

BACKGROUND REPORT
WHITTIER GENERAL PLAN

**BACKGROUND REPORTS
FOR THE
WHITTIER GENERAL PLAN UPDATE**

Prepared for:

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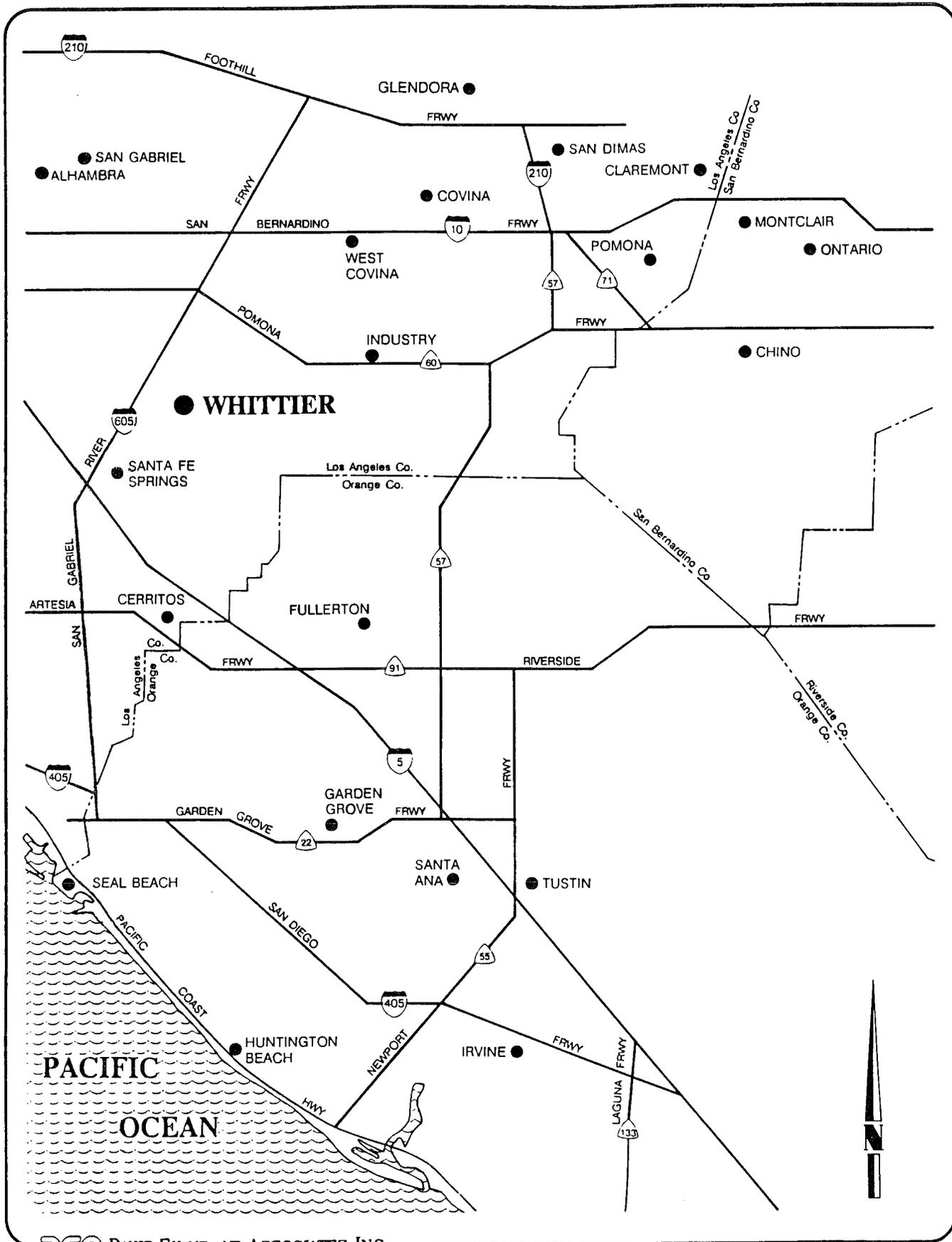
SECTION 1: INTRODUCTION

The City of Whittier is located in the eastern portion of Los Angeles County, 15 miles east of downtown Los Angeles. The City is on the southwestern slopes of the Puente Hills just east of the San Gabriel River and the San Gabriel River Freeway (State Route 605). The land features a sloping terrain on the north and east where the Puente Hills are located and becomes flat on the southern and western sections. Elevations range from 1,000 feet above sea level on the northeast to 140 feet above sea level on the south. The area slopes southwest and generally drains toward the San Gabriel River. Exhibit 1-1 shows the regional location of Whittier.

Neighboring cities and communities include Pico Rivera and Los Nietos on the west, Santa Fe Springs and La Mirada on the south, La Habra and La Habra Heights on the east, and the unincorporated communities of Hacienda Heights and Rowland Heights on the north. Exhibit 1-2 shows the vicinity map of the area.

Urban development in the area had started even before the turn of the century, providing the City with a mix of old and new structures. The City of Whittier is developed primarily with residential land uses with vacant land limited to scattered infill lots and hillside areas. The City's proximity to regional employment centers and recreational facilities has kept it an attractive residential location.

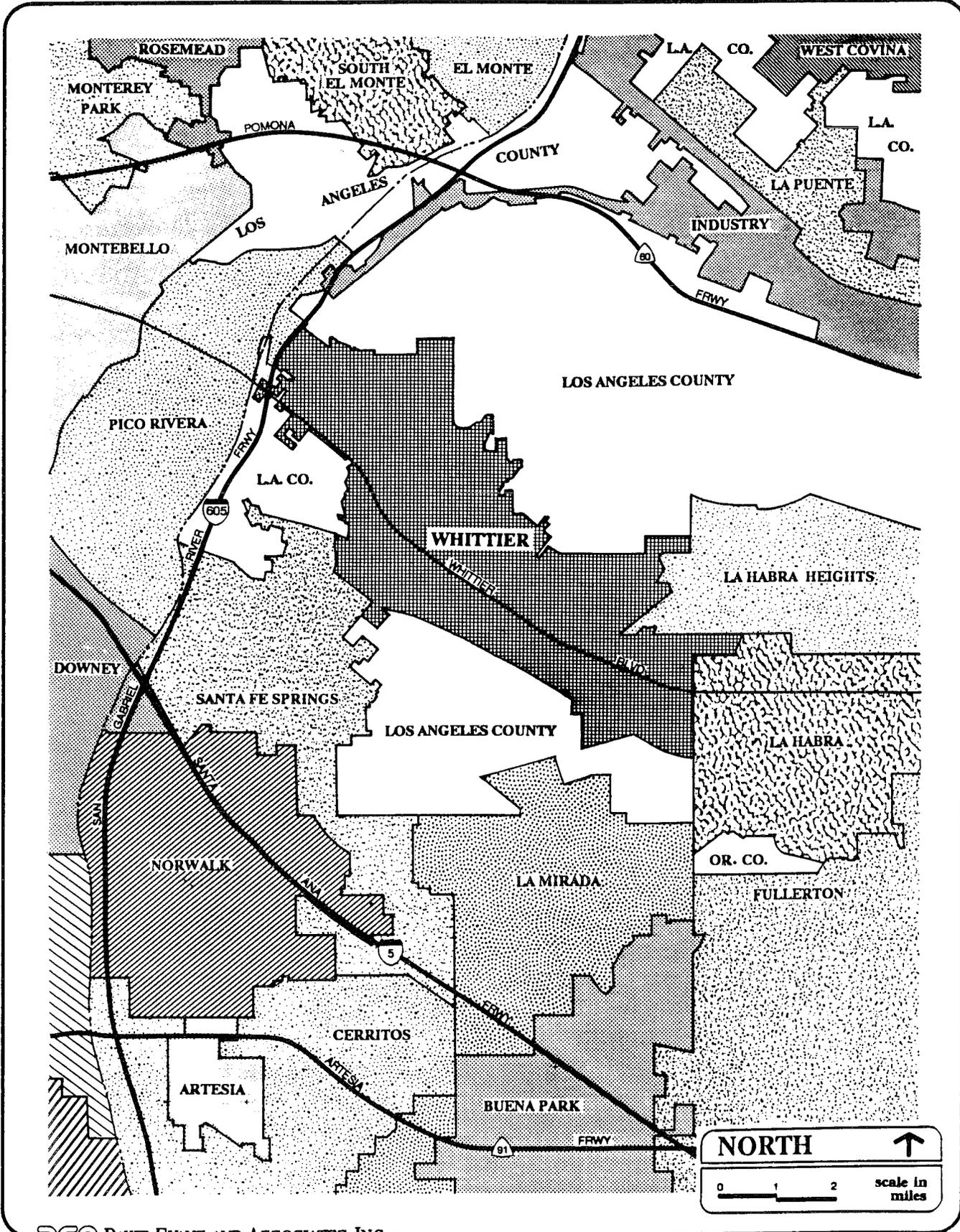
The sphere of influence of a City includes incorporated and unincorporated areas which are within the City's service area. It is the area which bears some relation to the City in terms of planning and service provision. The spheres are assigned by the Local Agency Formation Commission of Los Angeles County (LAFCO) as potential annexation areas to adjacent cities. This designation does not give any authority to the City in terms of development or permit processing. Rather, it serves as a preliminary basis for future annexation, subject to the consent of the property owners. Unincorporated areas surrounding Whittier which are included in its sphere of influence are shown in Exhibit 1-3. These areas are south and southeast of the City between Whittier and La Mirada and the Puente Hills area north and northeast of the City.



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**EXHIBIT 1-1
 REGIONAL LOCATION**

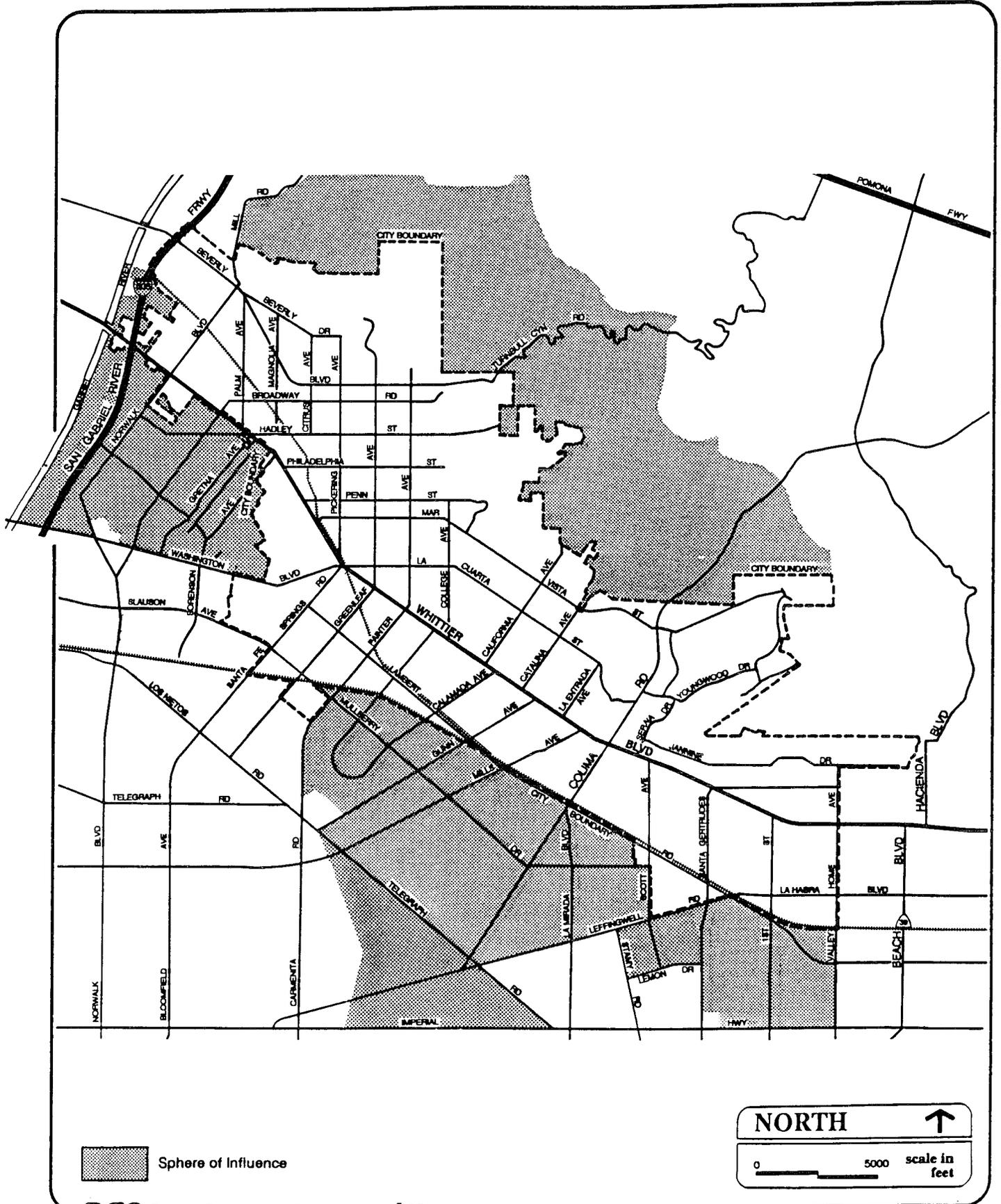


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City of Whittier



EXHIBIT 1-2
VICINITY MAP



 Sphere of Influence

NORTH ↑

0 ————— 5000 scale in feet

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City of Whittier



**EXHIBIT 1-3
SPHERE OF INFLUENCE**

SECTION 2: LAND USE ELEMENT BACKGROUND REPORT

INTRODUCTION

The Land Use Element Background Report provides a discussion of the issues and opportunities that affect land use planning in the City of Whittier. This section contains information on the location and distribution of existing land uses within the City and existing public services. In addition, land use trends and constraints that affect existing and future development are discussed.

LAND USE TRENDS

The City of Whittier covers an area of approximately 12.51 square miles. It was founded in 1887 by a Friends organization, the Pickering Land and Water Company. The City was subsequently incorporated on February 1898. Early development included the intersection of Hadley Street and Greenleaf Avenue, which was then known as the "Four Bricks". The original Pickering Land and Water Company land holding was subdivided into what is now the Uptown area.

In December 1961, the East Whittier area was annexed and Whittier's population more than doubled. Adjacent areas such as Los Nietos, South Whittier, and West Whittier have since been developed to complete the urbanization of the Whittier area. From 1970 to 1980, the City of Whittier experienced a decrease in population reflecting the aging of the City's population. Recent population growth can be attributed to the increase in Hispanic households who generally have larger families and the construction of multi-family structures in place of single-family structures.

The City of Whittier is a mature urban community. Nearly 90 percent of the residential land in the City is devoted to single family residences. Commercial areas are located along major highways and at the original city center - Uptown Whittier. Industrial uses are found on the western section of the City along Whittier Boulevard.

The 1990 U.S. Census reports a population of 77,671 persons in the City. This is an 11.4 percent growth over the last decade. Table 2-1 shows growth in the City from 1960. Compared to the County growth of 18.5 percent from 1980 to 1990, Whittier has been experiencing a more modest growth. This is due in large part to the existence of a developed community and the lack of vacant land. Future growth is expected to continue with its slow trend as land recycling and infill development represent the main precursors of development.

TABLE 2-1 HISTORIC POPULATION GROWTH		
Year	Population	Growth Percentage
1960	33,663	-----
1970	72,862 ^a	116 %
1980	69,717	- 4.2 %
1990	77,671	11.4 %

^a Growth reflects annexation of East Whittier
Source: U.S. Census

Another aspect that has significantly contributed to the City's slow growth is the long term stability of its residents. Over two-thirds of the City's residents have resided in the community for over ten years. The maturity of the City and the lack of developable land has increased the pressure for redevelopment and recycling of development where permitted. The Uptown area, now recovering from the October 1987 earthquake, and the Whittier Boulevard corridor are the focus of current commercial revitalization efforts.

Much of the recycling that has occurred in Whittier involves many older single-family units on R-3 lots being replaced with multi-family structures as a result of damage to structures during the 1987 earthquake. The resulting higher densities has placed greater demands on the infrastructure and streets in the area north of Hadley Street. In response to these pressures, the City undertook a program to re-zone the area in 1989. Residential subdivisions on the hillsides have also been developed in recent years.

Today, new construction continues to involve the recycling of older structures to commercial uses along key arterial roadways and single-family units being replaced by multi-family development. A few residential subdivisions have extended into the hillside areas, although the Puente Hills remain largely undeveloped.

The overall density in the City is low, with higher intensity developments located in and around the Uptown area. The majority of the single family residential areas have densities ranging from 3 to 5 units per acre. This type of development creates the suburban atmosphere in Whittier which residents have sought to preserve over decades of growth.

EXISTING LAND USES

A land use survey was conducted by the Whittier Planning Department, with existing land uses classified according to the following categories:

- Residential Uses. This category of land use includes:

Single-family units (lots with only one dwelling unit),
Duplex units, (lots with two dwelling units),
Multi-family units (structures containing 3 or more units), and
Trailer Parks.

- **Commercial Uses.** Commercial uses include:
Office Commercial - Administrative and professional office uses
Retail Commercial - Individual shops and retail stores
Mini-mall - Lots developed with structures accommodating 5 or more businesses under one structure
Shopping Centers - Lots developed with 20 or more department stores and retail shops
Hotel/Motel - Lots developed with hotels, motels and other temporary living quarters.
- **Industrial Uses.** Industrial uses include:
Warehouse/Manufacturing - Lots with structures used for the storage or distribution of goods or for the production or fabrication of finished or unfinished goods.
Automotive Uses - Lots used for any automotive-related uses such as auto repair, auto-wrecking, auto sales, etc.
- **Institutional and Public Uses** Institutional and Public uses include:
Schools - Areas owned by public and private schools
Parks - Designated park sites
Church/Library - Lots used by libraries, churches, religious, fraternal and other activities.
Hospitals - Sites developed with hospital uses.
Police and Fire Stations - Police and Fire Stations
City Hall/ Civic Center - The area occupied by the City Hall, post office, and other support offices
Utility Yards - Construction and public utility yards
Parking - Lots used solely for vehicle parking
Landfill - The area covered by the Savage Canyon Landfill
- **Vacant** - All other lots left undeveloped
- **Streets** - The area occupied by street rights-of-way

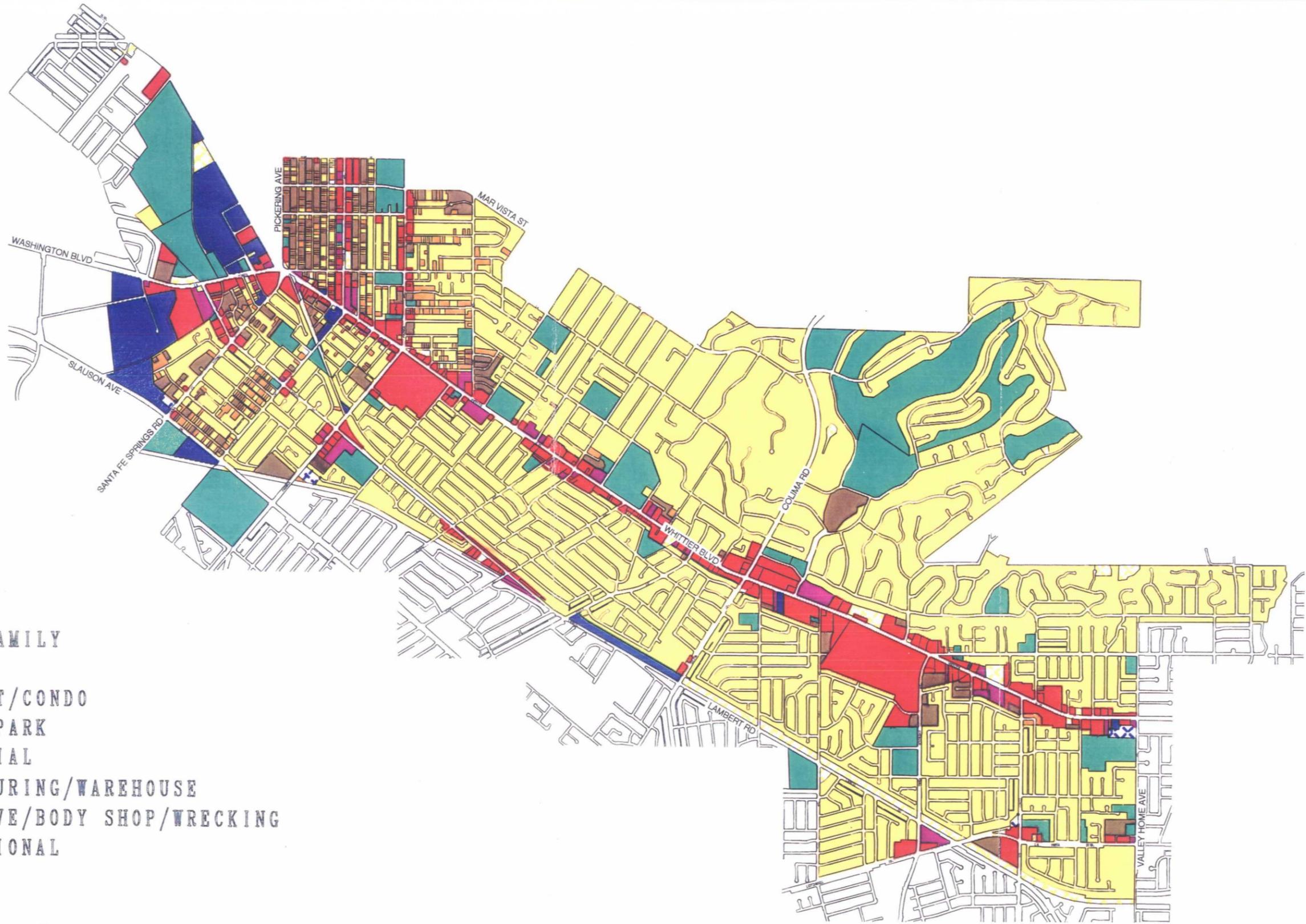
An acreage breakdown of existing land uses in the City is provided in Table 2-2. The location and extent of existing development in the City is shown in Exhibits 2-1 and 2-2.

TABLE 2-2 EXISTING LAND USES		
Land Use	Acreage	Percent
Residential		
Single Family Units	3,849.2	48.08
Duplex (two-family units)	102.5	1.28
Multi-family Units	327.0	4.08
Trailer Parks	<u>8.8</u>	<u>0.11</u>
Sub-total	4,287.5	53.55
Commercial		
Office Commercial	101.1	1.26
Retail Commercial	162.0	2.02
Mini-mall	55.7	0.70
Shopping Centers	96.9	1.21
Hotel/Motel	<u>8.8</u>	<u>0.11</u>
Sub-total	424.5	5.30
Industrial		
Warehouse Industrial	188.5	2.35
Automotive/Body Shop/Wrecking	<u>69.7</u>	<u>0.87</u>
Sub-total	258.2	3.22
Public and Institutional		
Schools	401.9	5.02
Parks	410.4	5.13
Churches/Libraries	77.1	0.96
Hospitals	31.7	0.40
Police/Fire Station	6.2	0.08
City Hall	27.5	0.34
Utility Yards	18.2	0.23
Parking	14.2	0.18
Friendly Hills Country Club	154.8	1.93
Landfill	<u>99.8</u>	<u>1.25</u>
Sub-total	1,241.8	15.52
Vacant	265.1	3.31
Streets	<u>1,528.8</u>	<u>19.10</u>
Total	8,005.9	100.0

Source: City of Whittier Planning Department, 1991; David Evans and Associates, 1991.

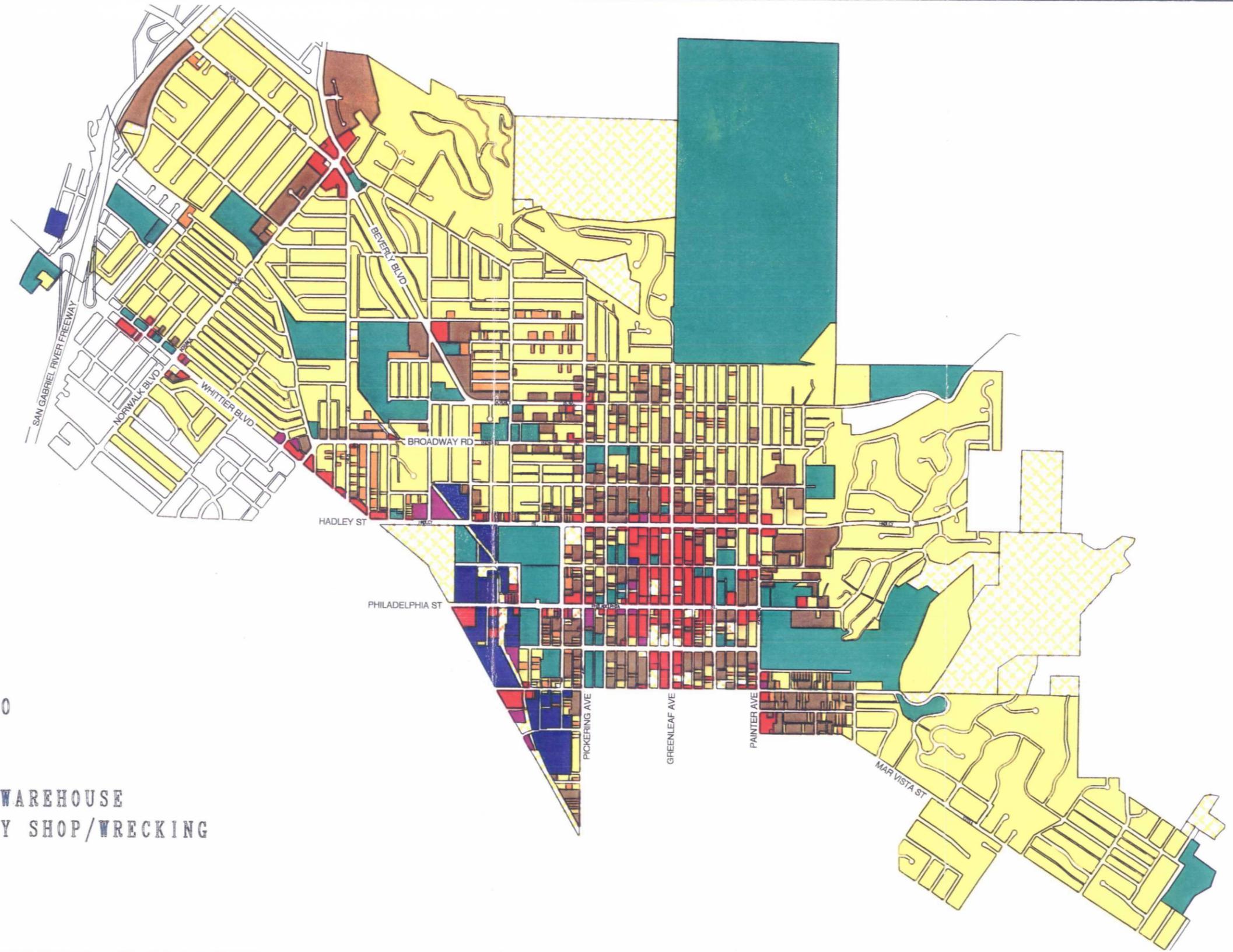
Residential Areas

Residential development is the most predominant type of land use in the City of Whittier. Residential development covers 4,287.5 acres of the City's total land area. Single-family detached units account for the largest type of residential use in the City (3,849.2 acres or 48.08 percent). Of the residential land uses, single-family development comprises nearly 90



- SINGLE FAMILY
- DUPLEX
- APARTMENT/CONDO
- TRAILER PARK
- COMMERCIAL
- MANUFACTURING/WAREHOUSE
- AUTOMOTIVE/BODY SHOP/WRECKING
- INSTITUTIONAL
- OTHER

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- SINGLE FAMILY
- DUPLEX
- APARTMENT/CONDO
- ▨ TRAILER PARK
- COMMERCIAL
- MANUFACTURING/WAREHOUSE
- AUTOMOTIVE/BODY SHOP/WRECKING
- INSTITUTIONAL
- OTHER

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EXHIBIT 2-1
EXISTING LAND USES
(NORTHWEST AREA)

percent of the total residential areas in the City. Two-family residences (duplex) occupy a total of 102.5 acres, while multi-family residences (3 or more dwelling units per lot) cover 327.0 acres of land within the City. Trailer parks in the City cover a total of 8.8 acres.

Single-family neighborhoods are located in the northern, eastern and central sections of Whittier. Newer residential developments are found in the eastern areas of the City. The majority of the two-family and multi-family projects are found around the Uptown area and near commercial developments. Multi-family developments are also found on the northwest section of the City along Beverly Boulevard and the area north of Hadley Street which was originally zoned for high density residential uses.

For the most part, Whittier neighborhoods are well-maintained and attractive. There are numerous historic residential structures, particularly in areas which developed in the late 1800's and early 1900's. This includes the area north of Hadley Street, Uptown Whittier, and East Whittier.

Due to the costs associated with hillside development, larger more expensive homes are found in the hillside areas. For example, the Friendly Hills neighborhood is noted for its large homes, along with other developments in the Puente Hills.

Commercial Development

Commercial areas in Whittier are generally divided into two major concentrations: the Uptown Business District and the Whittier Boulevard corridor. Several smaller commercial areas are located along Washington Boulevard and at key intersections elsewhere in the City.

Uptown was the original city center and has remained a vital commercial area in the City. Redevelopment efforts have helped businesses open, especially after the 1987 earthquake damaged a lot of older structures. Uptown contains many small specialty shops and entertainment businesses catering to businesses and residents of the surrounding area. The area has a village atmosphere where retail commercial and support services are within walking distance of residential neighborhoods in the City. Uptown Whittier accounts for approximately 60 percent of the total land area devoted to commercial uses.

Whittier Boulevard has always served as a major arterial from Los Angeles to Orange County. It was the route of the Red Cars (railway cars) in the late 1800's and has attracted businesses and commercial ventures throughout the century. Highway-related commercial businesses such as auto sales, motels, gas stations, restaurants, convenience centers, and realty offices are concentrated along Whittier Boulevard southeast of Greenleaf Avenue.

There are two sub-regional shopping centers in Whittier: the Whittwood Mall and the Whittier Quad. Both centers are located along Whittier Boulevard with the Whittier Quad on Painter Avenue and Whittwood Mall on Santa Gertrudes Avenue. Commercial areas along Whittier Boulevard account for approximately 25 percent of the total area devoted to commercial activities in the City.

Administrative and professional uses are located in three areas of the City: the Uptown Business District near the Civic Center, the area near the Whittier Medical Center and the area around the Presbyterian Inter-community Hospital on Washington Boulevard.

Industrial Development

The City has a limited amount of land devoted to industrial development. Industrial areas account for 258.2 acres or 3.22 percent of the City area. Industrial uses are adjacent to Whittier Boulevard between Philadelphia Street and Washington Boulevard. Some industrial uses are also found between Washington Boulevard and Santa Fe Springs Road. These areas are adjacent to the Union Pacific Railroad, as they historically depended on rail transportation for the distribution of goods.

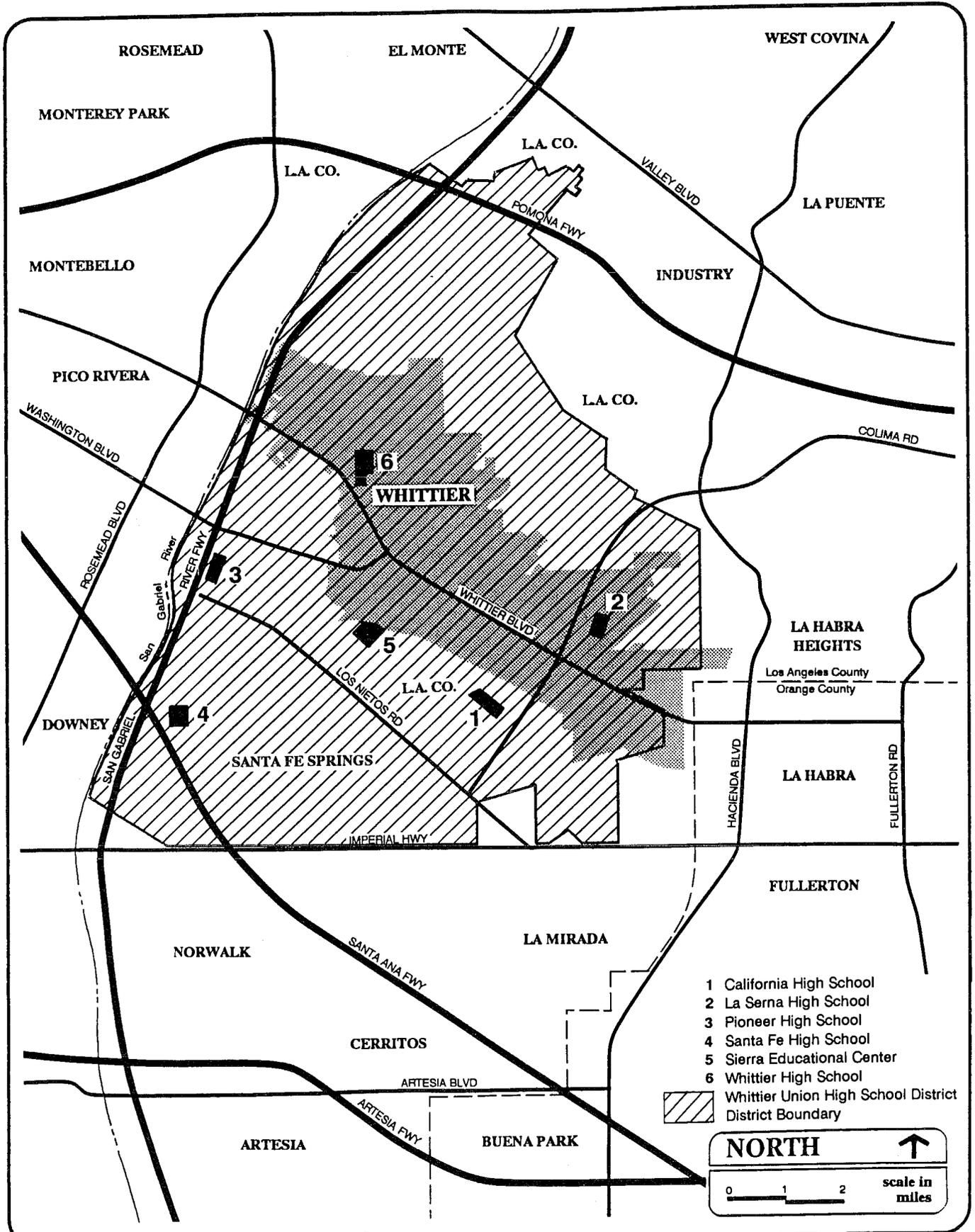
Schools

The City of Whittier and the surrounding communities have a diversity of schools. In addition to the public elementary, intermediate and high schools, the City also has parochial and other private institutions, including Whittier College. A total of 401.9 acres within the City of Whittier are occupied by these public and private schools and their support facilities. Another 210 acres are occupied by school facilities outside the current City boundaries but serving Whittier residents.

High Schools

The Whittier Union High School District serves the majority of the City. There are two public high schools (Whittier Union High School and La Serna High School) and one private high school (Whittier Christian High School) located in Whittier. The Pioneer, California and La Habra High Schools are located outside the City boundaries but serve city residents.

The Whittier Union High School District has 5 high schools and one continuing education school (Frontier) serving the Cities of Whittier, Santa Fe Springs, Norwalk, Pico Rivera, Downey and unincorporated Los Angeles County areas. Its district boundaries are shown in Exhibit 2-3. Table 2-3 lists the current capacity and enrollment at each school.



- 1 California High School
 - 2 La Serna High School
 - 3 Pioneer High School
 - 4 Santa Fe High School
 - 5 Sierra Educational Center
 - 6 Whittier High School
 - Whittier Union High School District
 - District Boundary
- NORTH** ↑
- 0 1 2 scale in miles

DEA DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



GENERAL PLAN

EXHIBIT 2-3 WHITTIER UNION HIGH SCHOOL DISTRICT

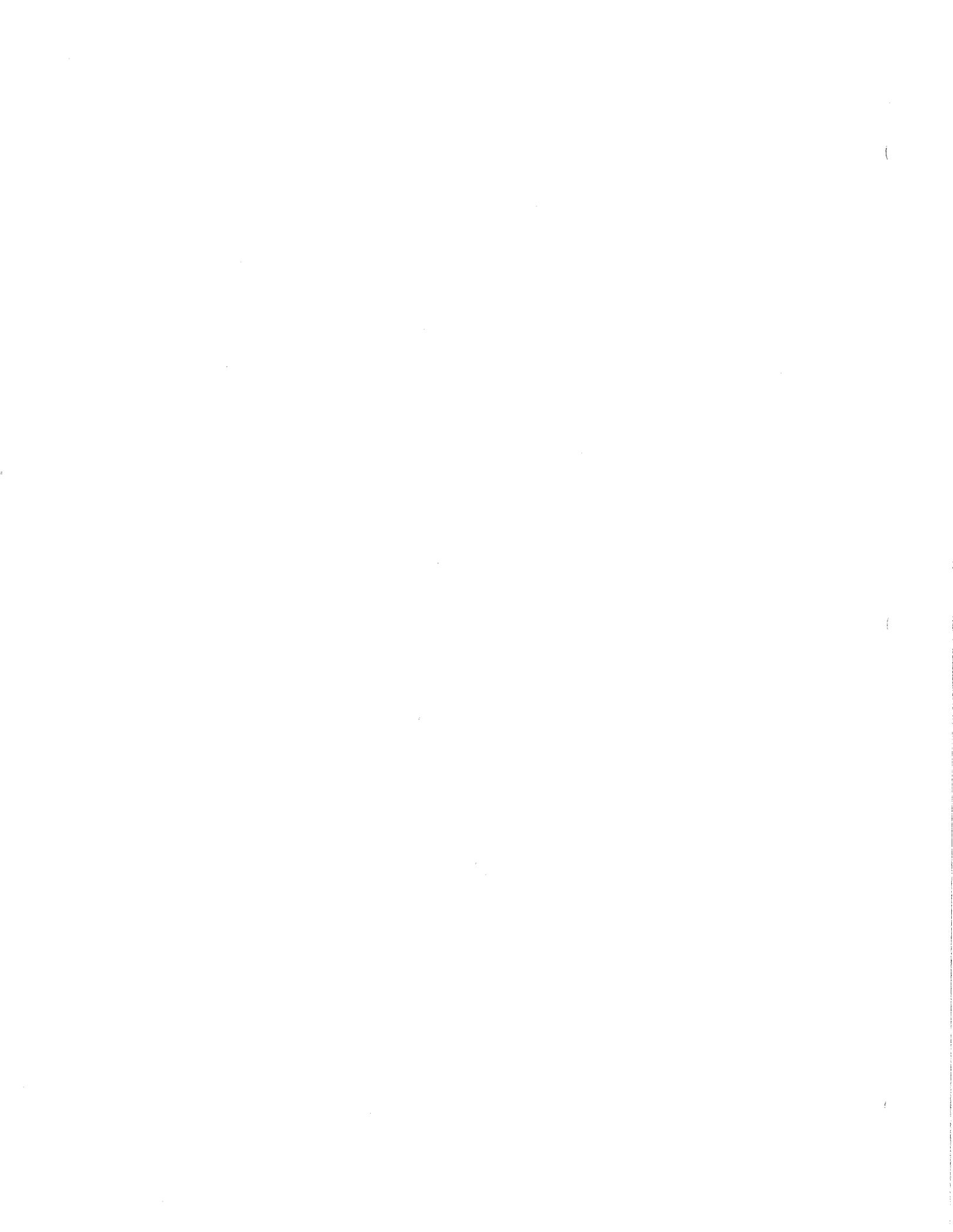


TABLE 2-3 HIGH SCHOOLS				
High Schools	Address	Capacity	1991 Enrollment	Remaining Capacity
Whittier	12417 Philadelphia Street	2,160	1,662	498
California	9800 Mills Avenue	1,748	1,717	31
Pioneer	10800 E. Benavon Street	1,796	1,471	325
La Serna	15501 Youngwood Drive	1,680	1,591	89
Frontier	9401 S. Painter Avenue	---	460	---
Santa Fe*	10400 Orr and Day Road	<u>1,912</u>	<u>1,471</u>	<u>441</u>
Total		9,296	7,912**	1,384

* does not serve City of Whittier.
 ** excludes Frontier Continuation School enrollment.
 Source: Whittier Union High School District, 1991.

Whittier High School serves the northwestern section of Whittier. La Serna High School is located east of Colima Road and serves the eastern section of Whittier. Pioneer High School is in unincorporated L. A. County area but serves the southwestern section of Whittier. California High School is just south of Whittier and serves the north-central and southern sections of the City. The District's continuing education school, Frontier High School is located with the school district office. Sierra Education Center, the district's adult school, and the Regional Occupational Program are at the site of the district office and Frontier High School. Santa Fe High School does not serve Whittier residents. The schools are not generally overcrowded. Thus, the District has no expansion plans under review.

The Fullerton Joint Union High School District serves the eastern tip of Whittier and the Cities of Fullerton, La Habra, Buena Park, and Yorba Linda. Whittier is served by the La Habra High School on 801 W. Highlander Avenue. La Habra High School has a capacity for 2,000 students and currently has 1,605 students enrolled. Approximately 386 or 24 percent of the students are residents of Whittier. Aside from its comprehensive high schools, the district has a continuation school and a facility for the trainable mentally-retarded.

Junior High Schools

There are 3 public intermediate schools in Whittier. They include the East Whittier Middle School on Whittier Boulevard and Catalina Avenue; the Edwards Junior High School on Norwalk Boulevard and Reichling Lane; and the Walter Dexter Junior High School on Floral and Palm Avenues. Edwards Junior High School is operated by the East Whittier Elementary School District and the two other schools are by the Whittier Elementary School District.

Elementary Schools

City residents are served by the Whittier City, East Whittier Elementary, Los Nietos and Lowell Joint School Districts. There are 14 elementary schools within City limits. The Whittier City School District has 11 elementary schools and 2 junior high schools in the City. Six elementary schools and 1 junior high school are within the City of Whittier. The rest are in unincorporated county area. Table 2-4 provides the address, capacity and enrollment of each school. Exhibit 2-4 shows their locations. There are approximately 29 students per classroom. Kindergarten classes are on double sessions and some schools are year-round. Busing of students has helped to address overcrowding in the schools.

**TABLE 2-4
WHITTIER CITY SCHOOL DISTRICT**

School	Address	Capacity	Enrollment	Remaining Capacity
Andrews School ^a	1010 Caraway Dr.	668	477	191
Hoover School	6302 S. Alta Dr.	374	406	-32
Jackson School	8015 S. Painter Ave	502	471	31
Lincoln	12620 E. Broadway	372	339	33
Longfellow School	6005 S. Magnolia Ave	557	566	-9
Mill School	4030 Workman Mill Rd	437	394	43
Orange Grove School	10626 E. Orange Grove	352	481	-128
Phelan School	7150 S. Cully Ave	504	422	82
Sorensen School	11493 E. Rosehedge Dr	447	445	2
Washington School	7804 S. Thorncake Ave	327	309	18
West Whittier School	6411 S. Norwalk Blvd	573	531	42
Wiggins School ^b	7348 S. Wexford Ave	-	-	-
Edwards Junior High School	6812 S. Norwalk Blvd	785	581	204
Walter Dexter Junior High School	11532 E. Floral Dr	785	755	30

^a Does not serve Whittier

^b Will be used by Dexter Jr. High School for 1991-1992.

Source: Whittier City School District, 1991.

The East Whittier School District has 10 elementary schools and 3 junior high schools. Table 2-5 provides the enrollment and capacity for each school. Exhibit 2-5 shows the location of the district's schools. The schools are not generally overcrowded, and the Mar Vista School has been leased to private businesses.

School	Address	Capacity	Enrollment	Remaining Capacity
Ceres School	10601 S. Ceres Ave	600	446	154
Evergreen School	12915 E. Helmer Dr	570	540	30
La Colima School	11225 S. Miller Rd	630	561	69
Laurel School	13350 E. Lambert Rd	720	712	8
Leffingwell School	10625 Santa Gertrudes Ave	450	357	93
Mulberry School	10429 E. Mulberry Dr	690	610	80
Murphy Ranch School	16021 E. Janine Dr	450	277	173
Ocean View School	14359 E. Second Street	540	572	-32
Orchard Dale School	10625 E. Cole Rd	840	604	236
Scott Avenue School	11701 S. Scott Ave	510	473	37
Mar Vista School (leased out)	8036 S. Ocean View Dr	---	---	---
East Whittier Junior High School	14421 E. Whittier Blvd	810	802	8
Granada Junior High School	15337 E. Lemon Drive	798	721	77
Hillview Junior High School	10931 S. Stamy Rd	818	788	30

Source: East Whittier School District, 1991.

Outlying areas of the City are served by other school districts (see Exhibit 2-6). A small area on the western section of the City is served by the Los Nietos Elementary School District. All schools in the district are outside Whittier City boundaries. The Wiggins School owned by the district but is currently leased by the Whittier City School District. The southeastern section of the City is served by the Lowell Joint School District. Only the Jordan School is within City limits. Table 2-6 provides school enrollment, addresses and capacities.

TABLE 2-6 OTHER SCHOOL DISTRICTS				
School	Address	Capacity	Enrollment	Remaining Capacity
<u>Los Nietos School District</u>				65
Ada S. Nelson School	8140 S. Vicki Dr	600	535	85
Aeolian School	11600 Aeolian Ave	600	515	130
Rancho Santa Gertrudes	11233 Charlesworth Rd	470	340	100
Los Nietos Middle School	11425 Rivera Road	700	600	
<u>Lowell Joint School District</u>				
Jordan School	10654 Jordan Rd		515	
Macy School	2301 W. Russell Rd		636	
Meadow Green School	12025 Grovedale Rd		445	
Rancho Starbuck Middle School	16430 Woodbrier Dr		583	

Source: Los Nietos School District, 1991; Lowell Joint School District, 1991.

Colleges

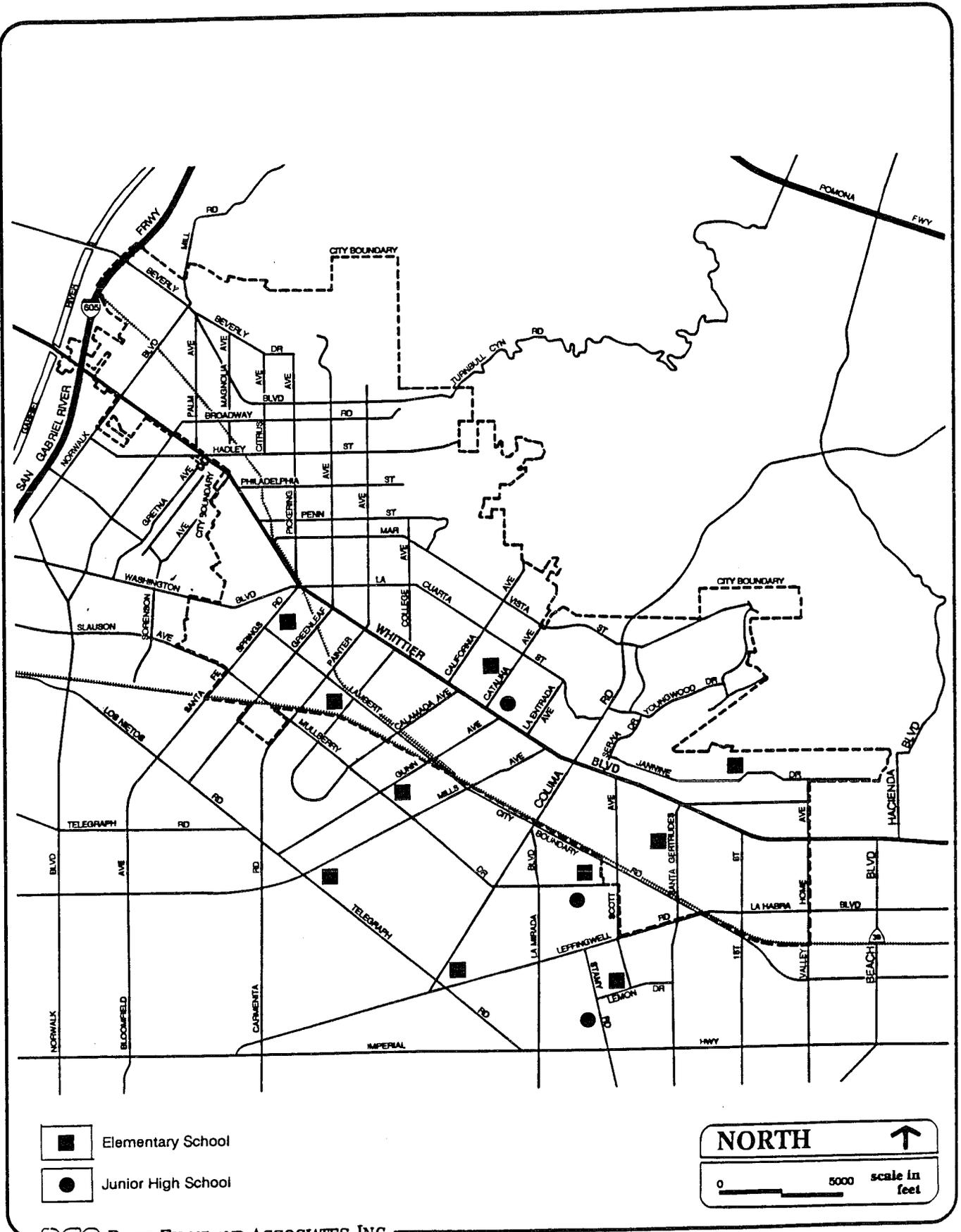
There are three colleges within and near Whittier. The Whittier College, founded in 1901, is a private liberal arts school located east of Painter Avenue near the Civic Center. Rio Hondo College is a Community College, located northwest of the City near the Rose Hills Cemetery. Los Angeles College of Chiropractic, a private health services school, is located southeast of the City on First Street and Amber Valley Drive. See Exhibit 2-7.

Parks and Recreational Facilities

The City of Whittier currently has 24 City-owned parks and recreational facilities (Friendly Hills Country Club) ranging in size from 1 to 200 acres and totaling 565.2 acres or 7.07 percent of the total land area. The largest park owned by the City is the Hellman Park which is 200 acres of primarily undeveloped land. The Pio Pico State Park is also within the City but managed by the State.

Private recreational facilities in the City include a golf course (Friendly Hills Country Club), bowling lanes, billiard parlors, Boy's Club and the YMCA/YWCA. Joint use agreements with the different schools allow the use of game fields and school grounds outside of school hours.

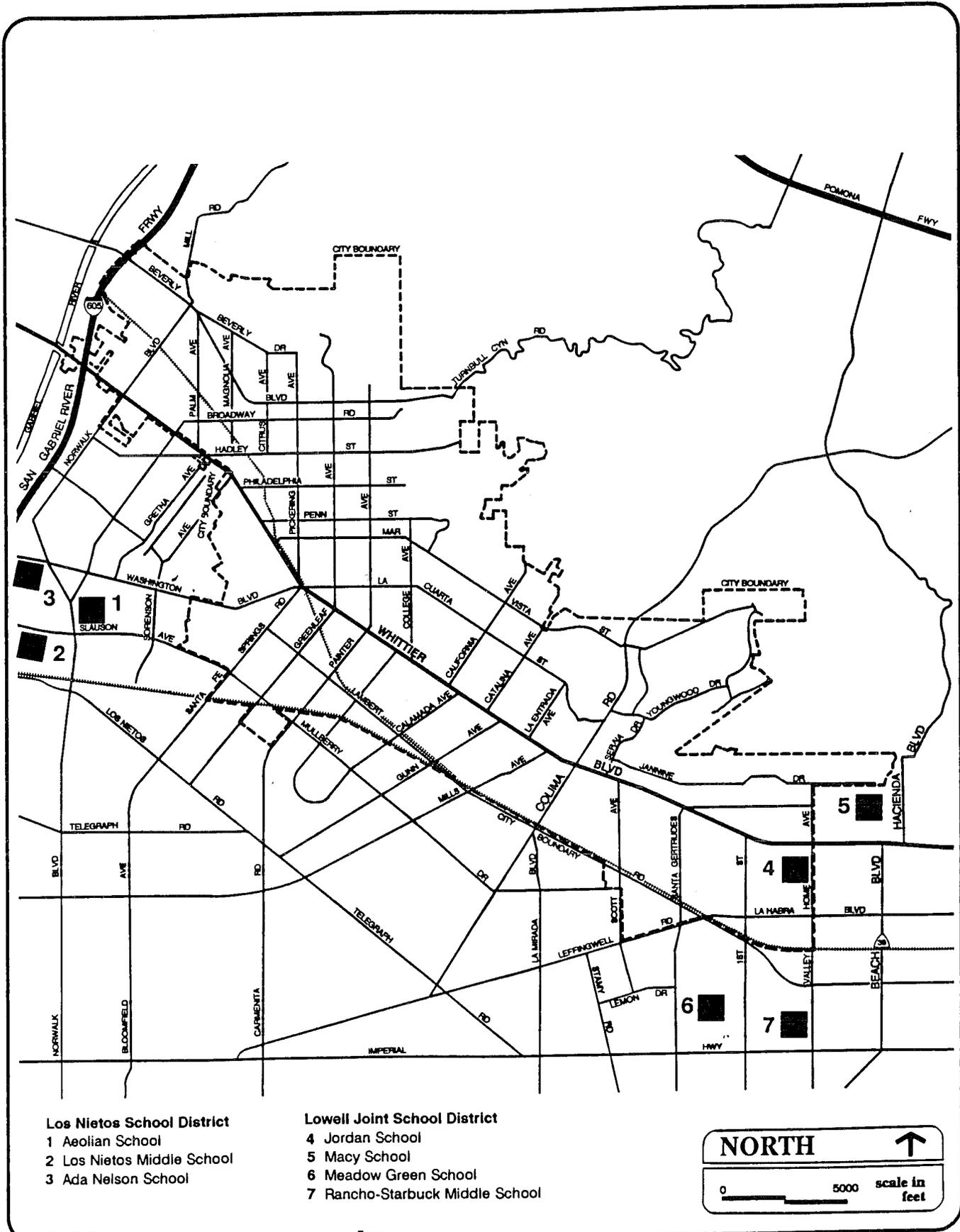
To supplement the City's parks, there are three regional parks in adjoining communities that are available for public use: Whittier Narrows Regional Park, La Mirada Regional Park and



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EXHIBIT 2-5
EAST WHITTIER SCHOOL
DISTRICT



Los Nietos School District
 1 Aeolian School
 2 Los Nietos Middle School
 3 Ada Nelson School

Lowell Joint School District
 4 Jordan School
 5 Macy School
 6 Meadow Green School
 7 Rancho-Starbuck Middle School

NORTH ↑

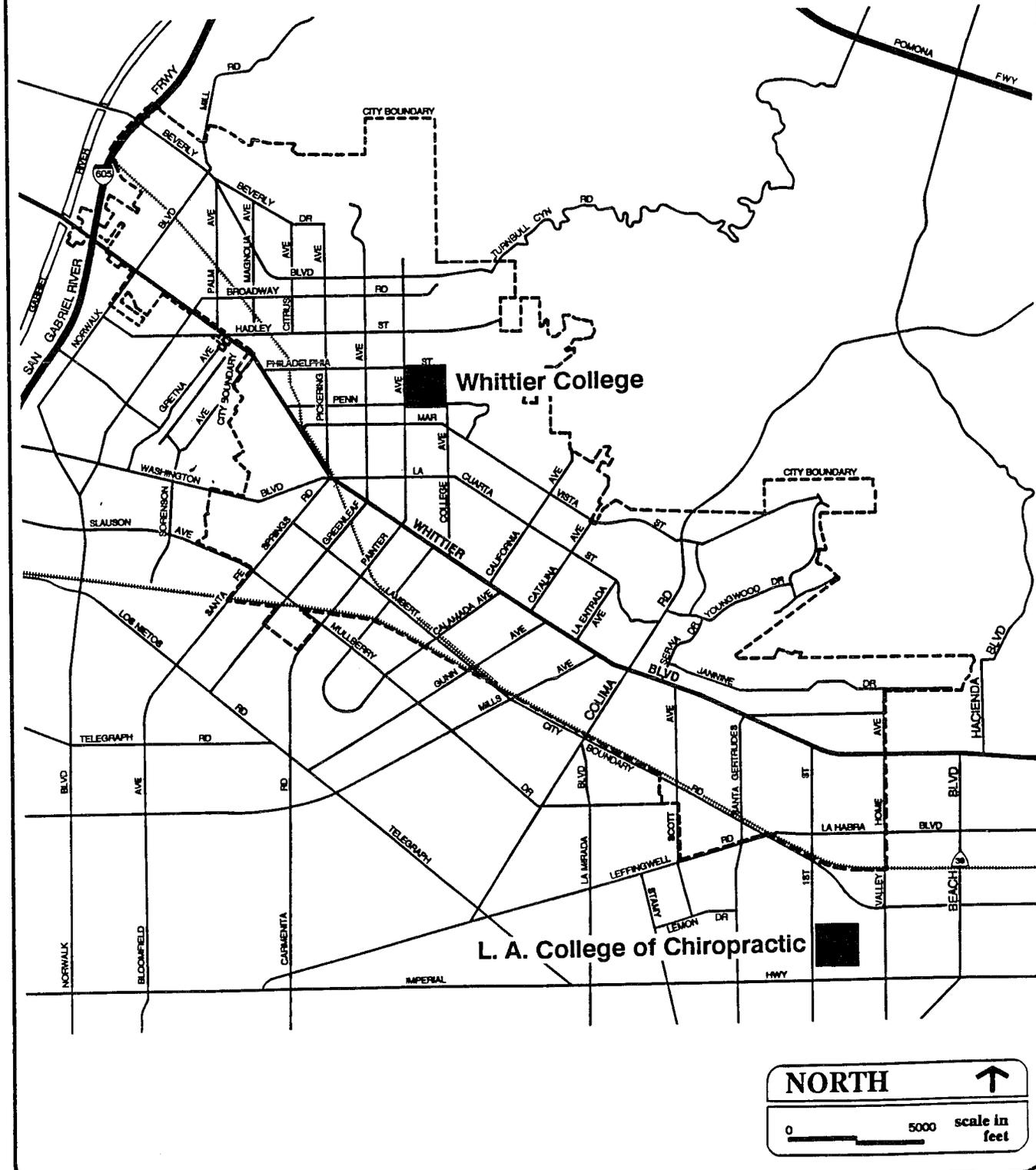
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**EXHIBIT 2-6
 LOS NIETOS & LOWELL
 JOINT SCHOOL DISTRICTS**

Rio Hondo College



DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



NORTH ↑

0 5000 scale in feet

**EXHIBIT 2-7
LOCAL COLLEGES**

the Schabarum Regional Park. The Environmental Resource Management Element Background Report discusses the parks and recreational facilities/opportunities in more detail.

Institutional Uses

Institutional uses within the City include the Civic Center, the Court House, libraries, post office, hospitals, and churches. The Civic Center and County Court House are located on Painter Avenue and Penn Street, southeast of Uptown Whittier. Institutional land uses account for 136 acres or 1.70 percent of the City. See Exhibit 2-8.

Libraries

There are two City libraries - the Central Library on Mar Vista Street and the Whittwood Library (branch) on Santa Gertrudes Avenue. The Central Library has a 34,481-square-foot floor area with 106 adult seats. The building was constructed in 1959 and the mezzanine was added in 1974. It is a full-service library with a 190,000-book collection, 600 periodicals (plus backfiles), 12,000 microforms, and numerous record albums, cassettes, films, and video cassettes. An estimated 450,000 persons used the library from July 1990 to June 1991. Library cards have been issued to 11,500 residents.

The Whittwood Library has a floor area of 10,015 square feet within a structure built in 1968. This library has a 61,000-book collection plus documents, pamphlets, microforms and magazines. Approximately 200,000 persons used the library from July 1990 to June 1991. There are 22 full-time librarians, 69 part-time positions and 1.78 full-time equivalent volunteers serving both libraries. Both libraries are open Mondays to Saturdays.

Services offered at the libraries include research referral, reference and homework assistance, story-time for children, summer reading programs, and other activities that promote literacy. The library participates in the universal borrowing program that allows any citizen of California to borrow materials for free. Also, as a member of the Metropolitan Cooperative Library System, the City libraries may borrow at other member libraries and have interdependent resources for extended reference research, training and workshops, and purchasing discounts.

With the growing population and cultural diversity in Whittier, the City libraries need to expand their services. Additional space for quiet areas, parking and an expanded collection are needed to adequately serve all users. Outreach programs for limited-English speaking households and minorities have to be established. Advanced technologies will also improve the library system, such as an on-line catalogs and databases, CD ROMs, hypercards, fax, microforms, laser discs, video formats, etc.

Churches

There are numerous churches in the City. They include Anglican, Apostolic, Baptist, Catholic, Latter-Day Saints, Eastern Orthodox, Episcopal, Friends, Lutheran, Methodist, Nazarene, Pentecostal, Presbyterian, and Adventist churches, and other religious centers.

Hospitals

There are two hospitals in Whittier. The Whittier Medical Center is located near Colima Road and Whittier Boulevard and the Presbyterian Intercommunity Hospital is located on Washington Boulevard near Whittier Boulevard. The Public Safety Element Background Report discusses the services offered by these facilities.

Fred Nelles School

The Fred Nelles School for Boys was the first correctional facility for boys in the State. It is a state-funded facility and houses male minors within an 89-acre site on Sorensen Avenue. This facility does not directly provide educational services to the City.

Public and Quasi-Public Uses

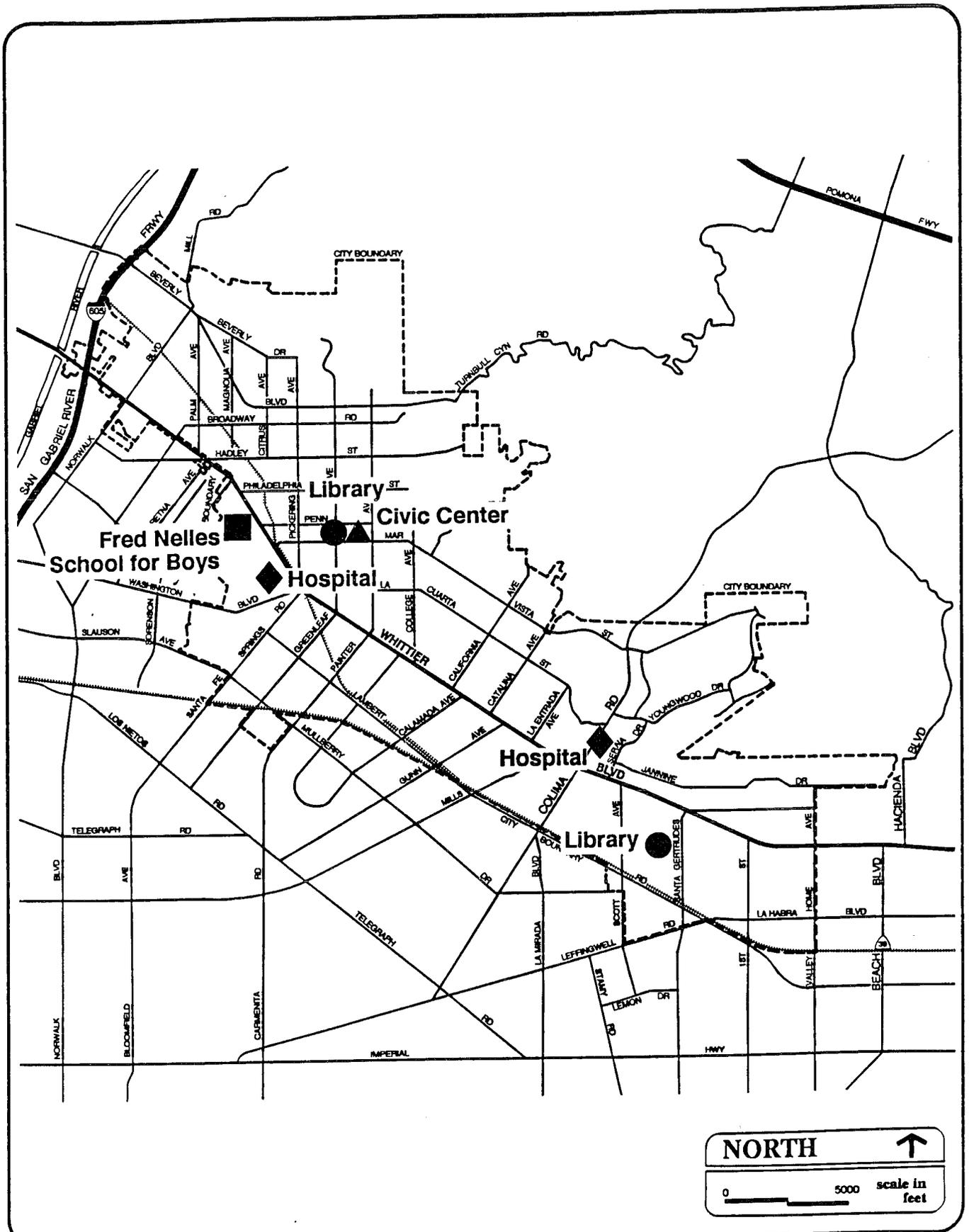
Public and quasi-public land uses in the City include 3 fire stations, police station, flood control utility facilities, Savage Canyon Landfill, reservoirs, pump stations, and utility service yards. They cover approximately 124.2 acres. The landfill alone covers 99.8 acres. The Public Safety Element Background Report discusses fire and police protection services in the City.

Fire Protection

Fire protection services for the City of Whittier are provided by the Los Angeles County Fire Department. There are 3 fire stations in the City and their locations are shown in Exhibit 2-8. The Public Safety Element Background Report discusses fire protection services in detail.

Police Protection

Police protection service are provided by the Whittier Police Department. The main station is located at 7315 S. Painter Avenue, near City Hall. The City Police Department serves the entire City with 91 sworn officers. The Department provides patrol services, law enforcement, traffic enforcement, investigative services, and special programs on gang suppression, drug abuse prevention and narcotics interdiction.



DAVID EVANS AND ASSOCIATES, INC.



**EXHIBIT 2-8
INSTITUTIONAL FACILITIES**

Water Services

Water service in the City of Whittier is provided by four agencies: the City of Whittier, the Suburban Water System, California Domestic Water Company, and California American Water Company. Approximately 60 percent of Whittier is served by the City Department of Public Services. Water comes from 9 groundwater wells in the Whittier Narrows area and near the San Gabriel River. It is pumped from the Central and Upper (San Gabriel Valley) water basins in which the City has water pumping rights to a total of approximately 9,166 acre-feet per year.

Well water is chlorinated at pumping plants and main transmission lines carry the water to eleven reservoirs on the hillside areas north and east of the City. See Exhibit 2-9. Water system facilities are summarized in Table 2-7.

TABLE 2-7 WATER SYSTEM FACILITIES	
<p>Groundwater Wells Upper Basin Wells No. 9 No. 11 No. 12 No. 13 No. 15 Central Basin Wells No. 5 No. 7 No. 8 No. 14</p>	<p>avg production of 2,384 af/yr avg production of 2,991 af/yr avg production of 8 af/yr avg production of 843 af/yr avg production of 3,151 af/yr avg production of 0 af/yr avg production of 9 af/yr avg production of 0.45 af/yr avg production of 903 af/yr</p>
<p>Pumping Plants No. 2 No. 3</p>	<p>Includes chlorinator, 2 clearwell basins with 270,000 gallon capacity, booster pump station with 6 pumps and well pump No. 7. Supplements pumping plant No. 2</p>
<p>Booster Pump Stations</p>	<p>Rideout, Greenleaf, College Hills, Murphy, Washington and Summit stations</p>

**TABLE 2-7
WATER SYSTEM FACILITIES**

Reservoirs	
Painter (No. 1)	1.0 mg capacity; pre-stressed concrete tank
Greenleaf (No. 2)	6.0 mg capacity; concrete lined with redwood roof
College Hills (No. 3)	300,000 g capacity; cylindrical concrete tank with exposed roof
Hoover (No. 4)	9.75 mg capacity; trapezoidal concrete lining*
Rideout (No. 5)	150,000 g capacity; elevated cylindrical concrete tank
Hazzard (No. 6)	150,000 g capacity; cylindrical concrete tank
College Hills (No. 8)	475,000 g capacity; cylindrical concrete tank with exposed roof
Ocean View (No. 9)	4.0 mg capacity; rectangular concrete lined and covered tank
Murphy (No. 10)	500,000 g capacity; cylindrical concrete tank
Murphy (No. 11)	500,000 g capacity; cylindrical concrete tank
Starlight (No. 12)	300,000 g capacity; cylindrical concrete tank
avg - average	af/yr - acre-feet per year
mg - million gallon	g - gallon
* approved for replacement with 10.0 mg concrete tank	
Source: 1987 Water Master Plan Update, Ott Water Engineers, Inc., 1987	

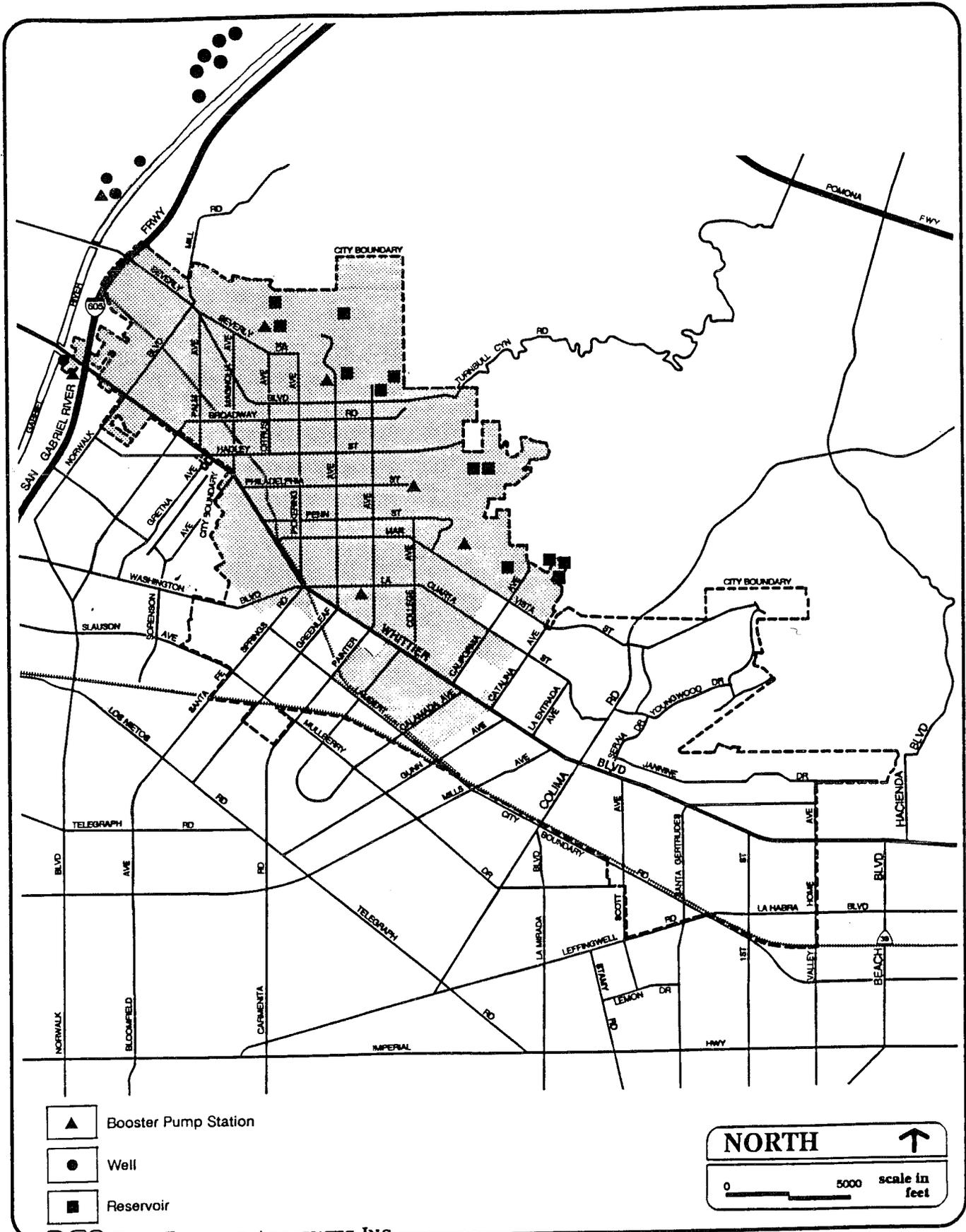
The water distribution system operates through gravity feed as water from the reservoirs flow to individual users at lower elevations. The Whittier Water Master Plan discusses system improvements, priorities and funding. In 1987, the Water Facilities Earthquake Repair Program was initiated to repair system damages caused by the 1987 earthquake. Reservoir, pump and pipe improvements are ongoing as part of the City's capital improvement program.

Traces of organic contaminants have been found in City wells, although they are below contaminant levels. Indications of contaminants travelling toward the groundwater source of Whittier have been inferred in groundwater studies for the San Gabriel Valley Water Basin.

Suburban Water Company serves the remainder (40%) of the City and California Domestic Water Company and California American Water Company only serve a total of approximately 200 users in the City.

Sewer Services

The City of Whittier is served by the Los Angeles County Sanitation District No 18. Wastewater from the City is transported by sewer lines to District sewer mains and to the Los Coyotes Treatment Plant at Piuma Avenue in Cerritos and/or to the Joint Water



-  Booster Pump Station
-  Well
-  Reservoir

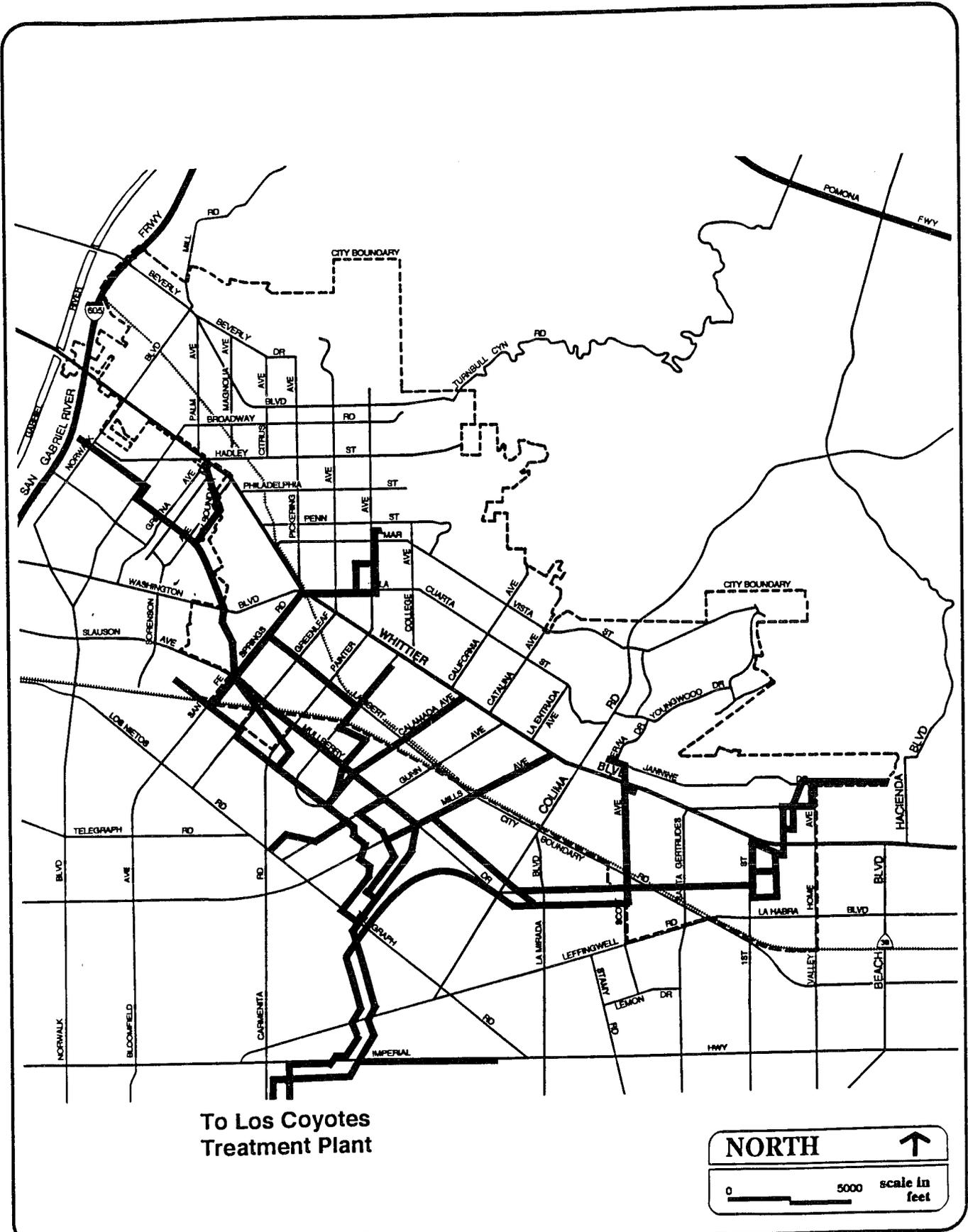
NORTH 

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 DAVID EVANS AND ASSOCIATES, INC.



EXHIBIT 2-9 WATER SYSTEM SERVICE AREA & FACILITIES



To Los Coyotes
Treatment Plant

NORTH ↑

0 5000 scale in feet

DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



GENERAL PLAN

**EXHIBIT 2-10
SEWER TRUNK LINES**

Pollution Control Plant in Carson. Main sewer lines are shown in Exhibit 2-10. All individual lots are served by laterals maintained by the City of Whittier.

The Los Coyotes Water Reclamation Plant has a design capacity of 37.5 million gallons per day (mgd) and currently provides tertiary treatment to 27.4 mgd. All sludge and excess wastewater are diverted to the Joint Water Pollution Control Plant (JWPCP) at Figueroa Street in Carson. The JWPCP has a design capacity of 385 mgd and currently treats 326 mgd. The effluent from the JWPCP is discharged into the Pacific Ocean through a 2-mile outfall 200 feet below sea level. An average of 344 dry tons of sludge is processed at the JWPCP and composted at an off site desert location. The Sanitation District has indicated that sewer trunk and treatment plant capacity is available to accommodate additional wastewater.

A sewer capacity study was done for the General Plan and Zoning update for the area north of Hadley in 1989. The study pointed out the full utilization of most sewer lines in the City and its inability to handle future development without system improvements. The upgrading of sewer lines is ongoing as part of the City's capital improvement program.

Storm Drainage

The City's storm drainage system is supported by the southwestern slope of the area and the proximity of the San Gabriel River. The San Gabriel River is the major drainage channel that carries stormwater runoff from the City and the Puente Hills into the ocean. Main storm drain lines are maintained by the County Department of Public Works (see Exhibit 2-11). City storm drain facilities supplement the system with local lines to provide a complete storm drainage system.

Solid Waste

Solid waste disposal is provided by the City of Whittier with collection services provided by the City and a number of private haulers. Solid waste is disposed at the city-owned landfill, Savage Canyon Landfill, on Penn Street across Penn Park. Savage Canyon Landfill is a Class III landfill and receives municipal wastes only. It accepts a maximum of 300 tons of garbage per day or 100,000 tons per year. No hazardous wastes are disposed at the landfill. Waste is covered with dirt at the end of each workday and watering trucks are constantly on site to control dust. Gas collection systems are used to control odors and gas from affecting adjacent uses. Groundwater monitoring has shown that no contamination from the landfill has occurred. Aside from present technologies, the expansion area for the landfill will have both clay and synthetic liners underneath to prevent groundwater contamination.

The landfill is approximately 120 acres (including the recent expansion area) and has a remaining life span of 55 more years. Thus, it will accommodate the solid waste disposal

needs of the City to the year 2046. Landfill permits are processed every five years to comply with state regulations.

Utilities

The Southern California Edison Company provides electric power service to the region including the City of Whittier. Whittier is served primarily by the Murphy Substation on Mulberry Drive, just southwest of the City; the Westgate substation on Whittier Boulevard, the Friendly Hills substation on Colima Road; and the Telegraph substation on Lambert and Leffingwell Roads in the eastern section of the City. High voltage transmission lines are not found within the City boundaries although 220-kilovolt transmission lines run approximately parallel to the San Gabriel River on the western boundary of the City and on the Puente Hills on the northeastern boundary of the City.

Natural gas service to the region is provided by the Southern California Gas Company. The Santa Fe Springs Regulating Station at Pike Street serves the City of Whittier and the surrounding area. A 30-inch line extends from the station to the Southern Pacific Railroad right-of-way and runs along this right-of-way to the east with a maximum pressure of 465 pounds per square inch.

The East Whittier Storage Facility in La Habra Heights is a natural gas field and storage facility with 10 and 16-inch lines running south of the facility and along Leffingwell Road, La Habra Boulevard and Lambert Road. Pressure within these lines range from 300 to 465 pounds per square inch. Distribution lines extend from the main transmission lines and serve individual parcels throughout the City.

The Public Safety Element Background Report provides maps of power lines and substations and high pressure gas lines.

GTE provides telephone service to the City through both overhead and underground lines.

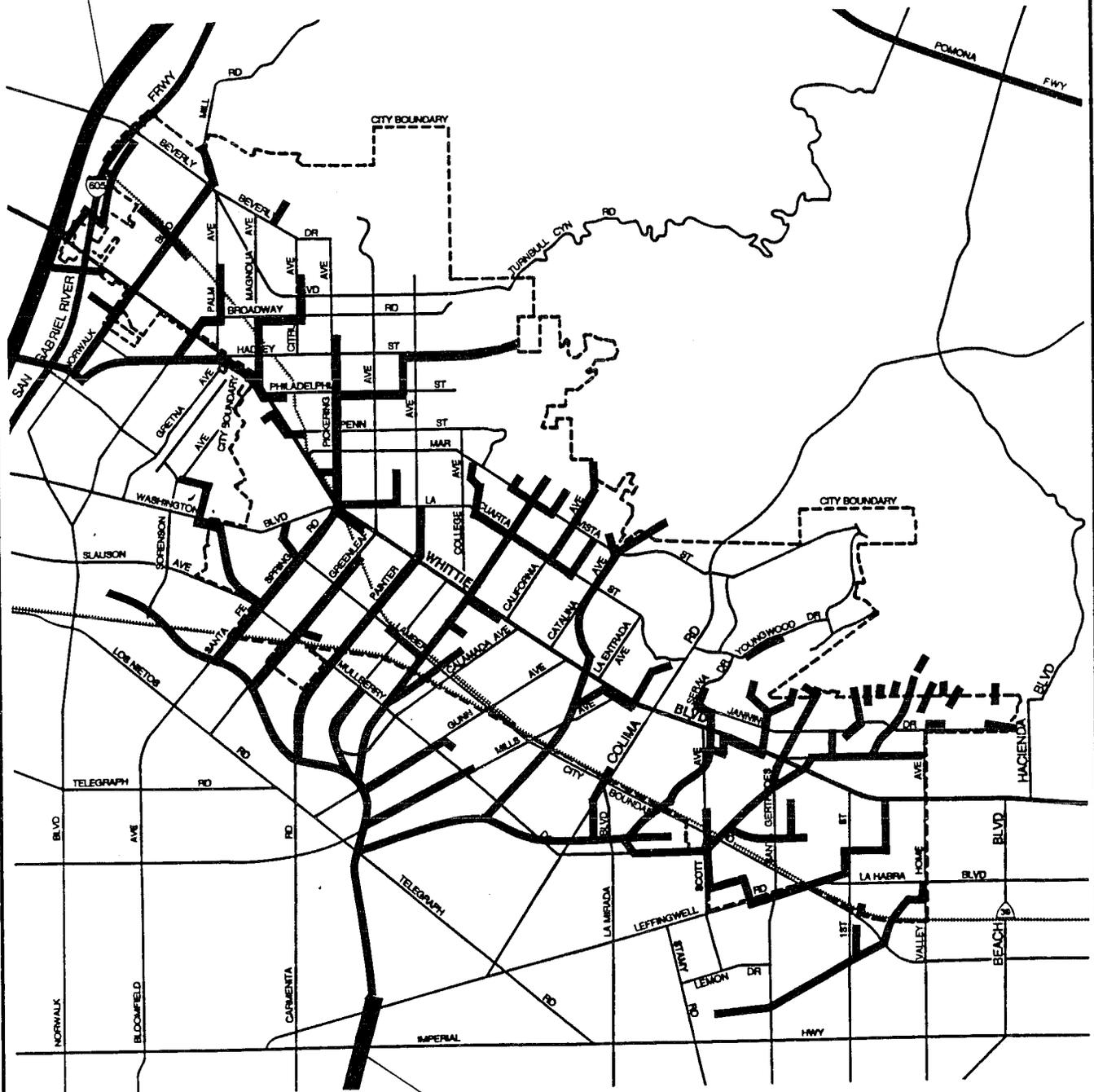
Vacant Areas

Vacant land in the City accounts for approximately 265.1 acres. This is 3.31 percent of the total land area. A number of vacant lots are small infill lots located in Uptown Whittier and along Whittier Boulevard. Larger vacant parcels are located along the hillsides of the Puente Hills, north and east of the City.

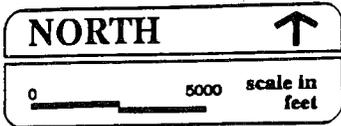
Streets, Highways, and Railroad Rights of Way

City streets, private roads and railroad rights-of-way cover 1,528.8 acres or 19.10 percent of the City land area. The Southern Pacific railroad tracks run east-west across the City and the Union Pacific Railroad tracks run north-south on the western side of the City.

San Gabriel River Channel



Coyote Creek Channel



DECO DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



EXHIBIT 2-11 STORM DRAIN SYSTEM

ZONING ORDINANCE

The *Zoning Regulations of the City of Whittier* is the primary implementation mechanism for the general plan land use policy. The current Zoning Regulations control development in the City by designating areas where specific land uses are allowed in a fashion similar to that of the Land Use Plan. The Zoning Regulations consist of two primary components: Development Standards and the Zoning Map. The development standards are detailed in the ordinance text and include lists of permitted uses and various standards governing setbacks, minimum lot sizes, building height, etc. The Zoning Map is very specific in that every parcel of land in the City is assigned a zone district category.

The Whittier Zoning Map contains twelve land use categories or districts. Six of these categories apply to residential development, four categories apply to commercial development, one category applies to industrial uses, and one category for transitional uses. Zoning designations for specific plan areas and redevelopment areas are incorporated into the Zoning Map. The zone districts are summarized in Table 2-8.

TABLE 2-8 SUMMARY OF EXISTING ZONE DISTRICTS		
Zoning Category	Symbol	Permitted Uses
Single Family Estate Residential	R-E	Single family dwelling units
Hillside Residential Zone	H-R	Single family dwelling units, recreational facilities for the exclusive use of the residential development
Low Density Residential Zone	R-L	Single family dwelling units, Foundational mobile homes
Medium Density Residential Zone	R-M	One dwelling unit per 3,000 square feet of lot area
Medium-High Density Residential Zone	R-MH	One dwelling unit per 2,050 square feet on lots 7,000 square feet or less; One dwelling unit per 1,750 square feet on lots greater than 7,000 square feet
High Density Residential Zone	R-H	One dwelling unit per 2,650 square feet of lots 7,000 square feet or less; one dwelling unit per 1,400 square feet on lots 7,000 - 20,000 square feet; one dwelling unit per 1,250 square feet on lots 20,000 square feet or more
Commercial Office	C-O	Professional services and offices, incidental restaurant uses, medical/dental offices, labs and clinics, professional and trade schools, studios, service shops and offices and similar uses; multi-family dwelling units
Light Commercial	C-1	Retail stores (limited), professional offices, clinics, labs, schools, service shops and similar uses

**TABLE 2-3
SUMMARY OF EXISTING ZONE DISTRICTS**

Zoning Category	Symbol	Permitted Uses
General Commercial	C-2	Retail stores, fortune telling, health spas and centers, hotels and motels, restaurants, churches and chapels, auto sales, repair and garages, restaurants, pet shops, trailer sales and similar uses
Commercial-Manufacturing	C-3	Assembly facilities, auto body painting and repair, veterinary hospital, medical and motion picture labs, cabinet and ceramic manufacturing, scientific instrument manufacturing and assembly, tire recapping, kennels, greenhouses and similar uses
Manufacturing	M	Auto assembly, bakeries, lumber yards, machine shops, bottling plants, engraving and fabrications, self-storage, recycling facility, truck storage, laundries, commodity manufacturing, utility yards, welding shops and similar uses
Transitional	T	For areas formerly zoned Parking (P) and Light Multi-Family Residential with a Parking Overlay Zone (R-2-P) subject to future reclassification.

Source: Zoning Regulations for the City of Whittier.

In addition, the zoning map includes four overlay zones. An overlay zone is a second zone over an underlying zone district which modifies or adds to the development standards of the underlying zone. This allows additional control on development in areas that may be affected by special conditions (such as steep slopes, historic architecture, special land uses, established neighborhoods, etc.) A lot with an overlay zone shall comply with the standards of both the underlying zone and the overlay zone. The following overlay zones are included in the Zoning Ordinance.

- The *Parking Overlay Zone* is used for designating off-street parking lots and structures. It provides additional standards for access, landscaping and maintenance of the site.
- The *Urban Design District* is an overlay zone which provides standards for the development, redevelopment and revitalization of designated areas. Specific design standards have been adopted to regulate development within the Urban Design District. These are mainly geared towards the development of architecturally compatible structures and the improvement of the living environment.

- The *Planned Development District* provides flexibility within residential hillside developments. It encourages creative developments that accommodate unique design features with a site plan that preserves the natural and environmental characteristics of the site. Planned developments are allowed within any residential zone and are used on commercial zones to permit senior housing projects.
- The *Hadley/Greenleaf Historic District* was established to preserve and enhance the architectural and historical character of the Hadley/Greenleaf residential neighborhood. A large number of historical structures exist in the area including Victorian cottages, Spanish or Mediterranean Revival houses and Craftsman bungalows. The district sets standards for the preservation of these structures and ensures that new development is compatible with the existing community character.

Redevelopment Project Areas

The City's redevelopment agency was formed in 1971. Since then, three redevelopment project areas have been established in the City (see Exhibit 2-12).

- The first redevelopment plan, *Uptown Whittier/Greenleaf Avenue Redevelopment Area*, was adopted in February 1974. It covers a 137-acre area in Uptown Whittier and along Greenleaf Avenue. The 24 city blocks within the Uptown Whittier/Greenleaf Avenue Redevelopment Area are developed with office buildings, retail stores, condominiums and institutional buildings.
- The *Whittier Boulevard Redevelopment Area* was adopted in October 1978 and encompasses commercial and industrial areas on the western section of Whittier. It covers approximately 238 acres northeast of Whittier Boulevard and south of Hadley Street. Landscaping and street trees, street widening, signals have been provided to create an inviting industrial and commercial section in the City. This areas provides for major commercial and industrial uses in the City.
- The *Whittier Earthquake Recovery Redevelopment Project Area* was established on November 1987 to revitalize the area damaged by the earthquake of October 1987. It covers 521 acres of residential and commercial developments. The redevelopment plan calls for the repair, restoration, demolition and replacement of property and facilities damaged by the earthquake. These projects include the rehabilitation of commercial structures to preserve the area's employment base; the replacement and improvement of the housing supply for low and moderate income households;

relocation assistance for displaced households, and the repair of infrastructure and their deficiencies.

Past redevelopment activities include construction of luxury condominiums, the Bank of America office buildings, First Interstate Bank Building, Whittier Financial Center II, renovation of Mission Court and Village Square. Numerous street improvements have been undertaken for Uptown Whittier Village along with storefront renovations. Commercial ventures include Urbatec, Eastman-Kodak, Bedline Manufacturing, 3M Corporation, and Northrop Corporation. Home repair loans are also being provided by the Redevelopment Agency.

The City offers fast-tracking, off-site and street improvements, land assembly, utility undergrounding and zone changes as incentives to developers in the redevelopment area.

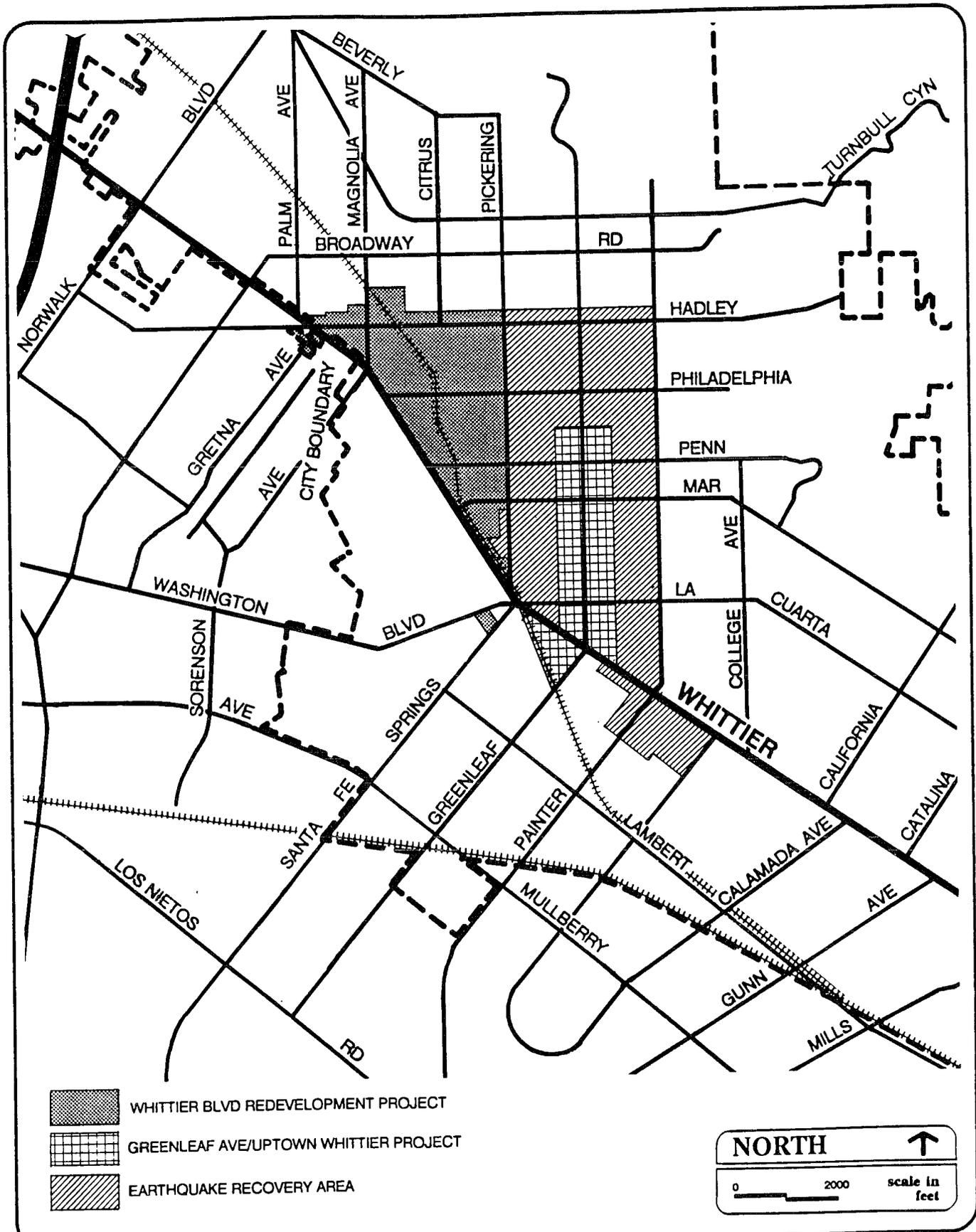
Specific Plans

Two areas in the City have been developed under the criteria of a Specific Plan: the Uptown Whittier Specific Plan and the Quad at Whittier Specific Plan (see Exhibit 2-13). The Uptown Whittier Specific Plan was adopted in 1989 and the Quad was adopted in 1988.

The Uptown Whittier Village is located in a specific plan area which contains the City's original commercial district. It covers 33 city blocks on over 200 acres developed with retail stores, specialty shops, restaurants, residences, and offices. The Whittier Historical Museum and a 2-acre Central Park are also found in the village. The specific plan for Uptown Whittier was developed specifically to preserve the historic character of the area. The plan calls for rebuilding of the retail commercial base, development of mixed uses, restoration of historic buildings, development of buildings which complement the existing architectural style, promotion of the area's retail uses, creation of entertainment opportunities, and development of support residential and office uses.

Projects for the area have included the improvement of automobile, pedestrian and transit circulation, improvement of existing infrastructure, development of parking lots and structures, landscaping, and walkway paving. The City has provided decorative street treatments (ornamental street lights, street furniture) and brick-lined pedestrian walks, and shade trees to the area. Development and design standards have been developed to assist new construction and rehabilitation efforts in Uptown Whittier.

The Quad at Whittier Specific Plan covers the area developed with the Quad shopping center on Whittier Boulevard between Painter and Laurel Avenues. The site covers 32.4 acres with approximately 540,000 square feet of gross leasable area. Major tenants include T.J. Maxx, Ross Dress for Less, Service Merchandise, Hinshaw's Department Store, Ralph's Market and Thrifty Drugstore.



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**EXHIBIT 2-12
REDEVELOPMENT AREAS**

The Urbatec site has been approved for the development of the Whittier Station Center. The 16-acre neighborhood shopping center is located on the southeast corner of Whittier Boulevard and Hadley Street, down to Philadelphia Street. Demolition activities are underway with construction planned from 1991-1993. The Whittier Station Center will have 175,000 square feet of gross leasable area that will be used for a market, drugstore, retail, and service shops.

DEVELOPMENT CONSTRAINTS

Physical suitability is a major consideration in the designation of land uses throughout the City. There are areas that cannot successfully accommodate certain types of development due to inherent physical characteristics. These include geotechnical, seismic and flood hazard areas, irregular parcel size and shape, adjacent sensitive land uses, former land uses, and other features which constrain development. These constraints should be considered in future land use plans.

Seismic Hazards

The Whittier area is crossed by the Whittier fault on its northern and eastern sections. Groundshaking and surface rupture hazards are associated with earthquakes along these faults. Development near this fault zone should be limited to low density uses which will expose the minimum number of people and property to harm and damage. Other nearby faults which present seismic risks to the City include the Norwalk, Elysian Park, San Andreas, Chino and Sierra Madre faults.

The City of Whittier has first hand experience of the destructive potential of an earthquake. On October 1987, the City of Whittier and the surrounding neighborhoods experienced an earthquake of magnitude 5.9 with an epicenter at Montebello. The earthquake originated from the Elysian Park fault system which was unknown until then.

Following the initial tremor, a series of aftershocks occurred in the vicinity of the Whittier faultline. The earthquake primarily affected older structures and the urban centers of the community. The damage included the structural collapse of buildings associated with unreinforced brick and non-conforming construction technology. Estimates of damage exceeded 70 million dollars. On November 24, 1987, the City adopted an Emergency Ordinance to establish a redevelopment district in the area to aid the stricken areas in their recovery efforts.

Land Availability

Very little growth may be expected in the City because the area is relatively built out. Future growth is constrained by the lack of available vacant land suitable for development.

The City is over 90 percent developed with vacant parcels limited to 265.1 acres. The potential for future growth largely depends on the development of the Puente Hills area and the recycling or expansion of existing land uses.

Steep Terrain

The unincorporated area of the Puente Hills, above the City have areas of rugged and steep terrain. The hills, which today are predominately undeveloped, are scarred by deep and rugged canyons on the west side facing Whittier, while more gentle slopes existing on the east side. There are residential developments in the lower parts of the Hills on the Whittier side and near the crest on the eastern side. The engineering technology and cost of construction on steep terrain will limit development in this area.

The Hillside Residential (H-R) Zone in the Whittier Zoning Ordinance limits development in the hillside areas, to preserve the natural environment. It sets standards for density, grading, erosion control and fire protection in designated areas. This maintains the low density development in the hills.

Landslide and Flood Hazards

In addition to the steep slopes of the hills, there are landslide areas and unstable soils. Also, scattered areas are subject to flooding and dam inundation. Development on these areas will unnecessarily exposed residents and property to hazardous conditions. These issues are discussed in detail in the Public Safety Element Background Report.

Fire Hazards

Steep slopes, combustible plant materials, high temperatures, low humidity, strong winds, and an ignition source would provide a dangerous combination for a devastating fire. Dry brush in the hills, thick canopy trees and wood shingle roofs present wildfire hazards at Puente Hills. Industrial uses, high voltage power lines, high pressure gas lines, and substandard electrical systems are factors to consider in urban fire hazards. Fire prevention efforts must focus on the use of fire retardant construction materials, the provision of adequate fire fighting equipment, the buffer of structures from fuel areas, and the use of fire retardant landscaping.

Manmade Constraints

Manmade constraints to future development in the planning area include existing development, the presence of designated utility easements, and zoning restrictions to development. Other factors that control growth are the adequacy of the existing infrastructure (water, sewer, and storm drain lines and streets) to handle additional demands brought by new development.

SECTION 3: HOUSING ELEMENT BACKGROUND REPORT

INTRODUCTION

The Housing Element Background Report discusses the issues and opportunities related to housing in the City of Whittier. In order to adequately house all residents in the City, there must be a match between the type of housing needed and the available housing stock. The housing needs and resources of the City are analyzed in this Report. Housing programs can then be tailored to better meet the needs with the available resources.

The Housing Element Background Report also describes the population and housing characteristics of the City. This discussion includes an analysis of the age distribution, race, disability, income, household size of the City's population, and groups with special housing needs. Also, the existing housing stock, overcrowding, tenure, overpayment, and housing conditions are analyzed. Finally, an analysis of the constraints to the development of housing in the area is also provided.

POPULATION CHARACTERISTICS

Whittier's housing production needs stem from both local and regional conditions. These conditions include the following:

- New housing is needed as regional employment and population growth generate a demand for housing throughout Southern California.
- New housing is needed as Whittier's current population increases and ages.
- New replacement housing is needed to replace some of the housing which was lost when housing areas underwent a transition from residential to commercial uses.
- New housing is needed when vacancy rates are low to ensure reasonable levels of choice and mobility in the marketplace.

According to estimates of the California Department of Finance, the 1988 population of the City of Whittier was 73,601 persons. This represents a 5.6 percent increase over the 1980 population of 69,717 persons. The 1990 U.S. Census estimates the population at 77,671 persons. This represents an 11.4 percent growth over 10 years.

Consistent with the fully developed nature of the City, there has been a very slight increase in the number of households since 1980. From 1980 to 1990, the number of households

Section 3: Housing Element Background Report (continued)

increased by less than 1 percent. According to the projections of the Southern California Association of Governments (SCAG), this rate of growth is expected to increase in the next 5 years. In 1988, SCAG estimated 27,118 households in the City. In 1994, they expect that number to increase by 1,014 to bring the total to 28,132 households.

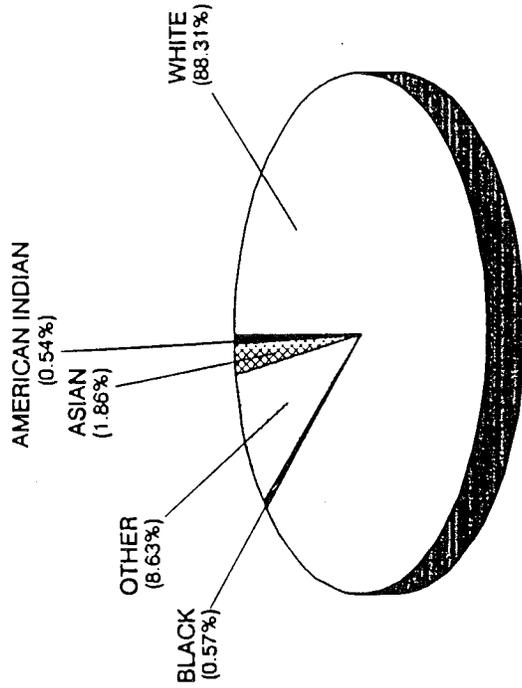
The average size of households in Whittier has increased from 2.52 persons per household in 1980 to 2.72 persons in 1990. Nearly 60 percent (15,954 households) of Whittier's households own their own homes and 42.3 percent (11,683 households) are renters.

Table 3-1 and Exhibit 3-1 shows historic growth in Whittier from 1960-1990. The rapid increase in population and housing stock from 1960 and 1970 was primarily due to the annexation of the East Whittier area during this period.

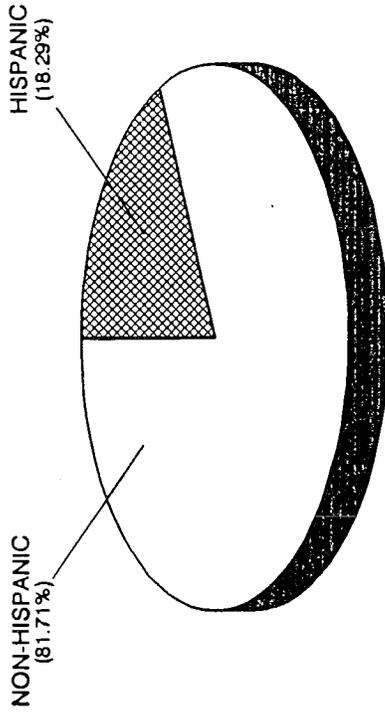
TABLE 3-1 HISTORIC GROWTH (1960-1990)			
Year	Population	Housing Stock	Household Size
1960	33,663	12,684	2.30
1970	72,863	25,817	3.40
1980	69,717	27,792	2.52
1990	77,671	28,758	2.72

Source: U.S. Census.

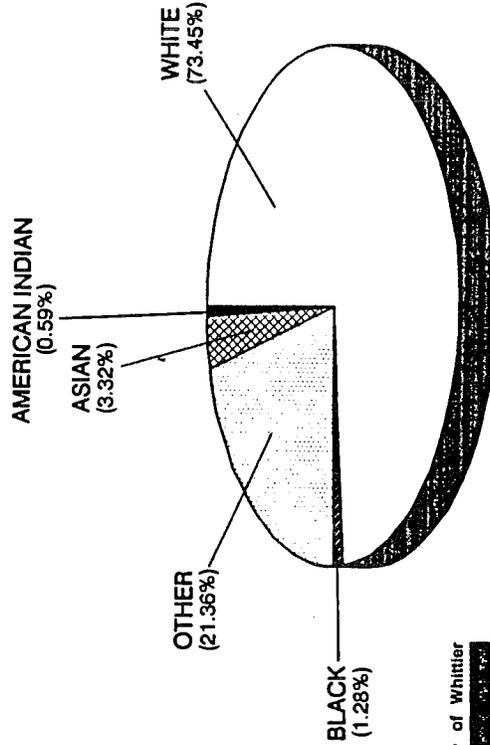
The breakdown of the City's population by age in 1980 showed a significant portion (26.1 percent) over the age of 55. This was higher than the countrywide average of 19.3 percent, showing that Whittier has a concentration of elderly residents. In 1990, the elderly population has dropped to 22.0 percent or 17,079 persons (see Table 3-2). Furthermore, 23.5 percent of Whittier's households are headed by people 65 years of age or over. Seventy-eight percent of these households are owners and 22.0 percent are renters. Approximately 27.2 percent of Whittier's residents are below the age of 19, and the remaining 50.1 percent of the population is between the ages of 20 and 54.



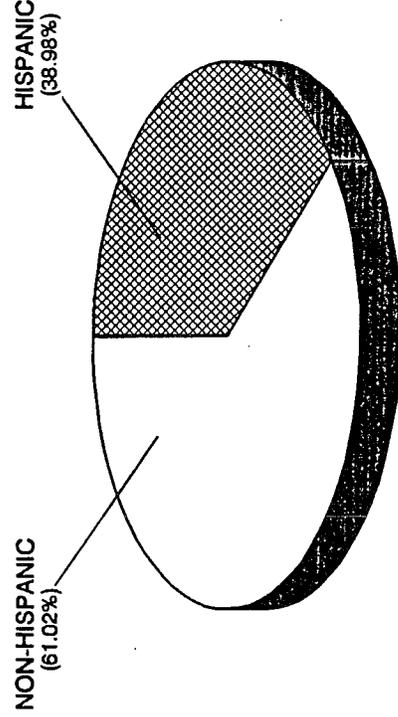
1980



1980



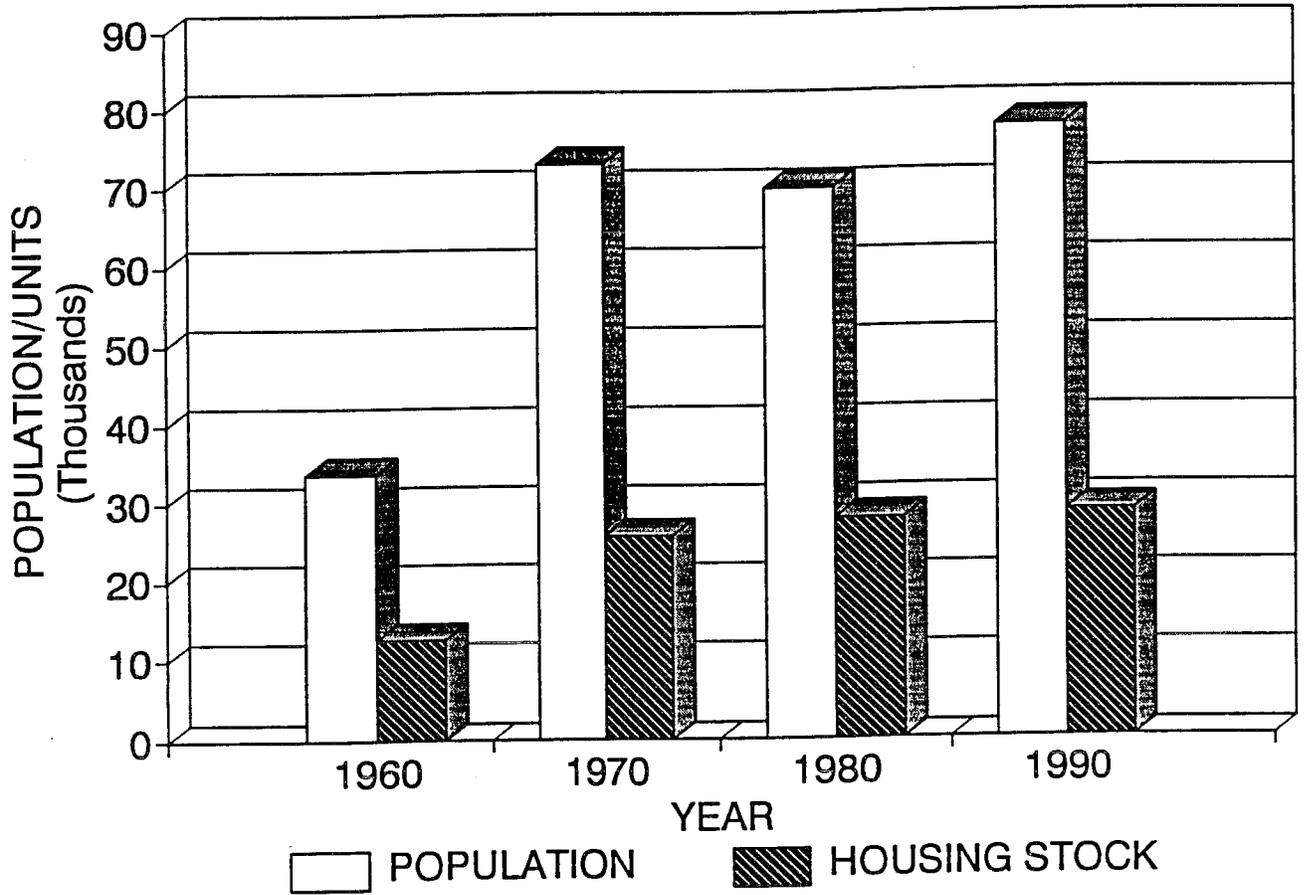
1990



1990



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**EXHIBIT 3-1
POPULATION AND
HOUSING GROWTH**

Section 3: Housing Element Background Report (continued)

TABLE 3-2 POPULATION BY AGE GROUP		
Age Group	Number	Percent
14 years and under	16,798	21.6
15 to 19 years old	5,641	7.3
20 to 34 years old	20,548	26.4
35 to 54 years old	17,605	22.7
55 to 64 years old	6,290	8.1
65 years and older	<u>10,789</u>	<u>13.9</u>
TOTAL	77,671	100.0

Source: 1990 U.S. Census.

Although the City of Whittier has an increasing Hispanic minority, the majority of residents are white. Table 3-3 provides a breakdown of Whittier residents by race and ethnicity in 1980 and 1990. Exhibit 3-2 shows the change in race breakdown.

TABLE 3-3 POPULATION BY RACE					
Racial Category	1980	Percent	1990	Percent	Percent Increase/Decrease
White	61,570	88.31	57,048	73.45	-7.34
Black	394	0.57	992	1.28	+151.78
Asian	1,294	1.86	2,581	3.32	+99.46
American Indian	410	0.54	462	0.59	+12.63
Other	<u>6,049</u>	<u>8.68</u>	<u>16,588</u>	<u>21.36</u>	+174.23
TOTAL	69,717	100.0	77,671	100.0	
Hispanic	12,751	18.29	30,278	38.98	+137.46

Source: 1980 & 1990 U.S. Census

EMPLOYMENT

In 1980, there were 35,236 Whittier residents in the work force. Based on the 5.6 percent increase in the City's population between 1980 and 1990, it is estimated the current work force is made up of 39,256 persons. Unemployment in Los Angeles County is estimated at 5.1 percent. At the time of the 1990 Census, the unemployment rate for Whittier residents was substantially lower than that of the county. Assuming the same pattern in 1990, the City's unemployment rate is estimated to be 3.9 percent.

Section 3: Housing Element Background Report (continued)

So-called "white-collar" jobs make up the largest category of employment for Whittier residents. Since Whittier College is located in the City, it is not surprising that managerial/professional and sales/technical jobs account for over 40 percent of the jobs held by the City's population. Another large percentage (27.3 percent) of residents are employed in manufacturing jobs with the remainder in clerical/support or service-related employment. The jobs held by Whittier residents in 1980 are broken down in Table 3-4.

TABLE 3-4 JOBS HELD BY WHITTIER RESIDENTS		
Job Category	Number	Percent
Managerial/Professional	9,334	27.7
Sales/Technical	4,563	13.6
Clerical/Support	7,267	21.3
Service	3,173	9.4
Farming	248	.7
Manufacturing	<u>9,178</u>	<u>27.3</u>
Total	33,663	100.0
Source: 1980 U.S. Census		

The economy of the City is dominated by retail trade and the service industry (which includes education) which together account for over half the jobs and two-thirds of the job sites located in the City of Whittier as shown in Table 3-5. However, there is also significant activity in the manufacturing, wholesale trade, and financial industries. The number of jobs in the City of Whittier was approximately 22,331 in 1984, the most recent year for which data was available. This means that there are approximately 13,000 fewer jobs in the City than there are employed residents living in the City. Thus, workers commute to jobs in other parts of the region.

Section 3: Housing Element Background Report (continued)

TABLE 3-5 EMPLOYMENT IN WHITTIER			
Industry	Jobsites	Employees	Percent
Agriculture	11	97	0.4
Mining	2	^a	
Construction	81	697	3.1
Manufacturing	99	2,487	11.1
Transportation, Communication, Gas, Electric, Sanitation	47	834 ^b	3.7
Wholesale Trade	75	1,718	7.7
Retail Trade	330	6,486	29.0
Finance, Insurance, Real Estate	141	1,821 ^b	8.2
Services	662	7,196	32.2
Public Administration	15	395 ^b	1.8
Nonclassifiable/unknown	10	242	1.1
TOTAL	1,473	22,331	
^a Data Suppressed			
^b Estimated			
Source: Industrial-Commercial Employment Project, 1984.			

FUTURE HOUSING NEEDS

By state law, projections of growth in the entire Southern California region and the housing needed to accommodate this growth are prepared by the Southern California Association of Governments (SCAG). In the Regional Housing Needs Assessment (RHNA), SCAG estimates future housing needs by estimating growth to 1994 and adjusting for regional low-income impactation, desirable vacancy rates and the projected rate of residential demolition. The estimated future housing needs of Whittier are shown in Table 3-6. SCAG has projected that Whittier will need to add 1,589 units between January 1988 and July 1994 to meet the needs of expected new residents, replace substandard units, and maintain a healthy vacancy rate. Between January and September 1988, the City issued 165 building permits and 96 demolition permits for an average annual net gain of approximately 240 units which is slightly less than the growth rate deemed desirable by SCAG (315 units per year).

Section 3: Housing Element Background Report (continued)

TABLE 3-6 WHITTIER FUTURE HOUSING NEEDS		
Income Group	Units	Percent
Very Low Income	243	15.3
Low Income	333	21.0
Moderate Income	291	18.3
High Income	<u>722</u>	<u>45.4</u>
TOTAL	1,589	100.00

Source: Regional Housing Needs Assessment, 1989-1994.

HOUSEHOLD CHARACTERISTICS

Table 3-7 presents the breakdown of households by income category from the 1980 census. The figures reveal that the incomes of Whittier households are higher than the county average. The median household income for Whittier in 1980 was \$19,948, which is 14 percent higher than the median income for Los Angeles County. A full 50 percent of Whittier families earned \$20,000 or more in 1980 compared to only 44 percent of families countywide. Additionally, only 16.5 percent of Whittier households had incomes less than \$7,500 compared to over 20 percent of Los Angeles County households.

TABLE 3-7 1980 HOUSEHOLD INCOME		
Income Category	Number of Households	Percent
Less than \$5,000	2,698	10.0
\$5,000 to \$7,499	1,747	6.5
\$7,500 to \$9,999	1,892	7.0
\$10,000 to \$14,999	3,619	13.4
\$15,000 to \$19,999	3,530	13.1
\$20,000 to \$24,999	3,379	12.6
\$25,000 to \$34,999	4,528	16.8
\$35,000 to \$49,999	3,125	11.6
\$50,000 and more	2,391	8.9

Source: 1980 U.S. Census

The median household income for homeowners (60 percent of the total households) was \$26,435; for renters \$12,703. Table 3-8 presents income data for renters and homeowners. The median area income for Los Angeles in 1980 was \$17,551. The \$10,000 income level

is 57 percent of the area median, or roughly equivalent to the 50 percent of median threshold for "very low income" households. The \$20,000 income level is 114 percent of the area median or roughly the upper level for "moderate income" households (which are defined as between 80 and 120 percent of median). Table 3-8 shows that 38 percent, or over one-third of all renter households fall near or below the very low income category. This is compared to only 13 percent of all homeowner households. Conversely, two-thirds of all homeowner households are in the "high income" category compared to only 25 percent of renters.

TABLE 3-8 HOUSEHOLD INCOME BY TENURE (FOR SELECTED HOUSEHOLDS)		
Tenure	Number of Households	Percent
Homeowners		
Less than \$10,000	1,915	13.2
\$10,000 to \$19,999	2,872	19.8
\$20,000 or more	9,742	67.1
Renters		
Less than \$10,000	4,100	38.1
\$10,000 to \$19,999	3,949	36.6
\$20,000 or more	2,732	25.3
Source: 1980 U.S. Census		

As shown in Table 3-9, the major source of income for Whittier households is earnings from wages and salaries; over 80 percent of households receive income from this source. Over one-fourth of Whittier households receive social security income while less than 2,000 households (or 7 percent) receive public assistance.

TABLE 3-9 SOURCE OF INCOME - WHITTIER HOUSEHOLDS		
	Number of Households	Percent
Wage/Salary	22,019	81.9
Social Security	7,052	26.2
Public Assistance	1,893	7.0
Source: 1980 U.S. Census		

Census data for 1980 show that only 5.3 percent (987) of families living in Whittier had incomes below the poverty level. This is only one-half of the countywide rate; still more

Section 3: Housing Element Background Report (continued)

evidence of Whittier's relatively affluent income profile. A majority of these poverty-level households have children and half have a householder who works. In addition, close to half of the families living in poverty in Whittier are headed by a female, and 72 percent of the poverty-level households are renters, compared to 42 percent of all households. See Table 3-10.

TABLE 3-10 FAMILIES BELOW POVERTY		
	Number	Percent
Families Below Poverty Level	987	100.0
Householder Employed	494	50.1
With Children	705	71.4
Female Head	465	47.1
With Elderly Head	105	10.6

Source: 1980 U.S. Census

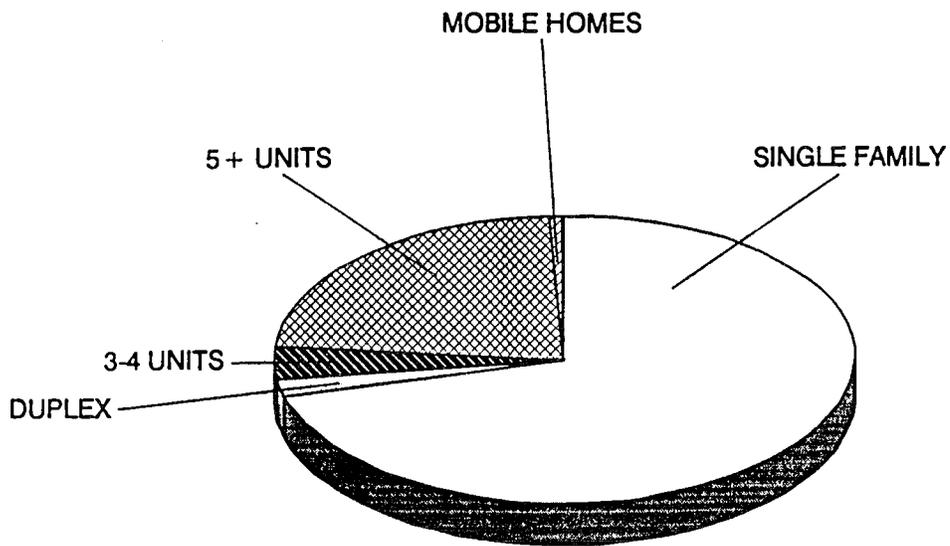
HOUSING STOCK

Table 3-11 shows that the last 10 years have seen a slight (less than 3.5 percent) increase in the number of housing units in the City of Whittier. There are currently 28,758 housing units in the City. The housing stock is located primarily in single-family units and small (2- to 4-unit) buildings. The majority of housing units in the City are owner occupied, (57.8 percent compared to 42.2 percent which are rented). Table 3-11 and Exhibit 3-3 provides a breakdown of housing stock in 1980 and 1990.

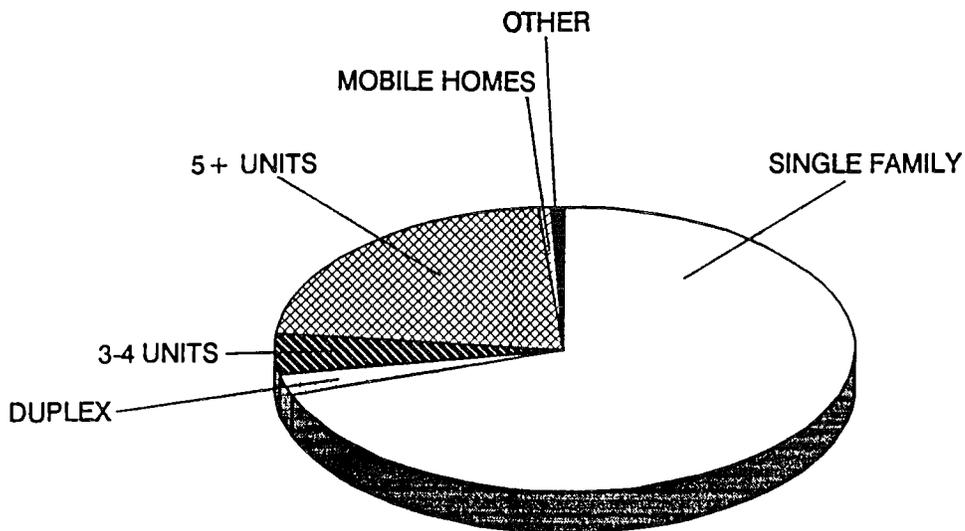
TABLE 3-11 HOUSING STOCK BREAKDOWN				
Stock	1980	Percent	1990	Percent
Single-Family	19,648	70.70	19,968	69.93
Duplex	564	2.03	688	2.41
3-4 Units	1,055	3.80	1,362	4.77
5 + Units	6,336	22.80	6,337	22.19
Mobilehomes	189	0.68	200	0.70
Other	0	0.00	203	0.71
TOTAL	27,792	100.00	28,758	100.00

Source: 1980 and 1990 U.S. Census

With respect to rental units, in September 1981 a survey of 103 apartment complexes in the City with a total of 2,368 units was completed. Distribution of apartment units by bedroom



1980



1990

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City of Whittier



GENERAL PLAN

**EXHIBIT 3-3
HOUSING STOCK**

Section 3: Housing Element Background Report (continued)

size from this survey is presented in Table 3-12, and data for all units from the 1980 census are shown in Table 3-13. Most of the apartment units contain 1 bedroom (40.9 percent) or 2 bedrooms (43.2 percent), and very few units consist of bachelor (12.5 percent) or 3-bedroom units (3.4 percent).

TABLE 3-12 APARTMENT UNIT SIZE, 1981		
Number of Bedrooms	Number of Units	Percent
Bachelor	296	12.5
1-Bedroom	969	40.9
2-Bedroom	1,024	43.2
3-Bedroom	79	3.4
TOTAL	2,368	100.0

Source: 1981 Apartment House Survey conducted by TDC Planning.

TABLE 3-13 HOUSING UNIT SIZE		
Unit Size	Units	Percent
1-Room	935	3.3
2-Rooms	1,824	6.3
3-Rooms	3,851	13.4
4-Rooms	4,934	17.2
5-Rooms	6,327	22.0
6-Rooms	5,474	19.0
7-Rooms	2,957	10.3
8 or More Rooms	2,456	8.5
TOTAL	28,758	100.0

Source: 1990 U.S. Census

As a City's housing stock ages, more units are likely to wear out and need repair or replacement. The age of Whittier's housing stock is an indicator of housing rehabilitation and production needs. The City of Whittier has 7,773 housing units (or 27.9 percent of the total housing stock) built prior to 1950. Roughly half of these units were built prior to 1940. Units built prior to 1934 were not subject to the safety standards set in the Uniform Building Code. As a result, they are more likely to have substandard original construction and need repair. These units suffered extensively in the October 1987 earthquake.

Overcrowding can also be an indicator of pent up housing demand. There is a slight overcrowding problem in the City of Whittier. Nearly 10 percent of the total housing stock,

Section 3: Housing Element Background Report (continued)

or 2,796 units, have 1.01 or more persons per room. Seventy-four percent of these units are renter-occupied and only 26 percent are owner-occupied.

Another factor creating a need to produce new housing is low vacancy rates. When vacancy rates are low, they restrict the opportunity and choice in the City's housing market. The 1990 Census reports a 3.9 percent vacancy rate. According to the Federal Home Loan Bank Board Vacancy Survey, the vacancy rate in 1988 for the Whittier area was 0.8 percent. The rate for single family units was 0.7 percent, and the rate for multiple-family units was 1.3 percent. The vacancy rate for mobile homes in the area was 1.5 percent. To some extent, the low vacancy rate was reflective of the loss of housing in the 1987 earthquake.

Whittier's housing supply, as noted in Table 3-11, amounts to 28,758 units in 1990. Some 1,119 housing units, or 4 percent of the housing stock showed visible evidence of substandard conditions in 1987. This estimate is based on the code inspections of over 5,000 structures which were performed following the October 1987 earthquake. These inspections covered most of the older housing and over half of the total units in the City. Of the total housing stock, about 3 percent are suitable for rehabilitation and approximately one percent are judged unsuitable for rehabilitation. These and other figures are summarized in Table 3-14.

TABLE 3-14 SURVEY OF HOUSING CONDITIONS				
Condition	Owner	Percent	Renter	Percent
Standard	15,915	96.0	11,058	96.0
Suitable for Rehabilitation	495	3.0	321	2.8
Unsuitable for Rehabilitation	<u>165</u>	<u>1.0</u>	<u>138</u>	<u>1.2</u>
Total Housing Units	16,575	100.0	11,517	100.0

Source: City of Whittier Housing Assistance Plan, 1988.

A needed improvement to the housing environment is the replacement of substandard housing units which are not suitable for rehabilitation. As noted in Table 3-14, there are an estimated 303 dwelling units which cannot be economically rehabilitated. These housing units need to be replaced by new housing of adequate quality. Because of this, replacement of substandard housing is a source of demand for new construction.

Geographically speaking, housing units needing improvement are concentrated in the older areas of Whittier. Some of the concentration of need is due to the 1987 Whittier earthquake, which hit these older areas especially hard because of the age of the units and the construction techniques of their time period.

AFFORDABILITY

Data on gross rent as percentage of household type by income in 1980 are presented in Table 3-15. As shown earlier, the majority of the City's lower income households are renters and this influences the character of housing assistance needs. In 1980, there were 2,413 (15.1%) households in owner-occupied housing units spending more than 30 percent of their income on housing. The City had 10,907 renter households and 4,446 (41%) of these were spending 30 percent or more of their income on housing costs. The majority of these (3,548 renter households) were actually paying more than 35 percent of their income on housing. The vast majority (75 percent) of households in the lower income bracket spend 30 percent or more of their income for housing costs. For instance, 79 percent of all the renters in the "less than \$10,000" group allocate more than 30 percent of their income for shelter. Because of the high home values in California, overpayment is a trend that is expected to continue in the region, including the City of Whittier.

TABLE 3-15 HOUSEHOLDS PAYING OVER 30 PERCENT OF INCOME FOR SHELTER		
Income	Owner	Renter
Less than \$10,000	811 (5.1%)*	3,391 (29.0%)
\$10,000 to \$20,000	737 (4.6%)	1,004 (8.6%)
\$20,000 or more	865 (5.4%)	51 (0.4%)
TOTAL	2,413 (15.1%)	4,446 (38.1%)

* Percentage of total 15,954 owner-occupied or 11,683 renter-occupied units.
Source: 1980 U.S. Census

Table 3-16 shows the number of low income households paying more than 30 percent of their income for shelter in 1988. There are 4,861 low income households overpaying for housing in the City of Whittier. The majority (64 percent) of these households are renters. As expected, the impact is greater among very low income households. These households represent the existing housing needs of the City. Exhibit 3-4 provides existing and future housing needs based on SCAG estimates.

Section 3: Housing Element Background Report (continued)

TABLE 3-16 LOW INCOME HOUSEHOLDS OVERPAYING FOR HOUSING - 1988			
Income Group	Renters	Owners	Total
Very Low Income	2,481	648	3,129
Low Income	<u>1,375</u>	<u>357</u>	<u>1,732</u>
Total	3,856	1,005	4,861

Source: Regional Housing Needs Assessment, SCAG, 1988.

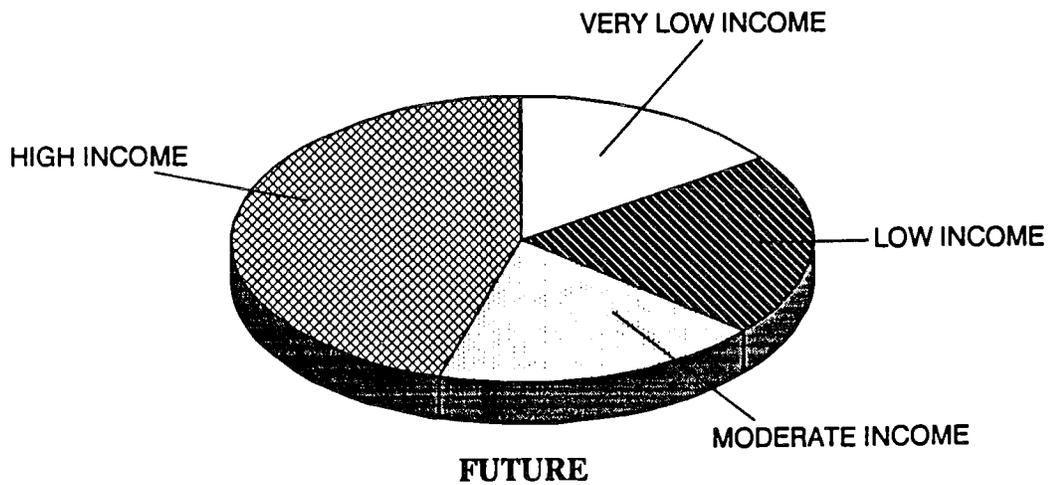
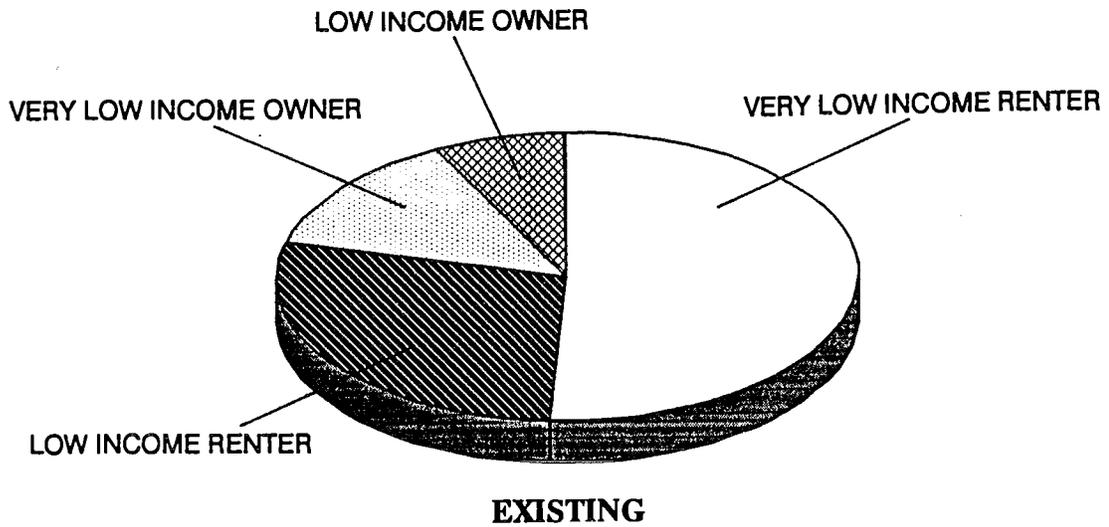
SUBSIDIZED HOUSING

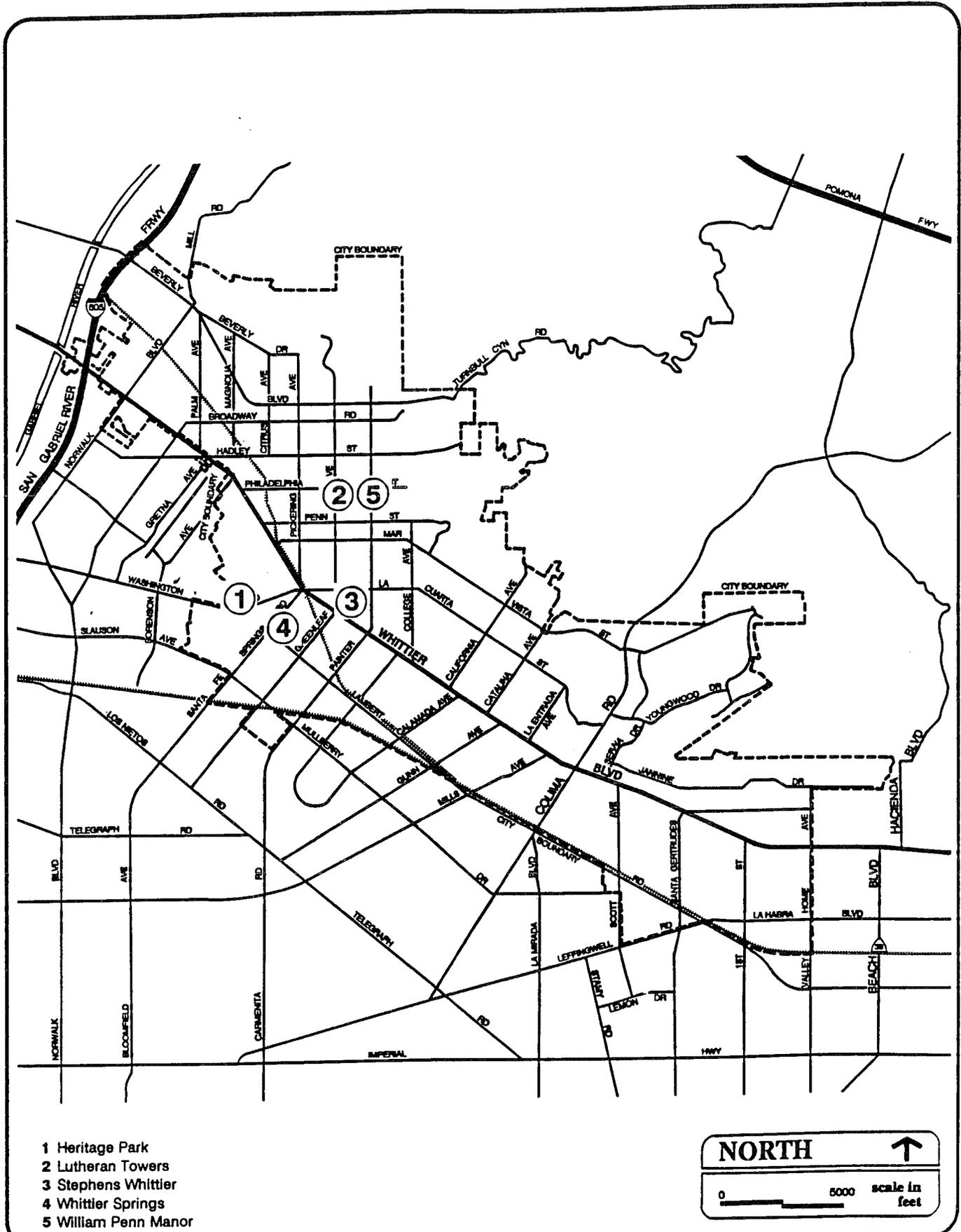
Projects in the City

The City of Whittier has five housing projects which are funded by federal and local housing programs. They provide affordable housing units for senior citizens, disabled persons, and low and moderate income households in the City. Table 3-17 lists these projects and Exhibit 3-5 shows their location.

TABLE 3-17 SUBSIDIZED HOUSING PROJECTS			
Project/Address	Funding Source/Date	Earliest Date of Subsidy Termination	No. of Units
Heritage Park Whittier 12251 Washington Blvd.	County Bond Financing 1990	2030	169 senior housing units
Whittier Lutheran Towers 7215 Bright St.	FHA Section 236 and Section 8 1975	2015 1995 (Section 8)	155 senior housing units with 140 under Section 8
Stephens Whittier 8011 Bright St.	FHA Section 221 (D)(3) 1972	1992	14 units
Whittier Springs 8218 Santa Fe Springs Rd.	FHA Section 202 and Section 8 1985	2025 (FHA) 2005 (Section 8)	13 units
William Penn Manor 7025 Friends St.	FHA Section 202 and Section 8 1991	2031 2011 (Section 8)	74 senior housing units

Source: Inventory of Federally Subsidized Low-Income Rental Units at Risk of Conversion, California Coalition for Rural Housing Project, 1990; City of Whittier, 1992; HUD Rental Housing Handbook, 1991.





- 1 Heritage Park
- 2 Lutheran Towers
- 3 Stephens Whittier
- 4 Whittier Springs
- 5 William Penn Manor

NORTH ↑

0 ————— 5000 scale in feet

DEA DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



**EXHIBIT 3-5
SUBSIDIZED HOUSING PROJECTS**

These projects have been provided low interest loans and/or rental assistance payments in return for the provision affordable housing units. Others are funded by tax-exempt bonds, redevelopment funds, or provided incentives by the City in exchange for units reserved for special needs or low income households. There is no housing project in Whittier which is funded by State revenue bonds.

Aside from these projects, approximately 10 rental units have been provided rehabilitation loans with a 10-year resale restriction. Also, the City has recently completed rehabilitation on a single family unit for first-time homebuyers.

Units at Risk

Three housing projects are considered to be at risk of conversion to market rate housing within the next 10 years. The other projects with a total of 243 units are not considered at risk at this time. Thus, they are not subject to the more detailed analysis below. The conversion of subsidized housing to market rate housing may occur at any time after termination of the contract or pre-payment of the loan. This means that the affordability controls are terminated and an increase in rents for senior citizens, disabled persons and low-income households currently occupying the units may occur. It is in the City's interest to preserve or replace low-income housing before they are converted.

The Stephens Whittier apartments has 14 units (eight 1-bedroom and six 2-bedroom units) and is owned by Stephens Whittier. The project was granted a \$222,000 loan in 1972 under FHA Section 221 (D) (3) - Multifamily Rental Housing For Moderate Income Families. The FHA loan had a prepayment option starting January 1992. Stephens Whittier has filed a Notice of Intent (NOI) to convert the project. However, no plan of action was approved by HUD. Stephens Whittier has since then retracted their NOI application. Because the project has not filed a plan of action, future NOI will be subject to the regulations of Title 6 (Low Income Housing Preservation Residential Homeownership Act - LIHPRHA). This means prepayment of mortgages on Section 236 and 221 programs must show proof that current tenants would not be affected economically; the affordable housing stock in the area is not affected; safe and sanitary housing near jobs is available for low income residents; housing for minorities is not affected; and other restrictions. The future conversion of this project will lead to the loss of 14 low and moderate income housing units in the City.

The Whittier Lutheran Towers has 155 units with 105 studio apartments and fifty 1-bedroom units. It is owned by Gilliam Falkenberg and was constructed in 1975 with HUD Section 236 funds. It currently has a Section 8 contract for 140 of its 155 units. Under Section 8, the tenant pays 30 percent of his gross income to the owner as rent and the Department of Housing and Urban Development (HUD) pays the difference between the tenant's contribution and the fair market rent of the unit. HUD sets fair market rents based on the

median income in the region, the number of persons in a household and other factors. The project's Section 8 contract is up for termination in 1995.

The Whittier Springs apartments has 13 units (twelve 1-bedroom and one 2-bedroom units) and is owned by the Exceptional Children's Fund of Los Angeles. It was granted a \$757,300 loan in 1985 under FHA Section 202 - Direct Loans for Housing for the Elderly or Handicapped and a Section 8 contract for 12 of its units. The FHA loan will be eligible for prepayment in 2025 but the Section 8 contract will expire in 2005. The termination of the Section 8 contract will lead to the loss of 13 affordable housing units.

At the expiration of the Section 8 contract, the owner will be allowed to raise rents and the Section 8 subsidy will compensate him. However, the units should remain affordable to low and moderate income households for the life of the project or at least 50 years. Also, at expiration of the Section 8 contract, the owners may choose to renew the contracts for the next five years. Section 8 contracts are automatically reviewed by HUD for the next five-year period, as a general practice. If the owner does not want to renew, a Notice of Intent should be filed one year before expiration. During the year before expiration, HUD may offer incentives (e.g. allowing higher rents or refinancing the mortgage) to preserve the units.

Replacement vs. Preservation

In order to determine the more feasible alternative between preservation and replacement, the City is comparing the cost of buying out the project for preservation and the cost of building a new development with the same number of units. Area realtors were consulted on the housing market in Whittier. Land in the City is estimated to cost approximately \$110,000 for a 6,000-square-foot lot which can accommodate 3 units. The Stephens Whittier project is located on 13,508-square-foot parcel; which may cost \$250,000. The average cost of construction for a multi-family project in 1992 is approximately \$70 per square foot. At a gross floor area of 15,033 square feet, the Stephens Whittier project could be built for approximately \$1.05 million at this time.

Because the market is often driven by the number of dwelling units more than anything else, a 14-unit apartment would have a market value based on its gross rent and expenses. Considering average rents in the City right now, a new 14-unit apartment would cost approximately \$1.2 to 1.4 million. The market value of the Stephens Whittier project would be around this range, if it converts to market-rate. Although, its daily maintenance expenses would be slightly higher than that of a new development.

Preservation may be a more viable alternative for Stephens Whittier, because it would involve less capital outlay (especially for development fees), would not involve tenant

displacement, and will allow continued use of the existing structure. On the other hand, it will require greater operating costs and less amenity than what would be available in a new development.

Assuming the same basic costs above, the Lutheran Towers can be built for approximately \$13 million. The Whittier Springs project has a conversion date of 2005, and estimating its replacement or preservation cost at this time would not reflect real estate trends or inflation costs by then. The City will analyze this project during the Housing Element Update for that planning period.

Available Funds

Available resources in the City of Whittier which may be used to buy-out the Stephens Whittier or Lutheran Towers project include redevelopment funds, City General Fund, CDBG monies, bond financing, non-profit agencies, the Whittier Housing Authority, the California Housing Partnership Corporation, and other entities.

The Whittier Redevelopment Agency has a Low and Moderate Income Housing Fund which represents 20 percent of the tax increment received by the agency. At the end of fiscal year 1991, the fund had a balance of \$467,100. It is expected to receive \$459,000 from the 1991-1992 tax year for a total of \$925,400. Projects planned for this fund total \$312,000 which leaves \$613,400. This money will be made available for rehabilitation loans and could be used for funding the preservation of rental units at risk. Also, the agency has a fund balance of approximately \$2.0 million.

The City's CDBG program receives approximately \$700,000 of federal subsidies. The money is used for the City's housing rehabilitation loan program, graffiti abatement, code enforcement, fair housing council services, and other social services benefitting low and moderate income residents. Approximately \$100,000 is expected remain after program and administration costs for fiscal year 1991-1992. The City of Whittier's budget is expected to have a balance of \$11.3 million at the end of fiscal year 1991-1992. The City may also use bond financing to preserve Stephens Whittier, subject to a two-thirds vote of the local electorate.

These financial resources place Whittier in a position to buy-out the Stephens Whittier project if prepayment occurs. The Lutheran Towers would require additional funding sources than that available in the City. If the City does not want to acquire the property, other private resources and programs could also be tapped for the preservation of low income units. Local lenders may apply for funds from the Federal Housing Finance Board's Affordable Housing Program (AHP). This program is relatively new (2 years old) and

makes subsidized financing available for participating lenders for the purchase and rehabilitation of single family and multi-family housing.

The Corporate Fund for Housing, a local non-profit organization, developed the 169-unit Heritage Park Whittier through a tax-exempt bond issue. Non-profit agencies also developed Lutheran Towers of the West (155 elderly units) and the William Penn Manor (75 elderly units).

The La Habra Neighborhood Housing Services (NHS) is developing affordable housing (10 units in the John Greenleaf Whittier neighborhood of the City and provides home improvement loans at below market rates. Other local organizations which may be in a position to take over affordable housing projects include: Keystone Enterprises, HomeAid, Southern California Presbyterian Homes, Ralph Carrico, TELACU, etc.

Courses of Action

The City of Whittier is developing a program to preserve all affordable housing units in the City. The program shall include talks with the property owner to determine if they intend to prepay the projects or continue the projects through existing incentives. If prepayment is expected or the mortgage/contract due to expire, the tenant association shall be offered to right of first refusal to take over the property. Otherwise, the City shall establish a fund to buy-out the project or actively look for an organization who is interested in maintaining the project as affordable housing. Entities who are involved in affordable housing projects shall be contacted early in the process. If the City is not in a position to buy-out the project, it may also provide rehabilitation funds, technical assistance and other forms of incentives to interested entities who may be interested in acquiring and maintaining affordable housing projects.

SPECIAL HOUSING NEEDS

In shaping a housing strategy, the City of Whittier has taken great care to identify and serve the needs of its special populations. The City acknowledges that certain populations require different housing solutions. A comprehensive response to housing needs must incorporate the special requirements of these populations.

- **Elderly:** 1990 Census data show that 13.9 percent of Whittier's population is over the age of 64 and 22 percent is at age 55 or over. It is estimated that there are currently 1,587 lower income elderly households residing in Whittier. In 1990, 42 percent of the elderly households were homeowners and 58 percent renters. Elderly households are more likely to be disabled, and

require similar housing modifications. They may also need special security features and access to public transportation and medical services.

- **Disabled:** Another group with special housing needs is the physically disabled population. Correctly serving this population requires housing unit design modifications and alternative solutions to housing accessibility. Though there is no reliable data on the size of the handicapped population in Whittier, the 1980 Census does provide information on the number of persons between the ages of 16 and 64 with either work or public transportation-disabilities. There are 3,640 persons with such disabilities, or 7.9 percent of the adult population under 65 years of age. Among persons 65 and older, 1,606 have disabilities (18 percent).

A study completed one year earlier than the census revealed that 3.9 percent of Whittier population was handicapped at the time of the study. The difference in figures may be due to different definitions of "handicapped" and "disabled" used in the two studies. Assuming the same percentage of lower income households among the handicapped as in the rest of the population, and using a midpoint figure between the two estimates of handicapped/disabled population, it is estimated that there are currently 4,660 handicapped/disabled persons in Whittier, and 1,630 of these are lower income.

Handicapped residents need housing with wider doorways, ramps rather than stairs, elevators for two or more story units, modified cabinets, plumbing, and lighting. These modifications are expensive and not usually found in older units. New construction is required by state law to be accessible, but may not have all the features needed by specific individuals.

- **Homeless:** In the past 10 years, the size of the nation's and Los Angeles County's, homeless population has sky-rocketed. As this population has increased so has the need for emergency shelter, transitional housing, and very low income re-entry (such as single room occupancy) housing. City officials and homeless advocates estimate a homeless population in Whittier between 70 and 100 persons. It is estimated that half of these persons are single individuals, and that there are about five homeless families in Whittier. Twenty percent of the homeless persons are children. It is estimated that one-third of the homeless have some mental illness, and one-third are alcohol and/or substance abusers. There was a Salvation Army shelter in the City which was damaged and closed after the October, 1987 earthquake. The City has provided \$50,000 of redevelopment funds to the Rio Hondo Temporary

Home in Norwalk. The home serves homeless families by providing shelter (110 beds), meals, child care, job development, and savings and housing assistance. A Homeless Ad Hoc Committee has also been formed to study the homelessness problem in Whittier, to develop ways of alleviating homelessness or providing better services, and to coordinate services available to residents. Several local churches and service agencies operate programs in the City and the surrounding communities to serve the homeless. The City considers all multi-family and commercial zones potentially suitable for emergency shelters for the homeless.

- **Large Families:** Large families (that is those having five or more members) also represent a special housing need because they require larger units than the market normally provides, and because larger units generally cost more. Thus, large families can be caught in a bind because the units they can afford are too small to provide adequate accommodation. It is estimated that there are currently 3,455 large family households in the City of Whittier with approximately 45 percent of these as renters and 55 percent are homeowners.
- **Female-Headed Households:** Female-headed households are disproportionately represented among the poor throughout the United States. This is true in Whittier as it is elsewhere. Though just 5 percent of Whittier families live below the poverty level in 1980, over 20 percent of female-headed families fall in this category. In 1980, there were 2,305 female-headed families in Whittier, 12 percent of all Whittier families; 1,381 of these included children under age 18. In 1990, there were 3,303 female-headed households, an increase of 43%, and 2,031 of these had children. Female-headed households are in need of affordable units which are located near schools, day care centers, and recreation services.
- **Farmworkers:** The 1980 Census indicated that 248 Whittier residents were employed in agriculture or a related field. Since Whittier is urbanized, and located in an urban area, these people are likely to work as gardeners or stable hands, or to be the employees of the ornamental business in the area, rather than the migrant farmworkers which state law is concerned about.

CONSTRAINTS

The availability and affordability of housing within the City of Whittier, as with housing availability in any community, is dependent upon a variety of factors which either encourage or constrain housing development. These constraints range from City ordinances to state legislative mandate to market mechanisms. Often, the combination of these constraints

affect the housing market by making it unaffordable to the consumer or uneconomical to produce for developers. The City of Whittier, similar to municipalities throughout the region, suffers from both governmental and market constraints which make a full range of housing opportunities very difficult to achieve.

Governmental Constraints

The City of Whittier has an excellent record of assisting developers to understand City regulations and proceed expeditiously through the development review process. City fees are lower than those for adjacent Los Angeles County areas (see Table 3-18). Permit processing generally takes less than 3 months, although projects requiring extensive environmental review can take twice as long (6 months). Staff meets with all developers who request assistance prior to submittal to explain City requirements and procedures.

TABLE 3-18 PERMIT AND PROCESSING FEES		
Application	Filing Fee	Appeal Fee
Zone Change	\$1,000	\$150
Variance	500	150
Variance Modification	400	150
Minor Variance	250	150
Conditional Use	1,000	150
Conditional Use Permit Modification	500	150
Minor Conditional Use Permit	250	250
Temporary Use Permit	35	25
Hillside Plan	2,000	150
Precise Plan of Development	1,800	150
Development Review (includes DRB where required)		
a. Level A, Planning Director		
1. Signs, siding, roofing, additions under 100 sq. ft., and patios under 300 sq. ft.	25	25
2. Additions and garages under 600 sq.ft.	100	75
3. Const. over 600 sq.ft.	300	200
4. Third and subseq. corr.	25	n.a.
b. Level B, Zoning Administrator	500	300

Section 3: Housing Element Background Report (continued)

TABLE 3-18 PERMIT AND PROCESSING FEES		
Application	Filing Fee	Appeal Fee
c. Level C, Planning Commission	1,000	500
d. Level C, Optional Standards	1,500	500
e. Preliminary Review Fee	25% of Level B or C	
Order of Abatement of Nonconforming Building, Structure, or Use	fee	150
Lot Line Adjustment	n.a.	150
Equestrian Permit	350	
Environment Review (CEQA)	200	
a. Environmental Initial Study		
1. In House		n.a.
2. Consultant	400	n.a.
b. Negative Declaration	Cost plus \$200	n.a.
c. Environmental Impact Report	100	n.a.
d. Notice of Exemption	Cost plus \$1,000	n.a.
Certificate of Compliance (R-1 zone)	100	n.a.
Certificate of Compliance (Subdivisions)	100	n.a.
Tentative Parcel Map	150	
Tentative Tract Map	\$750 + \$10/lot	
Historic Designation	1,500 + \$10/lot	n.a.
Uptown Specific Plan Development Review	250	
a. Signs, except neon (admin.)		50
b. Awnings, repaints, storefront remodel and neon signs	25	50
c. New Construction or major remodel	50	
1. Up to 2000 sq. ft.		200
2. Over 2000 sq. ft.	300	350
3. Modifications	750	75
d. Special Meeting	100	
General Plan Amendment	Fee plus \$500	n.a.
General Plan Update Fee	3,000	
Amendment of Zoning Regulations	0.02/\$100 valuation	150
Administrative Interpretation	3,500	150
Clarification of Ambiguity	n.a.	50
Correspondence	200	n.a.
Agenda Fee	100	n.a.
	200	

Source: City of Whittier Planning Department, 1991.

The most direct method by which local governments, including the City of Whittier, are able to affect housing availability, particularly for low- and moderate-income families, is through direct housing subsidies. Unfortunately, such programs are inadequately funded at all levels

Section 3: Housing Element Background Report (continued)

of government. As an example, the 1980 census recorded 6,859 renter households in the City of Whittier as paying more than 30 percent of income for rent; slightly more than 27 percent of the rental households are overpaying for housing costs. Yet, only 206 Section 8 certificates and housing vouchers are currently assigned to residents in the City of Whittier. The Federal Government has continued to reduce housing subsidies during the last administration and it appears this trend will continue.

The most significant factor limiting the provision of new housing to meet the needs of all residents of the City appears to be the inability of the existing infrastructure to support increased density. The Uptown area of the City of Whittier is quite old and the sewer and water systems were initially developed based upon population projections which have been exceeded. Most of these systems have not been upgraded since they were installed prior to 1940. The infrastructure is sufficient to meet current demand, but will not support additional development without system improvements. This area has experienced redevelopment pressures from private developers who would like to build to higher density, thereby, providing affordable housing. The City of Whittier has adopted a capital improvement plan to upgrade the sewer and water systems. The improvements will allow for increased density within the City which could assist in providing more affordable housing.

On the other hand, following the October, 1987 earthquake, the City Council authorized the preparation of a specific plan for the Uptown area which was hit hard by the 1987 earthquake. One of the findings of that study, embodied in the specific plan, was that the Uptown itself had more commercially designated land than necessary to meet foreseeable market demand. Therefore, the plan recommended changing some land use designations from commercial to multi-family residential. This would permit construction of up to 1,100 additional units to meet the growth needs projected by SCAG, in close proximity to services and shops.

Whittier has 816 units which are deemed substandard but suitable for rehabilitation. The devastation to housing units suffered in the earthquake of October 1987 resulted in an additional 276 units of substandard housing which did not exist prior to the earthquake. Approximately 174 of these are considered suitable for rehabilitation. Following the 1987 earthquake, building inspectors from all over Los Angeles County volunteered their services to assist the City to identify damaged and hazardous buildings. Over 5,000 structures were inspected, including most of the older housing and over half of all units. It is anticipated that a number of the earthquake damaged units will be rehabilitated by the owners for protection of their economic investment in housing units. However, a number of the units will remain in substandard condition in spite of the efforts of the City of Whittier to maintain and improve the housing stock. The reasons for these units to remain substandard would include the following:

Section 3: Housing Element Background Report (continued)

- Many households do not have sufficient income to qualify for a home improvement loan or to afford the payments on a renovation loan.
- The availability of home improvement dollars is limited and most financial institutions will fund only house loans which carry the highest probability of repayment.
- The public funding at both the State and Federal levels has been severely reduced and the costs of home improvement to bring all units into habitable condition is well beyond the available subsidies.

Home improvement costs vary from home to home depending upon the type and extent of the improvements. However, it is currently estimated that home improvements costs in the City of Whittier average between \$9,000 and \$12,000. These estimated costs include total labor and materials necessary to bring the average substandard unit up to Federal Section 8 housing quality standards. Clearly, these costs are well beyond the ability of most households to assume on a cash basis. Consequently, most families interested in improving their housing will seek traditional bank financing and will often encounter difficulties related to the constraints outlined above.

The high costs associated with major home rehabilitation and/or renovation, as well as difficulties in qualifying for financing will greatly limit the number of Whittier households able to improve their residences. In addition, there is not enough money to meet the estimated rehabilitation needs of the entire City of Whittier. The earthquake in October 1987 damaged a number of homes in the City, adding to the number of substandard units. Further exacerbating the problem is the aging character of the housing stock within the City of Whittier. Much of the housing, particularly in the Uptown area was built before 1930. As the housing ages, it will require greater maintenance and, in all likelihood, major repairs to maintain the unit in good condition.

Consequently, assuming that a major portion of these repairs would require below market financing in order for the owner or renter to qualify for the funding, it is substantially more than is currently available to the City. The below-market funding needed to meet all the home improvement work is estimated at between \$9 and \$10 million. The estimated dollars at below-market interest needed for rehabilitation is based upon the assumption that 50 percent of the units are occupied by residents who would require long-term financing at rates less than conventional financing. Further, the average rehabilitation cost of \$10,500 per unit when factored into the equation results in an estimated \$9 to \$10 million funding need.

The Community Development Block Grant from which most rehabilitation subsidy is derived has been reduced significantly. Limits have been imposed at the Federal and State level on bond financing by municipalities. Funding at both the Federal and State level is not sufficient to provide the needed subsidies. Realizing the severe limitations to funding sources, the Whittier City Council established areas of priority appropriation. The purpose of identifying these target areas was to maximize the use of available funding resources in areas where the need is greatest. Exhibit 3-6 shows the rehabilitation target areas.

Market Constraints

The most significant factor affecting the affordability of housing within the City of Whittier is the disparity between housing cost and household income levels. The median priced home in the City of Whittier is estimated to be around \$175,000.

To purchase this home, a family would be required to produce a 10 percent down payment of \$17,500 and carry a mortgage of approximately \$1,600 monthly. The qualifying income needed would be between \$50,000 and \$60,000 annually. Significantly, the annual median family income reported for the City of Whittier in 1980 was \$19,948. In 1988, it is estimated to be \$32,800.

Typically, loan qualification either through traditional lenders or government-sponsored programs is limited to 30 percent or less of gross income as allowable for housing costs. The median income of the City, thus, would allow purchase of a home in the range of \$100,000 or less and still require a down payment of approximately \$10,000 or more.

A sales analysis provided by the Whittier Area Board of Realtors (includes La Mirada and La Habra) showed a total of 83 homes sold for under \$100,000 during the period May through July 1988. This was compared to more than 690 housing units which sold for prices between \$100,000 to \$200,000 and more than 100 units which sold for more than \$300,000 during this same period.

It is noted that the housing units selling for under \$100,000 tend to be older units. While these units are more affordable than the new housing within the City, the units usually are much older and smaller. And, though the family may see a savings in the initial cost of the housing, there often are major repairs needed to maintain or upgrade these homes which may produce unexpected added costs to those already fixed by the initial mortgage on the property.

Land suitable for housing development is very limited in the City of Whittier, making land acquisition a very costly component of development. Additionally, construction costs are also very high. The combination of high land acquisition and construction costs make the

Section 3: Housing Element Background Report (continued)

new construction prohibitively expensive for the average income household within the City of Whittier. The City of Whittier will permit the location of mobilehomes on single-family lots, so long as they comply with the design character of the area. However, land costs are so high that it is not economical to choose this option and no one has done so to date.

There is a sizeable rental housing stock within the City of Whittier, approximately 33,123 units. However, the rental inventory is best suited for small families and, thus, is limiting for larger households residing in the City. There is very little vacant land available and the built-out character of the City and limited high density zoning makes it unlikely that greater numbers of rental housing will be built.

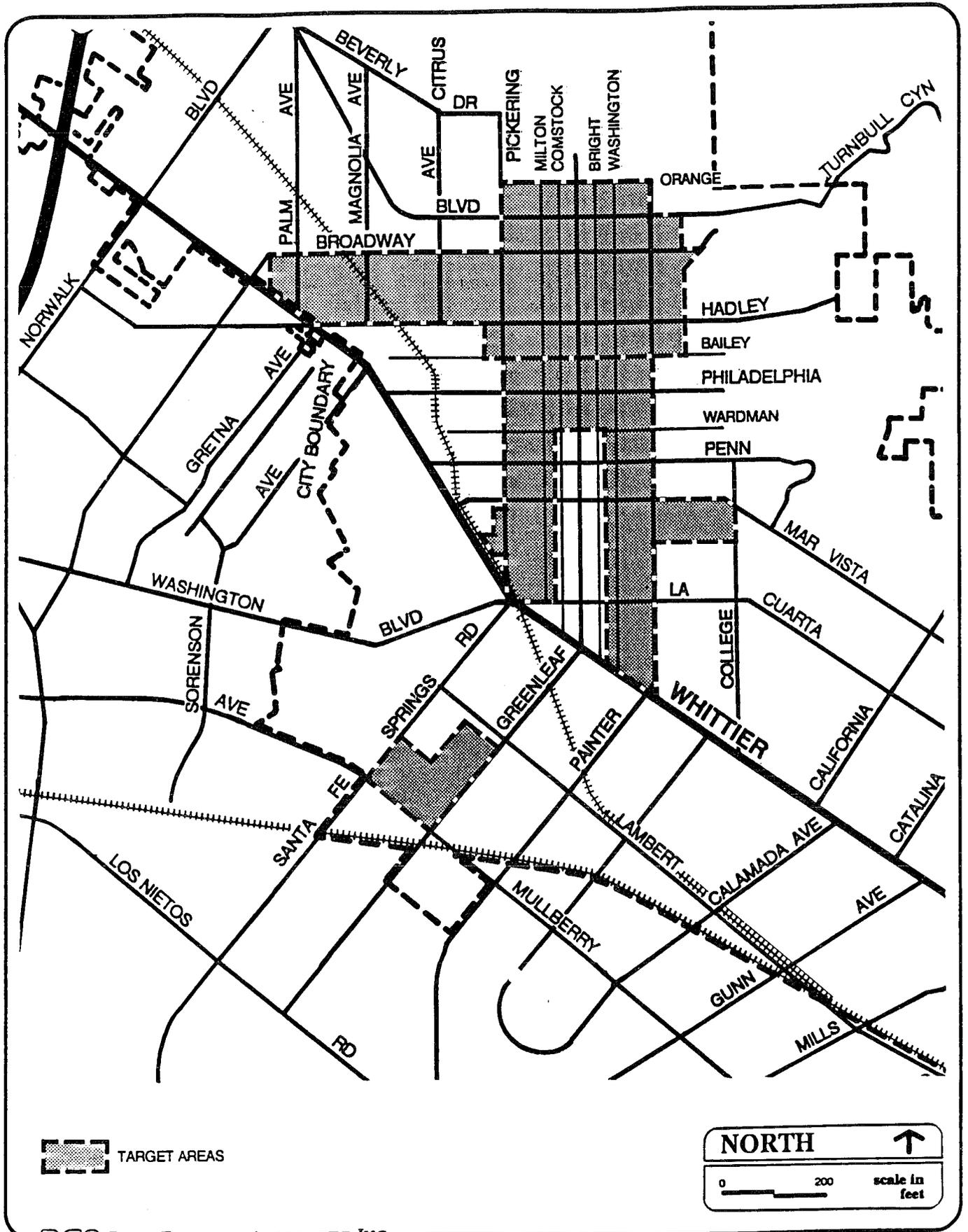
The cost for rental housing must also be explored to determine if there is a rent-to-income constraint for any income level. The Federal guidelines limit housing cost to 30 percent or less of gross income. A family at the very low income level (50 percent of median) would be able to afford maximum monthly rents of \$445. A family at the low income level (80 percent of median) would be able to afford maximum monthly rents of \$730.

According to information provided by the Fair Housing Council, a total of 491 units were recorded as available for rent during the period June 1988 through August 1988. The vast majority of the units, greater than 90 percent, rented for \$475 or more per month. There were only 51 units reported or 10 percent of the total units which were available for rent at less than \$400 per month. Fewer than 37 units, or 8 percent of the total units were available at rents less than \$300 per month. The majority of the units for rent at less than \$400 per month were just rooms, as in a boarding home, or single room units in a complex. Significantly, there were no units larger than a one-bedroom renting at levels affordable to the low- and very low-income households. Alternatively, there are reasonable economic choices for rental housing available to moderate income households and for those generally able to afford market rate housing.

The combined effects of the governmental and market constraints is to place a serious limitation on the provision of housing affordable to residents of the City of Whittier at all income levels. Compounding the problem is the fact that most of the constraints previously discussed are not within the control of the City to address or resolve. And, those constraints which may be within the City's administrative jurisdiction, are often beyond the City's financial ability to resolve.

Land Inventory

The production of housing through new construction as a means of meeting the range of housing needs within the City is greatly circumscribed by the scarcity of vacant land on which to develop. Also affecting the development of vacant land is the general plan and



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EXHIBIT 3-6 REHABILITATION PROGRAM TARGET AREAS

zone designations throughout the City. Much of the City is zoned for low to medium density and, since the current infrastructure will not function at greater capacity, these zone designations will change only when infrastructure deficiencies are corrected.

When all vacant parcels are pooled and collectively analyzed, it appears on the surface that there is vacant land available for development which would significantly assist the City's efforts to address the housing production needs of this community. However, many of these parcels are not available for development because of multiple ownership or poor lot configuration, and it would be unsound to attempt development. Some of the limitations to these parcels may at some time be overcome. However, for the most part many of these parcels will not soon be available and for others, development will never be possible.

Most of the vacant land which remains available in Whittier is in the form of smaller, scattered sites. And, when the lots are larger with some excess land which could be used for development, such lots are generally restricted under current zoning and not available for subdivision. Also, some parcels are landlocked, substandard in size, or for various other reasons not suitable for development.

The hillside areas, much of which is vacant, is environmentally sensitive and development in these areas is difficult and often impossible. When development is allowed in the hillside areas, zoning restrictions are at the lowest density which makes the majority of such areas prohibitively expensive for the development of affordable housing. The Hillside Residential (H-R) Zone in the Whittier Zoning Ordinance requires the preparation of a development plan for hillside areas. It limits development density by the percent of slope and minimizes the required grading to maintain the natural terrain. Other standards for the H-R zone do not make these areas suitable for affordable housing projects.

It is estimated that the hillside areas potentially may develop as many as 300 dwelling units. The cost involved in the hillside development means that these units will only meet a small percentage of the housing production need at the high income level.

A survey of vacant parcels within the City of Whittier was conducted for purposes of identifying those parcels suitable for development, data required for updating the housing element. The survey developed an inventory of approximately 60 acres as realistically available for development. Significantly, all the vacant parcels identified are currently under construction or the application process for development has been initiated. The acreage and estimated number of dwelling units to be derived from the vacant parcels is summarized in Table 3-19.

Section 3: Housing Element Background Report (continued)

TABLE 3-19 POTENTIAL HOUSING PRODUCTION OF VACANT SITES				
General Location	Zoning District	Acreage	Estimated # of Units	Current Status
1. Painter Avenue/Oval Drive	R-L	6.58	60	Complete
2. Murphy Hill Condos	R-H	8.7	126	Complete
3. Worsham Canyon Planned Dev.	R-L (8,200)	13.5	64	Denied
4. Lowell School Site SFD	R-L/R-MH	9.2	70	Under Construction
5. Lowell School Maintenance SFD	R-M (PD)	4.5	35	Final Map Approved
6. Beverly Hills Estates	H-R	<u>17.07</u>	<u>15</u>	Approved
TOTAL		59.55	355	

Source: City of Whittier Planning Department, 1989.

Projections for the City of Whittier are that an additional 1,589 housing units will be needed to meet the community's needs during the effective period of this housing element. In order to produce this number of new dwelling units, approximately 150 acres of vacant or redevelopable land would be required at 10 units per acre and approximately 106 acres if development was permitted at 15 units per acre.

It is obvious that the City's housing production will not approach these numbers with only 42 acres available for development, even should extensive redevelopment to higher densities occur. As summarized above, the parcels are already at some stage in the development process. Further compounding the problem of new housing production is the built-out character of the City of Whittier. The only method by which much land may be generated is through land recycling. It is expected that recycling will be pursued as a means for housing production. However, it is unlikely that large parcels of land will be available since land assembly and lot consolidation, necessary in order to amass large parcels in developed areas, is a lengthy process, as well as laborious and expensive. The City nonetheless encourages recycling of land where feasible and appropriate.

The City of Whittier's guide in the recycling process is the Land Use Element of the General Plan. The Land Use Element estimates a maximum number of dwelling units at 35,661. This is based on the maximum number of dwelling units that can be built within the land use categories, using the allowable densities. This represents an increase to the inventory level which was in use prior to the update of the Land Use Element. The distribution of land uses is summarized in Table 3-20. The potential addition to the housing inventory, based upon the revised figures of the Land Use Element, exceeds/falls short of net housing production needs. The housing supply would, therefore, be sufficient to meet housing production needs using the Land Use Element land supply allocations and residential density designations.

There are several acres of former railroad right-of-way areas which are under private ownership and may be available as a resource for housing development. These areas are vacant but have development limitations in size, shape, configuration, and access, as well as generally being held under multiple ownership, further compounding development potential. If these limitations can be overcome, the property would greatly enhance the housing production capabilities in the City.

TABLE 3-20 WHITTIER DEVELOPMENT CAPACITY			
Land Use Category	Acreage	Theoretical Unit Capacity	Existing * Units
Residential			
Hillside	314.27	628	
Low Density	3,785.81	22,715	19,968
Medium Density	225.27	3,379	2,050
Medium High Density	65.90	1,648	6,740
High Density	184.34	6,452	
Urban Design District	<u>(296.74)</u>	<u>742**</u>	
Total	4,575.65	35,564	28,758
<p>* 1990 U.S. Census ** assumes 10 percent of Urban Design District is developed as residential at 25 du/ac.</p>			

ENERGY CONSERVATION

Section 65583(a)(7) states that a housing element must include the following:

- Analysis of opportunities for energy conservation with respect to new development.

During the course of reviewing proposed residential projects, alternative ways of promoting energy conservation will be considered as part of the EIR process. Feasible opportunities for energy conservation in new developments will thereafter be presented to the Planning Commission and City Council. Energy conservation opportunities are also evaluated and achieved in the City's housing rehabilitation programs. Costs associated with insulation and weatherization are eligible for funding under the City's housing rehabilitation program. Moreover, the City has adopted the 1988 version of the Uniform Building Code which includes standards to promote energy conservation in new development.

SECTION 4: TRANSPORTATION ELEMENT BACKGROUND REPORT

INTRODUCTION

This report describes the existing transportation system and traffic conditions in the City of Whittier. The existing roadway system is first discussed, followed by a summary of recent traffic volume counts and existing levels of service on arterial links and at key intersections. The highway circulation plan contained in the City's current General Plan Circulation Element is then presented, followed by discussions on transit routes and the bikeway system.

EXISTING ROADWAYS

The existing roadway system in the City of Whittier is illustrated in Exhibit 4-1. The number of midblock travel lanes on individual roadway segments is represented on the diagram by the band width of each arterial facility. As the diagram illustrates, the arterial system is composed of several grid systems which merge at the intersection of Whittier Boulevard, Pickering Avenue, Washington Boulevard and Santa Fe Springs Road. This is the most complex intersection in the City due to the convergence of four arterials and a Union Pacific Railroad bridge that passes over the intersection's northeast corner.

Both the Union Pacific and Southern Pacific Railroads pass through the City. Grade separated crossings of the local street system occur at Norwalk Boulevard and at the five-way intersection noted above.

Regional access to the City is provided by the San Gabriel River Freeway (I-605) which is the major north-south route for inter-regional traffic. The freeway has four travel lanes in each direction and interchanges at Whittier, Washington, and Beverly Boulevards. The I-605 Freeway also provides direct links with major east-west freeways in the region. Other freeways near Whittier include the Santa Ana Freeway (I-5) on the south, and the Pomona (SR-60) and San Bernardino (I-10) Freeways on the north.

The existing roadway system serving the City is comprised of the following streets:

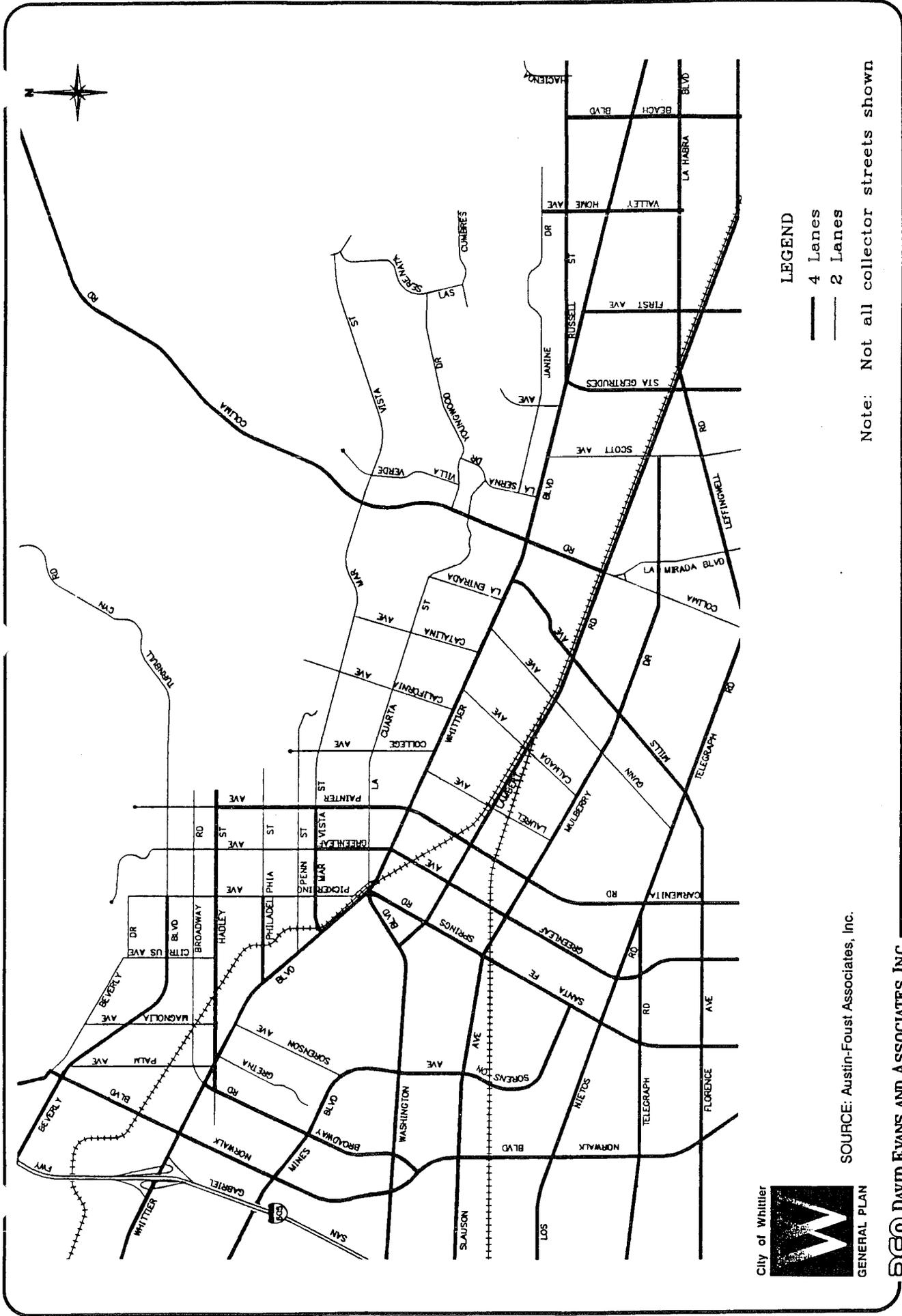
Arterial Streets: East-West Routes

- *Beverly Boulevard* is a four-lane minor arterial west of Pickering Avenue and becomes a two-lane major arterial east of Pickering Avenue to Painter Avenue. Beverly Boulevard then becomes Turnbull Canyon Road which provides access over the Puente Hills to Hacienda Heights and the City of Industry.

- *Lambert Road* is a four-lane minor arterial beginning at Washington Boulevard and running approximately parallel to the railroad tracks on the southeast section of the City. It extends east into the City of La Habra and continues further as a six-lane major arterial into Orange County.
- *Leffingwell Road* is a four-lane minor arterial west of Lambert Road, and becomes a secondary street east of Lambert Road.
- *Mines Boulevard* is a four-lane minor arterial extending from Sorenson Avenue, west to the City of Pico Rivera.
- *Slauson Avenue/Mulberry Drive* is a four-lane minor arterial and ends at Scott Avenue.
- *Washington Boulevard* has four lanes along its length and runs from Los Angeles and ending at its intersection with Whittier Boulevard and Santa Fe Springs Road in Whittier.
- *Whittier Boulevard* is a four-lane state highway (SR-72) that begins in North Orange County and terminates near downtown Los Angeles.

Minor Arterials: North-South Routes

- *Colima Road (County Highway N-8)* is a four-lane minor arterial in the City and crosses over the Puente Hills to Rowland Heights in the north. South of Whittier, Colima Road continues as a secondary street.
- *La Mirada Boulevard* is a two-lane extension of County Highway N-8, south of Lambert Road.
- *Norwalk Boulevard* is a four-lane minor arterial beginning at Beverly Boulevard and running south until Slauson Avenue, where it continues southward as a secondary street.
- *Painter Avenue* is a four-lane minor arterial south of Hadley Street and becomes a two-lane minor arterial from Hadley Street north to Beverly Boulevard. Its northerly extension from Beverly Boulevard serves as a collector street.
- *Santa Fe Springs Road* has four lanes along its entire length where it ends at its intersection with Whittier and Washington Boulevards.



**EXHIBIT 4-1
EXISTING ROADWAY SYSTEM**

SOURCE: Austin-Foust Associates, Inc.

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- *Sorenson Avenue* is a four-lane minor arterial running from Mines Boulevard south to Santa Fe Springs Road.
- *Workman Mill Road* is a four-lane minor arterial beginning at Beverly Boulevard and extends north past the Pomona Freeway (I-60).

Secondary Streets: East-West Routes

- *Hadley Street* is a four-lane secondary street from Broadway to Painter Avenue, then it becomes a two-lane local street until its easterly terminus.
- *Leffingwell Road* is a four-lane secondary street east of Lambert Road until Valley Home Avenue.
- *Mar Vista Street* is a four-lane secondary street from Whittier Boulevard to Painter Avenue. It becomes a two-lane collector street east of Painter Avenue.
- *Philadelphia Street* is a four-lane secondary street from Whittier Boulevard to Pickering Street. Then, it narrows into two lanes east of Pickering and into Whittier College.
- *Russell Street* is a secondary street beginning at Whittier Boulevard, near Santa Gertrudes Avenue, and extending east into the City of La Habra.

Secondary Streets: North-South Routes

- *Colima Road* is a two-lane secondary street south of Lambert Road and the City limits.
- *College Avenue* is a two-lane secondary street from Whittier Boulevard to Penn Street with a terminus north of Penn Street.
- *Broadway* is a four-lane secondary street from Norwalk Boulevard and extends northeast to Whittier Boulevard. From here, it bends east as a two-lane collector street until Painter Avenue.
- *First Avenue* is a four-lane secondary street, extending south from Whittier Boulevard.
- *Greenleaf Avenue* is a four-lane secondary street south of Mar Vista Street and narrows to two lanes north of Mar Vista Street.

- *Gunn Avenue* is a two-lane secondary street from Telegraph Road to Whittier Boulevard.
- *Laurel Avenue* is a two-lane secondary street from Mulberry Drive to Whittier Boulevard.
- *Magnolia Avenue* is a two-lane secondary street from Whittier Boulevard to Beverly Boulevard.
- *Mills Avenue* is a four-lane secondary street from Whittier Boulevard and extending south to Telegraph Road where it becomes Florence Avenue.
- *Pickering Avenue* is a two-lane secondary street from Whittier Boulevard to Beverly Drive.
- *Santa Gertrudes Avenue* is a four-lane secondary street beginning at Whittier Boulevard and extending south in the City of La Mirada.
- *Scott Avenue* is a two-lane secondary street from Whittier Boulevard and extending south to Lemon Drive.
- *Sorenson Avenue* is a two-lane secondary street from Mines Boulevard and to Hadley Street where it extends north as Magnolia Avenue.

The remaining roadways in the City are collector and local streets, providing one travel lane in each direction.

ROADWAY IMPROVEMENTS

Plans for intersection and street improvements at the following locations have been recently completed or are underway:

Mar Vista Street - Mar Vista Street currently provides only two travel lanes from Whittier Boulevard to Whittier Avenue. This will be widened to four lanes.

Whittier Boulevard and Mar Vista Street - A new traffic signal will be installed at Mar Vista Avenue and Whittier Boulevard.

Painter Avenue at Mar Vista Street - At the intersection of Painter Avenue and Mar Vista Street, the existing signal phasing will be modified to provide protected left turns in the northbound and southbound directions.

Painter Avenue at Lambert Road - At this intersection, the existing signal phasing will also be modified to provide protected left turns in the northbound and southbound directions.

Colima Road at Whittier Boulevard - Colima Road will be widened at its southbound approach and a second eastbound left turn lane will be provided.

CONGESTION MANAGEMENT PLAN

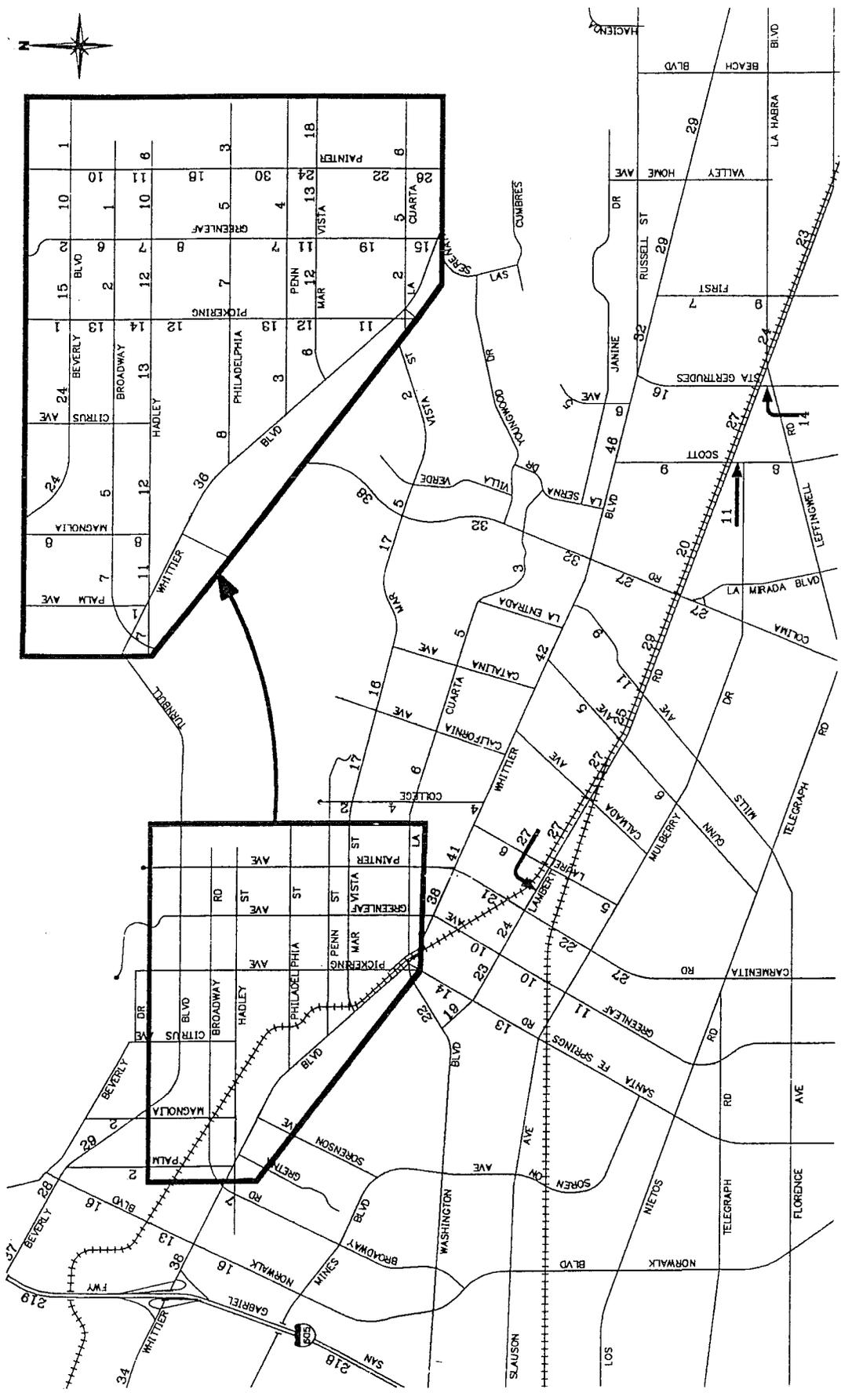
Recent state legislation requires the preparation of a Congestion Management Plan (CMP) for Los Angeles County. The CMP is intended to make cities responsible for the regional traffic impacts of their land use decisions. Compliance with the standards outlined in the CMP will allow cities to continue receiving gas tax monies from the State. The CMP has been completed by the Los Angeles County Transportation Commission (LACTC). LACTC has included Whittier Boulevard (State Highway 72) as part of the county's proposed CMP Roadway Network. Inclusion of this roadway in the CMP network will keep levels of service at E or better on this roadway, along with other standards that have to be met. No other streets in the City of Whittier are included in the CMP system.

CURRENT TRAFFIC VOLUMES AND LEVELS OF SERVICE

Average daily traffic (ADT) volumes reflect the traffic volume on a particular segment of roadway during a 24-hour period on the City's circulation system and are listed in Table 4-1 and shown in Exhibit 4-2. These volumes are based on recent counts taken by the City of Whittier. Existing volumes on the San Gabriel Freeway (I-605) were taken from counts performed by the California State Department of Transportation (Caltrans) in 1990. The heaviest volumes on the arterial system occur along Whittier Boulevard, where volumes range from 29,000 vehicles per day (vpd) east of First Street to 46,000 vpd between Santa Gertrudes and Scott Avenues.

Section 4: Transportation Element Background Report continued

TABLE 4-1 AVERAGE DAILY TRAFFIC AND LEVELS OF SERVICE					
Road Segment	No. of Lanes/Type*	Capacity	Existing ADT	V/C	LOS
Beverly Boulevard					
west of Pioneer	4/M	40000	37000	0.93	E
west of Norwalk	4/M	40000	28000	0.70	B
west of Magnolia	4/M	40000	29000	0.73	C
east of Magnolia	4/M	40000	24000	0.60	A
east of Citrus	4/M	40000	24000	0.60	A
east of Pickering	2/M	20000	15000	0.75	C
east of Greenleaf	2/M	20000	10000	0.60	A
east of Painter	2/L	10000	1000	0.10	A
Broadway Avenue					
south of Whittier Blvd	4/S	30000	7000	0.23	A
west of Magnolia	2/C	15000	7000	0.47	A
west of Citrus	2/C	15000	5000	0.33	A
west of Greenleaf	2/C	15000	2000	0.13	A
west of Painter	2/C	15000	1000	0.07	A
Hadley Street					
west of Whittier Blvd	4/S	30000	7000	0.23	A
east of Whittier Blvd	4/S	30000	11000	0.37	A
east of Magnolia	4/S	30000	12000	0.40	A
west of Pickering	4/S	30000	13000	0.43	A
west of Greenleaf	4/S	30000	12000	0.40	A
west of Painter	4/S	30000	10000	0.33	A
east of Painter	4/S	30000	6000	0.20	A
Philadelphia Avenue					
east of Whittier Blvd	4/S	30000	8000	0.27	A
east of Pickering	2/S	15000	7000	0.47	A
east of Greenleaf	2/S	15000	5000	0.33	A
east of Painter	2/L	10000	3000	0.30	A
Penn Street					
east of Whittier Blvd	2/C	15000	3000	0.20	A
west of Painter	2/C	15000	4000	0.27	A



Source: City of Whittier Traffic counts, 1989-1991, and Caltrans counts, 1990.
 NOTE: Numbers are in thousands.



SOURCE: Austin-Foust Associates, Inc.

DAVID EVANS AND ASSOCIATES, INC.

EXHIBIT 4-2
EXISTING ADT VOLUMES (000's)

Section 4: Transportation Element Background Report continued

TABLE 4-1 AVERAGE DAILY TRAFFIC AND LEVELS OF SERVICE					
Road Segment	No. of Lanes/Type*	Capacity	Existing ADT	V/C	LOS
Mar Vista Avenue					
east of Whittier Blvd	4/S	30000	6000	0.20	A
east of Pickering	4/S	30000	12000	0.40	A
east of Greenleaf	4/S	30000	13000	0.43	A
east of Painter	2/C	15000	18000	1.20	F
east of College	2/C	15000	17000	1.13	F
east of California	2/C	15000	16000	1.07	F
east of Catalina	2/C	15000	17000	1.13	F
east of Colima	2/C	15000	5000	0.33	A
east of Villa Verde	2/C	15000	2000	0.13	A
Washington Boulevard					
west of Whittier Blvd	4/M	40000	22000	0.55	A
La Cuarta Street					
east of Whittier Blvd	2/C	15000	2000	0.13	A
east of Painter	2/C	15000	6000	0.40	A
west of Painter	2/C	15000	5000	0.33	A
east of College	2/C	15000	6000	0.40	A
east of Catalina	2/C	15000	5000	0.33	A
east of La Entrada	2/C	15000	3000	0.22	A
Whittier Boulevard					
west of SR-605	4/M	40000	34000	0.85	D
east of SR-605	4/M	40000	38000	0.95	E
east of Norwalk	4/M	40000	36000	0.90	D
east of Five Points	4/M	40000	38000	0.95	E
east of Painter	4/M	40000	41000	1.03	F
east of Mills	4/M	40000	42000	1.05	F
east of Colima	4/M	40000	46000	1.15	F
east of Santa Gertrude	4/M	40000	32000	0.80	C
west of Valley Home	4/M	40000	29000	0.73	C
east of Valley Home	4/M	40000	29000	0.73	C

Section 4: Transportation Element Background Report continued

TABLE 4-1 AVERAGE DAILY TRAFFIC AND LEVELS OF SERVICE					
Road Segment	No. of Lanes/Type*	Capacity	Existing ADT	V/C	LOS
Lambert Road					
east of Washington	4/S	30000	19000	0.63	B
east of Santa Fe Springs	4/S	30000	23000	0.77	C
east of Greenleaf	4/S	30000	24000	0.80	C
east of Painter	4/S	30000	27000	0.90	D
east of Laurel	4/S	30000	27000	0.90	D
east of Calmada	4/S	30000	27000	0.90	D
east of Gunn	4/S	30000	25000	0.83	D
east of Mills	4/S	30000	29000	0.97	E
east of Colima	4/S	30000	20000	0.67	B
east of Scott	4/M	40000	27000	0.68	B
east of Santa Gertrude	4/M	40000	24000	0.60	A
east of First	4/M	40000	23000	0.58	A
Norwalk Boulevard					
south of Whittier Blvd	4/M	40000	16000	0.40	A
north of Whittier Blvd	4/M	40000	13000	0.33	A
south of Beverly Blvd	4/M	40000	16000	0.40	A
Palm Avenue					
north of Whittier Blvd	2/C	15000	1000	0.07	A
south of Beverly Blvd	2/C	15000	2000	0.13	A
Magnolia Avenue					
north of Hadley	2/S	15000	8000	0.53	A
north of Broadway	2/S	15000	8000	0.53	A
north of Beverly	2/L	15000	2000	0.20	A
Santa Fe Springs Road					
north of Mulberry	4/M	40000	13000	0.33	A
north of Lambert	4/M	40000	14000	0.35	A
Pickering Road					
north of Whittier Blvd	2/S	15000	11000	0.73	C
north of Mar Vista	2/S	15000	12000	0.80	C
north of Penn	2/S	15000	13000	0.87	D
north of Philadelphia	2/S	15000	12000	0.80	C
north of Hadley	2/S	15000	14000	0.93	E
north of Broadway	2/S	15000	13000	0.87	D
north of Beverly	2/C	15000	1000	0.07	A

Section 4: Transportation Element Background Report continued

TABLE 4-1 AVERAGE DAILY TRAFFIC AND LEVELS OF SERVICE					
Road Segment	No. of Lanes/Type*	Capacity	Existing ADT	V/C	LOS
Greenleaf Avenue					
south of Mulberry	4/S	30000	11000	0.37	A
north of Mulberry	4/S	30000	10000	0.33	A
north of Lambert	4/S	30000	10000	0.33	A
north of Whittier Blvd	4/S	30000	15000	0.50	A
north of La Cuarta	4/S	30000	19000	0.63	B
north of Mar Vista	2/S	15000	11000	0.73	C
north of Penn	2/S	15000	7000	0.47	A
north of Philadelphia	2/S	15000	8000	0.53	A
north of Hadley	2/S	15000	7000	0.47	A
north of Broadway	2/S	15000	6000	0.40	A
north of Beverly	2/S	15000	2000	0.13	A
Painter Avenue					
south of Mulberry	4/M	40000	27000	0.68	B
north of Mulberry	4/M	40000	22000	0.55	A
north of Lambert	4/M	40000	21000	0.53	A
north of Whittier Blvd	4/M	40000	26000	0.65	B
north of La Cuarta	4/M	40000	22000	0.55	A
north of Mar Vista	4/M	40000	24000	0.60	A
north of Penn	4/M	40000	30000	0.75	C
north of Philadelphia	4/M	40000	18000	0.45	A
north of Hadley	2/M	20000	11000	0.55	A
north of Broadway	2/M	20000	10000	0.50	A
Laurel Street					
south of Lambert	2/S	15000	5000	0.33	A
south of Whittier Blvd	2/S	15000	6000	0.40	A
College Road					
north of Whittier Blvd	2/S	15000	4000	0.27	A
north of La Cuarta	2/S	15000	4000	0.27	A
north of Mar Vista	2/S	15000	2000	0.13	A
Gunn Avenue					
south of Lambert	2/S	15000	6000	0.40	A
south of Whittier Blvd	2/S	15000	5000	0.33	A
Mills Avenue					
north of Lambert	4/S	30000	11000	0.37	A
south of Whittier Blvd	4/S	30000	9000	0.30	A

Section 4: Transportation Element Background Report continued

TABLE 4-1 AVERAGE DAILY TRAFFIC AND LEVELS OF SERVICE					
Road Segment	No. of Lanes/Type*	Capacity	Existing ADT	V/C	LOS
Colima Road					
south of Lambert	4/M	27000	27000	0.68	B
south of Whittier Blvd	4/M	27000	27000	0.68	B
north of Whittier Blvd	4/M	32000	32000	0.80	C
south of Mar Vista	4/M	32000	32000	0.80	C
north of Mar Vista	4/M	38000	38000	0.95	E
Scott Avenue					
south of Mulberry	2/S	15000	8000	0.53	A
south of Lambert	2/S	15000	11000	0.73	C
south of Whittier Blvd	2/S	15000	9000	0.60	A
Santa Gertrudes Avenue					
north of Leffingwell	4/S	30000	14000	0.47	A
south of Whittier Blvd	4/S	30000	16000	0.53	A
north of Whittier Blvd	2/C	15000	6000	0.40	A
north of Janine	2/L	10000	5000	0.50	A
First Avenue					
north of Leffingwell	4/S	30000	9000	0.30	A
south of Whittier Blvd	4/S	30000	7000	0.23	A
ADT - average daily traffic V/C - volume to capacity ratio LOS - Level of Service Source: Austin-Foust Associates, 1991.			*TYPE 4M = 4 Lane Major/Minor 2M = 2 Lane Major/Minor 4S = 4 Lane Secondary 2S - 2 Lane Secondary 2C = 2 Lane Collector 2L = 2 Lane Local		

Levels of Service (LOS) were estimated based on volume-to-capacity (V/C) ratios as provided in Table 4-2.

TABLE 4-2 ROAD CAPACITY VALUES (MAXIMUM ADT)					
Type of Roadway	LOS A	LOS B	LOS C	LOS D	LOS E
4-lane Major-Augmented	27,000	31,500	36,000	40,500	45,000
4-lane Major	24,000	28,000	32,000	36,000	40,000
2-lane Major-Augmented	15,000	17,500	20,000	22,500	25,000
2-lane Major	12,000	14,000	16,000	18,000	20,000

Section 4: Transportation Element Background Report continued

TABLE 4-2 ROAD CAPACITY VALUES (MAXIMUM ADT)					
Type of Roadway	LOS A	LOS B	LOS C	LOS D	LOS E
4-lane Secondary-Augmented	21,000	24,500	28,000	31,500	35,000
4-lane Secondary	18,000	21,000	24,000	27,000	30,000
2-lane Secondary-Augmented	12,000	14,000	16,000	18,000	20,000
2-lane Secondary	9,000	10,500	12,000	13,500	15,000
2-lane Collector	9,000	10,500	12,000	13,500	15,000
2-lane Local	6,000	7,000	8,000	9,000	10,000
Note: Augmented roadways contain additional intersection lanes and, therefore, have higher capacities.					
Source: Austin-Foust Associates, Inc., 1991.					

Existing AM and PM peak hour turn movement volumes for eleven major intersections throughout the City were collected by Traffic Data Services (TDS) in May 1991. Counts were collected from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. The data presented here represents the maximum one-hour total volume within the two-hour peak periods.

Existing intersection levels of service are calculated using the peak hour counts in combination with the geometric lane configuration of each intersection location. The technique used to assess the operation of an intersection is known as intersection capacity utilization (ICU). A level of service (LOS) scale is used to evaluate intersection performance based on ICU values. The levels of service range from "A" to "F", with LOS "A" representing free flow conditions and LOS "F" representing severe traffic congestion. A detailed description of traffic flow qualities characteristic of the different levels of service and corresponding ICU ranges is summarized in Table 4-3 and illustrated in Exhibit 4-3. Every jurisdiction establishes its own criteria for acceptable congestion levels, and a value of 0.85 (mid-range) is typically used as the maximum acceptable ICU value for an urban community in Los Angeles County.

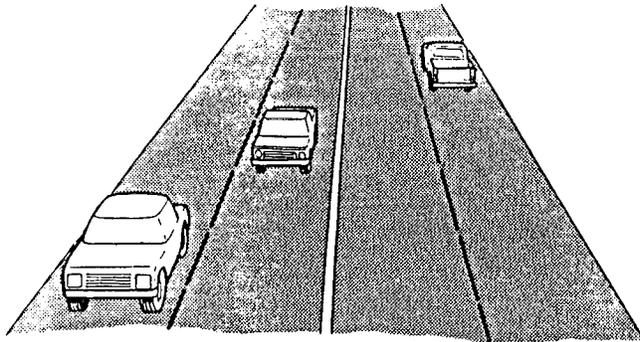
TABLE 4-3 PEAK HOUR LEVEL OF SERVICE DESCRIPTIONS		
Level of Service	Traffic Flow Quality	ICU Value
A	Low volumes; high speeds; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.	.00 - .60

TABLE 4-3 PEAK HOUR LEVEL OF SERVICE DESCRIPTIONS		
Level of Service	Traffic Flow Quality	ICU Value
B	Operating speeds beginning to be affected by other traffic; between one and 10 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	.61 - .70
C	Operating speeds and maneuverability closely controlled by other traffic; between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods; recommended ideal design standards.	.71 - .80
D	Tolerable operating speeds; 31 to 70 percent of the signal cycle have one or more vehicles which wait through more than one signal cycle during peak traffic periods; often used as design standard in urban areas.	.81 - .90
E	Capacity; the maximum traffic volume an intersection can accommodate; restricted speeds; 71 to 100 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	.91 - 1.00
F	Long queues of traffic; unstable flow; stoppages of long duration; traffic volume and traffic speed can drop to zero; traffic volume will be less than the volume which occurs at Level of Service "E".	Above 1.00

Source: Highway Capacity Manual, Highway Research Board Special Report 87, National Academy of Sciences, Washington D.C., 1965, Page 320.

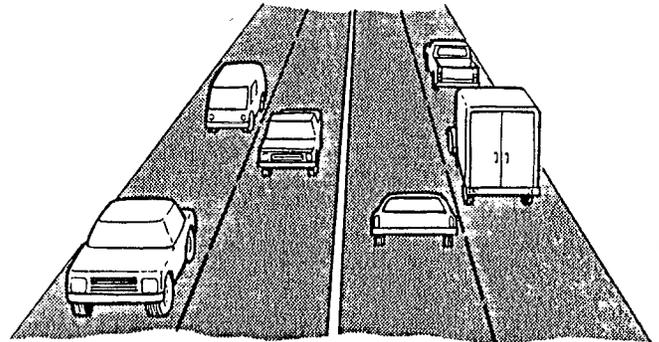
The study intersections are shown in Exhibit 4-4 and the existing ICU values are listed in Table 4-4 with the date on which each intersection count was performed. These are based on the existing lane configurations illustrated in Exhibits 4-5 and 4-6 (the latter shows the configuration of the intersection of Whittier Boulevard, Pickering Avenue, Washington Boulevard and Santa Fe Springs Road.) As the summaries indicate, a number of intersections show ICU values greater than 0.85, indicating that on the day of the count, the maximum acceptable ICU value was exceeded.

The majority of the study intersections are operating at LOS D or worse. The intersections of Mar Vista Street/Colima Road and Whittier Boulevard/Norwalk Boulevard are operating at LOS F during the morning peak hours. Colima Road/Lambert Road intersection is operating at LOS F during the afternoon peak hours. These streets carry traffic from Whittier, as well as neighboring communities.



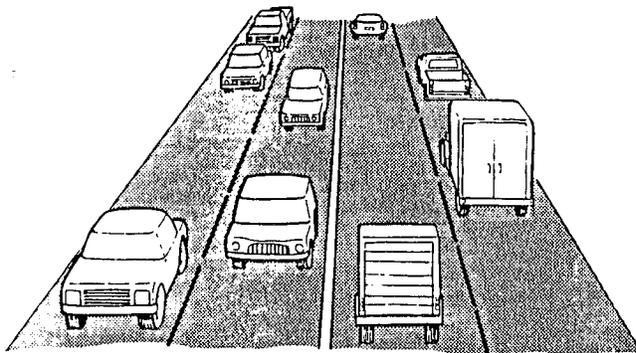
Level of Service A

Free flow in which there is little or no restriction on speed or maneuverability.



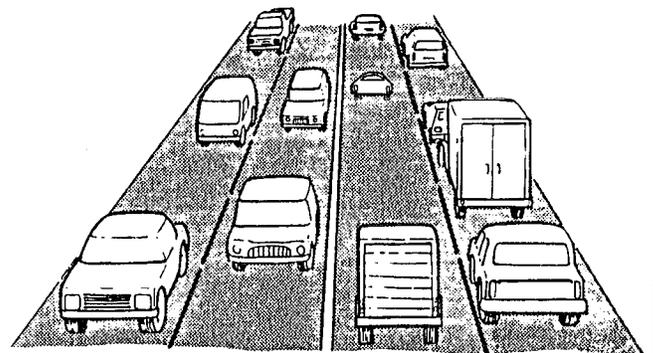
Level of Service B

Stable flow though operating speed is beginning to be restricted by other traffic.



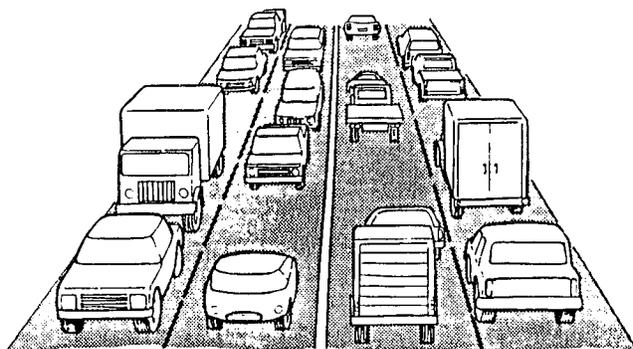
Level of Service C

Stable flow though drivers are becoming restricted in their freedom to select speed, change lanes or pass.



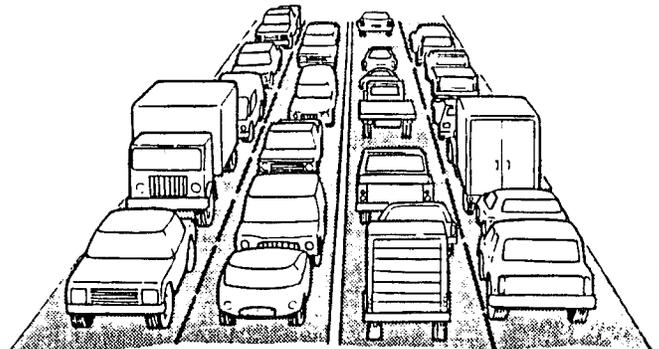
Level of Service D

Tolerable average operating speeds are maintained but are subject to considerable sudden variation.



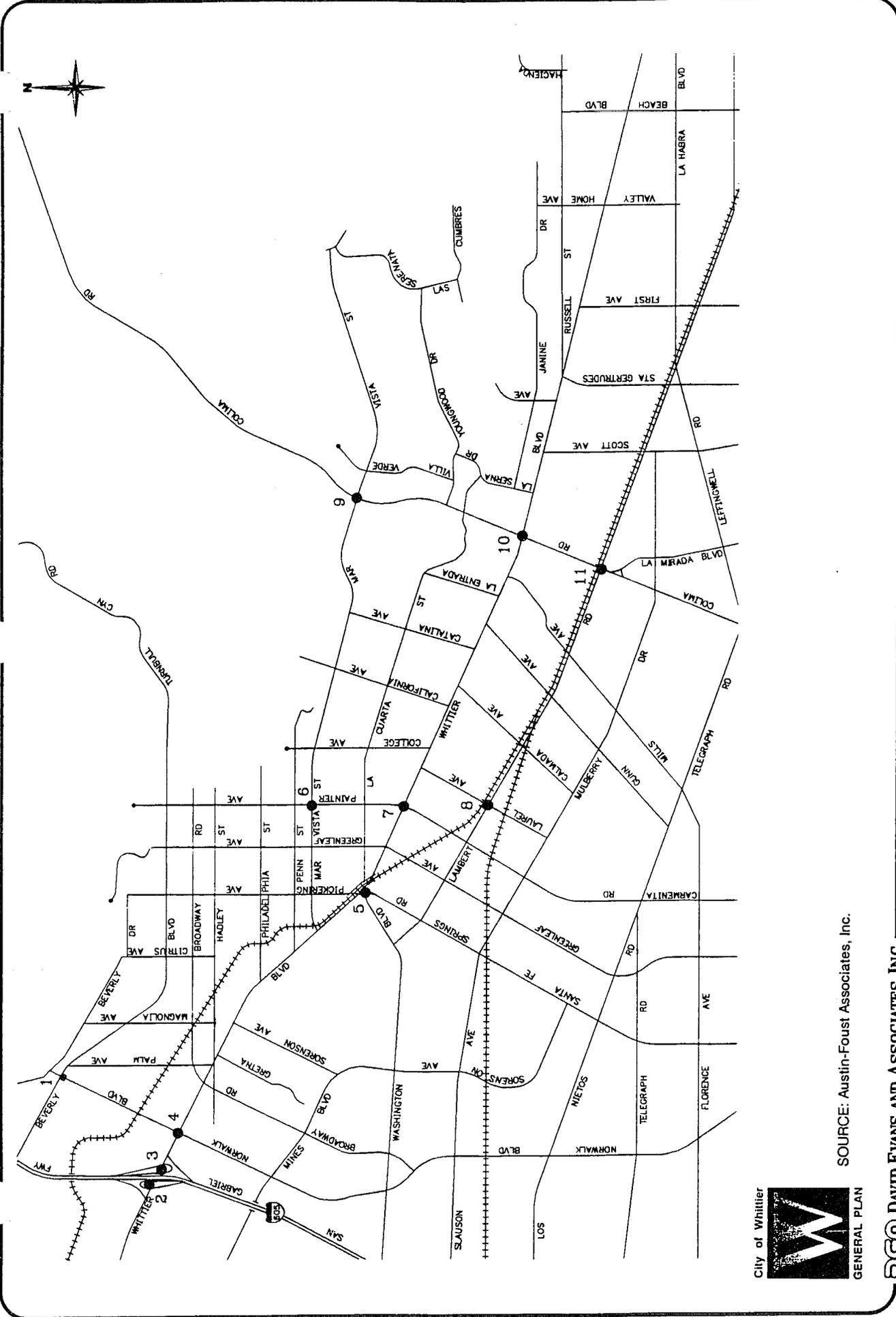
Level of Service E

Speeds and flow rates fluctuate and there is little independence on speed selection or ability to maneuver.



Level of Service F

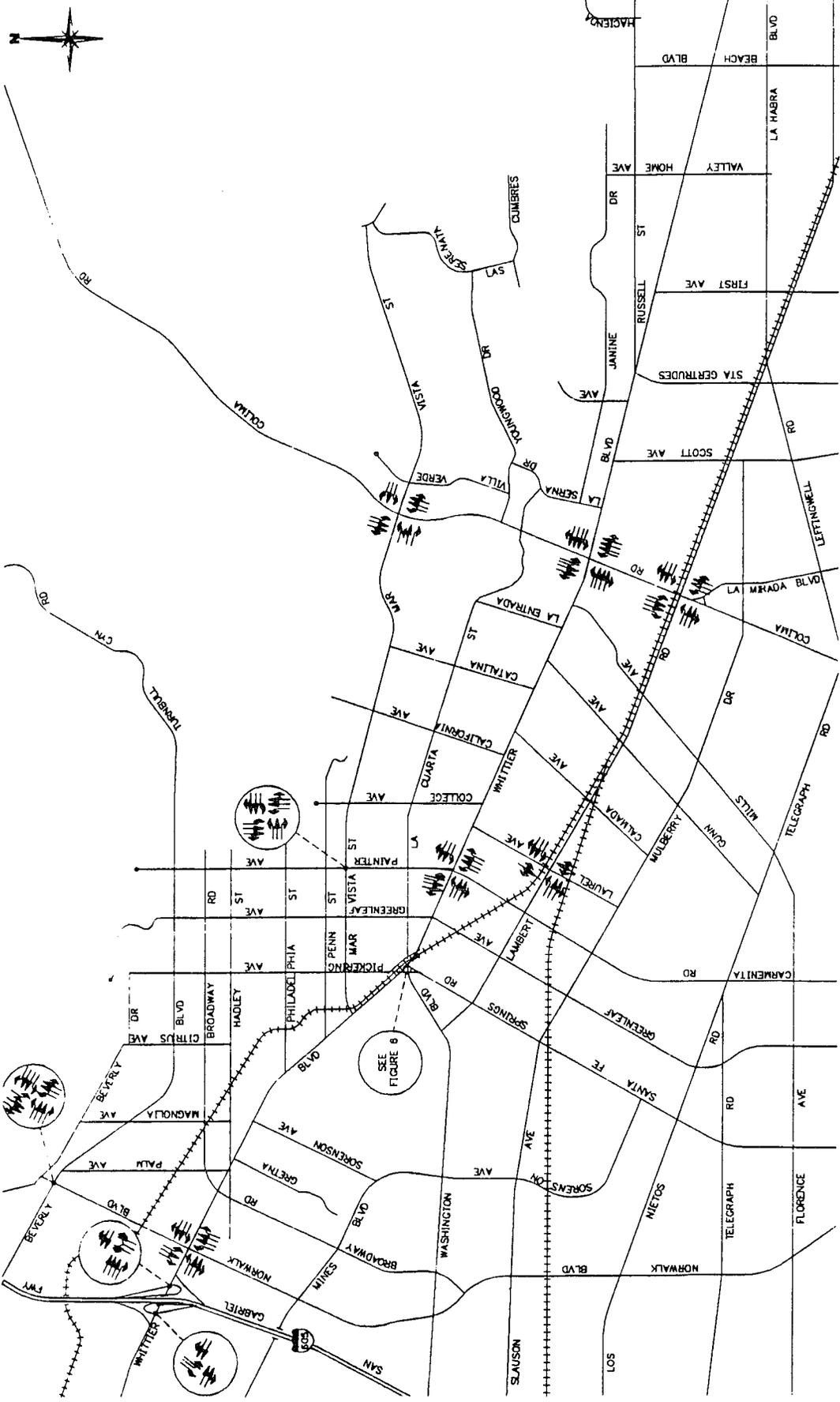
Speeds and flow rates are below those attained in Level of Service E and may, for short time periods, drop to zero.



SOURCE: Austin-Foust Associates, Inc.

DAVID EVANS AND ASSOCIATES, INC.

EXHIBIT 4-4
INTERSECTION LOCATION MAP



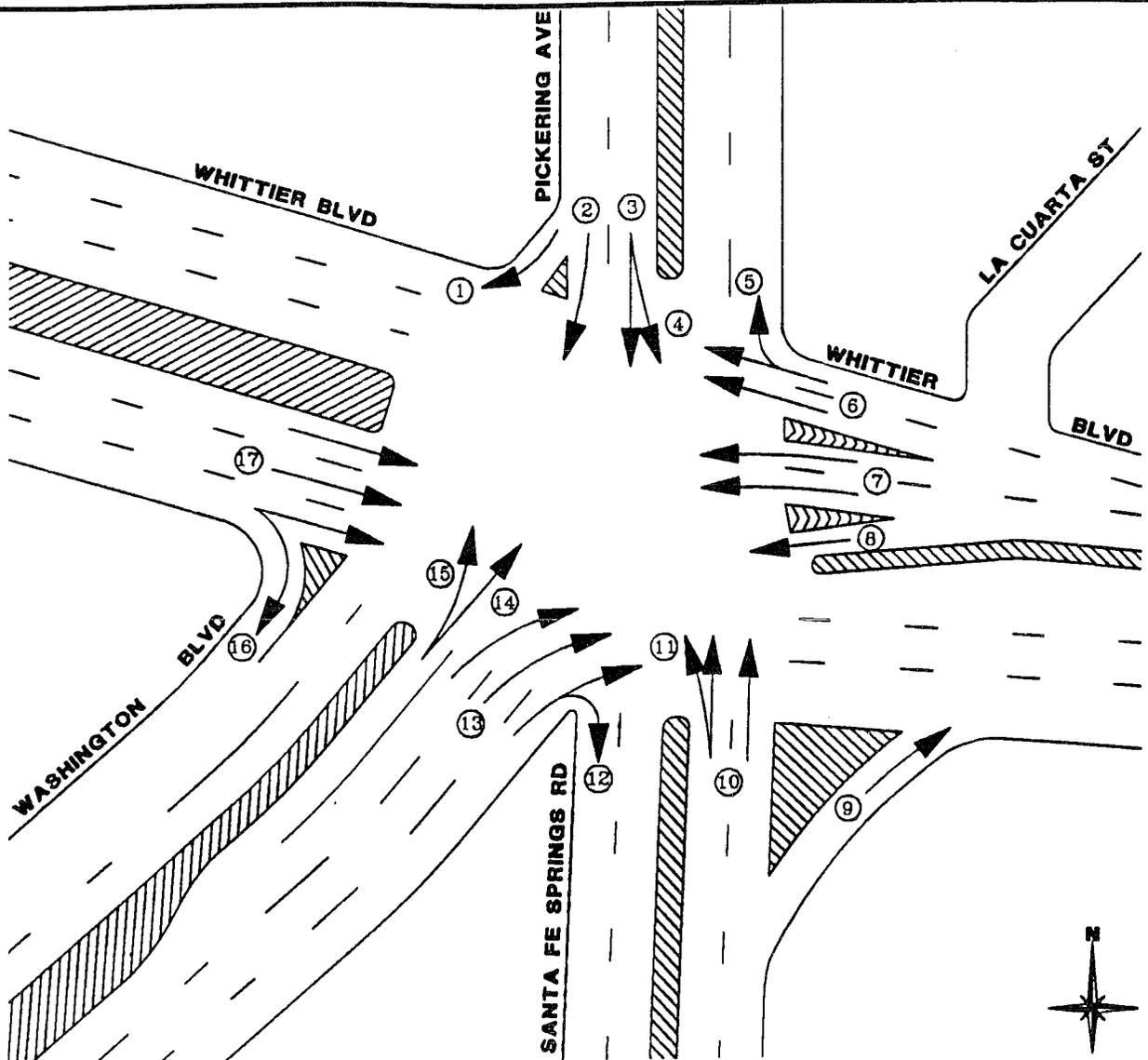
 Lane Number and Direction

SOURCE: Austin-Foust Associates, Inc.



DEW DAVID EVANS AND ASSOCIATES, INC.

**EXHIBIT 4-5
EXISTING LANE CONFIGURATIONS**



- Notes: 1) Drawing not to scale.
 2) This drawing illustrates the following:

Movement	Description
1	Pickering to Whittier
2	Pickering to Washington
3	Pickering to Santa Fe Springs
4	Pickering to Whittier
5	Whittier to Pickering
6	Whittier thru.
7	Whittier to Washington
8	Whittier to Santa Fe Springs
9	Santa Fe Springs to Whittier
10	Santa Fe Springs to Pickering
11	Santa Fe Springs to Washington or Whittier
12	Washington to Santa Fe Springs
13	Washington to Whittier
14	Washington to Pickering
15	Washington to Whittier
16	Whittier to Washington
17	Whittier thru or to Santa Fe Springs

SOURCE: Austin-Foust Associates, Inc.

DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



EXHIBIT 4-6
EXISTING LANE CONFIGURATION
FOR "5 POINTS" INTERSECTION

The roadways in Whittier's circulation system is comprised of four types: arterials, secondary streets, collector streets and local streets.

Arterials are streets and highways designed to move large volumes of traffic between freeway systems and between the freeway and local circulation system. Intersections along arterials are at grade and usually signalized. In many cases, access from private property and collector streets is limited, as is on-street parking. When the arterial roadway is divided, median strips wide enough for left-turn pockets are provided along with extensive landscaping of the median to reduce headlight glare and to increase the overall aesthetic impact of the street. Major and minor arterials in Whittier generally have the following standards:

Right-of-way width	100 - 110 feet
Curb-to-curb width	84 feet
Number of travel lanes	4 - 6
Number of parking lanes	0 - 2
Average daily traffic	10,000 - 40,000 vehicles per day

Secondary streets and highways are located and designed to collect and distribute traffic from major highways and other arterials to traffic destinations, such as schools, shopping centers, and employment centers. Secondary streets are similar to minor arterials since they both have intersections at grade, use traffic signals and restrict parking where necessary. The geometrics of secondary streets are generally as follows:

Right-of-way width	80 - 88 feet
Curb-to-curb width	64 feet
Number of travel lanes	4
Number of parking lanes	0 - 2
Average daily traffic	5,000 - 10,000 vehicles per day

Collector streets distribute traffic from higher classified arterial streets to local access streets and to adjacent properties. Collector streets generally follow these standards:

Right-of-way width	60 - 66 feet
Curb-to-curb width	40 feet
Number of travel lanes	2
Number of parking lanes	0
Average daily traffic	2,500 - 5,000 vehicles per day

Local streets are intended to be low-speed, low-volume streets that provide access to individual properties in the City. Since these streets are not intended to handle through traffic, they are often designed as loop or cul-de-sac streets and discourage traffic other

those to and from residential lots. Due to the large number of local streets in the City, these are not shown in the circulation plan. They are generally designed according to the following standards:

Right-of-way width	60 feet
Curb-to-curb width	40 feet
Number of travel lanes	2
Number of parking lanes	0
Average daily traffic	variable (less than 2,500 vehicles per day)

PUBLIC TRANSIT

An existing network of public bus routes providing access to employment centers, shopping and recreational areas within the City is shown in Exhibit 4-8. Service is provided by both the Southern California Rapid Transit District (SCR TD) and the Whittier Transit. SCR TD routes 104, 270, 275, 470 and 475 traverse the entire length of the City of Whittier. Routes 270, 470 and 471 provide access out of the City to the north, Route 104 provides service to the west and Route 275 provides service with the cities of Norwalk, La Mirada and areas further south.

The Whittier Transit is the City's fixed-route bus system. Its Sunrise Route serves the southern part of the City including the Whittier Quad Shopping Center, Whittwood Mall and various parks and recreation centers. Also, along the Sunrise Route are the public library and the senior center. The Sunset Route passes through the northern parts of the City. It serves the Whittier Quad Shopping Center, Whittwood Mall, Michigan Park, and the Whittier Hospital Medical Center. Exhibit 4-9 shows the Whittier Transit routes.

BIKEWAYS AND BIKEWAY PLAN

The existing network of bicycle routes in the City of Whittier are shown in Exhibit 4-10. The existing bikeways consist of the San Gabriel River Class 1 bike trail and Class 2 bike lanes along parts of Broadway Road, Norwalk Boulevard, Milton Avenue, Painter Avenue, Greenleaf Avenue, Colima Road, La Cuarta Street, and Janine Drive. The Environmental Resource Management Element discusses bikeways and trails in greater detail.

RAILROADS

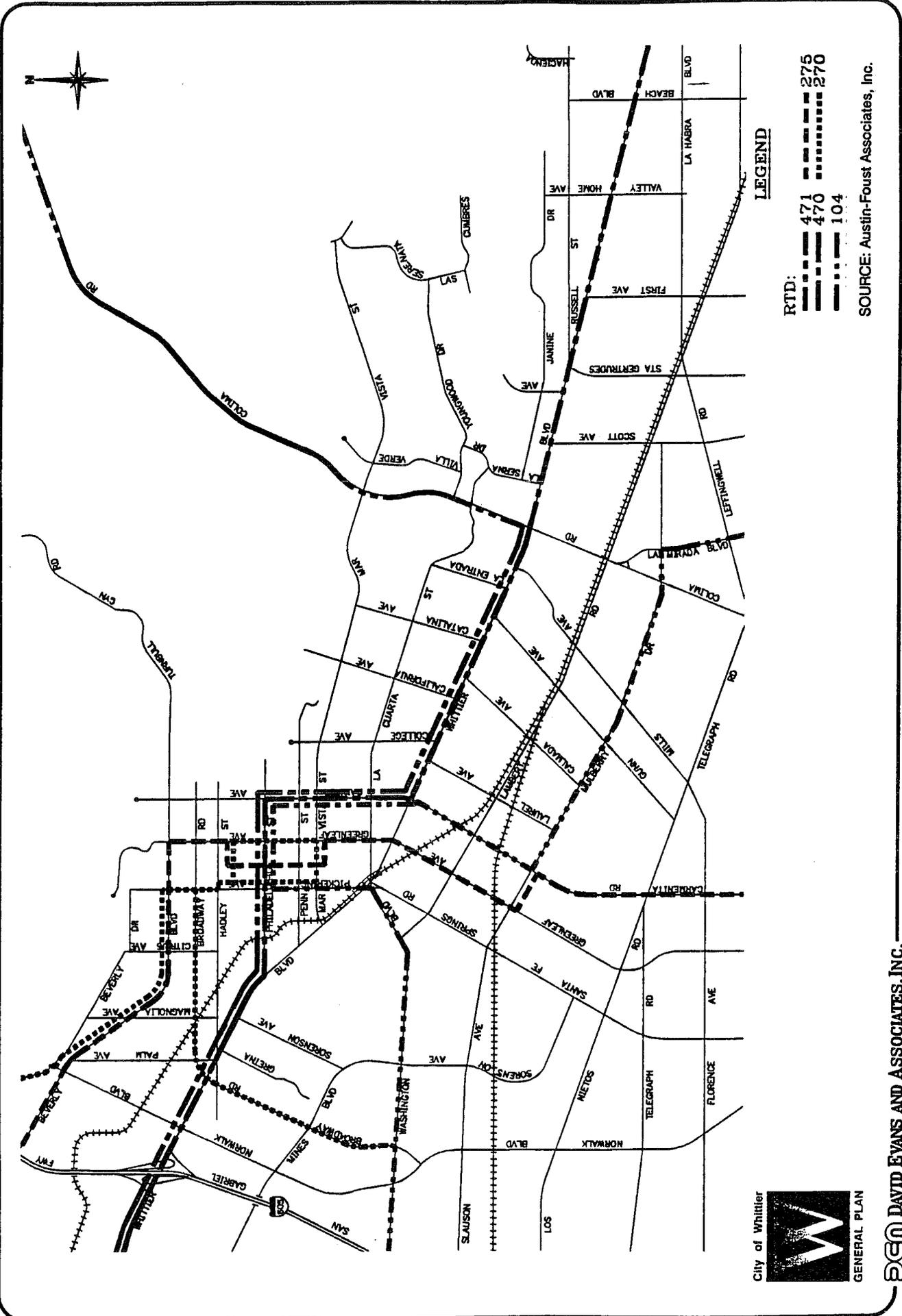
Two railroad companies currently operate tracks through the City. The Southern Pacific Railroad runs parallel Lambert Road and continues west into the City of Santa Fe Springs and east into the City of La Habra. The Union Pacific Railroad runs off the Southern Pacific track at Mills Avenue and Lambert Road and continues northwest into the City of

Pico Rivera. Both companies only provide transportation for the distribution of goods and equipment and serve primarily the industrial areas west of the City.

AIRPORTS

No major airport facilities exist within the City of Whittier. The closest commercial airports are the Los Angeles International Airport, the Long Beach Municipal Airport and the John Wayne Airport in Orange County and the Ontario International Airport. Transportation to these facilities is available either through private vehicles or public shuttle services.

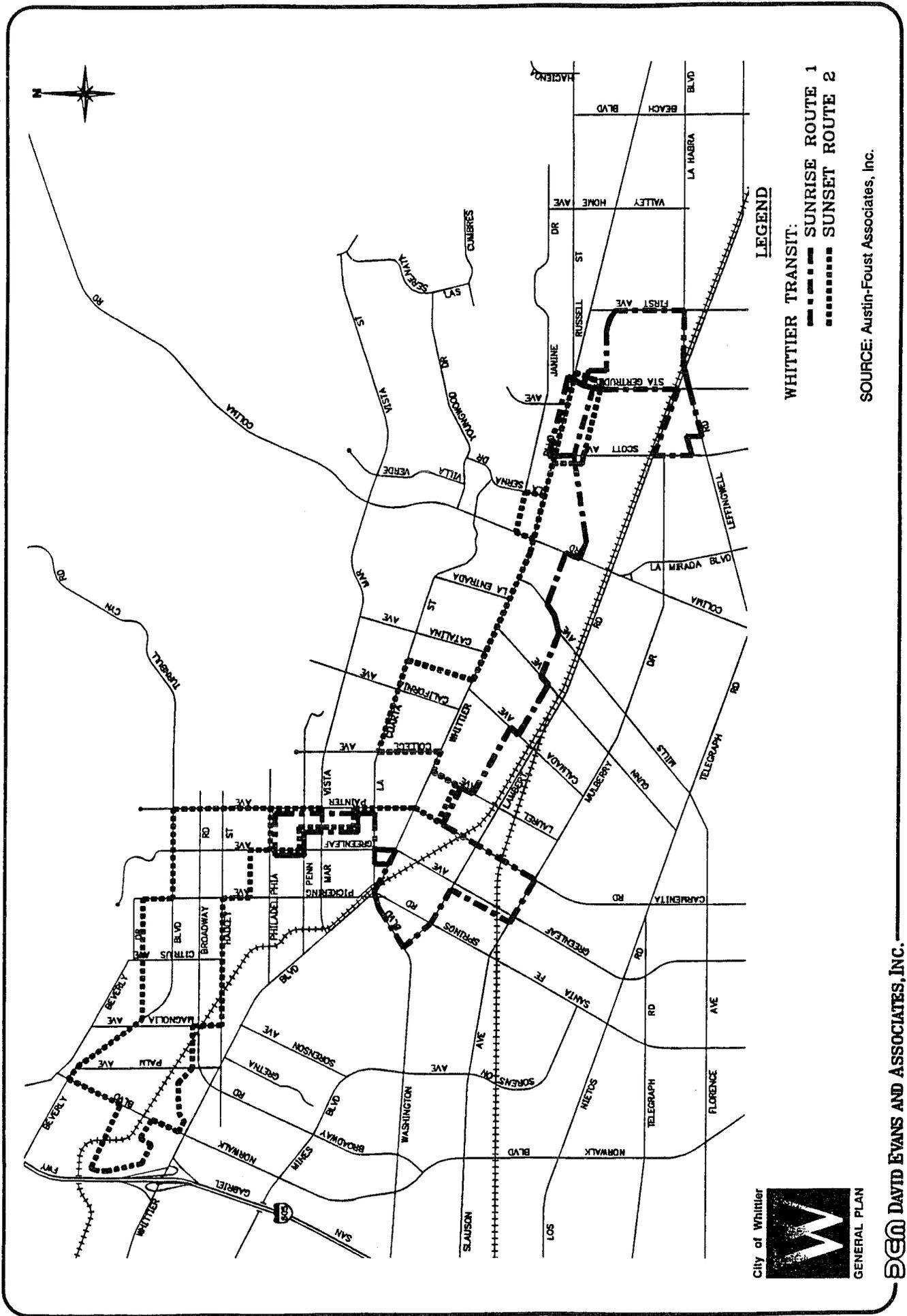
**EXHIBIT 4-8
RTD BUS ROUTES**



DAVID EVANS AND ASSOCIATES, INC.

SOURCE: Austin-Foust Associates, Inc.

**EXHIBIT 4-9
WHITTIER TRANSIT**



City of Whittier

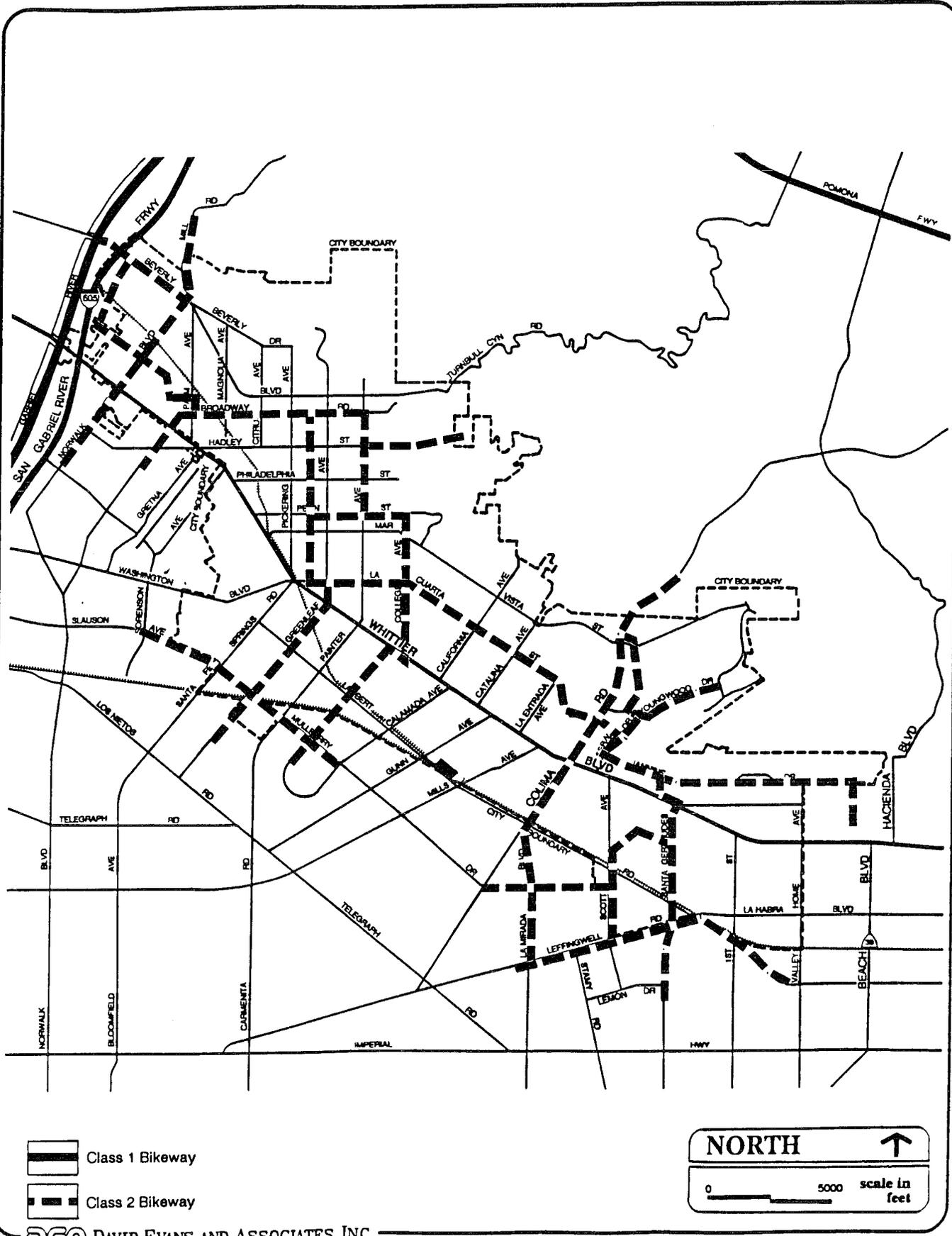
 GENERAL PLAN

DAVID EVANS AND ASSOCIATES, INC.

SOURCE: Austin-Foust Associates, Inc.

WHITTIER TRANSIT:
 - - - - - SUNRISE ROUTE 1
 SUNSET ROUTE 2

LEGEND



-  Class 1 Bikeway
-  Class 2 Bikeway

NORTH 

0  5000 scale in feet

 DAVID EVANS AND ASSOCIATES, INC.



**EXHIBIT 4-10
DESIGNATED BIKEWAYS**

SECTION 5: ENVIRONMENTAL RESOURCES MANAGEMENT ELEMENT BACKGROUND REPORT

INTRODUCTION

The Environmental Resources Management Element (ERME) combines the state-mandated Conservation and Open Space Elements. This Background Report deals with water, mineral, oil, and plant and animal resources, as well as open space, parks and recreation facilities. This report is divided into two sections. The first section provides background data relating to conservation issues and the second section contains background data on open space and recreation.

Resources considered in the report include water resources, mineral resources, biotic resources, open spaces and scenic highways. Air quality will be addressed in a separate element, as will cultural and historic resources. Many of the City's resources are limited or nonrenewable and need to be preserved and managed to ensure their availability to future generations.

With most of the City developed, the Puente Hills on the north provides the greatest potential for conservation and open space in the City. This area is outside the Whittier City limits and is unincorporated county land. The Puente Hills is largely undeveloped with some oil fields and residential structures at the foothill area. It has an abundance of plant and animal life and creates a scenic backdrop for the City. The combination of plant and animal habitats together with sources of water and the rugged topography creates an ecologically significant area.

GEOLOGICAL RESOURCES

The City of Whittier is on the northeast corner of the Los Angeles coastal plain, just south of the Puente Hills. The City's elevation ranges from 150 to 1000 feet above main sea level. The area consists of alluvial fans deposited by streams draining the Puente Hills located to the north and east of the City. The San Gabriel River, west of the City, serves as the major drainage channel for the area.

The Puente Hills are geologically young in origin with the highest elevation being 1,387 feet above sea level. The Whittier Narrows area separates Merced and Puente Hills. Whittier Narrows is 1.6 to 2 miles wide and generally flat with steep sides. It is the area where the San Gabriel valley and highlands drains to the coastal plain. Small canyons and streams are found throughout the surrounding hills.

The Puente Hills is believed to have been, at one time, part of the San Gabriel Mountains. As wind and rain eroded away parts of the mountains, this debris was washed downstream, eventually becoming a part of the coastline. Later, seismic activity in the area caused the

uplifting of various areas, one of which resulted in the creation of the Puente Hills. The La Vita member of the Puente formation is marine in origin and can be seen occasionally where outcroppings expose these sedimentary rocks on the hills. The Puente Hills are scarred by deep canyons on the west and slopes more gently down the eastern side toward Hacienda Heights. It is here that the majority of natural vegetation exists, providing food and habitats for animals.

The geologic setting relating to seismic characteristics of the City is discussed further in the Public Safety Element Background Report.

Within the planning area, ten soil associations were identified by the U. S. Department of Agriculture Soil Conservation Service. Exhibit 5-1 delineates the general location of soils occurring in the area. These soil associations consists of one or more soil types that have similar characteristics, and each is named for the predominant soil series it contains. Each soil association is described according to the following criteria:

- Natural drainage refers to the soil absorption and percolation qualities.
- Runoff potential refers to the soil's ability to channel stormwater runoff to lower areas due to its impermeability.
- Erosion hazard qualifies the soil's potential for erosion from running water, wind, ice or other geologic processes. Soil type, consolidation, vegetative cover, slope and runoff velocity determine the degree of erosion hazard.
- Shrink and swell behavior refers to the change in volume when the soil is wetted. This quality depends on the amount of moisture and the amount and kind of clay in the soil. Soils with higher percentages of clay have higher shrink-swell potential.
- Soil pressure refers to the soil's ability to withstand pressure from structural loads. Allowable soil pressure is considered severe if the soil can withstand loads less than 1,000 pounds per square foot; moderate if it can withstand loads of 1,000 to 2,000 pounds per square foot and slight if it can withstand loads of more than 2,000 pounds per square foot.
- Excavation potential refers to the limitations presented by cobbles, stones, rocks, bedrock and water table to excavation activities. Severe limitations are posed by high percentages of rock and cobble content, shallow hard bedrock and a high water table.

Table 5-1 provides a summary of the characteristics and qualities of the different soils in the area. Soil properties should be considered in evaluating proposed urban developments and land uses. While the information is general in nature, it provides a basis where more detailed investigation may be needed.

MINERAL RESOURCES

Tertiary sedimentary formations on the Puente Hills contain conglomerate and sandstone deposits which may be used for aggregate. These are found in the La Habra and Fernando Formations and Sycamore Canyon and Soquel members of the Puente Formation. The Sycamore Canyon member consists of fine to coarse-grained sandstone, pebbly conglomerate and interbedded micaceous sandy siltstone. The Sycamore Canyon member is mined near Prado Dam. The Fernando Formation consists of massive sandstone and siltstone and is mined near Carbon Canyon. Thus, the hills have a potential for these resources, although insufficient data is available to determine if the deposits in the Puente Hills are significant and can be economically mined. No significant aggregate resources have been identified by the State Department of Mines and Geology in the Whittier area.

The sands of the La Habra formation have been historically used for plaster, surfacing material and fill. An open sand pit, then known as the Murphy Ranch deposit, was located along West Road at the City's eastern boundary. The deposits were unconsolidated pebbly sand approximately less than 1 inch in diameter and well-rounded. After years of intermittent operation, the pit closed in 1949. A smaller inactive pit was found on Via del Llano Drive, north of the City's eastern boundary. These sand resources do not represent regionally significant deposits.

California oil production in 1991 was 350.0 million barrels (1 barrel = 42 gallons) with an average production of 948,000 to 980,000 barrels per day. Low unstable crude oil prices has led to decreasing oil production in the State. California crude oil is generally of low quality and, thus, is cheaper because of costs associated with refining and transportation. Approximately 296.0 million barrels of oil were produced by onshore wells and 54.2 million barrels by offshore wells.

As of December 1990, estimated recoverable oil reserves in the State totalled 4.2 billion barrels. Oil production in District 1, which includes Long Beach, Los Angeles, Riverside, San Diego, Imperial and San Bernardino counties, was 46.6 million barrels in 1991 and 49.2 million barrels in 1990. The 1990 production in Los Angeles County's 4,918 oil wells was 41.5 million barrels.

There are large oil and natural gas fields in the Whittier area, specially in the Puente Hills. Approximately 855 acres are in the Whittier oil field with 670 acres in the Central Area, 90 acres in the La Habra Area and 95 acres in Rideout Heights. Exhibit 5-2 shows the location of these fields. The first oil well in Whittier was drilled in 1897 to a depth of 984 feet below the surface. Hundreds of oil wells have been drilled since then.

TABLE 5-1
SOILS CHARACTERISTICS AND QUALITY

Soil Name	Soil Profile (dry)		Natural Drainage	Runoff	Erosion Hazard	Shrink-Swell Behavior	Allowable Soil Pressure	Excavation
	Surface Layer	Subsoil						
Hanford association, 2 to 5 percent slopes								
Hanford	Pale-brown coarse sandy loam, (8 in.)	Lt.yell.-brn. coarse sandy loam & grav. loamy coarse sand. Slightly acid to mod. alk. throughout. May be stratified below 40 in.	well	slow	slight	low	moderate	slight
Yolo association	Grayish-brown med. acid and sl. acid loam, (18 in.)	Grayish-brn. neutral loam, near silt loam, (18 in.)	well	slow	slight	moderate	moderate	slight
Yolo		Lt. yell.-brn. neutral loam, near silt loam						
Mocha-Sorrento association, 2 to 9 percent slopes								
Mocha	Grayish-brn. loam (15 in.)	Grayish-brn. and lt. brownish-gray loam. Moderately to strongly alkaline throughout becoming more calcareous with depth.	mod.well	slow to medium	slight to moderate	moderate	moderate	slight
Sorrento	Brown, mildly alkaline loam, (7 in.)	Brown moderately alkaline loam, (7 in.)	well	slow to medium	slight to moderate	moderate	moderate	slight
Cropley association								
Cropley	Dark gray neutral and mildly alkaline clay, (38 in.)	Grayish-brown mod. alk. and calc. clay, (12 in.)	well	very slow	slight	high	slight	slight
		Grayish-brn. mod. alk. & calc., grav. clay loam. 20% gravel.						

TABLE 5-1
SOILS CHARACTERISTICS AND QUALITY

Soil Name	Soil Profile (dry)			Natural Drainage	Runoff	Erosion Hazard	Shrink-Swell Behavior	Allowable Soil Pressure	Excavation
	Surface Layer	Subsoil	Substratum or Parent Material						
Chino association									
Chino	Gray and dk. gray loam, silt loam or clay loam, (16 in.)	Gray and lt.brn.-gray silty clay loam and clay loam. Calcareous throughout, mottled in lower part. High water table.		somewhat poor	slow	slight	moderate	moderate	moderate
Ramona-Piacentia association, 2 to 5 percent slopes									
Ramona	Bn. to red-brn. heavy loam, loam, or sandy loam (18 in.)	Bn. to red-brn. dense clay loam or clay. Some areas with up to 60%.	Bn. to red-brn. loam or light clay loam, (30 in.) coarse fragments.	well	slow	slight	high	moderate	slight
Piacentia	Bn. to red-brn. loam or sandy loam (16 in.) abruptly underlain by dense clay loam subsoil (18 in.)	Dark reddish-brown dense clay loam which restricts roots (48 in.)	Some areas with gravelly or iron-cemented hardpan subsoils.	mod. well	very slow	moderate	high	moderate	slight
Perkins-Rincon association, 0 to 15 percent slopes									
Perkins	Bn. medium acid gravelly loam (12 in.)	Reddish-brown al. acid, grav. clay loam or light clay. (36 in.)	Reddish-brown cobbly alluvium	well	slow to medium	slight to moderate	high	slight	slight

TABLE 5-1
SOILS CHARACTERISTICS AND QUALITY

Soil Name	Soil Profile (dry)			Natural Drainage	Runoff	Erosion Hazard	Shrink-Swell Behavior	Allowable Soil Pressure	Excavation
	Surface Layer	Subsoil	Substratum or Parent Material						
Rincon	Dk. grayish-brown mildly alkaline silty clay loam (13 in.)	Brown mod. alkaline and calcareous silty clay, (22 in.)	Yell.-brn. and white mod. alk. and v. strongly calc. silty clay loam.	well	slow to medium	slight to moderate	high	slight	slight
Altamont- Diablo association, 9 to 30 percent slopes, eroded									
Altamont	Dark brn. neutral clay (12 in.)	Brn. calcareous clay	Partially scattered calcareous soft shale or sandstone at 24 to 36 in.	well	medium to rapid	moderate to high	high	moderate	severe
Diablo	Dark-gray, neutral clay, (20 in.)	Dark grayish-brn. strongly calcareous clay.	Very strongly calcareous shale at 22 to 52 in. Few rock outcrops.	well	medium to rapid	moderate to high	high	moderate	severe
Altamont- Diablo association, 30 to 5 percent slopes, eroded									
Altamont	Dark brn. neutral clay (12 in.) Moderately eroded, therefore reducing soil depth.	Brn. calcareous clay	Partially scattered calcareous soft shale or sandstone a 24 to 36 in.	well	rapid	high	high	moderate	severe

TABLE 5-1
SOILS CHARACTERISTICS AND QUALITY

Soil Name	Soil Profile (dry)			Natural Drainage	Runoff	Erosion Hazard	Shrink-Swell Behavior	Allowable Soil Pressure	Excavation
	Surface Layer	Subsoil	Substratum or Parent Material						
Diablo	Dark-gray, neutral clay, (20 in.) Moderately eroded, therefore reducing soil depth.	Dark grayish-brn. strongly calcareous clay.	Very strongly calcareous shale at 22 to 52 in. Few rock outcrops.	well	rapid	high	high	moderate	severe
San Andreas-San Benito association, 30 to 75 percent slopes, eroded	Grayish-brn. and brn. neutral and mod. acid fine sandy loam, (15 in.)	Grayish-brn. and brn. med. acid very fine sandy loam, (13 in.)	Very pale-brn. soft med. grained sandstone	well	rapid to very rapid	high to very rich	low	moderate	slight
San Benito	Dk. grayish-brn. neutral clay loam, (28 in.)	Lt. yell.-brn. med. alk. and calcareous clay loam.	Yellowish-brn. soft calc. sandy shales at 36 to 48 in.	well	rapid to very rapid	high to very rich	moderate	moderate	slight

Source: Report and General Soil Map, Los Angeles County, California, U.S.D.A., 1969.

Oil production remains an extractive resource use in Whittier. The oil production fields are located in the western hillside areas and concentrated primarily between Turnbull Canyon Road and Hacienda Boulevard. Crude oil is produced from these wells. Two oil production facilities at the hills are currently in operation. One is owned by Chevron (18.5 acres in LA County) and another operated by McFarland (owned by City of Whittier).

The Whittier area currently has 136 oil and associated gas wells and 7 gas storage/withdrawal wells in production. In 1990, there were 251 wells abandoned and 30 remain idle but have not been abandoned. In 1990, approximately 314,372 barrels of oil were produced by local wells. This represents approximately 0.76 percent of the total production in Los Angeles County. Cumulative production since drilling in the area began, was 52,109 million barrels with estimated reserves of 3,622 million barrels.

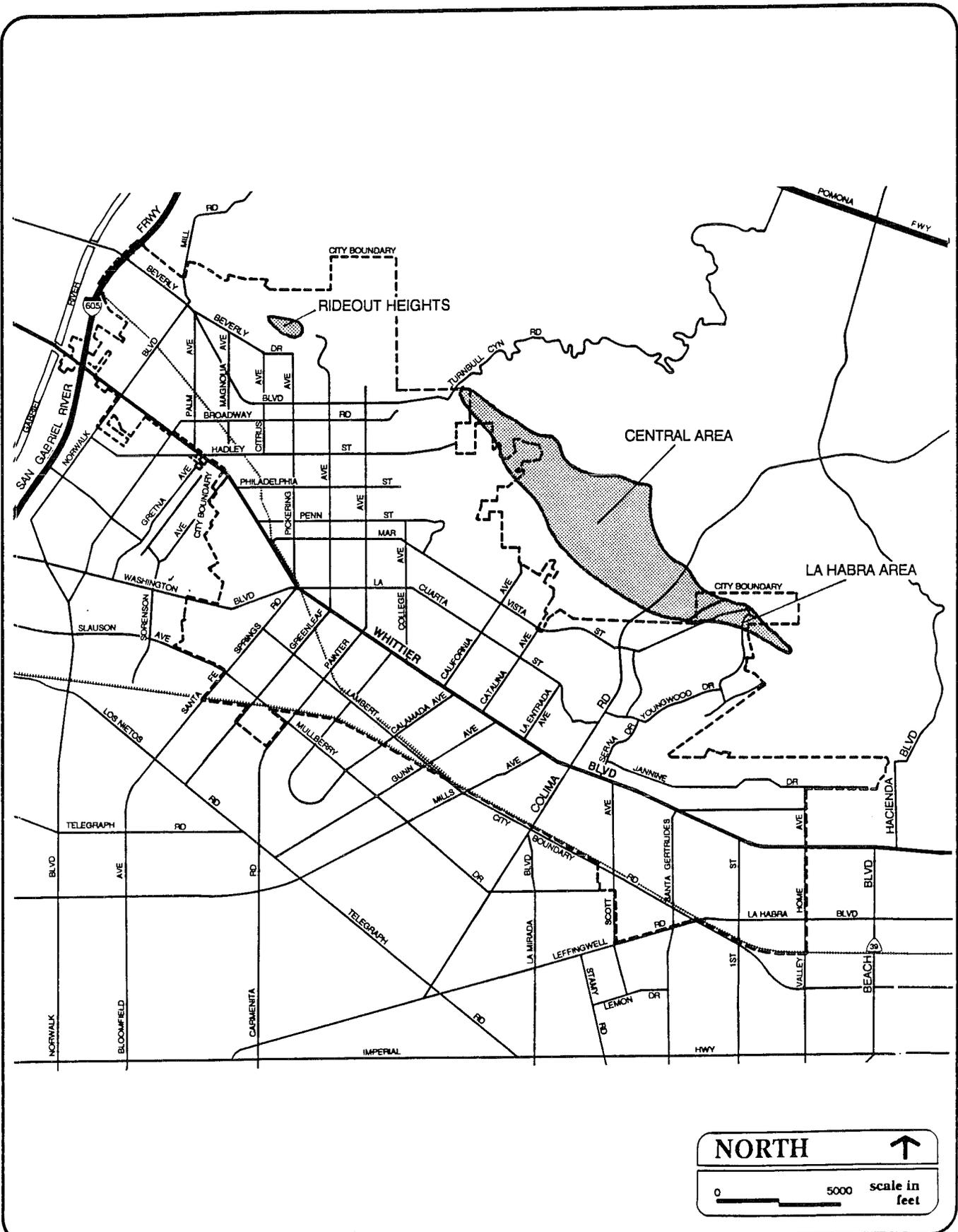
Wells often produced oil, gas and water at the same time. Of the 143 wells in production, 509,236 million cubic feet of gas were produced along with 4.08 million barrels of water. Waterflooding is a method of advanced oil recovery where water is injected into the wells to make crude oil rise. Waterflooding methods produced 217,200 barrels of the total oil production in 1990. Estimates of 1991 production show that approximately 215,000 barrels of oil and 440,000 million cubic feet of gas were produced by oil fields in Whittier.

Oil production operations result in extensive grading of the natural vegetative cover near wells in order to minimize fire hazards. In some instances, oil is dumped on the hillsides to control vegetation growth and lower the fire risk. Not only is the vegetation damaged, but wildlife habitats in the area are lost. Wildlife are driven from their natural habitats, are exposed to oil covered ground, and their food sources are destroyed.

Oil production has kept much of the hillside areas undeveloped. On the other hand, urban developments in oil field areas can limit oil drilling and recovery operations. With the majority of the land in the hills owned by oil companies, the use of the area will depend on the remaining economic life of the Whittier oil fields. The oil fields have been operating for more than 75 years and are likely to continue to operate as long as the oil production is profitable.

WATER RESOURCES

The City of Whittier is underlain by the complex groundwater basin system of the Los Angeles coastal plain. There are four groundwater basins in the coastal plain: the West Coast, Santa Monica, Hollywood and Central Basins. The City of Whittier is within the Central Basin which is bounded on the north and northeast by the Elysian, Repetto, Merced and Puente Hills; on the east by the County line and on the south and west by the Rosecrans, Signal and Bixby Ranch Hills. Groundwater resources in the Central Basin



DAVID EVANS AND ASSOCIATES, INC.



**EXHIBIT 5-2
OIL RESOURCES**

generally consists of an upper layer of shallow, unconfined and semi-perched water; a principal body of fresh water underneath; and salt water under the freshwater resources. Water movement is generally from points of recharge (percolation areas, spreading grounds, streams) to points of discharge (groundwater wells, ocean, springs) because of differences in pressure between these points. The major recharge area in the coastal plain is the Whittier Narrows area.

Aquifers underlying the Los Angeles coastal plain resulted from the historical development of the topography for over 100 million years. The deposition of sand, gravel, silt, clay and rock has resulted in a highly complex geologic and groundwater structure. Water-bearing deposits are unconsolidated and semi-consolidated alluvial sediments from Recent times (approximately 15,000 years ago). These deposits hold water, allow water to pass through, and are referred to as aquifers. Non-water-bearing deposits are consolidated rocks and ground layers which provide limited water. They form the boundaries between aquifers.

The Whittier area of the Central groundwater basin starts at the Puente Hills and goes into the Coyote Hills uplift in Santa Fe Springs. Exhibit 5-3 shows cross sections of the geologic structure underlying the Whittier area. The topmost layer of deposition in the area is from the Recent time, consisting of alluvium and the Gaspur aquifer. Alluvium is found on or near the surface of the City of Whittier and much of the County. This layer may be 60 feet thick or less with unconfined and poor quality water of small quantities.

The Gaspur Aquifer is a water-bearing zone with cobbles and pebbles deposited from erosion of the San Gabriel Mountains. The upper layer is medium to coarse-textured sand and the lower layer is sand, gravel, and cobbles. The Gaspur Aquifer is 120 feet thick at the most. The aquifer is partially dewatered but water yields are high. The aquifer merges with the ground surface at the Montebello Forebay between the Rio Hondo and San Gabriel Rivers and between the Los Angeles River and the Harbor Freeway in the Los Angeles Narrows area. It also merges with deeper aquifers at Whittier Narrows, south of the Los Angeles Narrows area and along the Los Angeles River. Near Whittier Narrows, the deep aquifers merge with the Gaspur aquifer and receive recharge. Whittier Narrows serves as major recharge area for the Gaspur aquifer and underlying aquifers.

The Pleistocene period (approximately 1,000,000 years ago) resulted in the deposition of several ground layers including Older Dune Sand, the Lakewood Formation and the San Pedro Formation. The Lakewood Formation includes terrace deposits, Palos Verdes sand and other unnamed deposits. It is generally characterized by variable particle size in the upper layer and a lower layer of gravel and coarse sands. Sand and gravel are interspersed by discontinuous lenses of sandy silt and clay. Near Puente Hills, the Lakewood Formation overlies the San Pedro Formation, Pliocene Pico and Repetto Formations and the Miocene Puente Formation.

The Lakewood Formation contains the Exposition, Gage, and Gardena aquifers and aquicludes (fine sand, silt and clay that transmit water slowly). The Exposition aquifer is beneath the Gaspur aquifer and merges with it between the Los Angeles and San Gabriel Rivers. This aquifer is not found under the Whittier area.

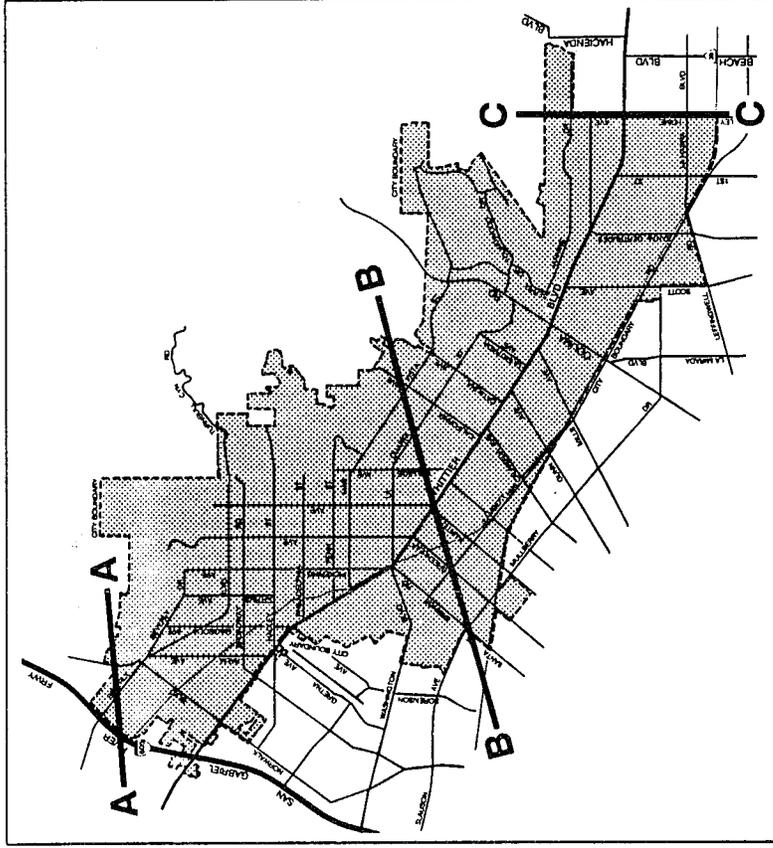
The Gage Aquifer generally lies below the Exposition aquifer and is approximately 10 to 160 feet thick. It has fine to medium sand with varying amounts of coarse yellow sand and gravel. The Gardena Aquifer has coarse deposits that are about the same age as the Gage Aquifer which has fine deposits. The Gardena Aquifer are similar in thickness and elevation to the Gage Aquifer and in direct continuity with it. Both aquifers yield large amounts of water.

The San Pedro Formation contains deposits of lower Pleistocene age containing San Pedro sand, Timms Point, silt and Lomita Marl. It has five major aquifers with fine grained layers interbedded within the aquifers. These aquifers are the Hollydale, Jefferson, Lynwood, Silverado and Sunnyside Aquifers. They are the principal aquifers used for domestic water in the Los Angeles area.

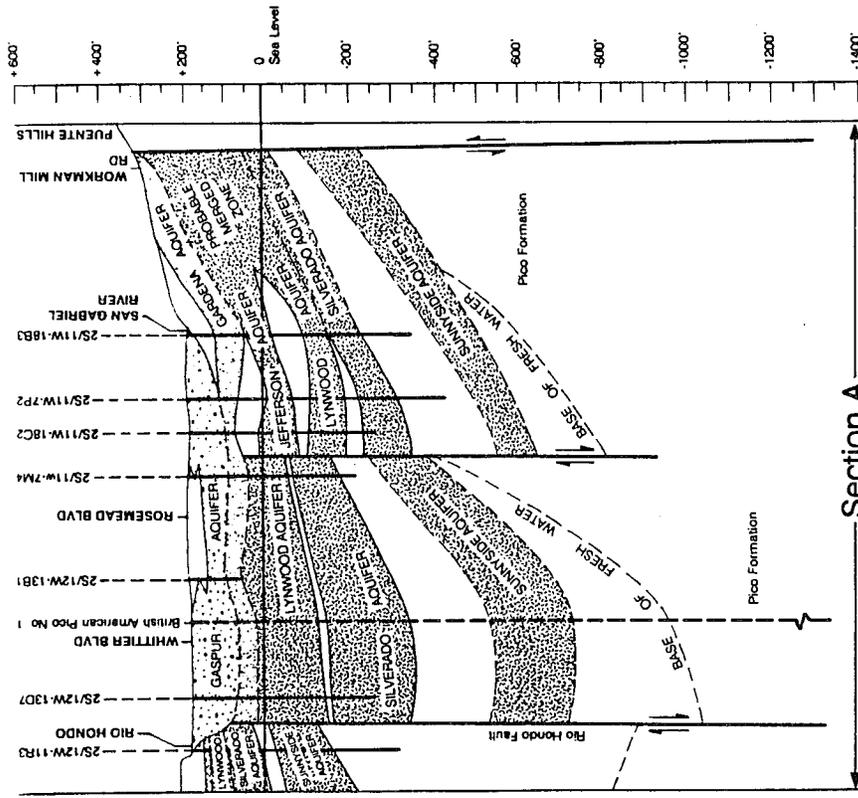
The Hollydale Aquifer is discontinuous aquifer beneath the Gage-Gardena Aquifer. It consists of yellow sands and gravel in the northeastern sections and grey, blue and black sand with mud, clay and marine shells near the Newport-Inglewood fault. Its boundary is irregular and sinuous, suggesting it was formed by stream deposition but only shallow marine deposits are found. Presence of the Hollydale Aquifer is confirmed only in western area of the Whittier sub-basin. It is 10 to 25 feet thick and consists of sand and gravel with some interbedded clay. It merges with Gage aquifer in south Whittier area. Its lack of continuity and the presence of fine-grained materials do not allow it to store large amounts of water.

The Jefferson Aquifer is found under the entire Whittier area with a thickness ranging from 20 to 40 feet. The aquifer consists of sand and gravel and little interbedded clay and has a maximum depth of 350 feet below sea level. It merges with Hollydale aquifer near Montebello Forebay area. The aquifer is made up to sand with gravelly and clayey layers and has a maximum thickness of 145 feet. Within the City of Whittier, its base is 100 feet below sea level. It merges with overlying and underlying aquifers near the Montebello Forebay and the hillsides at the northwestern section of the City. Very few wells tap the Jefferson Aquifer.

The Lynwood Aquifer is made up of yellow, brown, and red coarse gravel, sand, silts and clay. It has a thickness of 50 to 70 feet within Whittier. The Rio Hondo and Pico faults have caused offsets on the Lynwood Aquifer. It is a major producer of water with a yield ranging from 200 to 2,100 gallons per minute. Its base is 50 to 150 feet below sea level in the Whittier area.



SECTION LOCATIONS



- Aquifers and Deeper undifferentiated formations
- Aquifers in Recent Alluvium (Includes Gaspar and Ballona Aquifers)
- Aquifers in Lakewood Formation (Includes the Artesia, Exposition, Gage and Gardens Aquifers)
- Aquifers in San Pedro Formation (Includes the Hollydale, Jefferson, Lynwood, Silverado and Sunnydale Aquifers)
- Water Wells
- Oil Wells
- Faults

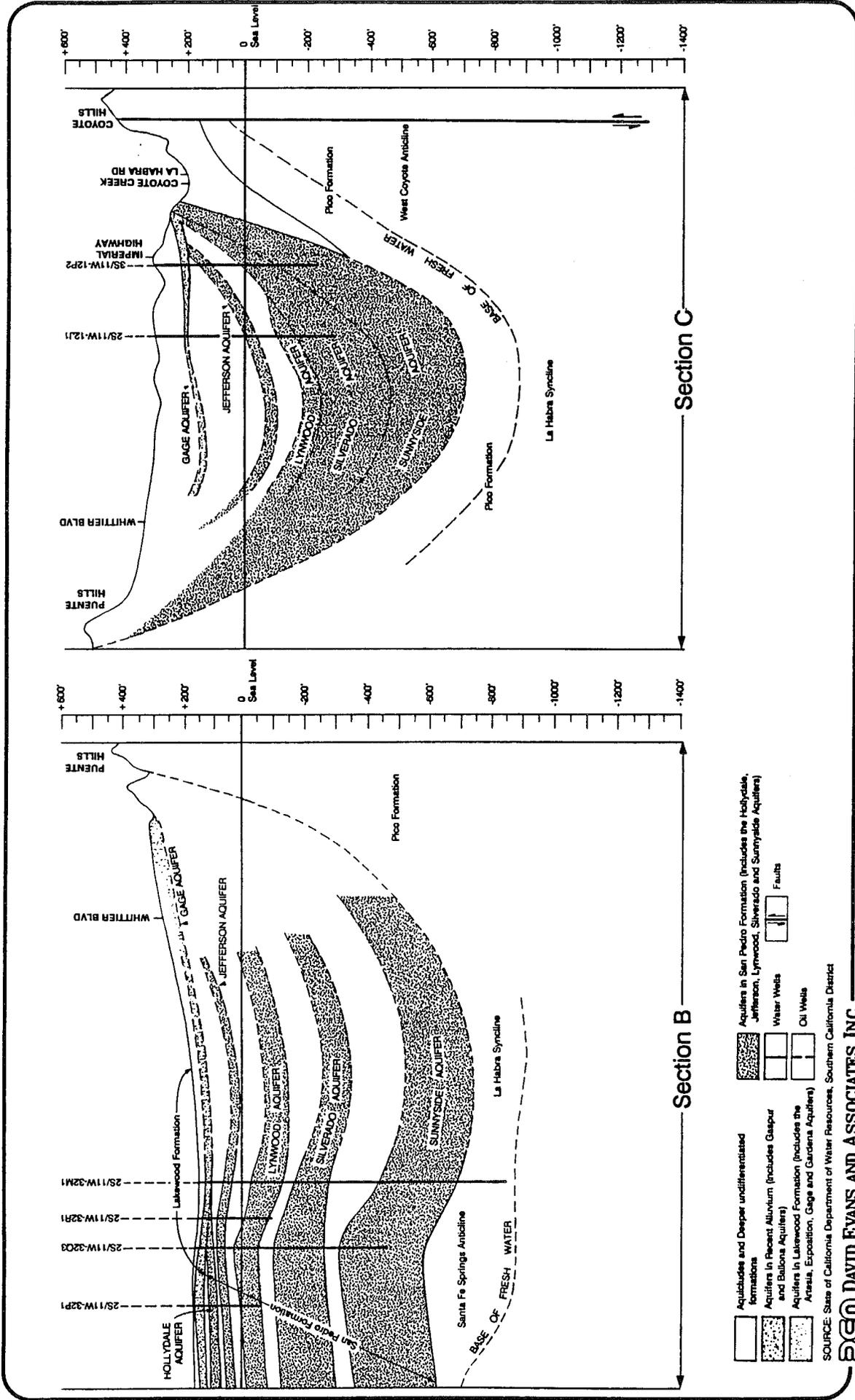
SOURCE: State of California Department of Water Resources, Southern California District

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City of Whittier



GENERAL PLAN



- Aquifers and Deeper undifferentiated formations
- Aquifers in Recent Alluvium (Includes Gaspar and Balboa Aquifers)
- Aquifers in Lakewood Formation (Includes the Artesia, Exposition, Gage and Gardena Aquifers)
- Aquifers in San Pedro Formation (Includes the Hollydale, Jefferson, Lynwood, Silverado and Sunnyside Aquifers)
- Water Wells
- Oil Wells
- Faults

SOURCE: State of California Department of Water Resources, Southern California District

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City of Whittier



GENERAL PLAN

The Silverado Aquifer has yellow to brown coarse to fine sands and gravel interbedded with yellow to brown silts and clays. It has a maximum thickness of 300 feet in the Whittier area at a maximum depth of 500 feet below sea level. It has also been considerably offset by all faults in the region. It is a major water producer with a maximum yield of 4,700 gallons per minute. Within the planning area, this aquifer is found 100 to 500 feet below sea level.

The Sunnyside Aquifer has coarse deposits of sand and gravel with interlayers of sandy clay and clay. Well logs show marine shells and marine type clays and shales are present within the aquifer. It has a maximum thickness of 300 feet and has a maximum yield of 1,500 gallons per minute. It is offset by many faults in the region. Its base is 400 to 700 feet below sea level in Whittier. Outcrops of this aquifer are found in northern boundary of the Whittier and Coyote Hills.

Aquifers beyond the Pleistocene age are not known because well log data are limited. Pliocene and Miocene sediments below the San Pedro formation contain salt water in this area. Pliocene aged deposition is responsible for the formation of the lower and upper members of the Fernando Formation (also called Pico Formation and Repetto Formation). The lower Fernando formation consists of sand, silt, clay marine deposits with beds of marine gravel. Gravel and sand beds intersperse with micaceous siltstone and clays. Water in this formation is generally poor and limited. The upper Fernando Formation consists of siltstone with layers of sandstone, conglomerate and fragmented marine shells. It is approximately 5,000 feet thick.

The Miocene age consists of sedimentary and volcanic rocks forming the Monterey, Modelo and Puente Formations. These formations have a maximum thickness of 11,000 feet and are made up of clay shales, siliceous shales, sandstones and conglomerates. The Topanga Formation is interbedded with Miocene volcanic rocks, is 7,500 feet thick, and consists of shale, sandstone and conglomerate. Older Tertiary and Sedimentary rocks may also underlie the Central Basin since they are found in the Santa Monica Mountains. These rocks are non-water-bearing.

Earthquake faults have caused offsets within the aquifers, resulting in disrupted subsurface water flows and creating zones of cementation and low permeability. In Whittier, these offsets were identified along the Rio Hondo and Pico faults (see Section A of Exhibit 5-2).

Watershed areas serve to capture rainfall and channel surface waters to water recharge areas where the water is retained or slowed and allowed to percolate down into the groundwater aquifers. Watershed land is characterized by steep slopes and a shallow depth of overlying soil. Most of the hillside area has been identified as watershed by the State of California Department of Water Resources and by the Los Angeles County Regional Planning Commission.

Groundwater recharge areas are generally flat or gently sloping with deep alluvial soil through which water can percolate down to the underground aquifer. This area is found in the canyon bottoms near the base of the hills and in the bottoms of unlined channels. Such areas are vital to the maintenance of local groundwater supplies. In 1973, at least 137 wells in the Whittier area produced water from these aquifers which were recharged, at least in part, by runoff from the Puente Hills. Urban development on groundwater recharge areas lessens the amount of water returned to the underground basins.

Overdrafting (when discharge is greater than recharge) of the groundwater has caused water levels to decline over the years. Lower levels increase the cost of pumping and increase the potential for salt water intrusion. In order to ensure the availability of natural water resources for the planning area, land uses at the canyon bottoms and along drainage channels should be compatible with recharge areas.

Flood Protection

Flood protection and drainage has been handled by the County Flood Control District. The District has built various flood control facilities including check dams, debris basins, and flood control channels throughout the county. Natural channelization and stream management allow the percolation of water into the groundwater basins and also allow natural plant and animal communities to exist. Where there is water, there are plant and animal communities. If the natural watershed areas are to be retained, future development within the Puente Hills will have to take measures to preserve undisturbed open space.

Domestic water in the area is provided by the City water system and is derived from local groundwater wells near the Whittier Narrows. Water pumping is controlled by Central Basin Replenishment District. The Central and West Basin Water Replenishment Districts levy an assessment on all parties pumping groundwater in the Central and West Basins. Funds collected are used to purchase surplus water from the Colorado River Aqueduct or the State Water Project. Water is spread and injected into the ground to replenish underground water supply resources. When a water company needs more water than allotted, it buys or leases additional water rights. The district has historically purchased water from Colorado River but in 1974, MWD started to get water from State Water Project.

NATIVE PLANT AND ANIMAL LIFE

The City of Whittier is landscaped with non-native species throughout most of the urbanized areas. Puente Hills represents the largest undeveloped land with native plants and animal species. The majority of vegetation in the Puente Hills are located in the canyon bottoms and slopes of watershed lands. The north slopes have more vegetation because the shade

helps to retain the moisture during the hot summer months. Vegetation is also concentrated in the canyon bottoms primarily because of the availability of water which is not found on higher slopes.

Sycamore Canyon runs in an east-west direction in the Puente Hills (see Exhibit 5-4). It contains one of the largest watershed areas in the hills and, consequently, has many varieties of vegetation including riparian woodlands, sage, and grasses. Sycamore trees are found along the canyon with other plants. In other canyons, plants of similar varieties are found but to lesser degrees. Generally, the variety and density of the vegetation decreases toward the top of the hills and where grasses and chaparral grow. Grasses are dry during the summer and autumn months and present a wildfire potential during these periods. The Los Angeles County Environmental Resources Committee has identified Sycamore Canyon as an ecologically significant area because it is one of the few remaining examples of an association of riparian woodland, coastal sage, and chaparral habitats.

Vegetation on the hills may be classified as grassland, inland sage scrub, mixed chaparral or riparian woodland with some areas supporting non-native eucalyptus trees. Disturbed grassland consists of non-native weeds on disturbed areas and dry farming, non-native annuals including wild mustard, thistle, wild radish, brome grass. Inland sage scrub is identified by moderately dense scrub with California sagebrush on the south and west facing slopes, California buckwheat, toyon, prickly pear, laurel and sumac.

Mixed chaparral is similar to sage scrub but thicker and found on north and east facing slopes and deep canyons. It includes toyon, elderberry, poison oak, and California sagebrush. The dense chaparral in the watershed areas of the Puente Hills reduces the water runoff and allows water to percolate into the ground. Chaparral, as a part of its natural life cycle, requires a periodic burn-off. Otherwise, chaparral thickens and increases the potential for wildfire when it finally does catch fire.

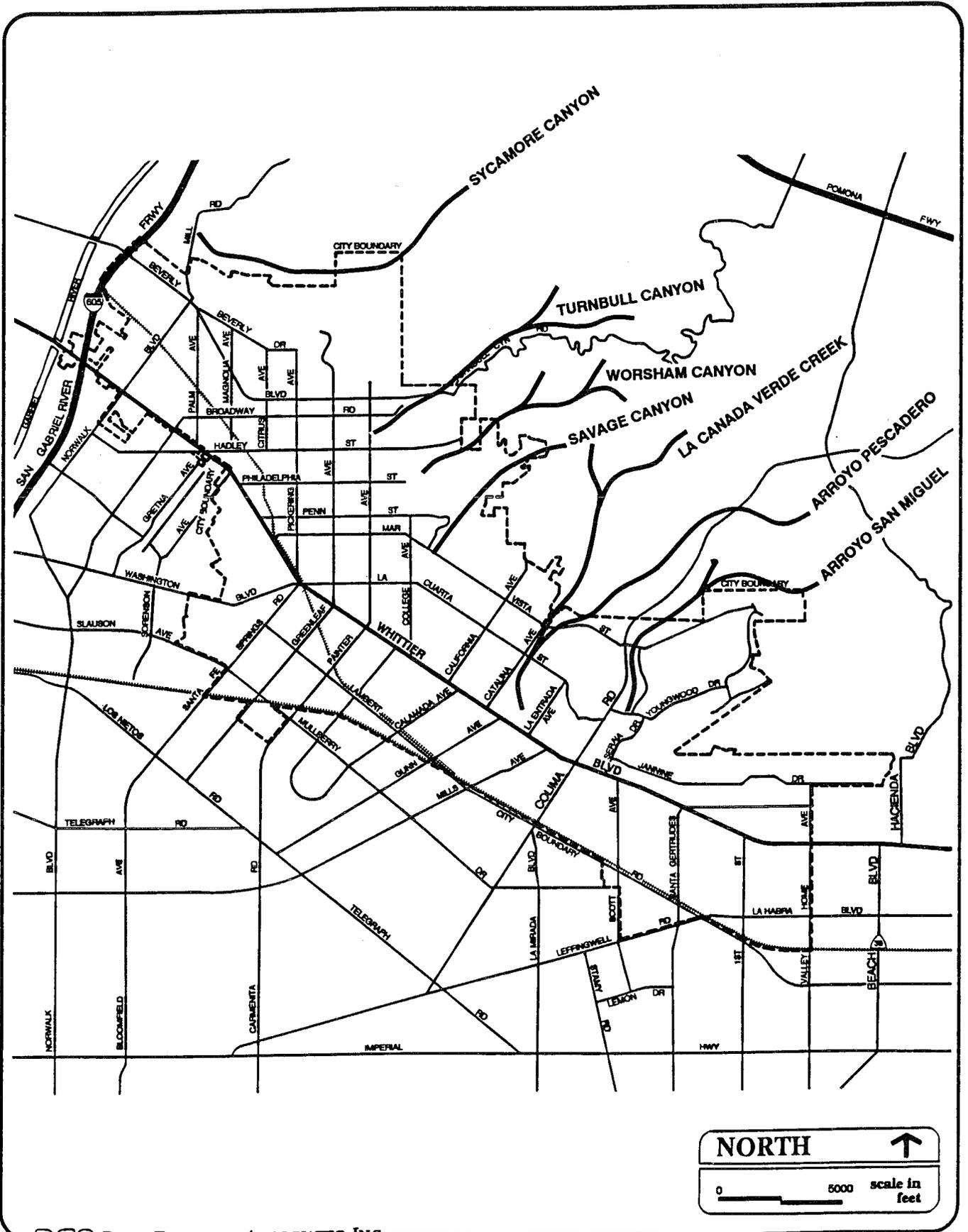
Riparian woodland refers to the major drainage areas such as Sycamore Canyon, Arroyo Pescadero, Arroyo San Miguel and La Canada Verde Creek (see Exhibit 5-4). Plants in these communities include sycamores, live oaks, elderberry, toyon, willow and mulefat.

Other plants that may be found in the area include golden stars, blue dicks, wild oats, chess, giant ryegrass, barley, Italian ryegrass, lemonadeberry, laurel sumac, California pepper, poison oak, wild cherry, sweet fennel, coastal sagebrush, mulefat, thistle, encelia, golden yarrow, match weed, layia, milk thistle, popcorn flower, mustard, peppergrass, prickly pear, elderberry, russian thistle, morning glory, dodder, live-forever, wild cucumber, castor bean, deerweed, lupine, coast live oak, storksbull, horsehound, white sage, black sage, purple sage, sycamore, California buckwheat, miner's lettuce, toyon, willow, monkeyflower, and tree tobacco.

The different plant communities serve as wildlife habitats. Animal species in the area include amphibians, reptiles, birds, rodents and mammals. The water drainage areas support amphibians like the western toad, tree frog, and slender salamander. Reptiles would also be found in the Puente Hills and may include western-fence lizard, side-blotched lizard and western rattlesnake. Other animals that may live in the area are gopher snakes, king snakes and striped racers.

A number of bird species may be found in the hills. They include the California quail, red-tailed hawks, American kestrels, turkey vultures, common crow, brewer's blackbird, linnet, mourning dove, scrub jay, meadow lark, mockingbird, Annas hummingbird, white-crowned sparrow, song sparrow, brown towhee, and Say's phoebe. Rodents and mammals in the area may include California ground squirrels, Audubon's cottontail, pocket gopher, deermouse, harvest mouse, woodrat, coyote, skunk, weasel, and raccoon. Table 5-2 is a list of some of the more common animals found in the Puente Hills along with their preferred habitats.

The natural habitats in the hills is the remaining natural resource area that once prevailed in the planning area. The hills contain ecological areas that are unique and valuable for scientific, educational, and cultural purposes. The viability of the existing plant and animal communities in the hillside areas is highly dependent on the intrusion of urban development.



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City of Whittier



GENERAL PLAN

**EXHIBIT 5-4
MAJOR DRAINAGE AREAS**

TABLE 5-2 COMMON ANIMALS FOUND IN PUENTE HILLS & WHITTIER	
Animal	Habitat
Rabbit	Washes, canyon bottoms, chaparral and grassy hills
Ground Squirrel	Found most often in altered environments such as cemeteries, dumps, urban development, etc.--Sycamore and Turnbull Canyons.
Gopher	Grass-covered areas, flatter terrain, meadows, etc.
Various Mice & Rats	Grasslands, hillside vegetation, prickly-pear cactus, dense streambed and banks.
Skunk	Fields, canyons, chaparral and wooded areas--Sycamore Canyon.
Raccoon	Canyon bottoms near water sources--Sycamore Canyon.
Gray Fox	Primarily chaparral areas.
Coyote	Found along dirt roads, trails, firebreaks and canyon bottoms. This is the dominant carnivore of the area.
Opossum	Seen in abandoned buildings. Mainly in Sycamore Canyon, Whittier College Campus, and the Whittier Narrows area.
Hawks, Quail, and other birds	Canyon bottoms and areas of heavy vegetation and trees are primary habitats.
Mule Deer	Upper Sycamore and Turnbull Canyons are main meadows for their feeding. Also tall grasses and shrubs.
Bobcat and Other Cats	These mammals cover a great deal of territory and don't stay in one place for long periods of time. No permanent habitats in the area. Occasionally seen.
Source: Whittier General Plan.	

Endangered Species

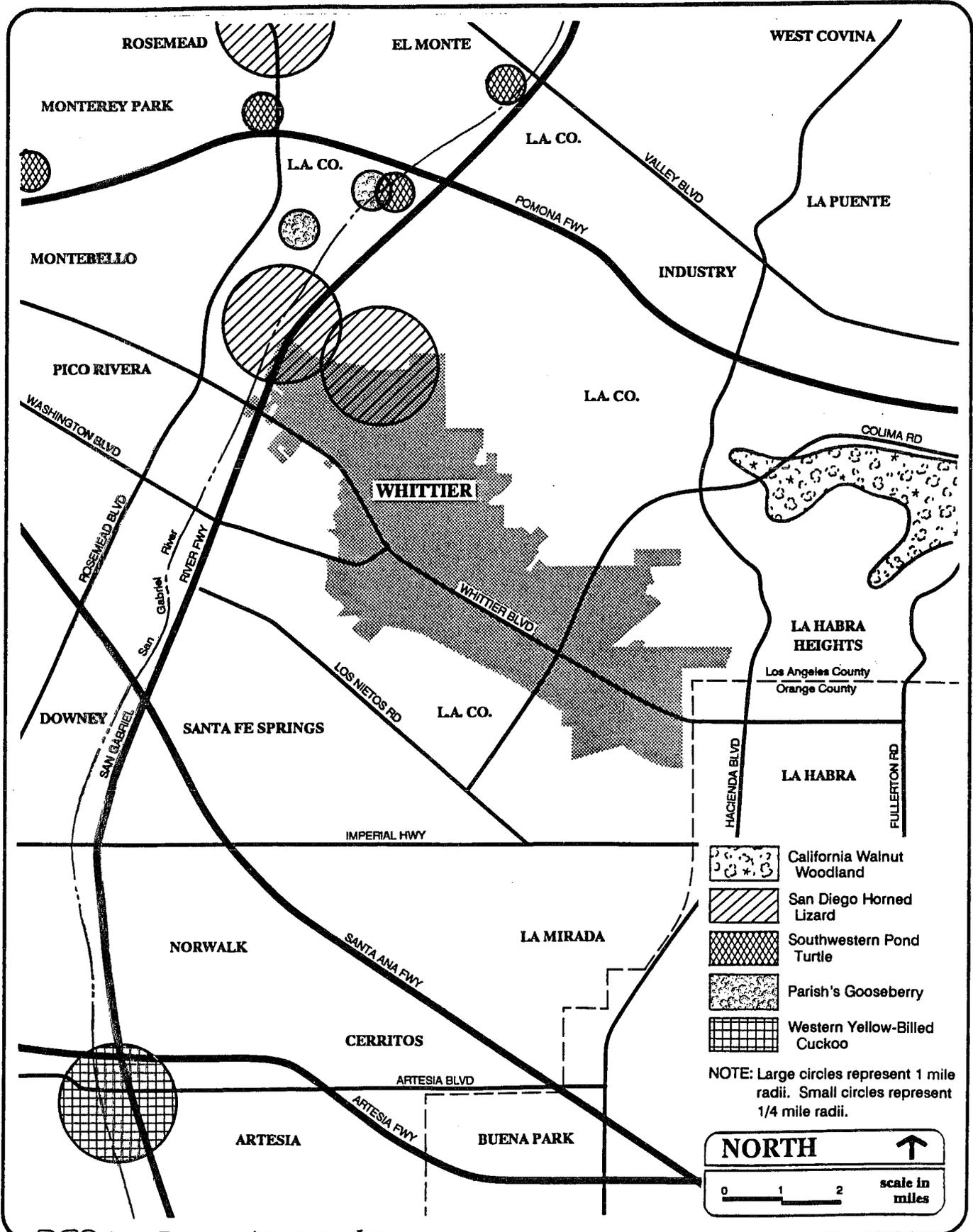
The Federal and State trustee agencies have categorized sensitive plant and animal species according to the following criteria:

- Endangered species are native species or subspecies which are in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

- Threatened species are native species or subspecies not presently threatened by extinction but likely to become an endangered species in the future in the absence of special protection and management efforts.
- Category 1 candidate species are species on which data on file is sufficient to support Federal listing.
- Category 2 candidate species are species on which threat and/or distribution data are insufficient to support Federal listing.
- Species listed under 3A, 3B, and 3C are those withdrawn from the Federal listing due to the following reasons: Species designated as 3A are those which the Fish and Wildlife Service has overwhelming evidence of extinction. If the species is rediscovered in the future, it may acquire a high priority for listing. Species designated 3B are those which, under current taxonomic understanding, do not represent distinct species and do not meet the Endangered Species Act's definition of a species. Species designated 3C are proven to be more abundant or widespread than previously believed or those not subject to any identifiable threat.

A record search with the Department of Fish and Game Natural Diversity Database identified known habitats of endangered, rare and threatened plant and animal species in and near the City of Whittier. Exhibit 5-5 shows the general location of these sitings.

- The Western Yellow Billed Cuckoo (*Coccyzus Americanus Occidentalis*) is the most common nesting cuckoo. It is about the size of a dove with a brown back and white breast area. It is differentiated from the black-billed cuckoo by large white spots on its black undertail. It has a bright rufous flash in the open wing and a yellow lower mandible. It is often found in woods and brush areas, especially during outbreaks of the tent caterpillars during summer. Its song is guttural and toneless and never in a series of 3 or 4 coos. It is an endangered species in the State listing and 3B in the Federal Listing. It inhabits riparian forest and was found near the San Gabriel River near the Artesia Freeway. It was historically fairly common and nested in the area but the site is now destroyed and unsuitable for the habitat.
- The San Diego Horned Lizard (*Phrynosoma Coronatum Blainvillii*) is about 4 inches long with a yellowish or reddish-gray color. It has a dark mark on the neck and 2 long horns on the back of the neck and several smaller ones around its neck. Two spine rows on each side run along its back. It is considered rare and endangered by the DFG and Category 2 in the Federal



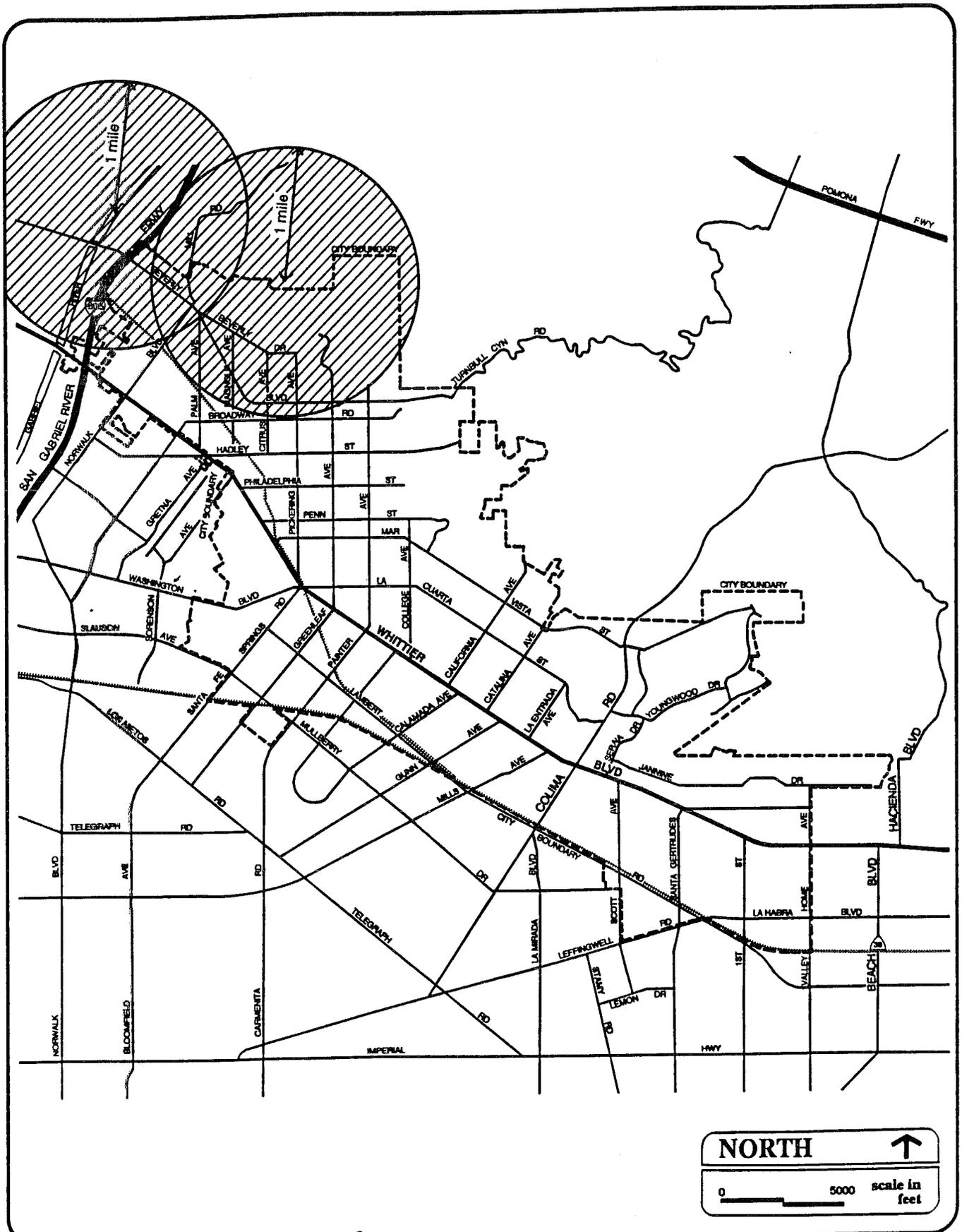
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GENERAL PLAN

**EXHIBIT 5-5
ENDANGERED SPECIES**



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**EXHIBIT 5-6
SAN DIEGO HORNED LIZARD**

listing. It was located 3 miles southeast of the San Gabriel River, northwest of the City and last observed in 1960. The lizard was located in Sycamore Canyon in the northwestern section of Whittier. The lizard was also found south of the Whittier Narrows Dam along the San Gabriel River with the specimen at the Whittier Narrows Nature Center. It is believed to be in existence at these sites (see Exhibit 5-6).

- The Southwestern Pond Turtle (*Clemmys Marmorata Pallida*) is a fresh water turtle about 1 foot long. It is brownish-yellow in color with a grayish-brown neck with dark spots. It lives most of the time in water and comes out on logs and rocks during summer. It feeds on water plants, insects and dead animals. The female lays eggs on sandy soil. It is considered rare and endangered by the DFG and a Category 2 Federal Listing. It was seen in Monterey Park in 1965 in a gully drainage area south of Orange Avenue and at the San Gabriel River near Mountain View High School in El Monte in 1977. Turtles were found in a small pond at Whittier Narrows Dam near San Gabriel River in 1976. They were also found at the Alhambra Wash where the wash meets the Rio Hondo River at the Whittier Narrows Recreational Area. The species is presumed to be in existence.

- Parish's Gooseberry (*Ribes Divaricatum Var Parishii*) is a thorny bush with 3 to 5 lobed maple-like leaves which are alternate (not opposite like maples). In winter, it grows long papery-scaled brown buds, very narrow leaf scars, lines on twigs and a papery shreddy bark. These plants have 1 to 3 thorns at the base of leafstalks. Their fruits are ball-shaped and bristly in clusters of 1 to 5. The fleshy berries are eaten by most birds and some mammals. Twigs and barks are eaten by animals too. The Parish's Gooseberry is considered endangered by the DFG and Category 2 in the Federal List. It was last seen in 1980 or 1981 at the Whittier Narrows under the power lines and immediately east of a power line, north of the flood control channel. A single plant was found on sandy loam soil growing with *Ribes Aureum*. Collections may be seen at the Whittier Narrows Nature Center. This plant species is presumed to be in existence.

- The California Walnut Woodland consists of California Walnuts (*Juglans Californica*), strong-smelling 15 to 50-foot trees. Young branches of the tree have brownish fuzz and slender leaflets are 1.5 to 3 feet long. Female flowers are egg-shaped with curved yellow stigmas. It is considered endangered by the DFG but is not included under the state or federal listings. It was found in 1988 1.5 miles south of the Pomona Freeway on Fullerton Road south of Rowland Heights near La Habra Heights. The woodland was a closed canopy

forest on the north slope of the Puente Hills with annual grasses in the understory. Three stands were found, one with 60 percent coast live oak and 2 with 100 percent walnut. It is presumed to be in existence although threatened by nearby residential developments. The walnut woodland was also found north of Brea Boulevard, east of the Orange Freeway on the south side of Puente Hills and is bounded on western end by oil fields. It was mapped as close canopy *Juglans Californica* in 1935 but the canopy has become thin.

Although not reported to the Department of Fish and Game, a live-forever (*Dudleya*) was once found on the slopes of Sycamore Canyon. It is a 6 to 12-inch plant rising from a low circle of fleshy leaves. Flower stems are thin and flowers are yellow, orange or red. This species is considered endangered by the California Native Plant Society.

OPEN SPACE RESOURCES

Open space serves as outdoor recreation areas and allows the preservation of resources and the promotion of health and safety. Open space includes all vacant land in the planning area, including undeveloped private land and public areas left as open space. Some open space areas are unsuitable for development due to steep slopes or unstable ground conditions. There are other areas that remain undeveloped to comply with existing land use controls. They include parks, building setback areas, utility easements, school fields and equestrian trails.

In Whittier, range open space lands are located mainly in the Puente Hills area. The hillside areas above the City are basically undeveloped and provide the area and surrounding region with a unique ecology. Managed resource lands in the Puente Hills include oil production lands, flood control facilities and managed parkland such as the Murphy Ranch Wilderness Park and the Hellman Estate. Also, about 1,610 acres of the hillside area is planned for the expansion of the Rose Hills Memorial Park. Vacant land on the Puente Hills include Workman Hill, Sycamore Canyon, and Savage Canyon Landfill.

Residents have been calling for the preservation of the Puente Hills as a permanent open space area. The Whittier Hills Park Plan outlines the opportunities for a wilderness park for the hillside area extending from Workman Mill Road to Colima Road, north and east of the City. The implementation of the Plan would depend on the availability of funding to acquire all private lands within the proposed park site.

Natural resources in the hillside areas include the natural terrain and geology, soils, water, flora and fauna. Managed resource lands include oil fields, flood control facilities and natural preserves (Murphy Ranch Wilderness Park and Hellman Estate).

Land which is kept as open space for the public health and safety reasons in the planning area include areas with unstable soils, the earthquake fault zones, and areas with high fire risk. Areas with unstable soils are located in the Puente Hills. The Whittier earthquake fault zone runs northwest to southeast along the area north of the City. The hillside area is also a high fire risk zone because of topography and native vegetation. Public safety issues related to the wildfire risk and other constraints are discussed in the Public Safety Element Background Report.

City staff conducted field surveys to identify the location and distribution of development in the City. The information was mapped to define existing land uses. The Land Use Element Background Report discusses the distribution of existing land uses in more detail. Table 5-3 shows the areas which may be considered open space.

Vacant	265.1 acres	28.50%
Park	410.4 acres	44.12%
Friendly Hills Golf Course	154.8 acres	16.65%
Landfill	99.8 acres	10.73%
Total	930.1 acres	100.0%

Source: Whittier Planning Department, David Evans and Associates, 1991.

The Murphy Ranch Wilderness Park in the Friendly Hills area is a regional nature park. Unlike most parks, this one was left in its natural state rather than "developed" with grass, activity areas, and typical park furniture and buildings. It features riding and hiking trails and some picnic areas. The Hellman Estate is another undeveloped park on 200 acres which is owned by the City and maintained as a wilderness area. These parks provide recreational and educational values to the City. With the lack of undeveloped land, the parks represent important resources to the community.

The City itself is relatively built out with fairly low density development in most areas. Vacant areas are found in a few undeveloped parcels. Many of the large undeveloped areas in the Puente Hills are not suitable for development. They feature steep slopes or serve as water drainage courses. Other areas are large parcels under private ownership and are likely to develop in the future.

There are a number of private school sites in Whittier, including the Whittier College. Whittier College provides large open spaces visible to the public. These areas influence the urban form and contribute to the community identity of the City.

PARKS AND RECREATIONAL FACILITIES

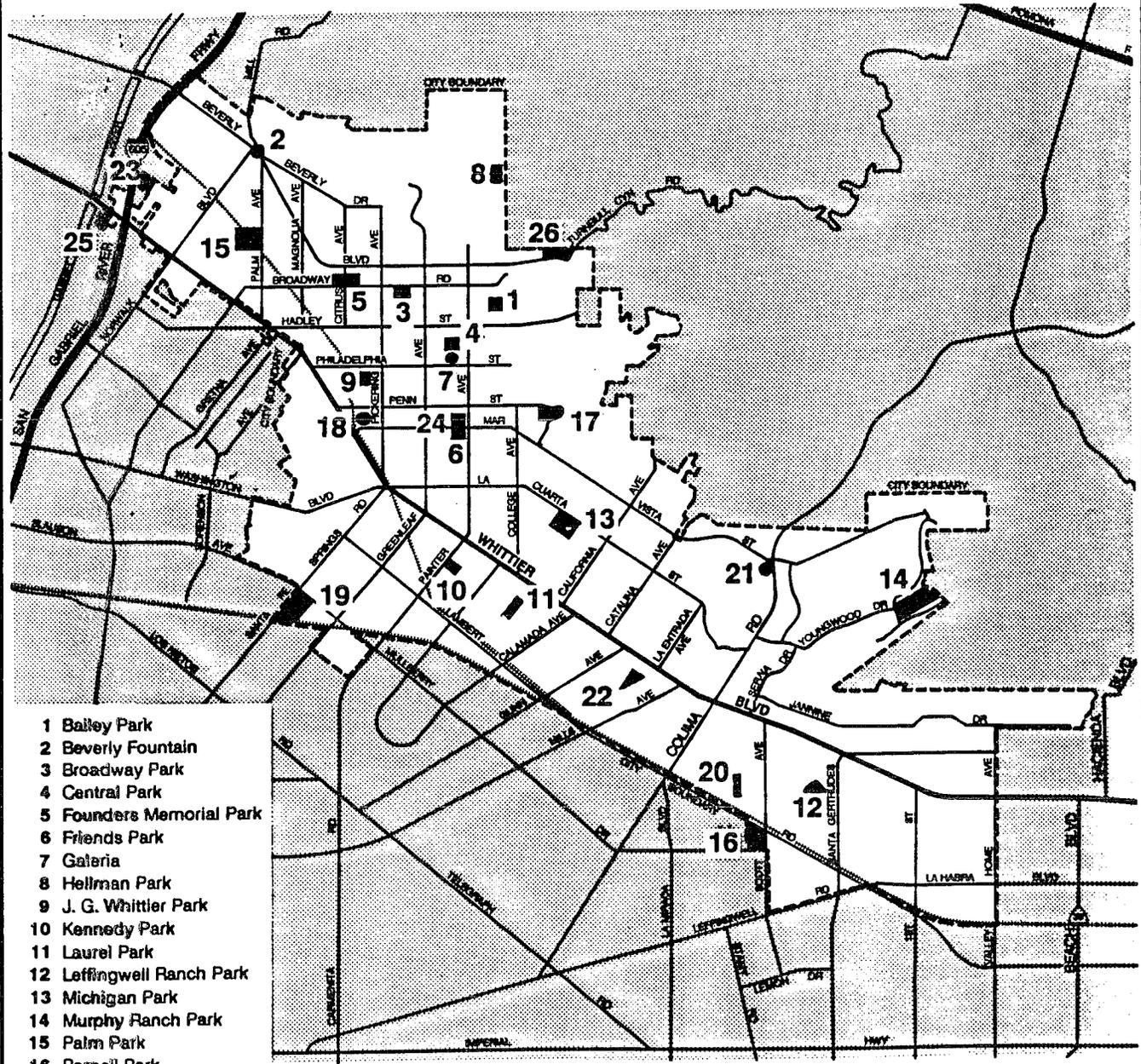
Manmade and natural recreation areas provide facilities for passive and active leisure activities and sports. These areas include regional parks, local parks, school facilities, public land, and private commercial recreational facilities. Other outdoor recreation areas include private recreational facilities, scenic areas, and school facilities available for the leisure and use of residents.

Description of Parks and Recreation Facilities

Public parks include all publicly-owned land which is used for recreation. City parks are found in various locations throughout the City. They are equipped with facilities designed for community, neighborhood, and special uses such as baseball fields, picnic areas, water fountains and play areas. Parks offer recreational, educational, and aesthetic values to the public. Exhibit 5-7 shows the location of all City parks and Exhibit 5-8 summarizes their facilities.

There are 24 City parks with sizes ranging from 1 to 200 acres in size. The total area occupied by City parks is approximately 337.9 acres. Large community parks in the City are Palm, Parnell, Michigan and Penn Parks and 2 wilderness parks - Murphy Ranch and Hellman Estate. Also, there is a 5.4-acre landscaped area on Whittier Boulevard which serves as a roadway median and holds the oldest Walnut Tree in the City. Table 5-4 lists the City parks, their addresses and size.

TABLE 5-4 CITY PARKS		
Park Name	Address	Size
Anaconda Park	14575 Anaconda Street	2.5 ac
Bailey Ranch House	13421 Camilla Street	0.5 ac
Broadway Park	12816 Broadway	3.0 ac
Central Park	6532 Friends Avenue	2.0 ac
Founders Memorial Park	6031 Citrus Avenue	4.0 ac
Friends Park	13229 Mar Vista Street	7.5 ac
Gallerias	Greenleaf Avenue	0.5 ac
Guirado Park	5760 Pioneer Boulevard	3.5 ac
Hellman Park	Greenleaf Avenue and Orange Drive	200 ac
Hester Landscape	Hester Avenue	0.5 ac
Hoover(Beverly) Fountain	10839 Beverly Boulevard	1.0 ac



- 1 Bailey Park
- 2 Beverly Fountain
- 3 Broadway Park
- 4 Central Park
- 5 Founders Memorial Park
- 6 Friends Park
- 7 Galeria
- 8 Hellman Park
- 9 J. G. Whittier Park
- 10 Kennedy Park
- 11 Laurel Park
- 12 Lettingwell Ranch Park
- 13 Michigan Park
- 14 Murphy Ranch Park
- 15 Palm Park
- 16 Parnell Park
- 17 Penn Park
- 18 Walnut Tree
- 19 York Field
- 20 Hester Landscape
- 21 Mar Vista Fountain
- 22 Anaconda Park
- 23 Guirado Park
- 24 Joe Miller Field
- 25 Pio Pico State Park
- 26 Beverly Hills Estates Park

NORTH ↑

0 ————— 5000 scale in feet

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**EXHIBIT 5-7
EXISTING PARKS**

Recreation Building	Supervised Recreation	Picnic Facilities	Cook Facilities	Playground Equipment	Gymnasium	Swimming Pool	Wading Pool	Multi-Purpose Fields	Baseball Fields	Multi-Purpose Courts	Basketball Courts	Tennis Courts	Volley/Badminton Courts	Handball Courts	Shuffleboard Courts	Rogue Courts	Horseshoe Pits	Overnight Camping	Restrooms	Off-Street Parking	Lighted Facilities		
																						HISTORICAL LANDMARKS	
																							Bailey Park
																							Walnut Tree
																							SPECIALTY PARKS
									●										●	●			Joe Miller Field
								●									●		●	●	●		York Field
																							MINI PARKS
																							Beverly Fountain
																							The Galerias
																							Hester Landscape
																							Mar Vista Fountain
																							NEIGHBORHOOD PARKS
																							Anaconda Park
	●		●	●	●						●										●		Guirado Park
	●	●	●	●		●		●		2		4								●	●		Broadway Park
		●	●	●							2		6	●	2					●	●	●	Central Park
		●	●	●																	●	●	Founders Memorial Park
		●		●			●	●	1							●			●	●	●	Friends Park	
	●	●	●	●						1										●			J. G. Whittier Park
	●	●	●	●			●	●									●			●	●	●	Kennedy Park
	●	●	●	●													●			●			Laurel Park
		●									4											●	Leffingwell Ranch Park
																							COMMUNITY PARKS
	●	●	●	●			●	●	1	●		1				●			●	●	●		Michigan Park
	●	●	●	●		●	●	●	1	●	1	7	1			●	4			●	●	●	Palm Park
	●		●	●	●		●	●	1	●	1	1								●	●	●	Parnell Park
		●	●	●	●		●	●		●		1						●		●	●	●	Penn Park
																							NATURAL PARKS
																							Hellman Park
	●	●																					Murphy Ranch Park

TABLE 5-4 CITY PARKS		
Park Name	Address	Size
Joe Miller Field	7630 Washington Boulevard	---
Kennedy Park	8530 S. Painter Avenue	2.0 ac
Laurel Park	8825 Jacmar Avenue	1.0 ac
Leffingwell Ranch Park	15740 Starbuck Street	2.0 ac
Mar Vista Fountain	Mar Vista and Colima Roads	0.5 ac
Michigan Park	8228 Michigan Avenue	10.0 ac
Murphy Ranch Park	Youngwood and Las Cumbres Avenues	48.0 ac
Palm Park	5703 Palm Avenue/5785 El Rancho Drive	12.0 ac
Parnell Park	10711 Scott Avenue	11.5 ac
Penn Park	13950 Penn Street	8.0 ac
J.G. Whittier Park	7227 S. Whittier Avenue	2.5 ac
York Field	Santa Fe Springs Road and Slauson Avenue	10.0 ac
Walnut Tree Landscape	Whittier Blvd. south of Philadelphia St.	5.4 ac
	TOTAL	337.9 ac

Source: Whittier Parks Department, 1991.

The City also offers recreational programs, organized sports and other activities. They include the Whittier Hills Bike Challenge, Little League baseball, Pop-Warner Football, Whittier Grand Prix, and the Bicycle Race, among others. The City has a Community Center Building with multi-purpose rooms and an auditorium with a stage. The facility can accommodate 10 or more groups at one time.

Aside from City-owned parks, there are nearby County parks. They include Gunn Avenue Park on 10130 S. Gunn Avenue; La Mirada Regional Park at 13701 S. Adelfa Avenue; Amelia Mayberry Park at 13201 E. Meyer Road; McNees Park on Gretna Avenue and Whittier Boulevard; and Sorensen Park on 11419 Rosehedge Drive. The State maintains the Pio Pico State Park on Whittier Boulevard, west of the San Gabriel River Freeway. The park is 2.5 acres in size and contains the Pio Pico Mansion which houses historical and cultural artifacts of the region.

Private outdoor recreation areas are privately-owned and operated for profit or for the benefit of members. Two privately owned facilities in the City: the Friendly Hills Country Club Golf Course and a segment of the railroad right-of-way used for the corralling and riding of horses. Other private facilities include Boys Club, YMCA, YWCA, bowling lanes, billiard parlors, and other recreation associated with membership or fees.

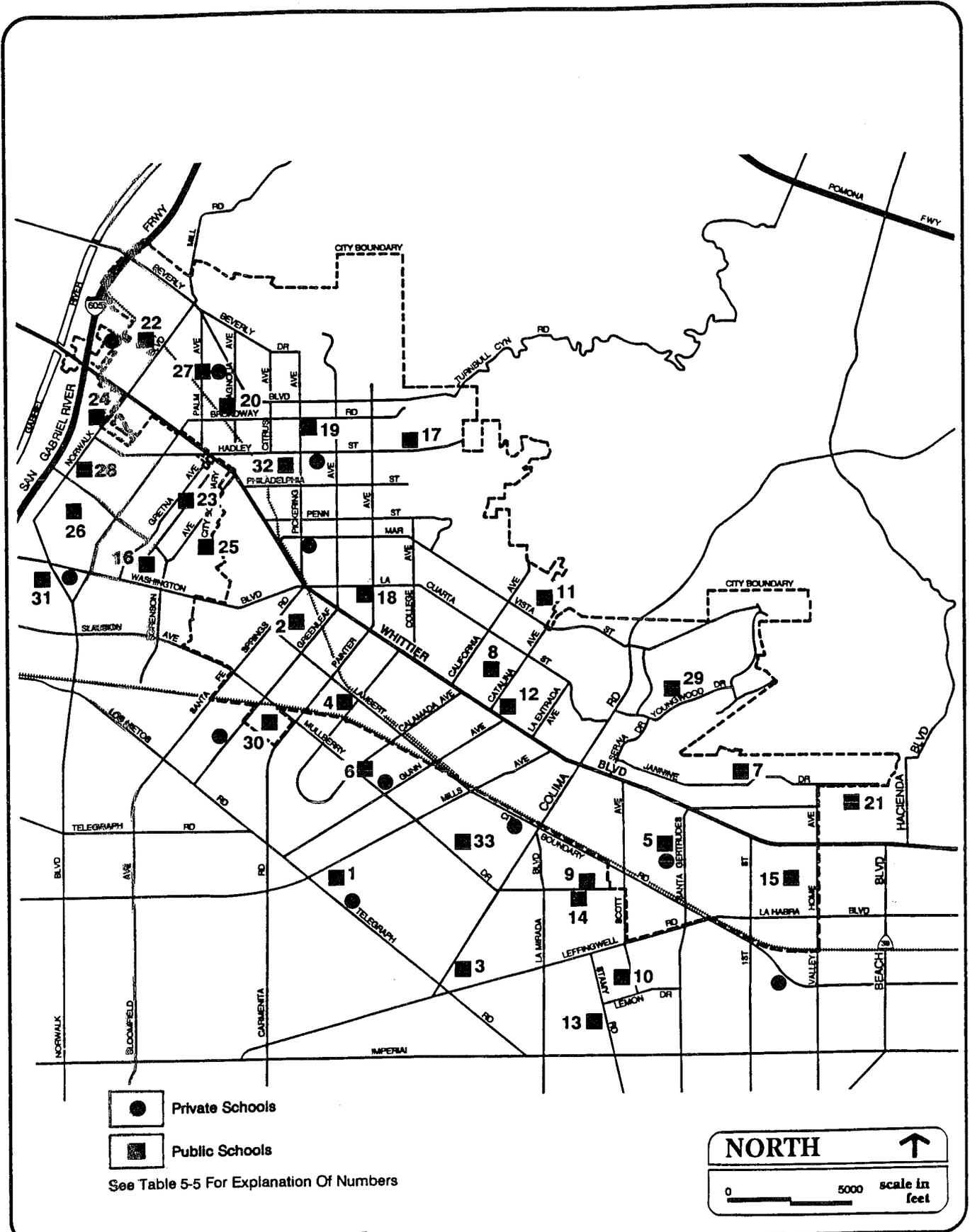
Schools

Public school sites are included as open space uses because they contain large open grounds that often supplement park open space. The school districts allow the use of playing fields and school grounds outside of school hours subject to prior arrangements. School sites are located throughout the planning area as shown in Exhibit 5-9. Table 5-5 lists the schools and their locations.

In particular, the Whittier Union High School District has an agreement with the City of Whittier for the use of school recreational facilities by the public. The Whittier Christian High School, the America Youth Soccer Association (AYSO), Parent Teacher Association (PTA), and the Whittier Police Department are groups that use the district's facilities.

Also, the Los Nietos and Lowell Joint School Districts have made their recreational facilities available to the public. Individual groups and organizations can use the facilities with prior arrangements with the schools. Little League, Boy Scouts, Girl Scouts, and PTA groups commonly use these facilities.

TABLE 5-5			
Site No.	School	Address	Size (acres)
1	Ceres School	10601 S. Ceres Avenue	10.5
2	Evergreen School	12915 E. Helmer Drive	9.7
3	La Colima School	11225 S. Miller Road	9.6
4	Laurel School	13350 E. Lambert Road	9.1
5	Leffingwell School	10625 Santa Gertrudes Avenue	10.9
6	Mulberry School	10429 E. Mulberry Drive	10.2
7	Murphy Ranch School	16021 E. Janine Drive	10.5
8	Ocean View School	14359 E. Second Street	9.8
9	Orchard Dale School	10625 E. Cole Road	10.1
10	Scott Avenue School	11701 S. Scott Avenue	8.6
11	Mar Vista School (leased out)	8036 S. Ocean View Drive	9.8
12	East Whittier Junior High School	14421 E. Whittier Blvd.	21.0
13	Granada Junior High School	15337 E. Lemon Drive	20.9
14	Hillview Junior High School	10931 S. Stamy Road	18.6



DECO DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



EXHIBIT 5-9
EXISTING SCHOOLS

TABLE 5-5			
Site No.	School	Address	Size (acres)
15	Jordan School	10654 Jordan Road	
16	Washington School	7804 S. Thornlake Ave.	9.0
17	Hoover School	6302 S. Alta Avenue	5.5
18	Jackson School	8015 S. Painter Avenue	4.0
19	Lincoln School	12620 E. Broadway	2.5
20	Longfellow School	6005 S. Magnolia Avenue	5.0
21	Macy School	2301 W. Russell Road	
22	Orange Grove School	10626 E. Orange Grove Ave	10.5
23	Sorensen School	11493 E. Roschedge Dr.	7.0
24	West Whittier School	6411 S. Norwalk Blvd.	6.5
25	Wiggins School	7348 S. Wexford Ave	
26	Phelan School	7150 S. Cully Avenue	10.0
27	Walter Dexter Junior High School	11532 E. Floral Drive	16.0
28	Edwards Junior High School	6812 S. Norwalk Blvd.	21.0
29	La Serna High School	15501 Youngwood Drive	40.0
30	Frontier High School	9401 S. Painter Avenue	
31	Pioneer High School	10800 E. Benavon Street	40.0
32	Whittier High School	12417 Philadelphia Street	29.48
33	California High School	9800 Mills Avenue	59.3

Refer to Exhibit 5-9 for site location.
 Source: Whittier Union High School District, 1991; East Whittier High School District, 1991; Whittier City School District, 1991.

Bicycle and Equestrian Trails

There are a number of county trails near the City of Whittier. Many of the trails run along rivers, washes and flood control channels. In Whittier, the Rio Hondo and San Gabriel Rivers provides riding and hiking trails leading to as far south as Long Beach and north into the Los Angeles National Forest in the San Gabriel Mountains.

The Rio Hondo River Trail is a 15 mile long trail along the Rio Hondo Flood control channel and wash. It is the extension of the Santa Anita Wash east of the City of Arcadia

and passes through the Whittier Narrows Recreation Area south until it joins the Los Angeles River Trail. This trail is used for biking, horse riding and hiking.

The San Gabriel River Trail runs along the San Gabriel River flood control channel for 24 miles, with staging areas at the Whittier Narrows Recreation Area, Santa Fe Dam Recreation Area in Irwindale, El Dorado Park in Long Beach and the Santa Fe Springs Park. The trail starts at the foot of the San Gabriel Mountains, where it is connected to U.S. Forest trails in the Los Angeles National Forest by Van Tassel Trail. The San Gabriel River Trail runs from north to south, until it stops approximately 2 miles from the Long Beach Harbor.

The Skyline Trail runs along the ridge of the Puente Hills. It is 28 miles long from the Whittier Narrows Area, crossing the San Gabriel River Trail and east by the Puente Hills Landfill and into the Schabarum Regional Park. From this park, it continues northerly to the Walnut Creek County Park by the San Bernardino Freeway. The Walnut Creek trail starts from the park and goes northeast into the Frank Bonelli Regional Park in Pomona. The trail features rolling hills, open spaces, and urban areas. It provides views of the San Gabriel valley and the mountain ranges to the north. Proposed extension of the trail from Schabarum Park will lead it into the trail system of San Bernardino County.

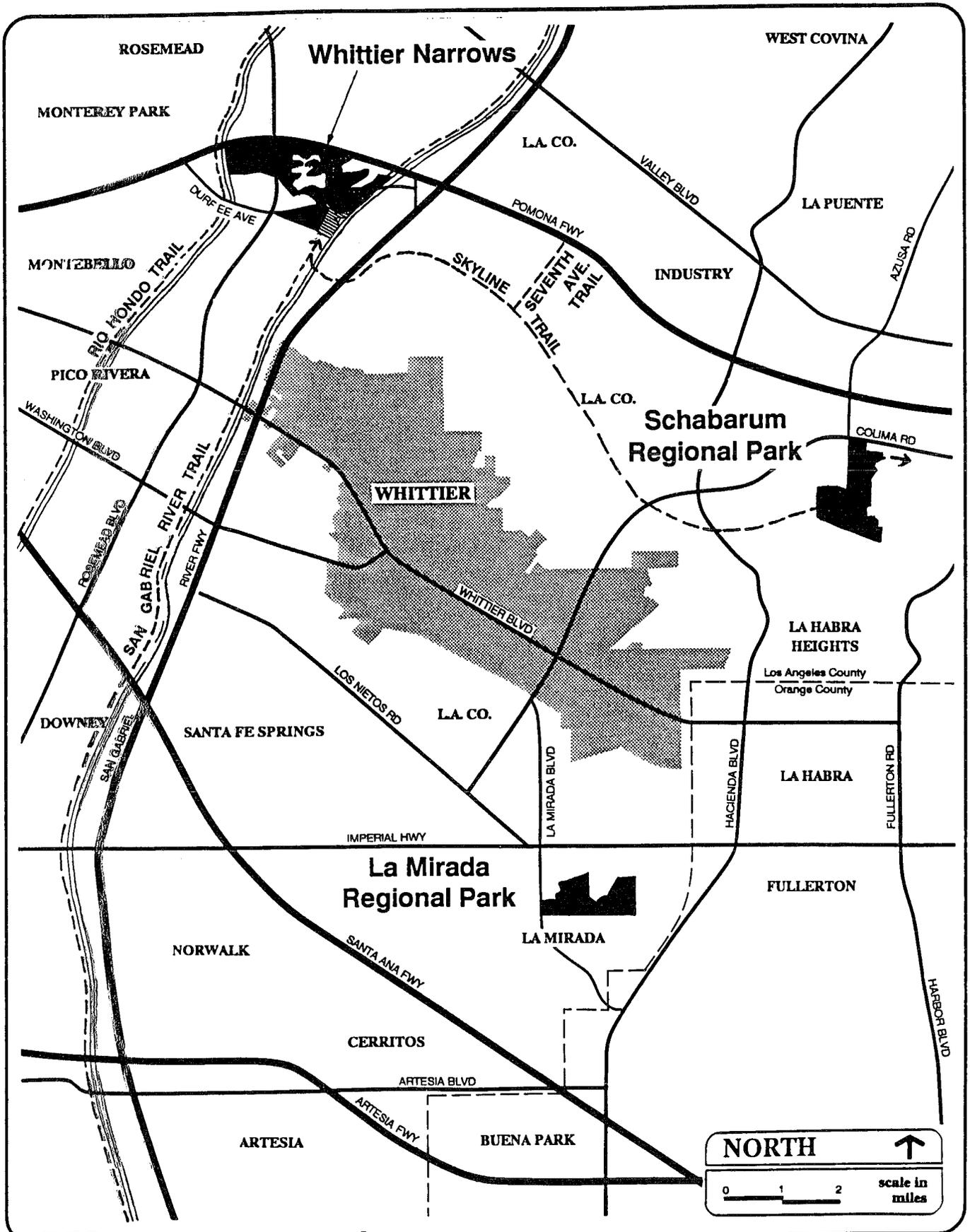
The Seventh Avenue Trail is a 2 mile trail along Seventh Avenue and is primarily an access from the north to the Skyline trail. A proposed Whittier connector trail will provide access from Whittier to the Skyline trail. Regional trails and parks in the area are shown in Exhibit 5-10.

There are designated bicycle routes in the City connecting the western and eastern sections of Whittier and running past the Uptown area. Class 1 routes are exclusive bikeways with minimum crossflows of vehicles and pedestrians. Class 2 routes are restricted bikeways with preferential use of bicycles. These are usually within the roadway on the outside lane by the curb. Exhibit 5-11 shows the designated bicycle lanes in the City.

Regional Parks

There are several regional parks near Whittier (see Exhibit 5-10). The Whittier Narrows Regional Park is located along the Pomona Freeway in El Monte, just west of Whittier. It is a groundwater recharge facility operated by the County Department of Public Works. The park covers approximately 1,092.21 acres of park areas and 206 acres are developed with a golf course.

The La Mirada Regional Park is located south of Whittier in La Mirada. It has approximately 105.56 acres of game fields, picnic areas, and a golf course on 104 acres.



DAVID EVANS AND ASSOCIATES, INC.



**EXHIBIT 5-10
REGIONAL PARKS AND
COUNTY TRAILS**

The Schabarum (formerly Otterbein) Regional Park is located at the corner of Azusa Avenue and Colima Road, northeast of the City. It covers approximately 589 acres and is linked to Whittier Narrows by the Skyline trail. It features picnic areas, game fields, hiking trails, a horse corral and undeveloped areas.

PARK NEEDS ASSESSMENT

The Puente Hills provide many of the open space and recreation resources of Whittier. Aside from its open space and recreation values, the hills contain unstable soils; is crossed by the Whittier earthquake fault; and has a high fire risk. Development in the area can also adversely affect air quality and destroy watershed and groundwater basin recharge areas. Unplanned development of the hillsides is also likely to destroy valuable scientific, educational, and cultural resources. Since this area is outside the City limits and under private ownership, it is difficult to control the use and development of the area. Still, it is in the City's interest to monitor development in the hillside areas.

The National Parks and Recreation Association has classified parks into different types:

- Mini Parks are approximately 1/4 to 1 acre in size with a 1/4 mile service radius. It often utilizes available vacant land and best located in high density housing and commercial areas. Mini-parks are considered only where larger parks not possible.
- Neighborhood Parks are 1 to 7 acres in size with a 1/2 mile service radius. They may be smaller (1 to 4 acres) if located near schools. The service area of neighborhood parks is defined by arterial streets, railroads and other physical barriers. Neighborhood parks often serve an established residential area and are used by bike-to or walk-to users.
- Community Parks serve several neighborhoods and are 7 to 30 acres with a 1 mile service radius. They serve drive-to users and have facilities such as tennis courts, swimming pools, multi-purpose courts, community center, senior citizen center, and other varied facilities.
- Specialty Parks often have only one facility such as tennis court or baseball field and would be used City-wide. A natural park is often developed by counties since its use is regional. It should cover 50 acres or more to accommodate users from the region. Natural parks may have lakes, and equestrian, hiking and bicycle trails. They often have unique vegetation and topography and are not fully developed.

Plotting the service radius around each park shows that most areas of the City are within easy access of a park. While most of the City is served by community parks (Exhibit 5-12) the northwest, southeast and eastern sections are not within easy access to neighborhood parks (Exhibit 5-13). Only the southeastern section of the City is outside both the community and neighborhood parks service areas.

Existing outdoor recreation areas in Whittier cover approximately 337.9 acres of land. The ratio of open space in public parks is 4.35 acres of parkland for every 1,000 City residents. The National Recreation and Park Association recommends a minimum of ten (10) acres per 1,000 residents of an urban area. This includes 4 acres of local recreation areas and 6 acres of regional recreation areas. In addition, the association recommends that there be within a one hour drive, another 15 acres of extra urban open space for each 1,000 residents.

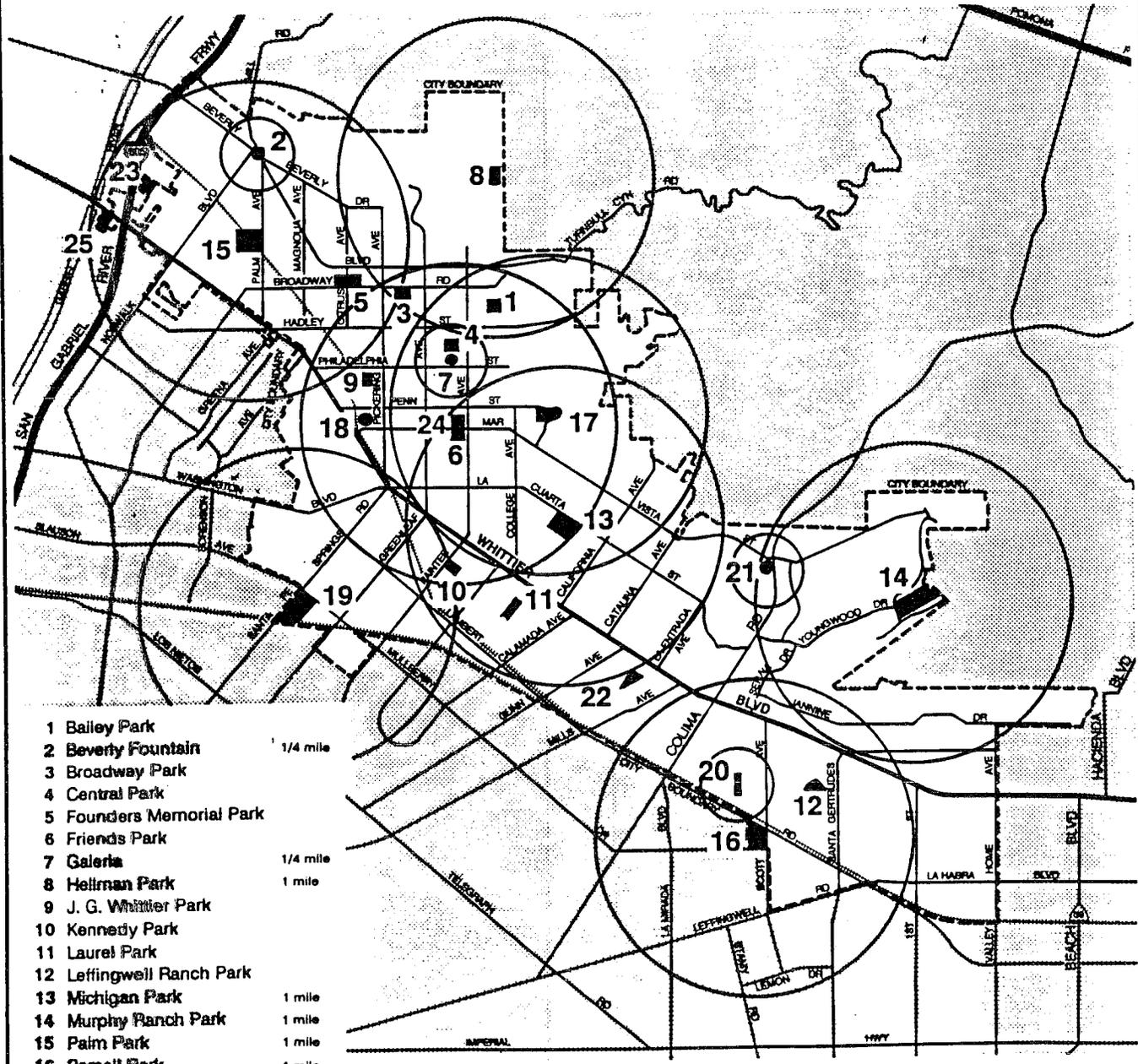
The City of Whittier is within the NPRA standard for local recreation areas. In addition, there are three regional parks in adjacent cities (Whittier Narrows, Schabarum, and La Mirada) and regional facilities (lakes, beaches, and mountains) are within easy driving distance from the City.

A Park Needs Study for Whittier was completed in 1977. It established a Parks Master Plan for the improvement of City parks and recreation facilities. The plan included the creation of better linkages between the different parks in the City; the provision of parks according to the needs of each community; and the creation of better visibility of parks for community identity. Programs and measures that the City can do to further develop its parks and recreational facilities include: buying vacant land or excess school property for new parks, forging more joint agreements for the use of school facilities; expansion of the bikeway system to utilize railroad and flood control rights-of-way; equal distribution of parks in City; and creation of better linkages of bikeways to adjacent cities and the regional system.

SCENIC AREAS

Scenic areas include areas that have unique visual and aesthetic values. The Puente Hills provide a visual framework for the City and a break in urban development. The hills are visible from almost any part of the City. Scenic vistas from the hills also have aesthetic value to the community. All of the Los Angeles Basin and surrounding mountains can be seen from the ridge lines on the hills on a clear day. Because the Puente Hills provide a valuable and unique visual amenity, the entire hillside area should be considered as a scenic resource.

Public and semi-public rights-of-way include power line rights-of-way, flood control easements and railroad rights-of-way. These areas have potential open space value as bicycle and equestrian trails, linear parks, or links between major recreation areas of the



- 1 Bailey Park
- 2 Beverly Fountain 1/4 mile
- 3 Broadway Park
- 4 Central Park
- 5 Founders Memorial Park
- 6 Friends Park
- 7 Galeria 1/4 mile
- 8 Hellman Park 1 mile
- 9 J. G. Whittier Park
- 10 Kennedy Park
- 11 Laurel Park
- 12 Leffingwell Ranch Park
- 13 Michigan Park 1 mile
- 14 Murphy Ranch Park 1 mile
- 15 Palm Park 1 mile
- 16 Parnell Park 1 mile
- 17 Penn Park 1 mile
- 18 Walnut Tree 1 mile
- 19 York Field 1 mile
- 20 Hester Landscape 1/4 mile
- 21 Mar Vista Fountain 1/4 mile
- 22 Anaconda Park
- 23 Guirado Park
- 24 Joe Miller Field 1 mile
- 25 Pio Pico State Park

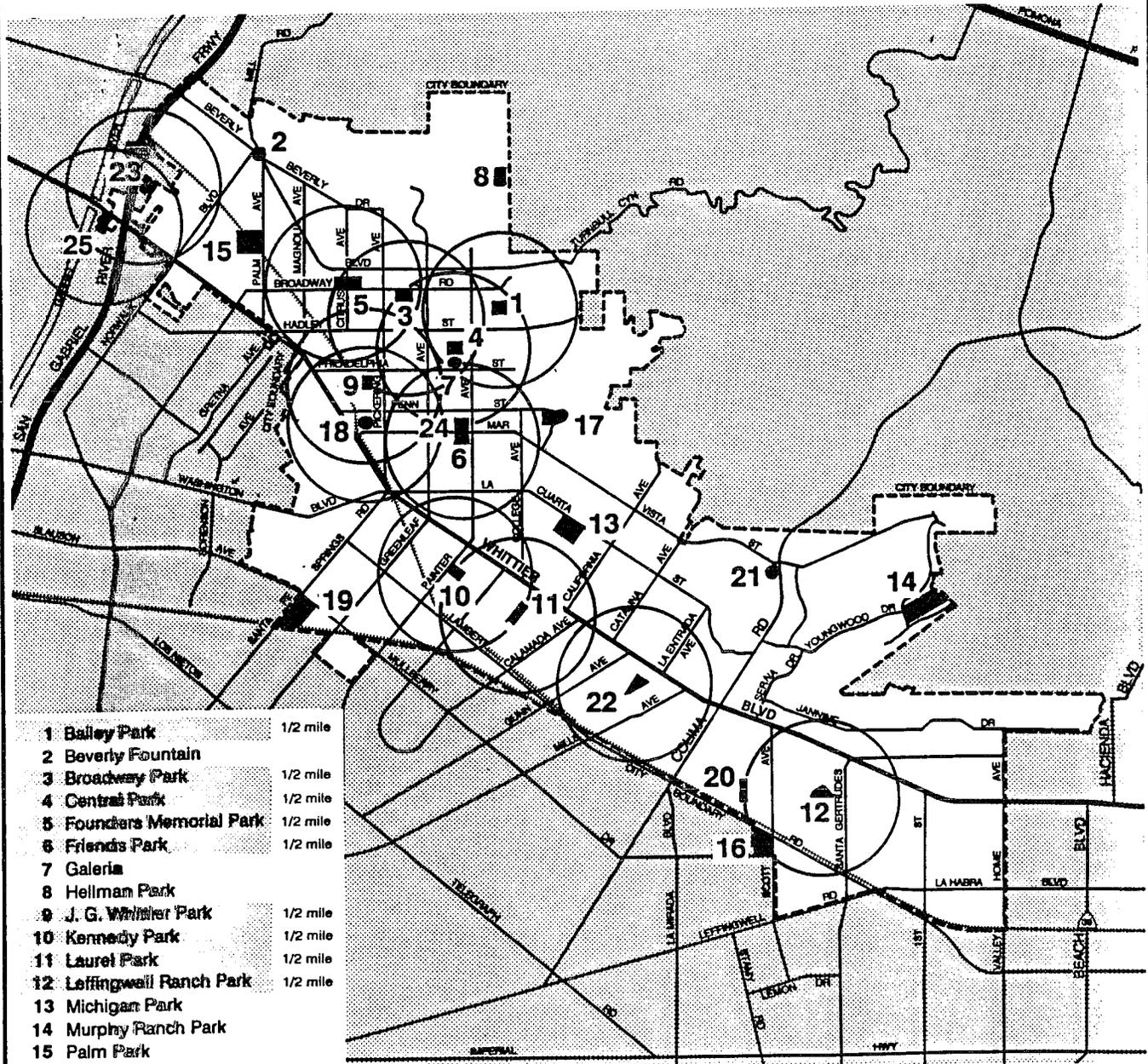
NORTH ↑

0 ————— 5000 scale in feet

DEA DAVID EVANS AND ASSOCIATES, INC.



EXHIBIT 5-12
PARK SERVICE AREAS
1/4 MILE AND 1 MILE RADII



- 1 Bailey Park 1/2 mile
- 2 Beverly Fountain
- 3 Broadway Park 1/2 mile
- 4 Central Park 1/2 mile
- 5 Founders Memorial Park 1/2 mile
- 6 Friends Park 1/2 mile
- 7 Galeria
- 8 Hellman Park
- 9 J. G. Whittier Park 1/2 mile
- 10 Kennedy Park 1/2 mile
- 11 Laurel Park 1/2 mile
- 12 Leffingwell Ranch Park 1/2 mile
- 13 Michigan Park
- 14 Murphy Ranch Park
- 15 Palm Park
- 16 Parnell Park
- 17 Penn Park
- 18 Walnut Trees 1/2 mile
- 19 York Field
- 20 Hester Landscape
- 21 Mar Vista Fountain
- 22 Anaconda Park 1/2 mile
- 23 Guirado Park 1/2 mile
- 24 Joe Miller Field
- 25 Pio Pico State Park

NORTH ↑

0 ————— 5000 scale in feet

DEA DAVID EVANS AND ASSOCIATES, INC.



EXHIBIT 5-13
PARK SERVICE AREAS
1/2 MILE RADII

City. Recreational use of these rights-of-way and easements is limited by their primary use and private ownership. There is a possibility that abandoned railroad rights-of-way could be converted to recreational use in the future. Flood control channels could be enhanced by the preservation of the natural water courses wherever feasible and concrete or riprap materials should be used only where erosion is likely.

Scenic Highways

Scenic highways refer to the road right-of-way and the scenic corridor along the right-of-way. The corridor includes areas adjacent to the roadway that create the visual appearance of the highway. The boundaries of the corridor are usually delineated by visibility from the road. The elements which make the scene are the major components of a scenic highway. These may be scenic, historic, or cultural features that merit recognition or interest as a destination or passive recreation. Scenic highways should provide opportunities for the development of roadside complementary facilities such as rest areas or viewpoints.

The designation of scenic highways should be based on the landscape or recreation resources within the corridor which provide a unique travel experience. There must be distinguishing characteristics such as natural beauty, historic, or cultural value. Other elements which influence scenic quality include proximity and accessibility of the highway; recreation and open space value; visual and aesthetic qualities of the scenic features along the route; and opportunities for compatible recreation and open space land uses along the route.

Routes within the Whittier planning area that may be considered for their scenic potential are shown in Exhibit 5-14. They include:

- Colima Road (east of Mar Vista Street) This route passes through natural undeveloped terrain and offers unique views of large stands of eucalyptus trees on the west slope of the hills. This route connects the City of Whittier directly with Rowland Heights, Hacienda Heights and the Schabarum Regional Park.
- Turnbull Canyon Road (east of Painter Avenue) Turnbull Canyon is historically one of the earliest sources of water for Whittier. The road consists of rugged steep slopes, varied natural vegetation and wildlife habitats, and has easy access to Workman Hill, which offers a 360 degree panorama of the Los Angeles Basin.
- Beverly Boulevard (from Norwalk Boulevard to Pickering Avenue) This street is planted on each side with rows of large mature pine trees and

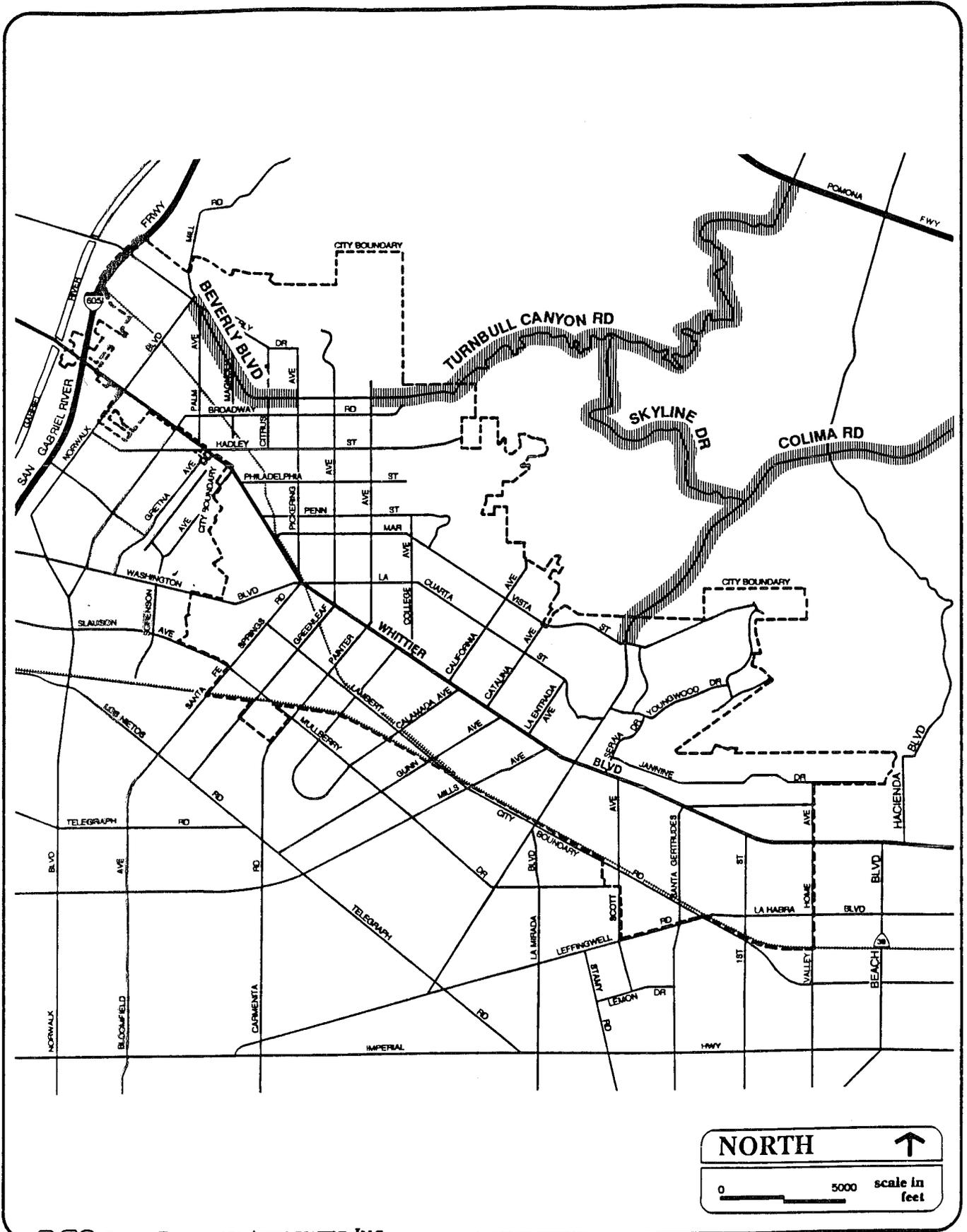
provides the most pleasing entryway into Whittier. The road should be preserved and possibly extended to connect with Turnbull Canyon Road and the westerly limits of the City.

- Skyline Drive (from Turnbull Canyon Road to south of Colima Road) This route is followed by the Skyline Trail which connects Whittier Narrows area with the Schabarum Regional Park. This corridor offers views of the Los Angeles Basin, the San Gabriel Valley, and the San Gabriel Mountains.

Major entryways into the City should also be designed as scenic corridors to help create an identity for the City. The City of Whittier could establish a corridor protection program and an ordinance for the protection of scenic corridors. The ordinance should contain guidelines for signs, utility lines, drainage, architecture and landscaping. The following elements should be considered in the protection and design of scenic highways:

- Roads and drainage ditches, culverts, drop inlets, bridges, etc.
- Buffers to screen out unsightly features existing outside the right-of-way.
- Outstanding scenic features abutting the scenic highway which may be destroyed by future developments.
- Pedestrian, equestrian, and bicycle paths and trails.
- View points, roadside rest areas, and parking turnouts.
- Rights-of-way for planting and landscaping.
- Highway widths to accommodate riding and hiking trails.
- Undergrounding of utility lines unless they are screened from view.

Cooperation with the County should be made for scenic corridors outside the City boundaries.



DECO DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



**EXHIBIT 5-14
POTENTIAL SCENIC ROUTES**

SECTION 6: AIR QUALITY ELEMENT BACKGROUND REPORT

INTRODUCTION

Southern California's air quality has become severely degraded, despite nearly 45 years of the most stringent pollution control in the nation. Air quality standards set by the State and Federal governments to protect public health are frequently violated. Ozone levels have been exceeded by significantly greater margins more frequently than anywhere else in the nation.

Early efforts in air pollution focused on the reduction of industrial emissions and were later expanded to include automobile emissions. More recently, efforts have been directed at the use of automobile, land, and energy sources rather than on expanding technological controls. Because these actions are largely the responsibility of local governments to implement, local governments are being asked to take a stronger role in air pollution control. The adopted 1989 Air Quality Management Plan (AQMP) for the Basin identified Air Quality Elements in General Plans as the focus for these local efforts.

This Background Report for the Air Quality Element to the City of Whittier General Plan is intended to provide the City's decision makers with information on local air quality, emission sources, and legal requirements for air quality planning. In addition, the report summarizes existing City programs already in place that meet AQMP requirements. This background information will provide the basis for identifying additional programs and policies to be incorporated into an Air Quality Element.

CLIMATE AND METEOROLOGY

The City of Whittier is located in the South Coast Air Basin of California, a 6,600-square-mile area encompassing Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It is an area of high air pollution potential.

Regional Climate

The strength and location of a semipermanent, subtropical high pressure cell over the Pacific Ocean primarily controls the climate of the Basin. Climate is also affected by the moderating effects of differential heating between the land area of California and the adjacent Pacific Ocean. Warm summers, mild winters, infrequent rainfall, moderate daytime onshore breezes, and moderate humidities characterize local climatic conditions.

The terrain features of the Basin make it possible for various micro-climates to exist within the area's overall climate. The pattern of mountains and hills within the Basin is primarily responsible for the wide variations of rainfall, temperatures, and localized winds that occur throughout the region. Temperature variations have an important influence on Basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry. Since the moderating marine influence decreases with distance from the coast, monthly and annual spreads between temperatures are greatest inland. Precipitation is highly variable seasonally. Summers are often completely dry. There are frequent periods of four to five months with no rain. In the winter, an occasional storm from the high latitudes sweeps across the coast, bringing rain. Annual rainfall is lowest in the coastal plain and inland valleys, higher in the foothills, and highest in the mountains.

City of Whittier Microclimate

The City of Whittier lies in the middle of the Los Angeles Coastal Plain. The area is within the semi-marine microclimatic zone of the South Coast Air Basin. Although generally behind the fog belt, the area is nearly always under the ocean's influence. Winters are seldom cold, frost is rare, and the temperatures seldom fall below twenty-eight degrees Fahrenheit (28°F). Spring days may be cloudy due to the presence of high fog. Summers are warmer than along the coast, but the entire area is reached by sea breezes and is not extremely hot (typical summer temperatures generally range from 68°F to 81°F). The area has lower winter temperatures than a marine climate, but is somewhat warmer and has less fog in the summer. Humidities tend to be lower than at areas close to the coast.

Annual average daytime temperatures range from 84.1 °F in August to 66.6 °F in January. Overnight low temperatures vary from 64.4 °F in summer to 48.4 °F during winter. Annual precipitation at Whittier is 14.85 inches and occurs almost exclusively from late October to early April.

Winds across the City are an important meteorological parameter since they control both the initial dilution rate of locally-generated air pollutant emissions, as well as their regional trajectory. Predominant wind patterns for the Whittier area generally follow those described for the Basin. During the day, the effects of the onshore flow reach inland across the Los Angeles Coastal Plain. During the night, surface radiation cools the air in the surrounding mountains and hills. The air then flows into the valleys and meanders to the coast, producing a gentle "land breeze".

The predominant daytime wind is from the west through southwest directions, demonstrating the effect of the regional onshore flow pattern. At night, the direction of the local offshore flow is generally out of the northeast through east directions at Whittier.

Differences in the frequency and direction of wind in the basin are due to the effects of seasonal and topographical variations. During summer, the nighttime land breeze nearly disappears, and conversely, the daytime sea breeze is weaker and of shorter duration in the winter.

A characteristic of the sea breeze flow that affects the observed daytime wind directions in the Whittier area is evident every month. In July, the onshore flow is at a maximum. (See Exhibit 6-1). The initial onshore flow from the Santa Monica Bay is westerly, while flow across the coast below the Palos Verdes Peninsula is more southerly. As the day progresses, the westerly flow becomes predominant, and the remaining southerly flow is pushed eastward and eventually becomes indistinct.

In summer, the weaker nighttime land breeze does not completely overwhelm the strong daytime onshore flow. As a result, very light southwesterly winds continue throughout most of the night, with variable eddies forming just before sunrise when the winds become non-distinctive. In winter, the land breeze is more pronounced and steady. Nighttime winds are normally sustained from the north-northeast throughout most of the night.

The predominant patterns for the Whittier area are broken by occasional winter storms and episodes of Santa Ana winds. Santa Ana winds are strong northerly or northeasterly winds that originate from the desert of the Great Basin and predominantly occur from September through March. Usually warm, always very dry, and often full of dust, these winds are particularly strong in passes and at the mouths of canyons. On the average, Santa Ana winds occur five to ten times a year, each lasting up to a few days.

Meteorological Influences on Air Quality

Regional flow patterns have an effect on air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as light winds and shallow vertical mixing, and topographical features, such as surrounding mountain ranges, create areas of high pollutant concentrations by hindering dispersal. Temperature inversions especially hamper dispersion by trapping air pollutants in a limited atmospheric volume near the ground. In the month of January, a surface inversion exists on 70 percent of the mornings. The average wind speed in the South Coast Air Basin is less than five miles per hour on 80 percent of the days during the summer smog season. This is a measure of daily stagnation.

During summer's longer daylight hours, plentiful sunshine provides the energy needed to fuel photochemical reactions between nitrogen oxides and reactive organic compounds which form ozone. To reach high levels of ozone requires adequate sunshine, early morning stagnation in source areas, high surface temperatures, strong and low morning inversions,

greatly restricted vertical mixing during the day, and daytime subsidence that strengthens the inversion layer. Because of ozone's long formation time in the atmosphere, ozone patterns are most affected by transport patterns. With southwesterly winds occurring on most days, the most frequent ozone transport route into Whittier is from source areas in the populated areas of the South Coast Air Basin to the west and southwest. Ozone precursor pollutants emitted in Whittier are most likely to contribute to ozone levels in areas to the northeast and east of the City.

In the winter, temperature inversions occur close to ground level during the night and early morning hours. At this time, the greatest pollution problems are from carbon monoxide and nitrogen oxides. High carbon monoxide concentrations occur on winter days with strong surface inversions and light winds. Carbon monoxide transport is extremely limited. Since carbon monoxide is produced almost entirely from automobiles, the highest concentrations are associated with areas of heavy traffic.

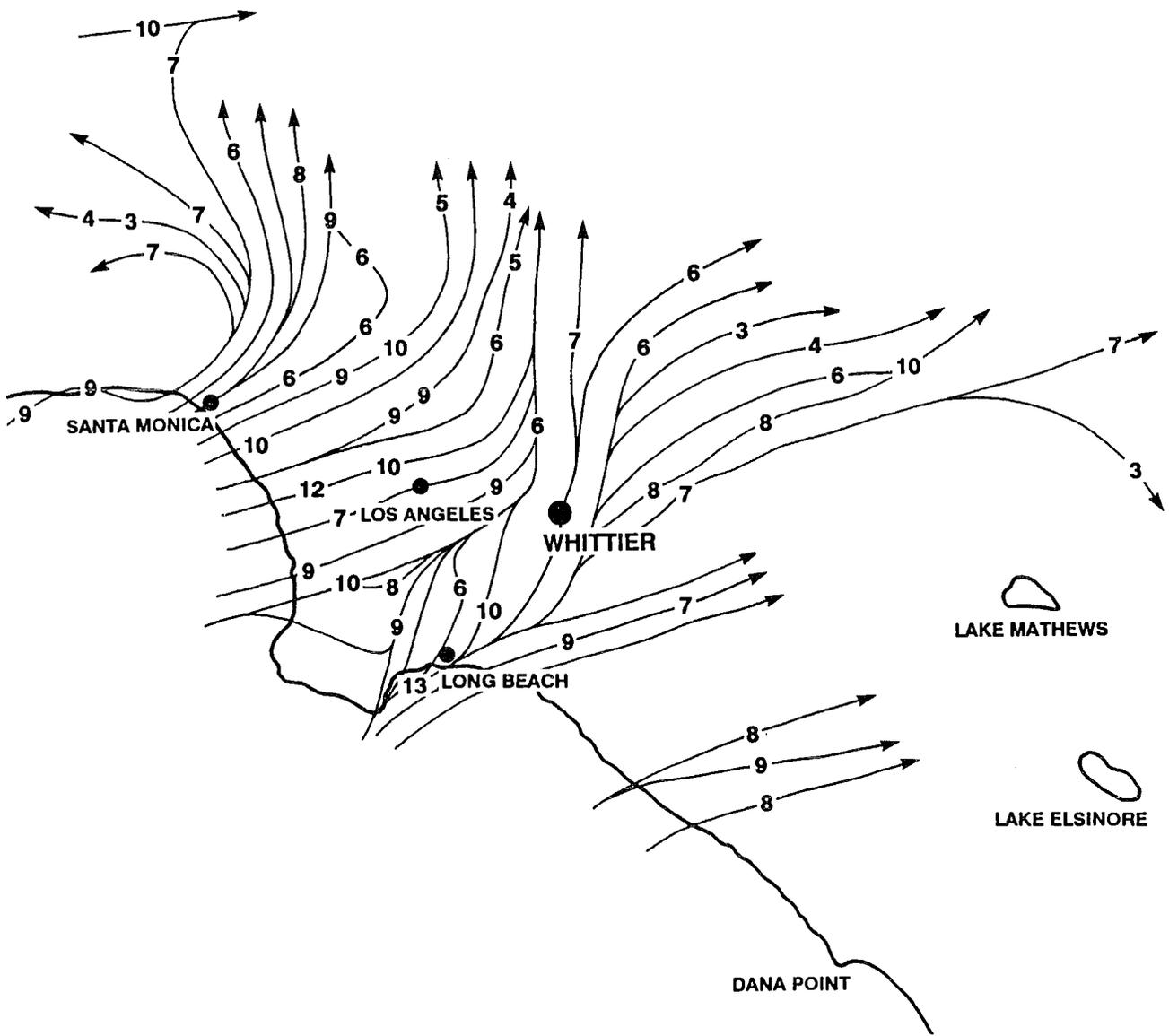
High nitrogen dioxide levels usually occur during the autumn or winter on days with summer-like weather conditions. These conditions include low inversions, limited daytime mixing, and stagnant windflow conditions. Although days are clear, sunlight is limited in duration and intensity and photochemical reactions necessary to form ozone are incomplete.

AIR QUALITY

Air Quality Standards and Pollutants

Air quality standards are set by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) at levels to protect public health and welfare with an adequate margin of safety. The State of California also sets ambient air standards. There are federal and air quality standards for six criteria pollutants: ozone (O₃), carbon monoxide (CO), fine particulate matter (PM₁₀), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb). California's ambient air standards are generally stricter than federal standards for the same pollutants. California also has established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Federal and California standards are shown on Table 6-1.

The four pollutants of major concern in the South Coast Air Basin are ozone, carbon monoxide, nitrogen dioxide and PM₁₀. Ozone (O₃) is a colorless toxic gas which irritates the lungs and damages materials and vegetation. Carbon monoxide (CO) is a colorless gas which interferes with the transfer of oxygen to the brain. Nitrogen dioxide (NO₂) is a reddish-brown gas which at high levels can cause breathing difficulties. PM₁₀ causes a greater health risk than larger sized particles since these fine particles can more easily



0 Average Wind Speeds In Miles Per Hour

NORTH ↑
no scale

NOTE: Information is the most frequent Basin wind flow during July at 12:00 PST.

SOURCE: A Climatological/Air Quality Profile, California South Coast Air Basin, Ralph W. Keith, SCAQMD, 1980

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City of Whittier



EXHIBIT 6-1
WIND FLOW PATTERNS

penetrate the defenses of the human respiratory system and cause irritation by themselves and in combination with gases.

TABLE 6-1 AMBIENT AIR QUALITY STANDARDS			
California		National	
Air Pollutant	Concentration	Primary	Secondary
Ozone	>0.09 ppm, 1-hr avg. ^a	>0.12 ppm, 1-hr avg.	0.12 ppm, 1-hr avg.
Carbon Monoxide	>9.0 ppm, 8-hr. avg. >20 ppm, 1-hr. avg.	>9.0 ppm, 8-hr. avg. >35 ppm, 1-hr avg.	>9.0 ppm, 8-hr. avg. ^b >35 ppm, 1-hr. avg.
Nitrogen Dioxide	>0.25 ppm, 1-hr avg.	0.053 ppm, annual avg.	0.053 ppm, annual avg. ^c
Sulfur Dioxide	≥0.05 ppm, 24-hr avg. with ≥0.10 ppm, 1-hr avg ozone or with 24-hr TSP ≥100 ug/m ³ >.25 ppm, 1-hr. avg.	0.03 ppm, annual avg. >0.14 ppm, 24-hr avg.	>0.50 ppm, 3-hr. avg.
Suspended Particulate Matter (PM ₁₀)	>30 ug/m ³ annual geometric mean >50 ug/m ³ , 24-hr. avg.	>150 ug/m ³ , 24-hr avg.; >50 ug/m ³ annual arithmetic mean	>150 ug/m ³ , 24-hr avg.; >50 ug/m ³ annual arithmetic mean
Sulfates	≥25 ug/m ³ , 24-hr avg. ^d		
Lead	≥1.5 ug/m ³ , 30-hr. avg.	≥1.5 ug/m ³ , calendar quarter	>1.5 ug/m ³
Hydrogen Sulfide	≥0.03 ppm, 1-hr avg.		
Vinyl Chloride	≥0.010 ppm, 24-hr. avg.		
Visibility-Reducing Particles	In sufficient amount to reduce prevailing visibility to less than 10 miles at relative humidity less than 70%, 1 observation.		

^a Effective 3/9/87. The standard was previously ≥0.10 ppm, 1-hr. avg.
^b Effective 9/13/85. The standard changed from ≥9.3 ppm to ≥9.5 ppm.
^c Effective 7/1/85, standard changed from >.0532 ppm to >.0534 ppm.
^d Effective 3/9/87, standard changed from ≥25 ppm to >25 ppm.
^e Effective 7/1/87. The standards were previously:
 Primary: Annual geometric mean TSP >75 ug/m³ and 24-hr avg. TSP >260 ug/m³
 Secondary: Annual geometric mean TSP >60 ug/m³ and 24-hr avg. TSP >150 ug/m³

TABLE 6-1 AMBIENT AIR QUALITY STANDARDS	
ppm	= parts per million by volume
ug/m ³	= micrograms per cubic meter
>	= greater than
≥	= greater than or equal to
Source: South Coast Air Quality Management District, 1991.	

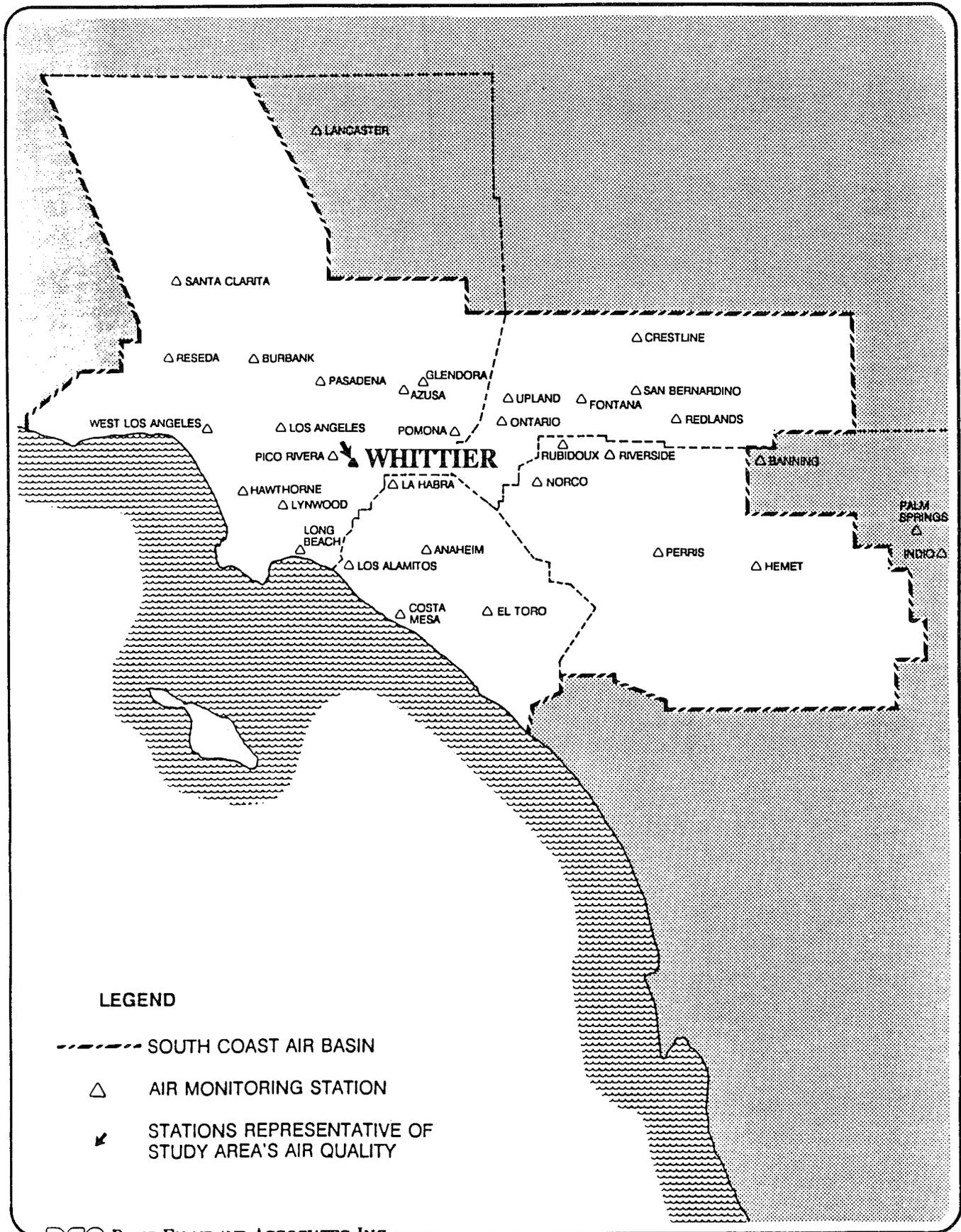
These pollutants come from vehicle exhaust, power generation, natural gas generation and the operation of certain equipment in construction and industry. Exhaust emissions from vehicles vary according to speed, type of engine (gasoline or diesel), the length of use, and the power available. Emissions from stationary sources occur at offsite power plants and are estimated by the amount of natural gas and electric power consumptions. Construction and industrial equipment generate pollutant emissions that are highly variable according to the type and technology of a specific equipment.

Existing Regional Air Quality

To determine regional compliance with air quality standards, the South Coast Air Quality Management District (SCAQMD) samples ambient air at over 32 monitoring stations in and around the Basin. Locations of these stations are shown on Exhibit 6-2. The Basin has not attained national and state standards for ozone, carbon monoxide, nitrogen dioxide, and PM₁₀

Levels of ozone exceed both national and state standards in all areas within the Basin. In 1989, the peak ozone reading was almost three times the National Ambient Air Quality Standard (NAAQS). The Los Angeles urban area exceeds this standard more frequently than any other area in the United States, and also records the highest peak readings. National and state standards for carbon monoxide are exceeded in more densely populated Los Angeles and Orange counties, but not in Riverside and San Bernardino counties.

The national nitrogen dioxide standard is exceeded in Los Angeles County, the only area in the nation which still exceeds this standard. The state nitrogen dioxide standard is exceeded in both Los Angeles and Orange counties. The number of readings over the standard fluctuates from year to year, depending on weather patterns. PM₁₀ levels regularly exceed the national and state standards in Los Angeles, Riverside, and San Bernardino counties, and state standards in Orange County. Sulfur dioxide and lead levels in all areas of the Basin are below national and state standard limits.



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City of Whittier



GENERAL PLAN

EXHIBIT 6-2
SCAQMD AIR MONITORING NETWORK

Existing Whittier Air Quality

Ambient air quality in the City of Whittier can be characterized by readings taken at the SCAQMD pollutant monitoring station located in Whittier. (See Exhibit 6-2). Table 6-2 lists the air quality readings at the Whittier station from 1986 through 1990. The SCAQMD monitors ozone, carbon monoxide, and nitrogen dioxide at the Whittier station. Neither PM₁₀ nor total particulates are monitored at Whittier or any monitoring station in the general vicinity. The nearest station that monitors PM₁₀ is the Los Angeles station. The last five years of PM₁₀ data from that station are shown in the table.

TABLE 6-2 SUMMARY OF AIR QUALITY DATA WHITTIER AIR QUALITY MONITORING STATION					
Pollutant Standards ^a	1986	1987	1988	1989	1990
Ozone (O₃)					
State standard (1-hr.avg.>0.09 ppm) ^b					
Number of days State standard exceeded	82	71	72	70	47
Federal standard (1-hr.avg.>0.12 ppm)					
Number of days Federal standard exceeded	39	40	29	37	21
Maximum 1-hr concentration (ppm)	0.25	0.23	0.29	0.26	0.19
Carbon Monoxide (CO)					
State standard (1-hr.avg.>20 ppm)					
State standard (8-hr.avg.>9.0 ppm)					
Number of days State 1-hr standard exceeded	0	0	0	0	0
Number of days State 8-hr standard exceeded	0	1	0	0	0
Federal standard (1-hr.avg.>35 ppm)					
Federal standard (8-hr.avg.>9.0 ppm)					
Number of days Federal 1-hr standard exceeded	0	0	0	0	0
Number of days Federal 8-hr standard exceeded	0	1	0	0	0
Maximum 1-hr concentration (ppm)	15	13	13	13	12
Maximum 8-hr concentration (ppm)	NA	9.7	7.29	8.8	9.0
Nitrogen Dioxide (NO₂)					
State standard (1-hr.avg.>0.25 ppm)					
Number of days State standard exceeded	1	0	0	1	0
Federal standard (0.053 AAM in ppm)					
Percent Federal standard exceeded	0	0	0	0	0
Maximum 1-hr concentration (ppm)	0.28	0.25	0.22	0.29	0.23

TABLE 6-2 SUMMARY OF AIR QUALITY DATA WHITTIER AIR QUALITY MONITORING STATION					
Pollutant Standards^a	1986	1987	1988	1989	1990
Total Suspended Particulates (TSP)^{c,d}					
State standard (24-hr.avg. > 150 ug/m ³)					
Percent of samples exceeding State standard	3	n.a.	n.a.	n.a.	n.a.
Federal standard (24-hr.avg. > 260 ug/m ³)					
Percent of samples exceeding Federal standard	0	n.a.	n.a.	n.a.	n.a.
Maximum 24-hr concentration (ug/m ³)	235	216	257	217	211
Suspended Particulates (PM₁₀)^{c,d}					
State standard (24-hr.avg. > 50 ug/m ³)					
Percent of samples exceeding State standard	66	62.1	56.9	56.9	51.7
Federal standard (24-hr.avg. > 150 ug/m ³)					
Percent of samples exceeding Federal standard	n.a.	1.7	0	0	1.7
Maximum 24-hr concentration (ug/m ³)	178	158	130	137	152
<p>AAM - annual arithmetic mean ppm - parts per million ug/m³ - micrograms per cubic meter NA - not available n.a. - not applicable</p> <p>^aPollutants shown are those for which South Coast Air Basin is designated a Federal non-attainment area. ^bThe State ozone standard was changed from ≥0.10 to ≥0.09 ppm (1-hr.avg.) in 1987. ^cTSP standards were superseded by PM₁₀standards in 1987. ^dTSP and PM₁₀readings are for the Los Angeles Monitoring Station.</p>					
Source: SCAQMD Air Quality Data, 1986-1990.					

Under predominant meteorological conditions, local emissions in Whittier tend to disperse towards the northeast and east during the day, and slowly drift southwest or south at night. Most industrial emissions contribute to regional ozone concentrations downwind, but can, especially under stagnant meteorological conditions, add to localized levels of ozone and other criteria pollutants (i.e., NO_x, CO, and PM₁₀).

Because of geographical and meteorological conditions, the Whittier area attains high ozone concentrations, and annually records a number of exceedances of the State and Federal ambient standards. Local sources of ozone precursors such as nitrogen dioxide (NO₂) and reactive organic compounds (ROC) contribute to regional levels of ozone. Local ozone concentrations usually result from the transport of precursor emissions produced from

upwind sources. Predominant wind patterns and temperature inversions, limit pollutant dispersion, both vertically and horizontally.

In addition, local automobile traffic contributes on occasion to elevated concentrations of carbon monoxide. Localized carbon monoxide concentrations are greatest in winter and occur at congested intersections generally along Whittier Boulevard. Carbon monoxide levels in the area exceed the State 8-hour standard a few times a year, but are below the 1-hour standard.

Nitrogen dioxide, an ozone precursor, periodically exceeds the state standard. As with other ozone precursors, high concentrations of NO₂ emissions in the City will increase ozone concentrations at downwind locations.

FEDERAL AND STATE AIR QUALITY PLANNING REQUIREMENTS

Federal Clean Air Act Requirements

The Federal Clean Air Act (1977 Amendments) stated that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards by December 31, 1987. The South Coast Air Basin could not meet the deadline for ozone, nitrogen dioxide, carbon monoxide, or PM₁₀. Congress enacted amendments to the Clean Air Act in October 1990 that extend this deadline to 2010 for all areas (including Southern California) that have severely degraded air quality.

The 1990 Amendments divided the nation into five categories of planning regions, depending on the severity of their pollution and set new timetables for attaining the air quality standards. The categories range from "marginal" to "extreme." Attainment deadlines are from three to twenty years, depending on the category. The attainment timeframe applicable to the South Coast Basin, which is the only region in the nation classified as "extreme," is 2010. Deadlines for attaining carbon monoxide and PM₁₀ standards are 2000 and 2005, respectively. Each nonattainment area must achieve a 15% reduction from its actual 1990 emissions inventory within six years. Thereafter, each area must achieve a 3% annual reduction.

Provisions of the 1990 Clean Air Amendments that relate to ozone and carbon monoxide non-attainment areas emphasize strategies for reducing vehicle miles travelled, and require submission of a plan revision "that identifies and adopts specific enforceable transportation control strategies and transportation control measures to offset any growth in emissions from growth in vehicle miles travelled (VMT) or number of vehicle trips in such area" to meet statutory requirements for demonstrating periodic emissions reduction requirements.

EPA can withhold certain transportation funds from states which fail to comply with the planning requirements of the Act. If a state fails to correct these planning deficiencies within two years of federal notification, EPA is required to develop a federal implementation plan for the identified nonattainment area or areas.

In the South Coast Air Basin, the agencies designated by the governor to develop regional air quality plans are the South Coast Air Quality Management District and the Southern California Association of Governments (SCAG). The two agencies adopted a revised Air Quality Management Plan (AQMP) on March 17, 1989. This plan, which set an attainment date for all pollutants of 2007, was adopted prior to enactment of the 1990 Clean Air Act Amendments. Therefore, the SCAQMD is required to prepare an amended plan in 1993 to conform to federal Clean Air Act requirements.

The 1989 AQMP emphasized local government measures and required adoption of local air quality elements.

California Clean Air Act

In 1988, the California Legislature enacted the California Clean Air Act (CCAA). The CCAA amended the enabling authority for air pollution control districts in California. The legislature gave these districts, including the SCAQMD, broad new authority through the CCAA to regulate motor vehicle use with indirect source controls in areas that have not met national or state ambient air quality standards.

The CCAA requires that regional emissions be reduced by 5 percent per year, averaged over 3 year periods, until attainment can be demonstrated. Each area that does not currently meet a national or state ambient air quality standard must prepare a plan which demonstrates how the 5 percent reductions will be achieved. A plan was to be locally adopted and submitted to the ARB by June 30, 1991. Areas, including the South Coast Air Basin, with the most heavily degraded air quality are required by the CCAA to reduce emissions 50 percent from 1987 levels by December 31, 2000. Plans must be updated in 1998 if attainment cannot be demonstrated by the year 2000.

1991 Air Quality Management Plan

In July 1991, the South Coast Air Quality Management District adopted the 1991 Air Quality Management Plan, which was prepared to address the requirements of the California Clean Air Act.

Local governments are required by the 1991 AQMP to implement specified AQMP measures, but the 1991 AQMP differs from the earlier 1989 AQMP in how local

Section 6: Air Quality Element Background Report (continued)

governments must comply. Truck restriction and parking management, including policies to revise parking codes, are the only measures required by the 1991 AQMP for inclusion in an air quality element for a city without a large special event center. Bicycle routes which facilitate home/work commuting are required in a general plan, although not necessarily in an air quality element. Other measures can be implemented through adoption of ordinances at least as stringent as model ordinances to be developed by the SCAQMD.

The 1991 AQMP requires local governments to adopt ordinances for the following strategies:

- Person Work Trip Reduction
- Non-motorized Transportation
- Employer Rideshare and Transit Incentives
- Auto Use Restrictions
- Parking Management
- Merchant Transportation Incentives
- Auto Use Restrictions
- Truck Dispatching, Rescheduling and Rerouting

The SCAQMD declared its intent to adopt backstop rules that would be imposed in any city where implementation ordinances are determined by the SCAQMD to be inadequate. Additional local government measures, including control of emissions associated with new construction and reducing emissions from energy use, are also suggested in the AQMP.

Those measures for which the SCAQMD intends to adopt model ordinances are described below and summarized in Table 6-3.

TABLE 6-3 LOCAL ACTIONS REQUIRED OR RECOMMENDED BY 1991 AQMP				
AQMP STRATEGY	ORDINANCE		GENERAL PLAN	OTHER
	Required	Optional		
Alternative work weeks, telecommuting by government employees	X			
Alternative work weeks, telecommuting, trip reduction by local employers	X			
Telecommuting centers for new developments	X			

Section 6: Air Quality Element Background Report (continued)

**TABLE 6-3
LOCAL ACTIONS REQUIRED OR RECOMMENDED
BY 1991 AQMP**

AQMP STRATEGY	ORDINANCE		GENERAL PLAN	OTHER
	Required	Optional		
Set-aside local resident space for employers with multiple facilities	X			
Zoning and licensing to allow telecommuting and home employment	X			
Non-work trip reduction programs for special event centers	X			
Bicycle routes that support job and non-work trips			X	
Parking for bicycles, showers and locker facilities for new commercial and industrial facilities	X			
Trip reduction plans for employers of 100 and buildings housing 100	X			
Support for Transportation Management Association formation		X		
Parking management practices			X	
Revised parking codes			X	
Clean Streets Program	X			
Auto-free zones for special event centers (where applicable)			X	
Customer mode-shift incentives for large retail establishments	X			
Improved truck routing, delivery scheduling and shipping and receiving plans	X		X	
Supplemental development standards	X			
Actions to facilitate transit for regional shopping centers	X			

TABLE 6-3 LOCAL ACTIONS REQUIRED OR RECOMMENDED BY 1991 AQMP				
AQMP STRATEGY	ORDINANCE		GENERAL PLAN	OTHER
	Required	Optional		
Local implementation of Regulation XV		X		
Data collection for SCAQMD				X
Source: South Coast Air Quality Management District. 1991 AQMP Appendices IV-C and IV-E.				

The SCAQMD intends to adopt model ordinances for the following measures, which are described in Appendix IV-E of the 1991 AQMP:

Measure 1a - Person Work Trip Reduction

This measure requires that local governments adopt, by December 31, 1992, a program for alternative work weeks and telecommuting by local government employees that would reduce motor vehicle person work trips by 12%, increasing to 20% in 2000, and 30% in 2006. Local governments shall also support state legislation for employer tax credits for telecommuting equipment and services, as well as encourage the development of telecommuting centers.

Local governments are also required by the AQMP to adopt trip reduction ordinances for local employers to reduce employee motor vehicle person work trips through telecommuting; alternative work weeks and non-motorized transportation. The same targets apply as for government employees. The AQMP acknowledges that the impact of Regulation XV was not considered in setting these targets.

Local governments are also expected to adopt ordinances requiring regionally significant housing developments in housing-rich areas and regionally significant employment centers in job-rich areas to implement telecommuting centers in housing-rich areas.

By December 31, 1994, local governments should adopt ordinances that require employers with multiple facilities to set aside space in every office facility above a certain size to facilitate its use by employees who live nearby but would normally work at another location.

Local governments should examine, in conjunction with locally licensed businesses and cable television operators, the feasibility of developing centralized ordering and home delivery services. Local governments must ensure by December 31, 1992 that their zoning and

licensing ordinances permit telecommuting and do not excessively restrict reasonable home occupations. New facilities that include and use video teleconferencing facilities should be given credit for satisfying portions of local or regional indirect source requirements and VMT reductions.

1b - Non-motorized Transportation

In addition to the requirements above, local governments are required by the 1991 AQMP to adopt non-work trip reduction ordinances for large retail establishments and special event centers which require facilities and incentives for non-motorized transportation. If local governments fail to act, the SCAQMD would adopt an Indirect Source regulation requiring these measures.

By December 31, 1994, local governments should include bicycle routes in their General Plans that support the employer and non-work trip bicycle transportation plans included above. One option specified in the AQMP is for local governments to amend their General Plans to allow mixed use and cluster development and local commercial development within walking distance of residential areas.

By December 31, 1993, local governments are required to enact ordinances requiring that bicycle parking spaces be provided in new commercial and industrial developments in excess of 10,000 square feet, and that employee shower and locker facilities be provided in new commercial and industrial development in excess of 100,000 square feet.

2a - Employer Rideshare and Transit Incentives

Local governments are required to adopt an ordinance or regulation by December 31, 1992 to require facilities and buildings with 100 or more employees to submit trip reduction plans. Local governments may adopt one trip reduction ordinance that includes specific individual provisions and traffic reduction targets for this measure, as well as the two measures described above.

If actions are found to be ineffective, local governments should expand the regulation by 1994 to cover businesses and buildings with 25 or more employees. (Note: This measure transfers authority presently utilized by the SCAQMD in administering Regulation XV and expands coverage to include buildings housing 100 employees, as well as individual employers of 100 or more at a single site.)

Local governments shall also encourage the formation of Transportation Management Associations and support legislation favoring vanpools.

2b - Parking Management

By December 31, 1992, local governments are required by the AQMP to adopt an air quality element into their general plans and revise parking codes, as follows:

- Increase daytime parking fees in all congested centers
- Establish a surcharge for single occupancy vehicles and/or discount for multi-occupancy vehicles
- Eliminate peak-period parking on arterial streets
- Require employer-sponsored preferential parking for ridesharers for employers of 100 or more (short term) and 25 or more (long term)
- Establish residential parking zones/permit programs
- Implement short term commercial parking turnover through increased parking fees, shorter time limits, increased enforcement, etc.
- Implement Park and Ride and peripheral parking programs
- Increase parking enforcement
- Cap the number of parking spaces in a zone
- Cap the number of parking spaces permitted per square foot for a particular use
- Reduce the amount of free parking at non-work centers by limiting length of free parking time, validating only for purchase, or importing user charges based upon vehicle passenger occupancy rates
- Develop a local government parking fee structure to support transit and TDM programs
- Restrict residential parking to residents only through a permit process in all areas adjacent to congested commercial activity centers
- Allocate additional staff time and/or new parking enforcement techniques to parking enforcement operations
- Eliminate free parking for new non-residential developments

Local governments are required to establish procedures for reporting progress in implementing the above parking restrictions.

2d - Merchant Transportation Incentives

By December 31, 1992, local governments must adopt ordinances which would require large retail establishments to offer customer mode-shift travel incentives and require owners/managers/developers of existing and new retail establishments to provide incentives for non-motorized transportation needs. Suggested incentives include providing bike racks, pathway systems, and mixed use cluster developments.

If local governments do not act, the SCAQMD would adopt an Indirect Source regulation to implement the same control methods.

2e - Auto Use Restrictions

This measure applies only to special event centers with capacities of 10,000 or more and requires incorporation of offsite park-and-ride lots, shuttle services, etc. It also requires designation of auto-free zones in areas of associated pedestrian activity. The SCAQMD would develop a regulation if cities where such facilities are located fail to act.

3a - Truck Dispatching, Rescheduling and Rerouting

This measure requires local governments to adopt air quality elements in general plans which facilitate improved truck routing and delivery scheduling, and which call for the development of shipping and receiving plans. It also calls for local governments to adopt local ordinances or Memorandums of Agreement by December 31, 1992 to facilitate improved truck routing and delivery scheduling.

- Clean Streets Program

Local governments will be required to develop by December 31, 1992 a "clean streets" management program which includes enacting construction carryout and entrainment ordinances and vehicle entrainment ordinances, as well as controlling emissions from unpaved areas. Local governments may adopt Development Impact Fee ordinances or create street maintenance districts to fund this program.

Indirect Source Program

In addition to the programs listed above, the 1991 AQMP set forth the following local government measures as constituting its indirect source program, as required by the California Clean Air Act. The AQMP gives local governments the option of also adopting these measures and implementing them at the local level, or letting the SCAQMD adopt and implement them.

- Environmental Review Program
- Trip Reduction for Schools
- Supplemental Development Standards
- Special Activity Centers
- Enhanced Regulation XV
- Truck Programs
- Registration Program

■ **Sensitive Receptor Review for Risks from Toxic Air Contaminants**

The measures are described in detail in Appendix IV-C of the 1991 AQMP and summarized below:

M-H-1 - Environmental Review Program

The SCAQMD will adopt a rule that will establish standards for the air quality analysis in environmental documents and institute a review program in which the District would validate the adequacy of the air quality analysis for local governments and insure the incorporation of best available mitigation measures. The SCAQMD will also offer pre-project consultation review to developers to insure that mitigation measures are incorporated in project design in order to minimize delays associated with environmental document review. The pre-project review will be similar to review meetings that local governments hold when evaluating subdivisions.

M-H-2 - Trip Reduction for Schools

This measure would require that students at senior high schools and colleges be included in developing Regulation XV plans for the facility and meeting the required Average Vehicle Ridership (AVR).

M-H-3 - Supplemental Developmental Standards

This measure involves a number of source categories ranging from urban tree planting to reduce heat island effects, incorporating design standards that will support carpooling and non-motorized transportation modes such as bicycling through construction of showers and lockers, and actions to reduce vehicle idling. This measure would require local governments to adopt or amend zoning ordinances to specify minimum supplemental development standards for projects that are indirect sources. It would also require warehouses, business parks, etc. to provide consolidated freight loading/unloading zones. The SCAQMD will adopt a model ordinance.

M-H-4 - Special Activity Center

This measure is similar to the Special Event Center measure, but would also apply to airports and regional shopping centers. Suggested actions for shopping centers include offering discounts on merchandise to customers that utilize transit, institute a parcel delivery service for transit riders, give preferential parking to high occupancy vehicles, and working with local governments to establish temporary roadway controls. The City of Carson's local

shuttle service is cited as an example of an approach that could be used to partially fulfill this measure.

The SCAQMD will adopt a model delegation package and give cities the option of implementing the program at the local level, as authorized by Section 40717 (e) (1-3) of the Health and Safety Code.

M-H-5 - Enhanced Regulation XV

This measure would lower the size threshold for firms regulated by Regulation XV, the District's Employer Trip Reduction Rule and increase the average vehicle ridership (AVR) that must be met. Local governments currently have the option of requesting an exemption to Regulation XV so that they can implement the measure by applying for "certification" to the SCAQMD to implement the regulation. To receive such certification, local governments would need to adopt an ordinance at least as stringent as Regulation XV and to permit the District to audit implementation. Although it is not stated, local governments would presumably have to amend the local regulation to conform to Regulation XV each time the latter is amended.

M-H-6 - Truck Programs

The District will adopt a series of rules that would: (1) establish requirements for new and existing facilities that generate large numbers of truck trips, such as truck terminals, truck stops, and warehouses; (2) establish operating practices for facilities that receive trucks; (3) require facilities that attract trucks for the purpose of refueling to reduce truck-related emissions; and (4) restrict truck traffic on arterial streets during peak periods and establish a surcharge. For facilities that generate truck trips, credit would be given towards compliance if the trucks are low-emission vehicles, as defined by the California Air Resources Board. Local governments have the option of applying for certification to administer the program.

SCAG's guidance calls for truck operators to develop voluntary compliance plans. SCAG also states that local governments should consider levying a fine for noncompliance with the voluntary plan.

M-H-7 - Registration Program

This measure would require existing commercial and light industrial facilities to supply data to the SCAQMD on activities that impact the number and time that vehicles arrive at the facility. This information would be provided to the District, along with a small fee to support the cost of the program. Initially, data would be collected through Regulation XV

and the District's permit system. Later, the District would work with local governments to collect the needed data through their business licensing process. For cities that do not have a business licensing process, the SCAQMD would work directly with businesses.

M-H-9 - Sensitive Receptor Review for Risks from Toxic Air Contaminants

The District will develop a regional database and modeling tool for toxic air contaminants, based upon information received under the AB 2588 program. At the request of a city or county, the District will evaluate the potential impacts on a new development from existing toxic sources will be evaluated. A fee will be charged to cover the District's processing costs.

In addition to the above measures, SCAG's guidance calls for amending general plans and adopting ordinances and interregional agreements to implement SCAG's growth management performance (job/housing) goals.

Southern California cities differ significantly in size and character. Therefore, some recommended actions are not applicable to all cities. Other programs need to be tailored to meet the unique conditions of each city.

AQMP Conformity

The EPA requires that local and regional components of state implementation plans (SIPs) that are developed to meet federal standards include conformity procedures for evaluating federally funded projects. Conformity demonstration procedures for the 1989 AQMP extended these demonstration requirements to non-federally funded capacity-enhancing wastewater treatment projects and to regionally significant transportation and general development projects. Guidelines for demonstrating this conformity were developed by SCAG and approved by the SCAQMD and ARB. These conformity requirements were also extended to the 1991 AQMP. Criteria for determining whether a project is required to demonstrate conformity are shown in Table 6-4.

TABLE 6-4
AQMP GENERAL DEVELOPMENT CONFORMITY CRITERIA

1. Airports with at least 50 based aircraft, 25,000 annual itinerant operations, or 35,000 local operations.
2. Airports served by a CAB or PUC certified carrier.
3. Public use airports more than 20 miles away from the nearest airport meeting the above criteria.
4. Sports, entertainment or recreation facilities that accommodate at least 4,000 people per performance, or that contain 1,500 fixed seats or more.
5. Office building or office parks that employ more than 1,000 people or containing over 250,000 square feet.
6. Hotels or motels with 500 rooms or more.
7. New electrical generating facilities or expansion of existing generating facilities.
8. Transmission lines with capacity of 22 kw or more.
9. Flood control project, dams, reservoirs or debris basins on or affecting a major water body that has a tributary area greater than 20,000 acres at the county line, or facilities on a drainage course having a tributary basin greater than 50,000 acres and draining directly into the ocean.
10. Projects in an area that is designated to be of regional significance and concern in the SCAG adopted Conservation and Open Space Plan.
11. Industrial plants and industrial parks that employ more than 1,000 people, occupy more than 40 acres of land or contain more than 650,000 square feet of floor space.
12. Mining operations with more than 40 acres or producing 600,000 short tons annually.
13. Petroleum or gas refineries, recovery operations, storage facilities or expansion of existing facilities (not gas station storage facilities).
14. Designation of a drilling district.
15. Petroleum and gas pipelines that are part of national distribution system.
16. Water ports, or the expansion of an existing port, so that capacity is increased by at least one million short tons of cargo per year.
17. Small craft harbors with 300 or more boat slips or open water moorages, or expansions of an existing harbor to accommodate at least 300 additional boat slips or open water moorages
18. Residential development including mobile home parks with 500 dwellings or more.
19. State highways and arterial roads (construction or major modification) or roads that provide primary access to a regionally significant area (designated in the SCAG adopted Conservation and Open Space Plan).
20. Construction of a post-secondary school, public or private, for 3,000 students or more, or expansion of an existing facility having a capacity of 3,000 students or more by an addition of at least 20 percent more students.
21. Sewage treatment facilities with a capacity of at least 750,000 gallons per day, or the expansion of an existing facility by at least that much, and any proposed interceptor.
22. Shopping centers or trade centers that employ 1,000 persons or more, or contain 500,000 square feet of floor space.

TABLE 6-4
AQMP GENERAL DEVELOPMENT CONFORMITY CRITERIA

- | | |
|-----|--|
| 23. | Class I solid waste disposal sites or the expansion of an existing Class I site, or other sites of more than 40 acres, or expansions of sites by at least 40 acres. |
| 24. | Transit projects. |
| 25. | Water treatment facilities with a capacity of 225,000 gallons a day or more, or the expansion of an existing facility by that much, and proposed major arterial water mains. |
| 26. | Construction of a hospital of 500 beds or more, or expansion of a hospital of this size by 20% or more. |

Source: SCAQMD, 1991.

General development projects subject to conformity review must demonstrate that they conform to the subregional job/housing balance goals established in the SCAG's Growth Management Plan and incorporated in the AQMP. If not, such projects must implement trip reduction measures, user fees, or other appropriate mitigation measures which will achieve reductions in vehicle miles traveled (VMT) equivalent to the amount that SCAG estimates would be achieved through meeting the job/housing balance target. The 1991 AQMP simply calls for transportation demand measures equivalent to the job/housing performance goal. These measures must be in addition to all those otherwise required in the AQMP. Job/housing balance is still one option for achieving these reductions.

Initially, SCAG performs the conformity review for all applicable projects. Once a city or county has adopted an Air Quality Element consistent with the AQMP, the local jurisdiction takes over the conformity monitoring and SCAG review is no longer required. Each city or county is responsible for monitoring the cumulative impact of small projects within its jurisdiction to determine whether progress is being made towards achieving job/housing balance. Semi-annual reports on local actions to implement the plan, as well as progress towards achieving job/housing balance or equivalent reductions in VMT are required by SCAG and the SCAQMD in order to compile reports required by the California Air Resources Board as part of its 1989 AQMP approval action.

Conformity procedures for the 1991 AQMP were issued by SCAG in May, 1991. They require that environmental documentation for all regionally significant general development projects be forwarded to SCAG for review through the Inter-Governmental Review process. Staff will complete its review within the CEQA review period, providing the document is received by SCAG at the beginning of the review period. SCAG will charge a fee to cover staff review time and expenses.

Conformity procedures for general development projects are similar to those for the 1989 AQMP. Two areas of difference are (1) that mitigation measures which achieve reductions in vehicle miles traveled equivalent to that which would be achieved through jobs/housing

balance can be substituted for a jobs/housing balance demonstration, and (2) the analysis must show the alternative with the least air quality impact rather than showing that the project will result in no significant long term adverse impacts on air quality.

Comments are advisory to the lead agency. Failure to respond to SCAG's comments could establish a basis for legal challenge. Staff comments are subject to appeal to the Executive Committee. Once a local jurisdiction finds its general plan to be consistent with the AQMP, it may assume responsibility for making its own conformity findings.

Conformity results when a project is contributing to attainment of the appropriate regional vehicle miles traveled (VMT) target for its subregion. The VMT reduction target for the Long Beach/Downey subregion is 1,250,000 miles. Transportation control measures used to make this finding must be in excess of current requirements, including Regulation XV, and other AQMP transportation measures. Alternatively, the project may show conformity by contributing to the jobs/housing performance ratio for the subregion.

POLLUTION SOURCES

Whittier's economy is diversified, ranging from educational, medical and waste disposal facilities to professional and government offices to subregional retail centers to truck distribution centers to small to medium manufacturing companies. This latter category includes machine shops, printers, metal casters, food processors, building supplies, etc. The largest manufacturer in terms of employees is Calcor Space Facility, Inc. with 330 employees; the largest single source of emissions is CMC Printed Bag.

Many local facilities are covered by SCAQMD regulations. Examples of the types of industries which would be regulated include those which conduct metal plating; manufacture fiberglass and plastic products; use or store organic solvents; utilize degreasing equipment; and use materials which emit hazardous air pollutants. Landfills are also subject to regulation. The SCAQMD controls solvent emissions from dry cleaners, print shops, metal platers, etc. Internal combustion engines used in many operations are controlled. Commercial restaurants are subject to SCAQMD regulations covering charbroilers.

Any new, or modified existing, source of emissions that emits more than 1 pound a day of a regulated air pollutant is subject to the requirements of the recently revised SCAQMD Regulation XIII, which requires that all increases in emissions be offset by achieving at least an equal amount of reductions from existing sources. Small sources, i.e. sources emitting less than 2 tons/year of any regulated contaminant, are eligible to receive these offsets from the Community Bank, which is funded through shutdowns of facilities throughout the Basin. In addition, new or modified equipment is required to install Best Available Control Technology (BACT), as specified by the SCAQMD.

Section 6: Air Quality Element Background Report (continued)

Facilities which do not directly emit pollutants but which attract concentrations of motor vehicles are called indirect sources. Within this category, facilities with 100 or more employees are regulated by the SCAQMD's Regulation XV.

Whittier's contribution to regional air pollutant emissions is divided approximately equally among mobile sources; area sources (household emissions and those from commercial sources such as gasoline stations); and stationary or "point" sources, which include manufacturing emissions. Table 6-5 shows the relative contribution of each of these sources in Whittier.

Source	TOG	CO	NO _x	SO _x	PM
Area	4.51	2.21	1.11	0.10	12.60
Mobile	3.78	29.18	4.91	0.24	0.76
Point	4.94	0.31	1.91	0.83	0.43
TOTAL	13.23	31.71	7.92	1.17	13.78

Source: South Coast Air Quality Management District (May 1991)

The SCAQMD collects emissions data from all facilities within the District which annually emit more than 10 tons of any regulated contaminant. The eight largest stationary sources of emissions in the Whittier area in 1989 are listed in Table 6-6 and shown in Exhibit 6-3. Only two of these sources are within the Whittier City limits.

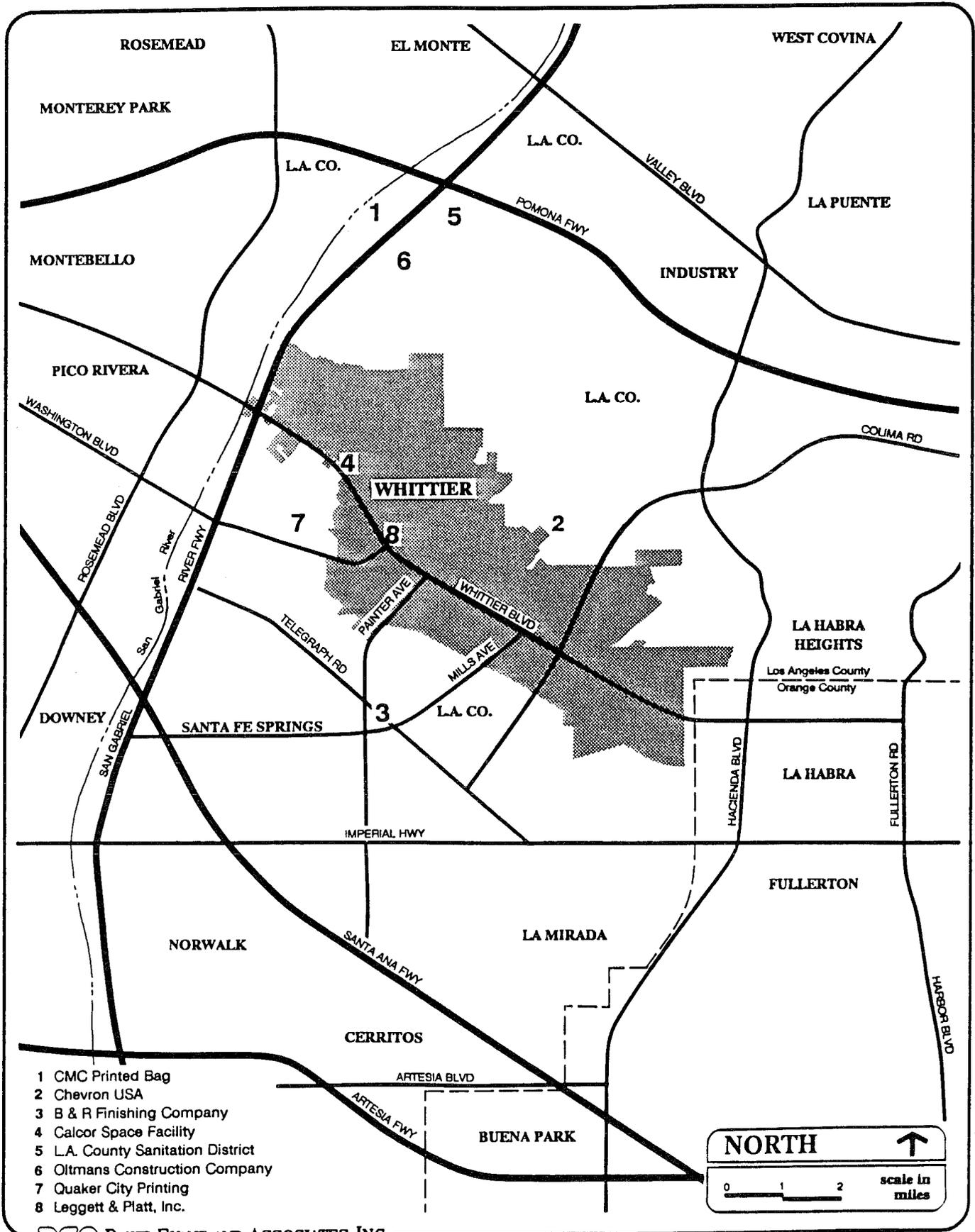
Source/Address	Emission Rate (tons/yr)				
	TOG	CO	NO _x	SO _x	PM
CMC Printed Bag 2615 Pacific Park	192	0	0	0	0
Chevron USA 8000 Catalina Street	74	3	21	0	0
B & R Finishing Co. 10704 Inez Street	21	0	0	0	0

Section 6: Air Quality Element Background Report (continued)

TABLE 6-6 LARGEST EMITTERS IN THE WHITTIER AREA IN 1989					
Source/Address	Emission Rate (tons/yr)				
	TOG	CO	NO _x	SO _x	PM
CALCOR Space Facility ^b 12031 Philadelphia	14	0	0	0	0
LA County Sanitation Dist. 2300 S. Workman Mill Road	19	20	64	38	36
Oltmans Construction Co. ^a 10005 Mission Mill Rd.	4	49	1	0	0
Quaker City Printing 11729 E. Washington	25	0	0	0	0
Leggett & Platt, Inc. ^b 12352 E. Whittier Blvd.	18	0	3	0	0
^a New source established in 1990 ^b Within Whittier City Limits Source: South Coast Air Quality Management District, May 1991.					

The South Coast Air Quality Management District's Regulation XV applies to all facilities which employ 100 or more persons at a single site. Employers subject to the regulation are required to develop plans which include sufficient incentives to bring the average vehicle ridership in employee vehicles to 1.5 persons. In 1991, there were 35 facilities in the City of Whittier which had 100 or more employees at one site. Some employers, such as the Whittier Unified School District, have several facilities which are subject to the Regulation. All eligible facilities on the SCAQMD rolls are shown in Table 6-7.

TABLE 6-7 SOURCES SUBJECT TO SCAQMD REGULATION XV	
Source	Address
Alpha Beta Company #150	13413 Telegraph Road
Arga's Mexican Food Products	2825 Pellissier Pl.
Board Ford, Inc.	15265 E. Whittier Blvd.
Broadway Department Store	15600 Whittwood Lane
Calcor Space Facility, Inc.	12031 E. Philadelphia St.
California (State)	11850 E. Whittier Blvd.



- 1 CMC Printed Bag
- 2 Chevron USA
- 3 B & R Finishing Company
- 4 Calcor Space Facility
- 5 L.A. County Sanitation District
- 6 Oltmans Construction Company
- 7 Quaker City Printing
- 8 Leggett & Platt, Inc.

NORTH ↑

0 1 2 scale in miles

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**EXHIBIT 6-3
POLLUTANT EMITTERS**

TABLE 6-7 SOURCES SUBJECT TO SCAQMD REGULATION XV	
Source	Address
Consolidated Converting Company	2601 Workman Mill Road
Delta Technical Coatings, Inc.	2550 Pellissier Pl.
GTE California	13925 E. Whittier Blvd.
Hinshaw's Dept. Stores, Inc.	13550 Whittier Blvd.
ICBO	5360 S. Workman Mill Road
ISUZU Motors America, Inc.	2300 Pellissier Pl.
J.C. Penney	15740 Whittwood Lane
L.A. County Sheriff Academy	11515 S. Colima Rd.
Los Angeles College of Chiropractors	16200 E. Amber Valley Dr.
Los Angeles Freightliner-GMC	2429 S. Peck Road
Miller Castings, Inc.	2503 Pacific Park Dr.
Presbyterian Intercommunity Hospital	12401 E. Washington Blvd.
Pupil Transportation Cooperative	9401 S. Painter Avenue
Ralphs Grocery Company #162	8510 Painter Avenue
Rose Hills Memorial Park	3900 S. Workman Mill Road
Sanitation District-Puente Hills	2800 S. Workman Mill Road
Sanitation District-San Jose Creek	1955 Workman Mill Road
U.S. Postal Service	8520 Michigan Avenue
Viking Freight System Inc. - Whittier	3200 Workman Mill Road
Whittier College	13406 E. Philadelphia St.
Whittier Hilton	7320 Greenleaf Avenue
Whittier Hospital	15151 Janine Dr.
Whittier Union High	9401 S. Painter Avenue
Whittier Unified School District	9800 Mills Avenue
Whittier Unified School District	15301 E. Youngwood Dr.
Whittier Unified School District	12417 E. Philadelphia

TABLE 6-7 SOURCES SUBJECT TO SCAQMD REGULATION XV	
Source	Address
Whittier, City of	12016 Hadley
Whittier, City of	13230 E. Penn St.
Source: South Coast Air Quality Management District, August 1991.	

The SCAQMD received authorization through the California Clean Air Act to adopt rules regulating indirect sources of pollutants. These are facilities which do not have equipment which emit pollutants, but which attract large numbers of automobiles and represent, in aggregate, a significant source of pollution. Colleges, hospitals, and shopping centers are examples of indirect sources, as well as any special event activity, whether occasional or regularly scheduled.

REGIONAL CLEAN AIR INCENTIVES MARKET

In March, 1992, the South Coast Air Quality Management District Board authorized staff to begin development of a regulatory system that would be a major departure from the traditional command and control system. The new program is titled RECLAIM, for Regional Clean Air Incentives Market. Companies subject to the new regulations will be able to achieve required emission reductions of reactive organic gasses, nitrogen oxides, and, potentially, sulfur oxides through their choice of add-on controls, use of reformulated products, and/or purchasing excess emission reductions from other sources. Equipment permits will be replaced with facility permits. Emission rates are to be replaced with mass emission limits. Retrofit control rules will be replaced with annual emission reductions.

The District is recommending that source categories with annual emissions equal to or greater than four tons of these pollutants be included in the program. They estimate that the program will apply to approximately 2,000 sources of ROG, 700 sources of NO_x emissions, and possibly 100 sources of SO_x emissions. Certain essential public services, restaurants, dry cleaners, and gasoline dispensing facilities will be regulated through command and control rules. Additional small source exemptions may also be considered where it appears more cost effective to regulate through source specific rules. Sources that emit less than 4 tons a year may be included in the program at a later date.

WHITTIER PROGRAMS IMPACTING AIR QUALITY PLANNING

As described earlier, Air Quality Elements or their equivalent must be incorporated in local general plans in order to conform to requirements of the adopted 1989 AQMP and the 1991

AQMP. Guidelines for the Development of Local Air Quality Elements have been prepared by the Southern California Association of Governments. These guidelines contain a number of actions which are recommended or required for local governments in order to conform to the 1989 AQMP. Southern California cities differ significantly in size and character. Therefore, some recommended actions are not applicable to all cities and programs need to be tailored to meet the unique conditions of each city.

Identification of existing programs and conditions in the City of Whittier that impact on air quality will help identify opportunities and constraints for new or modified programs. The following discussion expands on City programs that are helping to improve local air quality.

- **Land Use.** Although primarily residential, the City of Whittier's land uses also provides residents with a balance of shopping, entertainment, and cultural activities. There are also manufacturing and commercial employment areas, as well as the Whittier College.
- **New Construction.** The City has no special controls on fugitive dust other than complying with the SCAQMD's nuisance regulations. Developers must submit a grading plan before receiving a grading permit; the plan must include dust control on site, such as periodic watering, soil binders, etc. Trucks are not required to cover their loads on city streets. However, the City does notify the developer if complaints are received regarding dust from trucks on city streets.
- **Street Trees.** The City maintains street trees throughout the City and requires landscaping in new developments.
- **Energy.** The City uses Title 24, but has no additional ordinances. The City has no fuel-saving or alternate fuel vehicles. It plans to replace vehicles with lower-emitting vehicles as they need to be replaced.
- **Truck Travel.** Travel by trucks weighing over three tons (6,000 pounds) is prohibited by ordinance on many streets throughout the City. Trucks and trailers of any size can not park on any residential street. Trucks over 6,000 pounds are limited to 30 minute parking on any street or alley between 2:00 a.m. and 6:00 a.m. The City has no noise ordinance restricting trucks.
- **Parking.** Whittier provides free parking in Uptown. Street parking is limited to two hours between 9 a.m. and 6 p.m. Public parking lots in Uptown have three hour limits. Parking limits apply in selected areas throughout the City.

There are only 13 parking meters in the City, all in a parking structure. Parking fees in the 13 meters are 25 cents per half-hour.

- **Waste/Recycling.** The City runs a City-wide trash collection program and owns the Savage Canyon Landfill. It has a goal of recycling 25 percent of all waste by 1995, and is cooperating with other cities in Southeast Los Angeles County to develop a recycling plan for the region. Emphasis is being placed on developing a market for compost materials. Currently, the City collects toxic materials at the Savage Canyon Landfill for disposal at offsite landfills. Los Angeles County is operating the program and sets the charges.
- **Regulation XV.** The City of Whittier provides monetary incentives to carpoolers. Employees are given \$25 a month if the employee carpools at least 4 days/week and \$15 for 3 days/week. Drawings are held once a month for participants. Prizes are usually free lunches at a Whittier restaurant.

The City also provides preferential parking to participants and provides free bus tokens to those who take public transit. It is also experimenting with a 9/80 work week for some departments. Several departments participate in a 4/10 workweek, including the Department of Public Works. These programs are considered successful and the City is meeting its Regulation XV goals. The City's Transit Department administers the program for City employees.

There are no Transportation Management Associations in the City--or at least the City does not participate in any.

Job/Housing Balance

Whittier is a medium-sized city with a diverse employment base. The majority of Whittier residents who are employed work in manager/professional, sales/technical, and clerical/support and service classifications. Approximately 25 percent are employed in manufacturing. The City is housing-rich, with approximately half as many jobs in the City as there are workers.

Whittier is located in the Long Beach-Downey subregion. For the subregion as a whole, the ratio of jobs to housing units was estimated to be 1.21 jobs per housing unit in 1984 and is projected at 1.26 in 2010. To meet the performance goal of 1.45 jobs per unit set by SCAG, the subregion should increase jobs more than housing units by between 1984 and 2010.

To be consistent with SCAG's 1989 AQMP growth management goals, Whittier would either need to add additional jobs through redevelopment programs or reach agreements with

surrounding cities to show that its housing surplus is being accounted for in subregional job/housing planning.

Transportation

The Southern California Rapid Transit District (RTD) operates several intercity bus routes through the City. These routes also provide transportation within the City. The City is served by the San Gabriel River Freeway (Route 605) running north and south at the western boundary of the City.

There is a designated bikeway system within the City. One existing route links the Uptown area with the surrounding residential neighborhoods. Free transportation is provided by the City for selected recreation activities.

Whittier Transit

The City of Whittier contracts with a private company to run a bus system in Whittier which serves the Uptown Village, as well as commercial and residential areas. Buses run every 40 minutes between 6:30 a.m. 7:00 p.m., Monday through Saturday.

All major destination points in the city are served by the four buses: the Whittier and Presbyterian Hospitals; the Senior Center; libraries and parks; and the City's two shopping centers. The 160 designated bus stops are within easy walking distance of all residents. Ridership has been increasing and currently approximately 1,000 persons use the transit daily.

The Sunset Route serves the northern half of the City, north of Whittier Boulevard. Stops include Michigan Park, Whittier Quad, Whittier Hospital Medical Center, Uptown and Whittwood Mall. The Sunrise Route serves the area south of Whittier Boulevard. It passes along the Whittier Quad, Sierra Education Center, Uptown, Whittwood Mall, Presbyterian Intercommunity Hospital and various other parks. The transfer point of the routes is at Philadelphia and Greenleaf Avenues within the Uptown Village. The City has new trolley style buses, all of which are equipped with wheelchair lifts.

Whittier has transfer agreements with the RTD. It also has transfer agreements with La Mirada Dial-A-Ride at Leffingwell and Santa Gertrudes Streets. In addition, Whittier Transit connects with the Norwalk Transit, the Montebello Municipal Transit, and the Santa Fe Springs Tram.

Rides are 25 cents per boarding, which contributes approximately 8 percent of the average cost per trip. The costs incurred by the transit program is primarily funded by Proposition A monies.

Dial-A-Ride

The City provides Dial-a-Ride service within the City to senior citizens (age 60 and over) and to those who have disabling conditions that limit mobility. Dial-a-Ride provides curb to curb service.

Three hours advance notice is required to schedule a trip, and rides can be scheduled for up to one week in advance. Routine appointments can be scheduled without having to call for each trip. The return trip can be ordered when needed. The average wait for a vehicle is 30 minutes, although 15 minutes is the goal for all pre-scheduled trips. Service is provided seven days a week.

A Dial-a-Ride card costs \$9.00 and is good for 30 rides (30 cents per ride per direction). The program operates with five vehicles and back-up taxi service when the Dial-A-Ride vehicles are fully occupied.

SECTION 7: PUBLIC SAFETY ELEMENT BACKGROUND REPORT

INTRODUCTION

The Public Safety Element Background Report discusses existing natural and manmade hazards in the Whittier area. Natural hazards that may be expected, their probable locations, and the likelihood that they will occur is influenced by the local and regional geologic settings. Manmade hazards are dependent on the extent of human activity and the propensity for accidents and errors. The potential for injury and damage from these hazards is directly related to the user population living in an area subject to risk, the stability of structures, and the availability of emergency services. These issues are analyzed in the Background Report to provide a better understanding of the environmental risks in Whittier.

Regional and local earthquakes present a major safety concern in the City. Fault locations and major earthquake events are discussed in this report. Seismically-induced hazards such as groundshaking, surface rupture, slope failure, and liquefaction are also evaluated. Other geologic hazards analyzed include landslides, debris flow, erosion and flooding potential. Likewise, dam inundation, wildfire, urban fire, hazardous materials, crimes and accidents are addressed below. Finally, the adequacy of emergency services is analyzed in terms of manpower, equipment and facilities.

GEOLOGIC CHARACTERISTICS

The Los Angeles basin lies at the north end of the northwest-trending Peninsular Ranges province. This province is transected by the east-trending ridges and valleys of the Transverse Ranges province. The dominant structural feature of the Peninsular Ranges province are northwest-trending fault zones. These zones separate large elongated blocks that stand at different structural elevations. Moreover, the basin is underlain by a structural depression, parts of which have been the sites of discontinuous deposition since Late Cretaceous time (135 million years ago) and of continuous subsidence and chiefly marine deposition since middle Miocene time (25 million years ago).

The Los Angeles basin is a transition zone between the strike-slip faults and other related features of the Peninsular Ranges and the geologic feature of the Transverse Ranges. Both strike-slip and compressional tectonic structures exist within this transition zone. The opening of the Gulf of California in late Pliocene time (2 to 4 million years ago) had a profound effect on the geology of Southern California. In the Los Angeles basin, the type of deformation changed from northwest-southeast extension to north-south compression. Since the onset of compressional tectonics, the upper Pliocene sediments have been uplifted, folded, and in some cases overturned by the north-south compression.

In addition to the compressional geologic features, the basin is also crosscut by northwest to north-northwest striking right-lateral strike-slip faults of late Quaternary age (10,000 to 2 million years ago), including the Whittier fault, the Palos Verdes fault, and the Newport-Inglewood fault. These faults are generally parallel to the San Andreas fault to the east and to offshore faults to the west.

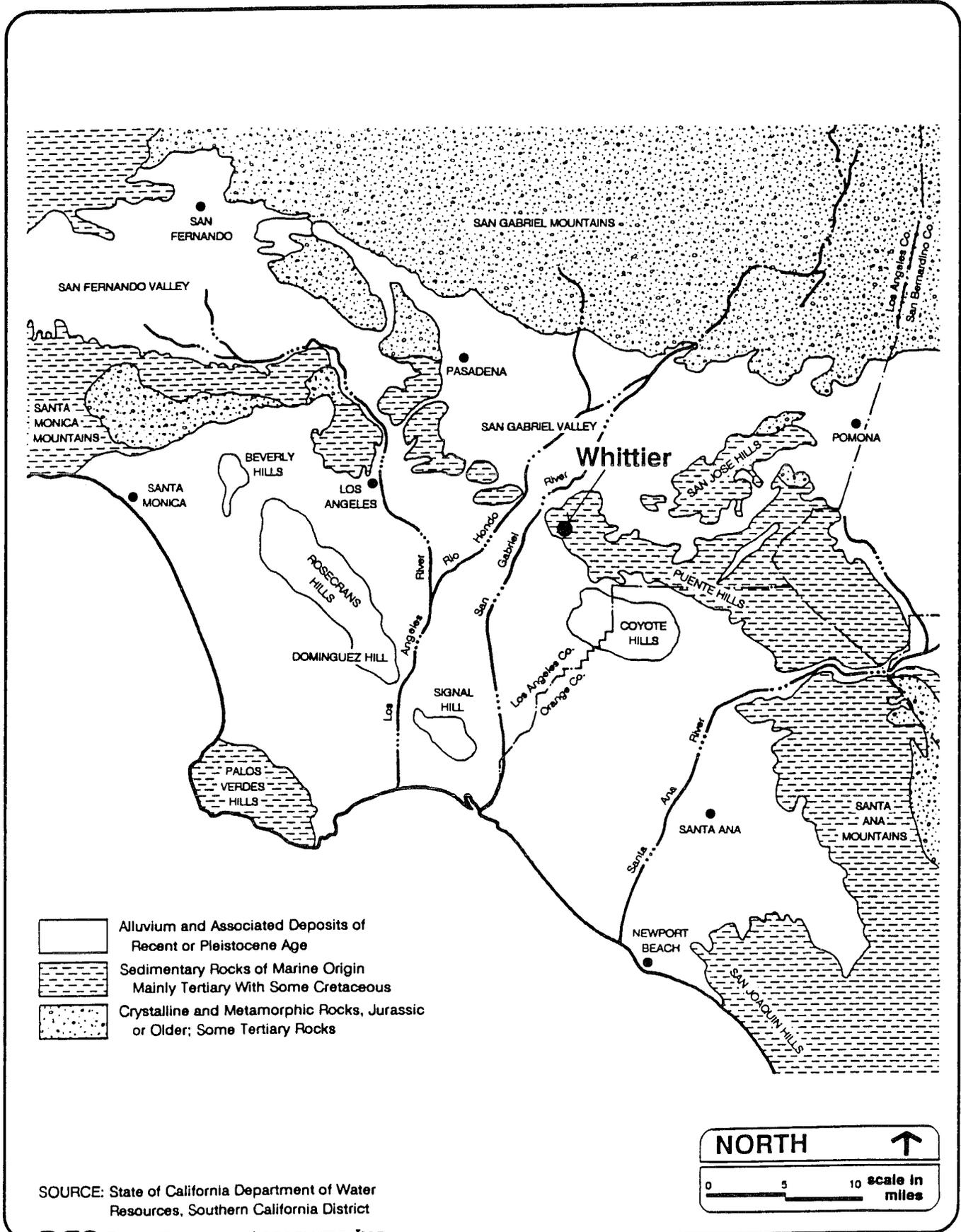
The Puente, Elysian and Repetto Hills, mark the eastern boundary of the Los Angeles basin and represent an eroded structural block uplifted between the Whittier and Chino faults. The Whittier fault is considered to be active and the intervening structural block is still in the process of uplift. The Puente Hills are bounded on the north by the Whittier Narrows (a gap through which the San Gabriel River and Rio Hondo flow) and on the northwest by the Repetto Hills.

The City of Whittier is located along the southern section of the northwestern Puente Hills (also known as the Whittier Hills). The Puente Hills has moderate to highly rugged topography, is relatively flat-topped, and contains numerous southwest to northeast ephemeral streams (water channels above the water table that flow only during rainy seasons and are dry at other times). West of the hills is a lowland plain that slopes gently to the southwest and south toward the Pacific Ocean which is approximately 17 miles away. Elevations range from approximately 500 feet to 1,260 feet above mean sea level (msl) in the northwest portion of the hills to over 1,400 feet msl southeast of Fullerton Road. See Exhibit 7-1.

The majority of the City of Whittier is situated on the lowland surface. Elevations within Whittier range from approximately 150 feet to 1,000 feet above msl and between 150 and 500 for the lower areas. The average slope is approximately 30:1 (horizontal to vertical) as compared to 3:1 or steeper on the hilly areas to the northeast. Drainage is generally toward the south and southwest and into the San Gabriel River. The western portions of Whittier lie on the flood plain of San Gabriel and Rio Hondo Rivers.

Geologic Units

The geologic units exposed in the City of Whittier and surrounding area include both bedrock and surficial deposits. The bedrock units include siltstones, sandstones, and conglomerates of the upper Miocene age Puente Formation, Pliocene age Fernando Formation, and Pleistocene age La Habra Formation. The surficial deposits include colluvium/alluvium and landslide debris, and are generally composed of poorly consolidated sediments of Pleistocene and Holocene age at the canyon bottoms, alluvial aprons and fans, and some landslide deposits in the surrounding bedrock units.



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City of Whittier



GENERAL PLAN

**EXHIBIT 7-1
GENERAL GEOLOGY**

The Puente Hills area (and San Jose Hills) form the structurally-elevated east half of the northeastern structural block of the Los Angeles basin. The block is wedge-shaped and is at an elevation higher than the central plain of the basin to the south and lower than the San Gabriel Mountains to the north.

The major structural component in the Puente Hills is the Whittier fault. Movement along the fault in this area has created an area of folding and faulting in a narrow band parallel to and north of the Whittier fault. Many of the folds are inclined so that their surfaces are subparallel to the Whittier fault and are overturned to the north. South of the Whittier fault, the rock layers dip to the south less steeply away from the fault.

Puente Formation

The upper Miocene Puente Formation has been divided into four classes or members in the western Puente Hills and include from oldest to youngest the La Vida Member, Soquel Member, Yorba Member, and the Sycamore Canyon Member (Yerkes, 1972). Considerable variation in thickness and exposure of the members are due to the variety of formational contacts and fault relationships. The four classes or members include the following:

- ***La Vida Member.*** The La Vida Member consists chiefly of pale yellow-brown to pale gray-brown siltstone and sandy siltstone. It is interbedded with pale yellow-brown fine to medium-grained sandstone (with local exposures of dolomite) and tuff. Along Turnbull Canyon Road, the La Vida member is composed principally of layered siltstone and platy porcelaineous shale, with a few impure limy lenses exposed. The sandstone is commonly well-graded, although some graded bedding structure is present in the siltstone. The strata adjoining the Whittier fault are intensely sheared that the individual beds cannot be traced.

- ***Soquel Member.*** The Soquel Member, in the area west of Hacienda Boulevard, consists chiefly of coarse-grained sandstone that contains an approximately 30 feet thick massive conglomerate. Breccia (coarse rocks) of blocks and slabs of dolomite and siltstone are present in the middle of the member. The lower part of the member consists of interbedded sandstone, sandy siltstone and platy siltstone. North of Whittier, the Soquel Member consists chiefly of coarse breccia and coarse-grained sandstone. Interbedded with the breccia is pebbly sandstone, conglomerate, and minor amounts of sandstone.

- **Yorba Member.** The Yorba Member is dominantly a pale white, pale greenish-yellow, or very light gray, layered, platy siltstone and sandy siltstone. It is found with interbedded sandstone and minor gray to yellow-gray dolomite beds.
- **Sycamore Canyon Member.** The Sycamore Canyon Member is composed of a rusty brown pebble to cobble (few boulders) conglomerate overlain by a series of pale yellow siltstone, sandy siltstone and fine sandstone beds. Exposures at the Whittier fault are composed of crumpled black siltstone which contains hard, brown sandstone lenses, and tan to gray, medium and fine-grained sandstones, silty sandstone and conglomerate. The bedding structures within the sandstone and silty sandstones are typically thin.

Fernando Formation

The Fernando Formation is the name assigned to the Pliocene age rocks in the Puente Hills and is divided into lower and upper members. The lower member of the Fernando Formation are exposed within the city limits south of Turnbull Canyon. The upper member is exposed in the southern parts of the hills in the City.

- **Lower Member.** The Lower Member of the Fernando Formation consists of a series of siltstone, sandstone, and conglomerate, and interbedded conglomerate sandstone. In the Whittier area, it consists of gray-orange to light brown pebble-cobble conglomerate, and pale yellow-brown to light olive-gray sandy siltstone and pale yellow-gray to gray-orange, fine to medium-grained sandstone. The bedding structure in the sandy siltstone, sandstone, and conglomerate is generally massive. Some of the sandstone are well-bedded, platy and graded.
- **Upper Member.** The Upper Member of the Fernando Formation is described as principally tan to gray sandy siltstone and silty sandstone with scattered small conglomerate lenses and beds, and fine to medium-grained sandstone with few conglomerate beds. Yerkes (1972) divides the Upper Member into a lower sandstone and conglomerate, a middle sandstone, and an upper sandstone and pebbly sandstone. The lower sandstone is a pale yellow-brown to dark red-brown pebbly sandstone that is thick to massively bedded and underlain by a pale yellow-brown massive conglomerate. The middle sandstone is yellow-gray, contains scattered pebbles, and the

bedding structure is massive. The upper unit consists of a grayish-orange to yellowish-gray, thick bedded (locally cross-bedded) to massive sandstone, and a pale to moderate yellow-brown, massive, pebbly sandstone.

La Habra Formation

The late Pleistocene La Habra Formation consists of an unconsolidated basal cobble-pebble conglomerate, sandstone, and mudstone (and silt) beds. The basal conglomerate is pale yellow-gray to pale yellow-brown, and is massive to very crudely bedded. This is overlain by a pale yellow-gray to moderate red-brown, very coarse-grained to pebbly sandstone that is massive or very crudely bedded. The upper two-thirds of the formation is composed of olive-gray to moderate red-brown, sandy to pebbly mudstone.

Alluvium/Colluvium

Alluvium underlies a majority of the City of Whittier and is of Recent to possibly Late Pleistocene age. The alluvium consists of alluvial fan and terrace deposits that are generally gray, poorly sorted gravel, sand, and silt transported and deposited by flowing water. Alluvial deposits also extend up the canyons principally in active stream channels, and intermittently-active flood plains. These deposits exhibit low density, are generally very porous, and contain organic debris.

Colluvium is a thick residual soil derived from slope wash and in-place weathering of the underlying bedrock. It varies in thickness depending on the underlying material characteristics, vegetation, and slope gradient. Colluvium is typically shallow on the flanks of hillsides and increases in thickness towards the canyon bottoms, within swales, and at the mouth of tributary drainages. These soils are predominantly clayey and of low density, are porous, and often contain considerable amounts of organic matter from vegetation growth.

SEISMIC CHARACTERISTICS

The probability of an earthquake affecting the City of Whittier is dependent on the distance of regional faults to the City and the seismic activity of these faults. The characteristics of the major faults that could impact the project area are discussed in this section. To clarify the technical terms used to describe fault characteristics, Exhibit 7-2 illustrates the various types of faults.

Regional Faults

Numerous faults have been mapped within the southern California region, several of which are within 60 miles of Whittier. The most significant of these are described below and are shown in Exhibit 7-3. Distances to the faults are given as the closest straight-line distance from the City of Whittier Civic Center (City Hall).

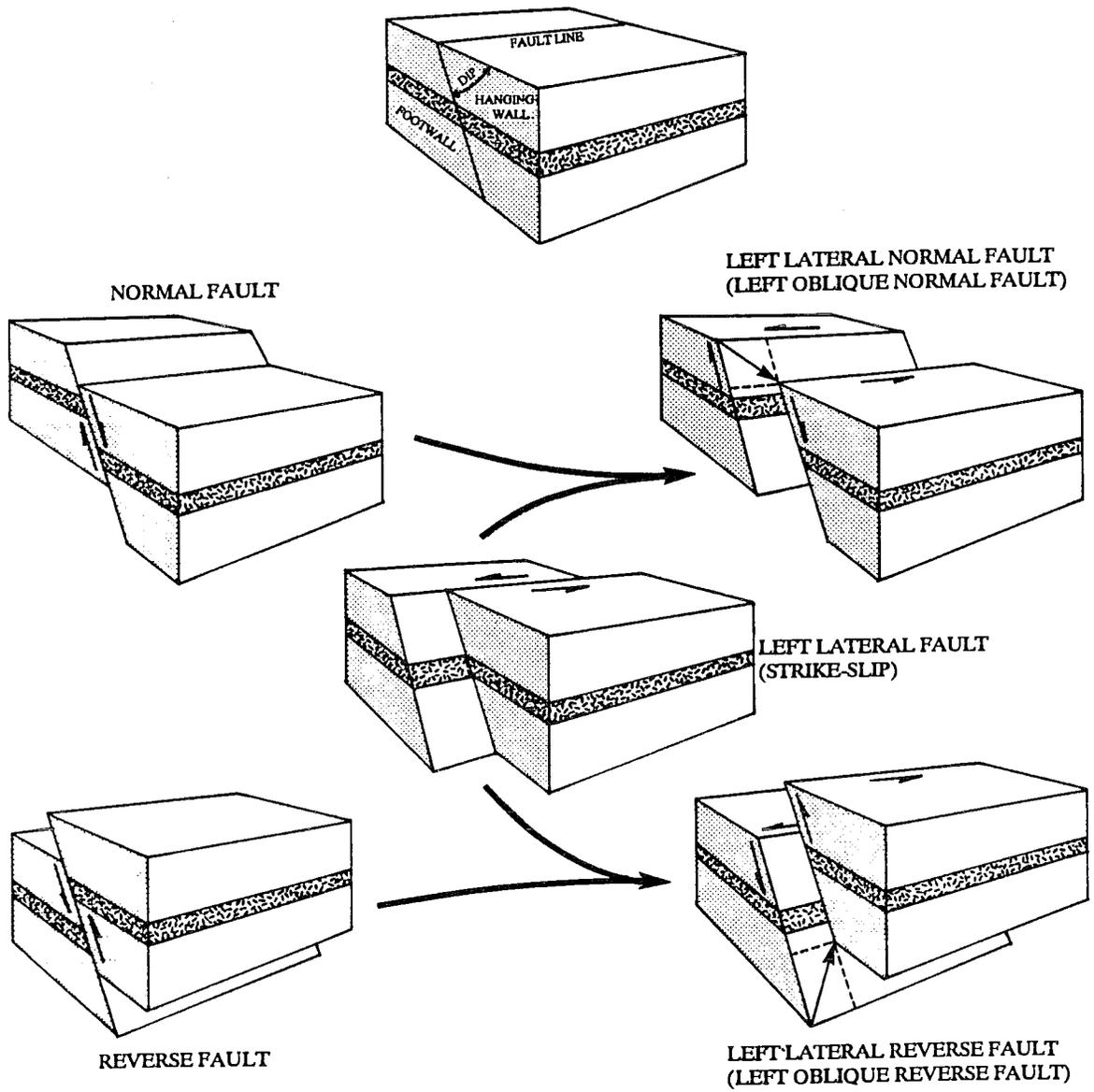
Whittier-Elsinore/Chino Faults

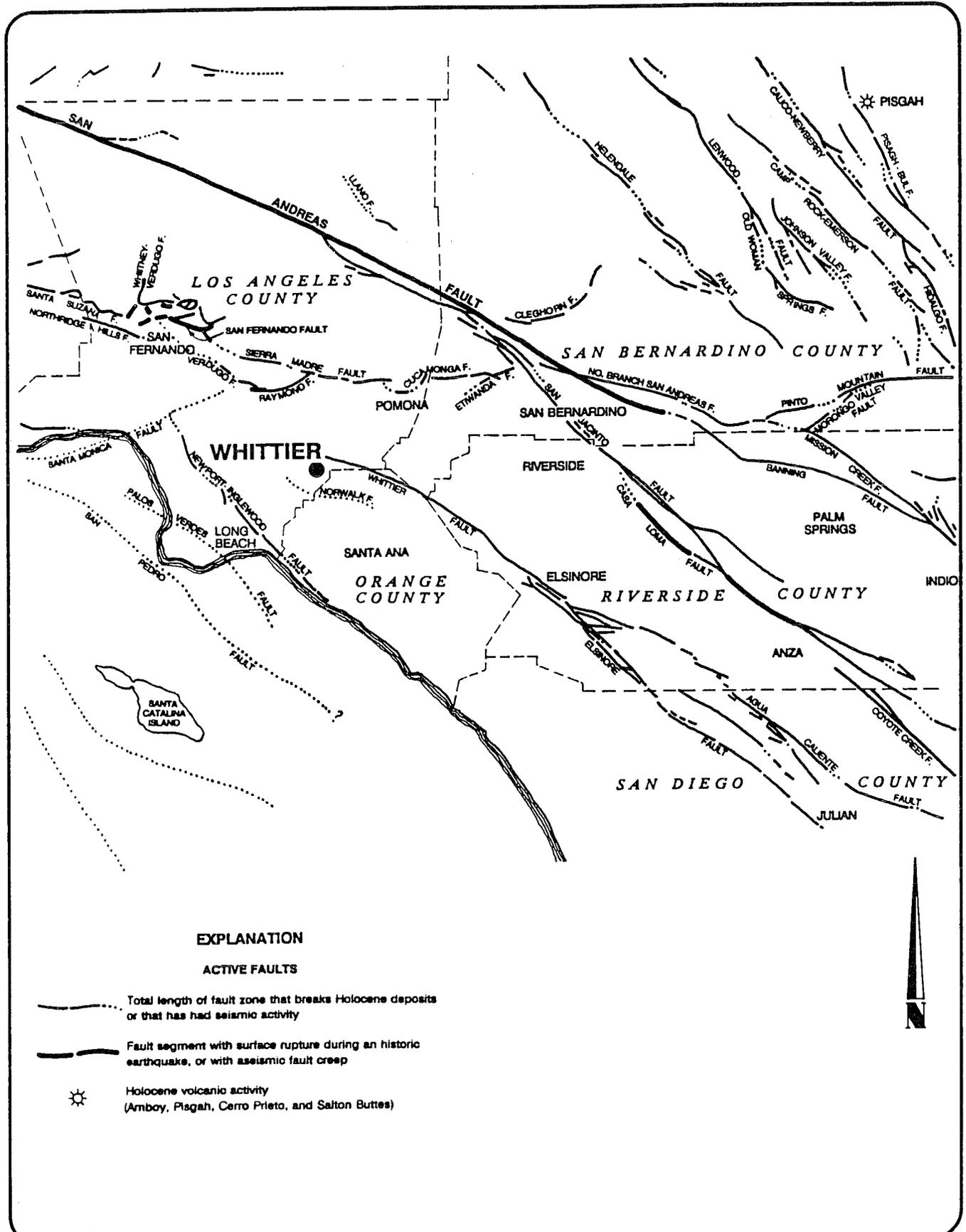
The Whittier fault is part of the Whittier-Elsinore system that parallels the San Jacinto fault. As part of the same right-lateral tectonic system as the San Andreas and San Jacinto faults, the Whittier-Elsinore fault is characterized by right lateral offsets along a series of both right and left-stepping fault segments. Near Santa Ana Canyon, the Elsinore fault branches into the Whittier fault, which borders the Puente Hills to the southwest, and the Chino fault, which borders the Puente Hills to the northeast.

The Whittier fault roughly parallels the northwest limits of the City, crossing the northern boundary about 1.2 miles northeast of City Hall as shown in Exhibit 7-4. The Whittier fault is a steeply northeast-dipping, strike-slip fault with a small reverse component (see Exhibit 7-2). It consists of 1 to 3 subparallel strands in a zone approximately 0.7 mile wide. The length of the Whittier fault, from where it diverges from the Elsinore fault near Corona northwesterly to the City of Whittier, is estimated at 28 to 46 miles by different geologists. The fault strikes 65 to 85 degrees to the northwest and dips 65 to 80 degrees to the north along its northern segment near the City of Whittier. The reported slip rate is 1.2 millimeters per year (mm/yr). Evidence of offset Holocene deposits has been reported northwest of Brea Canyon in Orange County. The segment of the fault near Whittier is interpreted as late Quaternary. However, other investigators have reported Holocene displacement 2.5 miles east of the City in Arroyo San Miguel near Colima Road.

The Whittier fault is considered capable of producing a moderately large earthquake. It has not been designated as an Alquist-Priolo Special Studies Zone. However, traces of the fault near the City of Brea, not far from its junction with the Elsinore fault to the southeast, have been so designated. The largest historical earthquake on this fault occurred in 1976 and had a Richter magnitude of 4.2. The maximum credible earthquake for the Whittier fault is estimated to be of magnitude 7.0.

The Elsinore fault extends from Santa Ana Canyon through the City of Elsinore and to the Mexican border for a distance of approximately 137 miles. The northernmost end of the fault is located approximately 26 miles from the Whittier City Hall. This fault is predominantly a right-lateral strike slip fault zone (see Exhibit 7-2) consisting of several



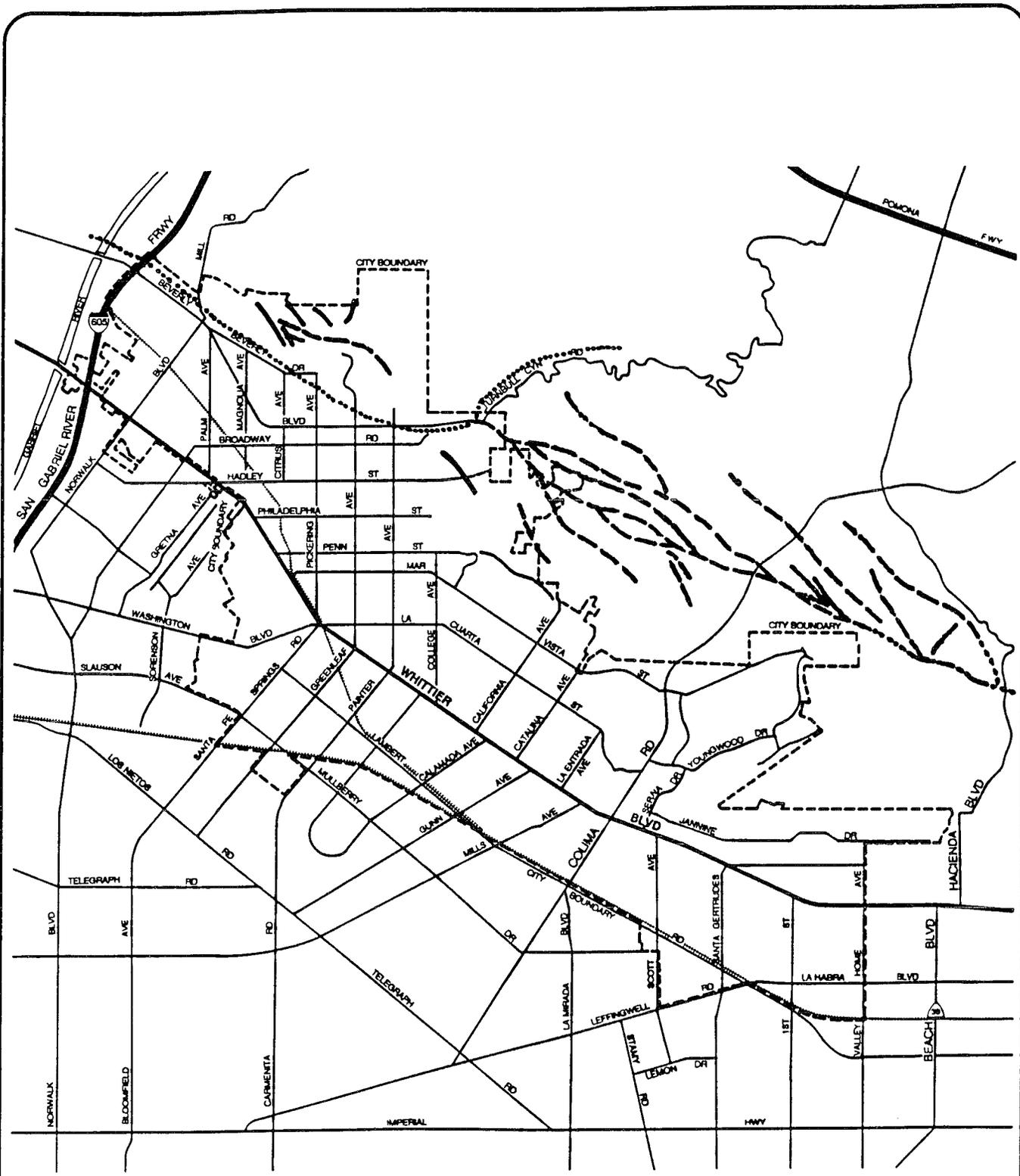


DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



**EXHIBIT 7-3
MAJOR FAULTS IN SOUTHERN CALIFORNIA**



-  Well Located Surface Trace Fault
-  Approximately Located Trace Fault
-  Inferred Buried Fault

SOURCE: Fault Evaluation Report FER-41,
 December 12, 1977, Drew P. Smith
 (Supplement); April 20, 1979,
 E.W. Hart, CDMG

NORTH ↑

0 ————— 5000 scale in feet

DEA DAVID EVANS AND ASSOCIATES, INC.



**EXHIBIT 7-4
 COMPILATION OF THE
 WHITTIER FAULT**

fault segments that dip steeply to the southwest. The reported slip rate for this fault is 3.0 mm/yr.

The Elsinore fault has produced only one large earthquake in historical time. This was the 1910 magnitude 6.0 earthquake near Lake Elsinore. The historical seismicity has been low along the Elsinore fault but geological evidence suggests a much higher level of prehistoric earthquake activity. Paleoseismic (prehistoric) events are documented by Rockwell et al. (1986) at Glen Ivy Marsh along the Glen Ivy segment of the Elsinore fault. Four or five ground rupture events (one possibly historical) were recognized. The data suggests a recurrence interval of 250 years for earthquakes of magnitude 6 to 7. Based on the lengths of the major fault segments, the zone is believed to be capable of producing a maximum credible earthquake of magnitude 7.25.

The Chino fault is buried along most of its length. Based on geomorphic evidence, it does not appear to have as great a potential for seismic activity as does the Whittier fault. Where exposed in the Puente Hills area, the Chino fault is not as well-expressed as the Elsinore fault.

Elysian Park Fold and Thrust Belt

The Elysian Park fold and thrust belt is located approximately 6 miles northwest of Whittier. It is cross-cut by several strike-slip faults, including the Whittier fault. Prior to the 1987 Whittier earthquake, the Elysian Park fold and thrust belt was unknown. Hauksson and Jones (1989) described it as a zone of gently-dipping buried thrust faults.

The Elysian Park fold and thrust belt appears to be a zone of folds and discontinuous faults that extend from the Elysian Park Anticline to the Montebello Anticline, for a total of 13 miles. It is found between the west-striking reverse faults of the Transverse Ranges to the north and the northwest-striking strike slip faults of the Peninsular Ranges to the south. When slip occurs on buried thrust faults, the ground surface exhibits broad folding rather than surface rupture. It is for this reason that buried thrust faults are thought to be associated with anticlines (layers of rock that slope downward and outward from the location of the fold) in the Los Angeles basin. The anticline that underlies the City of Whittier is part of the Elysian Park fold and thrust belt. The estimated slip rate of 0.2 mm/year is based on comparisons with the Raymond Hill and Whittier faults.

The Elysian Park, and not the Whittier fault, was the site of the 1987 Whittier Narrows earthquake. The available data are insufficient to formulate a definitive assessment about the future earthquake potential of this belt. If the Elysian Park fold and thrust belt is segmented, it could produce earthquakes of moderate (M 5) or large (M 6.7) size. Conversely, should the belt rupture as a whole, a large (M 6.7) or great (M 7.8) earthquake

could result. Based on its possible relationship with the Whittier fault and the 1987 Whittier Narrows earthquake of magnitude 5.9, it may be capable of producing a maximum credible earthquake magnitude of 6.5 anywhere along its length.

Newport-Inglewood Fault

The Newport-Inglewood fault represents a major fault structure in the Los Angeles basin. Located 13 miles southwest of Whittier, the fault consists of a series of left stepping, northwest-trending discontinuous stepped fault segments and anticlinal folds extending approximately 44 miles. The Newport-Inglewood fault is visible on the surface as a series of northwest-trending elongated hills (including Signal Hill and the Dominguez Hills) extending from Newport Beach to Beverly Hills. The fault segments and anticlinal folds are believed to be the expression of a deep-seated fault within the bedrock. The orientation of the structural elements along the zone has been attributed to a nearly vertical right-lateral strike-slip (horizontal) shearing at depth. However, more recent work suggests that the anticlinal folds are related to buried thrust faults similar to the Elysian Park fold and thrust belt. The reported slip rate along the fault is between 0.1 mm/yr to 6.0 mm/yr.

Although no surface faulting has been associated with earthquakes along the Newport-Inglewood fault zone, various segments have a history of moderate to high seismic activity. Recent significant earthquakes on the Newport-Inglewood fault are the 1933 Long Beach earthquake (magnitude 6.3) and the 1920 Inglewood earthquake (magnitude 4.9). The estimated maximum earthquake assigned to the fault is magnitude 7, based on an estimated rupture length versus magnitude relationship and a slip rate of about 0.5 mm/yr.

Sierra Madre Fault System

Located approximately 20 miles north of Whittier, the Sierra Madre fault system forms a prominent 50-mile long east-west structural zone on the south side of the San Gabriel Mountains. It consists of a complex system of north-dipping left lateral/reverse and reverse/left lateral faults. This fault system has been responsible for uplift of the San Gabriel Mountains by reverse faulting in response to north-south tectonic compression. In many places, the faults have placed basement bedrock over alluvium where they dip northerly below the steep topographic front of the San Gabriel Mountains. Geologists indicate that the fault system tends to rupture in discrete structural segments during earthquakes. The Sierra Madre fault system has been divided into the Cucamonga, Duarte, Dunsmore, San Fernando and Sierra Madre segments.

The Sierra Madre fault consists of one to five connected active and potentially active strands in a zone approximately 11 miles long and 0.6 mile wide. A 5.8 earthquake in 1991 occurred on the Sierra Madre segment of the fault, 7 miles north of the City of Monrovia. The Sierra Madre fault has an average slip rate of 2.0 mm/yr.

The San Fernando segment, unknown until the September 9, 1971 earthquake, is comprised of five major reverse-left-oblique stepped strands that strike from 75 degrees east of north to 70 degrees west of north. The fault dips 50 degrees to the north near the surface and shallows to 35 degrees north at depth. The fault is approximately 12 miles long and 3.1 miles wide. The rate of slip for this fault is reported to be 3.0 mm/yr.

The San Fernando segment was the site of the September 9, 1971 San Fernando earthquake of magnitude 6.4. The zone of surface rupture associated with this earthquake extends discontinuously for approximately 9 miles. It has a maximum measured vertical displacement across the entire fault zone of 8.9 miles, with the north side of the fault displaced upward.

The Cucamonga fault segment is an easterly extension of the Sierra Madre fault segment. It consists of 1 to 3 subparallel connected strands 0.6 mile wide and approximately 15 miles long. The fault strikes about 70 degrees east of north, and has moderate to steep northerly dips. The reported slip rate is between 2.9 mm/yr and 6.4 mm/yr. The Cucamonga fault displays fresh-appearing scarps in the alluvial fan deposits, south of the mountains. Other evidence of recent activity has been identified in newly-appearing scarps, measuring up to 3 meters in alluvial areas. Also, in large canyons, the fault has placed crystalline basement beside alluvium, forming bedrock scarps up to 23 meters high.

Although there have been no records of historic earthquakes occurring on the Cucamonga, Duarte, Dunsmore, or Sierra Madre segments, an estimated maximum credible earthquake magnitude of 7 is assigned to all five segments based on comparisons with the San Fernando segment.

Palos Verdes Fault

The Palos Verdes fault strikes southeast, across and offshore of Palos Verdes Peninsula and comes as close as 20 miles to Whittier. The onshore extent of the fault extends from north of the Palos Verdes Peninsula southward across the peninsula to about 9 miles offshore, forming the abrupt northern front of the Palos Verdes Hills. The total length of the fault, including the offshore portions is approximately 50 miles. The Palos Verdes fault coincides with a structure similar to the Elysian Park fold and thrust belt named the Torrance-Wilmington fold and thrust belt. Movement along the Palos Verdes fault appears to accommodate little of the total convergence on the southwest flank of the Los Angeles basin as indicated by a low vertical slip rate. Davis et al. (1989) believe that the convergence is taking place below the Palos Verdes fault at rates between 1.9 and 3.5 mm/yr. The lateral slip rate is not known, although ranges have been reported between 0.02 mm/yr and 0.7 mm/yr. A slip rate of 0.8 mm/yr has been assigned based on a comparison with the Newport-Inglewood fault (a geologically similar zone that parallels the Palos Verdes fault to the northeast).

Strike-slip earthquakes have occurred near the Palos Verdes fault as it heads offshore, both in the San Pedro and Santa Monica Bays. The onshore extent of the fault is assumed to be the central portion of the fault and capable of producing earthquakes similar in size to the 1933 Long Beach earthquake. Two thrust earthquakes (M 4.0 and 4.5) have occurred on the down dip end of the fault on the southwest section of the Los Angeles basin. If the Torrance-Wilmington fold and thrust belt is segmented, it could produce earthquakes of moderate (M 5) or large (M 6.7) size. Should the belt rupture as a whole, a large (M 6.7) or great (M 7.8) earthquake could result. The estimated maximum credible earthquake assigned to this zone is magnitude 7.

San Jacinto Fault

The San Jacinto fault is located 43 miles from Whittier and is similar to the San Andreas fault. It is a large strike-slip fault that has been active for several million years. The San Jacinto fault is approximately 160 miles long and extends from the north near Wrightwood where it joins the San Andreas fault to the south at Superstition Mountain near El Centro. It has been the principal focus of historic release of strain in southern California, between the North American continental and the Pacific oceanic crustal plates. Stepped segments of the San Jacinto fault extend from the area near San Bernardino at its northern end, southeast more than 186 miles across the Imperial Valley and into Baja Norte, Mexico. Geologic, geodetic, and seismologic observations suggest an average slip rate of 8 to 12 mm/yr during late Quaternary time. Where San Jacinto fault joins with the San Andreas fault, approximately 10 mm/yr of slip is transferred to the central segment of the San Andreas fault.

The San Jacinto fault has experienced numerous large earthquakes along its length since 1890. The largest recorded earthquake event on this fault was a magnitude 7 in 1899. As many as nine earthquakes have been reported since then, ranging in magnitude from 6 to 7. The fault is a major active fault in California and its geologic slip rate is slightly less than that of the San Andreas fault. Surface rupture has been associated with several historic earthquakes. The estimated maximum credible earthquake for this zone is magnitude 7.5, based on its estimated rupture length versus magnitude relationship and historical earthquake events.

San Andreas Fault

The San Andreas fault is widely recognized as the longest and most active fault in the State. The northwest to southeast-trending fault has been mapped continuously from Cape Mendocino to the Gulf of California, a distance of over 700 miles. This length is divided into four loosely defined segments: the northern, central, south-central and southern segments. It consists of numerous subparallel faults in a zone from 0.2 to 2.4 miles wide. The south-central segment of the San Andreas fault is approximately 34 miles from Whittier,

and extends from Cajon Pass to Bombay Beach. The displacement on the fault is right-lateral strike-slip, and faults within the zone are vertical.

The San Andreas fault is known to be active from historic earthquakes (some of which have caused ground surface rupture), and from abundant evidence of displacement in Holocene sediments. Two historical earthquakes (M 8+) have occurred along the fault; one in 1857 (surface rupture from Cholame to Cajon Pass, central segment) and one in 1906 (surface rupture from Cape Mendicino to Gilroy, northern segment). The south-central segment was responsible for the 1857 Fort Tejon earthquake (M 7.9).

Recent studies indicate that large earthquakes have occurred along the south-central segment of the fault at widely varying intervals, but averaging every 145 to 200 years. In addition, calculated slip rates are as high as 36 mm/yr for the south-central segment. This segment is estimated to have a 30 percent chance of producing a 7.5 magnitude event by the year 2018. The maximum credible earthquake assigned for the south-central segment of the fault is estimated to be magnitude 8.5.

Norwalk Fault

Although the existence, location, and activity status of the Norwalk fault has long been controversial, its location has generally been placed at the southern end of the Coyote Hills, between Buena Park and Fullerton. The Norwalk fault is generally known only from subsurface information, but late Quaternary activity has been cited based on relatively young surface deposits along a trace of the fault. The fault strikes 65 to 85 degrees west of north and dips steeply to the northeast.

Offshore Faults

The offshore faults of coastal California have been mapped from marine seismic surveys but their seismic potentials have remained generally unknown. Recently, seismologists from the University of California at Los Angeles, conducted Global Positioning Surveys (GPS) that detected crustal motions between satellite receiver sites throughout southern California. About 0.5 inch of movement per year between the offshore islands and the onshore areas of southern California have been detected. This slip rate is equivalent to parts of the southern San Andreas fault.

The offshore faults have remained seismically inactive but evidence suggests that strain is currently building. A sudden release of this stored strain energy could result in a earthquake of magnitude 7 or greater.

Seismicity

The principal considerations for structures in southern California are surface rupture along fault traces and damage to structures and foundations due to seismically-induced groundshaking (strong ground motion). The fault classification criteria adopted by the California Department of Conservation, Division of Mines and Geology (CDMG) is used here. This classification was established as part of state legislation requiring the delineation of special study zones along active or potentially active faults (Alquist-Priolo Special Studies Zone (APSSZ) Act of 1972 and subsequent amendments).

An active fault is defined as one which has exhibited earthquake activity in Holocene time (the last 10,000 to 11,000 years). A fault which has moved during Quaternary time (during the past 2 million years) but not within the last 10,000 to 11,000 years (Holocene time) is considered to be potentially active. Any fault that is pre-Quaternary (older than 2 million years) or without recognized Quaternary displacement is considered inactive. Table 7-2 classifies earthquake faults in the region.

The intensity of groundshaking at a given location depends primarily on the earthquake magnitude, distance from the source (epicenter), and the characteristics of soils and geology of the impacted area. Severe shaking and differential settlement can be expected to occur on consolidated upper Quaternary deposits which include alluvium, slopewash and colluvium, landslide debris, and, to a lesser degree, older alluvial terrace deposits where urbanization has taken place. Many of the strike-slip faults within the Los Angeles basin are capable of generating moderate-sized (M 5) and large (M 6.7) earthquakes. These faults include the Whittier/Elsinore fault, Elysian Park fold and thrust belt, Newport-Inglewood fault, Sierra Madre fault, Palos Verdes fault, San Jacinto fault, San Andreas fault, and the offshore faults.

Historic Earthquakes

The three largest historic earthquakes that have caused major damages in the Los Angeles basin are the 1933 (M 6.3) Long Beach, 1971 (M 6.4) San Fernando, and the 1978 (M 5.9) Whittier Narrows earthquakes. The 1933 Long Beach earthquake occurred on the southern segment of the Newport-Inglewood fault, from Newport Beach to Signal Hill, and showed right-lateral strike-slip movement. The 1971 San Fernando earthquake showed reverse faulting with a component of left-lateral strike slip. It occurred along the San Fernando segment of the Sierra Madre fault zone. The Whittier Narrows earthquake, which occurred on the Elysian thrust fault, showed pure thrust motion on a gently north-dipping plane. Recent earthquake events that have affected the City are shown in Table 7-1.

TABLE 7-1 HISTORIC EARTHQUAKES THAT HAVE AFFECTED THE AREA		
Date	Fault or Location	Richter Magnitude
1812	Newport-Inglewood-San Andreas (?)	6.9
1857	San Andreas	7.9
1910	Elsinore?	6.0
1920	Newport-Inglewood	4.7
1925	Santa Barbara	6.8
1929	Norwalk	4.7
1933	Newport-Inglewood (Long Beach)	6.3
1941	Newport-Inglewood(?)	4.9
1941	Newport-Inglewood(?)	5.4
1971	Sierra Madre (San Fernando)	6.6
1971	San Fernando	5.1
1979	San Bernardino Mountains	4.9
1987	Elysian Park-Whittier Narrows	5.9
1987	Elysian Park	5.3
1988	--	5.2
1988	Elysian Park(?)	5.0
1989	Fault complex - Santa Monica Bay	5.0
1991	Sierra Madre	5.8

Note:

- 1) Richter magnitudes for earthquakes prior to 1933 are estimated as based on historical accounts.
- 2) ? where fault source has not been verified

Source: Los Angeles County Safety Element, 1990; Seismological Center, California Institute of Technology, 1992.

Aside from earthquakes showing surface evidence, micro-earthquakes below the surface have occurred throughout the region. The rate of micro-earthquakes in the Los Angeles basin and the adjacent offshore area is similar to the average rate for southern California. Except for the Newport-Inglewood fault, micro-earthquakes in the Los Angeles basin do not show any simple correlation with the late Quaternary faults. The random distribution of epicenters suggests that much of the Los Angeles basin is underlain by structures that are capable of generating earthquakes. If there is interconnectivity between these structures, then large earthquakes may be possible. The average depth of micro-seismicity in the region is 9 miles from the surface with the majority occurring between 4 to 7 miles from the surface. These depths reflect the average for the western United States. However, if the earthquakes occur on shallow or horizontal fault planes (as suggested by buried thrust faults), the intensity of shaking would be greater over a larger area. The densest concentration of micro-seismicity in the Los Angeles Basin is associated with aftershock sequences related to past moderate earthquakes.

Maximum Earthquake

Earthquakes in Southern California with Richter magnitude 4.5 and larger, with few exceptions, have occurred on faults that are known to be active. The faults that pose hazards to the City of Whittier are listed in Table 7-2, along with their fault classification, distance from the City, length of the fault, maximum historical earthquake, and estimated maximum credible earthquake magnitude.

**TABLE 7-2
REGIONAL EARTHQUAKE FAULTS**

Fault Name	Fault Classification	Approx. Fault Length (miles)	Estimated slip rate (mm/yr)	Ref.	Maximum Historic Earthquake Magnitude (year)	Estimated Maximum Credible Earthquake Magnitude	Ref.	Closest distance to City Hall (miles)
Whittier	Right Lateral-Reverse	28 146	1.2	c	4.2 (1976)	7	a	1.2
Elsinore	Right Lateral	137	3.0	b	6.0 (1910)	7-1/4	a	26
Elysian Park-Montebello Zone of Deformation	Reverse	13	0.2	j	6.0 (1987)	6-1/2	h,j	6
Newport-Inglewood	Right Lateral	44	0.5	c	6.3 (1933)	7	a,c	13
Sierra Madre System								20
-Cucamonga	Reverse/Left Lateral	15	3.0	f	--	7	a	
-Duarte	Reverse/Left Lateral	19	3.0		--	7	a	
-Dunsmore	Reverse/Left Lateral	9	3.0	f,i	--	7	a,i	
-San Fernando	Left Lateral/Reverse	12	3.0	f	6.4 (1971)	7	a	
-Sierra Madre	Left Lateral/Reverse	11	2.0	f	--	7	a,c	
Palos Verdes	Reverse/Right Lateral	50 5	0.8 0.1	e,k	3.9 (1972) --	7 6-1/2	a a	20
	Reverse	14	0.2	f	5.0 (1988)	6-3/4	a	
	Reverse/Left Lateral							
San Jacinto	Right Lateral	160	8.0	f	7.0 (1899)	7-1/2	a,h	43
San Andreas (South-Central)	Right Lateral	196	36.0	g	7.9 (1857)	8-1/2	a,h	34

References: (a) Based on estimated rupture length and Slemmons (1977 and 1982).
 (b) Based on Pinault and Rockwell (1984).
 (c) Woodward-Clyde Consultants (1979)
 (d) Unknown, assumed to be approximately 0.1 mm/yr.
 (e) Based on comparisons with the Newport-Inglewood Fault Zone.
 (f) Based on Clarke et al. (1984).
 (g) Based on Sieh (1984) and Sieh and Jahns (1984).
 (h) Based on historical events.
 (i) Based on Crook et al. (1987) and Matti et al. (1982).
 (j) Based on comparison with the Raymond Hill and Whittier faults.
 (k) Davies et al. (1989).

Seismic Hazards

Earthquakes create different kinds of hazards, the most common of which is strong ground motion. Depending on the geologic characteristics of an area, liquefaction, surface rupture, ground failure, tsunamis (seiche) and slope failure can occur. The earthquake hazards in Whittier are influenced by the area's potential for these seismic effects.

Strong Ground Motion

Strong ground motion results from severe groundshaking produced by a moderate to large earthquake. The distribution of potential damage caused by groundshaking depends on the size and type of fault (e.g., strike-slip or reverse), the orientation of the fault rupture, the basin geometry and topography, and the subsurface geology. Accelerograph records from recent moderate earthquakes have shown wide variance in acceleration amplitudes, frequency content, and duration of groundshaking. The 1987 Whittier Narrows earthquake produced asymmetrical earthquake wave radiation patterns.

Several new complex strong ground motion methodologies are being introduced for earthquake-resistant design. A commonly-used method of predicting regional ground motion is seismic intensity. Seismic intensity describes groundshaking in terms of structural damage and human response. Table 7-3 provides a description of the Modified Mercalli Intensities which measures seismic intensity.

**TABLE 7-3
MODIFIED MERCALLI INTENSITY SCALE***

I	Tremor not felt.
II	Tremor felt by persons at rest or in upper floors of a building.
III	Tremor felt indoors. Vibrations feel like a light truck passing by; may not be recognized as an earthquake. Hanging objects swing.
IV	Hanging objects swing. Vibrations feel like a heavy truck passing by, and the jolt feels like a heavy ball striking the walls. Standing cars rock. Windows, dishes and doors rattle. Glasses clink and crockery clashes. Wooden walls and frames crack in the upper range of scale IV.
V	Earth felt outdoors, and its direction can be estimated. Liquids are disturbed, some spilled. Small unstable objects are displaced or upset. Doors swing, closing and opening. Shutters and pictures move. Pendulum clocks stop, start, or change rate.
VI	Earthquake felt by everyone. Windows, dishes, and glassware are broken. Knick-knacks and books fall off shelves; pictures fall off walls. Furniture moves or is overturned. Weak plaster and masonry D are cracked.
VII	Steering of motor cars is affected. Partial collapse of masonry C structures. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting and falling of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame structures, if not bolted to foundation, shift. Loose panel walls are thrown out; decayed pilings brake off.

**TABLE 7-3
MODIFIED MERCALLI INTENSITY SCALE***

- IX Masonry D structures destroyed, masonry C heavily damaged, sometimes completely collapsed. General damage to foundations. Frame structures, if not bolted, shift off their foundations. Underground pipes are broken. Conspicuous cracks in the ground.
- X Most masonry and frame structures are destroyed. Most foundations destroyed. Some well-built wooden structures and bridges are destroyed. Serious damage to dams, dikes, and embankments. Underground pipelines are seriously damaged. Large landslides.
- XI Underground pipelines completely out of service. Many and widespread disturbances of the ground, including broad fissures, earth slumps and land slips in soft, wet ground. Sea-waves (tidal waves or tsunami) of significant magnitude. Severe damage to wood-frame structures, especially if near to the shock center.
- XII Damage is nearly total. Lines of sight and level are distorted. Objects are thrown into the air. Great and varied disturbance of the ground, including numerous shearing cracks, landslides, large rockfalls, and numerous and widespread slumping of river banks.

Masonry A: Good workmanship, mortar and design. Reinforced, especially laterally, and bound together with steel, concrete, etc. Designed to resist lateral forces.

Masonry B: Good workmanship and mortar. Reinforced, but not designed to resist lateral forces.

Masonry C: Ordinary workmanship and mortar. Not reinforced or designed to resist horizontal forces.

Masonry D: Weak materials, such as adobe; poor mortar. Low standards of workmanship; weak horizontally. These masonry types are not to be confused with the conventional Class A, B, and C construction types.

* Modified and rewritten after Richter (1958) and Topozada and others (1988) using Rossi-Forel's Intensity Scale.

The U.S. Geological Survey produced a composite ground motion map by comparing estimated Modified Mercalli Intensities from all active faults in the region. The highest intensity at a given site is selected and plotted on the map. The Modified Mercalli Intensity identifies the predicted distribution of potential damage that could be caused by the highest expected ground motion at a site. According to Evernden and Thompson (1985), the composite Modified Mercalli Intensity for the City of Whittier is intensity VII. However, the effect of an earthquake on the Elysian Park fold and thrust belt has not been taken into account. By itself, the Elysian Park thrust is estimated to be capable of producing an earthquake with intensity ranging from VIII to X on the Mercalli scale.

Fault-Induced Ground Surface Rupture

The California Department of Mines and Geology published a series of maps that show active faults with associated setback zones as prescribed by the Alquist-Priolo Special Studies Zone Act. Although parts of the Whittier fault have been designated special studies zones and others are currently under investigation, the portion of the fault that crosses the City of Whittier has not been zoned to date. The Whittier fault is a prominent and reasonably well-defined fault feature along much of its length. Further study of this fault

is likely to result in sufficient evidence proving surface displacement in Holocene time (within the last 10,000 to 11,000 years) and thereby suggesting a significant surface rupture hazard.

The Elysian Park fold and thrust belt is located, in part, below the City of Whittier. Current knowledge indicates that buried thrust faults typically deform the surface above them rather than break to the surface as a surface fault rupture. This does not preclude the potential for surface rupture resulting from earthquakes of magnitude 6.0 or larger.

Slope Stability

Slope stability is dependent on the type of earth material (its porosity, fissility, cohesive/shear strength, internal friction, etc.), steepness of slope, and bedding, jointing, faulting, etc. with reference to the topography. Other significant factors that affect slope stability include rainfall, erosion, seismic shaking, grading activities, and density and type of vegetation.

Liquefaction and Resulting Ground Failure

Liquefaction refers to the total loss of internal shear strength of the soil during groundshaking. High pressures occurring in sediments during repeated earthquake vibration cause the sediment to behave as a liquid. Liquefaction and earthquake-induced ground failure depends on sediment age and type, textural characteristics, and the depth to perched or other groundwater. Sediments that are susceptible to deformation and displacement from groundshaking are generally water-saturated, medium dense to loose cohesionless soil materials within 50 feet of the surface. The U.S. Geological Survey has published liquefaction susceptibility maps for the southern California region based on the above criteria.

The City of Whittier is located in an area that ranges in liquefaction susceptibility from very low to moderate, depending on the location and depth to ground water (Exhibit 7-5). The majority of the City exhibits very low to low liquefaction susceptibility. Areas located in or at the mouths of canyons, and/or areas where there is shallow ground water, are considered to have a moderate liquefaction susceptibility. Liquefaction within the City of Whittier is generally not a hazard as the water table is deeper than 50 feet except for areas along drainage channels with shallow groundwater.

There are four types of ground failure caused by liquefaction: (1) lateral spread, (2) flow failure, (3) ground oscillation and, (4) loss of bearing strength. These types of ground failure can cause broken pipelines and disrupted utilities, damage to foundations, and severe tilting of multi-story structures.

Seismically-Induced Slope Failure

Seismically-induced slope failure is a common occurrence with moderate to large earthquakes. The predominant types of seismically-induced slope failure (as seen during the 1971 San Fernando earthquake, the 1987 Whittier earthquake and the 1989 Loma Prieta earthquake) were shallow, internally disrupted failures such as soil slides, rockfalls, and rock slides. Seismically-induced slope failure can be expected within the hillsides north of the City of Whittier where slopes are 35 degrees or greater. It is also highly probable where coarse rocks cover the bedrock hillsides.

Seismic Effects

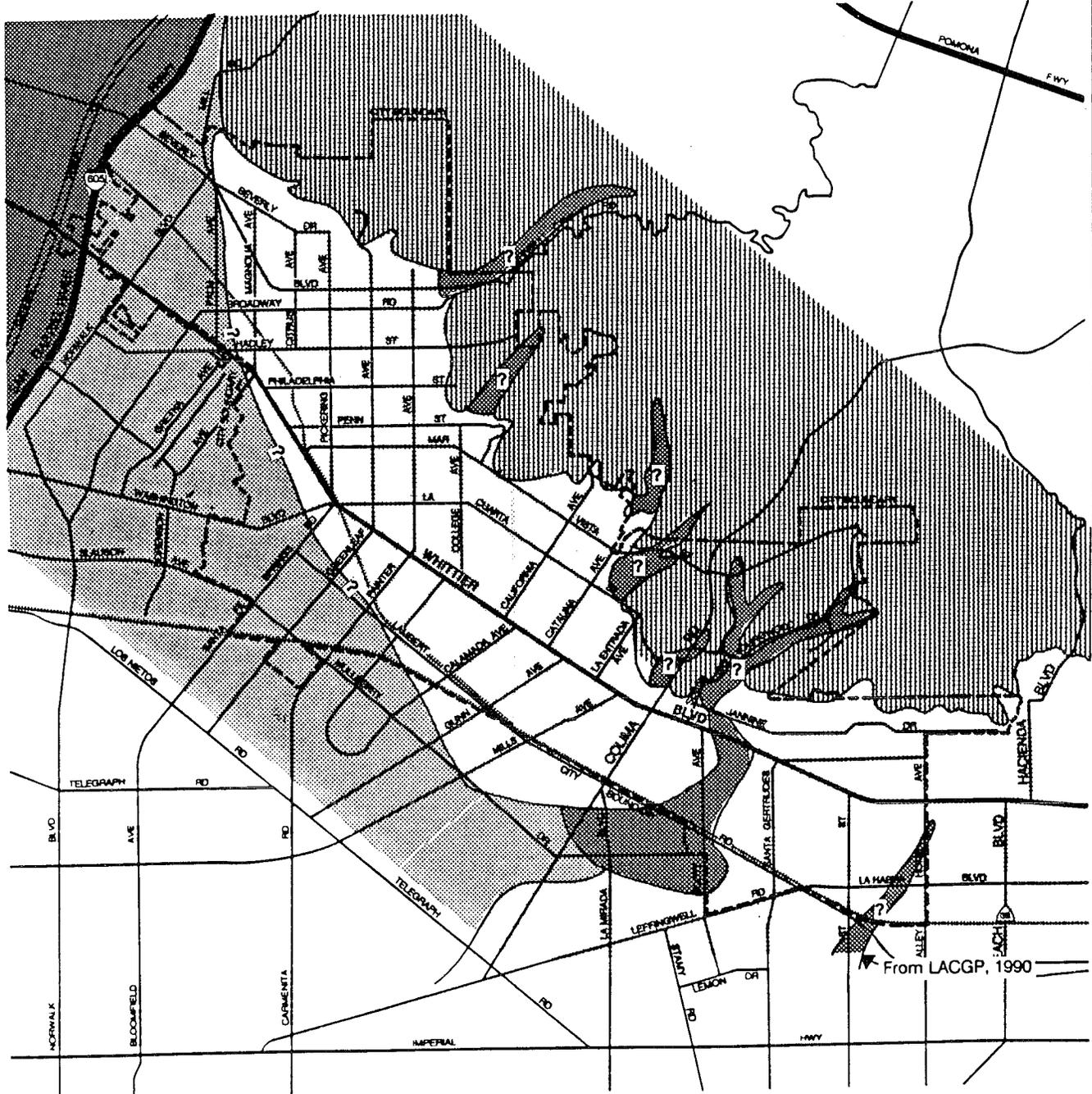
Seismic hazards are often associated with the collapse of structures and subsequent property damage and personal injury. Fires, gas leaks, explosions, hazardous material spills, the interruption of utility services, and damage to infrastructure are secondary hazards of earthquakes.

Structures that are highly susceptible to earthquake hazards include unreinforced masonry buildings, buildings with non-bearing walls and partitions, non-ductile concrete frame buildings, pre-cast tilt-up construction, long span and irregularly-shaped structures, mobile homes and residences not secured to foundations. Older structures were likely built when the seismic design of structures was not required for construction. This makes them less earthquake-resistant than newer buildings.

LANDSLIDES

Bedrock materials involved in landslides vary in composition and condition. A block-type slide may contain relatively intact, dense bedrock materials. Other slides consist of highly fractured and broken, jumbled bedrock. Overall, large ancient landslides tend to be relatively competent internally, with compressible materials present in the upper 10 to 15 feet and along the margins. Common bedrock materials that are expected to be associated with the identified landslide deposits within the Puente Hills include siltstones, silty sandstones and coarse rocks.

Landslides often occur along pre-existing zones of weakness within the bedrock. Local folding of the bedrock adds to the potential for slope failure. Landslides occur where the dip of the bedding of the rock is parallel with the slope. However, many landslides do not seem to be controlled by the position of the bedding relative to the topography but by other factors such as rock type and its attendant characteristics (density of jointing and fracturing).



Moderate (? Where Uncertain)
 Very Low (Bedrock Area)

Low
 Very Low

SOURCE: Tinsley et al., 1985, USGS, p. 1360, pp. 263-315

NORTH ↑

0 5000 scale in feet

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City of Whittier

GENERAL PLAN

EXHIBIT 7-5 RELATIVE LIQUEFACTION SUSCEPTIBILITY

Natural slope stability in the Puente formation ranges from moderately good (Sycamore Canyon member) to poor (lower Puente siltstone member). Bedrock landslides are not common in the Sycamore Canyon member but surficial failures are common. The lower Puente siltstone is characterized by bedrock landslides and surficial slumps during heavy rains with mudflows occurring on steeper slopes.

Natural slope stability in the Fernando formation ranges from moderate (lower member) to generally fair to poor (lower member). Bedrock landslides are relatively few in the upper member but surficial slumping is common during heavy rainfall. The lower member is characterized by surficial slumps during periods of rainfall with mudflows during heavy rainfall.

Natural slope stability in the La Habra formation is fair due to moderate topographic relief and principal drainage direction. Surficial failures and creep are common in areas underlain by claystone and siltstone, or overlain by thick expansive soil, colluvium and fill derived from these types of material.

Surficial slumping typically occurs in areas where deposits with low cohesion have been subjected to over-steepening or undermining due to erosion along active stream channels. In addition, surficial slumping may occur where bedrock has been over-steepened by folding or faulting.

It is speculated that major landslides in the area (including the Puente Hills) may have occurred at the end of the Pleistocene and/or the beginning of Holocene time, (from approximately 10,000 to 20,000 years ago) in response to varying climatic conditions. In addition, areas with a potential for landsliding are expected to coincide with areas where landsliding has already occurred. This is not to say that areas with no prior record of landsliding are not likely to have landslides. If conditions change that adversely affect slope stability, landslides may occur.

Hillsides underlain by the Puente Formation are prone to landslides. In addition, landslides are more common on south-facing slopes which are typically underlain by thick soil and slopewash deposits. The City's northern boundary along the Puente Hills encompasses hilly terrain with steep slopes and intervening valleys and canyons. Landslides or questionable landslide deposits have been identified by Tan (1988) and are located along the north-facing slopes on the south side of Sycamore Canyon (Exhibit 7-6). Yerkes (1972) notes that slope failures are fairly common in the siltstone units that crop out in the Puente Hills and are especially numerous on slopes underlain by Yorba and Sycamore Canyon members of the Puente Formation. Landslides are combinations of rotational slump in the upslope part and debris flow in the lower part.

A map of relative landslide susceptibility has also been prepared to aid in general land use planning (Exhibit 7-7). Areas are depicted by their relative landslide susceptibility on a scale that includes four levels of susceptibility; least, marginally, generally, and highly susceptible. With the exception of the hilly terrain in the north and southeast parts, the vast majority of the City is designated as either least or marginally susceptible to landslides. The hilly areas are considered generally susceptible with only the northernmost area adjacent to Sycamore Canyon being designated as highly susceptible. The area designated as highly susceptible corresponds to the area in which landslides or questionable landslides have occurred.

EROSION

Erosion is the natural process by which earth materials are loosened, worn away, decomposed or dissolved, and transported to another site within a few feet or many miles away. Precipitation and runoff, running water, and wind are common agents of erosion.

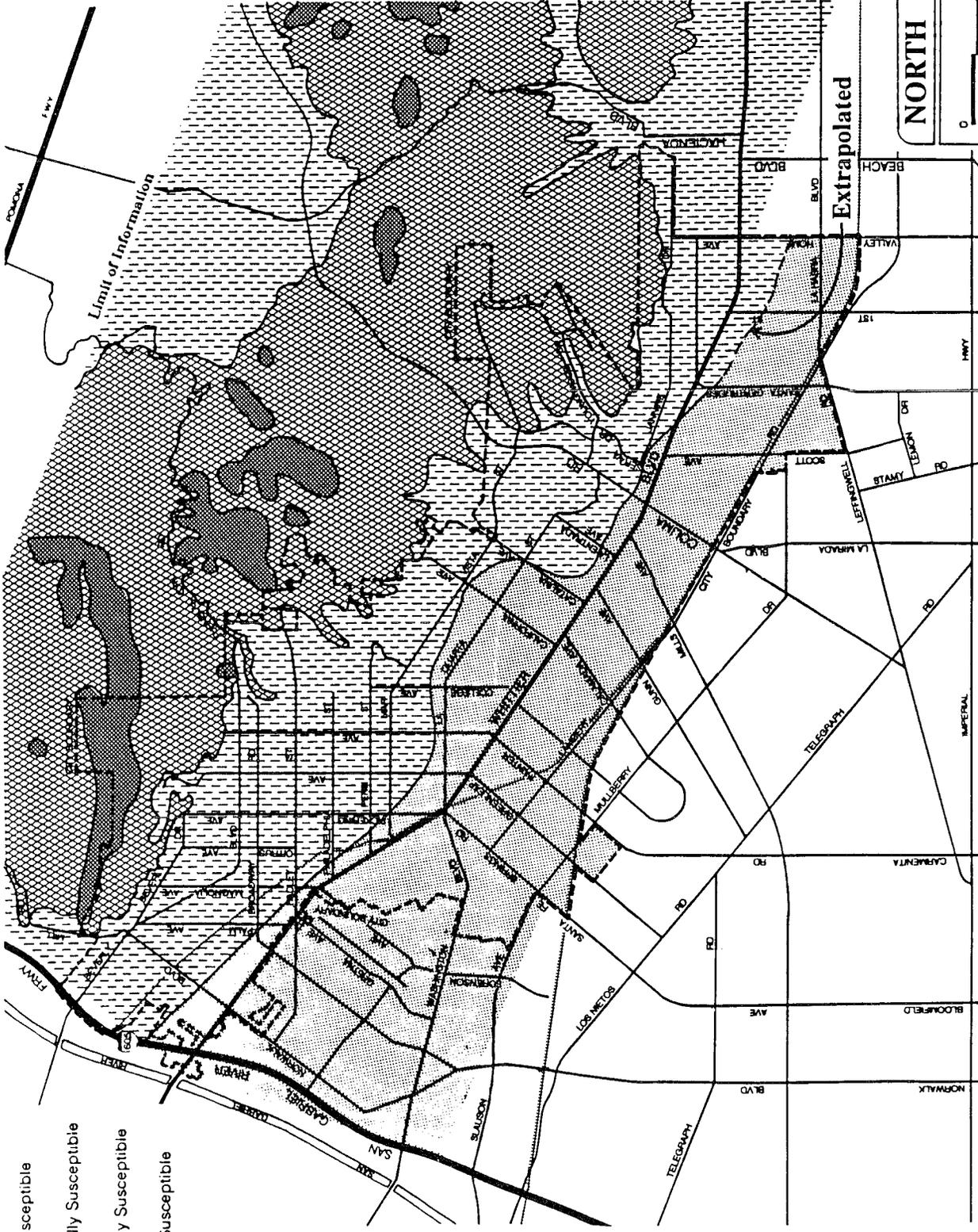
The majority of the City is underlain by alluvium on fairly gentle slopes, and the ground surface is covered by asphalt and concrete, with much of the rain water being diverted to storm drains. The potential for erosion is generally low in exposed natural slopes but greatly increases to highly erodible in excavated slopes or steep channel walls in natural drainages. The potential for erosion, in the parts of the City that border the Puente Hills to the north and east, ranges from low to high, depending on the soil or bedrock type and the amount of vegetation. Barren slopes are usually more susceptible to erosion and subject to rilling or ravelling. In addition, bedrock landslide debris are more susceptible to erosion than adjacent bedrock.

Ordinarily, the rate of erosion proceeds slowly, but may be greatly accelerated if the natural topography is changed by either natural events or unsound development practices. The result can create aesthetic as well as engineering problems, and if left unchecked, poses a threat to life and property.

DEBRIS FLOW

The potential for debris flow (mudflow) depends primarily on the presence of colluvium deposits upslope, the slope, and the increase in soil moisture content typically due to heavy rainfall. Debris flows often occur when saturated soils are subjected to a rainstorm of high intensity and short duration. Another factor contributing to debris flow is the loosening of near-surface soils by weathering. Wetting and drying of soils result in alternate expansion and contraction which, through many cycles, cause a gradual loosening and weakening of surface soils. Root growth and the burrowing of insects and rodents also contribute to

**EXHIBIT 7-7
LANDSLIDE SUSCEPTIBILITY MAP**



SOURCE: California Dept. of Mines & Geology, Open File Report 88-21, "Landslide Hazards in the Puente Hills & San Jose Hills", 1987 by Siang Tan.



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loosening of the soil. This allows more rapid penetration of moisture and when saturation occurs to sufficient depth, the surficial materials begin to flow.

Debris flows commonly originate as shallow soil slumps in rounded, colluvium-filled "hollows" at the heads of natural drainages. The rigid soil mass is deformed into viscous fluid and moves down the natural drainage swale. It takes in additional soil and vegetation scoured from the channel during the flow. The velocity of the flow depends on the viscosity, the slope gradient, the height of the slope, the roughness of the channel, and the baffling effect of vegetation.

FLOODING

Three flood zones, as recognized by Federal Emergency Management Agency (FEMA), have been identified within the City of Whittier. Zone "A" refers to areas of 100-year flood potential. Zone "B" are areas between the limits of the 100-year flood and 500-year flood. They also include certain areas subject to 100-year flooding with average depths less than one foot, where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood. Zone "C" are areas of minimal flooding potential.

The areas subject to flooding as a result of surface-water runoff caused by 500 and 100-year storms are shown in Exhibit 7-8. These areas are local low-lying depressions and areas immediately adjacent to natural or engineered drainage channels. The majority of the City is designated as Zone "C" and has minimum flood potential. The twelve areas designated as Zone "A" have a 100-year flood potential and currently experience street ponding problems. They include short segments of Hadley Street, Palm Avenue, Pickering Avenue, Scott Avenue, Valley Home Avenue, Whittier Boulevard, and Slauson Avenue, among others. Five areas are designated as Zone "B" and have a 100-500 year flood potential. They are small scattered sites along the northeastern and eastern portions of the City.

DAM INUNDATION POTENTIAL

There are four small reservoirs located in the Puente Hills above the City (within city limits) that potentially pose a flood hazard. These include Whittier Storage Facility Numbers 1, 2, 4 and 9. Exhibit 7-9 shows their potential inundation areas. All are constructed of concrete and have capacities ranging between one and ten million gallons. There are several other water tanks located throughout the city, but they pose very minor flood hazards.

Whittier No. 1 Storage Facility

The Whittier No. 1 storage facility (Painter Reservoir) is located 0.15 mile north of the intersection of Painter Avenue and Beverly Boulevard at an elevation of approximately 580 feet msl. The reservoir is a concrete structure with a capacity of approximately 1.0 million gallons (3.07 acre-feet). Water released from this structure would flow southwest across the alluvial fan towards Beverly Boulevard for a distance of about 0.2 mile from the source. The area that may be impacted in the event of failure of the structure is approximately 250,000 square feet wide.

Whittier No. 2 Storage Facility

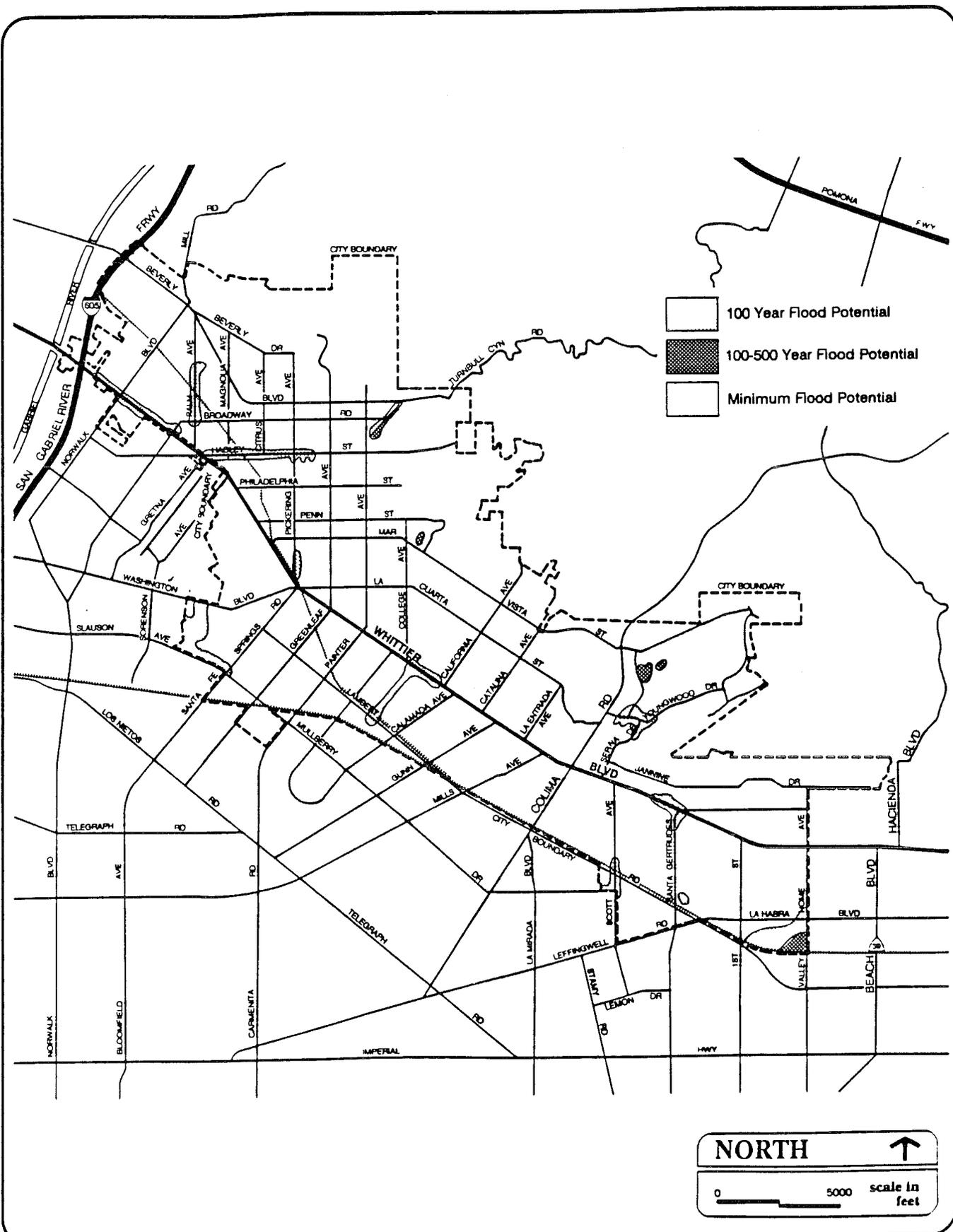
The Whittier No. 2 storage facility (Greenleaf Reservoir) is located 0.35 mile northwest of the intersection of Beverly Boulevard and Painter Avenue at an elevation of approximately 460 feet msl. The reservoir, constructed at the mouth of the junction of three canyons, is a concrete vault structure with a capacity of approximately 6 million gallons (18.4 acre-feet). Water released from this structure would flow southwest across the alluvial fan towards Beverly Boulevard for a distance of approximately 0.5 mile from the reservoir. The potential inundation area is approximately 700,000 square feet wide.

Whittier No. 4 Storage Facility

The Whittier No. 4 storage facility (Hoover Reservoir) is located 0.6 mile east of the intersection of Norwalk and Beverly Boulevards at an elevation of approximately 460 feet msl. The reservoir is a concrete vault structure with a capacity of approximately 9.75 million gallons (30.7 acre-feet). In the event of tank failure, water from the storage facility initially would be confined to the southwest-trending canyon that drains its headward region. Once out of the confines of the canyon walls, the flood waters would flow southward along a natural, gentle swale. Crossing Beverly Boulevard, the flow turns west and northwest along the Pacific Union Railroad alignment, probably stopping just short of Norwalk Boulevard. The total estimated maximum distance of flow is 2.3 miles from the facility with approximately 64 acres within its inundation area.

Whittier No. 9 Storage Facility

The Whittier No. 9 storage facility (Ocean View Reservoir) is located 0.7 mile from the intersection of Colima Road and Mar Vista Street at an elevation of approximately 460 feet msl. The reservoir is a concrete vault structure with a capacity of approximately 4 million gallons (12.3 acre-feet). The area that may be potentially impacted in the event of failure of the structure would cover approximately 500,000 square feet. Water released from this structure would flow southwest within the confines of a gentle swale southwest across the



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**EXHIBIT 7-8
FLOOD HAZARDS**

alluvial fan towards Mar Vista Street. The total estimated maximum distance of flow is 0.4 mile from the source.

Other Storage Structures

A number of other storage structures (tanks) are located within in the Puente Hills at various sites. All contain less than 1 million gallons and are listed in Table 7-4.

TABLE 7-4 MINOR STORAGE TANKS		
Storage Tank	Reservoir Name	Size
Whittier No. 3	College Hills	300,000 gallons
Whittier No. 5	Rideout	150,000 gallons
Whittier No. 6	Hazzard	150,000 gallons
Whittier No. 8	College Hills	475,000 gallons
Whittier No. 10 & 11	Murphy	500,000 gallons (each)
Whittier No. 12	Starlight	300,000 gallons

Damage which could result in the release of water from these structures would cause localized erosion and very limited flooding. Thus, they are not considered significant inundation hazards in the City.

Whittier Narrows Dam

The Whittier Narrows Dam is located 3.8 miles northwest of the City of Whittier Civic Center. It is west of the San Gabriel River flood control channel and the Freeway (SR-605). Inundation from flood waters released from the Whittier Narrows Dam includes a limited area in the northwest corner of the City as shown in Exhibit 7-9.

WILDFIRE

The potential for wildfire is generally restricted to naturally vegetated open space areas in the hills and canyons of the Puente Hills along the northern boundaries of the City. The degree of hazard from wildfire depends on the amount and distribution of seasonal rainfall, the density of native vegetation, the period from the last wildfire, and the amount of development in these areas. Other factors that may cause a fire hazard are associated with oil fields. A map delineating areas of potential wildfire hazards in the undeveloped areas in and adjacent to the City is presented as Exhibit 7-10.

In the Whittier area, the brush is generally thicker on the north facing slopes because they are partially protected and tend to retain more moisture. There are three fire hazards in the area: dry brush, high thick canopy trees, and houses with wooden shingle roofs. According to Mr. Ron Rayhawk of the Whittier Battalion Chief's office, these fire hazards are located along the eastern edge of the City. The primary fire hazard areas are the Turnbull Canyon Road area, the Puente Hills, Friendly Hills, and the area around Colima Road and Calle Terra. The high risk area around Turnbull Canyon is south of the road where homes are found at the top of a steep north-facing slope, and the majority of the hillsides are covered with heavy brush. The undeveloped areas of the Puente Hills is covered with scrub brush, posing a fire hazard. The area east of Colima Road does not have as much brush and therefore do not pose as great a fire hazard. The Friendly Hills area is used by equestrians and contains many high canopy trees. It is also considered a high fire hazard. The areas around Colima Road and Calle Terra are considered high fire hazard areas due to many high canopy trees (primarily Eucalyptus) and a number of houses with wood shingle roofs.

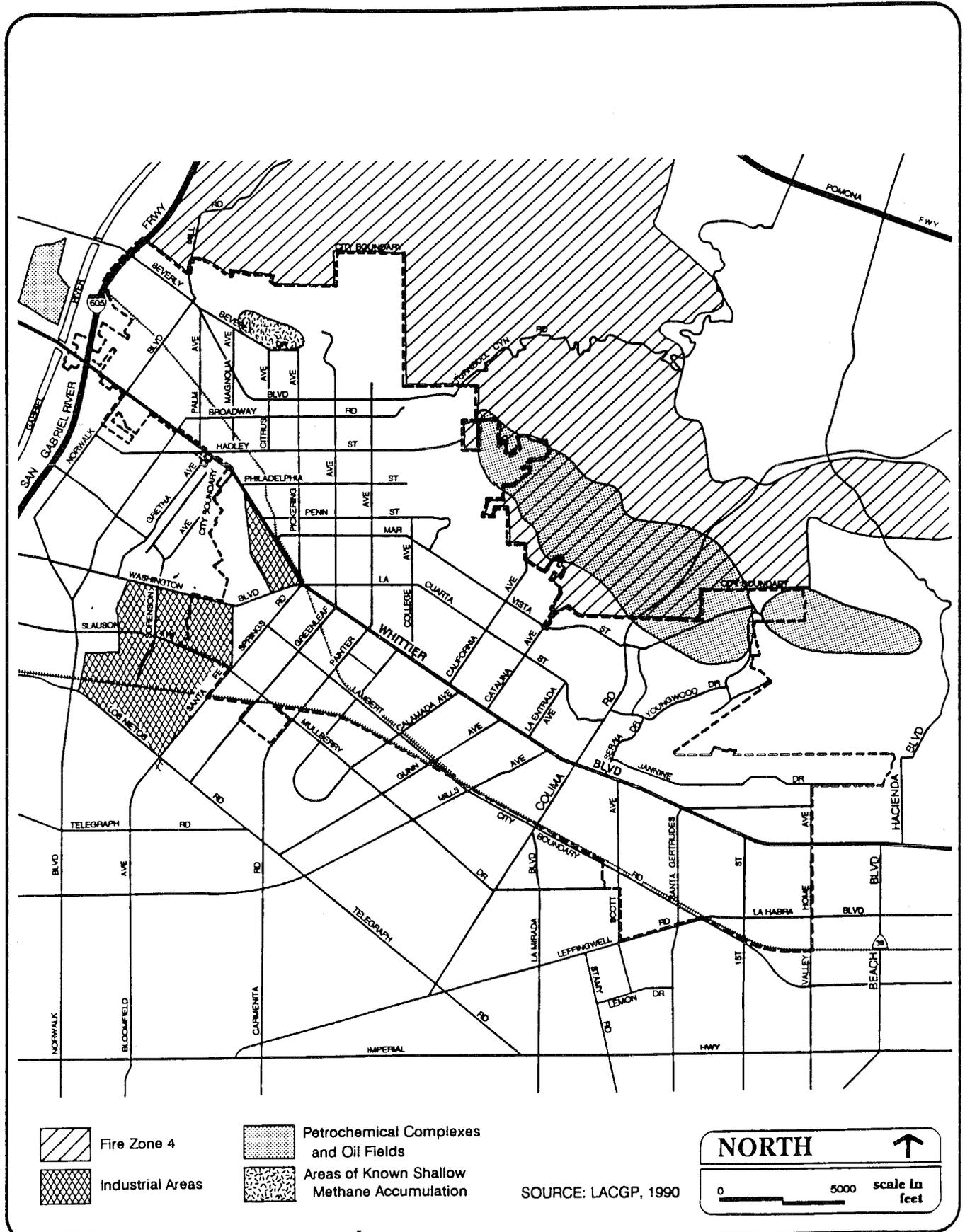
Natural fires caused by lightning or spontaneous combustion are infrequent and represent little threat to the community. However, natural areas of dense vegetation in the Puente Hills may be exposed to man-made fire hazards and are considered a high fire risk. This condition is only exacerbated during the periods of hot, dry desert winds and hot local temperatures, creating the potential for a major threat to lives and property in the City.

Other potential sources of fire, not necessarily associated with the undeveloped areas of the City are the industrialized areas and areas of known shallow methane accumulations. These areas are limited to the developed parts of the City and pose a potential fire hazard to adjacent areas in the case of a major fire.

URBAN FIRE

Urban fires occur in developed areas and destroy buildings and other manmade structures and pose threats to life and safety. Fire disasters are often due to accidents, carelessness, faulty wiring or electrical equipment, as exacerbated by combustible construction materials, the absence of fire alarm and sprinkler systems, and presence of fire-supporting chemicals.

Urban fire hazards in the planning areas are posed by industrial uses (Exhibit 7-10), high voltage power lines (Exhibit 7-11) and high pressure gas lines (Exhibit 7-12). High voltage power transmission lines are not found in the City but 220-kilovolt lines run along the west side of the San Gabriel River and on the Puente Hills. Substations within the City include the Murphy Substation on Painter Avenue by the SPRR railroad; the Westgate Substation on Whittier Boulevard, the Friendly Hills Substation on Colima Road; and the Telegraph Substation on Santa Gertrudes Avenue and Lambert Road. Main gas lines in the City are

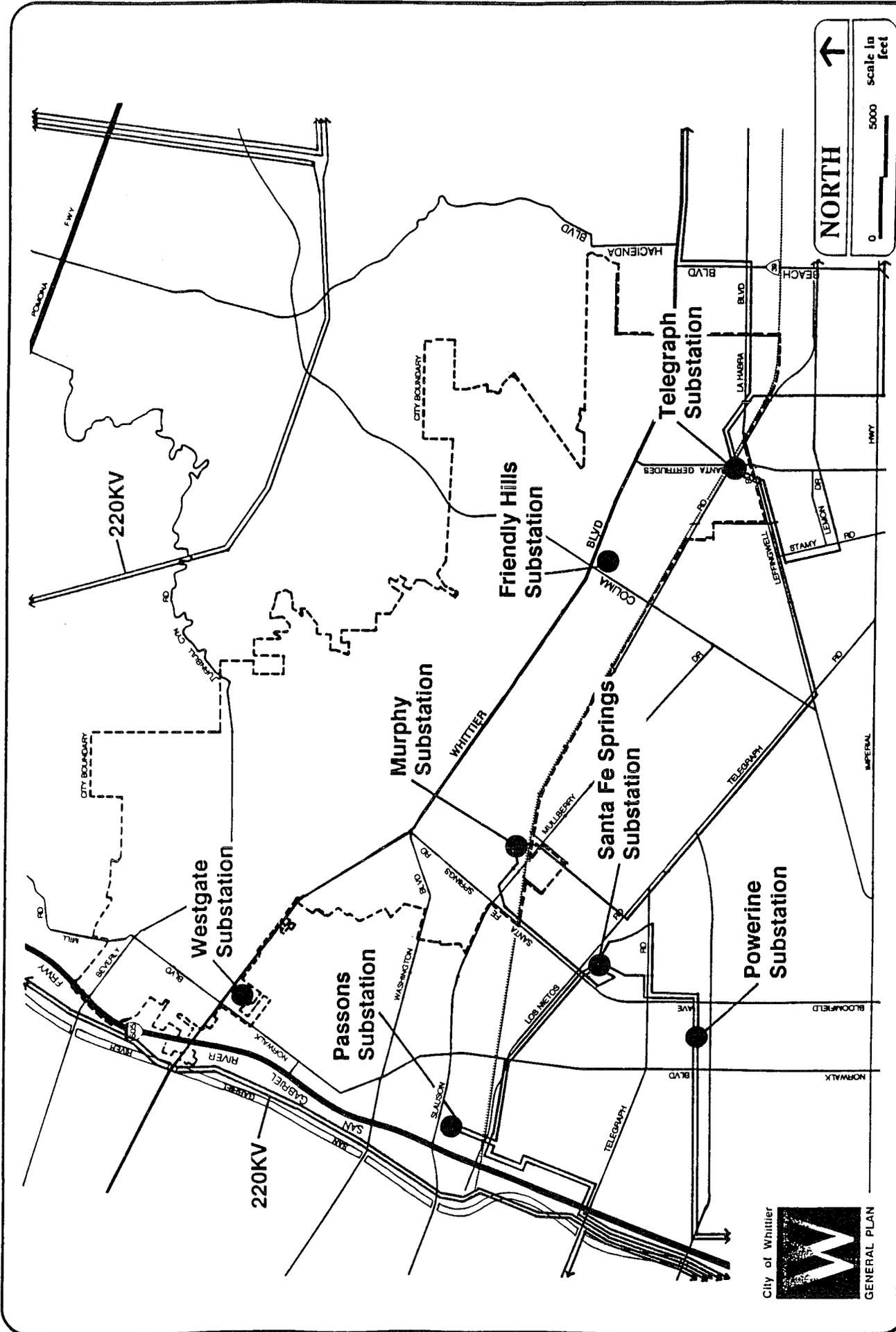


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City of Whittier



**EXHIBIT 7-10
WILDLAND AND SELECTED
URBAN FIRE HAZARDS**



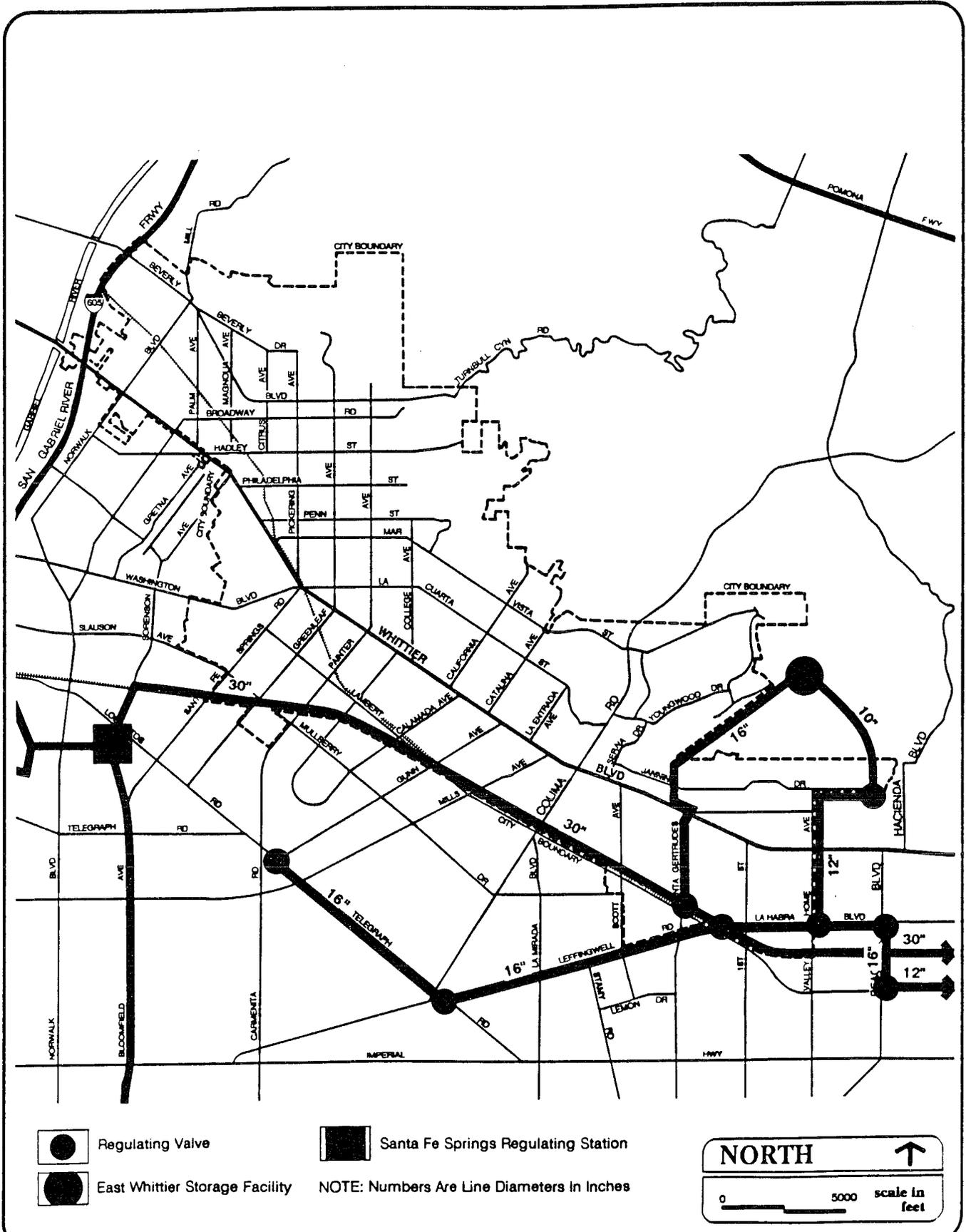
NORTH ↑

0 5000 scale in feet



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**EXHIBIT 7-11
POWER LINES
AND SUBSTATIONS**



- Regulating Valve
 - Santa Fe Springs Regulating Station
 - East Whittier Storage Facility
- NOTE: Numbers Are Line Diameters In Inches

NORTH ↑

0 ————— 5000 scale in feet

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EXHIBIT 7-12 HIGH PRESSURE GAS LINES

Section 7: Public Safety Element Background Report continued

pressurized from 300 to 465 pounds per square inch (psi). They range in size from 10 to 30 inches in diameter. The majority of the gas used in Whittier comes from the Santa Fe Springs Station. The East Whittier storage facility utilizes local gas oil from wells in the Puente Hills. The fire hazard posed by structures with substandard electrical systems cannot be readily evaluated.

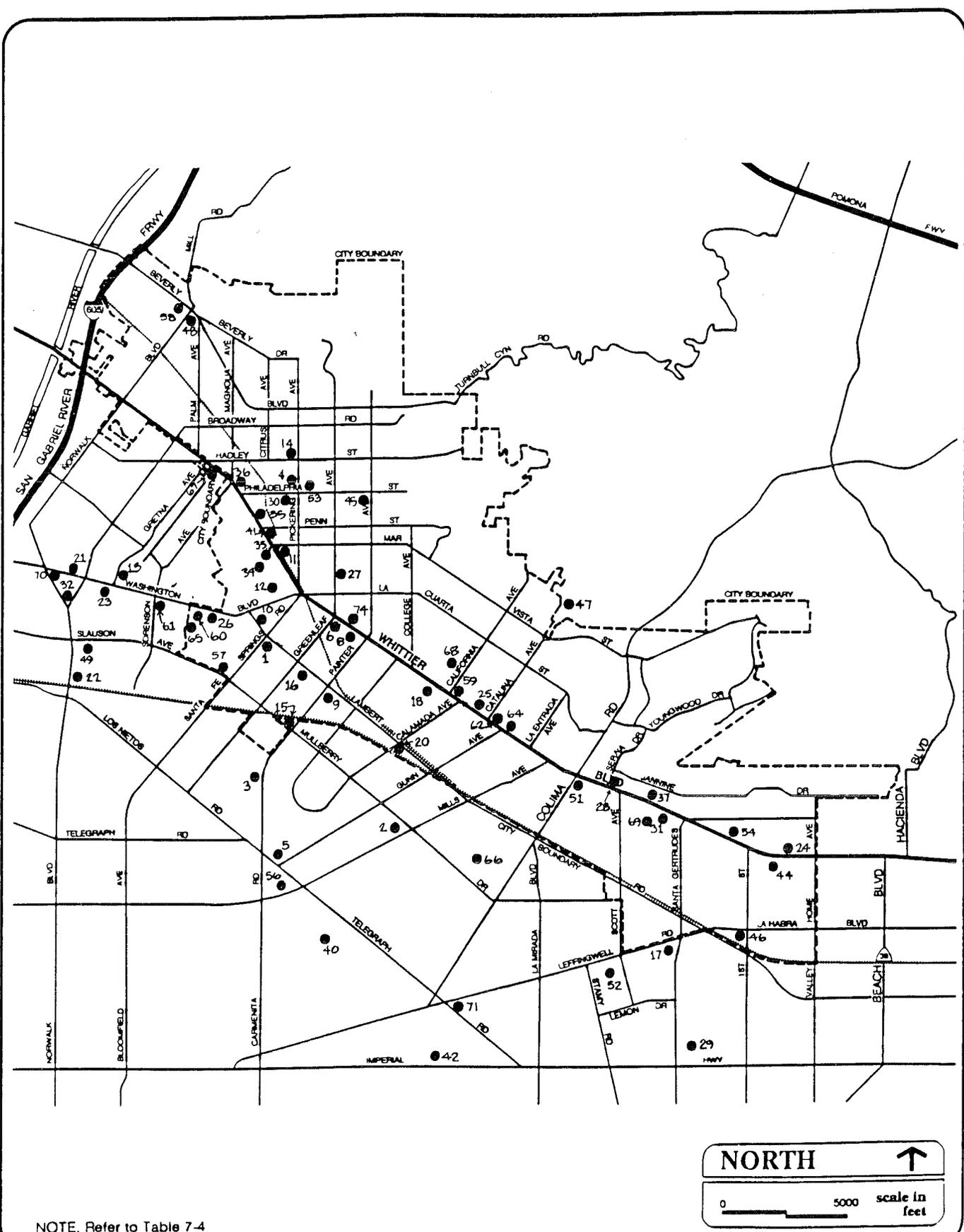
HAZARDOUS MATERIALS

Based on the review of the available records, a number of sites associated with the use of hazardous materials and the generation of hazardous wastes have been identified within the Whittier area. Table 7-5 provides a list of these sites. Exhibits 7-13 through 7-15 show the relative location of identified sites.

TABLE 7-5 HAZARDOUS MATERIALS HANDLERS & WASTE SITES				
No.	Site	Address	Source	Status
1	7-Eleven Store 2114-18470/WPD	8438 Santa Fe Springs Rd.	HWIS	3
2	7-Eleven Store 2114-16931/WPD	10011 Mills Rd	HWIS	3
3	7-Eleven Store 2114-16028/WPD	9727 Carmenita Ave	HWIS	3
4	7-Eleven Corp 2114-17896/WPD	12515 E. Philadelphia St.	HWIS	3
5	AAA Body & Paint Shop	13422 Telegraph Rd.	HWIS	2
6	AAMCO Transmission	13130 E. Whittier Blvd.	HWIS	3
7	Agricultural Property	Slauson Ave.	LUST/CORTESE	S
8	Al's Rubber Stamp & Specialty Works	13211H E Whittier Blvd.	HWIS	TSDF
9	America Transmission	13422 Lambert Rd., E.	LUST	S
10	American Medical Enterprises	12508 Lambert Rd., E.	LUST	S
11	Zieman Manufacturing Co.	12425 Whittier Blvd.	HWIS	2
12	Anchor Post Prods Inc. CA	12482 E. Putnam Dr.	HWIS	1
13	Apex Bulk Commodities	11655 Washington Blvd. E.	LUST/CORTESE	U
14	ARCO FAC. #5206	12525 Hadley	LUST	U
15	ARCO Station #1661	9151 Painter Ave.	LUST/CORTESE	G
16	ARCO Station #0211	13010 Lambert Road	LUST/CORTESE	U
17	ARCO Station #6149	15750 Leffingwell Rd.	LUST/CORTESE	G
18	Ask Waste Oil	9112 Strub Ave.	HWIS	TRANS
19	Associated Oil Co.	2118 S. Norwalk Blvd.	ASPIS	PAL

Section 7: Public Safety Element Background Report continued

TABLE 7-5 HAZARDOUS MATERIALS HANDLERS & WASTE SITES				
No.	Site	Address	Source	Status
20	Atlantic Richfield Co. Sta 1090	14000 E. Lambert	HWIS	1
21	B & W Cleaners	11235 E. Washington Blvd	HWIS	2
22	Barret Station	8728 Norwalk Blvd.	LUST	4
23	BB Plant & Body Center	11506 E Washington Blvd	HWIS	2
24	BC Auto Parts & Service	16511 E. Whittier Blvd.	HWIS	3
25	Ben Niemi Buick	14365 E. Whittier Blvd.	HWIS	2
26	Blower Drive Service	12140 E. Washington Blvd.	HWIS	1
27	Blu White Linen Cirs Inc.	7734 S. Greenleaf Ave.	HWIS	1
28	Board Ford	15265 E. Whittier Blvd.	HWIS/LUST/CORTESE	1,S
29	Bob Perkins Trucking	16017 Landmark Dr.	HWIS	1
30	Bobs Automotive Center Inc.	12510 Philadelphia	HWIS	3
31	Broadway the Whittier	15600 Whittwood	HWIS	3
32	Broadway Cleaners	8023 S. Broadway	HWIS	1
33	C M C Printed Bag Co.	2615 Pacific Park Dr.	HWIS	1
34	C & D Inc. DBA Tool & Jig Plating	7635 S. Baldwin Pl.	HWIS	1
35	Cal-Air Inc.	12484 Whittier Blvd.	HWIS	TRANS
36	Calcor Space Facility Inc.	12031 Philadelphia St.	HWIS	1
37	California Domestic Water Co.	15505 E. Whittier Blvd.	HWIS	2
38	Caltrans Eastern Regional Sta	1940 Workman Mill Rd.	HWIS	1, TRANS
39	Caltrans, Whittier Maint. Station	1940 Workman Mill Rd., S.	LUST/CORTESE	U
40	Candlewood Country Club	14000 Telegraph Rd., E.	LUST/CORTESE	S
41	Carcoa Auto Painting	12615 E. Whittier Blvd.	HWIS	2
42	Chambers Recycle	12206 Colima Rd.	HWIS	TRANS
43	Chem Resource Co.	12236 Coast Dr.	HWIS	1
44	World Oil Co.	16360 Whittier Blvd.	HWIS/LUST/CORTESE	2
45	Chevron Station #8623	7001 Painter Ave., S.	LUST/CORTESE	S
46	Chevron Station #93408	16170 Leffingwell Rd.	LUST/CORTESE	G
47	Chevron Station	8000 Catalina Ave. No.	LUST/CORTESE	
48	Chevron Station #91190	10808 Beverly Blvd. E.	LUST/CORTESE	U
49	Circle K #3064	11642 W. Slauson	HWIS	



NOTE. Refer to Table 7-4

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EXHIBIT 7-13
HAZARDOUS MATERIAL SITES
Numbers 1-74

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
50	Circle K #3043	13746 Meyer Road	HWIS	3
51	Cleaning Store The	15030 Whittier Blvd #2	HWIS	1
52	Cousins Waste Oil	15321 Saranac Dr.	HWIS	TRANS
53	Covenant Cooperative Enter Inc.	12727 Philadelphia St. #C	HWIS	3
54	Craig's Automotive	16017 Whittier Blvd.	HWIS	1
55	Crazy Joe's Repair	12630 E. Whittier Blvd.	HWIS	2
56	D & B Machine	10706 Inez	HWIS	3
57	DCR Transmission Parts	12407 Slauson, Ste B	HWIS	3
58	Dicks Salvage Co.	5408 S. Rockne Ave	HWIS	TRANS
59	Discount Tire Ctr #98	14101 W. Whittier Blvd.	HWIS	3
60	D N S Auto Body	12130 Washington Blvd.	HWIS	2
61	Drive Line Service of Whittier	11840 E Washington Blvd	HWIS	3
62	Dry Clean for Less	14153 Whittier Blvd #101 A	HWIS	2
64	East Whittier City School District	14535 Whittier Blvd. E.	LUST/CORTESE	S
65	Eastman Kodak Co. Regl MS D Ctr.	12100 Rivera Rd.	HWIS	1
66	Econo Lube N Tune	12320 Valley View	HWIS	1
67	Ed Prader Automotive	11630 Whittier, Unit D	HWIS	3
68	Environmental Graphics Ptg.	8512 Strub Ave.	HWIS	3
69	Firestone Store #27FT	15710 La Forge	HWIS	3
70	Firestone Store #2798	11230 E. Washington Blvd	HWIS	2
71	Firestone Store 2797	14428 Telegraph Rd.	HWIS	3
72	G I Waste Oil	13528 Excelsior	HWIS	TRANS
73	G D W Trucking	2208 S. Mardell St.	HWIS	TRANS
74	Gen Telephone of CA/Whittier-2	13119 E. Whittier Blvd.	HWIS	1
75	Gen Telephone of CA/Whittier-1	11024 First Ave	HWIS	1
76	General Telephone of Cal.	10603 E. Whittier Blvd.	HWIS	3
77	General Telephone of CA	13687 Telegraph Rd.	HWIS	3
78	Graphic-Dies	11822 E. Washington Blvd	HWIS	1
79	Guirado Dump	Pioneer Rd/Orange Grove Ave	ASPIS	PAM

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
80	Gunlocke Corporation	12468 Putnam Street	LUST/CORTESE	S
81	Halferty & Debeikes Properties	12353 Whittier Blvd.	HWIS	1
82	Harris Oldsmobile Inc.	13617 E. Whittier Blvd.	HWIS	1
83	Holiday One Hour Cleaners	11131 S. First Ave	HWIS	3
84	Hood Corporation	8201 Sorensen Ave	HWIS	1, TRANS
85	Imperial Paving Co., Inc.	13555 Imperial Hwy., E.	LUST	U
86	J & C Auto Supply	13214 Whittier Blvd.	HWIS	2
87	J & R Transmissions	15836 Lambert Rd.	HWIS	3
88	Jiffy Lube #5	1418 Lambert	HWIS	1
89	Jiffy Lube	11705 Colima Rd.	HWIS	3
90	Jones Chevrolet	12560 Whittier Blvd.	HWIS/LUST/CORTESE	U
91	Kings Cleaners	16501 E. Leffingwell Rd.	HWIS	3
92	L & N Precision Radiator	11707 G Washington Blvd.	HWIS	3
93	L & N Body Repair	12301 1/2 Wardman St.	HWIS	1
94	LA County Sanitation Dist.	1965 Workman Mill Rd.	HWIS	1
95	Lankford Charles H Trucking	11419 Newgate Ave	HWIS	TRANS
96	Larry's Body & Paint	13542 E. Telegraph Rd.	HWIS	1
97	Leggett & Platt, Bedline	12352 Whittier Blvd.	HWIS/LUST/CORTESE	1,U
98	Lidyoff Maurice M.	7621 Forest Ave.	HWIS	TRANS
99	Los Angeles Freightliner GMC	2429 South Peck Rd.	HWIS	2
100	McAllister Cadillac, Inc.	15311 E. Whittier Blvd.	HWIS	1
101	McConnell & Jones, DBA WCC Co.	12504 E. Whittier Blvd.	HWIS	TRANS
102	McFarland Energy - Old Whittier	W/2 Sec 22 T2S R11W	HWIS	1
103	Miguels Diesel	2332 S Peck Rd	HWIS	1
104	Miller Castings Inc.	2503 Pacific Park Dr.	HWIS	
106	Mission Rubber Co., Inc.	6533 S. Magnolia Ave.	HWIS	1
107	Mobil S.S. #11-E75	10737 Beverly Blvd. E.	LUST	U
108	Mobil Station	15827 Whittier Blvd. E.	LUST/CORTESE	6
109	Mobil Station #11-E6W	11253 Whittier Blvd.	LUST/CORTESE	U
110	Mobil Station #11-E50	8441 Pioneer Blvd., S.	LUST/CORTESE	U

Section 7: Public Safety Element Background Report (continued)

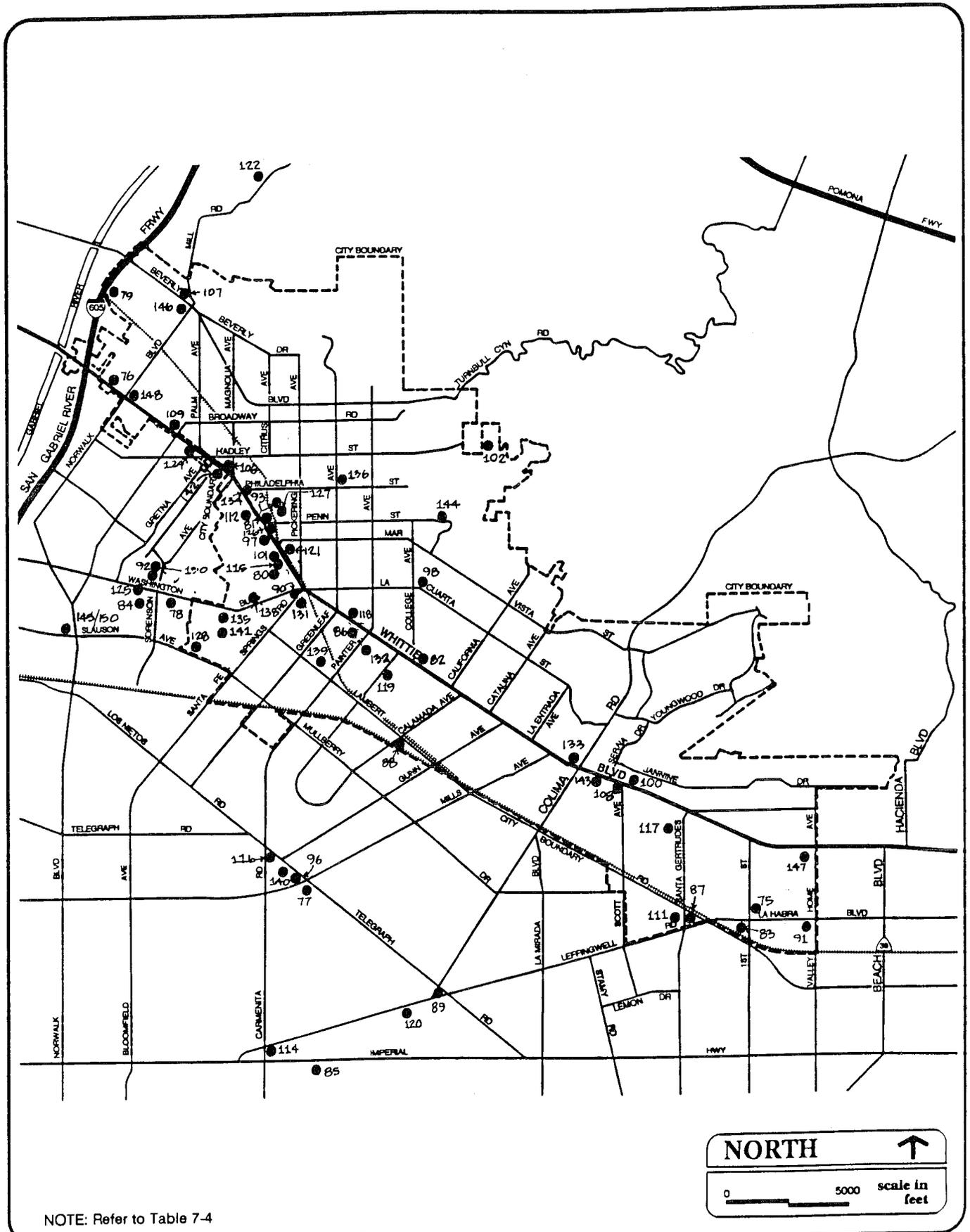
**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
111	Mobil Station #11-EOR	15735 Leffingwell Rd.	LUST/CORTESE	U
112	Modine Manufacturing Co	12252 E. Whittier Blvd.	HWIS/CORTESE/ASPIS/ CERCLIS	1/SIRM/S /I
113	Mustang Equipment Co.	2425 Kella Ave.	HWIS	1
114	Nash Salvage Inc.	13324 E. Leffingwell Rd.	HWIS	TRANS
115	Omega Chemical Co. RP	12504 E. Whittier Blvd.	HWIS	1, TRANS, TSDf
116	One Hour Martinizing Cleaners	13407 Telegraph Rd.	HWIS	3
117	Our Cleaners Inc.	1571 E. La Forge	HWIS	1
118	Pacific Bell	13119 E. Whittier Blvd.	HWIS	1, TRANS
119	Pacific Bell	8414 S. Laurel	HWIS	1
120	Pacific Hazardous Pumping	11818 Valley View Ave	HWIS	TRANS
121	Paragon Machine & Tool Inc.	7352 Whittier Ave	HWIS	2
122	Paul Munroe Hydraulics	9999 Rose Hills Rd.	HWIS	1
123	Puente Hills Landfill #6	2800 S. Workman Mill Rd.	ASPIS/CERCLIS	PAM, SI
124	Precision Transmission	11630 Whittier Blvd, Unit H	HWIS	3
125	Precision Automotive Cauper Exc.	11715 1/2 Washington Blvd.	HWIS	1
126	Preston Weed Control	12363 Whittier Blvd.	LUST/CORTESE	7, S
127	Priti-Paint	12302 3/4 Wardman St.	HWIS	1
128	Pryor-Giggey Company	12393 Slauson Ave. E.	LUST/CORTESE	U
130	Quaker City Pltg & Silversmith	7937 Chatfield Ave.	HWIS	1
131	Rainbow Car Wash	12604 Whittier Blvd. E.	LUST/CORTESE	S
132	Ralphs Grocery Co. #81	13241 E. Whittier Blvd.	HWIS	3
133	Ralphs Grocery Co. #64	14919 Whittier Blvd.	HWIS	3
134	Rasmussen Iron Works	12028 E. Philadelphia St.	HWIS	2
135	Refractory Composites Inc.	12220 A Rivera Rd.	HWIS	2
136	Reliable Printing Service	6743 Bright St.	HWIS	2
137	Rio Hondo Community Dist.	3600 Workman Mill Rd.	HWIS	2
138	Rippy, Fred R. Inc.	12471 Washington Blvd.	HWIS	1

Section 7: Public Safety Element Background Report continued

**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
139	Roadwest Oil Company	8643 Shoemaker Ave.	HWIS	TRANS
140	Rube's Body & Paint, Inc.	10634 So. Inez	HWIS	1
141	Russ Bassett Corp	8189 Byron Rd.	HWIS	1
142	Sabir Development Inc.	11630 E. Whittier Blvd.	HWIS	3
143	Sackett & Peters	15214 E. Whittier Blvd.	HWIS	2
144	Savage Canyon Landfill	13919 E. Penn St.	HWIS/LUST/CORTESE	3/U
145	Shell Service Station	11515 Slauson	LUST	1
146	Shell Station No. 204-8458-0800	10742 E. Beverly	HWIS/CORTESE/LUST	1, U
147	Winston Tire Company #44	16554 E. Whittier Blvd.	HWIS	3
148	Shell Station	10807 Whittier Blvd.	LUST/CORTESE	S
149	Shell Station	14963 Mulberry Rd., E.	LUST/CORTESE	L
150	Shell Station No. 204-8458-1600	11515 E Slauson	HWIS/CORTESE	1, S
151	Shell Station	11347 Washington Blvd.	LUST/CORTESE	S
152	Sierra Education Center	9401 Painter Ave., S.	LUST	S
153	So. Calif Gas Co/Whittier Base	12460 Mar Vista Dr.	HWIS	2
154	Soabar Co.	12450 E. Whittier Blvd.	HWIS	1
155	Southern California Edison	11954 E. Washington Blvd.	HWIS	3
156	Southland Corp DBA 7-11	8280 Norwalk Blvd.	HWIS	3
157	Southland Corp, The	13939 Whittier Blvd. E.	LUST/CORTESE	S
158	Standard Transmission Exchange	12407 Slauson, Ste B	HWIS	3
159	Stop N Go Market #914	12604 Beverly Blvd.	HWIS	3
160	Stop N Go Market #910	11601 E. Hadley	HWIS	3
161	Sun Nissan Datsun	16050 E. Whittier Blvd.	HWIS	1
162	Susana Transportation Systems. Inc.	2845 Workman Mill Rd.	HWIS	1
163	Swiss Dry Cleaners	15043 Mulberry	HWIS	2
164	Texaco Station	10810 La Mirada Blvd.	LUST/CORTESE	G
165	Texaco Service Station	12608 Hadley Pickering	HWIS	3
166	Thielmann, Mary Ann Property	16161 Leffingwell Rd.	LUST	S
167	Tin Plating Co., The	11748 1/2 Washington Blvd.	HWIS	2
168	Tony's Dry Cleaners	14836 E. Whittier Blvd.	HWIS	1



DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



EXHIBIT 7-14
HAZARDOUS MATERIAL SITES
Numbers 75-148

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
169	Toyota of Whittier	14577 Whittier Blvd.	HWIS	3
170	Tuneup Masters	11620 E. Hadley	HWIS	3
171	U-Haul Leffingwell 713-80	157707 Leffingwell	HWIS	3
172	Ultra Sonic Deburring	8136 Byron Rd.	HWIS	2
173	Unitog Rental Services	2829 Workman Mill Rd.	HWIS	1
174	Unocal S.S. #4090	14200 Telegraph Rd., E.	LUST/HWIS	U, 3
175	Unocal 76 Station #5091	11808 Washington Blvd. E.	LUST/HWIS	U, 3
176	Unocal Station #5287	7304 Painter Ave., S.	LUST/CORTESE/HWIS	S, 3
177	Unocal 76 Station #5195	16205 Leffingwell Rd.	LUST	S
178	Unocal 76 Station #5619	10506 Whittier Blvd.	LUST/CORTESE/HWIS	U, 3
180	Unocal Station #5350	10805 La Mirada Blvd.	LUST/CORTESE	S
181	Unocal Svc Sta #6 241	11760 Whittier Blvd.	HWIS	3
182	Unocal Svc Sta #3 132	12823 E Hadley St.	HWIS/CORTESE/LUST	3, U
183	Unocal Svc Sta #6 907	10025 E Washington Blvd.	HWIS	3
185	Unocal Svc Sta #4 362	13709 E. Whittier Blvd.	HWIS	3
186	Unocal Svc Sta #4 606	8803 S. Painter	HWIS	3
188	Unocal Svc Sta #3 495	14940 E. Whittier Blvd.	HWIS	3
189	Unocal Svc Sta #5 195	16205 E. Leffingwell	HWIS	3
190	Unocal Svc Sta #5 044	10201 E. Beverly Blvd.	HWIS	3
191	Wholesale Body Shop, The	12213 Philadelphia Ave.	HWIS	2
192	Unocal Svc Sta #4 459	15806 E. Whittier Blvd.	HWIS	3
193	Whittier Propel	12132 Hadley	CERCLIS	RV
194	Urich Motor Co.	13003 E. Whittier Blvd.	HWIS	2
195	USA Petroleum Station #228	11806 Valley View Ave	LUST/CORTESE	G
196	Usary Automotive Repair	13132 E. Whittier Blvd.	HWIS	3
197	Viking Freight System Inc.	3200 Workman Mill Rd.	HWIS	1
198	Vogue International Display Co.	12460 Putnam St.	HWIS	1

Section 7: Public Safety Element Background Report continued

**TABLE 7-5
HAZARDOUS MATERIALS HANDLERS & WASTE SITES**

No.	Site	Address	Source	Status
199	W. Whittier School Dist.	14535 Whittier Blvd.	HWIS	2
200	Walts Cleaners	8002 S. Greenleaf Ave.	HWIS	1
201	Washington Plating Inc.	7060 S. Elmer Ave.	HWIS	1
202	Waste Disposal, Inc.	12731 E. Los Nietos Rd.	CERCLIS/CORTESE/ ASPIS	CO
203	Weddle Auto Repair Corp.	12548 Putnam	HWIS	1
204	Westwat Cleaners	1262 Whittier Blvd.	HWIS	3
205	Whittier College	13729 Earlham Dr.	HWIS/LUST	1, 4
206	Whittier Union High Sch Dist.	9401 S. Painter	HWIS	3
207	Whittier Dodge	16114 E. Whittier Blvd.	HWIS	3
208	Whittier UNSD La Serna High School	15301 E. Youngwood	HWIS	3
209	Whittier City Yard	12016 Hadley St.	HWIS	3
210	Whittier UHSD Pioneer High School	10800 Benavon	HWIS	3
211	Whittier UHSD Whittier High School	12417 E. Philadelphia	HWIS	3
212	Whittier Honda Kawasaki	14043 E. Whittier Blvd.	HWIS	3
213	Whittier UHSD California High School	9800 Mills Ave.	HWIS	3
214	Whittier Hospital Medical Center	15151 E. Janine Dr.	HWIS	1
215	Whittier Chrysler Plymouth	13840 E. Whittier Blvd.	HWIS	2

Status Definitions:

HWIS

- 1 - Generators who generate at least 1,000 kg/mo of non-acutely hazardous waste or 1 kg/mo of acutely hazardous waste
- 2 - Generators who generate 100 kg/mo but less than 1,000 kg/mo of non-acutely hazardous waste
- 3 - Generators who generate less than 100 kg/mo of non-acutely hazardous waste.

TRANS - engaged in off-site transportation of hazardous waste

TSDf - engaged in treatment, storage or disposal of hazardous waste

LUST

- D - One or more municipal or domestic wells have been affected by tank leak
- G - Groundwater and soil have been affected by tank leak
- S - Soil only has been affected by tank leak
- U - Undetermined effect on soil and groundwater.

CERCLIS

SI - Site Inspection

RV - Removal Action

CO - Combined Remedial Investigation and Feasibility Study

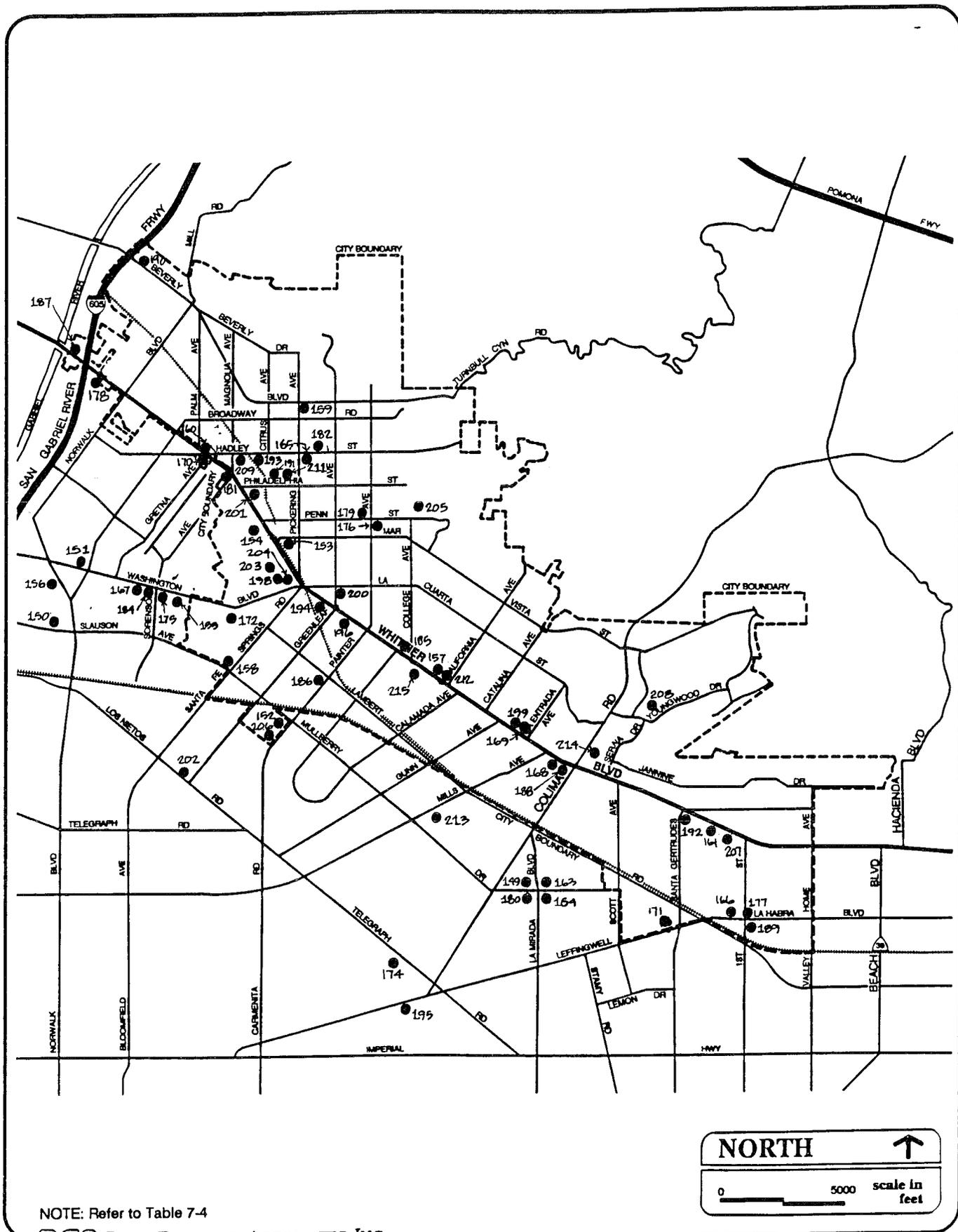
ASPIS

PAL - Preliminary Assessment Required - Low Priority

PAM - Preliminary Assessment Required - Medium Priority

SIRL - Site Inspection Required - Low Priority

SIRM - Site Inspection Required - Medium Priority



NOTE: Refer to Table 7-4

DECO DAVID EVANS AND ASSOCIATES, INC.

City of Whittier



GENERAL PLAN

**EXHIBIT 7-15
HAZARDOUS MATERIAL SITES
Numbers 149-215**

The sites identified above require further action and may be currently under investigation. They include sites that fall under the Abandoned Site Program and Federal Superfund and still require mitigation. Also, sites that have in the past or are presently producing or using hazardous wastes or substances are identified. Some Abandoned Site Program and Federal Superfund sites in Whittier are not shown on the map because no further actions were required on them.

Many local, state and federal government records or information identify significant users of hazardous materials and/or generators of hazardous wastes. Although these databases are comprehensive, and updated periodically, the potential still exists that some existing hazardous material sites have not been identified. Therefore, Table 7-5 should not be considered as a complete listing. However, it provides a good first order estimate of the kinds, numbers and locations of sites that are associated with hazardous materials and wastes. The source agencies used to compile this information are listed in Table 7-6.

TABLE 7-6 SOURCES OF HAZARDOUS MATERIALS HANDLERS & WASTE SITES		
Database	Type of Records	Agency
CERCLIS CORTESE	Federal Superfund Sites Hazardous Waste and Substances Site List	U.S. EPA California Governor's Office of Planning and Research
BEP	Sites Authorized for cleanup under the California Bond Expenditure Plan	CAL-DHS
ASPIS HWIS	Abandoned Site Program Hazardous Waste Generators, Treatment, Storage and Disposal Facilities	CAL-DHS CAL-DHS
LUST Local	Leaking Underground Storage Tanks Information on Users of Hazardous Materials	RWQCB Whittier Fire Department

Cerclis

The Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) is a database of contaminated properties under the Federal Superfund program. Since 1982, the U.S. Environmental Protection Agency (EPA) has developed and maintained the list pursuant to the Comprehensive Environmental Response, Conservation and Liability Act of 1980 (CERCLA), 42 U.S.C. Section 9601 (1985). The U.S. EPA discovers these sites from citizen reports, routine inspection of hazardous waste generators, treatment, storage and disposal facilities, and other reporting requirements.

Five Federal Superfund sites have been identified in the area. Two sites are located within the City limits but require no further action, and one is located outside the City limits (Puente Hills Landfill). The two Cerclis sites located within the City limits which are currently active include:

- Whittier Propel on 12132 Hadley Street, and
- Modine Manufacturing Company on 12252 Whittier Boulevard.

Hazardous Waste and Substances Sites List (CORTESE)

The California Governor's Office of Planning and Research annually publishes a list of potential and confirmed hazardous waste sites throughout the State of California under Government Code Section 2.65962.5. This listing is called CORTESE after the sponsor of the bill in the Legislature. The database contains over 6,000 entries with 40 of these entries located in Whittier. They are mainly gasoline service stations and oil and vehicle related uses. These sites are also listed in the Leaking Underground Storage Tanks List by the California Regional Water Resources Control Board.

Bond Expenditure Plan (BEP)

The Bond Expenditure Plan (BEP) contains a list of all verified hazardous waste sites that are or will be targeted for abatement by the California State Department of Health Services (DHS) under the Hazardous Substance Cleanup Bond Act of 1984 (Health and Safety Code Section 25356) and the Hazardous Substance Account (HSA). Hazardous waste sites are discovered by the department directly or referred to the department for confirmation and follow-up action by another government agency, such as a local health department, the Regional Water Quality Control Board, a responsible party or a concerned citizen. New sites are added to this database as they are verified and the "Preliminary Assessment, Site Investigation and Hazard Ranking System" processes are completed. This database is updated once annually after approval of the California State legislature.

Abandoned Sites Program Information System (ASPIS)

Developed under Section 25359.6 of the Health and Safety Code, this DHS database contains a listing of potential hazardous waste sites identified by the earlier Abandoned Site Survey Program and the current Rural Site Evaluation Program. Records from the Regional Water Quality Control Boards, Department of Fish and Game and other state environmental regulatory agencies are utilized to make this list. Information concerning the sites in this list should be considered preliminary although confirmed sites from this database are merged into the BEP database once they have been priority ranked. Many of these sites are currently identified as requiring no further action based on DHS determination that no release has occurred or, if a release may have occurred, it did not

represent a significant threat to the public or the environment. Four sites in and near the City of Whittier are currently identified for future site inspection or preliminary assessment.

Hazardous Waste Information Systems (HWIS)

The DHS Toxic Substances Control Division, has developed and maintained lists of hazardous waste generators and hazardous waste treatment storage and disposal facilities in the State of California, pursuant to the Hazardous Waste Control Law (Health and Safety Code Section 25100 et seq.), and the Hazardous Waste Management Act of 1976 (Health and Safety Code Section 25179.1 et seq.). In addition, the law requires all counties to prepare and submit hazardous waste management plans. To assist the counties, the Toxic Substances Control Division maintains a list containing generation and disposal data within each county. This information has been assembled by the Toxic Substances Control Division from manifest reports required from hazardous waste generators.

Seventy-one sites have been identified in and near the City of Whittier. They include gas service stations, industries, dry cleaners, groceries, auto shops, service yards, and hospitals. Two sites have been identified that currently treat, store and/or dispose (TSD facilities) of hazardous wastes. Both TSD facilities and one superfund site are located within approximately 0.8 mile of each other along Whittier Boulevard between Painter Avenue and Mar Vista Street.

Leaking Underground Storage Tanks (LUST)

The California Water Resources Control Board, in cooperation with the Office of Emergency Services, compiles a listing of leaks of hazardous substances from underground storage tanks in the State of California pursuant to Section 25295 (b) of the Health and Safety Code. The nine regional water quality control boards maintain information on all reported leak cases within their jurisdiction, both for those where the regional board and where other local agencies take the lead in overseeing investigations and remedial actions. Although the data represents sites where at least one leak is known to have occurred, it is not uncommon for more than one tank to have leaked at a given site or cleanup case. Fifty sites are listed in Whittier and includes sites listed under the Cortese Database.

Significant Users and Generators

All together, at least 75 sites in the City have been identified generators of hazardous wastes (see Table 7-5). The Federal Superfund site on Whittier Boulevard (Modine Manufacturing) is considered a generator of hazardous waste and is part of the Abandoned Site Program. Some of the generators of hazardous waste are facilities engaged in the off-site transportation of hazardous waste.

The Savage Canyon Landfill is a Class III municipal landfill located north of William Penn Park at 13919 East Penn Street. This site is also identified as having a leaking underground storage tank. The contents of the tank is reported to be diesel and the site is under investigation as of January 11, 1991. There are no hazardous waste landfills currently operating within the City.

Hazardous Waste Transportation Routes

The transportation of hazardous materials is generally regulated by the issuance of permits, not by transportation route (Mr. Gary Adkins, Motor Carrier Safety, California Highway Patrol). Law enforcement agencies are empowered to strictly enforce regulations regarding the inspection of vehicles and the training and licensing of transportation personnel. The transportation of hazardous materials on interstate freeways is controlled by the Bureau of Motor Carrier Safety, U.S. Department of Transportation via vehicle safety inspections.

According to Mr. Keith Glenn, Motor Carrier Safety, U.S. Department of Transportation, the primary concern with respect to the transportation of hazardous materials/wastes on public roads, is its flash point (fire) and explosive potential. Restrictions placed on transporters of hazardous materials/wastes include the avoidance of heavily populated areas unless no other satisfactory route exists, limitations on access to bridges and tunnels, and a one-mile wide zone limitation along freeways for access to fuel and services. The gross vehicular weight is another limitation that restricts transporters from some public roads.

The railroads are similarly regulated in that explosive materials are controlled within the train, but there are no controls regarding train routes. The only restriction is that potentially flammable or explosive materials cannot be any closer than six rail cars from the train locomotive.

Based on the distribution of the five sites identified with the off-site transportation of hazardous waste (Exhibit 7-13), the likely main transportation route within the City limits is Whittier Boulevard (State Highway 72). A number of other boulevards and avenues provide access from these sites to Whittier Boulevard including Beverly Boulevard, Norwalk Boulevard, Greenleaf Avenue, Painter Avenue, and La Cuarta Street. Whittier Boulevard in turn provides access to the San Gabriel River Freeway (Interstate 605) which has been designated as one of the main hazardous waste transportation corridors in Los Angeles County. In addition, the Union Pacific and Southern Pacific Railroad tracks pass along the southern boundaries of the City.

The potential for contamination and harm in the event of a hazardous materials/waste spill or explosion and fire incident is a serious threat to public safety. The degree of impact to the local environment will depend on the nature of the materials involved, the type of

incident (spill, explosion, fire, etc.), the affected population and the capacity of emergency systems to abate the danger.

CRIME AND ACCIDENTS

Criminal elements in a community pose risks to public safety and accidents present safety considerations in planning. Statistics of crime incidence from 1988 to 1991 in Whittier as compiled by the Whittier Police Department are provided in Table 7-7.

TABLE 7-7 CRIME STATISTICS				
Type of Crime	1988	1989	1990	1991*
Willful Homicide	1	4	6	4
Forcible Rape	14	17	29	7
Armed Robbery	58	84	82	25
Strong/Arm Robbery	39	54	52	29
Felony Assault	193	257	265	151
Residential Burglary	493	410	463	249
Commercial Burglary	329	191	223	127
Vehicle Burglary	337	423	482	283
Auto Theft	496	488	503	258
Grand Theft	253	297	314	151
Petty Theft	828	1039	1035	508
Shoplifting Burglary	59	89	73	47
Arson	12	22	13	22
Foreign Recoveries	(156)	(138)	(199)	(69)
Total	3,112	3,375	3,540	1,861

* January to June 1991 only.
Source: Whittier Police Department, 1991

The majority of crimes committed in the City consists of petty theft, residential burglary, auto theft, and vehicle burglary. The increase in crime cases was 5 to 8 percent annually from 1988 to 1990. Comparison of 1990 half year statistics with 1991 half year statistic show an increase of 5 percent. Of the 3,112 cases in 1988, 852 or 27% were cleared. Of the 3,375 cases in 1989, 993 or 29% were cleared. In 1990, 976 cases out of 3,540 were cleared (28%).

EMERGENCY SERVICES AND FACILITIES

The availability of emergency services and facilities is presented in this report to determine their adequacy in meeting the needs of Whittier. They include fire and police department staffing and equipment, clinics and hospitals, emergency shelters, evacuation routes and mass care facilities.

Fire Department

Fire protection services for the City of Whittier are provided by the Los Angeles County Fire Department. There are 3 fire stations in the City and their locations are shown in Exhibit 7-16. Table 7-8 summarizes their manpower and resources. As part of the Consolidated Fire Protection District, all other resources of the County Fire Department are available to the City of Whittier as needed.

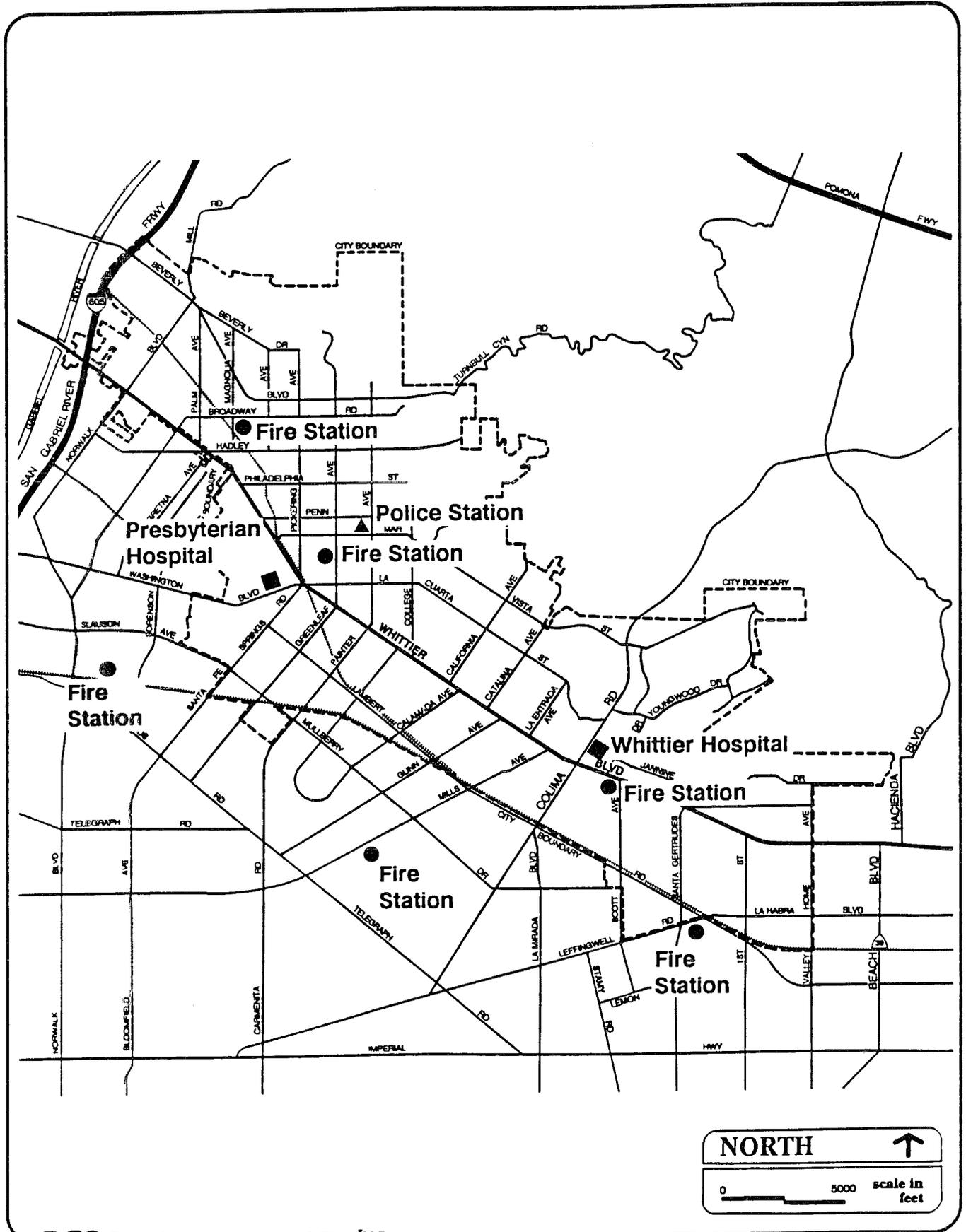
TABLE 7-8 FIRE STATION STAFF AND EQUIPMENT		
Fire Station	Address	Staff and Equipment
17	12006 Hadley	4 firefighters 1 fire engine
28	7733 S. Greenleaf	9 firefighters 1 fire engine 1 ladder truck 1 paramedic team
59	10021 Scott Avenue	4 firefighters 1 fire engine

Source: Los Angeles County Fire Department, 1991.

The Fire Department is responsible for fire and emergency services, including hazardous material spills. Fire flow requirements range from 1,250 gallons per minute (gpm) at 20 pounds per square inch (psi) residual pressure for two hours for single-family residences to 5,000 gpm at 20 psi for 5 hours for multi-family, commercial and industrial buildings. Hydrant spacing is set at every 300 or 600 feet depending on land use intensity.

Access Roadways

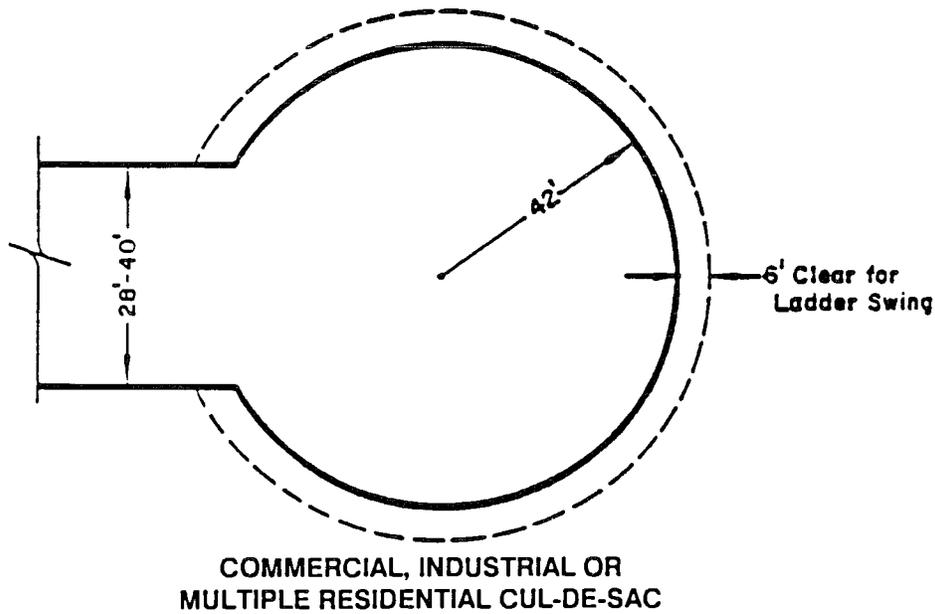
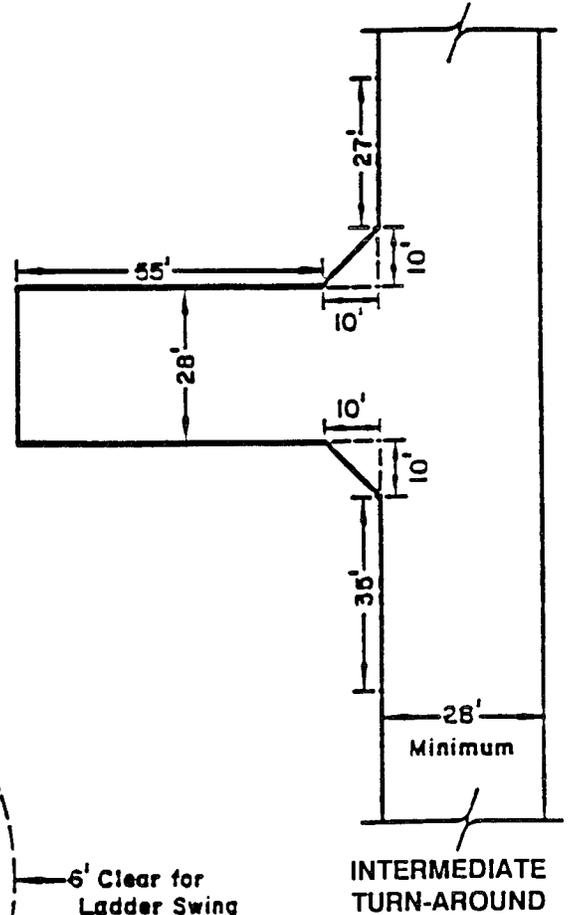
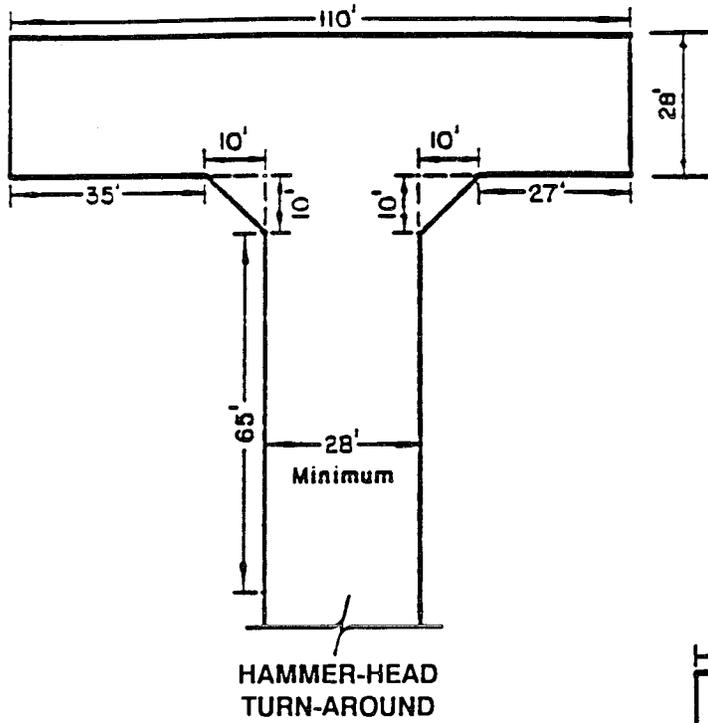
The provision of adequate roadway widths will facilitate emergency response during a disaster. The following roadway standards have been established by the County Fire Department to ensure access for firefighting equipment to all areas of the City: (Exhibits 7-17 and 7-18 show access standards for pumps and ladder trucks.)



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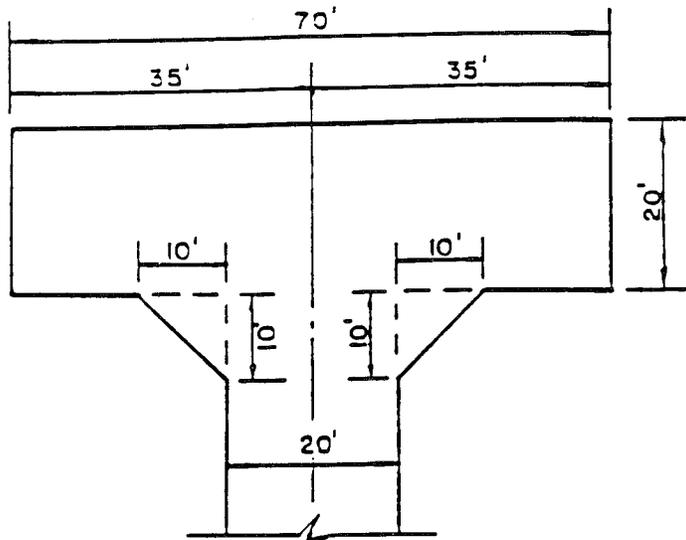
**EXHIBIT 7-16
EMERGENCY FACILITIES**



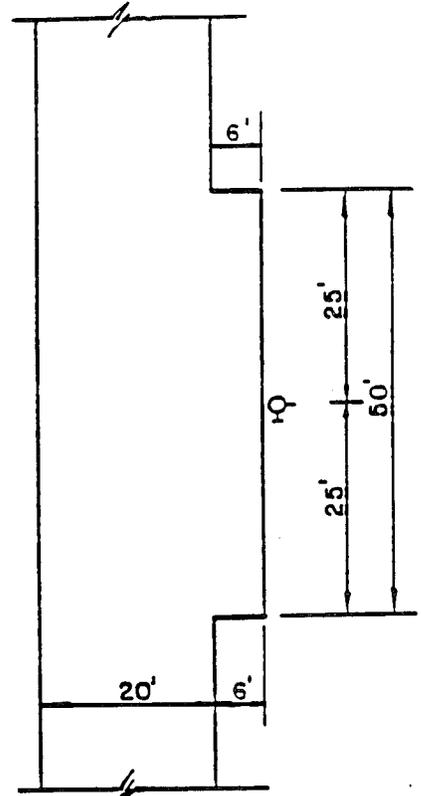
DEA DAVID EVANS AND ASSOCIATES, INC.



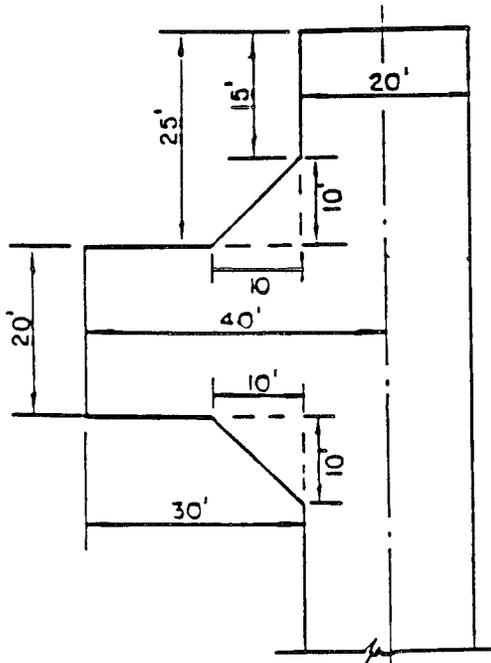
EXHIBIT 7-17
ACCESS ROADWAY STANDARDS
FIRE APPARATUS - LADDER TRUCK & SNORKEL



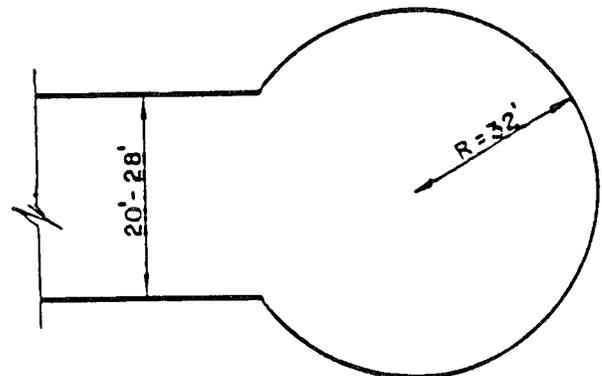
HAMMER-HEAD
TURN-AROUND



AREA ADJACENT
TO HYDRANT



INTERMEDIATE
TURN-AROUND



PRIVATE STREET
(CUL-DE-SAC)

DEA DAVID EVANS AND ASSOCIATES, INC.



EXHIBIT 7-18
ACCESS ROADWAY STANDARDS
FIRE APPARATUS - PUMPER

Section 7: Public Safety Element Background Report (continued)

- Every building hereafter constructed shall be accessible to Fire Department apparatus by way of access roadways with all-weather driving surface capable of supporting the imposed loads of fire apparatus of not less than 20 feet of unobstructed width, clear to the sky, and with adequate roadway turning radius.
- A paved fire apparatus access roadway shall be required when any portion of an exterior wall of the first story of any building is located more than 150 feet from a public vehicle access.
- Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities.
- The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths shall be maintained at all times.
- The Chief shall have the authority to require an increase in the minimum access widths where such width is not adequate for fire or rescue operations.
- When conditions prevent the installation of an approved fire apparatus access road, the chief may permit the installation of a fire-protection system or systems in lieu of a road, provided the system or systems are not otherwise required by this or any other code.

For Industrial and Commercial Developments

- All on-site roadways/driveways serving industrial and commercial properties shall provide a minimum unobstructed width of 26 feet clear to the sky to within 150 feet of all portions of the exterior walls of the first story of any building. The minimum width of 26 feet shall be increased when any of the following conditions exist.
 1. When proposed buildings or portions of buildings are more than three stories or 35 feet in height above the ground level, the width shall be 28 feet to allow Fire Department aerial apparatus. The centerline of the access roadway shall be located parallel to and within 30 feet of the exterior wall on at least one side of such building. The public street may be used when the building wall is within 20 feet of the

street and there are no obstructions such as power and telephone lines, trees, etc.

2. When parallel parking is allowed on one side of the access roadways/driveway, the width shall be 34 feet. Preference is that the parallel parking not be adjacent to the building. If parallel parking is needed on both sides of the access roadways/driveway adjacent to a building, in order to insure the minimum clear width of 26 feet, the driveway shall be 42 feet in width.

- When on-site hydrants are required, roadways/driveway width at the hydrant location shall be a minimum of 26 feet. A linear distance of 25 feet clear is required on both sides of the hydrant.
- Fire Department approved turnarounds shall be required when dead-ending access roadways/driveway exceed 300 feet.
- When access for a given development requires accommodation of Fire Department apparatus, overhead clearance shall be unobstructed clear to the sky.
- Improved walking access may be required to connect vehicular access with the required ingress and egress of the building. Required walking access shall be designed to prevent sharp turns or obstacles which would hinder the carrying of ground ladders, other hand held equipments, or rescue equipment.
- Buildings 75 feet or greater in depth, from an approved Fire Department access roadway to the rear wall of the building, need not have the access roadway extended along the rear side of the building provided the building is protected by an approved fire sprinkler system and a four hour fire rated area separation wall extends along the rear wall of the building. All openings in the wall shall be protected by three hour fire rated assemblies. Any building used for high-piled combustible storage is exempted, but shall comply with Section 81.109 of the Los Angeles County Fire Code.
- Buildings with rail spurs shall have the access roadways located on the opposite side of the tracks from the building. Drill track area may be used for the access roadways provided it has the proper base and the surface of the road is level with the top of the track rail. The edge of the roadway shall be measured six (6) feet from the outside rail of the spur track.

- All the roadways/driveways shall be labeled as "Fire Lane" on the final subdivision map or building plans. Labeling is necessary to assure the access availability for Fire Department use. The designation allows for appropriate notices prohibiting parking.
- All roadways/driveways shall be constructed with paving which will support a 25 ton fire-fighting vehicle. Minimum paving standard shall be 2" of asphaltic concrete, or equal, over 4" of decomposed granite or equivalent.
- All roadways/driveways shall not exceed 15% grade.

For High Density Residential Developments (Apartments, Condominiums, etc.)

- Private access roadways/driveways serving these properties, shall provide a minimum unobstructed 26 feet clear to the sky access for firefighting vehicles, to within 150 feet of all portions of the exterior walls of the first story of any building. The need for 26 feet or greater of access in these properties is as follows:
 - A. The structural conditions of these properties may require the deployment of a Fire Department aerial apparatus, when fires are beyond the incipient stage. Twenty-eight feet (28') of unobstructed width clear to the sky will accommodate an aerial truck with ground jacks in place, while providing sufficient clear roadway width for evacuation and the deployment of additional fire equipment.
 - B. Where fire hydrants are required, roadways/driveway width at the hydrant locations shall be a minimum of 26 feet.
- Parking Restrictions - When roadways/driveways measure the following dimensions curb to curb, parking restrictions shall be:
 - 26 feet: No parking allowed.
 - 34 feet: Parallel parking allowed on one side only.
 - 36 feet: Parallel parking is allowed on both sides of the street; except in front of fire hydrants.
- Fire Department approved turnarounds shall be required when dead-ending access roadways/driveways exceed 300 feet.

Section 7: Public Safety Element Background Report (continued)

- When fire hydrants are required, roadways/driveway width at the hydrant locations shall be a minimum of 26 feet. A linear distance of 25 feet clear is required on both sides of the hydrant.
- When access for a given development requires accommodation of Fire Department apparatus, overhead clearance shall be unobstructed clear to the sky.
- All the roadways/driveways shall be labeled as "Fire Lane" on the final subdivision map or building plans. Labeling is necessary to assure the access availability for Fire Department use. The entrance to all required roadways/driveways with restricted parking and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs with the following wording:

"NO PARKING - FIRE LANE" in three-inch high letters.
- All roadways/driveways shall be constructed with paving which shall support a 25 ton firefighting vehicle. Minimum paving requirements shall be 2" of asphaltic concrete, or equal, over 4" of decomposed granite or equivalent.
- All roadways/driveways shall not exceed 15% grade.
- Any gates, to control vehicle access, shall be located to allow a vehicle waiting for entrance to be completely off the public roadway. If applicable, it is recommended that the gate(s) swing in both directions. The method of gate control shall be subject to review by the Fire Department.
- Where the access requirements cannot be provided, approved fire protection system or systems shall be provided as required and approved by the Chief.

For Restricted Lots

- A restricted access lot shall mean a lot whose shape and size restricts the width available for vehicle access. The Fire Department will review each project with restricted access and may apply a modification of the standard access requirements if fire and life safety are not adversely affected. The modification from the standard 26 feet of unobstructed access shall not be to less than 20 feet of unobstructed width clear to the sky.

- Due to topographic restrictions brought about by flag lots, this Department will allow a modification from the 26 feet of access required in multiple residential units to a minimum 20 feet of unobstructed width clear to the sky. The modification may be applied subject to the following requirements:
 - A. Development has less than ten (10) units.
 - B. The lot does not extend beyond 300 feet from an improved public street.
 - C. Single driveway.
 - D. Maximum of two stories.
 - E. The driveway shall be labeled "Fire Lane" on the final subdivision map or building plan.

The entrance to the driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs with the following wording:

"NO PARKING - FIRE LANE" in three-inch high letters.

- F. The driveway shall be constructed with paving which will support a 25 ton firefighting vehicle. Minimum paving requirements shall be 2" of asphaltic concrete, or equal over 4" of decomposed granite or equivalent.
- G. The driveway shall not exceed 15% grade.

For Building Sites not Served by Improved Public Right-of-Ways

- Private access roadways having a grade of 10% or greater shall have a paved surface.
- Private access roadways having a grade of less than 10% may use a surface other than pavement if the proposed surface will support the weight and use of fire apparatus during inclement weather conditions. The proposed road surface shall be designed for:
 - (1) Fire apparatus which have a gross weight of up to 50,000 pounds.

- (2) Weight distribution is approximately 30% on the front axle and 70% on the rear axle(s). Axle weights will range from 9,000 lbs. to 16,000 lbs. on the front axle and 19,840 lbs. to 34,000 lbs. on the rear axle(s). The rear axle is of a dual tire configuration.
- The 20-foot minimum standard shall be adhered to with the following exceptions:
 - a. Where geological or other restricting forces preclude the development of a full 200 feet of driving surface along the entire length of the access road and the access road does not serve more than two single-family dwellings, modifications may be made. A minimum of 15 feet in width with suitable turnouts at not more than 1/4 mile intervals and turn-arounds at not more than 1/2 mile intervals may be acceptable, when in the opinion of the Chief, fire fighting or rescue operations would not be impaired.
 - b. Where fire hydrants are required the access road width shall be increased to 26 feet for a minimum of 25 feet on each side of the hydrant location.
 - All private access roads shall be extended to within 150 feet of all portions of the exterior walls of the first story of any building exclusive of accessory buildings under 1,000 square feet. This measurement shall be taken along the path of access.
 - The maximum allowable grade shall not exceed 15% except where the topography makes it impractical to keep within such grade and then an absolute maximum of 20% will be allowed for up to 150 feet in distance. The average maximum allowed grade including topography difficulties shall be no more than 17%. Grade breaks shall not exceed 10 percent in 10 feet. Grades may be increased where on-site fire protection systems approved by the Fire Chief are provided.
 - Road drainage shall be evaluated by an engineering analysis of the site to determine that the proposed roadway is reasonably free of either sheet flow or concentrated channel flow to the extent that damage will not take place such as to impair its usability and capacity to support heavy fire fighting trucks or equipment. Any dip crossing, culvert, or bridge constructed shall be designed to accommodate the widths and grades listed above, be capable of

supporting heavy fire department equipment, and be designed to withstand capital flood flows.

- Where the proposed access way lies within or crosses a dedicated or future dedicated public right-of-way, the Los Angeles County Road Department must approve the improvements. If the access road is to become a public maintained street, the above standards should be upgraded to Los Angeles County Road Department standards.
- When the proposed building(s) conform to all of the following requirements, the density of housing does not exceed one unit per acre, and in the opinion of the Fire Chief, firefighting or rescue operations would not be impaired, access requirements may be modified. Then, the proposed building must incorporate on-site fire protection facilities which will include a supply of water, fire resistant construction, interior automatic fire sprinkler system, and sufficient brush clearance. The sprinkler system shall be installed according to Regulation No. 19 of the Fire Code.

Police Department

Police protection services are provided by the Whittier Police Department. The Department enforces local, state and federal laws. Patrol services are performed within the City and for schools, shopping centers, and other businesses. Traffic enforcement and accident investigations are also provided throughout the City.

The Police Department investigates criminal acts and suspicious circumstances. They file criminal cases and assist in the prosecution of offenders. Special programs in the City include gang suppression, problem-oriented policing, narcotics interdiction, and substance abuse prevention. Mutual aid agreements with the Los Angeles County Sheriff's Department and the La Habra Police Department are in place.

The Police station is located at 7315 S. Painter Avenue, near City Hall. The Department has 91 sworn officers and a number of administrative staff. Police equipment include 26 patrol sedans, 20 investigator vehicles, 2 canine units, 1 narcotics and vice team, 1 drunk driving unit, and 3 motorcycles for traffic officers. Response time for emergency calls averaged 3 minutes and 13 seconds in May 1991. Non-emergency calls had a response time of 12 minutes and 4 seconds.

Demographic and social changes in the area are requiring expanded police services and the Department is likely to need more manpower and equipment in the future. The City continually evaluates the need for improved police services.

Hospitals and Clinics

There are two hospitals in the City: the Presbyterian Intercommunity Hospital on Washington Boulevard and the Whittier Hospital on Colima Road (see Exhibit 7-16). Also, clinics and medical facilities in the area include individual and group practices throughout the commercial areas of the City.

The Whittier Hospital is a private hospital that offers diagnostic services, critical care, cardiology, obstetrics, gynecology, dialysis and general medicine. It has 179 beds and operates an emergency department. Its community services include free physician referral, blood pressure screening, CPR classes, volunteer programs, women's health network, senior care programs, Litalife (obesity) and patient transportation. A medical professional building is located beside the hospital where doctors operate private clinics.

The Presbyterian Intercommunity Hospital is a full service (acute care) hospital with a 358-bed capacity. It offers a wide range of medical services including emergency care, obstetrics, diabetes and scoliosis program and laser facilities. The hospital also offers CPR classes, support services, health screening, rehabilitation programs and courses on a wide variety of health and medical issues. The facility is planning a building expansion to augment their emergency services, women's center and other facilities.

Emergency Care Facilities

The City of Whittier has 88 emergency shelters listed with the Office of Emergency Services. These buildings and their capacities are listed in Table 7-10. Other evacuation centers include local schools, community centers, and gymnasiums.

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-9
EMERGENCY SHELTERS**

Building Name	Address	FALLOUT SHELTER SPACES				
		PF 0	PF 1	PF 2-3	PF 4+	BSMT
Rio Hondo Admin Bldg	3600 Workman Mill	1,663	1,295	245	0	0
Rio Hondo J C	3600 Workman Mill	1,876	2,058	926	111	0
Rio Hondo J C	3600 Workman Mill	744	1,653	490	85	626
Rio Hondo J C	3600 Workman Mill	0	0	100	0	0
Lt Inn	3600 Workman Mill	1,133	901	296	27	178
Rio Hondo J C Gym	3600 Workman Mill	2,917	739	101	90	157
Bank of America	13415 Tellaco St	0	0	0	21	0
Golden State Bank	8644 Norwalk	0	0	25	0	0
Hillcrest Cong Church	2000 N West Rd	55	35	0	0	0
Whittier Area Baptist Fellowship	8500 S Villa Verde Dr	160	0	0	0	0
E Whittier School	14421 Whittier Blvd	0	306	1,492	1	1,734
Whittier School	14421 Whittier Blvd	0	0	34	5	39
American Savings	15725 Whittier Blvd	0	0	0	795	795
La Serna High School	15301 Youngwood	100	302	0	0	0
La Serna High School	15301 Youngwood	83	318	0	0	0
La Serna High School	15301 Youngwood	0	0	0	13	0
Whittier Hospital	15151 Janine Dr	0	0	1,138	0	1,138
Salem Lutheran Church	6442 S Glengary St	0	158	0	0	158
Whittier Presbyterian Church	6030 S El Rancho Dr	0	0	228	0	228
Plymouth Church	11815 Pilgrim Way	0	129	3	0	0
Auditorium	12417 Philadelphia	676	877	762	1,445	923
Mushroom Growing Basement	12331 E Penn St	0	110	380	270	540
HS Library	12417 Philadelphia	643	626	469	192	1,014
Admin W H S	12417 Philadelphia	24	75	441	366	333
Comm H S	12417 Philadelphia	13	69	178	320	197
SCI W H S	12417 Philadelphia	8	1,085	21	548	569

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-9
EMERGENCY SHELTERS**

Building Name	Address	FALLOUT SHELTER SPACES				
		PF 0	PF 1	PF 2-3	PF 4+	BSMT
School District	7211 Whittier Ave	620	0	0	0	620
Whittier News Basement	7037 S Comstock Ave	100	0	158	280	438
Post Office Basement	6709 S Washington Ave	120	600	205	175	480
Dockstaders	6727 S Greenleaf Ave	0	0	280	0	280
Marsdens Christy Basement	6707 S Greenleaf Ave	200	220	102	0	102
McAllister Cadillac	7055 Greenleaf	0	0	450	0	450
Hover Hotel Basement	7035 S Greenleaf Ave	1,402	432	313	287	287
Wardman Annex Post Office	7038 S Pickering	0	0	269	0	269
General Telephone Basement	6737 S Bright Ave	410	210	0	265	265
First Methodist Church	13222 E Bailey St	487	135	414	128	542
Bank of America Bldg	13002 E Philadelphia St	404	1,350	470	80	80
Lincoln Elementary School	12620 E Broadway Ave	0	0	65	65	130
1st Methodist-Wesley B	13222 E Bailey St	0	0	141	0	141
YMCA	12817 E Hadley	0	0	65	65	130
United California Bank	6754 S Greenleaf Ave	160	0	0	103	103
American Savings & Loan	13103 E Philadelphia	0	0	46	0	46
Security Bank	12826 Philadelphia	0	0	13	2	0
Crocker City Bank	6707 Bright Ave	0	0	5	11	0
Calvary Baptist Church	6548 S Newlin	0	0	48	0	48
Park Apartments	12031 Beverly Bl	1,418	194	879	660	1,539
Penn Hotel	13200 Philadelphia St	1,710	965	107	412	458
Stauffer Hall	Painter Ave	0	180	60	1	240
Platner Hall WC	7026 Founders Hill	120	350	305	60	70
Johnson Hall Basement	7022 S Founders Hill	50	700	800	70	140
Stauffer Hall Basement	6737 S Stanford Way	680	430	1,750	740	120

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-9
EMERGENCY SHELTERS**

Building Name	Address	FALLOUT SHELTER SPACES				
		PF 0	PF 1	PF 2-3	PF 4+	BSMT
Wanberg Hall Basement	13737 E Earham Dr	515	425	325	85	170
Whittier Square	13215 E Pennsylvania St	1,783	4,076	3,534	677	610
Science Bldg	13610 Earham Dr	0	1,572	2,403	0	0
Maintenance Bldg	12016 Hadley St	85	0	0	0	0
Student Union Whittier College	7214 Painter St	620	0	0	0	0
General Telephone Co Basement	13119 E Whittier Blvd	0	0	0	70	70
Whittier Police Station	7315 Painter St	100	290	325	150	475
Urich Service Station Basement	12911 E Whittier Blvd	0	0	0	108	108
Whittier City Hall	13230 E Penn St	1,115	400	600	435	1,110
Municipal Courts Bldg	7339 S Painter Ave	2,225	1,375	50	1,067	97
National Bank of Whittier	13524 Whittier Blvd	0	0	140	60	170
Parking Structure	7621 S Painter Ave	3,850	1,150	0	0	0
Central Library	7444 Washington Ave	0	0	140	60	170
Community Center	7630 Washington Ave	0	0	202	0	0
General Telephone	13119 Whittier Blvd	0	0	76	220	296
Holland House Cafeteria	8407 Quadway	0	0	583	0	583
Barrons Pharmacy	8436 S Quadway	0	0	200	0	200
W T Grants Basement	1130 Quadway	0	0	315	0	315
Green Sons Basement	1111 Quadway	0	0	79	0	79
C H Baker Shoes	8413 Quadway	0	0	0	294	294
Chamber of Commerce	14442 Whittier Blvd	20	59	96	0	175
Hinshaw Quadway	8480 S Quadway	3,782	945	4,586	191	5,796
McDonalds	8840 Painter Ave	0	0	0	48	48
Presbyterian Inter Community Hospital	12401 E Washington Blvd	3,200	3,100	6,000	735	275
Calif Hi Sch Gym	9800 S Mills Ave	0	168	11	0	179

Section 7: Public Safety Element Background Report (continued)

**TABLE 7-9
EMERGENCY SHELTERS**

Building Name	Address	FALLOUT SHELTER SPACES				
		PF 0	PF 1	PF 2-3	PF 4+	BSMT
Calif Hi Sch Lkers	9800 S Mills Ave	0	48	194	0	242
Admin Bldg Calif HS	9800 S Mills Ave	0	0	87	0	87
Science Bldg Calif HS	9800 S Mills Ave	135	0	0	50	50
Bekins Storage	15146 Whittier Blvd	624	1,187	0	0	0
Broadway 2nd Flr	15600 Whittwood Lane	0	0	1,950	0	0
Crocker City	15000 Whittier Blvd	0	15	17	0	0
Bank of America	15320 Whittier Blvd	0	16	11	0	0
Security Bank	15730 Whittwood Ln	0	1	20	0	0
St Andrew Church	11345 Miller	0	0	75	164	239
Hillview School	10931 S Stamy Rd	0	0	0	51	51
McDonalds	15710 Lewffingwell	0	0	0	48	48
Security First Bank	15802 Imperial Hwy E	0	0	10	7	0
	Total Spaces	36,030	31,329	36,174	12,180	28,244

Note:

PF = Protection Factor as determined by the number of times safer to fallot gamma radiation than unprotected.

Category Range

- 0 10-19
- 1 20-39
- 2 40-69
- 3 70-99
- 4 100-149

BSMT Blast Spaces Located in Basement

Source: Office of Emergency Services, 1988.

Noise Reduction

Noise is reduced in different ways. Any physical barrier to its path can either absorb or reflect the noise. This results in a quieter environment for the area protected by the barrier. The farther away the noise source is, the softer the sound. Trees, berms, and other barriers to the path of noise will help to dampen its effect. Wind direction also influences the travel of noise. Noise is generally louder along the dominant wind flow direction.

Noise insulation may contain noises within an structure and prevent adverse impacts on adjacent areas. At the same time, insulation can protect persons and activities inside the building from being disrupted by outside noises. Where noise reduction methods are not feasible, "masking" may be used. Masking is the addition of another noise type to prevail over the less pleasant noise. For example, noise masking may use sounds of water, music, rustling leaves, and other relaxing sounds to drown out traffic noise, crowds, or any other offensive noise.

The five basic noise reduction measures include:

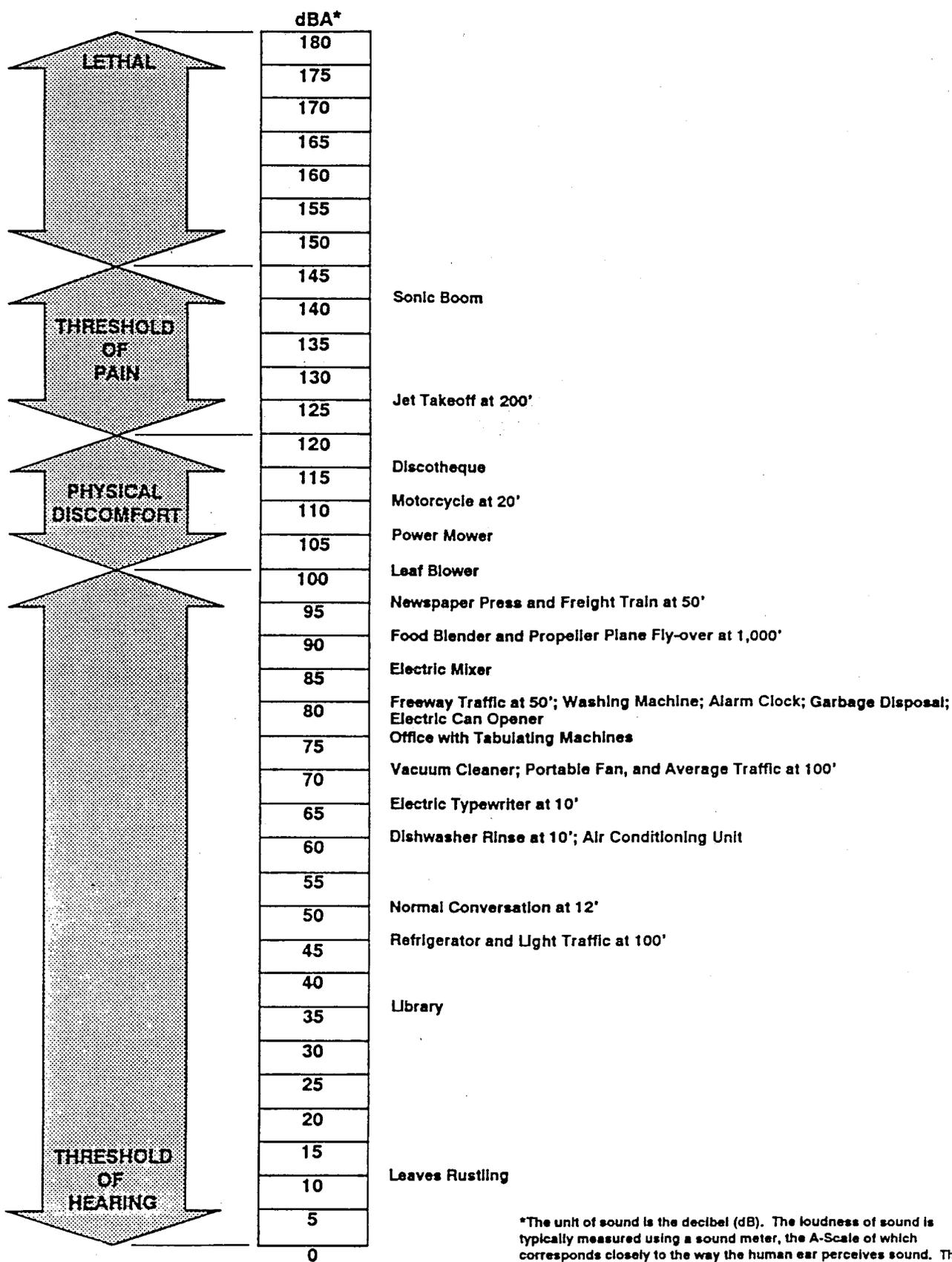
- Control the noise at the source (enclosure, insulation, alternative designs, etc.)
- Interrupt the path of the noise (barriers, distance separation, buffers, etc.)
- Prevent intrusion of exterior noise (insulation, blank walls, double-glaze windows, etc.)
- Masking the noise with more pleasant sounds
- Personal protection (earplugs, adaptation to the noise or vacation of the noise-impacted area.)

As with most pollution problems, the best way to control noise is to regulate it at the source. Personal protection should be done only when all other measures are not possible. However, noise sources cannot always be effectively controlled and interruption of the noise path is the most common and acceptable solution. Where noise sources cannot be economically or physically controlled to a point of compatibility with other "quiet" land uses, the separation of land uses through land use controls may be necessary. Some communities develop noise ordinances to control noise problems. Whittier has not adopted such an ordinance and should consider doing so.

Section 7: Public Safety Element Background Report (continued)

TABLE 7-9
EMERGENCY SHELTERS

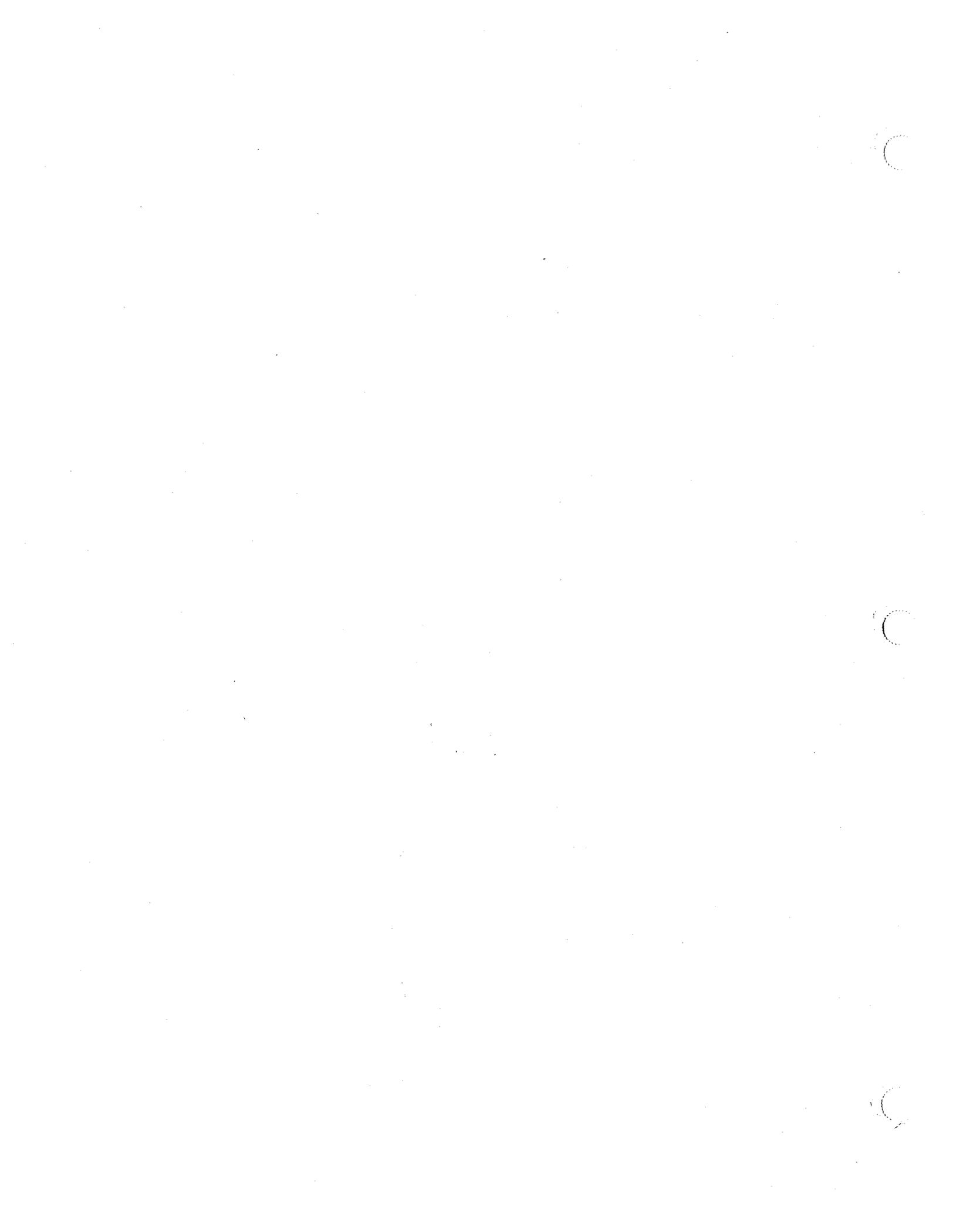
Building Name	Address	FALLOUT SHELTER SPACES				
		PF 0	PF 1	PF 2-3	PF 4+	BSMT
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Science Bldg	13610 Earham Dr	0	1,572	2,403	0	0
Maintenance Bldg	12016 Hadley St	85	0	0	0	0
Student Union Whittier College	7214 Painter St	620	0	0	0	0
General Telephone Co Basement	13119 E Whittier Blvd	0	0	0	70	70
Whittier Police Station	7315 Painter St	100	290	325	150	475
Urich Service Station Basement	12911 E Whittier Blvd	0	0	0	108	108
Whittier City Hall	13230 E Penn St	1,115	400	600	435	1,110
Municipal Courts Bldg	7339 S Painter Ave	2,225	1,375	50	1,067	97
National Bank of Whittier	13524 Whittier Blvd	0	0	140	60	170
Parking Structure	7621 S Painter Ave	3,850	1,150	0	0	0
Central Library	7444 Washington Ave	0	0	140	60	170
Community Center	7630 Washington Ave	0	0	202	0	0
General Telephone	13119 Whittier Blvd	0	0	76	220	296
Holland House Cafeteria	8407 Quadway	0	0	583	0	583
Barrons Pharmacy	8436 S Quadway	0	0	200	0	200
W T Grants Basement	1130 Quadway	0	0	315	0	315
Green Sons Basement	1111 Quadway	0	0	79	0	79
C H Baker Shoes	8413 Quadway	0	0	0	294	294
Chamber of Commerce	14442 Whittier Blvd	20	59	96	0	175
Hinshaw Quadway	8480 S Quadway	3,782	945	4,586	191	5,796
McDonalds	8840 Painter Ave	0	0	0	48	48
Presbyterian Inter Community Hospital	12401 E Washington Blvd	3,200	3,100	6,000	735	275
Calif Hi Sch Gym	9800 S Mills Ave	0	168	11	0	179



*The unit of sound is the decibel (dB). The loudness of sound is typically measured using a sound meter, the A-Scale of which corresponds closely to the way the human ear perceives sound. Thus the sound level for noise evaluations is frequently expressed in dBA.

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STATE AND FEDERAL GUIDELINES

A number of federal and state agencies have adopted standards and recommended noise criteria to protect people in both the working and home environments. Table 8-1 provides a chart of noise control responsibility by agency. While only the primary activities of each agency are identified, many of the agencies are directly or indirectly involved in all control areas. A summary of existing noise regulations is provided below.

Federal Regulations

In 1969 and 1970, the Department of Labor established occupational noise regulations through the Walsh-Healey Public Contracts Act and set standards for noise exposure for all businesses engaged in interstate commerce through the Occupational Safety and Health Act (OSHA).

The Federal Highway Administration (FHWA) has set design standards for the planning and design of federally-funded highway projects.

The Department of Housing and Urban Development (HUD) has environmental criteria for determining project acceptability of HUD-assisted housing and financial assistance programs. It includes noise standards of 65 dB Ldn for residential areas. These standards can be used to assess the exposure of sites to present and future noise conditions.

In 1972, the Noise Control Act authorized the Environmental Protection Agency to publish data on the effects of noise. This included noise levels requisite to protect public health (hearing loss) and welfare (annoyance) with an adequate margin of safety.

Section 8: Noise Element Background Report continued

**TABLE 8-1
NOISE CONTROL RESPONSIBILITY BY ACTIVITY AND AGENCY**

Agency	Highway Noise	Aviation Noise	Occupational Noise	Construction Noise	Land Use Compatibility	Building Siting	Complaints	Research	Product Noise
Federal Dept. of Housing and Urban Dev.					X	X			X
Dept. of Labor			X	X					
Environmental Protection Agency	X	X	X			X			
Federal Aviation Administration		X							
Federal Highway Administration	X								
State Dept. of Health	X			X	X	X		X	X
Dept. of Transportation	X	X	X			X			X
County of Los Angeles	X								X
City of Whittier City Council	X			X	X				
Building Dept.			X	X		X	X	X	
Planning Dept.			X	X	X	X	X	X	X
Police Dept.			X				X		

State Regulations

The State of California has adopted noise standards for areas not regulated by the federal government. State standards cover noise from motor vehicles, freeway noise affecting classrooms, noise insulation of structures, occupational noise control and airport noise. The California Motor Vehicle Code sets noise limits for vehicles according to type of vehicle and date of manufacture.

California Streets and Highways Code Division 1, Chapter 1, Article 6 requires State-funded noise abatement programs for freeway construction or any use which will result in noise levels exceeding 55 dBA L₁₀ or 52 dBA Leq at existing classrooms, libraries, multi-purpose rooms, and pupil personnel services of public and private elementary and secondary schools. The noise abatement program may include acoustical treatment, elimination of windows, air conditioning, sound buffer structures and other mitigation measures.

Sound Transmission Control Standards in the California Administrative Code, Title 24, Building Standards, Chapter 2.5 outline noise insulation performance standards for new hotels, motels, apartment houses, and dwellings other than detached single-family units. It requires an interior noise level of 45 dB CNEL or less for residential projects. For projects near noise sources (airport, major roads, and industrial areas), an acoustical analysis must be made to show compliance with the standards.

Noise standards in Title 21, Public Works, Chapter 25, Division of Aeronautics of the same code require compatible land uses within a criterion CNEL contour. Compatible and incompatible land uses have been identified for areas within an airport's 65 dB CNEL. Occupational Noise Control Standards are also found in Title 8, Industrial Relations, Chapter 4 of the state Administrative Code. It provides permissible noise level exposure at the workplace in terms of permitted hours per weekday.

The California Office of Noise Control has prepared "Guidelines for the Preparation and Content of Noise Elements of General Plans". This provides a guide for land use compatibility of noise sensitive land uses in areas subject to noise levels of 55 to 80 dB CNEL or Ldn. Residential uses are normally unacceptable in areas with 70 dB CNEL and conditionally acceptable within 60 to 70 dB CNEL. The CNEL land use compatibility standards are shown in Exhibit 8-2. This chart has been utilized by many cities to determine acceptable noise levels for new developments.

EXISTING NOISE ENVIRONMENT

Noise sources are classified as mobile sources if they are associated with vehicular traffic, railroad trains, airplanes, and other forms of transportation. They are stationary sources if the noise is created by stationary activities, equipment or site-specific uses.

Traffic Noise

Traffic noise consists of sounds from horns, engines, tire squeal, sirens, and various noises caused by cars, trucks, buses, motorcycles, police cars, emergency vehicles, and other related sources. Traffic on city streets represent the most predominant type of noise in the City.

The San Gabriel River Freeway (SR-605) is a source of freeway noise in Whittier but its impact on the City is limited to the northwest section where it passes. The high volume of traffic on the freeway generates noise in Whittier but this noise is reduced by the lower elevation of the freeway. Noise impacts are directly related to the number of vehicles using this freeway segment. Traffic volume is currently estimated at a total of 219,000 vehicles per day in both directions on the freeway.

Vehicles on surface streets also constitute a major source of noise. Whittier Boulevard is a primary highway which carries large volumes of traffic everyday. Land uses along this highway do not generally include residential areas, hospitals, churches, schools and other noise-sensitive uses. Exceptions include the Nelles School for Boys, the East Whittier Junior High School, and residential uses between Jacmar and Bovar Avenues; between Norwalk Boulevard and Broadway; and between La Entrada and La Puebla Avenues. The noise impacts of Whittier Boulevard are generally limited to the commercial and industrial uses along the road.

Other major transportation corridors in the City include Beverly Boulevard, Hadley Street, Painter Street, Greenleaf Avenue, Colima Road, Mar Vista Street, Broadway, Norwalk Boulevard, Pickering Street, Lambert Road, and Washington Boulevard/La Cuarta Street. Vehicular noise from these streets are influenced by:

- Daily and peak-hour automobile traffic
- Number of trucks and buses
- Slope gradient of the road
- Stop and go traffic (signals, stop signs, etc.)

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE					
	L _{dn} OR CNEL, dB					
	55	60	65	70	75	80
RESIDENTIAL-LOW DENSITY SINGLE FAMILY, DUPLEX MOBILE HOMES	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
RESIDENTIAL- MULTI FAMILY	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
TRANSIENT LODGING- MOTELS, HOTELS	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
SCHOOLS, LIBRARIES CHURCHES, HOSPITALS, NURSING HOMES	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
AUDITORIUMS, CONCERT HALLS, AMPITHEATRES	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
SPORTS ARENA, OUTDOOR SPECTATOR SPORTS	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
PLAYGROUNDS, NEIGHBORHOOD PARKS	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
OFFICE BUILDINGS, BUSINESS, COMMERCIAL AND PROFESSIONAL	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
INDUSTRIAL, MANUFACTURING, UTILITIES, AGRICULTURE	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

LEGEND



NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.



CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.



NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.



CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NORMALIZED NOISE EXPOSURE DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a "normalized" value of CNEL or L_{dn}. Normalized values are obtained by adding or subtracting the constants described in Table 1 to the measured or calculated value of CNEL or L_{dn}.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65dB CNEL criterion wherever possible and in order to facilitate the ability of airports to comply with the Act, residential uses located in Community Noise Exposure Areas greater than 65dB should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL of L_{dn}. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

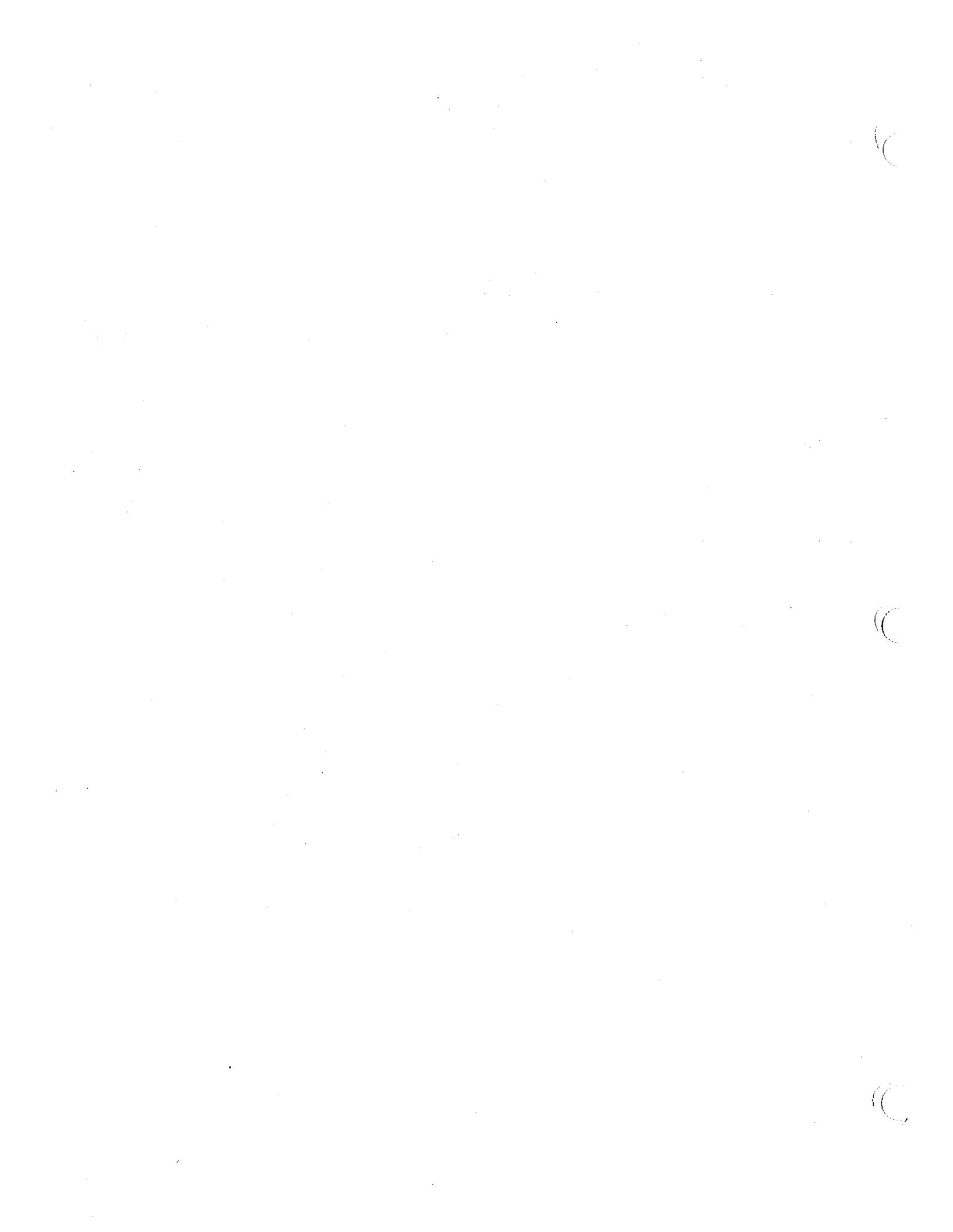
Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. When this is the case, more restrictive standards for land use compatibility, typically below the maximum considered "normally acceptable" for that land use category, may be appropriate.

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City of Whittier



GENERAL PLAN



- Average speed of traffic
- Barriers between roadway and adjacent uses
- Mechanical condition of the vehicles

Revisions of the California Vehicle Code lowered the vehicle noise level limits by adding restrictions and regulations affecting test procedures, exhaust standards, and noise standards for tires. Even with stricter legislation, streets and highways will continue to be the primary sources of noise. It is very difficult to protect residential areas from the noises of motor vehicles, modified exhausts, squealing tires, horns, and similar noises.

Aircraft Noise

Aircraft noise can create conflicts at and around airports and their traffic lanes or flight paths. Whittier does not have airport facilities. The nearest airport is the Fullerton Municipal Airport, approximately 3 miles south of the City. The major source of aircraft noise emanates from planes flying overhead. In addition, the City is located in an approach to Los Angeles International Airport and noise from jet aircraft is audible throughout the day and evening. The Puente Hills serves as a barrier to small aircraft from flying too low over the City. Thus, the higher the planes, the less noise is heard in the City. Low-flying aircraft is limited to occasional private airplanes that fly at lower levels than the hilltop elevations.

Railroad Noise

There are two major railroad lines through Whittier. The longest one is the Union Pacific Railroad (UPRR) which passes north-south along the western section of Whittier. It has one scheduled train every other day. The tracks merge with the Southern Pacific Railroad (SPRR) near Lambert Road and Gunn Avenue. The SPRR line runs northwest-southeast along Lambert Road. Train and railroad noises and railyard operations arising from the use of the UPRR tracks are limited. The low volume of train traffic translates to minimal noise impacts in the City.

Commercial and Industrial Noise

Commercial and industrial uses may create noise associated with equipment, work activities, patrons, and deliveries as part of the day-to-day operations of businesses. The commercial areas in Whittier are concentrated along Whittier Boulevard and the Uptown Village. Industrial uses are located along Whittier Boulevard on the western section of the City. Aside from these stationary noise sources, Whittier Boulevard is also a major transportation

route. The noise levels from stationary sources within these areas are higher than other areas of the City. Table 8-2 provides typical sound levels for various equipment. Exhibit 8-3 shows construction equipment noise levels.

TABLE 8-2 SOUND LEVELS FOR BUILDING EQUIPMENT AT 3 FT.	
Building Equipment	Range of Sound Level (dBA)
Ballast Fluorescent Lamp	20-50
Fan Coil Units	25-55
Diffusers, Grilles, Register	20-60
Induction Units	25-60
Dehumidifiers	40-70
Humidifiers	50-70
Mixing Boxes, Terminal Reheat Units, etc.	25-80
Unit Heaters	45-80
Transformers	70-80
Elevators	85
Absorption Machines	88
Boilers	55-90
Rooftop Air Conditioning Units	70-90
Pumps	45-95
Steam Valves	60-95
Self-contained Air Conditioning Units	55-95
Chiller - Rotary Screw Compressors	65-95
Condensers - Air-Cooled	80-95
Pneumatic Transport Systems	60-100
Central Station Air Conditioning Units	70-100
Chiller - Reciprocating Compressor	80-100
Electric Motors	20-100
Fans	40-105
Chiller - Centrifugal Compressor	75-105
Air Compressor	75-105
Cooling Towers	85-110
Diesel Engines	90-110
Gas Turbines	90-105

Source: Environmental Protection Agency. Noise from Construction Equipment and Operations, Building Equipment & Home Appliances. 1971.

Residential Noise

Residential noise is unlikely to be disruptive. Typical residential noise comes from activities, where power lawnmowers, small power tools, air-conditioning units, radios, stereos, musical instruments, and appliances are used. Whittier residential neighborhoods are, for the most

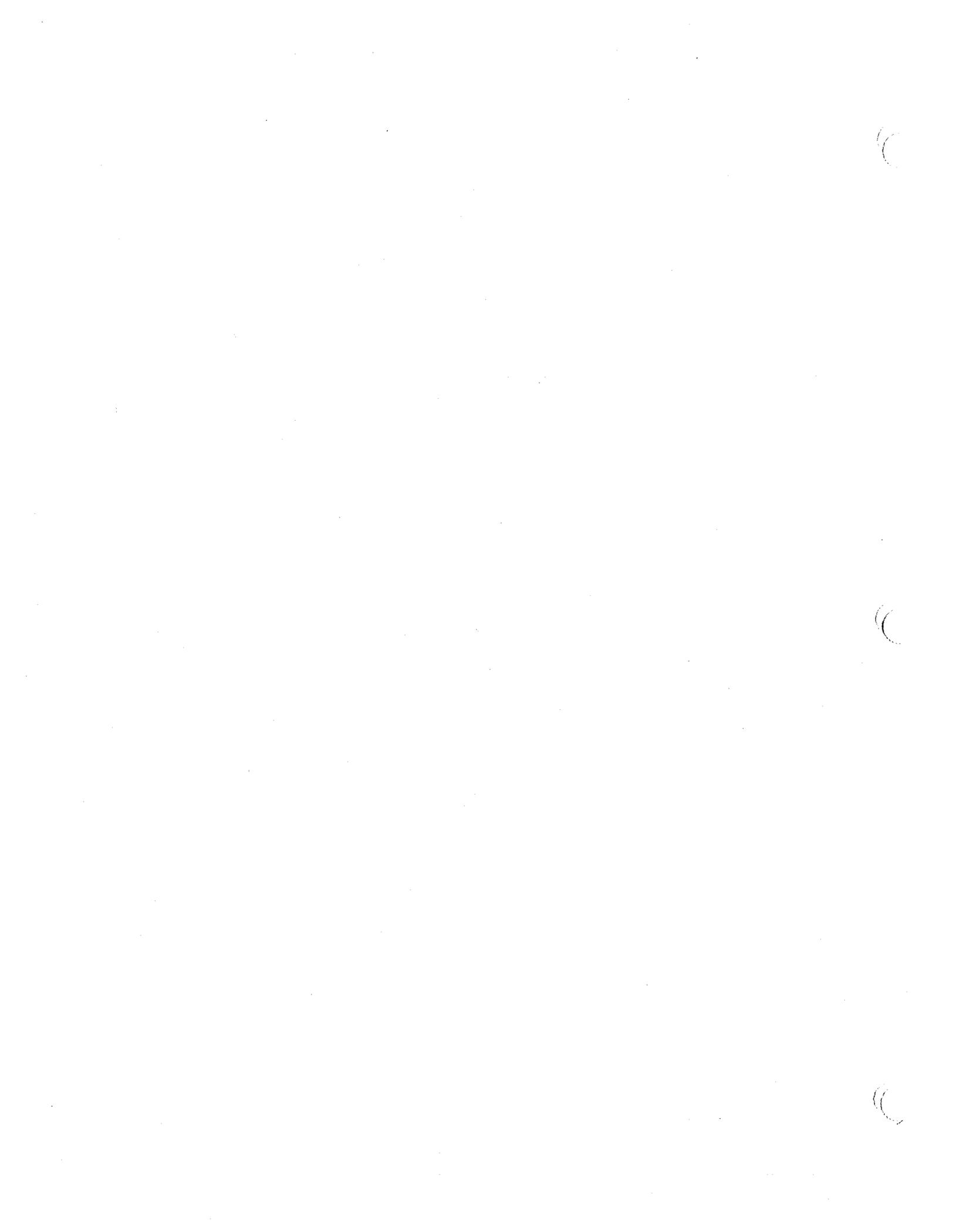
		NOISE LEVEL (dba) AT 50 FEET					
		60	70	80	90	100	110
EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	EARTH MOVING	COMPACTORS (ROLLERS)		■			
		FRONT LOADERS		■	■		
		BACKHOES		■	■	■	
		TRACTORS		■	■	■	
		SCRAPERS, GRADERS			■	■	
		PAVERS				■	
		TRUCKS			■	■	
	MATERIALS HANDLING	CONCRETE MIXERS			■	■	
		CONCRETE PUMPS			■		
		CRANES (MOVABLE)			■	■	
		CRANES (DERRICK)				■	
	STATIONARY	PUMPS		■			
		GENERATORS		■	■		
		COMPRESSORS			■	■	
	IMPACT EQUIPMENT	PNEUMATIC WRENCHES			■		
		JACK HAMMERS & ROCK DRILLS			■	■	
		PILE DRIVERS (PEAKS)					■
	OTHER	VIBRATOR		■	■		
		SAWS		■	■		

SOURCE: Environmental Protection Agency, NTID 300-1

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EXHIBIT 8-3
NOISE LEVELS FOR TYPICAL CONSTRUCTION EQUIPMENT



part, pleasant and quiet places to live with no major residential noise problems. Table 8-3 provides the range of noise levels for a number of household appliances.

TABLE 8-3 NOISE LEVELS FOR APPLIANCES		
Appliance	A-Weighted Sound Levels at 3 ft. (dBA)	
	Range	Mean
Freezer	39-45	42
Refrigerator	35-53	43
Heater, Electric	--	47
Hair Clipper	--	50
Toothbrush, Electric	48-55	52
Humidifier	42-65	53
Fan	38-69	57
Dehumidifier	52-62	57
Clothes Dryer	51-66	58
Air Condition	56-67	58
Shaver, Electric	57-69	60
Water Faucet	61	61
Hair Dryer	59-65	61
Clothes Washer	47-72	62
Water Closet	46-76	63
Dishwasher	54-72	65
Can Opener, Electric	54-76	66
Food Mixer	49-79	67
Knife, Electric	65-75	71
Knife Sharpener, Electric	--	72
Sewing Machine	70-74	72
Oral Lavage	70-74	72
Vacuum Cleaner	62-85	72
Food Blender	62-88	75
Coffee Mill	75-79	77
Food Waste Disposer	67-93	78
Edger and Trimmer	--	81
Home Shop Tools	63-98	83
Hedge Clippers	--	84
Lawn Mower, Electric	81-89	85

Source: Environmental Protection Agency. Noise from Construction Equipment and Operators, Building Equipment & Home Appliances. 1971.

Recreational Noise

Recreational activities in ball fields, outdoor swimming pools, school playgrounds, active parks, and other facilities can create noise in the community. Fortunately, these activities often take place during the daytime hours and occur for short periods only after dark. Recreational noise is less irritating to most people than other types of noise. In Whittier, it has not resulted in many noise complaints. Another recreational-related noise is the use of off-road vehicles, motorcycles and dirt bikes on vacant and undeveloped areas of the Puente Hills.

Noise-sensitive Uses

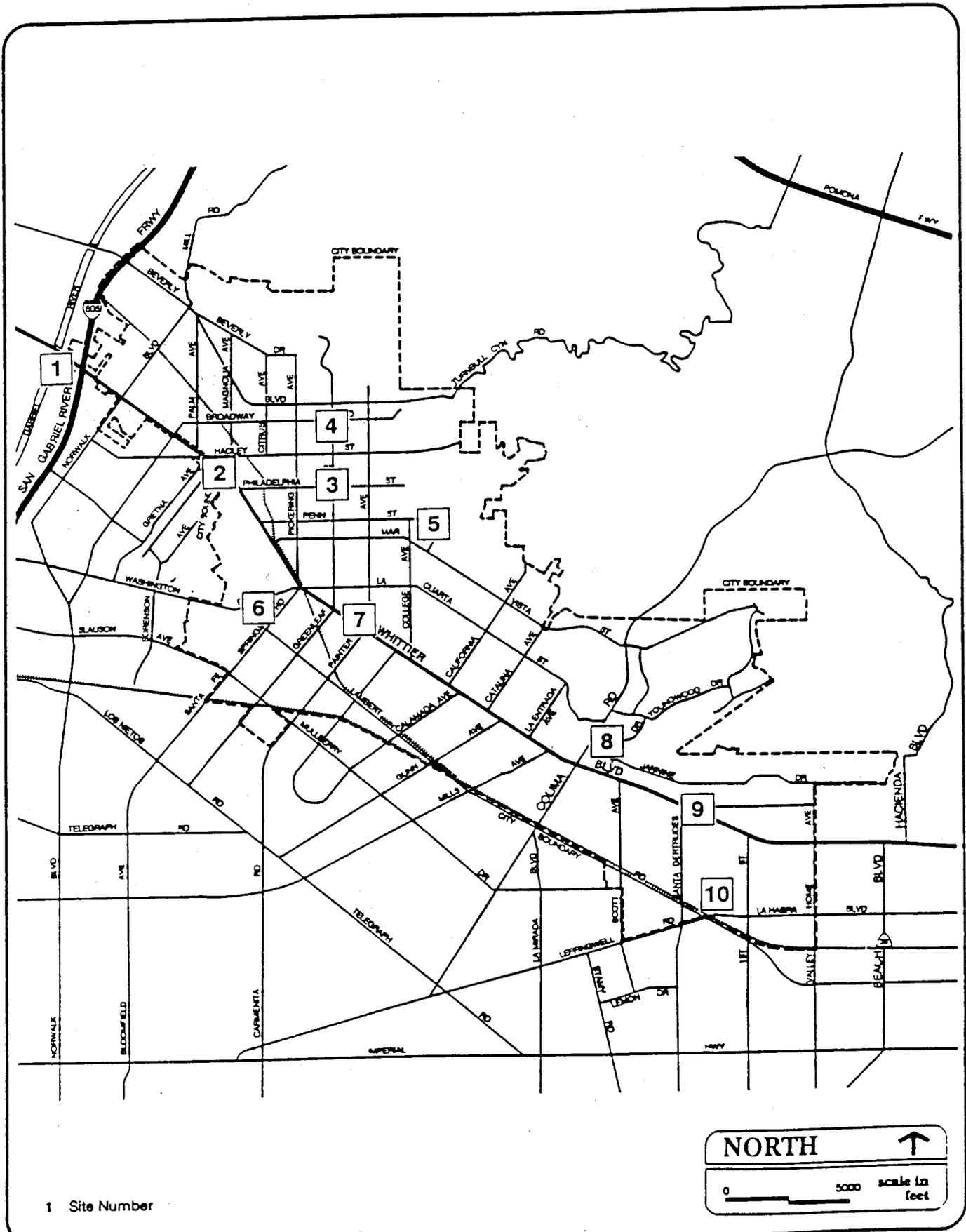
Residential uses are sensitive to noise impacts, particularly during the nighttime hours. Sleep and rest can easily be disrupted by noise during the night. Schools and libraries are also noise-sensitive. Excessive noises can annoy students and teachers, leading to speech interference, loss of concentration, difficulty in listening and other impacts that impair learning activities. The location of these facilities are discussed in the Land Use Element Background Report.

Hospitals and nursing homes also present a special concern. Day to day hospital operations and recovering patients are especially sensitive to noise. Older residents are often more sensitive to noises than others. Churches and religious services may be disrupted by noise, although activities within these centers often occur outside of peak hour traffic.

Noise Survey

A noise measurement survey was conducted on May 29 and 30, 1991 at ten different locations in Whittier. Site No. 1 is the Pio Pico State Park adjacent to the San Gabriel River Freeway. Site No. 2 is by the Fred Nelles School for Boys. Site Nos. 3 and 4 are within Uptown Whittier. Site No. 5 is at Penn Park, across the Savage Canyon Landfill. Site No. 6 is near the Presbyterian Hospital. Site No. 7 is at the Whittier Quad. Site No. 8 is across from the Whittier Hospital Medical Center. Site No. 9 is at Whittwood Mall and Site No. 10 is where the Southern Pacific Railroad, Leffingwell Road and Lambert Road intersect. Exhibit 8-4 shows the noise measurement locations.

The noise readings were taken for 15 minute intervals from 10:30 a.m. to 3:30 p.m. The results of the survey are summarized in Table 8-4. The noise measurements recorded typical noise levels for 90%, 50%, 33%, and 10% of the time. In addition, the maximum noise level recorded during the 15-minute period is shown.



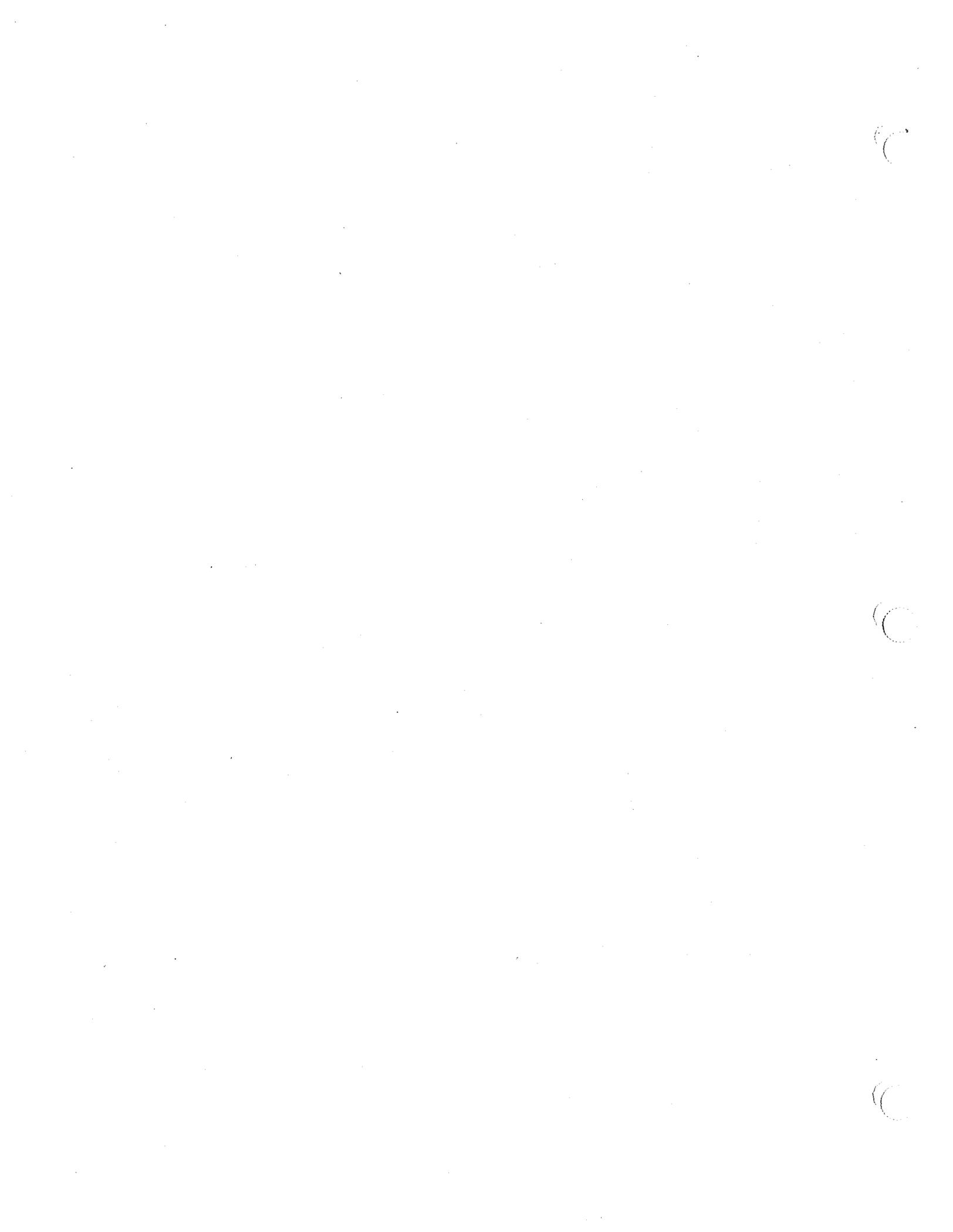
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City of Whittier



GENERAL PLAN

EXHIBIT 8-4
NOISE MEASUREMENT
LOCATIONS



**TABLE 8-4
NOISE MEASUREMENTS**

Site	Location	L _{max}	L ₁₀	L ₃₃	L ₅₀	L ₉₀
1	Pio Pico Park	87	87.0	83.2	81.4	76.4
2	Whittier Blvd./Sorensen Avenue	87	85.6	81.6	79.8	74.7
3	Philadelphia Street/Greenleaf Avenue	87	84.4	80.3	78.3	74.5
4	Greenleaf Avenue-Camilla/Broadway	77	77.0	71.0	68.1	63.7
5	William Penn Park	77	76.8	68.9	66.1	63.4
6	Washington Blvd./Lambert Road	87	85.9	82.1	75.3	75.7
7	Whittier Blvd./Painter Avenue	87	86.3	82.4	80.8	76.9
8	Whittier Hospital	87	85.4	81.6	79.3	74.3
9	Whittier Blvd./Santa Gertrudes Street	87	84.2	79.5	77.4	74.0
10	Leffingwell Road/Lambert Road	87	86.5	83.4	81.3	74.5

Notes: L_{max} is the maximum sound level recorded during the noise measurement duration.
 L₁₀ is the sound level exceeded 10 percent of the noise measurement duration.
 L₃₃ is the sound level exceeded 33 percent of the noise measurement duration.
 L₅₀ is the sound level exceeded 50 percent of the noise measurement duration.
 L₉₀ is the sound level exceeded 90 percent of the noise measurement duration. It is also considered the background noise level.

Source: David Evans and Associates, 1991.

The majority of noise sources at the survey sites were cars, buses and trucks along the roadways. Aircraft noises from planes flying overhead also contributed to the prevailing noises. Vehicle horns and motorcycles created high pitched noises intermittently. A light breeze was felt during the surveys which increased the noise levels measured by the sound meter. The noisiest areas were those located near the freeway and major streets. Quiet areas are residential neighborhoods on local streets.

Calculated Traffic Noise Levels

Existing noise along major roadways may be estimated using the Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA-RD-77-108). Major roadways were selected for the modelling, with the results provided in Table 8-5. The estimates are based on an average speed of 35 miles per hour, a roadway slope of 1 percent, completely paved roads, and traffic consisting mainly of automobiles. The roadway width and average daily traffic are the major factors that determine noise generation.

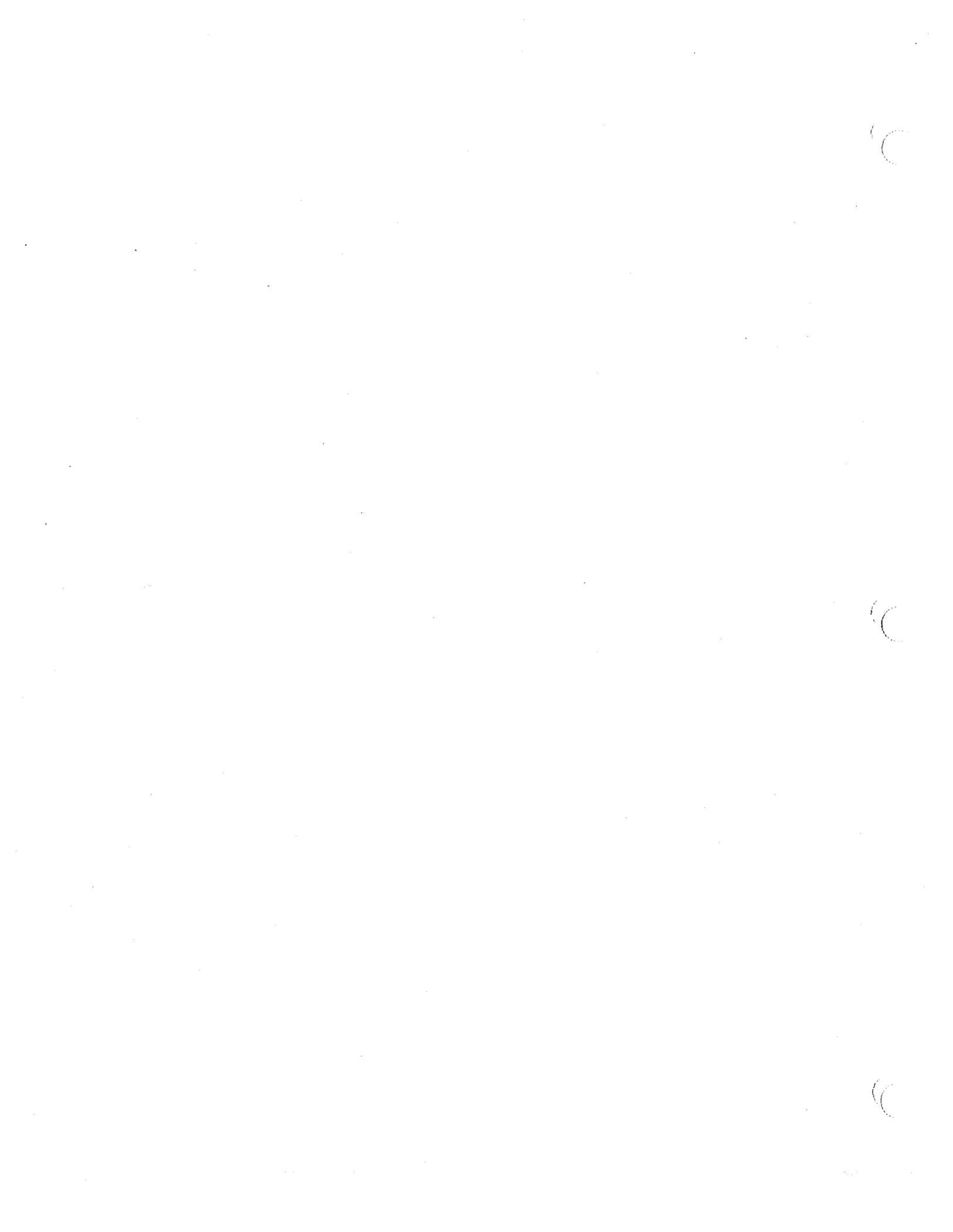
TABLE 8-5 EXISTING ROADWAY NOISE LEVELS					
Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
<u>Beverly Blvd.</u>					
SR-605/Carley	60.9	182.6	574.2	1814.6	69.30
Carley/Palm	0.0	138.9	434.8	1373.4	68.09
Palm/Magnolia	0.0	143.7	450.3	1422.4	68.24
Magnolia/Pickering	0.0	119.5	372.8	1177.3	67.42
Pickering/Greenleaf	0.0	76.4	233.6	736.0	65.38
Greenleaf/Painter	0.0	0.0	155.7	491.4	64.23
Painter/Turnbull Canyon	0.0	0.0	0.0	0.0	54.23
<u>Whittier Blvd.</u>					
West of SR-605	56.6	168.0	527.7	1667.5	68.93
SR-605/Painter	62.4	187.5	589.7	1863.6	69.42
Painter/Calmada	66.8	202.1	636.2	2010.7	69.75
Calmada/Santa Gertrudes	74.2	226.5	713.7	2255.9	70.25
Santa Gertrudes/First	0.0	158.3	496.8	1569.5	68.67
East of First Street	0.0	143.7	450.3	1422.4	68.24
<u>Hadley Avenue</u>					
Glengarry/Whittier Blvd.	0.0	0.0	110.5	344.0	62.07
Whittier Blvd./Hoover	0.0	57.7	171.8	539.9	64.03
Hoover/Pickering	0.0	64.7	195.0	613.4	64.59
Pickering/Greenleaf	0.0	62.3	187.3	588.9	64.41
Greenleaf/Painter	0.0	0.0	156.5	490.9	63.62
East of Painter Avenue	0.0	0.0	95.3	295.0	61.40
<u>Mar Vista</u>					
Whittier Blvd/Pickering	0.0	0.0	95.3	295.0	61.40
Pickering/Painter	0.0	64.7	195.0	613.4	64.59
Painter/California	0.0	86.5	272.1	859.8	66.66
California/Colima	0.0	81.6	256.5	810.7	66.40
<u>Washington</u>					
West of Whittier Blvd.	0.0	109.8	341.9	1079.2	67.04

TABLE 8-5 EXISTING ROADWAY NOISE LEVELS					
Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
<u>Lambert Avenue</u>					
Santa Fe Springs/Laurel	0.0	138.9	434.8	1373.4	68.09
Laurel/Calmada	0.0	119.5	372.8	1177.3	67.42
Calmada/Gunn	0.0	134.0	419.3	1324.4	67.93
Gunn/Colima	0.0	143.7	450.3	1422.4	68.24
Colima/Scott	0.0	100.2	310.9	981.1	66.63
Scott/Santa Gertrudes	0.0	134.0	419.3	1324.4	67.93
Santa Gertrudes/Beach Blvd.	0.0	119.5	372.8	1177.3	67.42
<u>Colima</u>					
South of Whittier Blvd.	0.0	133.0	419.6	1326.5	68.54
Whittier Blvd./Mar Vista	0.0	158.3	496.8	1569.5	68.67
North of Mar Vista	62.4	187.5	589.7	1863.6	69.42
<u>Santa Fe</u>					
South of Lambert Rd.	0.0	67.0	202.7	637.9	64.76
Lambert/Whittier Blvd.	0.0	71.7	218.1	686.9	65.08
<u>Norwalk</u>					
South of Whittier Blvd.	0.0	81.1	249.0	785.0	65.66
Whittier Blvd/El Rancho	0.0	67.0	202.7	637.9	64.76
El Rancho/Beverly Blvd.	0.0	81.1	249.0	785.0	65.66
<u>Pickering</u>					
Whittier Blvd/Penn	0.0	54.9	171.2	540.5	64.64
Penn/Hadley	0.0	62.2	194.5	614.2	65.20
Hadley/Beverly Blvd	0.0	64.6	202.2	638.8	65.37
<u>Greenleaf</u>					
South of Whittier Blvd.	0.0	0.0	156.5	490.9	63.62
Whittier Blvd/La Cuarta	0.0	76.4	233.6	736.0	65.38
La Cuarta/Franklin	0.0	95.4	295.4	932.1	66.41
Franklin/Beverly Blvd.	0.0	0.0	110.5	344.0	62.07

TABLE 8-5 EXISTING ROADWAY NOISE LEVELS					
Road Segment	Distance from Roadway Centerline to CNEL (feet)				
	70 CNEL	65 CNEL	60 CNEL	55 CNEL	CNEL at 50' from CL
<u>Painter</u>					
South of Oval Drive	0.0	109.8	341.9	1079.2	67.04
Oval/Whittier Blvd.	0.0	105.0	326.4	1030.1	66.84
Whittier Blvd/La Cuarta	0.0	129.2	403.8	1275.3	67.77
La Cuarta/Penn	0.0	119.5	372.8	1177.3	67.42
Penn/Philadelphia	0.0	148.6	465.8	1471.5	68.39
Philadelphia/Hadley	0.0	90.6	279.9	883.1	66.17
Hadley/Beverly Blvd.	0.0	55.4	164.2	515.4	63.83
Mills Avenue	0.0	0.0	156.5	490.9	63.62
Santa Gertrudes Avenue	0.0	81.1	249.0	785.0	65.66
Source: FHWA Traffic Noise Prediction Model, David Evans & Associates, Inc., 1991.					

The 65 dB CNEL is the area having a time-average sound level of approximately 65 dB. It may experience sound levels higher and lower than 65 dB. In areas where buffers, land forms, and other noise path barriers exist, the noise contours overestimate the noise levels. It is impossible to analyze each segment for the different types and location of noise barriers. Therefore, the noise contour map provides a worst case scenario and acoustical analysis should be performed for specific noise impact areas.

Peak hour traffic will also create noise impacts higher than the numbers above. A higher percentage of truck traffic will also increase the noise levels. On the other hand, buildings and landscaping serve to buffer noises and would result in lower noise impacts that estimated in this table. Exhibit 8-5 is the estimated noise contours based on existing traffic volumes along major streets.



SECTION 9: HISTORIC RESOURCES ELEMENT BACKGROUND REPORT

INTRODUCTION

The City of Whittier was incorporated in 1898, making it one of the oldest cities in Los Angeles County. The City has a wide variety of cultural resources which include the homes and businesses of early residents and founders, along with other notable sites. This Background Report provides an inventory of cultural resources that must be considered in future planning. It provides a brief history of the planning area, describes paleontological resources that may be found in the area, documents important archaeological resources, and details important historic resources in the community.

HISTORICAL OVERVIEW

The City of Whittier is within the historic territory of the Gabrieliño Indians (as derived from the nearest mission - the San Gabriel Mission). The territory includes the watersheds of the Los Angeles, San Gabriel and Santa Ana rivers and smaller streams in the Santa Monica and Santa Ana Mountains. This cultural sphere also includes the Los Angeles Basin, the coastline from Aliso Creek to Topanga Creek, and the islands of San Clemente, San Nicholas and Santa Catalina.

In 1769, all land in Whittier and the surrounding region was vested to the King of Spain. The land was declared property of the San Gabriel Mission in 1771. Jose Nieto received grazing rights to the land in 1784. In 1833, Juan Crispin Perez petitioned for a grant to Rancho Paso De Bartolo Viejo which included the Whittier area. In 1850, Pio Pico, the last Mexican Governor of California, purchased a part of the rancho from the descendants of Perez. Approximately 9,000 acres were deeded to Pio Pico in 1881. On his land, referred to as "El Ranchito" (Little Ranch), Pico built an adobe house near the bank of the San Gabriel River. This house was destroyed by the floods of 1883. A second adobe was constructed and is still standing today.

The final survey of Rancho Paso de Bartolo Viejo rendered much of the area as public lands. Individuals began filing claims, with the first claim filed by Jacob F. Gerkins. Gerkins was a German farmer who came to Los Angeles in 1854. His claim, filed under the Homestead Act on December 2, 1868, set aside a quarter section (160 acres) of the area which today lies north of Hadley Street and east of Greenleaf Avenue.

Through purchase and foreclosure, the land came into the hands of John M. Thomas, an Indiana farmer who had come to Los Angeles in 1868. Thomas constructed Whittier's first building which still stands at 522 East Camilla Street. The Thomas Ranch was then acquired by J. Mills Boal, James R. Boal and John D. Burch for \$33,000.00.

During this period, Aquilla H. Pickering (a resident of Chicago), was completing plans for establishing a Quaker community in California. During the early part of 1887, Pickering and his wife Hannah, went to California to select a site for a future settlement. After searching from Sacramento on the north to Ensenada on the south, they were about to give up until they saw the Thomas Ranch, which was for sale at the time. The Pickerings decided that the Thomas Ranch was an ideal place for a Quaker settlement.

A council of Southern California Friends were called at once and on May 3, 1887, the Thomas Ranch was purchased by the Pickering Land and Water Company. According to some historians, it was at the first meeting that the colony was named "Whittier" in honor of the New England Quaker poet, John Greenleaf Whittier. The Quakers began settling in town in 1887. Auction sales on tract sites were the popular form of buying property. The townsite was surveyed and subdivided the same year and the sale of lots started. One-acre lots sold for \$100 to \$200 and five-acre lots outside the townsite were offered at \$1,000 each.

The sale of the Whittier town lots corresponded with the real estate boom of the eighties which was sweeping over all of Southern California. The town was flooded with potential buyers from Pasadena and Los Angeles. Buildings were rapidly being constructed throughout the area. One of the first buildings was the Hotel Lindley, which was built by Hiram Gibbs, a brother-in-law of Aquilla Pickering. It was located on the southeast corner of Philadelphia and Bright Avenues.

Two groups of rival businessmen and builders began to develop the town center. Four brick buildings were built at the corner of Greenleaf and Hadley Street in an attempt to draw the business there. The other town center was known as the Strawbridge tract at the corner of Greenleaf and Penn. About this time, a drug store opened on North Greenleaf in the Bufkin block, north of the present California Bank. On the southwest corner of Greenleaf and Philadelphia Avenues, a building was erected by a Pasadena man where Willet Doty opened a general merchandise store and post office.

In 1940, Murphy Ranch Company began development of the open Friendly Hills subdivision. Initially, many citrus ranchers opposed development and the loss of agricultural land. Nevertheless, the farmers and ranchers sold their holdings for subdivision development in the 1950's when the crops failed.

PALEONTOLOGICAL RESOURCES

Sedimentary rocks in the planning area that are known to produce fossils include the Miocene Monterey and Repetto Formations, Late Pliocene Fernando Formation, the

Pleistocene Palos Verdes Sand and other Quaternary sediments. Fossils are often found in these sediments when the ground surface layer is removed for excavation or construction.

The Monterey Formation (approximately 9 to 12 million years ago) is an important lithologic unit comprised of marine sediments and is moderately fossiliferous. Specimens from this formation include vertebrate remains of aquatic carnivores such as walruses, sea lions and other marine animals such as whales and fishes, and aquatic birds including shearwaters and auks. As many of the specimens are isolated occurrences, there is no way of predicting where they will be found. The Topanga Formation, also marine in origin, occurs stratigraphically below the Monterey Formation in the area, and has been known to produce a similar suite of fossils.

The Fernando Formation (approximately 2.5 to 5 million years ago) is a marine sedimentary deposit composed of siltstone, conglomerate and fine sandstones. This formation is moderately fossiliferous and has yielded fossils including ray-finned bony fishes, sharks, snakes, and primitive artiodactyla. However, this is not an exhaustive taxonomic list of the types of fossils that may be expected to occur within this formation.

A record search of known paleontological sites indicated that one site was found near Penn Park and the Savage Canyon Landfill. The geology of the area is of the Fernando Formation of late Pliocene age. Fossils found were of whales and dolphins probably related to the American Land Mammal Age (2.5 to 5 million years ago).

The Quaternary deposits throughout the study area consist of unnamed alluvial units. There is a possibility that vertebrate fossils will be encountered by excavation. Several important Pleistocene ("Ice Age") fossil faunas (approximately 400,000 to 1.8 million years ago) and some Rancholabrean (approximately 10,000 to 400,000 years ago) fossils have been recovered in and near the planning area. These fossils include an extensive and well studied assemblage of marine invertebrates and vertebrates such as sharks and terrestrial animals such as sloth, mammoth, mastodon, camel, horse, bison, birds and reptiles.

Any of these fossils could be found as disarticulated or associated skeletons, but usually occur as isolated bones. Any significant excavation within the planning area will almost certainly uncover fossils such as mentioned above. Additionally, surface activities, such as foot and vehicle traffic can destroy fossils that have weathered out beneath the surface. Construction in the Whittier area should be very closely monitored during any excavation so that any fossils found may be quickly and safely recovered. All planning documents and environmental assessments should include references to the fossil resources (including invertebrates) and make strong recommendations for collecting and salvage of specimens wherever subsurface sedimentary rocks and surficial alluvium are disturbed. Such :

recommendation has support in existing County, State and Federal guidelines. A program for the collection and salvage of fossils should be established before grading activities start.

ARCHAEOLOGICAL RESOURCES

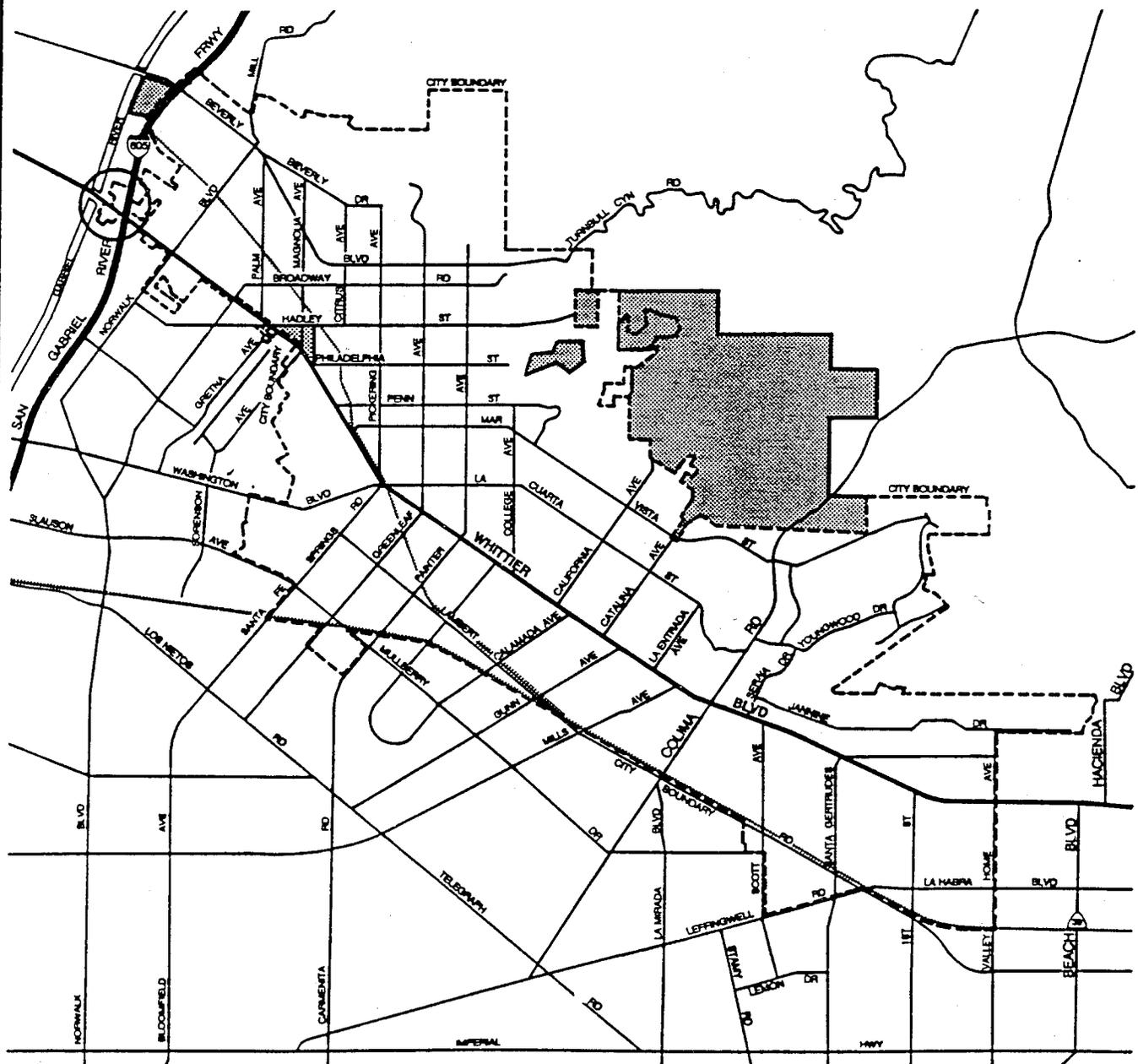
A record search at the UCLA Archaeological Center revealed the presence of known historic and archaeological resources in the Whittier area. One prehistoric site was identified near the intersection of Whittier Boulevard and the San Gabriel River Freeway. It is recorded as LAN-182a and is believed to be the site of a historic Gabrieliño Village. The occupied area may have been at the knoll of sandy soil, downstream of the Pio Pico Mansion; near the Southern Pacific Junction Tower; or near the Tomas Sanchez Colima House. The two latter sites were Indian graveyards. It may also have been west of the old Guarado place where the first settler built his home. These sites were suggested by Juan Ramirez to John Harrington and are located along the San Gabriel River. The village was known as Sejat and occupied by the Shoshonean-speaking Indians. The Indians lived in brush huts and survived on wild seeds, honey and small game animals. When the village became populous, Indians migrated south into the San Juan Capistrano Valley.

Archaeological surveys have been recorded for six different locations in the planning area. Approximately 1,058 acres were surveyed in total. These surveys uncovered unrecorded middens, a tightly packed rock scatter or possible hearth, burnt bone fragments, tarring pebbles, chert flakes, fire-altered stones, fired clay and seeds, mano, pestles and metate. These discoveries were primarily located within and around the Pio Pico Mansion. The other five site surveys uncovered no archaeological resources and are considered to have low sensitivity. Exhibit 9-1 provides archaeological sensitivity of the planning area.

There are also potential sites of archaeological value in the hillside areas. The Whittier planning area is within the historic territory of the Gabrieliño Indians. Village sites may be discovered in the canyon areas where there is available fresh water supply for a good part of the year. Such sites could easily be obliterated by development unless adequate standards are placed for the preservation of archaeological resources.

HISTORIC RESOURCES

During the 1970's, three studies were prepared documenting historic resources in the City. The first, a publication of the Whittier Historical Society and Rio Hondo College in 1977 entitled Founders and Friends provides a listing and description of 59 sites in the City which were determined to be of "historical interest".



-  Low Sensitivity
-  High Sensitivity
-  ALL OTHER SITES Unknown Sensitivity

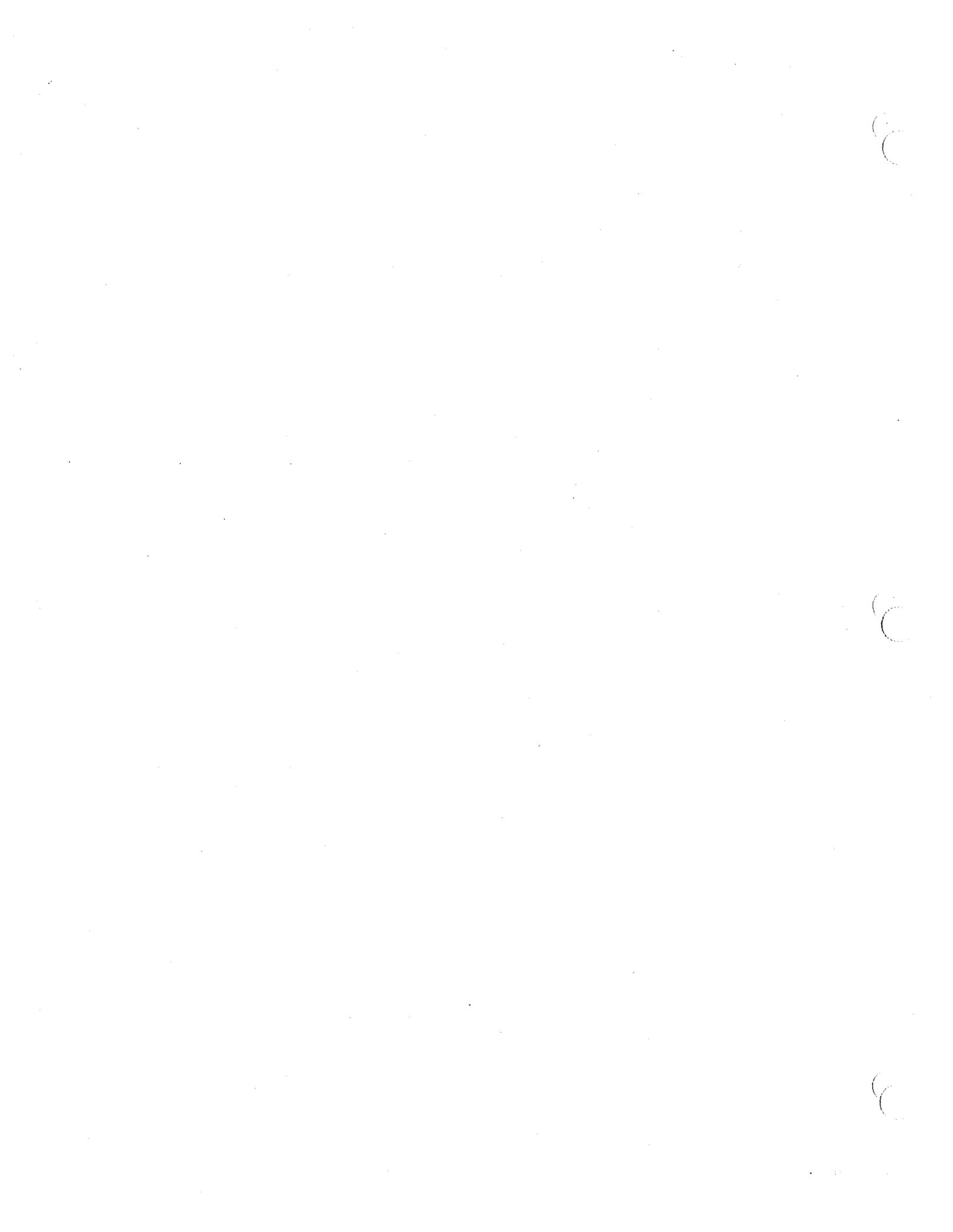
NORTH ↑

0 300 600 scale in feet

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EXHIBIT 9-1 ARCHAEOLOGICAL SENSITIVITY



A second study was conducted in 1977 by the Los Angeles County Museum of Natural History. This study was more of a formal inventory, using standardized inventory forms and assigning a classification to each building surveyed including eligibility for the National Register. This inventory identified 49 potential historic buildings in the City.

The City was not involved in, nor did the City sanction, either of these works. However, in 1978 the City contracted with Charles Hall Page and Associates to conduct a study of the Uptown Whittier area in conjunction with the creation of the Whittier Uptown Village. This initial study produced a map showing "buildings of architectural distinction" and "background buildings". The report states that these buildings, "contribute to the identifiable character of the built environment..."

The Federal Government maintains an official listing of the nation's cultural resources that are worthy of preservation. Listing in the National Register makes property owners eligible for Federal grants-in-aid for historic preservation through State Programs. All nominations to the National Register are made by the State through the State Historic Preservation Officer. Federal agencies may also nominate properties under their jurisdiction or control through designated Federal Representatives. This process is described in Part 60 of Chapter I of Title 36 of the Code of Federal Regulations (effective April 1, 1976).

Criteria has been established by the Federal Government to guide State and Federal agencies and the Secretary of the Interior in evaluating potential entries (other than areas of the National Park System and National Historic Landmarks) for the National Register. The site or structure must first be significant in terms of American history, architecture, archeology, and culture. It should meet the following criteria:

- The site or structure must be associated with events that have made a significant contribution to the broad patterns of our history; or
- The site or structure must be associated with the lives of persons significant in our past; or
- The site or structure must embody the distinctive characteristics of a type, period, or method of construction or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- The site or structure must have yielded, or may be likely to yield, information important to the prehistory or history of the area.

Cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, commemorative properties, and properties that have achieved significance within the past 50 years are not considered eligible for the National Register. However, such properties will qualify if they are integral parts of historic districts that meet the above criteria or if they fall within the following categories:

- A religious property deriving primary significance related to architectural, artistic or historical importance;
- A building or structure removed from its original location but which is significant primarily for architectural value, or where the surviving structure is associated with a historic person or event;
- A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his productive life;
- A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events;
- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived;
- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
- A property achieving significance within the past 50 years if it is of exceptional importance.

Six sites within the City have been placed in the National Register of Historic Places. They are listed in Table 9-1.

TABLE 9-1 NATIONAL REGISTER SITES		
National Register Number	Site and Address	Comments
77-000304	Jonathan Bailey House 13421 E. Camilla Street	Small redwood cabin built by Gerkins and later to become home of Jonathan Bailey, president of the Pickering Land and Water Company
80-000815	Orin Jordan House 8310 S. Comstock Avenue	
82-000969	Bank of America 13002 E. Philadelphia Street	formerly National Bank of Whittier
73-000408	Pio Pico Mansion 6003 Pioneer Boulevard	Home of Pio Pico, last governor under Mexican rule; built in 1852, flood damaged in 1867 and 1883-1884; rebuilt in 1885; historic artifacts found on site; known as El Ranchito; could be Indian Village site; designated State park in June 1927.
78-000701	Southern Pacific Railroad Station on blocks on Philadelphia Street	Built in 1888 as passenger and freight station for riders of the Red Cars; moved in 1991.
80-000816	Standard Oil Building 7257 Bright Avenue	
Source: National Register of Historic Places, 1990; UCLA Archaeological Center, 1991.		

The Pio Pico House, in addition to being on the National Register, is a state historic park. The park is located on the corner of Pioneer and Whittier Boulevards and is the site of the home of Pio Pico and the historical and cultural resources related to his era. The site covers 3.5 acres with 1.2 acres owned by state and 2.3 acres leased from the City of Whittier. The site is developed with residence, park service quarters, public rest rooms, pumping stations and reservoirs. Another 3 acres is used for storing old gravestones. The area is now urbanized with the freeway, channelized river and roadways around the site. The site became a state museum in 1915 and a state park in 1927.

According to the City of Whittier Historical Committee and the Whittier Historical Society, there are a number of sites and structures of historical significance in Whittier. Some have already been preserved, others have been recognized and identified by signs or plaques as

landmarks, and others are in need of attention and preservation. These sites are summarized in Table 9-2. Key sites, in addition to the Pio Pico Mansion, include the following:

- Jonathan Bailey House - This was the first house in the townsite of Whittier. It was built by Jacob Gerkins who originally owned the land and which became the City of Whittier in 1887. This house was the first meeting place for the Society of Friends.
- East Whittier Friends Church - This church has the largest congregation of the Society of Friends in the United States, including Richard Nixon and his family.
- Simon Murphy Home - This house, built in 1890, was the home of Simon Murphy who was responsible for developing an adequate water supply for East Whittier, and making agriculture possible. His son later donated land and a hospital to the community in 1921.
- Hadley and Greenleaf Intersection - This intersection was the site of four brick buildings erected in 1888 to attract development northward from Philadelphia and Penn Streets.

TABLE 9-2
HISTORICAL STRUCTURES

Structure	Address	Year Built	Comments
Lou Henry Hoover School (Whittier City School District)	6302 Alta	1938	Recommended for Historic Register
Residence	1322 Bailey		
Southern Pacific Railroad Station	11825 Bailey	1888	Historic Register
First Baptist Church	13106 Bailey	1921	
William P. Briggs (Arolan) House	6502 Bright	1901	Recommended for Historic Register
Edward Chase (Bullard) House	6523 Bright	1894	Recommended for Historic Register Oldest House in Uptown
Residences	7042/7052/7058 Bright		

**TABLE 9-2
HISTORICAL STRUCTURES**

Structure	Address	Year Built	Comments
Lincoln School	12620 Broadway	1930's	
Founders Park	Broadway & Gregory Avenue		Grave of George Caralambo or Greek George; Calif. Historical Landmark 646.
Fletcher (Anna Hayes) House	8119 California	1898	
Jacob Bickel House	8401 California	1910	
Jonathan Bailey House	13421 Camilla	1887	Historic Register
Sucksdorf House	8404 Catalina Avenue	1931	For Review
Sucksdorf House	8531 Catalina Avenue	1911	For Review
Albert Rideout House	11818 Circle	1913	Further Review
Curtis Jackson House	10214 Colima	1895	
Simon Murphy (Griffith) House	7758 College	1890	Recommended for Historic Register
Crook House	8114 College Ave.	1911	For Review
William Loftus (Kimble) House	5837 Comstock	1911	
First City Hall	7026 Comstock		Demolished
Orin L. Jordan (Ferraro) House	8310 Comstock		Historic Register
Dorland (Ferraro) House & Barn	12348 Dorland	1888	Recommended for Historic Register
Residence	6546 Friends		
Johnson (Harrison) House	6554 Friends	1912	Recommended for Historic Register
Whittier Women's Club (American Red Cross)	6705 Friends		Recommended for Historic Register
Residence	6706 Friends		
Residence	7026 Friends		
Residence	7040 Friends		
Whittier's First Bakery	7302 Greenleaf	1858	
Edward R. Guirado (Martin) House	6237 Greenleaf	1905	Recommended for Historic Register

**TABLE 9-2
HISTORICAL STRUCTURES**

Structure	Address	Year Built	Comments
Lindley Building	6501 Greenleaf	1888	Demolished
First Christian Church	6533 Greenleaf	1923	Further Review
United California Bank (Hader)	6754 Greenleaf		Recommended for Historic Register
Wardman Theater (Walnut Properties)	7040 Greenleaf		Recommended for Historic Register
Residence	7053 Greenleaf		
Buckmaster House	7643 Greenleaf	1910	Further Review
Ice Cream Plant (Politis)	12025 Hadley		Recommended for Historic Register
Residence	13218 Hadley St		
Residence	13302 Hadley St		
Edward Coffin House	12808 La Cuarta		
Strawbridge-McGee House	13648 La Cuarta	1888	Further Review
Murphy Ranch Superintendent's House (Jordan)	8600 La Tremolina Lane		Recommended for Historic Register
Hiram Biggs House	13634 Mar Vista	1890	
Fred Sargent House	8109 Michigan		Further Review
Williams House	8201 Michigan Avenue	1912	For Review
Strong (Stackhouse) House	11114 Orange		Recommended for Historic Register
C.W. Harvey (Light) House	5854 Painter	1888	Recommended for Historic Register
Smullins (Thomas) House	6045 Painter		Recommended for Historic Register
John B. Chaffey House	6222 Painter	1911	Further Review
Lindley Baldwin House	6354 Painter	1887	Further Review
John B.Green House	7037 Painter	1901	
John S. Butman House	7051 Painter	1903	
Residence	13227 Park St		
Residence	12625 Penn St		

**TABLE 9-2
HISTORICAL STRUCTURES**

Structure	Address	Year Built	Comments
Standard Oil Building (Mission Court))	13033 Penn	1914	Recommended for Historic Register
Mendenhall (Whittier College)	Philadelphia		Recommended for Historic Register
Auditorium and Gymnasium (Whittier Union High School District)	12417 Philadelphia		Recommended for Historic Register
First National Bank of Whittier (Bank of America)	13002 Philadelphia	1922	Historic Register
Goodyear Tire (Haendiges)	13303 Philadelphia	1930	
Whittier College (American Savings and Loan Assoc)	13406 Philadelphia	1888	
Manning House	5706 Pioneer Avenue	1895	For Review
Pio Pico Mansion (State of California)	6003 Pioneer		Historic Register
West House and Barn	15935 Russell Street	1910	For Review
Christie House	13953 Second Street	1929	For Review
Pump House (East Whittier Woman's Club)	14148 Second		Recommended for Historic Register
Frank Milhouse (Wright) House	13542 Starbuck	1897	Further Review
Aubrey Wardman House (Whittier College)	13952 Summit	1925	Recommended for Historic Register
E. Whittier Water Co. Pump House	13024 Walnut	1891	Further Review
George E. Chaffey house	6505 Washington	1912	Further Review
William King House	6237 Washington	1907	
Residence	6513 Washington		
Sutherland (Barclay Charles) House	6537 Washington	1893	Recommended for Historic Register
Residence	6543 Washington		
Residence	7027 Washington		
Landreth (Harrington) House	7055 Washington	1905	Recommended for Historic Register
St. Matthias Episcopal Church	7056 Washington	1929	

**TABLE 9-2
HISTORICAL STRUCTURES**

Structure	Address	Year Built	Comments
John Greenleaf Whittier Elementary School	7211 Whittier Ave.	1915	
Fred C. Nelles School	11850 Whittier Blvd.	1891	Formerly "Whittier State School"; California Historical Landmark 947.
Citrus Assn. Packing House	12327 Whittier Blvd.	1902	Recommended for Historic Register
"Nixon Home"	6799 Worsham	1932	
Whittier Walnut Tree	On Whittier Blvd. Median	1907	Calif. Historical Landmark 681
William L. Plotts (York) House	7722 York	1911	Recommended for Historic Register

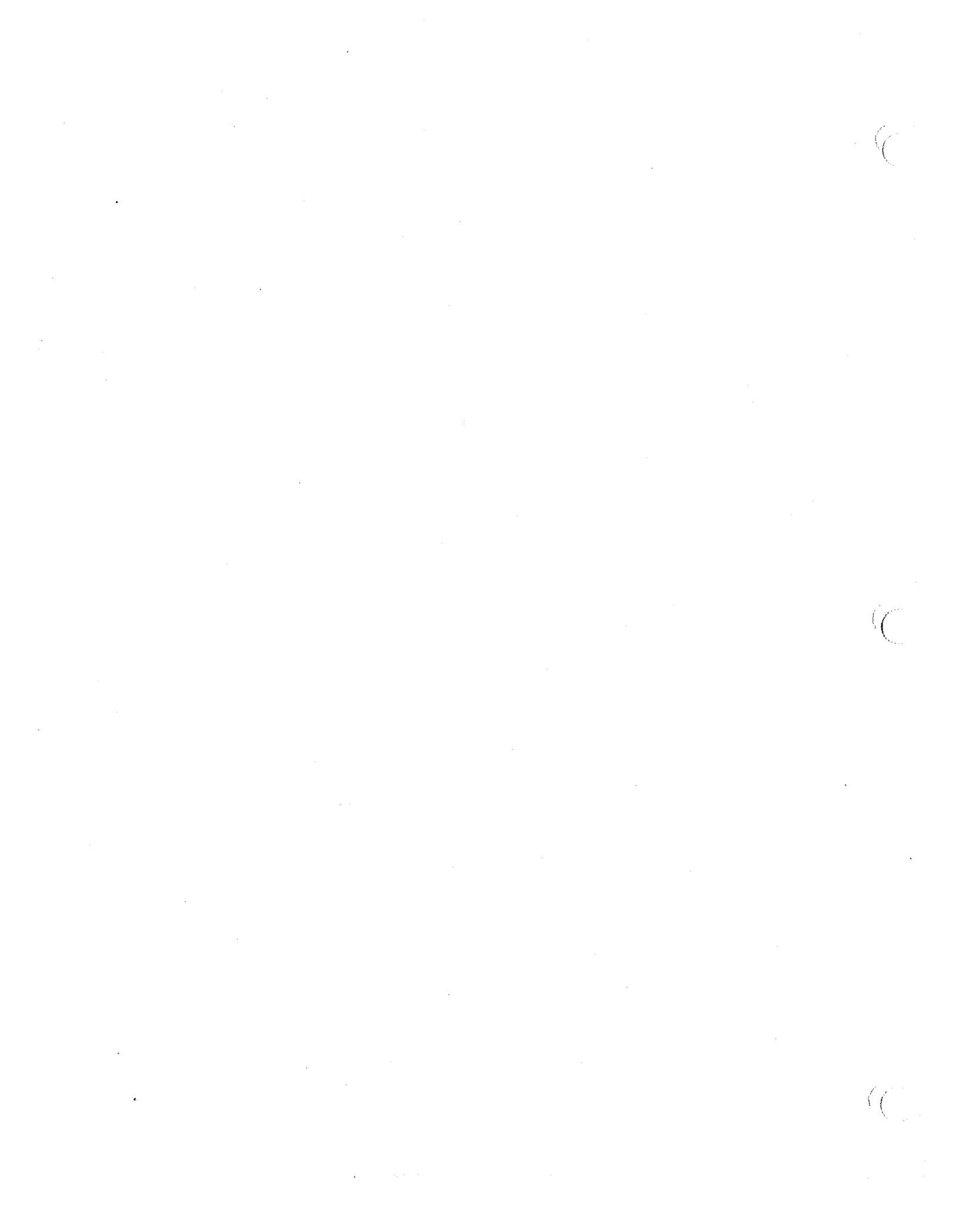
Source: Whittier Cultural Arts Commission; Uptown Whittier Specific Plan; Founders & Friends; General Plan Project Team surveys.

Because of Whittier's long and colorful history, many other historical and cultural sites exist throughout the City but are too numerous to mention here. Local historical and preservation groups have complete lists and additional information. Greater cooperation is needed at the local as well as other levels to effectively implement and continue preservation efforts.

Significant Landscapes

Aside from its historical structures, the City of Whittier contains landscapes which lend the area beauty and distinctive views. These include single trees in parks or private lots and parkway plantings that have created unique street corridors throughout the City. A number of the trees and landscapes also have historical value. A study of exceptional trees in the region includes 13 sites in Whittier which are considered significant due to age, historical/cultural value, aesthetic quality, endemic status, location, rarity and size. Table 9-3 lists these trees and Exhibit 9-2 shows their locations. These trees should be preserved for posterity and the enjoyment of future generations.

APPENDIX



APPENDIX A

INTERSECTION CAPACITY UTILIZATION WORKSHEETS

Peak hour intersection volume/capacity ratios are calculated by means of intersection capacity utilization (ICU) values. ICU calculations were performed for the intersections shown in Exhibit 4-4.

For simplicity, signalization is assumed at each intersection; precise ICU calculations of existing non-signalized intersections would require a more detailed analysis. Dependent on the control type, actual capacity could be higher or lower than what is given in the ICU. For instance, at a two-way stop-sign controlled intersection, capacity on the major street would be higher than what is shown on the ICU and capacity on the side street would be lower. At an intersection controlled with a four-way stop-sign, actual capacity for each approach would be lower than what is given in the ICU.

The ICU procedure is based on the critical movement methodology, indicating the amount of capacity utilized by each critical move. The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

EXAMPLE FOR NORTHBOUND RIGHT (NBR)

1. Right-Turn-On-Green (RTOG)

If NBT is critical move, then:

$$\begin{aligned} \text{RTOG} &= V/C (\text{NBT}), \text{ otherwise,} \\ \text{RTOG} &= V/C (\text{NBL}) + V/C (\text{SBT}) - V/C (\text{SBL}) \end{aligned}$$

2. Right-Turn-On-Red (RTOR)

If WBL is critical move, then:

$$\begin{aligned} \text{RTOR} &= V/C (\text{WBL}), \text{ otherwise} \\ \text{RTOR} &= V/C (\text{EBL}) + V/C (\text{WBT}) - V/C (\text{EBT}) \end{aligned}$$

3. Total Right-Turn Capacity (RTC) Availability For NBR

$$RTC = RTOG + \text{factor} \times RTOR$$

- Where factor = .75 (to reflect lower saturation flow rate for RTOR)

Right-turn adjustment is then as follows:

$$\text{Additional ICU} = V/C (\text{NBR}) - RTC$$

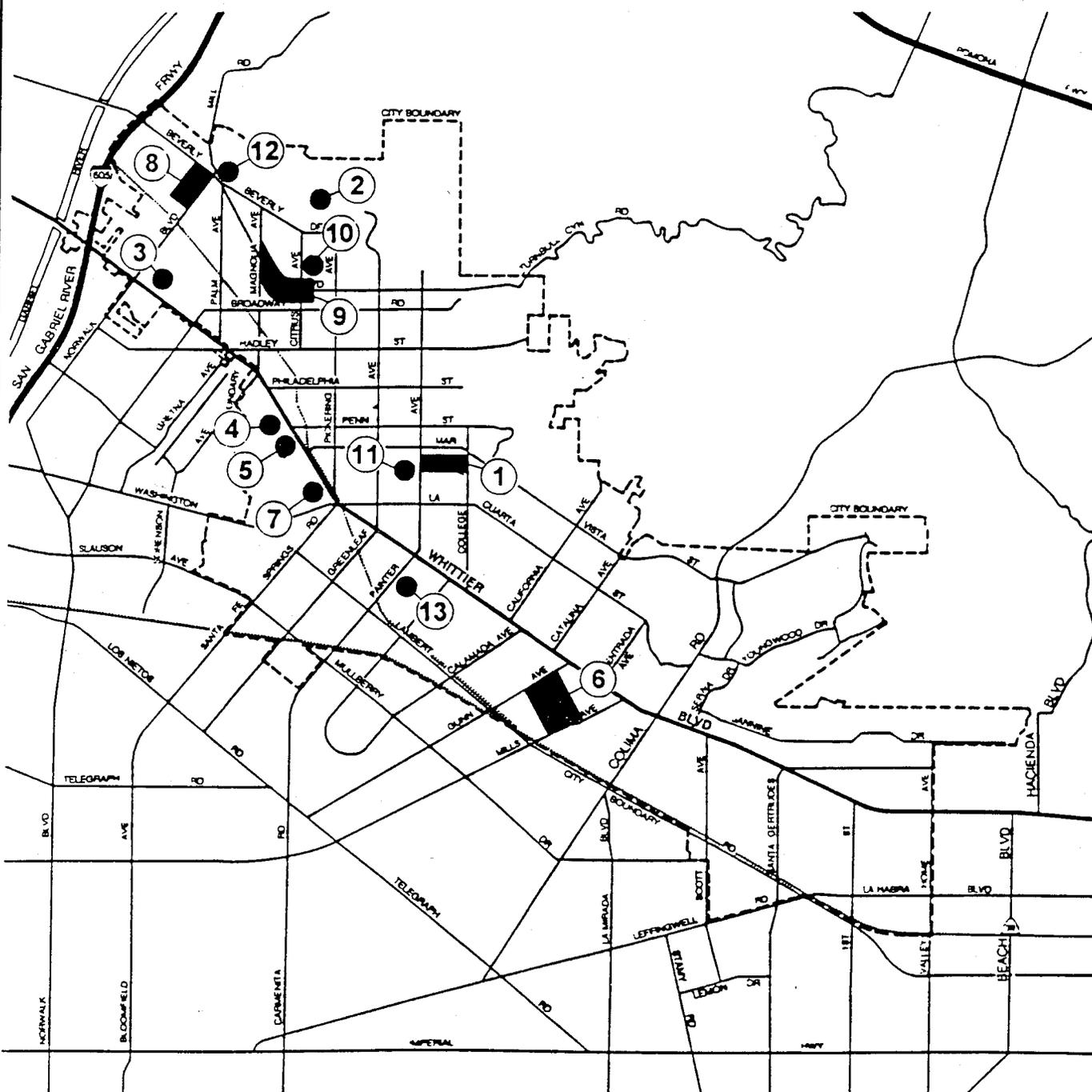
A negative value indicates that adequate capacity is available and no adjustment is necessary.

A level of service (LOS) scale is used to evaluate intersection performance based on the ICU values. The levels range from "A" to "F", with LOS "A" representing free flow traffic and LOS "F" representing severe traffic congestion. The table below describes each LOS and provides its corresponding ICU equivalent.

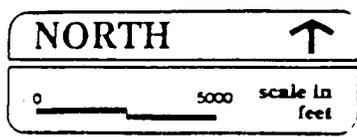
**TABLE 9-3
SIGNIFICANT LANDSCAPES**

Tree	Type	Location
1. Orchid Tree 2. Toog 3. Cedar-of-Lebanon 4. Banyan Fig 5. Silk Oak	Parkway Trees Single Tree Single Tree (planted 1888) Single Tree (planted 1904) Single Tree (planted 1900)	13400-13700 block of Walnut St. Rideout Way 11200 E. Howard Street Fred Nelles School Fred Nelles School
6. Jaracanda 7. Paradox Walnut 8. Tulip tree 9. Avocado, Alligator Pear "Ganter Avocado"	Parkway Trees Single Tree (planted 1907) Parkway Trees Single Tree (planted 1905)	Carnell, LaForge, Flomar Dr between Gunn and Mills Ave. Whittier Blvd median 5400 block of Rockne Avenue 5800 Magnolia Avenue
10. Canary Island Pine 11. Italian Stone Pine 12. Plumeria, Frangipani 13. Montezuma Cypress	Parkway Trees Single Tree Single Tree Single Tree	12000 block of Beverly Blvd. 7700 Painter Avenue Davidson Drive Kennedy Park - 8600 Painter Ave

Source: Exceptional Trees of Los Angeles, 1988.



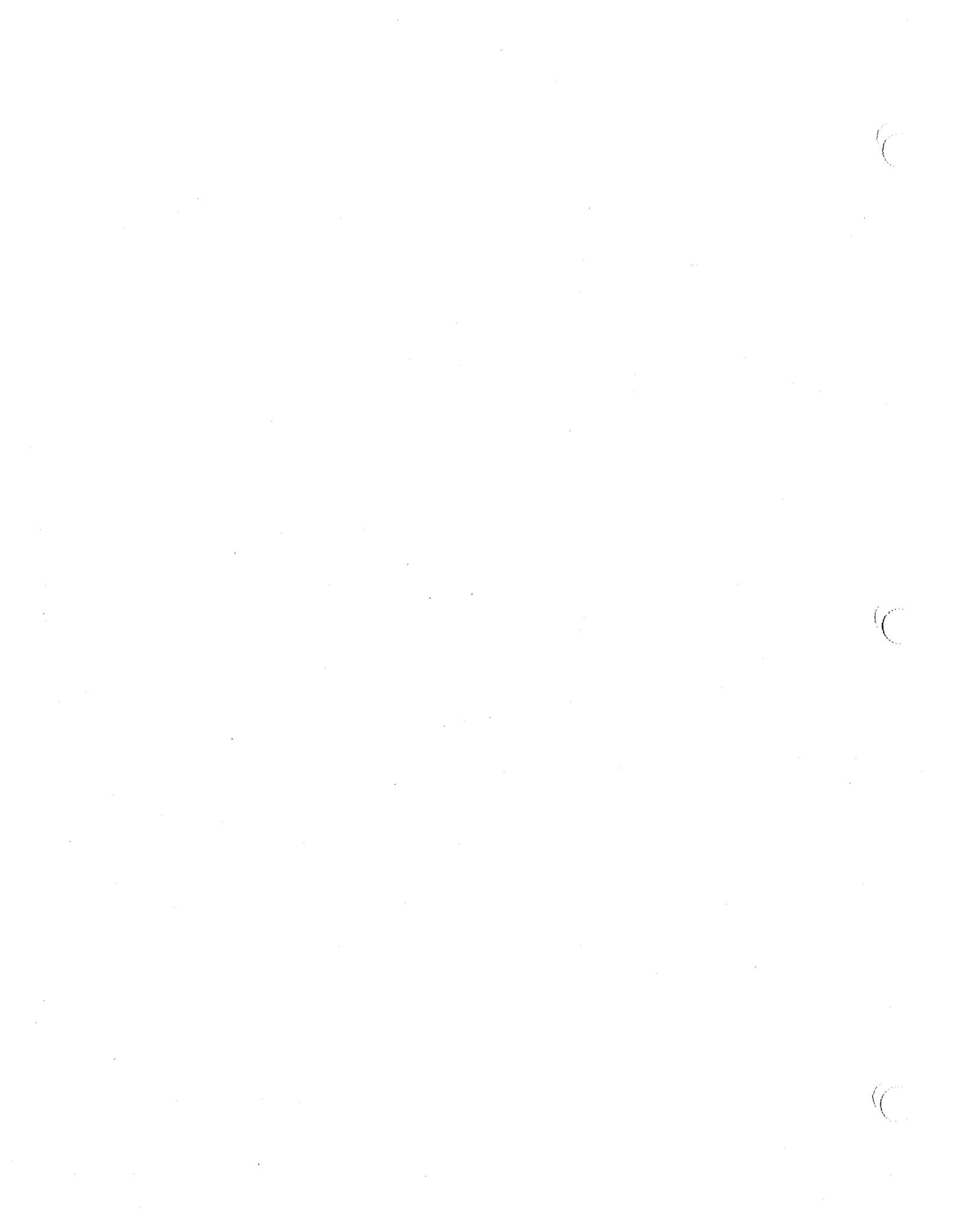
NOTE: Site Numbers Refer to Table 9-3



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EXHIBIT 9-2
EXCEPTIONAL TREES



1. Norwalk Blvd & Beverly Blvd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	257	.16*	199	.12
NBT	2	3200	311	.10	660	.22*
NBR	0	0	15		45	
SBL	1.5		519		499	{.16}*
SBT	1.5	4800	716	.28*	255	.16
SBR	0		115		31	
EBL	1	1600	63	.05*	77	.05
EBT	2	3200	500	.16	1167	.36*
EBR	1	1600	171	.11	259	.16
WBL	1	1600	34	.05	59	.05*
WBT	2	3200	1248	.39*	646	.20
WBR	1	1600	430	.27	444	.28
TOTAL CAPACITY UTILIZATION				.88		.79

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	310	.19*	240	.15
NBT	2	3200	370	.12	780	.26*
NBR	0	0	20		60	
SBL	1.5		580		560	{.19}*
SBT	1.5	4800	840	.32*	300	.19
SBR	0		120		30	
EBL	1	1600	60	.05*	80	.05
EBT	2	3200	570	.18	1330	.42*
EBR	1	1600	210	.13	310	.19
WBL	1	1600	40	.05	80	.05*
WBT	2	3200	1420	.44*	730	.23
WBR	1	1600	480	.30	490	.31
TOTAL CAPACITY UTILIZATION				1.00		.92

2. I-605 SB Ramps & Whittier Bl

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3200	212	.07*	521	.16*
SBT	0	0	0		0	
SBR	1	1600	234	.15	153	.10
EBL	0	0	0		0	
EBT	2	3200	878	.32	1933	.67*
EBR	0	0	159		206	
WBL	0	0	0		0	
WBT	2	3200	1522	.60*	859	.33
WBR	0	0	412		196	
Right Turn Adjustment			SBR	.08*		
TOTAL CAPACITY UTILIZATION				.75	.83	

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3200	220	.07*	580	.18*
SBT	0	0	0		0	
SBR	1	1600	290	.18	190	.12
EBL	0	0	0		0	
EBT	2	3200	1090	.39	2370	.81*
EBR	0	0	160		210	
WBL	0	0	0		0	
WBT	2	3200	1840	.72*	1040	.39
WBR	0	0	470		220	
Right Turn Adjustment			SBR	.11*		
TOTAL CAPACITY UTILIZATION				.90	.99	

2. I-605 SB Ramps & Whittier Bl

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3200	220	.07*	580	.18*
SBT	0	0	0		0	
SBR	1	1600	290	.18	190	.12
EBL	0	0	0		0	
EBT	3	4800	1090	.26	2370	.54*
EBR	0	0	160		210	
WBL	0	0	0		0	
WBT	2	3200	1840	.72*	1040	.39
WBR	0	0	470		220	
Right Turn Adjustment			SBR	.11*		
TOTAL CAPACITY UTILIZATION				.90		.72

3. I-605 NB Ramps & Whittier B1

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1.5		211	{.07}*	216	{.12}*
NBT	0	4800	0	.07	0	.12
NBR	1.5		147		348	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	3	4800	634	.13	1717	.36
EBR	1	1600	118	.07	251	.16
WBL	0	0	0		0	
WBT	2	3200	1514	.59*	1090	.43*
WBR	0	0	361		283	
TOTAL CAPACITY UTILIZATION			.66		.55	

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1.5		220	{.09}*	216	.14*
NBT	0	4800	0	.09	0	
NBR	1.5		207		460	.14
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	3	4800	760	.16	2070	.43
EBR	1	1600	140	.09	280	.18
WBL	0	0	0		0	
WBT	2	3200	1940	.76*	1400	.55*
WBR	0	0	480		370	
TOTAL CAPACITY UTILIZATION			.85		.69	

4. Norwalk Blvd & Whittier Blvd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	74	.05*	143	.09*
NBT	2	3200	354	.11	670	.21
NBR	1	1600	20	.05	52	.05
SBL	1	1600	79	.05	77	.05
SBT	1	1600	540	.34*	317	.20*
SBR	1	1600	167	.10	76	.05
EBL	1	1600	45	.05*	132	.08
EBT	2	3200	536	.21	1334	.47*
EBR	0	0	129		182	
WBL	1	1600	61	.05	50	.05*
WBT	2	3200	1782	.58*	1092	.37
WBR	0	0	87		94	

TOTAL CAPACITY UTILIZATION 1.02 .81

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	90	.06*	180	.11*
NBT	2	3200	420	.13	790	.25
NBR	1	1600	20	.05	50	.05
SBL	1	1600	90	.06	90	.06
SBT	1	1600	630	.39*	370	.23*
SBR	1	1600	240	.15	120	.08
EBL	1	1600	70	.05*	200	.13
EBT	2	3200	680	.27	1690	.60*
EBR	0	0	170		230	
WBL	1	1600	60	.05	50	.05*
WBT	2	3200	2250	.74*	1390	.47
WBR	0	0	110		110	

TOTAL CAPACITY UTILIZATION 1.24 .99

4. Norwalk Blvd & Whittier Blvd

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	90	.06*	180	.11
NBT	2	3200	420	.13	790	.25*
NBR	1	1600	20	.05	50	.05
SBL	1	1600	90	.06	90	.06*
SBT	2	3200	630	.20*	370	.12
SBR	1	1600	240	.15	120	.08
EBL	1	1600	70	.05*	200	.13
EBT	3	4800	680	.18	1690	.40*
EBR	0	0	170		230	
WBL	1	1600	60	.05	50	.05*
WBT	3	4800	2250	.49*	1390	.31
WBR	0	0	110		110	
TOTAL CAPACITY UTILIZATION				.80	.76	

5. 5-POINTS INTERSECTION

EXISTING PEAK HOUR VOLUMES

PHASE	MOVEMENT	#LANES	CAPACITY	-----AM-----		-----PM-----	
				VOLUME	V/C	VOLUME	V/C
A	8	1	1600	49	0.03	50	0.04
	14&15	1	1600	100	0.06 *	242	0.15 *
B & C	5&6	2	3200	771	0.24	291	0.09
	7	2	3200	896	0.28 *	651	0.20 *
	12&13	3	4800	255	0.05	780	0.16
	16	1	1600	67	0.04	44	0.03
	17	3	4800	586	0.12 *	1213	0.25 *
D	9	1	1600	58	0.04	227	0.14
	10&11	2	3200	478	0.15 *	520	0.16 *
E	1	1	1600	33	0.02	12	0.01
	2	1	1600	160	0.10	73	0.05
	3&4	1	1600	348	0.22 *	299	0.19 *
TOTAL CAPACITY UTILIZATION:				0.83		0.95	

NOTE: "MOVEMENT" REFERS TO FIGURE-II-5 IN REPORT.
 * = CRITICAL MOVEMENT

5. 5-POINTS INTERSECTION

BUILDOUT PEAK HOUR VOLUMES WITH EXISTING LANES

PHASE	MOVEMENT	#LANES	CAPACITY	-----AM-----		-----PM-----	
				VOLUME	V/C	VOLUME	V/C
A	8	1	1600	80	0.05	80	0.05
	14&15	1	1600	120	0.08 *	290	0.18 *
B & C	5&6	2	3200	1010	0.32	390	0.12
	7 12&13	2	3200	1070	0.33 *	800	0.25 *
		3	4800	300	0.06	920	0.19
	16 17	1 3	1600 4800	80 730	0.05 0.15 *	50 1530	0.03 0.32 *
D	9	1	1600	70	0.04	290	0.18
	10&11	2	3200	580	0.18 *	620	0.19 *
E	1	1	1600	40	0.03	10	0.01
	2	1	1600	190	0.12	70	0.04
	3&4	1	1600	410	0.26 *	370	0.23 *
TOTAL CAPACITY UTILIZATION:				1.00		1.17	

NOTE: "MOVEMENT" REFERS TO FIGURE II-5 IN REPORT.
 * = CRITICAL MOVEMENT

5. 5-POINTS INTERSECTION

BUILDOUT PEAK HOUR VOLUMES WITH PROPOSED INTERSECTION IMPROVEMENTS

PHASE	MOVEMENT	#LANES	CAPACITY	-----AM-----		-----PM-----	
				VOLUME	V/C	VOLUME	V/C
A	8	1	1600	80	0.05	80	0.05
	14&15	1	1600	120	0.08 *	290	0.18 *
B & C	5&6	2	3200	1010	0.32	390	0.12
	7	2	3200	1070	0.33 *	800	0.25 *
	12&13	3	4800	300	0.06	920	0.19
	16	1	1600	80	0.05	50	0.03
	17	3	4800	730	0.15 *	1530	0.32 *
D	9	1	1600	70	0.04	290	0.18
	10&11	2	3200	580	0.18 *	620	0.19 *
E	1	1	1600	40	0.03	10	0.01
	2	1	1600	190	0.12	70	0.04
	3&4	2	3200	410	0.13 *	370	0.12 *
TOTAL CAPACITY UTILIZATION:				0.87		1.06	

NOTE: "MOVEMENT" REFERS TO FIGURE 11-5 IN REPORT.

* = CRITICAL MOVEMENT

6. Painter Ave & Mar Vista St

EXISTING (1991)						
	LANES	CAPACITY	AM PK VOL	HOUR V/C	PM PK VOL	HOUR V/C
NBL	1	1600	107	.07	90	.06
NBT	2	3200	537	.18*	666	.24*
NBR	0	0	28		107	
SBL	1	1600	172	.11*	399	.25*
SBT	2	3200	503	.16	795	.26
SBR	0	0	15		25	
EBL	1	1600	2	.05*	37	.05
EBT	1	1600	192	.12	471	.29*
EBR	1	1600	64	.05	195	.12
WBL	1	1600	79	.05	58	.05*
WBT	2	3200	845	.37*	271	.14
WBR	0	0	331		171	
TOTAL CAPACITY UTILIZATION				.71	.83	

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK VOL	HOUR V/C	PM PK VOL	HOUR V/C
NBL	1	1600	130	.08	110	.07
NBT	2	3200	610	.20*	770	.27*
NBR	0	0	20		100	
SBL	1	1600	200	.13*	470	.29*
SBT	2	3200	580	.19	910	.30
SBR	0	0	20		40	
EBL	1	1600	10	.05*	60	.05
EBT	1	1600	230	.14	580	.36*
EBR	1	1600	80	.05	230	.14
WBL	1	1600	70	.05	50	.05*
WBT	2	3200	1020	.44*	330	.17
WBR	0	0	380		200	
TOTAL CAPACITY UTILIZATION				.82	.97	

7. Painter Ave & Whittier Blvd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	147	.09*	194	.12
NBT	2	3200	382	.12	493	.15*
NBR	1	1600	53	.05	147	.09
SBL	2	3200	261	.08	538	.17*
SBT	2	3200	430	.15*	446	.16
SBR	0	0	53		52	
EBL	1	1600	43	.05*	85	.05
EBT	2	3200	584	.21	1548	.52*
EBR	0	0	73		132	
WBL	1	1600	120	.08	115	.07*
WBT	2	3200	1353	.52*	867	.35
WBR	0	0	325		258	
TOTAL CAPACITY UTILIZATION				.81		.91

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	180	.11*	240	.15
NBT	2	3200	450	.14	580	.18*
NBR	1	1600	60	.05	170	.11
SBL	2	3200	310	.10	640	.20*
SBT	2	3200	510	.18*	530	.18
SBR	0	0	70		60	
EBL	1	1600	50	.05*	110	.07
EBT	2	3200	740	.26	1960	.66*
EBR	0	0	90		160	
WBL	1	1600	140	.09	140	.09*
WBT	2	3200	1710	.66*	1100	.44
WBR	0	0	390		310	
TOTAL CAPACITY UTILIZATION				1.00		1.13

7. Painter Ave & Whittier Blvd

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	180	.11*	240	.15
NBT	2	3200	450	.14	580	.18*
NBR	1	1600	60	.05	170	.11
SBL	2	3200	310	.10	640	.20*
SBT	2	3200	510	.18*	530	.18
SBR	0	0	70		60	
EBL	1	1600	50	.05*	110	.07
EBT	3	4800	740	.17	1960	.44*
EBR	0	0	90		160	
WBL	1	1600	140	.09	140	.09*
WBT	3	4800	1710	.44*	1100	.29
WBR	0	0	390		310	
TOTAL CAPACITY UTILIZATION				.78		.91

8. Laurel Ave & Lambert Rd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	0	0	154	{.10}*	35	{.05}*
NBT	1	1600	254	.35	131	.12
NBR	0	0	147		24	
SBL	0	0	171		95	
SBT	1	1600	239	.40*	143	.18*
SBR	0	0	228		48	
EBL	1	1600	153	.10*	97	.06
EBT	2	3200	678	.25	1374	.45*
EBR	0	0	129		66	
WBL	1	1600	156	.10	27	.05*
WBT	2	3200	1169	.41*	697	.24
WBR	0	0	158		56	

TOTAL CAPACITY UTILIZATION 1.01 .73

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	0	0	190	{.12}*	40	{.05}*
NBT	1	1600	300	.42	160	.14
NBR	0	0	180		30	
SBL	0	0	200		110	
SBT	1	1600	280	.46*	170	.21*
SBR	0	0	260		60	
EBL	1	1600	180	.11*	110	.07
EBT	2	3200	810	.30	1630	.53*
EBR	0	0	160		80	
WBL	1	1600	190	.12	30	.05*
WBT	2	3200	1390	.49*	830	.28
WBR	0	0	180		60	

TOTAL CAPACITY UTILIZATION 1.18 .84

8. Laurel Ave & Lambert Rd

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	190	.12*	40	.05*
NBT	1	1600	300	.30	160	.12
NBR	0	0	180		30	
SBL	1	1600	200	.13	110	.07
SBT	1	1600	280	.34*	170	.14*
SBR	0	0	260		60	
EBL	1	1600	180	.11*	110	.07
EBT	2	3200	810	.30	1630	.53*
EBR	0	0	160		80	
WBL	1	1600	190	.12	30	.05*
WBT	2	3200	1390	.49*	830	.28
WBR	0	0	180		60	

TOTAL CAPACITY UTILIZATION 1.06 .77

9. Colima Rd & Mar Vista St

EXISTING (1991)						
	LANES	CAPACITY	AM PK VOL	HOUR V/C	PM PK VOL	HOUR V/C
NBL	1	1600	211	.13*	190	.12
NBT	2	3200	695	.23	1710	.54*
NBR	0	0	36		33	
SBL	1	1600	34	.05	45	.05*
SBT	2	3200	1880	.88*	946	.39
SBR	0	0	925		313	
EBL	1.5		218	{.10}*	588	{.20}*
EBT	0.5	3200	91	.10	61	.20
EBR	1	1600	137	.09	233	.15
WBL	1	1600	73	.05	18	.05
WBT	1	1600	153	.10*	76	.05*
WBR	1	1600	64	.05	81	.05

TOTAL CAPACITY UTILIZATION 1.21 .84

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK VOL	HOUR V/C	PM PK VOL	HOUR V/C
NBL	1	1600	240	.15*	220	.14
NBT	2	3200	750	.25	1850	.59*
NBR	0	0	40		40	
SBL	1	1600	40	.05	50	.05*
SBT	2	3200	2020	.97*	1020	.43
SBR	0	0	1080		370	
EBL	1.5		250	{.11}*	690	{.24}*
EBT	0.5	3200	110	.11	80	.24
EBR	1	1600	160	.10	270	.17
WBL	1	1600	90	.06	20	.05
WBT	1	1600	190	.12*	100	.06*
WBR	1	1600	70	.05	100	.06

TOTAL CAPACITY UTILIZATION 1.35 .94

9. Colima Rd & Mar Vista St

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	HOUR V/C	PM PK HOUR VOL	HOUR V/C
NBL	1	1600	240	.15*	220	.14
NBT	2	3200	750	.25	1850	.59*
NBR	0	0	40		40	
SBL	1	1600	40	.05	50	.05*
SBT	2	3200	2020	.63*	1020	.32
SBR	1	1600	1080	.68	370	.23
EBL	1.5		250	{.11}*	690	{.24}*
EBT	0.5	3200	110	.11	80	.24
EBR	1	1600	160	.10	270	.17
WBL	1	1600	90	.06	20	.05
WBT	1	1600	190	.12*	100	.06*
WBR	1	1600	70	.05	100	.06

TOTAL CAPACITY UTILIZATION 1.01 .94

10. Colima Rd & Whittier Blvd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	171	.11*	172	.11*
NBT	3	4800	753	.17	968	.22
NBR	0	0	67		99	
SBL	2	3200	164	.05	346	.11
SBT	2	3200	981	.41*	691	.26*
SBR	0	0	325		133	
EBL	1	1600	222	.14*	539	.34*
EBT	3	4800	664	.16	1386	.32
EBR	0	0	123		149	
WBL	1	1600	123	.08	195	.12
WBT	3	4800	1273	.29*	1038	.26*
WBR	0	0	138		224	

TOTAL CAPACITY UTILIZATION .95 .97

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	220	.14*	230	.14*
NBT	3	4800	840	.19	1090	.25
NBR	0	0	70		110	
SBL	2	3200	170	.05	380	.12
SBT	2	3200	1100	.48*	790	.30*
SBR	0	0	430		180	
EBL	1	1600	290	.18*	700	.44*
EBT	3	4800	820	.20	1730	.40
EBR	0	0	160		200	
WBL	1	1600	130	.08	210	.13
WBT	3	4800	1560	.35*	1300	.32*
WBR	0	0	140		240	

TOTAL CAPACITY UTILIZATION 1.15 1.20

10. Colima Rd & Whittier Blvd.

BUILDOUT WITH PROPOSED IMPROVEMENTS						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	220	.14*	230	.14*
NBT	3	4800	840	.19	1090	.25
NBR	0	0	70		110	
SBL	2	3200	170	.05	380	.12
SBT	2	3200	1100	.34*	790	.25*
SBR	1	1600	430	.27	180	.11
EBL	2	3200	290	.09*	700	.22*
EBT	3	4800	820	.20	1730	.40
EBR	0	0	160		200	
WBL	2	3200	130	.05	210	.07
WBT	3	4800	1560	.35*	1300	.32*
WBR	0	0	140		240	

TOTAL CAPACITY UTILIZATION .92 .93

TABLE OF CAPACITY UTILIZATION

Direction	Phase	Capacity	Volume	Utilization	Notes
Northbound	BL	1600	220	.14*	
	BT	4800	840	.19	
	BR	0	70		
Southbound	BL	3200	170	.05	
	BT	3200	1100	.34*	
	BR	1600	430	.27	
Eastbound	BL	3200	290	.09*	
	BT	4800	820	.20	
	BR	0	160		
Westbound	BL	3200	130	.05	
	BT	4800	1560	.35*	
	BR	0	140		

VOLUME AND CAPACITY SUMMARY

11. Colima Rd & Lambert Rd

EXISTING (1991)						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	140	.09*	217	.14
NBT	2	3200	767	.26	1423	.48*
NBR	0	0	55		119	
SBL	1	1600	58	.05	89	.06*
SBT	2	3200	854	.27*	964	.30
SBR	1	1600	191	.12	114	.07
EBL	1	1600	97	.06*	264	.17
EBT	2	3200	615	.23	1778	.62*
EBR	0	0	128		196	
WBL	1	1600	60	.05	76	.05*
WBT	2	3200	1151	.38*	870	.30
WBR	0	0	67		97	

TOTAL CAPACITY UTILIZATION .80 1.21

BUILDOUT WITH EXISTING LANES						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	1	1600	160	.10*	240	.15
NBT	2	3200	890	.30	1640	.56*
NBR	0	0	60		140	
SBL	1	1600	70	.05	100	.06*
SBT	2	3200	980	.31*	1110	.35
SBR	1	1600	220	.14	130	.08
EBL	1	1600	110	.07*	290	.18
EBT	2	3200	700	.27	2040	.71*
EBR	0	0	150		220	
WBL	1	1600	70	.05	90	.06*
WBT	2	3200	1320	.44*	1000	.35
WBR	0	0	80		110	

TOTAL CAPACITY UTILIZATION .92 1.39

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