain in August. The difference in temperatures between the coast and inland areas is greatest in the summer months. The winter maximums are about the same while inland minimums are lower

throughout the year because the ameliorating influence of the ocean is weaker.

Temperatures are significant in terms of their effects on agriculture and outdoor recreation.

The County's rainfall regime is characteristic of mediterranean climates. A modest average of 14 inches falls principally during the winter months (December to March).

The County's rainfall also exhibits characteristically wide variations annually (from a low of 3.6 inches in 1961 to a high of 32.1 inches in 1940). It is not unusual for winter storms moving in from the Pacific to produce 3 to 10 inches of rainfall within a 24-hour period. The implications for water supply, irrigation, flood, fire, and erosion control are considerable.

Fog is a distinctive feature of the County's weather. During April, May, and June, fog or low clouds form at night and often persist until noon. Visibility in the fog remains adequate for travel, however. During the summer, with the semi-permanent low in the desert areas and a relatively high pressure area off the coast varying degrees of fog or cloudiness occur in the coastal area. Many people seeking relief from heat waves and brilliant sunshine of the interior coastal plain are surprised by coastal fog and low temperatures which may also persist until noon. Heavy fog in December and January is also a predictable occurrence. Annual average relative humidity is 70% at the coast and 56% in the eastern inland areas.

With very light average wind speeds, the South Coast Air Basin atmosphere has a

CHAPTER VI. RESOURCES ELEMENT

limited capacity to disperse air contaminants horizontally. The prevailing northwest winds of the summer months associated with high pressure off the coast give way to those generated by the passage of storm fronts in winter months. Summer wind speeds average slightly higher than winter wind speeds.

The dominant daily wind pattern (daytime sea breeze and a night-time land breeze) is broken only by occasional winter storms and infrequent strong northeasterly Santa Ana flows from the mountains and deserts north of the Basin. Santa Ana winds, with velocities of up to 70 miles per hour, send dry air from the desert to the coastal plain. On the way, temperatures are increased, often to 100 degrees F.

This combination of high temperatures and velocities, and low humidity coming at the end of the dry summer months, creates an exceedingly hazardous potential for wildland fires. Boat harbors are also seriously affected. More common are gentler daily sea breezes and nightly offshore breezes and moderate coastal temperatures.

On practically all spring and early-summer days, most of the pollution produced during an individual day is moved out of the Basin through mountain passes or is lifted by the warm, vertical currents produced by heating of mountain slopes.

In those seasons, the Basin can be "flushed" of pollutants by a transport of ocean air of sixty miles or more during the afternoon.

From late summer through the winter months, the flushing is less pronounced because of lighter wind speeds and the earlier appearance of off-shore (drainage) winds. With extremely stagnant wind flows, the drainage winds may begin near the mountains by late afternoon. Pollutants remaining in the Basin are trapped and begin to accumulate during the night and the following morning. A low average morning (6:00 a.m. to noon) wind speed in pollution source areas is an important indicator of air stagnation potential.

Under ideal meteorological conditions and irrespective of topography, pollutants emitted into the air would be mixed and dispersed into the upper atmosphere. However, the Southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground.

The inversion, a layer of warm, dry air overlaying cool, moist marine air is a normal condition in the southland. The cool, damp and hazy sea air capped by coastal clouds is heavier than the warm, clear air aloft which acts as a lid through which the marine layer cannot rise. The height of the inversion is important in determining pollutant concentration. When the inversion is 2,500 feet or so above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet the terrain prevents the pollutants from escaping and it backs up along foothill communities. Below 1,200 feet the inversion puts a tight lid on

pollutants concentrating them in a shallow layer over the entire coastal basin.

Usually, inversions are lower before sunrise than during the daylight hours. The mixing height normally increases as the day progresses, because the sun warms the ground, which in turn warms the surface air layer. As this heating continues, the temperature of the surface layer approaches the potential temperature of the base of the inversion layer. When these temperatures become equal, the inversion layer begins to erode at its lower edge.

If enough warming takes place, the inversion layer becomes weaker and weaker and finally "breaks". The surface air layers can then mix upward without limit. This phenomenon is frequently observed in the middle to late afternoon on hot summer days when the smog appears to clear up suddenly. Winter inversions frequently break by mid-morning, thereby preventing contaminant build-up.

During winter months, the inversion layer is broken up by passing storms. In the spring, April through June, the inversion layer is normally high and air quality is good. The inversion layer descends progressively during summer with the most adverse air quality conditions in August and September. Compounding this problem of pollutant concentration is the phenomenon of photochemistry in which certain original, or "primary," pollutants (mainly reactive hydrocarbons and oxides of nitrogen) react under the influence of the ultraviolet

radiation of sunlight to form "secondary" pollutants (principally oxidants the most serious problem in this region).

This photochemical process is time-dependent which means that secondary pollutants can be formed many miles downwind from the emission source of their primary precursors. Photochemical smog levels are much lower during winter due to the lack of strong inversions during the daylight hours and the lack of intense sunlight which is needed for the photochemical reactions. The potential for high concentrations varies seasonally for many contaminants.

During late spring, summer, and early fall, light winds, low mixing heights, and brilliant sunshine combine to produce conditions favorable for the maximum production of photochemical oxidants, mainly ozone. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form more of the typical photochemical smog. Carbon monoxide is not as great a problem in summer because inversions are not as low and intense in the surface boundary layer (within one hundred feet of the ground) as in winter and because horizontal ventilation is better in summer.

Air Pollution Emissions

Almost without exception, all human activities create some type of pollution. When these activities are concentrated in space and when climatic, and geographic

CHAPTER VI. RESOURCES ELEMENT

and atmospheric conditions restrict air currents, waste products collect in the air. The result is air pollution.

Pollutants can be smoke, dust, fumes, vapors, pollens, or any toxic substance that interferes with the use of air by humans and other living things. Many economic as well as health effects of pollutants have been identified: they can erode and discolor building materials; break down rubber, paint, and fabrics; slow the growth of and/or kill plants; and increase the risk of cancer and respiratory ailments. It is reasonable to assume that there are other effects that have not yet been identified.

Air pollution forms either directly or indirectly from pollutants emitted from a variety of sources. These sources can be natural, such as oil seeps, vegetation or windblown dust.

Emissions may also result from combustion, as in automobile engines; from evaporation of organic liquids, such as those used in coating and cleaning processes; or through abrasion such as from tires on roadways. The air pollution control strategy in the SCAB is directed almost entirely at controlling man-made sources.

About 40% of this area's air pollution comes from stationary sources. These can include anything from large powerplants and refineries to the corner gas station.

The SCAQMD is responsible for controlling emissions from stationary sources. There

are about 31,000 such businesses operating under SCAQMD permits. Other widespread stationary sources include consumer products such as house paint, charcoal lighter fluid and thousands of products containing solvents that evaporate into the air.

The major air pollutants emitted by stationary sources are carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), and total suspended particles (TSP).

The other 60% of our air pollution come from mobile sources-mainly cars, trucks and buses, but also including construction equipment, locomotives, trains and airplanes. Emission standards for mobile sources are established by state or federal agencies, such as the California Air Resources Board and the U.S. Environmental Protection Agency, rather than by the SCAQMD.

Although SCAQMD does not directly control pollution from motor vehicles, transportation-related programs have been aimed at reducing the number of cars on the road and promoting the use of cleaner fuels and vehicles. There are five major air pollutants emitted by motor vehicles: carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NO_x), oxides of sulfur (SO_x) and total suspended particles (TSP).

Air quality conditions in Orange County and the rest of the air basin come under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Despite

over twenty years of stringent air pollutant emission controls, the SCAB has not attained the state and federal standards for three (O_3 , CO, and PM₁₀) of the six pollutants with federal and state standards. Pollutants and associated health effects are briefly described below.

Carbon Monoxide: Carbon Monoxide (CO) combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can lead to headaches, aggravation of cardiovascular disease, impairment of central nervous system function, and fatigue.

CO is a product of inefficient combustion and is generated principally from automobiles and their internal combustion powered vehicles. CO is a very localized pollutant, so ambient concentrations of CO are normally related to the location and volume of vehicle traffic.

Relatively high concentrations of CO occur near heavily traveled roads and crowded intersections. CO concentrations are generally higher in the winter when meteorological conditions favor the accumulation of directly emitted contaminants.

Ozone: Ozone (O_3) is the primary component of the pollution effect commonly referred to as smog. Ozone is an eye and respiratory system irritant that also increases susceptibility to respiratory infections.

Ozone causes significant damage to leaf tissues of crops and natural vegetation, and also damages many materials by acting as a chemical oxidizing agent.

Ozone is the most common of a class of pollutants formed in the air by reactions between hydrocarbons (produced by incomplete combustion) and oxides of nitrogen (also a combustion product) in the presence of sunlight. Hydrocarbons and nitrogen oxides (NO_x) are called ozone precursors because of their role in ozone formation. Hydrocarbons are often referred to by other names or acronyms, including total organic gases (TOG), total organic compounds (TOC), reactive organic gases (ROG), reactive organic compounds (ROC), and volatile organic compounds (VOC).

The primary difference between these groupings is that TOG and TOC may contain some organic compounds that are not smog precursors, whereas ROG, ROC, and VOC imply only those chemicals that do have a significant role in smog photochemistry.

Fine Particulate Matter (PM₁₀): PM₁₀ consists of extremely small suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs and contribute to respiratory problems. PM₁₀ arises from such sources as road dust, diesel,



soot, combustion products, abrasion of tires and brakes, construction operations, and windstorms. It is also formed in the atmosphere from NO_2 and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility.

Fine particulates pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Fine particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance.

Since 1987, when U.S. EPA established air quality standards for PM_{10} , efforts to reduce fugitive dust levels have focused more specifically on PM_{10} emissions. While prior fugitive dust emission factors were

developed for total suspended particulates (TSP), both U.S. EPA and ARB have developed conversion factors to convert TSP to PM_{10} emission factors. Accordingly, the CEQA Handbook uses PM_{10} emission factors.

Nitrogen Dioxide: A by-product of fuel combustion and is a reddish brown gas. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2 , creating the mixture of NO and NO_2 commonly called NO_x . Nitrogen dioxide acts as an acute irritant and, in equal concentrations, is more injurious than NO .

At atmospheric concentrations, however, NO_x is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two to three years old) has also been observed at

concentrations below 0.3 parts per million (ppm). Nitrogen dioxide absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO₂ also contributes to the formation of PM₁₀.

Sulfur Dioxide: Sulfur dioxide (SO₂) aggravates chronic lung disease and increases the risk of acute and chronic respiratory disease. It also accelerates the corrosion of materials. Sulfur dioxide is a colorless gas characterized by its strong odor. It is created by the combustion of sulfur containing fuels.

Lead: Lead (Pb) is a human toxicant that accumulates in body tissues, where it impairs blood function and nerve conduction.

Lead in the atmosphere occurs as particulate matter. The combustion of leaded gasoline is the primary source of lead emissions in the Basin. Other sources of lead include the manufacturing of batteries, paint, ink, ceramics, and ammunition and secondary lead smelters.

With the phase-out of leaded gasoline, secondary lead smelters and battery recycling and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead induce gastrointestinal disturbances, anemia, kidney disease, and in severe cases,

neuromuscular and neurologic dysfunction.

Of particular concern are low-level lead exposures during infancy and childhood.

Such exposures are associated with decrements in neuro-behavioral performance (including IQ performance, psychomotor performance and reaction time) and growth.

Lead is currently classified as a probable human carcinogen with an U.S. EPA weight-of-evidence classification of B2.

Table VI-3 and Table VI-4 provide the average annual daily emissions in the SCAB for 1997 and 2020.

A comprehensive emergency program has been adopted by the SCAQMD (Regulation VII). This program sets forth actions to be taken by industry, business, commerce, government, and the public to prevent air pollution concentrations from reaching levels which could endanger or cause significant harm to the public, and/or to abate such concentrations should they occur. In the event of elevated levels of air pollution, the episode program can require reductions in the amount of pollution that may be emitted. In addition to the reductions in emissions, there are also provisions for advising the public to take precautionary measures.

Such an advisory includes recommendations to the public and specifically schools and day care centers to curtail unnecessary physical activities during "episode" conditions and to remain indoors as much as possible. Advisories are also issued to schools and day care centers when ozone

CHAPTER VI. RESOURCES ELEMENT

exceeds the federal health standard.

Table VI-3.

Major Sources of Emission Average Annual Day Emissions in the South Coast Air Basin

	1997 Baseline Year (Tons per Day)*						
Source Category	TOG	VOC	CO	NO _x	SO _x	TSP	PM 10
Fuel Combustion	49.64	10.43	64.12	63.40	1.40	9.98	9.66
Waste Burning	7.83	4.14	56.77	3.57	0.09	7.99	6.99
Solvent Use Totals	432.3	328.67	0.19	0.33	0.02	0.68	0.65
Petroleum Process, Storage & Transfer	104.69	47.63	4.63	0.03	0.01	3.28	2.48
Industrial Processes	25.58	18.57	0.93	0.18	0.02	26.07	21.73
Miscellaneous Processes	299.34	31.90	10.97	78.42	22.56	686.34	350.12
<i>Total Stationary and Area Sources</i>	919.38	441.34	137.61	145.93	24.10	734.34	391.63
On-Road Vehicles	493.36	443.41	3625.03	605.60	14.04	27.20	19.63
Other Mobile	117.91	111.89	1248.48	251.20	32.21	14.49	13.94
<i>Total Mobile Sources</i>	611.27	555.30	4873.51	858.60	46.25	41.69	33.57
<i>TOTAL – ALL SOURCES</i>	1530.65	996.64	5011.12	1002.73	70.35	776.03	425.20

* Source - 1997 Air Quality Management Plan (Table A-4 of Appendix III).

Table VI-4.

Major Sources of Emission Average Annual Day Emissions in the South

	2020 Baseline Year (Tons per Day)*						
Source Category	TOG	VOC	CO	NO _x	SO _x	TSP	PM 10
Fuel Combustion	57.42	12.04	88.39	70.07	1.56	11.61	11.27
Waste Burning	13.55	7.23	101.56	6.22	0.11	13.96	12.20
Solvent Use Totals	600.48	434.16	0.33	0.57	0.04	1.16	1.12
Petroleum Process, Storage & Transfer	108.40	49.45	4.63	0.03	0.01	3.32	2.50
Industrial Processes	46.57	33.21	1.17	0.25	0.04	29.91	24.41
Miscellaneous Processes	316.96	35.99	15.22	32.59	11.75	775.97	396.16
<i>Total Stationary and Area Sources</i>	138.76	131.52	1440.58	239.33	47.56	17.98	17.34
On-Road Vehicles	123.45	115.57	1698.35	368.69	19.42	25.61	15.23
Other Mobile	138.76	131.52	1440.58	239.33	47.56	17.98	17.34
<i>Total Mobile Sources</i>	262.21	247.09	3138.93	608.02	66.98	43.59	32.57
<i>TOTAL – ALL SOURCES</i>	1405.59	819.17	3350.23	717.75	80.49	879.52	480.23

* Source - 1997 Air Quality Management Plan (Table A-4 of Appendix III).

Episodes occur when the concentration of an air pollutant has reached a level at which a potential health hazard exists. Depending upon the episode level (first, second, or third stage), various segments of the public can be affected. A first stage episode may affect persons with chronic lung or heart disease, the elderly, the chronically ill, and the exercising young. Advanced episodes may cause significant aggravation of symptoms and decreased exercise tolerance in healthy persons.

County & Regional Air Resources Management

The management of air resources is dependent on both local and regional activities and controls. The resource itself is clearly regional since air cannot be confined to the boundaries of any political jurisdiction. For this reason, air quality surveillance and pollution abatement authority must be vested in an areawide agency.

However, the generation of air pollution is local in nature and can be substantially affected by local land use and transportation decisions. Following is a description of the air resources management framework for Orange County and the surrounding region.

REGIONAL AGENCIES

In its efforts to improve air quality, the South Coast Air Quality Management District (SCAQMD) has developed the nation's most comprehensive air pollution

control program.

The District traditionally has controlled emissions from stationary sources of air pollution. Senate Bill 151 (Presley) amended the Public Health and Safety Code to provide the District with authority to adopt transportation control measures and indirect source controls consistent with Section 40414 of the Public Health and Safety Code.

As part of a multi-faceted control program, SCAQMD develops and enforces rules regulating emissions; prepares and regularly updates the Air Quality Management Plan; maintains a network of air monitoring stations to track pollutant levels throughout the region 24 hours a day; coordinates public outreach; and notifies the public of potential air pollution alerts and the associated health hazards by providing information directly to the public and to the local media on the quality of the ambient air.



CHAPTER VI. RESOURCES ELEMENT

SCAG is the Southern California Association of Governments. As the name implies, its members are governments: six counties - Los Angeles, Orange, San Bernardino, Ventura, Riverside, and Imperial - and 160 cities. SCAG is designated by state and federal governments as the official planning agency for our area: its staff writes plans for, among other things, transportation systems, air and water quality, and housing supply.

AIR QUALITY MANAGEMENT PLAN

The Federal Clean Air Act, as amended in 1977, requires states to have State Implementation Plans (SIPs) to achieve established air quality goals - the National Ambient Air Quality Standards (NAAQS).

The Act requires that urban areas such as the South Coast Air Basin (SCAB) which do not meet these standards, implement transportation plans to achieve the standards for these pollutants. The AQMP serves as the blueprint for all the future rules necessary to bring the area into compliance with federal and state clean air standards.

The California Legislature has designated the SCAQMD and SCAG as the agencies responsible for development of the Air Quality Management Plan (AQMP) which would represent the basin's section of the SIP.

In preparing the 1997 AQMP, the SCAQMD coordinated closely with SCAG, the Southern California Economic Partnership

(The Partnership) and the California Air Resources Board (ARB), as well as the U.S. EPA.

SCAG provided future growth projections and developed the transportation control measures. The Partnership coordinated the market based Advanced Transportation Technology (ATT) implementation strategies and market based growth indicators. ARB developed the mobile source emissions inventories as well as mobile source and consumer product control measures.

The U.S. EPA provided information on the status of the control efforts for federally regulated sources (on road vehicle emission standards, trains, airplanes and ships, non-road engines, and off-shore oil development) and initiated a public consultation process to further the effort.

The 1997 AQMP includes policies and measures to achieve federal and state standards for healthful air quality in the SCAB. The current AQMP places a greater focus on particulate matter (PM10), since this is the first plan required by federal law to demonstrate attainment of the federal PM10 ambient air quality standards. The Plan also updates the demonstration of attainment for ozone and carbon monoxide, and includes a maintenance plan for nitrogen dioxide (NO2), as the SCAB now qualifies for attainment of that federal standard.

The 1997 AQMP proposes to attain federal clean air standards by 2010. State standards

will be met in post-2010. Implementation of the AQMP is based on a series of control measures that vary by source type, such as stationary or mobile, as well as by the pollutant that is being targeted.

Further, the 1997 AQMP utilizes two tiers of emission reduction measures, based on availability and readiness of technology. Short- and intermediate-term measures rely on known technologies and proposed actions to be taken by agencies that currently have the statutory authority to implement such measures. Long-term measures rely on the advancement of technologies and control methods that can reasonably be expected to occur between 2000 and 2010.

The 1997 AQMP includes 34 stationary and 20 mobile source control measures.

Stationary source control measures are grouped into the following 6 subcategories:

- Group 1 Coatings and Solvents
- Group 2 Petroleum Operations, Refueling, and Fugitive VOC Emissions
- Group 3 Combustion Sources
- Group 4 Fugitive Dust and Miscellaneous Source Categories
- Group 5 Compliance Flexibility Programs
- Group 6 Long-Term Stationary Source Measures

The mobile source control measures are divided into the following categories: on-road, off-road, transportation improvements, advanced transportation technology, and a

further study strategy. Table VI-5 summarizes the 1997 AQMP mobile source control measures.

Actions qualifying as control methods for TCM-01 Transportation Improvements include: HOV lanes; transit improvements; traffic flow improvements; park and ride and intermodal facilities; urban freeway, bicycle, and pedestrian facilities; rideshare matching; Congestion Management Program-based TDM; telecommunication facilities/satellite work centers; TDM demonstration projects/programs; transit pass centers; transportation improvements; capital-based actions and their pricing alternatives; and, non-capital-based actions and information services.

Long-term emission reduction measures are included in the 1997 AQMP to further reduce emissions and meet federal and state requirements. These measures are based on specific technological advancements and control methods that can be reasonably expected to be implemented and in use by the year 2010.

Many of the long-term emission reduction measures rely on technologies that are not fully developed for commercial use (such as fuel cells, hydrogen engines, and fly-wheel batteries). Other measures such as market-incentive programs which promote the advancement of new technologies, or long-term measures which rely on improving existing control technologies and have compliance dates beyond 2000 are also included in the AQMP.

CHAPTER VI. RESOURCES ELEMENT

Table VI-5.
1997 AQMP Mobile Source Control Measures

<i>On-Road Mobile Source Control Measures</i>	
M1	Accelerated Retirement of Light-Duty Vehicles
M4	Heavy-Duty Diesel Vehicles; Early Introduction of low NOx Engines
M5	Heavy-Duty Diesel Vehicles; Additional NOx Reductions in California
M6	Heavy-Duty Diesel Vehicles; 2.0 g/bhp-hr NOx Standard – National
M7	Accelerated Retirement of Heavy-Duty Vehicles
MON-09	In-Use Vehicle Emission Mitigation
MON-10	Emission Reduction Credit for Truck Stop Electrification
<i>Off-Road Mobile Source Control Measures</i>	
M11	Industrial Equipment; Gas & LPG – California
M12	Industrial Equipment; Gas & LPG – National
M13	Marine Vessels; National and International Standards
M14	Locomotives; Nationwide Standards, New and Rebuilt
M16	Pleasure Craft; Nationwide Emission Standards
MOF-07	Credits for the Replacement of Existing Pleasure Craft Engines with New Lower Polluting Engines
<i>Transportation Improvements</i>	
TCM-01	Transportation Improvements
<i>Advance Transportation Technology</i>	
ATT-01	Telecommunications
ATT-02	Advanced Shuttle Transit
ATT-03	Zero-Emission Vehicles/Infrastructure
ATT-04	Alternative Fuel Vehicles/Infrastructure
ATT-05	Intelligent Vehicle Highway Systems
<i>Further Study Strategy</i>	
FSS-02	Market-Based Transportation Pricing



Source: 1997 Air Quality Management Plan/ South Coast Air Quality Management District

The AQMP, in accordance with the federal guidelines for implementing the Clean Air Act Amendments of 1977, calls for a graduated decrease in air pollution emissions to a level that will permit attainment of the National Ambient Air Quality Standards. Because it is technically difficult to forecast ambient air quality, this analysis was performed on the basis of emission (tons) rather than concentrations (parts per million).

The 1988 AQMP establishes the regional goal of the attainment of the federal clean air standards by the year 2007. In order to make significant progress towards this goal, especially in light of the dramatic growth forecast for the region, tough choices must be made.

The regional choices for air quality improvement involve not only the issues of demand management, but even more fundamentally the question of how the

region will power its growth machine. The 1988 AQMP process is an attempt to promote ways in which growth can occur, yet provide mitigation for externalities such as traffic congestion and the resultant impact on air quality.

Control Measures:

In order to make significant progress towards the regional goal of attainment by the year 2007, tough control measure choices have been presented. The trade-offs between stationary source controls, area source controls, and mobile source controls can only occur if a major commitment is made by local, county, and regional governments. The regional choices for air quality improvement involve not only the issues of demand management, but even more fundamentally the issues of fuel and power.

CHAPTER VI. RESOURCES ELEMENT

The measures have been divided into three categories: Transportation, Land Use, and Energy Conservation. There are 25 Transportation measures, one major Land Use Measure, and three Energy Conservation Measures. Of these measures, Orange County is currently implementing 15 measures, to some degree, on the County level.

Each measure proposes a set of actions designed to cause a reduction in emissions. The measures are as explicit as possible; although, in many cases, multiple options exist for implementation.

RULE 2202: ON ROAD MOTOR VEHICLE MITIGATION OPTIONS

Regulation XV was adopted by the Southern California Air Quality Management District on December 11, 1987. This regulation set forth the actions for employers which employed 100 or more persons at any worksite to promote employee participation in trip reduction and ridesharing programs. The program was intended to reduce emissions from vehicles used for commuting between home and the worksite.

In December 1995, Regulation XV was replaced by Rule 2202-“On Road Motor Vehicle Mitigation Options.” Rule 2202 applies to all employers or worksites with 250 or more employees. The rule establishes emission reduction targets for affected businesses and allows them a menu of options to reach the specified emission

reduction target.

ORANGE COUNTY TRAFFIC REDUCTION INCENTIVE PROGRAM (TRIP)

The Traffic Reduction Incentives Program (TRIP) program was developed to address Orange County traffic problems by reducing congestion and to improve regional air quality. The program encourages a partnership of local governments, landowners, developers, businesses, and commuters to develop realistic and achievable strategies for improving traffic congestion and air quality. The TRIP program is intended to be as flexible as possible by offering a list of strategies for employers to choose from to implement the combination best meeting their specific needs.

GOAL, OBJECTIVE AND POLICY: *Air Resources* Component

Goal 1

Promote optimum sustainable environmental quality standards for air resources.

• Objective

- 1.1 To the extent feasible, attainment of federal and state air quality standards by the year 2007.

Policy

1. To develop and support programs which

improve air quality or reduce air pollutant emissions.

IMPLEMENTATION PROGRAMS: *Air Resources* Component

1. ALTERNATIVE WORK SCHEDULES

Action:

Encourage employers to implement modified work schedules; encourage public and private education efforts.

Discussion:

Many County departments, and some Orange County cities, currently provide alternative work schedules.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- SCAQMD
- OCTA
- Commuter Computer
- OCTA Commuter Network
- County of Orange (various agencies)

Source of Funds: Various funding sources

2. EMPLOYER RIDE SHARE AND TRANSIT INCENTIVES

Action:

Continue to encourage increased ridesharing and transit uses.

Discussion:

The County has made Commuter Computers and OCTA's carpool matching services available to its employees and encouraged carpooling through its County newsletter. The County also provides preferential parking for carpoolers.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- CEO
- SCAQMD
- OCTA

Source of Funds: County General Fund and other funding sources.

3. PARKING MANAGEMENT

Action:

Continue to seek additional measures which reduce trips by using various parking control strategies.

Discussion:

There has been some cursory work done in the area of parking management. In areas where parking spaces are already at a premium, additional caps on parking and elimination of on-street parking may pose problems for employers (i.e., the immediate area

surrounding the Santa Ana/Orange Civic Center Area).

A comprehensive study would need to be conducted in order to ensure that an adequate, available parking supply or other measures are in place at the time of full implementation of this measure. Also, viable transit commuter alternatives should be in place to keep full effectiveness of this measure.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- CEO
- SCAQMD

Source of Funds: County General Fund and various other funding sources.

4. MERCHANT RIDESHARE AND TRANSIT INCENTIVES

Action:

Continue to implement non-work trip reduction measures.

Discussion:

This measure seeks to reduce non-work single occupant auto trips by offering facilities for bicyclists and pedestrians and incentives for transit use, carpooling, bicycling, and walking. While not directly involved in merchant rideshare and transit incentive

programs, the County has been involved in ensuring that bicycle and pedestrian facilities exist for public use.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- SCAQMD
- OCTA

Source of Funds: County General Fund and various other funding sources.

5. AUTO-USE RESTRICTIONS

Action:

Continue to implement measures which decrease trips by requiring special event centers or other areas of heavy pedestrian activity to provide park-and-ride facilities.

Discussion:

As part of its environmental document review process, the County reviews projects for consistency with the County Bikeway Plan and OCTA's Commuter Bikeway Strategic Plan (CBSP) and encourages project proponents to provide local bikeway facilities as a mitigation measure. To encourage public awareness of bicycling opportunities, OCTA publishes a map of existing bikeways, which is provided free at County offices and bicycle shops. The County also provides bike

racks around its offices at the Civic Center and shower facilities at the Courthouse. Additionally, the County has a Bike Trail Program which is used to construct bikeways in the unincorporated area of the county to encourage the use of the bicycle as an alternative mode of transportation.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- SCAQMD
- OCTA

Source of Funds: County General Fund and various funding sources

6. HOV LANES AND FREEWAY CAPACITY ENHANCEMENT

Action:

Continue to support CalTrans in the implementation of HOV lanes on county freeways and transportation corridors.

Discussion:

This measure seeks to increase vehicle occupancy by providing HOV lanes. HOV lanes offer a time savings over mixed use land providing an incentive towards carpooling. HOV lanes have been constructed on many Orange County freeways. They are also being considered for the San Joaquin Hills,

the Foothill and Eastern Transportation Corridors in the county.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- CalTrans
- Transportation Corridor Agencies

Source of Funds: Federal and State funding, developer fees, tolls

7. GROWTH MANAGEMENT

Action:

Continue to implement growth monitoring and encourage balanced development.

Discussion:

The County has been involved in monitoring growth and encouraging balanced development. Actions taken include the following:

- The County monitors growth through its Annual Monitoring Report/Development Monitoring Program (AMR/DMP) process.
- The General Plan was amended to establish urban activity centers along major routes. Zoning to implement this concept was completed by 1985.
- The County land use policies

CHAPTER VI. RESOURCES ELEMENT

support balanced land uses containing a mix of residential, commercial, and public land uses, planned development in accord with the adequacy of the transportation system, and mitigation measures to accommodate added transportation system demand.

- In 1988, the Board of Supervisors approved a growth management plan that applies to all new projects.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- SCAG and/or SCAQMD and/or RDMD

Source of Funds: County General Fund and various other funding sources.

8. TRAFFIC FLOW IMPROVEMENTS

Action:

Encourage the implementation of measures which seek to reduce emissions by improving transportation system efficiency.

Discussion:

CalTrans operates the traffic signals in the vicinity of freeway interchanges while local jurisdictions coordinate their own. CalTrans signals are not

compatible with local agencies' signals and cannot be synchronized with them, a situation that often causes problems on the local arterials. Coordination between the two systems should be pursued to relieve arterial congestion in the vicinity of freeways.

CalTrans is planning to install ramp metering on all freeways in Orange County. CalTrans is working with the cities on signal coordination through the Signal Round Table Committee.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- CalTrans
- OCTA

Source of Funds: Various State and local funding sources.

9. NON-RECURRENT CONGESTION RELIEF

Action:

Encourage the implementation of measures which seek to reduce congestion caused by non-recurrent sources.

Discussion:

At the request of OCTA, CalTrans has committed to monitor the freeway system more closely in order to remove incidents more rapidly.

Additionally, the OC Freeway Callbox system aids in reporting freeway accidents/hazards, leading to improved incident response time.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- CalTrans
- CHP
- OCTA

Source of Funds: Various State and local funding sources.

10. INDIRECT SOURCE: AIRCRAFT AND GROUND SERVICE VEHICLES

Action:

Continue to encourage reduction of airport related emissions through more emission efficient operations and adoption of improved technology.

Discussion:

John Wayne Airport has been making significant progress in implementing clean air measures in the past few years. Actions taken include:

- As part of the Master Plan, two high speed runways have been added as well as two additional taxiways which are not high speed.

- The number of aircraft engines in use during taxi and idle is being reduced. In order to conserve fuel, most airline companies that operate two or more engine planes routinely shut down one or more of their engines when taxiing or idling.
- The airport controls departure times by setting limits on the number of departures and arrivals during any given time period.
- The terminal facilities have been redesigned. The new terminal is closer to the end of the primary runway, reducing the length of taxi time for departing aircraft. Combined with new high speed taxiway, this should reduce taxi time for all aircraft.
- The new terminal has centralized electric power outlets, as well as hydrant fueling which supersedes fueling by fuel truck.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- SCAQMD
- Airport operators

Source of Funds: Various funding sources.

11. INDIRECT SOURCE: AIRPORT GROUND ACCESS

Action:

Continue to encourage implementation of measures which seek to reduce congestion around airports.

Discussion:

This measure seeks to reduce congestion around airports by encouraging travelers to rideshare or use transit, to their departure airport and/or from their arrival airport and by improving ground airport access. In the John Wayne Airport Expansion, trip reduction methods were examined, with the result that they committed to increasing passenger load factors.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- SCAQMD
- OCTA
- Airport operators

Source of Funds: Various funding sources.

12. UNPAVED ROADS AND PARKING LOTS

Action:

Continue to implement measures which

reduce fugitive dust emissions.

Discussion:

This measure seeks to reduce fugitive dust emissions due to vehicle use of unpaved roads and parking facilities. The County's Zoning Code requires that "...All parking spaces, driveways and maneuvering areas shall be paved and permanently maintained with asphaltic concrete, cement concrete or other all-weather surfacing."

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies: RDMD

Source of Funds: County General Fund

13. REPLACEMENT OF HIGH EMITTING AIRCRAFT

Action:

Encourage the replacement of high emitting aircraft at local airports.

Discussion:

This measure seeks to replace older aircraft with more modern emission efficient ones. Compliance with noise regulations also insures a cleaner aircraft fleet mix, as the classification of planes complying with noise regulations is also less polluting.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- Airport operators
- Airlines
- FAA

Source of Funds: Various funding sources.

14. ENERGY CONSERVATION

Action:

Continue to implement energy conservation measures.

Discussion:

The County of Orange has had an active Board mandated energy conservation program since 1974.

The County's energy conservation program is still ongoing. All major new buildings and new facility additions are carefully analyzed for energy efficiency. In addition, energy projects are still being implemented in existing facilities.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- Special districts

Source of Funds: County General Fund.

15. WASTE RECYCLING

Action:

Continue to implement waste recycling measures.

Discussion:

This measure seeks to reduce energy use and thus emissions by requiring local government to recycle glass and paper products. Orange County currently collects white paper and computer paper for recycling. Local government could mandate glass recycling.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- SCAQMD
- IWMD

Source of Funds: County General Fund and various funding sources.

OPEN SPACE COMPONENT

Introduction

The rich diversity of open space within Orange County is exemplified by sparkling beaches, picturesque harbors, an urban national forest, natural areas sheltering unique wildlife habitats and vegetation, and the aquatic and marine system of marine life refuges and ecological reserves. The role of

CHAPTER VI. RESOURCES ELEMENT

open space within Orange County is generally:

- To preserve natural resources, i.e., conserve natural areas, their inhabitants, and their indigenous processes.
- To productively manage natural resources, e.g., groundwater replenishment along the Santa Ana River corridor.
- To protect the public from hazardous areas or conditions, i.e., floodplains, areas with unstable soil, and high fire hazard areas.
- To provide areas for outdoor recreation, e.g., parks, beaches, trails, and areas with notable aesthetics, historic or cultural values.

The Open Space Component is the open space plan for the unincorporated areas of Orange County. This component is the successor to the Open Space Element originally adopted by the Board of Supervisors on June 27, 1973. The preparation of this component is in compliance with State Government Code Sections 65560-65568, which require each city and county to prepare and adopt an open space plan for the comprehensive and long-range preservation of open space land within its jurisdiction.

Purpose of Component

The Open Space Component contains the necessary goals, objectives, policies, and programs to promote the preservation and protection of resource areas and the protection of the public from potential hazards. The component also functions in a manner to shape the overall urban form of Orange County. To that end, open space facilities such as greenbelts that buffer conflicting land uses or link recreation facilities along regional trails and water courses are desired, as well as areas set aside to preserve cultural-historic resources, significant wildlife habitats, and biotic resources such as oak groves, sycamore/riparian woodlands, and marshlands.

In general, open space areas are offered by landowners for dedication to the County or the County's designee as part of the overall development process. These areas are then turned over to the Harbors, Beaches and Parks District or to a County Service Area for operation and maintenance. The County evaluates public and private development proposals to insure that the goals, objectives, and policies of the Open Space Component are satisfied. In addition, a legitimate role exists for private conservation organizations and other non-profit corporate bodies to own and operate open space areas.



An integral part of the Open Space Component is the Open Space/Conservation Program Map which depicts an open space framework of countywide significance. This framework includes areas of resource concentration such as existing and proposed regional recreation facilities and a system of linkages such as trails and major open space corridors. The implementation programs provide the mechanism by which an integrated open space network can be realized.

Definition of Open Space

Open space is a valuable resource in any community or county experiencing urbanization. The value of open space to Orange County includes shaping the overall urban form, providing outdoor recreation opportunities, enhancing and protecting

scenic vistas, ensuring public health and safety, preserving valuable natural resources, and providing areas for the managed production of resources.

The State Government Code also contains an open space definition that further clarifies the role of open space. Open space is:

"Any parcel or area of land or water which is essentially unimproved and devoted to an open space use as defined (below).

1. The Preservation of Natural Resources, including but not limited to:
 - a) Areas required for the preservation of plant and animal life, including habitat for fish and wildlife species;
 - b) Areas required for ecological and other scientific study purposes;
 - c) Rivers, streams, bays and estuaries; and

CHAPTER VI. RESOURCES ELEMENT

- d) Coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.
- 2. The Managed Production of Resources, including but not limited to--
 - a) Forest lands, rangeland, agricultural lands, and areas of economic importance for the production of food or fiber;
 - b) Areas required for recharge of groundwater basins;
 - c) Bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and
 - d) Areas containing major mineral deposits, including those in short supply.
- 3. Outdoor Recreation, including but not limited to--
 - a) Areas of outstanding scenic, aesthetic, historic, and cultural values;
 - b) Areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, rivers, and streams; and

- c) Areas which serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails and scenic highway corridors.

- 4. Public Health and Safety, including but not limited to--
 - a) Areas which require special management or regulations because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, floodplains, watersheds, and areas presenting high fire risks;
 - b) Areas required for the protection of water quality and reservoirs; and
 - c) Areas required for the protection and enhancement of air quality.

Not all undeveloped land is to be considered for open space protection. In accordance with the State Government Code definition of open space, it is obvious that the objective is for local agencies to take the necessary measures that preserve and protect resource areas from incompatible development or use and to protect the public from potential development or use hazards.

Characteristics of Open Space



Open space areas within Orange County may be large expanses, long corridors, or small parcels. Large open space areas preserve needed wildlife and vegetation habitat, conserve natural resources and acreage necessary for natural processes such as groundwater recharge, and also provide recreation opportunities. Open space corridors generally follow natural features such as stream courses or ridgelines. These linear features are valuable because they emphasize natural resource conservation, natural habitat preservation, scenic vista enhancement, and outdoor recreation opportunities.

Often, open space corridors link the larger open space areas into an integrated open space network. This network supports the migration of wildlife between habitat areas, preserves significant watershed areas, shapes the urban form, and benefits the citizens of the County through recreation opportunities, scenic vista enhancement, and cultural-historic resources preservation.

Likewise, open space may be held in small parcels. These parcels are primarily held by individuals or homeowners' associations. These acreage, valuable in the aggregate for their scenic and recreation attributes, generally do not meet the other open space size criteria with which the County's open space program is concerned. It should be noted that the Open Space/Conservation Program Map does not map these parcels.

Open space areas designated on the program map, whether a large area or a corridor, can be publicly or privately owned and maintained. The County owns and maintains large open space areas like O'Neill Regional Park and Caspers Wilderness Park as well as open space corridors such as along Aliso Creek and portions of other stream courses.

The State and Federal governments are also holders of large open space areas within the County. The largest open space area in the County, the Cleveland National Forest, is maintained by the Federal government. The

CHAPTER VI. RESOURCES ELEMENT

State has jurisdiction over open space areas in the Chino Hills abutting Riverside and San Bernardino Counties and several large State beach parks. The State has plans for further expansion of its holdings within the County (e.g., Chino Hills).

Significant open space areas are also owned and maintained by private organizations. The Audubon Society owns the Starr Ranch Audubon Sanctuary, a large open space area adjacent to Caspers Wilderness Park and the Cleveland National Forest. In 2001, The Irvine Company dedicated 11,000 Open Space acres in this area. The private community of Coto de Caza owns a major permanent open space area adjacent to the Starr Ranch Audubon Sanctuary and Caspers Wilderness Park.

Open Space/Conservation Program Map

The Open Space/Conservation Program Map does not designate land use; rather, it identifies broad open space areas and corridors with physical, cultural, or economic attributes that require consideration at subsequent levels of planning. These open space areas and corridors are regional in nature and are intended to benefit and be enjoyed by the entire population of Orange County. They also enhance or augment regional recreation facilities.

The program map does not identify non-regional open space areas and corridors. The scope of non-regional open space is

intended primarily for the enjoyment, use, and benefit of the neighboring community. Non-regional open space, often referred to as local open space, may link local or community recreation facilities. These areas enhance or augment local recreation facilities. These areas are identified in the Community Profiles, Specific Plans, or other development plans.

The Open Space/Conservation Program Map is consistent with other elements of the General Plan. The map supports the Recreation Element, the Transportation Element Scenic Highway Plan and Countywide Bikeways Plan components, and the Natural Resources and Cultural-Historic Resources Components of this Element.

The map depicts open space areas for regional recreation, greenbelts, wildlife and vegetation habitats, major water courses, agriculture, mineral resources, major watershed and water recharge areas, tidelands, beaches, shoreline areas in need of sand replenishment, stream valleys, scenic and conservation corridors, and areas of cultural-historic importance. Educational /Park Compatible (EPC) overlay areas may include open space-compatible educational, research and development, cultural and recreational uses. With the exception of existing regional park facilities, open space

areas illustrated on the Open Space/Conservation Program Map (Figure VI-5) are schematically mapped.

Definition of Open Space/Conservation Categories

This section describes the open space categories depicted on the Open Space/Conservation Program Map. The descriptions provide insight into the physical, recreational, cultural, and economic attributes of regional open space areas within the County.

OPEN SPACE, CONSERVATION AND SCENIC CORRIDORS

Linear open space features satisfying multiple open space objectives such as shaping urban form, preserving cultural-historic resources, providing recreation linkage between open space nodes, preserving natural processes primarily those relating to the shoreline, watershed areas, establishing a visual sense of community identity, and conserving natural resources and habitat areas. Open space corridors may also act as buffers between incompatible land uses or as separation from noise of visual intrusion.

Open space corridors may involve a chain of regional recreation facilities such as along Aliso Creek and the Santa Ana River, a stream valley, a series of ridgelines, a linear expanse of agricultural land, a scenic highway corridor or series of riding and hiking trails or off-road bikeways (Class I). These corridors provide valuable conservation and protection for wildlife and vegetation habitats, agriculture, groundwater recharge, and promote recreation. Also,

open space corridors may include private recreation facilities such as golf corridors or recreational lakes.

OPEN SPACE AND CONSERVATION NODES

Large tracts of land serving as open space cores, often linked by open space corridors. These core areas contain resource concentrations, existing and proposed regional parks (e.g., O'Neill Regional Park and Limestone Canyon Regional Park), State and Federal open space areas (e.g., Crystal Cove State Park and the Cleveland National Forest), and other undeveloped areas with significant scenic, recreation, or ecological values.

These nodes are often a focus for riding and hiking trails, bikeways, and critical wildlife and vegetation habitat. These areas provide a focus for natural resource preservation, conservation, and protection functions, recreation opportunities, and promote community identity through the shaping of the urban form.

As stated, open space nodes include regional parks thus tying the Open Space Component to the Recreation Element. A regional park is an area of land which offers recreation or scenic attraction of countywide significance, generally not available in local parks. They are of sufficient size to offer recreation facilities and opportunities that are enjoyed by and benefit the citizens of Orange County.

CHAPTER VI. RESOURCES ELEMENT

Existing regional parks are regional open space areas that are owned and maintained by the County of Orange for the purpose of meeting the County's open space as well as recreation objectives.

A proposed regional park is an open space node or area that meets the County's open space and recreation objectives, but has not been obtained by the County. As acquisition opportunities present themselves, these important nodes are integrated into the regional recreation network.

HIGH-PRIORITY OPEN SPACE AREAS

Key open space areas that are subject to multiple public works programs (e.g., parks, trails, scenic highways), are subject to multi-agency implementation efforts, and/or buffer open space areas of national significance.

They are important and valuable because of a high concentration of open space and conservation features such as the presence of a regional recreation facility, critical wildlife or vegetation habitat, major shoreline or watershed area, or other important natural resources or processes. These areas are a priority because of the urbanization process that focuses attention upon their open space and conservation characteristics.

OPEN SPACE HIGH-PRIORITY AREAS

A list of open space high-priority areas follows. In general, all existing and proposed open space areas depicted on the Open Space/Conservation Program Map

possess important open space value to Orange County. These areas preserve important natural features, provide significant outdoor recreation opportunities, conserve valuable resources (i.e., agricultural, mineral, watershed, wildlife and vegetation habitats, tidelands, beaches and cultural-historic features), shape and guide urban development and form, and protect public health and safety.

Among these there exist several equally important, open space areas that merit high-priority attention and implementation efforts as may be necessary due to one or more special conditions. These special conditions are:

- 1) The open space area is subject to or is affected by other public works programs such as existing and proposed regional riding and hiking trails, off-road bikeways, scenic highways, County, State and/or Federal open space/recreation facilities; or the presence of unique or special physical features such as salt marshes, tide-lands, perennial streams, and freshwater bodies.
- 2) The open space area has broad based support from diverse organizations such as citizen advocacy groups, corporate non-profit conservation bodies, municipal, County, State and/or Federal agencies, and/or private landowners

- 3) The open space area enhances or buffers an existing open space resource of national significance, i.e., the Cleveland National Forest and coastal zone resources.

These high-priority areas identified through the aforementioned criteria are grouped below on the basis of the level of implementation to date.

- *Largely implemented, with some remaining opportunities for further refinement and expansion:*

CHINO HILLS: A special open space area providing abundant outdoor recreation opportunities as well as preserving important wildlife and vegetation habitat. The sole opportunity to implement a permanent large open space area in the North County, Chino Hills merits high priority status through the combined efforts of the City of Brea (Brea Wilderness), City of Yorba Linda (Lomas de Yorba Sur open space), County of Orange and U.S. Army Corps of Engineers (Carbon Canyon Regional Park), State of California (Chino Hills State Park) and Hills for Everyone, Inc., to create and operate a major recreation/open space area for the benefit of County residents. Reinforcing this high-priority status is the presence of a scenic highway, arterial bikeways, a State park, and a County regional park.

SANTA ANA RIVER Greenbelt

Corridor: Oldest of the County's greenbelt efforts, the Santa Ana River corridor has largely been implemented through the joint efforts of cities along the river, the County of Orange Flood Control District, the Harbors, Beaches and Parks District, various water districts, and the U.S. Army Corps of Engineers.

To date, open space and recreation facilities have been implemented along the Santa Ana River including various city parks, Orange County Flood Control District facilities and rights-of-way, four County regional parks, a public beach, regional bicycle and riding and hiking trails proposed for linkage to Riverside and San Bernardino Counties, and various water district facilities. The U.S. Army Corps of Engineers has completed a major flood control improvement project along the river in which various recreation amenities are included.

Opportunities for additional open space acquisitions may arise with this project in connection with future private project approvals along the river. The Santa Ana River merits high-priority open space implementation efforts due to the success of the multi-agency efforts in creating the existing and proposed public facilities described above.

- *Implementation underway with significant opportunities for further*

CHAPTER VI. RESOURCES ELEMENT

refinement and expansion:

ALISO CREEK CORRIDOR: A nineteen-mile greenbelt linking the Cleveland National Forest to the Pacific Ocean. This area is the subject of the Aliso Creek Corridor Specific Plan (Concept). Aliso Creek Corridor merits high-priority status due to the presence of scenic highways, arterial bikeways, regional riding and hiking trails, various local and community parks, and four existing County regional parks (Whiting Ranch Wilderness Park, Aliso/Wood Canyons, Laguna Niguel Regional Park, and Aliso Beach Park).

Portions of trails and parks within the corridor have been funded with grants from a variety of State and Federal sources. The corridor links the Laguna Greenbelt with the Cleveland National Forest, thus connecting the County's largest coastal and inland open space areas.

CASPERS WILDERNESS PARK : Areas approaching and surrounding the park including San Juan Creek Corridor, Caspers Wilderness Park and environs provide outdoor recreation opportunities in a "wilderness" setting.

The park and the adjacent Audubon property constitute the most substantial opportunity to buffer the Cleveland National Forest in the Southeast County. San Juan Creek open space corridor straddling Ortega Highway constitutes one of the major national

forest gateways, and opportunities exist to expand Caspers Wilderness Park downstream to enhance and preserve the overall gateway effect to Caspers Wilderness Park and the Cleveland National Forest.

This area is valuable because of its scenic qualities, recreation opportunities, and for the preservation of important ecological habitats. The Caspers Wilderness Park area merits high-priority status through the combined efforts of County of Orange (Caspers Wilderness Park), U.S. Department of Agriculture (Cleveland National Forest), the National Audubon Society (Starr Ranch Audubon Sanctuary), and adjacent private landowners to create and operate a major conservation and recreation open space area for the benefit of County residents.

Reinforcing this high-priority status is the presence of existing and proposed regional riding and hiking trails, off--road bikeways, a scenic highway, perennial streams, a private ecological preserve, a County wilderness park, and a Federal open space area.

LAGUNA GREENBELT: Proposed as the County's largest coastal open space/recreation area, Laguna Greenbelt is the subject of the Irvine Coast Local Coastal Program (LCP), the Aliso Remainder LCP, the Laguna Beach LCP, the South Laguna LCP, the Aliso

Creek Corridor Specific Plan (Concept), the Laguna Greenbelt Final Report, the Aliso Greenbelt Management Plan, the Aliso Greenbelt Development and Operations Plan, the Aliso Beach Park General Development Plan, and the Crystal Cove State Park General Development Plan.

Laguna Greenbelt is recognized statewide for its outstanding scenic and conservation aspects and its valuable wildlife and vegetation habitats.

One of the few opportunities to implement a permanent large open space and recreation area along the South Orange County coast, Laguna Greenbelt merits high-priority status through the combined efforts of the cities of Laguna Beach, Newport Beach, and Irvine; the South Laguna Civic Association; the County of Orange Aliso/Wood Canyons Regional Park, Laguna Niguel Regional Park, Aliso Beach Park, Laguna Coast Wilderness Regional Park, and the State Coastal Conservancy; the State Coastal Commission; the State Department of Parks and Recreation (Crystal Cove State Park) Laguna Greenbelt, Inc.; Friends of the Irvine Coast, Inc.; and in excess of fifteen private landowners, particularly the Rancho Mission Viejo and Irvine Companies.

Reinforcing this high-priority status is the presence of three scenic highways, various arterial bikeways and regional riding and hiking trails, five existing and proposed County regional parks and open spaces, and a State park.

ORANGE COUNTY SHORELINE:

The Orange County coast is recognized world-wide for its broad sandy beaches in the North County; its rocky cliffs and promontories punctuated with spectacular, isolated pocket coves in the South County; its delicate tidelands, marine life refuges, and various wetlands, bays, viewpoints, and harbors along the coast.

Preservation of bluffs and views accessible from public rights-of-way, maintenance and refurbishment of piers and boardwalks; maintenance dredging of harbors and bays; restoration of degraded wetlands; replenishment of beach sands; provision of vista points, beach parks, and parking facilities; and provision of adequate pedestrian rights-of-way and accessways to all public tidelands present opportunities for additional open space buffers to enhance and protect this resource of national significance.

CHAPTER VI. RESOURCES ELEMENT



The County shoreline open space buffer merits high-priority status due to its national significance and because of the combined efforts of numerous Federal, State, regional, and local agencies and various citizens groups to manage and preserve this major conservation and recreation resource for the benefit of the nation's residents.

Reinforcing this high-priority status is the presence of existing and proposed arterial bikeways; scenic highways; and many municipal, County, State, and Federal parks, harbors, accessways, viewpoints, preserves, wildlife refuges, wetlands, and/or other beach related public facilities wildlife and the County's Local Coastal Program planning efforts.

- *Early stages of implementation with greatest opportunities for success:*

BOLSA CHICA: One of the few opportunities to preserve a permanent

large open space area along the North Orange Coast, Bolsa Chica merits high-priority status due to the combined efforts of the City of Huntington Beach (Huntington Beach Central Park), the County of Orange (Harriet M. Wieder Regional Park), the State of California (Bolsa Chica State Beach and Bolsa Chica Ecological Reserve), land owners, and Amigos de Bolsa Chica, Inc. to create a major permanent water-oriented open space area for the benefit of County residents.

Reinforcing this high-priority status is the presence of a scenic highway, arterial bikeways, a State ecological reserve, a landowner commitment to increase the size of the wetland system in return for development approvals, and the presence of Harriet M. Wieder Regional Park.

CLEVELAND NATIONAL FOREST: Most of America's national forests are

located in rural areas, and very few urban counties in the United States possess an urban national forest. The presence of the Cleveland National Forest in Orange County is a unique legacy which merits special efforts to buffer this nationally significant open space resource from potential land use conflicts that can arise from urbanizing right to the forest boundary.

A substantial open space buffer is needed along the forest boundary to minimize inherent conflicts between urbanization and forest wildlife resources and to reduce the potential impacts on urbanization that can arise from wildfires, flooding, landslide, erosion, and siltation. In addition, the mountainous terrain within the Cleveland National Forest is very steep, and few opportunities exist to develop access points or staging areas inside the forest.

The foothills abutting the forest boundary possess outstanding scenic qualities and significant watershed and wildlife habitat for mountain lion, deer, hawks, and eagles. Moreover, they contain more gentle terrain that present opportunities to provide adequate access points and staging areas for forest-related recreation.

The Cleveland National Forest buffer area merits high-priority status due to the combined efforts of the County of Orange (Caspers Wilderness Park, Robinson Ranch Open Space, O'Neill

Regional Park, and the proposed Limestone and Whiting Ranch Regional Parks), the U.S. Department of Agriculture (Cleveland National Forest), and the National Audubon Society (Audubon Sanctuary at Starr Ranch) to create and operate a major conservation and recreation open space area for the benefit of the nation's residents.

Reinforcing this high-priority status is the presence of existing and proposed regional riding and hiking trails, arterial bikeways, scenic highways, the Starr Ranch Audubon Sanctuary, and existing and proposed County regional parks in close proximity.

UPPER NEWPORT BAY: A significant resource area that is valuable as a wildlife refuge, a recreation area, and for its archaeological and paleontological resources. One of the few opportunities to implement a permanent large open space area along the Central Orange coast, Upper Newport Bay merits high-priority status through the combined efforts of the City of Newport Beach and County of Orange (various jointly-owned parksites), County of Orange (Newport Dunes Aquatic Park), State of California (Upper Newport Bay Ecological Reserve), and the Friends of Upper Newport Bay, Inc., to create a major permanent water-oriented open space area for the benefit of County residents.



Reinforcing this high-priority status is the presence of a scenic highway, arterial bikeways, existing and proposed regional riding and hiking trails, a State ecological preserve, a large body of water with marshlands, and the Upper Newport Bay Regional Park.

UPPER SANTIAGO CANYON

The Upper Santiago Canyon area is proposed as the County's largest inland open space/recreation corridor, linking the proposed Limestone Canyon/Whiting Ranch Regional Park complex with the Irvine Park/proposed Villa Park Basin, Peters Canyon, and Weir Canyon Regional Park complex.

Upper Santiago Canyon open space corridor affords buffering and gateway

opportunities at points along the Cleveland National Forest boundary in the Central County and is easily accessible to residents of the County's largest cities.

The area includes Orange County's largest lake, Santiago Reservoir. When combined with the proposed Limestone Canyon Regional Park, Santiago Reservoir presents a centrally located opportunity to establish the County's largest active urban recreation area, modeled after Griffith Park in Los Angeles.

Upper Santiago Canyon and environs merit high-priority status due to the presence of a scenic highway, arterial bikeways, existing and proposed

regional riding and hiking trails, and six existing and proposed County regional parks.

- *Other open space opportunities through specialized treatments and cooperative efforts:*

URBANIZED AREAS: High-priority open space opportunities within the County's urbanized areas are very limited. Most remaining large open space parcels are already planned for urban development.

This situation is most evident in the urbanized Northwest County, where the West Orange County Regional Parks Study of 1978 concluded that due to dwindling vacant land at prohibitively high cost, no unidentified opportunities for new regional parks exist. Still, there are existing regional parks (Los Coyotes, Mile Square, Craig, etc.) and trails within Northwest County. More importantly, there are also proposed regional parks (Los Alamitos Armed Forces Reserve Center, Olinda landfill site, etc.) and trail opportunities located there.

Due to the limited availability of large open space parcels as urban infilling proceeds in the County's urbanized areas, many design opportunities exist to create small-scale internal and perimeter open spaces in future development projects.

Generous landscaping of these areas can enhance local ventilation, ameliorate local microclimates, reduce erosion, improve local wildlife habitat, and visually buffer high density land uses by instilling a sense of human privacy and garden ambiance.

So too can small open spaces be optically magnified by deployment of reflective building exteriors. The use of mirrors or dark glass on buildings for example, can optically magnify the space between buildings, reflect the sky and surrounding terrain, and optically multiply the number of adjacent trees. These effects can produce pleasing aesthetic and psychological benefits for man.

Owing to the lack of open space opportunities in urbanized areas, the County's open space program places high-priority on encouraging urban design that generates internal and peripheral open spaces; generous landscaping; variable building heights, angles, and setbacks; and the deployment of natural materials and/or reflective surfaces on building exteriors.

These benefits shall be sought through a combination of consultation and coordination with incorporated cities, pursuing EIR mitigations, and requiring such enhancements in the site plan review process.

Though the opportunities for open space



preservation are limited, the urbanized areas do deserve high-priority status because implementation efforts will require the cooperative efforts and inter-action of many organizations, citizen groups, City and County governments, State and/or Federal agencies, and/or private landowners

Open Space/Conservation Implementation

The Open Space/Conservation Program was formally adopted in 1972. Efforts towards the preservation of regional open space started in 1897 with the donation of Irvine Park. The continued process of preservation of open space has been enhanced by the efforts of the federal government, the State, the County and special interest groups. Concern and support for a formal program increased as the county experienced rapid urbanization in the 1950s and 1960s. The establishment of the Open Space/Conservation Program identified a systematic analysis of potentially desirable land to be preserved for its regional open

space/conservation qualities.

The implementation of the Open Space/Conservation Program to date is depicted by Figure VI-5. Progress toward the implementation of the program has been very successful. The following discussion identifies program accomplishments to date.

The largest single open space feature in the county is the Cleveland National Forest, established by the federal government in 1908. The 55,000+ forest acres have benefited significantly from the activities of the County and the National Audubon Society. The Starr Ranch Audubon Sanctuary and (existing and proposed) regional parks have provided buffer lands for the forest.

The combined activities of the State, local agencies, and interest groups have established two State parks since 1979. Crystal Cove State Park located along the Newport Coast is the single largest permanent open space expanse along the

County's coast. Chino Hills State Park adjoining San Bernardino and Riverside Counties is an important addition to the County's open space efforts. It represents a significant large open space area adjacent to the urbanized portion of the County.

Orange County's regional park system has also contributed greatly to the preservation and conservation of open space. The program is Countywide in focus serving all of the County's citizens. The first major regional parks were Irvine and O'Neill Parks located in the foothills of the Santa Ana Mountains.

During the 1960s and 1970s, implementation focused upon regional parks in close proximity to the population centers. Examples of this effort may be witnessed by the existence of Mile Square, Craig, Laguna Niguel, Mason, Fairview, and Featherly Regional Parks. These parks have done well to preserve open space and to provide regional recreation opportunities.

More recently, the open space program has had increased opportunities in the rural areas and in the newly developing communities. The significant open space additions include: the Arroyo-Trabuco addition to O'Neill Regional Park; the 2,000+ acres added to Caspers Wilderness Park; Wagon Wheel Regional Park; Limestone-Whiting Regional Park; Aliso and Wood Canyons Regional Park; and Peters Canyon Regional Park.

Inland, the opportunities are fewer; however,

proposed regional parks are identified for Olinda landfill site, Los Alamitos, and Seal Beach.

Orange County currently provides over 27,216 acres of regional open space. Regional recreation facilities are classified as urban regional parks, natural regional parks, coastal regional facilities, nature preserves and historical sites. A complete listing of Orange County's regional recreation facilities can be found in the Recreation Element.

In addition to regional open space, open space is provided in the unincorporated areas through local parks, greenbelts, open space median strips, creeks, streams, rivers, and other areas required by dedication of landowners. A more complete discussion of open space/conservation in implementation is found under "Open Space High Priority Areas."

GOALS, OBJECTIVES AND POLICIES: *Open Space*

Goals, objectives and policies are those parts of the plan that set in motion private and governmental actions. The goals are broad statements of purpose. The objectives are more measurable targets against which actions may be evaluated. The policies are specific statements that guide the action and provide clear commitment.

Goal 1

Retain the character and natural beauty of the environment through the preservation, conservation, and maintenance of open space.

- ***Objective***

- 1.1 To designate open space areas that preserve, conserve, maintain, and enhance the significant natural resources and physical features of unincorporated Orange County.

- ***Policies***

- 1.1 To guide and regulate development of the unincorporated areas of the County to ensure that the character and natural beauty of Orange County is retained.
- 1.2 To implement the Open Space Component through a program organization capable of conducting multiple projects at priority locations throughout the County and with sufficient resources, authority, and responsibility to effectively manage the program.
- 1.3 To seek out, evaluate, and take advantage of special opportunities to obtain open space as these opportunities become available and when the available open space meets or helps to meet established open space goals and objectives.
- 1.4 To assume a leadership role in establishing and supporting an open

space program for Orange County.

Goal 2

Promote the health and safety of Orange County residents and visitors through the regulation and maintenance of open space lands.

- ***Objective***

- 2.1 To protect life and property by regulating land use in areas subject to flooding, landslides, noise, high fire hazard, and high earthquake potential; and to set aside land for human refuge in times of natural disaster.

- ***Policy***

- 2.1 To ensure the health and safety of County residents by identifying, planning, and managing open space areas subject to flooding, landslides, noise, high fire hazards, and earthquake potential.

Goal 3

Conserve open space lands needed for the preservation of natural processes and the managed production of resources.

- ***Objective***

- 3.1 To preserve open space lands that prevent erosion, siltation, flood, and drought, and to promote the production of food and fiber products.

- ***Policies***

3.1 To encourage the conservation of open space lands which prevent erosion, siltation, flood, and drought, and to discourage the early conversion of open space to some other land use.

3.2 To ensure the wise use of County resources by identifying, planning, or assisting in the planning for and assuming management responsibility when appropriate for open space areas used for the managed production of resources including, but not limited to, forest lands, rangeland, agricultural lands, and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; tidelands, beaches, bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries and for beach sand replenishment; and areas containing mineral deposits.

Goal 4

Conserve open space lands needed for recreation, education, and scientific activities, as well as cultural-historic preservation.

- ***Objective***

4.1 To encourage the conservation of

open space lands which provide recreational scenic, scientific, and educational opportunities.

- ***Policy***

4.1 To plan for the acquisition, development, maintenance, operation, and financing of open space lands which provide recreational, scenic, aesthetic, scientific, and educational opportunities.

4.2 To significantly expand the urban regional park system through the conversion of El Toro into Orange County's Central Park.

IMPLEMENTATION PROGRAMS: *Open Space*

1. ACQUISITION PROGRAM

Description:

The Acquisition Program implements the Open Space/Conservation Program Map, supports the other four components of this Element, and assists in the implementation of the goals, objectives, and policies of the Recreation Element.

Implementation of this program occurs either through the negotiation of

CHAPTER VI. RESOURCES ELEMENT



irrevocable fee or easement dedication of open space followed by the expeditious handling/ processing of open space dedications, through the purchase of open space lands, or through donation of open space lands.

Action:

- Negotiate the location, shape, size, configuration, treatment, improvements (including landscaping and habitat restoration), buffering, and quality of title for open space dedications.
- Direct the offer and acceptance of open space dedication as follows:

Historic easements, resource/ preservation easements, and scenic preservation easements without County maintenance responsibilities are to be irrevocably dedicated and accepted when required by the County but no later than final subdivision maps for

residential projects or building permits for nonresidential projects.

When regional parks or regional open spaces are proposed to mitigate project impacts, the irrevocable offer of dedication shall be made concurrent with the approval of the project or at such later time as approved by the Planning Commission or Board of Supervisors when the project is approved by that body. The boundaries of such offers may be refined through the tentative map process.

All other irrevocable offers of dedication shall be made no later than recordation of a final map, or application for building permits when no subdivision is required. A separate recorded instrument will be required to irrevocably offer the dedication if no final map is required. Fee dedication and recreation easements, requiring County maintenance are to be accepted based upon financial capability of the



grantee (County or its designee).

Irrevocable offers of dedication are in most cases accepted expeditiously by the County. In some cases, however, an offer is placed in a land bank inventory maintained by RDMD and reviewed periodically for selection of offers of dedication to be accepted based on the financial capability of the grantee to assume ongoing operation and maintenance costs.

All offers of dedication shall be irrevocable.

NOTE: For Open Space Dedication Definitions, refer to Attachment VI-1 on page VI-129.

Open space purchase opportunities are accomplished as follows:

- Purchase opportunities are identified in RDMD/HBP 5-Year Capital Plan.

- RDMD/HBP undertakes the necessary steps to acquire the open space.
- RDMD/HBP reports to the Board of Supervisors requesting action.
- The Board of Supervisors takes an action.

Open space donation opportunities are accomplished as follows:

- Donor offers to dedicate fee on easement lands not associated with any development entitlements.
- RDMD undertakes the necessary steps to acquire the open space.
- RDMD reports to the Board of Supervisors requesting action.
- The Board of Supervisors takes an action.

New or Existing Program: Existing

Implementation Schedule: Ongoing

CHAPTER VI. RESOURCES ELEMENT

Responsible Agencies:

- RDMD
- CSA 26 (successor to former Harbors, Beaches & Parks District)

Source of Funds:

- Harbors, Beaches & Parks
- County General Fund
- County Service Area Funds
- Developer Endowments
- Gifts
- Grants

2. DEVELOPMENT PROGRAM

Description:

The Development Program provides for orderly improvement of recreation easements and fee open space lands through design and construction of facilities to enhance their public use and enjoyment or through design and implementation of habitat restoration projects. Limited public access is anticipated in historic, resource preservation or scenic easements, and, therefore, development programs focus on landscaping and fuel modification programs for these areas.

The emphasis of this program is to preserve recreation easements and fee open space lands largely in their natural state by limiting construction of improvements to trails, overlooks, and staging areas, thus avoiding more costly operations and maintenance associated

with regional parks.

Design and construction of open space improvements are undertaken in one of two ways:

- 1) Negotiation with developers to provide open space improvements and landscaping/habitat restoration as conditions of approval. In this context, developers design and construct improvements and landscaping to County specifications and approval and dedicate them to the County along with the open space.
- 2) County provides open space improvements with public funds or by coordinating donations of the same. In this context, design of construction and landscaping

projects may be prioritized and scheduled in the RDMD/HBP 5 Year Capital Plan described annual updates of the Harbors, Beaches and Parks Program Report or accomplished through facilities accounts.

Action:

In the case of developer provided improvement and landscaping/habitat restoration necessary agreements with developers for the design and construction of open space improvements and landscaping/habitat restoration and secure bonding to guarantee their installation and



entitlement.

In the case of County-installed improvements:

- Annually update RDMD/HBP 5 Year Capital Plan and/or
- Annually update HBP Program Report.
- Coordinate with RDMD for the design and construction of projects.

New or Existing Program: Existing

Implementation Schedule:

- Ongoing
- Annually update the RDMD/HBP 5 Year Capital Plan and the HBP Program Report.

Responsible Agency: RDMD

Source of Funds: See Program No. 4, Financing Program.

3. OPERATION AND MAINTENANCE (O&M) PROGRAM

Description:

Consistent with the Development Program, which calls for very limited design and construction of facilities on open space lands, the O&M Program recognizes that many open space parcels are endowed with natural biotic and topographic resources that are largely self-maintaining.

Since these natural resources possess significant aesthetic appeal and constitute the principal open space attractions in and of themselves, the O&M Program emphasizes a large degree of passive maintenance allowing these resources to experience natural processes and to evolve through time with minimum interference, domestication, and construction of man-made attractions.

This helps to minimize perpetual O&M costs per acre allowing actual expenditures to be focused largely on maintenance of trails and related facilities when landscaping or habitat

CHAPTER VI. RESOURCES ELEMENT

restoration programs are undertaken, however, maintenance and monitoring are required.

The Board of Supervisors has mandated that acceptance of fee and easement open space dedications be closely geared to the County's ability to finance perpetual O&M costs. For this reason, revenue projections are completed with an update of the RDMD/HBP 5 Year Capital Plan, HBP operation and maintenance budgets (including capital depreciation) and the County Service Area budgets.

These projections indicate the availability of future O&M funding for existing and new facilities. Capital depreciation recognizes increased operation and maintenance costs associated with an aging infrastructure. Depreciation of operation and maintenance costs will be factored into the operation. Revenues above and beyond current O&M needs indicate opportunities when new open space lands can be accepted and maintained in perpetuity.

Since the emphasis of the O&M Program is on minimal disturbance and maintenance of open space, and since amenities are limited to trail, staging areas, overlooks and related facilities or landscaping/habitat restoration, per acre costs differ from the more highly developed regional park.

Action:

- Operate and maintain open space facilities with minimal disturbance of natural resources by developing limited amenities and improvements.
- Annually update RDMD/HBP operation and maintenance financing requirements and revenue projections. Excess revenues above current O&M needs and O&M gifts will indicate opportunities for County to accept irrevocably offered open space dedications.
- Assume new O&M responsibilities, when possible, based on excess revenues, if any, detected in item 2 above.

New or Existing Program: Existing

Implementation Schedule:

- Ongoing.
- Annually update the RDMD/HBP 5 Year Capital Plan and HBP operation and maintenance financing requirements and revenues.

Responsible Agency: RDMD

Source of Funds:

- CSA 26 (successor to former Harbors, Beaches & Parks District)

- County Service Area Funds
- Gifts
- Grants

4. FINANCING PROGRAM

Description:

The Financing Program provides the financial planning basis for the acquisition, development, operation, and maintenance of regional open space lands, including regional open space corridors, parks, harbors, beaches, riding and hiking trails, and Class I off-road bikeways. This program includes an annually updated 5 Year Capital Plan and an analysis of annual operation and maintenance requirements both updated annually by the Harbors, Beaches and Parks and CSA 26. This plan identifies the fiscal capacity of RDMD/HBP to acquire, develop, operate, and maintain new regional open space lands and facilities compared to available financing.

Action:

- Annually update the RDMD/HBP 5 Year Capital Plan and HBP operation and maintenance financing requirements.
- Annually update the HBP Program Report.
- Coordinate with RDMD for the acquisition, development, operation, and maintenance of open

space and/or open space improvements.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- CSA 26 (successor to Harbors, Beaches and Parks district)
- Dana Point Tidelands Fund
- Newport Bay Tidelands Fund
- Fish and Game Propagation Fund
- Santa Ana River Environmental Enhancement Fund
- User Fees
- Concession Income
- Grant Revenues
- County General Fund
- County Services Area Funds
- Developer Endowments
- Gifts

NOTE: For Description of Financing Program Funds, see Attachment VI-2 on page VI-131.

CULTURAL-HISTORIC RESOURCES

Introduction

Cultural-historic resources are defined as buildings, structures, objects, sites, and districts of significance in history,

CHAPTER VI. RESOURCES ELEMENT

archaeology, architectural history, and culture. In Orange County, resources of paleontological significance are included in the cultural resource management program.

The preservation, management, study and use of these resources is important for a number of reasons. We seek to preserve because these resources are all that physically link us to our past. They provide a frame of reference, both psychologically and historically, for a society rapidly moving into a technological future.

Cultural-historic resources are an educational tool for learning about the events, persons, conditions, and lessons of the past. Many such resources have high scientific and aesthetic values, as well as being economic assets to a community for their potential reuse, stimulating jobs and attracting tenants or tourists.

Background

Orange County has a history and prehistory that, despite the rapid change of the recent past, has left us a rich heritage of valuable cultural resources. The ancient geological formations have yielded and still contain paleontological resources of major significance.

The Los Coyotes area of North County and the Pectin Reef area of South County are among the most prolific and scientifically valuable fossil deposits in the nation.

Evidence of human occupation in Orange County dates from 17,000 B.C. Over 1,000 archaeological sites are registered in Orange County. They contain artifacts and features of value in reconstructing cultural patterns of prehistoric life.

In 1542, Juan Rodriguez Cabrillo sailed along the coast of future Orange County, but apparently contact with native inhabitants by Europeans was not initiated until over two centuries later when such prominent figures as Father Junipero Serra and Gaspar de Portola participated in the initial exploration and settlement.

The Mission San Juan Capistrano, established in 1776, is a National Historic Landmark and numerous adobe buildings from the late 18th and early 19th centuries still remain.

The Rancho Era of this time yielded to the American Era of the second half of the 19th century as ranching continued, but the economy and population diversified and towns were settled. Many of the cultural resources remaining today date from the first land development boom of the late 1880s when the architectural fashion was Victorian.

The 20th century has seen further rapid growth with citrus and other agricultural crops, business, oil, the proliferation of the automobile, and expanding commerce and light industries. Remaining are the scattered rural ranch houses and associated features,

commercial centers, and residential neighborhoods of varying styles dating usually from periods of prosperity such as the mid-1920s.

Location/Sensitivity

Important physical remnants of our cultural heritage are present throughout Orange County. Resources significant in history or architectural history are logically concentrated in the areas where settlement and growth occurred during the historical era, roughly from the late 18th century

through World War II. With the exception of San Juan Capistrano and smaller South County communities such as Laguna Beach and San Clemente, most pre-World War II development of Orange County occurred in North County towns and cities.

Sub-surface resources such as archaeological and paleontological sites are abundant in South County, along the coast and in creek areas. Several factors contribute to this condition. Certain geologic formations, due to their nature and age, are fossil-bearing or nonfossil bearing. Fossil-bearing formations are prevalent in South County. Prehistoric human occupation was most prevalent in areas where food, water, and shelter were available.

Perhaps the most important factor in the presence or absence of cultural resources is the subsequent activity in the area which

may have impacted the resource. Activities such as floods, erosion, grading, demolitions, etc., if they occurred since the time when the cultural resource came into existence, may have destroyed or damaged the site. This is actually a perpetual sequential process and explains in part why the areas of pre-World War II development in the county contain a greater number of significant structures and fewer archaeological sites.

Although identifying large, broad areas of resource trends is historically interesting and academically valuable, greater specificity is needed for planning purposes and cultural resource management. Areas and levels of sensitivity have been developed for archaeology and paleontology by professionals in these fields.

These resources sensitive areas are depicted in the County Master Environmental Assessment (MEA) Sensitivity Maps. This computerized mapping system is a valuable tool in the planning process, primarily as it relates to environmental issues and to the cultural resource management programs.

For paleontology, they are based on known outcrops or sites and on the underlying geological formations, which have a strong predictive validity. For archaeology, numerous factors are considered including known sites, topography, proximity to food and water, etc. MEA maps for archaeology show sensitivity levels only. No MEA Sensitivity Maps exist for historical sites.

CHAPTER VI. RESOURCES ELEMENT

Further survey data are needed. For paleontology, registered sites often are simply small outcroppings visible on the surface or sites encountered during grading. While the sites are important indicators, it is the geological formations, of which these sites are a part, that are most important for large planning purposes since the formations may contain more fossils.

Maps for paleontology show some of the best known sites as well as sensitivity levels which are predicated primarily on the underlying geological formations. (See Figure VI-9.) Paleontological sites are not considered as great a planning constraint as archaeology or history and are also not considered as sensitive to vandalism.

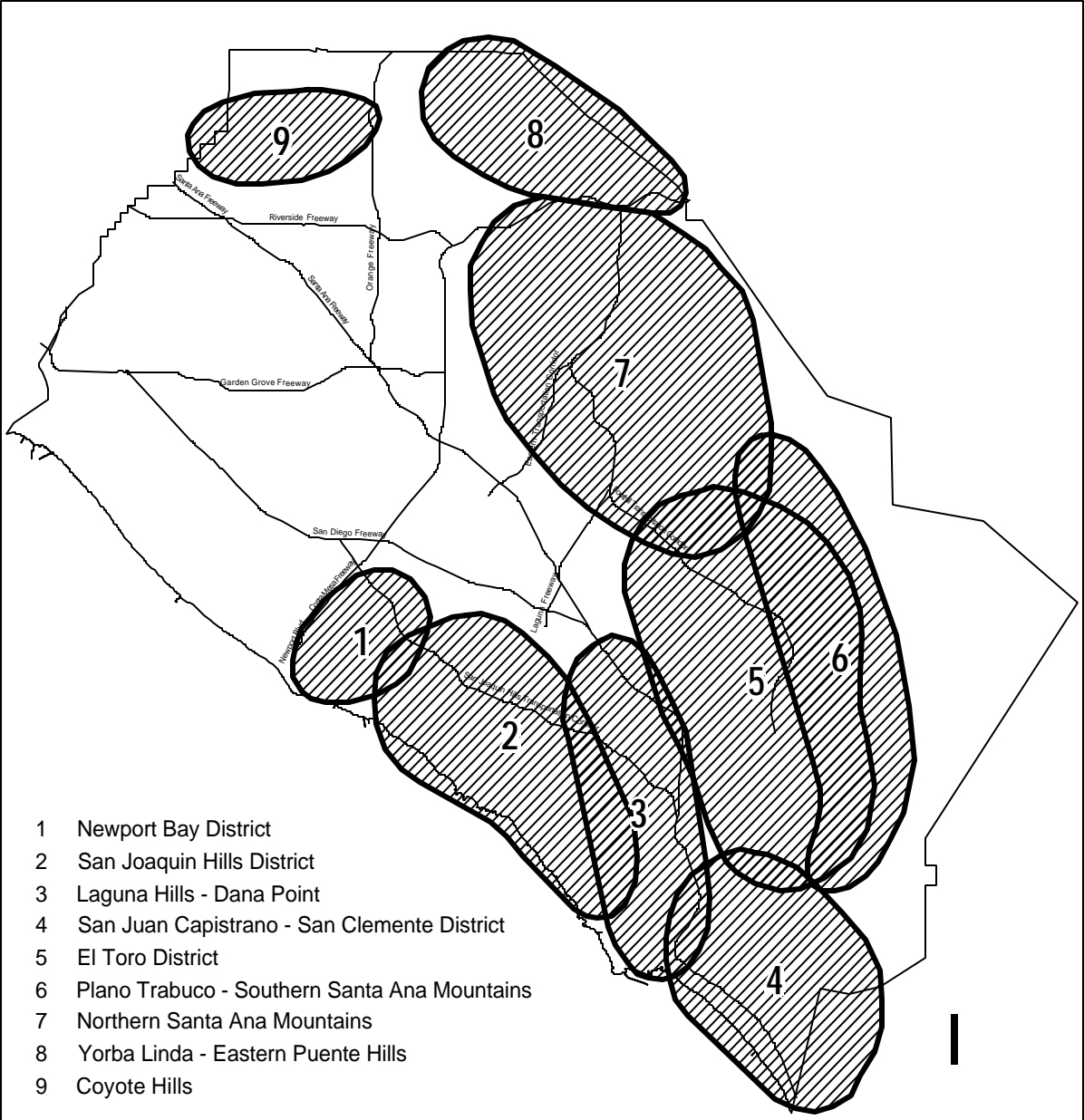
For archaeology, information regarding location of sites is considered very sensitive. "Pot hunting" and other deliberately destructive acts are a problem. Over 1,600 archaeological sites have been registered in Orange County at this time. The location of many of the sites are commonly known, others are protected on private property, and still others have been destroyed. Therefore, specific site locations are not depicted in order to protect them. (See Figure VI-10.)

For history, far less field survey information is available. Although several Orange County cities have been systematically surveyed, additional information is needed for unincorporated areas. In addition, all of the historical registration programs are passive and hence not at all comprehensive.

Figure VI-11 shows some of the most important historic sites but should not be construed as thorough because a very large portion of Orange County has not yet been field surveyed.

Figure VI-9

Figure VI-9



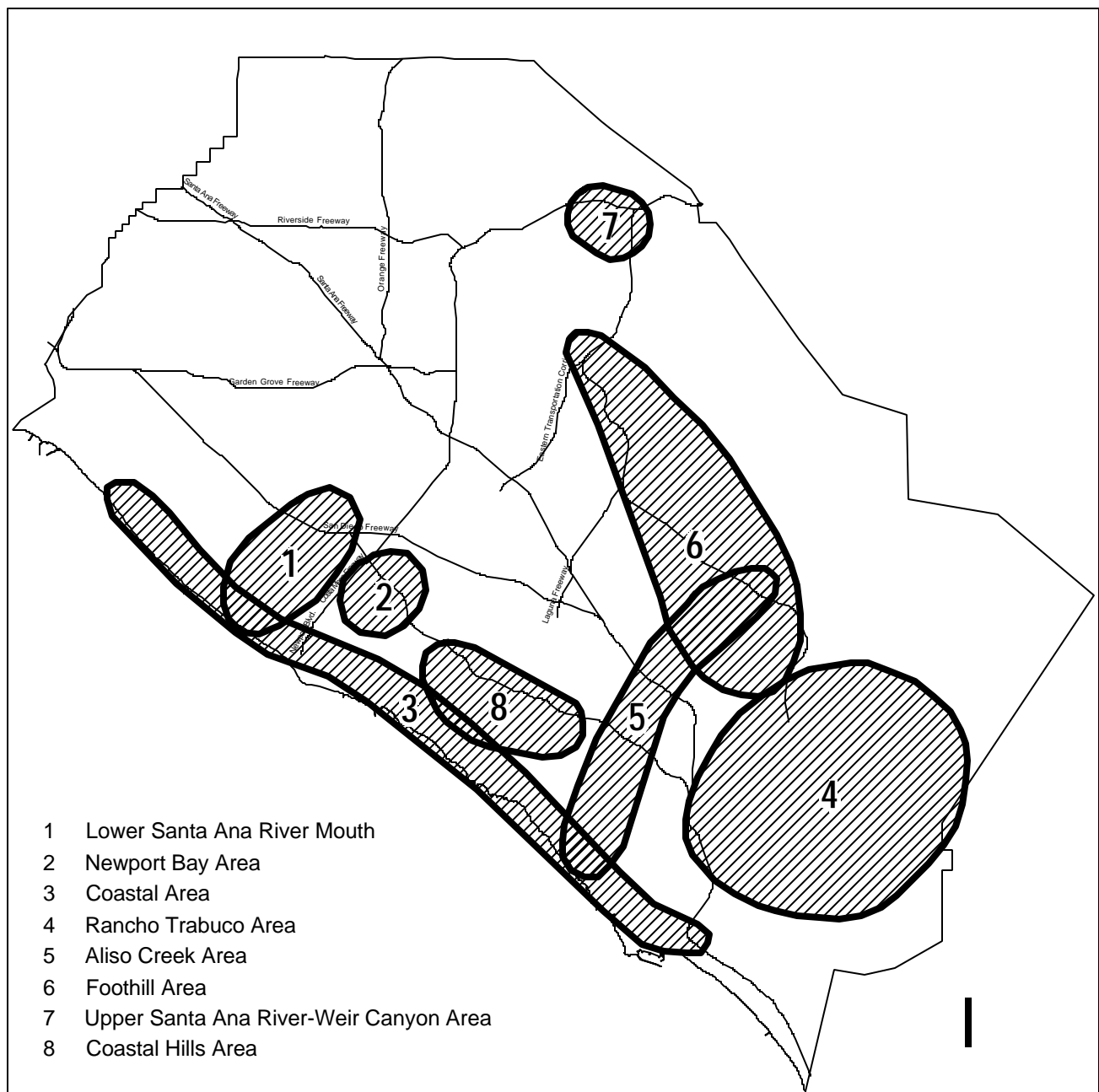
Source: Orange County Public Facilities & Resources Department

PALEONTOLOGY
General areas of Sensitivity

CHAPTER VI. RESOURCES ELEMENT

Figure VI-10

Figure VI-10



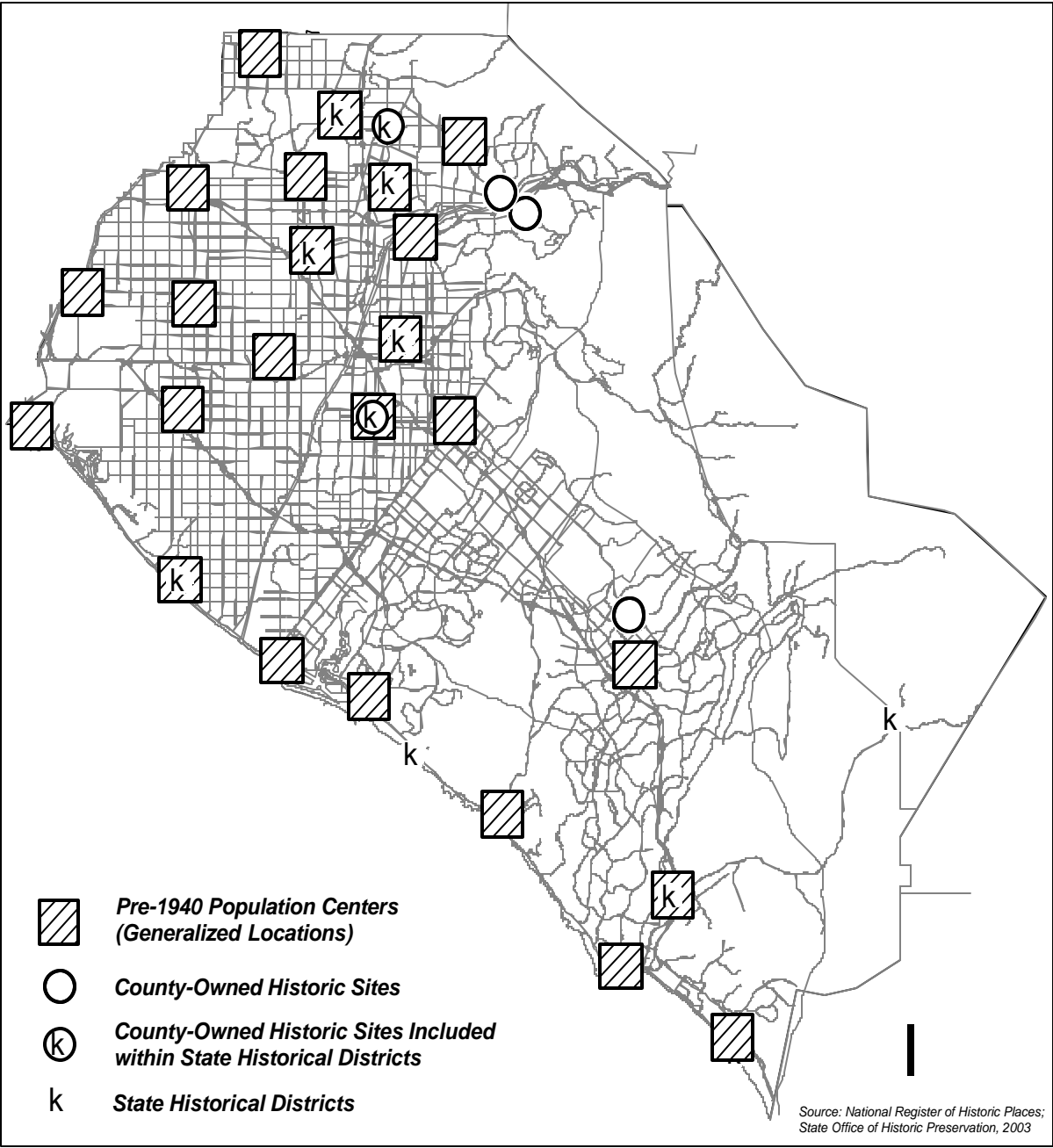
Source: Orange County Public Facilities & Resources Department

PREHISTORIC ARCHEOLOGY

General Areas of Sensitivity

Figure VI-11

Figure VI-11



ORANGE COUNTY HISTORICAL AREAS



Cultural-Historic Resources Preservation

NATIONAL

Early efforts to preserve cultural and historic resources at the national level are exemplified by the action of the Mount Vernon Ladies' Association in the mid 1850s when they succeeded in preserving a nationally significant building threatened with demolition for a new resort hotel complex. The threatened building was George Washington's Mount Vernon.

Systematic federal involvement began with the passage of the Antiquities Act of 1906, designed to protect Indian ruins and relics in the Southwest. In 1935, the Historic Sites Act was passed by Congress to further federal preservation efforts, to consolidate them in the National Park Service of the Interior Department, to create some related

jobs, and to establish the National Historic Landmarks program. Several projects were undertaken in Orange County.

In 1966, the keystone of contemporary federal preservation efforts became law, the National Historic Preservation Act (NHPA). This act established the current programs and funding. It delineated procedures and methods for both the environmental planning approach and the economic incentives approach to preservation.

Both approaches are used in Orange County. For example, road, block grant, and redevelopment projects are reviewed via the environmental planning approach during project review. Similarly, many historic buildings are rehabilitated with the assistance of economic incentives; that is special tax credits, low interest loans, and grants.

CHAPTER VI. RESOURCES ELEMENT

Numerous other laws have been passed (e.g., National Environmental Policy Act (NEPA)) and agencies have developed staff and procedures to deal with environmental regulations, primarily regarding archaeology. The biggest federal boost to historic preservation came with the Economic Recovery Tax Act of 1981 which established a 25 percent investment tax credit for rehabilitating a historic building.

STATE

As with federal preservation efforts, State level preservation in California is focused in the parks department. State historic parks, such as the gold rush town of Columbia in the foothills of the Sierras, were first established in the late 1920s.

In California, the State Historic Preservation Office (SHPO), which administers both federal and State preservation programs in California, is organizationally within the State Department of Parks and Recreation.

Planning-related preservation activities are performed by a variety of State agencies, with principal local liaison from SHPO, and coordination with the State Office of Planning and Research and Department of Transportation. Since the mid-1960s, most financial incentives for preservation have been granted by the federal government through the SHPO to local governments and private entities in the form of grants or tax credits.

In Orange County, State involvement in cultural resources has several forms. The California Environmental Quality Act (CEQA) adopted in 1970 provides a mechanism for the consideration of cultural-historic resources as a part of the local environmental review process.

Grants through the State Department of Parks and Recreation and SHPO have been received for historic surveys and acquisition and development projects. SHPO reviews private historic rehabilitation projects and, with other state agencies, participates in the environmental review process on projects such as roads.

QUASI-PUBLIC

The principal quasi-public preservation entity is the National Trust for Historic Preservation, established by Congress in 1949. In recent years, numerous "preservation" projects have been undertaken by private entities and local jurisdictions through a combination of federal funding sources (e.g., Housing and Urban Development, Revenue Sharing, NHPA, or federal tax credits) and local or private sources.

The number of local preservation organizations in the U.S. has expanded tenfold in the last fifteen years. Many are partially grant funded. Numerous local governments have established cultural resource preservation commissions during this time to deal with increased public



interest, environmental regulations, funding opportunities, and projects such as house museums, historic surveys, and preservation ordinances. In Orange County, there are over sixty organizations which promote the preservation and study of cultural and scientific resources in the County.

LOCAL

Orange County has a rich storehouse of cultural and scientific resources, beginning with prehistoric fossils and artifacts and carrying on through the historically and architecturally significant sites and buildings of the past two-hundred years. These resources are important for academic research and publications, for the education of school children and the general public, and for their cultural, social, and economic values.

Efforts to preserve these resources in Orange County started in 1897 when the first preservation organization in California, the Landmark's Club of Southern California,

selected as its first project the Mission San Juan Capistrano.

The twentieth century has seen museum development (such as the Bowers), the flourishing of numerous historical societies, the adoption of cultural environmental policies by the Board of Supervisors, the emergence of advocacy and fund-raising groups, and the undertaking of private historic rehabilitation projects as well as academic/research excavations.

Preservation of Orange County's significant archaeological, paleontological and historical resources in a manner that both preserves the site and is compatible with development is desirable. The County encourages early identification of significant resources in order that cultural resources can be given major consideration in land use planning.

GOALS, OBJECTIVES AND POLICIES: *Cultural-Historic Resources*

CHAPTER VI. RESOURCES ELEMENT

Goal 1

To raise the awareness and appreciation of Orange County's cultural and historic heritage.

- ***Objectives***

1.1 Facilitate and participate in activities that inform people about the social, cultural, economic, and scientific values of Orange County's heritage.

1.2 Work through the Orange County Historical Commission in the areas of history, paleontology, archaeology, and historical preservation.

- ***Policies***

1.1 To stimulate and encourage financial support for projects in the public and private sector.

1.2 To coordinate countywide programs and be the liaison for local organizations.

1.3 To advise and aid the public and private sectors in meeting museum needs and finding funding sources for same.

1.4 To stimulate and encourage research, writing, and publication of articles on Orange County subjects.

1.5 To develop and maintain a County archive for historically valuable records.

1.6 To encourage and facilitate cooperation among local historical societies.

Goal 2

To encourage through a resource management effort the preservation of the county's cultural and historic heritage.

- ***Objectives***

2.1 Promote the preservation and use of buildings, sites, structures, objects, and districts of importance in Orange County through the administration of planning, environmental, and resource management programs.

2.2 Take all reasonable and proper steps to achieve the preservation of archaeological and paleontological remains, or their recovery and analysis to preserve cultural, scientific, and educational values.

2.3 Take all reasonable and proper steps to achieve the preservation and use of significant historic resources including properties of historic, historic architectural, historic archaeological, and/or historic preservation value.

2.4 Provide assistance to County agencies in evaluating the cultural environmental impact of proposed projects and reviewing EIRs.

2.5 Provide incentives to encourage greater private sector participation in historic preservation.

Policies

The following policies addressing archaeological, paleontological, and historical resources shall be implemented at appropriate stage(s) of planning, coordinated with the processing of a project application, as follows:

- Identification of resources shall be completed at the earliest stage of project planning and review such as general plan amendment or zone change.
- Evaluation of resources shall be completed at intermediate stages of project planning and review such as site plan review, subdivision map approval, or at an earlier stage of project review.
- Final preservation actions shall be completed at final stages of project planning and review such as grading, demolition, or at an earlier stage of project review.

Archaeological Resources Policies:

1. To identify archaeological resources through literature and records research and surface surveys.

2. To evaluate archaeological resources through subsurface testing to determine significance and extent.
3. To observe and collect archaeological resources during the grading of a project.
4. To preserve archaeological resources by:
 - a) Maintaining them in an undisturbed condition, or
 - b) Excavating and salvaging materials and information in a scientific manner.

Paleontological Resources Policies:

1. To identify paleontological resources through literature and records research and surface surveys.
2. To monitor and salvage paleontological resources during the grading of a project.
3. To preserve paleontological resources by maintaining them in an undisturbed condition.

Historic Resources Policies:

1. To identify historic resources through literature and records research and/or on-site surveys.

CHAPTER VI. RESOURCES ELEMENT

2. To evaluate historic resources through comparative analysis or through subsurface or materials testing.
3. To preserve significant historic resources by one or a combination of the following alternatives, as agreed upon by RDMD and the project sponsor:
 - a) Adaptive reuse of historic resource.
 - b) Maintaining the historic resource in an undisturbed condition.
 - c) Moving the historic resource and arranging for its treatment.
 - d) Salvage and conservation of significant elements of the historic resources.
 - e) Documentation (i.e., research narrative, graphics, photography) of the historic resource prior to destruction.

Goal 3

To preserve and enhance buildings structures, objects, sites, and districts of cultural and historic significance.

• Objectives

- 3.1 Undertake actions to identify, preserve, and develop unique and significant cultural and historic resources.

- 3.2 Develop and maintain a County archive for historically valuable records, thereby promoting knowledge and understanding of the origins, programs, and goals of the County of Orange.

• Policies

- 3.1 To pursue grants and innovative funding strategies for acquisition or development of significant properties.
- 3.2 To develop, utilize, and promote effective technical conservation and restoration strategies.
- 3.3 To appraise, collect, organize, describe, preserve, and make available County of Orange records of permanent, historical value.
- 3.4 To serve as a research center for the study of County history.

IMPLEMENTATION PROGRAMS: *Cultural-Historic Resources*

1. ADVISORY BODIES PROGRAM

Description:

Provide for and assist cultural/historic resource and facility advisory bodies.

Action:

- Provide policy direction and staff support for Orange County Historical Commission, Historical Records Commission, Old Courthouse Museum Advisory Committee, Modjeska Advisory Board, etc.

- Provide policy direction and staff support for advisory bodies of a temporary nature such as task forces or ad hoc committees.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Grants
- Harbors, Beaches and Parks District
- Private Sources

2. ARCHAEO/PALEO CERTIFICATION PROGRAM

Description:

Administer program for certification of professionals in fields of archaeology and paleontology.

Action:

- Coordinate and perform review of resumes submitted by applicants.
- Present to Planning Commission for action.

- Maintain, update, and distribute list and resume file for client use.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agencies:

- RDMD
- Planning Commission

Source of Funds:

- County General Fund

3. ARCHIVE PROGRAM

Description:

Develop and operate a County archive to preserve for conservation and research use those historically valuable materials which document the origins, activities, and achievements of the County.

Action:

- Provide facility for the storage and preservation of County records of historic significance.
- Develop and conduct inter-agency program to train records coordinators.
- Provide access to records for researchers and interested public.

New or Existing Program: Existing

Implementation Schedule: Ongoing

CHAPTER VI. RESOURCES ELEMENT

Responsible Agencies:

- Recorder's Office
- RDMD

Source of Funds:

- Grants
- Recorder's Office

4. COUNTY HISTORICAL PARKS AND FACILITIES PROGRAM

Description:

Provide for and administer a parks program which includes the preservation, restoration, and use of cultural and historical properties; and

promote the development and operation of County interpretive sites of cultural-historic significance.

Action:

- Coordinate to identify, preserve and acquire, as County parks, significant cultural resources.
- Plan, develop, and operate County parks to enhance and preserve cultural resources and for public enjoyment.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors, Beaches and Parks
- Grants
- Leases and other Revenue

5. COUNTYWIDE HISTORIC SURVEY PROGRAM

Description:

Administer program for identification of historically significant properties. Promote and facilitate use of the survey material in related planning and historical preservation programs.

Action:

- Provide information and encouragement to local groups to expand the existing historic survey program.
- Provide contract administration, technical expertise, and data storage and retrieval for survey materials.
- Provide information to local planning departments to encourage surveying by cities.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Housing and Community Development Block Grants
- Other Grants
- Private Donations
- Private Development Fees
- Specific Public Projects

6. CULTURAL/SCIENTIFIC AND HISTORIC RESOURCE MANAGEMENT PROGRAM

Description:

Review public and private development proposals for their consideration of cultural resources and recommend measures to mitigate adverse effects, in accordance with California Environmental Quality Act (CEQA), federal historic resources legislation, and Board policy.

Action:

- Review/coordinate review of EIRs to address cultural resources and provide comments and recommendations to the lead agency/responsible office.
- Monitor the development process to ensure protection of cultural resources.
- Coordinate and manage research and preparation of cultural resource reports for County projects.
- Respond to inquiries from the public.

- Maintain historic, archaeological, and paleontological files and maps.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors, Beaches and Parks
- Specific Public Projects (roads, parks)
- Project Developer Fees

7. INFORMATION CLEARINGHOUSE PROGRAM

Description:

Provide information clearinghouse and technical advisory services regarding registration, design, finance, construction, management, and use of cultural resources. These services are provided to a wide-spectrum clientele including County offices, private developers, planning and engineering firms, archaeologists, paleontologists, historians, and local jurisdictions (planning departments, redevelopment agencies).

Action:

- Gather information from a wide variety of cultural heritage resource persons/organizations and maintain files for their use.

CHAPTER VI. RESOURCES ELEMENT

- Respond to requests for information, distribute information, and refer public inquiries to other sources and organizations.
- Provide speakers for a variety of conferences, seminars, workshops, and presentations.
- Maintain and distribute lists of consultants, professionals, and information sources to cultural heritage resource persons and others.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors Beaches & Parks
- Public Projects
- Project Developer Fees

8. LOCAL HISTORICAL ORGANIZATIONS LIAISON PROGRAM

Description:

Provide a communication network through the Orange County Federation of Historical Organizations, newsletters, and meetings.

Action:

- Facilitate communication between County historical groups by

gathering and disseminating information.

- Maintain detailed listing of all County historical organizations. Update and distribute listing regularly.
- Produce and distribute a quarterly newsletter.
- Organize and conduct workshops/ meetings on topics of historical interest.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors Beaches & Parks
- Private Donations
- Grants

9. PLAQUE PROGRAM

Description:

Acknowledge significant historical places through their evaluation and designation and through the placement of plaques and markers overseen by the Historical Commission.

Action:

- Receive and review requests for placement of plaques.
- Research County history to determine sites eligible for plaques

and significance of proposed plaques.

- Coordinate with local historical groups and special interest groups (e.g., to conduct research, order plaques, and plan dedication ceremonies).
- Maintain files on local historic sites and make information available to the public.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors, Beaches & Parks
- Private Donations

10. PRESERVATION INCENTIVES/ OPPORTUNITIES PROGRAM

Description:

Encourage greater private sector participation in historic preservation through the development and operation of preservation incentives and opportunities.

Action:

- Work with County offices and others to investigate the feasibility and implementation of contemporary preservation incentives such as joint ventures,

façade easements, Mill's Act Program, etc.

New or Existing Program: New

Implementation Schedule: As feasible

Responsible Agency: RDMD

Source of funds:

- Development Fees
- HBP
- Private Donations
- Grants

11. PUBLICATIONS PROGRAMS

Description:

Encourage, assemble, and disseminate information in the form of articles, brochures, and publications.

Action:

- Coordinate, research, publish, and update a guide to local cultural heritage resources.
- Research, publish, and distribute informational brochures on specific County-owned sites (e.g., parks).
- Provide information to newspapers, radio, and television for their use in promoting the County's cultural heritage.
- Solicit and accept material for cultural resources research and

CHAPTER VI. RESOURCES ELEMENT

maintain it for public use in a variety of publications.

New or Existing Program: Existing

Implemented Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Harbors, Beaches and Parks
- Grants
- Private Donations

12. SPECIAL ACTIVITIES PROGRAM

Description:

Coordinate countywide cultural activities on publications of a unique or one-time only nature.

Action:

- Seek out and review proposals for special activities such as conferences, seminars, fairs, and celebrations.
- Initiate and coordinate the presentation of such activities with local interest groups and County agencies.
- Research, write and publish historical-based publications.

New or Existing Program: Existing

Implementation Schedule: Ongoing

Responsible Agency: RDMD

Source of Funds:

- Private Donations
 - Harbors, Beaches and Parks
 - Grants
-

ATTACHMENT VI-1
OPEN SPACE DEDICATION DEFINITIONS

NOTE: The following information references the open space dedication easements discussed on pages VI-104 and VI-105 of the Resources Element.

OVERVIEW

There are two types of open space dedications commonly utilized for the acquisition of open space: fee dedication and easement dedication. Dedications may be irrevocably offered for dedication and accepted at a later date or accepted at the outset. Following are definitions of the types of dedications used by the County. Fee dedication transfers ownership to the grantee while easement dedication does not transfer ownership.

DEFINITIONS

Fee Dedication:

Under fee dedication, the County or its designee receives clear title to the designated open space in perpetuity. Generally, the property owner dedicates to the grantee or its designee fee title free of liens, encumbrances, assessments, fees, easements, leases (recorded or unrecorded), and taxes in a form suitable for recordation.

Easement Dedication:

- ***Resource Preservation Easement***

The resource preservation easement (formerly either the open space or conservation easement) serves to protect natural resources (e.g., native and exotic vegetation, major ridgelines, bluffs, in their natural state) provides an open space transition area at the private/public property interface and limits uses to those areas which are recreational in nature and improvements intended to retain open space character. Development of any form is prohibited within resource preservation easements.

- ***Scenic Easement***

The scenic easement serves to restrict alterations by the underlying fee owner of the natural scenic and/or manufactured landform through grading operations; structural development; storage and/or placement of fill material, equipment, and/or building materials; and removal of or damage to vegetation (native and/or exotic), rock outcroppings, etc. Development within said easement areas shall be restricted to 15 percent of said easement area

encumbering any individual lot and may include open fencing which does not constitute a visual barrier or wall impeding wildlife circulation, necessary flood control works and regional riding and hiking trails. Residential development of any form is prohibited within scenic easements.

- ***Recreation Easement***

A recreation easement is intended to provide a perpetual easement over an area designated for public use including regional and/or local riding and hiking trails and staging areas on privately-owned land.

- ***Historical Preservation Easement***

An historic preservation easement serves to protect historically and architecturally significant buildings and their settings. It operates like a resource preservation easement by protecting open space, biological resources, historic and scenic views, and the surroundings of culturally significant buildings and/or structures through restricted development rights. This easement also incorporates provisions of the exterior architectural façade easement by protecting the outside appearance of historically and architecturally significant buildings or structures.

- ***Landscape Maintenance Easement***

A landscape maintenance easement allows the County or its designated maintenance agency (County Service Area) to enter a property held in fee title by a landowner or his assigns and successors for the purpose of maintenance, repair, refurbishment, and general care and upkeep of landscaping and irrigation systems.

ATTACHMENT VI-2
DESCRIPTION OF FINANCING PROGRAM FUNDS

NOTE: This section describes Financing Program funding sources listed on page VI-109 of the Resources Element.

OVERVIEW

The primary funding source for the acquisition, development, operation, and maintenance of regional open space areas comes from the Harbors, Beaches and Parks District funds. These funds are derived from property tax revenue under a formula share allocation of the property tax base as adopted by State legislation. The following describes other funding sources that support the acquisition, development, operation, and maintenance of regional and non-regional open space areas.

Dana Point Harbor Tidelands Fund:

This funding source is derived from revenues generated through fees and concessionaire rents at Dana Point Harbor. Most of the harbor is on State tidelands held in trust by the County; therefore most rent and concession revenue is credited to the tidelands fund with remainder revenues credited to the Harbor, Beaches and Parks District.

Newport Bay Tidelands Fund:

This funding is derived from revenues generated by rent, concessions, off-shore moorings, and guest slips.

Sunset Beach Tidelands Fund:

This funding is derived from oil lease revenues.

Off-Road Vehicle Fund:

The State of California levies a license fee for all off-road recreation vehicles a portion of which is received by the County and deposited in this fund.

Federal Revenue Sharing Fund:

Federal funds received by the County and earmarked for specific regional recreation projects.

Fish and Game Propagation Fund:

This fund is created by obtaining one-half of fines and forfeiture collected by the State for Fish & Game Code violations.

Santa Ana River Environmental Enhancement Fund:

Fund established by agreement between the Board of Supervisors (Flood Control District) and the Orange County Water District.

Special-District Augmentation Funds:

This fund was established by State legislation (AB 8) to ease the financial burden on special districts created by limitations on property tax revenues resulting from Proposition 13.

Use Fees:

These fees are established to offset the cost of operating and maintaining regional recreation facilities. Examples of such fees are day use parking fee, overnight camping fees, and fees collected from coastal recreational facilities.

Concession Income:

Concessionaire leases may be offered on open space lands to provide basic public recreation services such as a golf course. Leases may also be offered for agricultural/horticultural purposes.

In addition, concessionaire leases which supplement the recreation intent of a particular regional recreational facility may be offered. Examples include concession stands at regional parks and stores and restaurants at the County harbors.

Grant Revenues:

State and Federal assistance programs provide grant funds to local governments for recreational projects meeting specific criteria.