A | NOISE TECHNICAL APPENDIX

STATUTORY REQUIREMENTS

The State of California has mandated that each county and city prepare a Noise Element as part of its General Plan. The Noise Element follows guidelines in Section 65302(f) of the State Government Code and Section 46050.1 of the Health and Safety Code. Section 65302(f) of the State Government Code requires the following:

1) *A noise element that shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:*
    - A. *Highways and freeways.*
    - B. *Primary arterials and major local streets.*
    - C. *Passenger and freight online railroad operations and ground rapid transit systems.*
    - D. *Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.*
    - E. *Local industrial plants, including, but not limited to, railroad classification yards.*
    - F. *Other ground stationary noise sources including, but not limited to, military installations, contributing to the community noise environment.*
2) *Noise contours shall be shown for all of the sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.*
3) *The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.*
4) *The Noise Element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.*

The State Guidelines for Preparation and Content of Noise Elements of the General Plan indicates that the Noise Element should present the noise environment in terms of noise contours and, for those areas identified as containing noise sensitive facilities, the noise environment should be determined by monitoring.

FUNDAMENTALS OF SOUND

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; and 20 dBA higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud). Examples of various sound levels in different environments are shown in Figure 1.

DEFINITION AND IMPACTS OF NOISE

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed below:

Hearing Loss is not a major noise concern because the potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy airport environs, are not sufficiently loud to cause hearing loss.

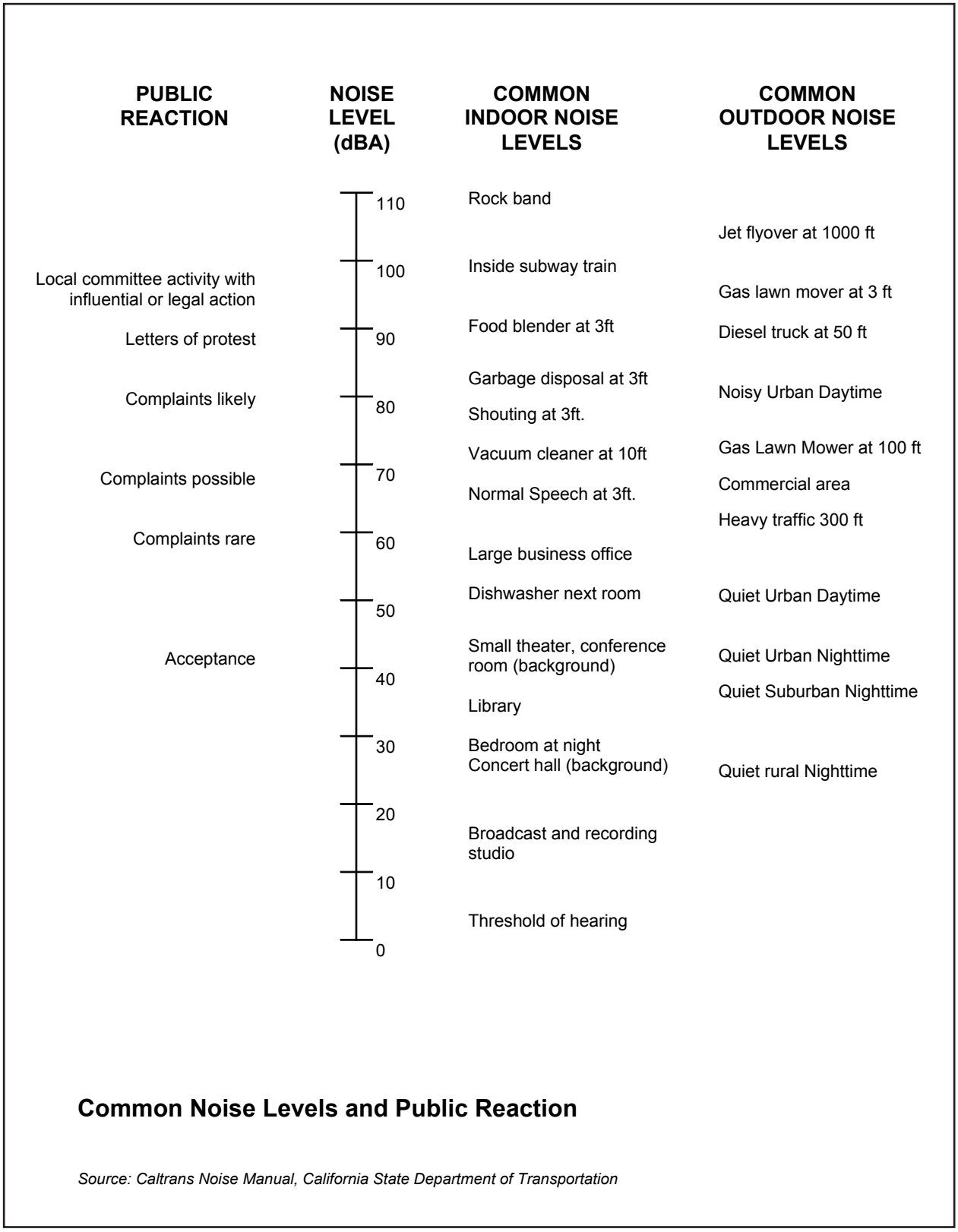
Speech Interference is one of the primary noise concerns. Normal conversational speech is in the range of 60 to 65 dBA, and any noise in this range or louder may interfere with speech.

Sleep Interference is a major noise concern because sleep is the most noise sensitive human activity. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

Physiological Responses are those measurable effects of noise on people which are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent to which these physiological responses cause harm or are signs of harm is not known.

Annoyance is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capacity.

FIGURE 1 - EXAMPLES OF TYPICAL SOUND LEVELS



Common Noise Levels and Public Reaction

Source: Caltrans Noise Manual, California State Department of Transportation

NOISE METRICS

Community noise is generally not a steady state and varies with time. Under conditions of non-steady state noise, some type of statistical metric is necessary in order to quantify noise exposure over a long period of time. Several rating scales have been developed for describing the effects of noise on people. They are designed to account for the above known effects of noise on people.

Based on these effects, the observation has been made that the potential for noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. These scales include: the Equivalent Noise Level (Leq), the Day Night Noise Level (LDN), and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

Leq is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the "energy" average noise level during the time period of the sample. Leq can be measured for any time period, but is typically measured for 15 minutes, 1 hour, or 24 hours.

Ldn is a 24-hour, time-weighted annual average noise level. Time-weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. In the Ldn scale, those events that take place during the night (10 pm to 7 am) are penalized by 10 dBA. This penalty was selected to attempt to account for increased human sensitivity to noise during the night, when most people sleep.

CNEL is similar to the Ldn scale, except that it includes an additional 5 dBA penalty for events that occur during the evening (7 pm to 10 pm). Either Ldn or CNEL may be used to identify community noise impacts within the Noise Element.

CITY OF COACHELLA NOISE GUIDELINES AND REGULATIONS

The goals, policies and actions contained in this Noise Element focus on establishing and applying criteria for acceptable noise levels for different land uses in order to minimize the negative impacts of noise, especially at sensitive receptors. In order to achieve these goals, and actions, the City has adopted its own Land Use/Noise compatibility and interior and exterior noise standards.

The State of California requires each City and County to adopt Noise Elements as part of their General Plans. Such Noise Elements must contain a Land Use/Noise compatibility matrix. A recommended (but not mandatory) matrix is presented in the "Guidelines for the Preparation and Content of Noise Elements of the General Plan," (Office of Noise Control, California Department of Health, 2003). The City of Coachella Land Use/Noise Compatibility Matrix, shown in Figure 2, is based on and is very similar to the California Land Use/Noise Compatibility Matrix. It clearly defines compatible, normally compatible, normally incompatible and clearly incompatible noise exposure levels by land use category. These standards are used as a guide to define where placement of certain land uses is considered acceptable. The City's Interior and Exterior Noise Standards, shown in Table 1, define the maximum acceptable exterior and interior noise levels that should be achieved after placement of the land use.

Figure 2: Coachella Land Use/Noise Compatibility Matrix

LAND USE CATEGORIES		CNEL						
CATEGORIES	**USES**	**55**	**60**	**65**	**70**	**75**	**80**	
RESIDENTIAL	Single Family, Duplex, Multiple Family							
RESIDENTIAL	Mobile Homes							
COMMERCIAL - Regional, District	Hotel, Motel, Transient Lodging							
COMMERCIAL - Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theater							
COMMERCIAL INDUSTRIAL	Office Building, Research and Development, Professional Offices, City Office Building							
COMMERCIAL - Recreation INSTITUTIONAL - Civic Center	Amphitheater, Concert Hall Auditorium, Meeting Hall							
COMMERCIAL - Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club							
COMMERCIAL - General, Special INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities							
INSTITUTIONAL - General	Hospital, Church, Library, School Classroom							
OPEN SPACE	Parks							
OPEN SPACE	Golf Couse, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat							
AGRICULTURE	Agriculture							

INTERPRETATION

ZONE A (GREEN) CLEARLY COMPATIBLE	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
ZONE B (YELLOW) NORMALLY COMPATIBLE	New construction or development should be undertaken only after an analysis of the noise reduction requirements is made and needed noise insulation features included in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice.
ZONE C (ORANGE) NORMALLY INCOMPATIBLE	New construction or development should 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.
ZONE D (RED) CLEARLY INCOMPATIBLE	New construction or development should generally not be undertaken.

* Construction of new residential uses will not be allowed within the 65 dBA CNEL contour for airport noise.

Table 1
COACHELLA INTERIOR AND EXTERIOR NOISE STANDARDS

LAND USE CATEGORIES		ENERGY AVERAGE CNEL (DB)	
CATEGORIES	USES	INTERIOR[1]	EXTERIOR[2]
RESIDENTIAL	Single Family, Duplex, Multiple Family	45[3]	65
	Mobile Homes	-----	65[4]
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Hotel, Motel, Transient Lodging	45	65[5]
	Commercial Retail, Bank, Restaurant	55	----
	Office Building, Research and Development, Professional Offices, City Office Building	50	----
	Amphitheater, Concert Hall, Amphitheater, Meeting Hall	45	----
	Gymnasium (Multipurpose)	50	----
	Sports Club	55	----
	Manufacturing, Warehousing, Wholesale, Utilities	65	----
	Movie Theaters	45	----
INSTITUTIONAL	Hospitals, School classroom	45	65
	Church, Library	45	
OPEN SPACE	Parks	----	65

INTERPRETATION

1. Indoor environment excluding: bathrooms, toilets, closets, corridors.
2. Outdoor environment limited to:
   - Private yard of single family residence
   - Multi-purpose private patio or balcony which is served by means of exit from inside
   - Mobile home Park
   - Hospital patio
   - Park's picnic area
   - School's playground
   - Hotel and motel recreation area
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of the Uniform Building Code.
4. Exterior noise level should be such that interior noise level will not exceed 45 CNEL.
5. Except those areas affected by aircraft noise.

The City also implements and enforces noise control through its Municipal Code. Chapter 7.04 of the Municipal Code, *Noise Control*, sets both daytime and nighttime sound level limits for residential and commercial zones; prohibits any person or property owner within the city to create excessive, impulsive or intrusive noise that annoys or disturbs persons of ordinary sensibilities; defines certain acts as disturbing, excessive or offensive noises; sets forth special provisions and exemptions; sets forth permitted hours for construction activities and property maintenance activities; and sets forth certain provisions for enforcement of these standards. Chapter 7.05 of the Municipal Code, *Multiple Responses to Loud or Unruly Parties, Gatherings or Other Similar Events*, declares such events to be a public nuisance and sets forth provisions for fining the parties responsible for such events.

COMMUNITY NOISE SURVEY

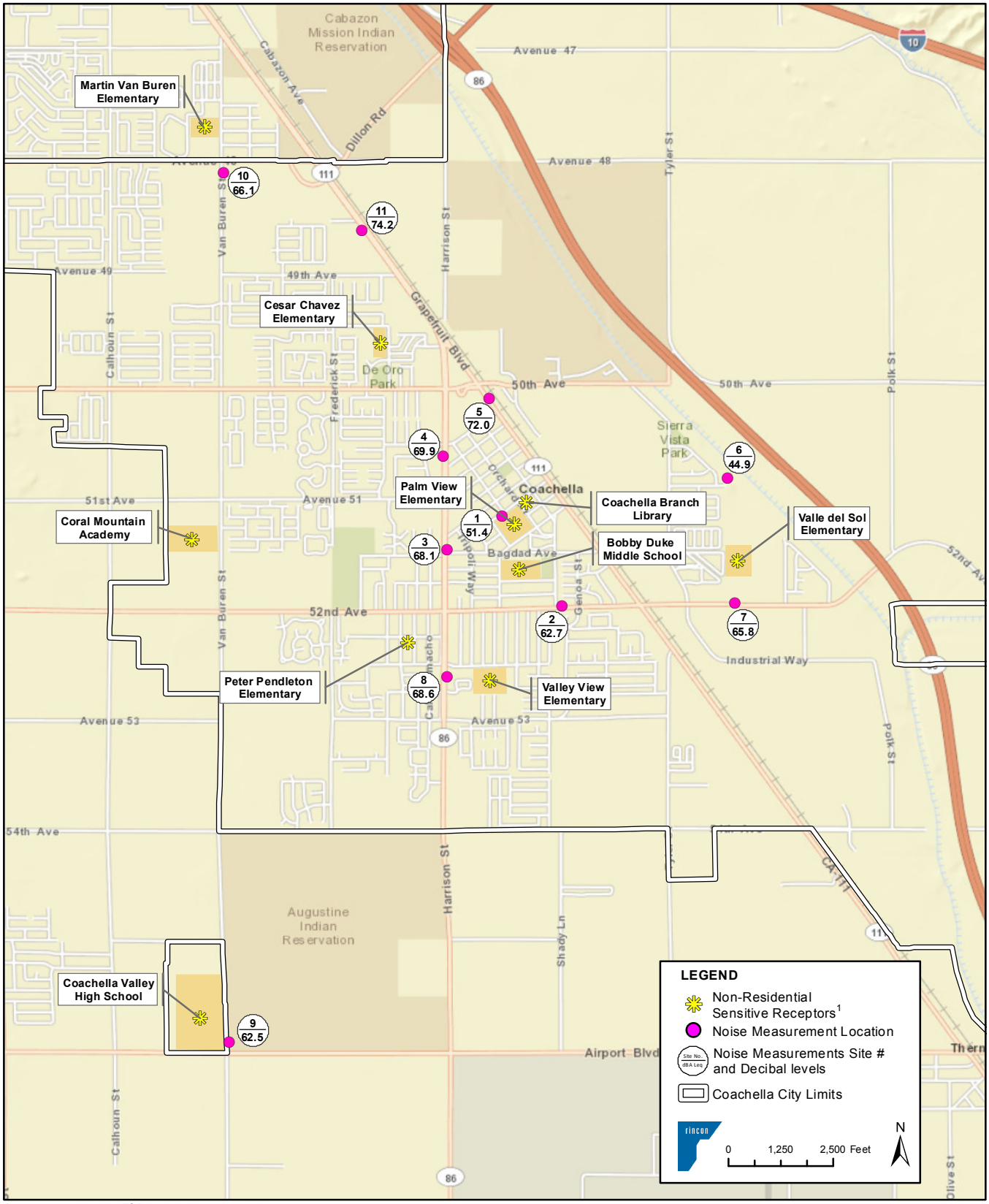
As part of the development of this Noise Element, eleven sites were selected for measurement of Coachella's existing noise environment. The measurement locations were selected on the basis of proximity to major noise sources, noise sensitivity of nearby land uses, and obtaining a representative sample of different noise environments throughout the community. The results of the community noise survey were used to determine existing noise levels at noise-sensitive receptors; provide empirical data for the correlation and calibration of the computer-modeled noise environment; and obtain an accurate description of ambient noise levels in various locations throughout the City.

The community noise survey was conducted on Tuesday, April 2, 2013, between 9:49 AM and 3:39 PM, by taking 15-minute noise reading using an ANSI Type II integrating sound level meter. The measurement locations and measured noise levels are depicted in Figure 3. Table 2 identifies the noise measurement locations, measurement time, and measured noise levels.

EXISTING NOISE LEVELS

As shown in Figure 3 and Table 2, the results of the Community Noise Survey support the conclusion that traffic along the city's busiest roadways, most notably SR 111 and Harrison Street, is the main noise source in Coachella, with the highest noise readings being recorded along the busiest roadways. The two highest noise readings (#11 and #5), both above 70 dBA, were taken along SR 111. The next three highest noise readings (#4, #8, and #3), all between 65 and 70 dBa, were taken along Harrison Street. Of the remaining six readings, only two (#10 and #7), were above 65 dBA. Reading #10 was taken along Van Buren Street south of Avenue 48 and Reading #7 was taken along 52nd Avenue west of Education Way, both of which are also roadways with relatively high traffic volumes. It is worth noting that SR 86S, although it is a high-volume roadway, does not produce high noise levels west of the Whitewater River (see Reading #6), apparently because the levees on either side of the river act as noise barriers to developed areas on the west side of the river. Also, aircraft overflights, even in the southern part of the city closest to Jacqueline Cochran Regional Airport, were minimal and did not make a substantial contribution to noise levels. As shown in Table 2, the City's exterior noise standard for Residential, Institutional, and Open Space uses is 65 dBA. The locations discussed above with recorded noise levels in excess of 65 dBA are therefore roadway segments where noise-sensitive receptors, if they are located close enough to the roadway, may experience noise levels in excess of City standards if these noise levels are not properly attenuated.

FIGURE 3 - NOISE-SENSITIVE RECEPTOR AND NOISE MEASUREMENT LOCATIONS



Basemap provided by ESRI and its Licensors, 2013.

[1]*The location of noise-sensitive residential receptors is not shown because residential neighborhoods are located throughout Coachella. Please refer to the Land Use section of this General Plan for a map of different land uses with the community.*

TABLE 2
NOISE MONITORING RESULTS

	Measurement Location	Primary Noise Source	Sample Time	Leq (dBA)
1.	7th Street, west of Palm Avenue in front of Palm View Elementary School, approximately 45 feet from the centerline of 7th Street.	7th Street	9:49 AM	51.4
2.	Shady Lane Park, northeast corner of 52nd Avenue and Shady Lane, approximately 50 feet from the centerline of 52nd Avenue.	52nd Avenue	10:22 AM	62.7
3.	Harrison Street, between 6th Street and Bagdad Avenue, approximately 45 feet from the centerline of Harrison Street.	Harrison Street	11:00 AM	68.1
4.	Harrison Street south of intersection with Westerfield Way/1st Street, approximately 45 feet from the centerline of Harrison Street.	Harrison Street	11:30 AM	69.9
5.	Highway 111, between 1st Street and Avenue 50, opposite Coronet Concrete factory, approximately 35 feet from the centerline of Highway 111.	Highway 111	12:08 PM	72.0
6.	Approximately 230 feet east of the east end of Las Flores Avenue and 1,000 feet southwest of the edge of State Route 86S.	State Route 86S	12:42 PM	44.9
7.	52nd Avenue west of Education Way, approximately 50 feet from the centerline of 52nd Avenue and 670 feet south of Valle del Sol Elementary School.	52nd Avenue	1:19 PM	65.8
8.	Harrison Street south of Valley Road, approximately 68 feet from the centerline of Harrison Street and 330 feet west of Valley View Elementary School.	Harrison Street	1:56 PM	68.6
9.	Van Buren Street north of Airport Boulevard, approximately 20 feet from the centerline of Van Buren Street and directly across from Coachella Valley High School.	Van Buren Street	2:26 PM	62.5
10.	Van Buren Street south of Avenue 48, approximately 30 feet from the centerline of Van Buren Street and 820 feet south of Martin Van Buren Elementary School.	Van Buren Street	2:58 PM	66.1
11.	Highway 111 south of Ed Mitchell Drive, approximately 50 feet from the centerline of Highway 111.	Highway 111	3:24 PM	74.2

Source: Rincon Consultants, Inc. field measurements taken with an ANSI Type II Integrating sound level meter on Tuesday April 2, 2013.

See the end of this appendix for noise monitoring data sheets

EXISTING NOISE MODELING

Existing roadway noise levels were quantified using the Federal Highway Administration Traffic Noise Model (TNM®), based on average daily traffic (ADT) data obtained from a city-wide traffic study conducted by Urban Crossroads on March 20, 2007. The TNM Model noise level estimates are based on traffic volume, vehicle mix, and vehicle speed to estimate roadway noise levels in Leq (dBA). Table 3 translates these Leq levels into CNEL levels to express distances to noise contours, with peak hour Leq assumed to approximate CNEL, per HUD regulations (24 CFR See 51.106(a)(1) and 51.106(a)(2)). An attenuation rate of 4.5 dBA per doubling of distance was used, to account for the fact that the modeled roadways are relatively lightly travelled and the flow of traffic is therefore not constant. Roadway noise level estimates do not account for intervening barriers or topography that may shield individual receptors from the noise source. Therefore, the levels that are presented in this section represent a reasonable, conservative worst-case estimate of noise levels. Also, this data is for the purpose of creating noise contours, and does not represent a specific estimate of sound levels at any particular site. For technical data associated with the noise modeling, please refer to the end of this appendix.

In general, the noise levels obtained through the TNM model are in agreement with those obtained through the readings obtained in roughly equivalent locations during community noise survey, with all but one of the equivalent noise readings within 3 dBA of the modeled noise level. The equivalent field reading on Avenue 52 between Harrison Street and Grapefruit Boulevard was substantially lower than the modeled noise level, but this was because of much lower traffic levels on this street segment during this noise reading (79 vehicles over 15 minutes, corresponding to 316 trips per hour), which was taken outside peak traffic hours at 10:22 AM, than the 1,360 trips expected during the peak traffic hour used in the TNM model. When 316 trips per hour were used in the TNM model, a noise level of 64.7 Leq (dBA) was obtained through the TNM model, which is within 2 dBA of the field reading.

EXISTING NOISE CONTOURS

The results of the noise modeling are illustrated in Figure 4, a map of existing traffic noise contours along the roadways that are the major source of noise in and immediately around Coachella. Noise contours represent lines of equal noise exposure, just as the contour lines on a topographic map represent lines of equal elevation. As shown in Figure 4, existing peak noise levels along SR-86S, I-10, Dillon Road, Grapefruit Boulevard, and parts of Harrison Street and Avenue 52 are now at or slightly above 70 dBA CNEL. Noise levels exceed 65 dBA along all modeled roadways. Comparing these noise levels to the City's exterior noise standards shown in Table 1 reveals that land uses in close proximity to these roads, such as residences and certain parks, are currently exposed to noise levels exceeding the City's 65 dBA CNEL exterior noise standard for residential and other noise-sensitive land uses. Schools in the community are not located on these roads, and thus are not exposed to noise levels that exceed the City's 65 dBA CNEL exterior noise standard. The Coachella Branch Library is also a noise-sensitive land use, but one for which the City does not have an exterior noise standard. It is also not in an area exposed to noise levels in excess of 65 dBA CNEL. The Noise Compatibility Contours Map for Jacqueline Cochran Regional Airport from the Riverside County Airport Land Use Compatibility Plan Policy Document, which shows existing and expected future noise contours for this facility, is shown in Figure 5.

Table 3
NOISE MODELING RESULTS, EXISTING CONDITIONS (2007)

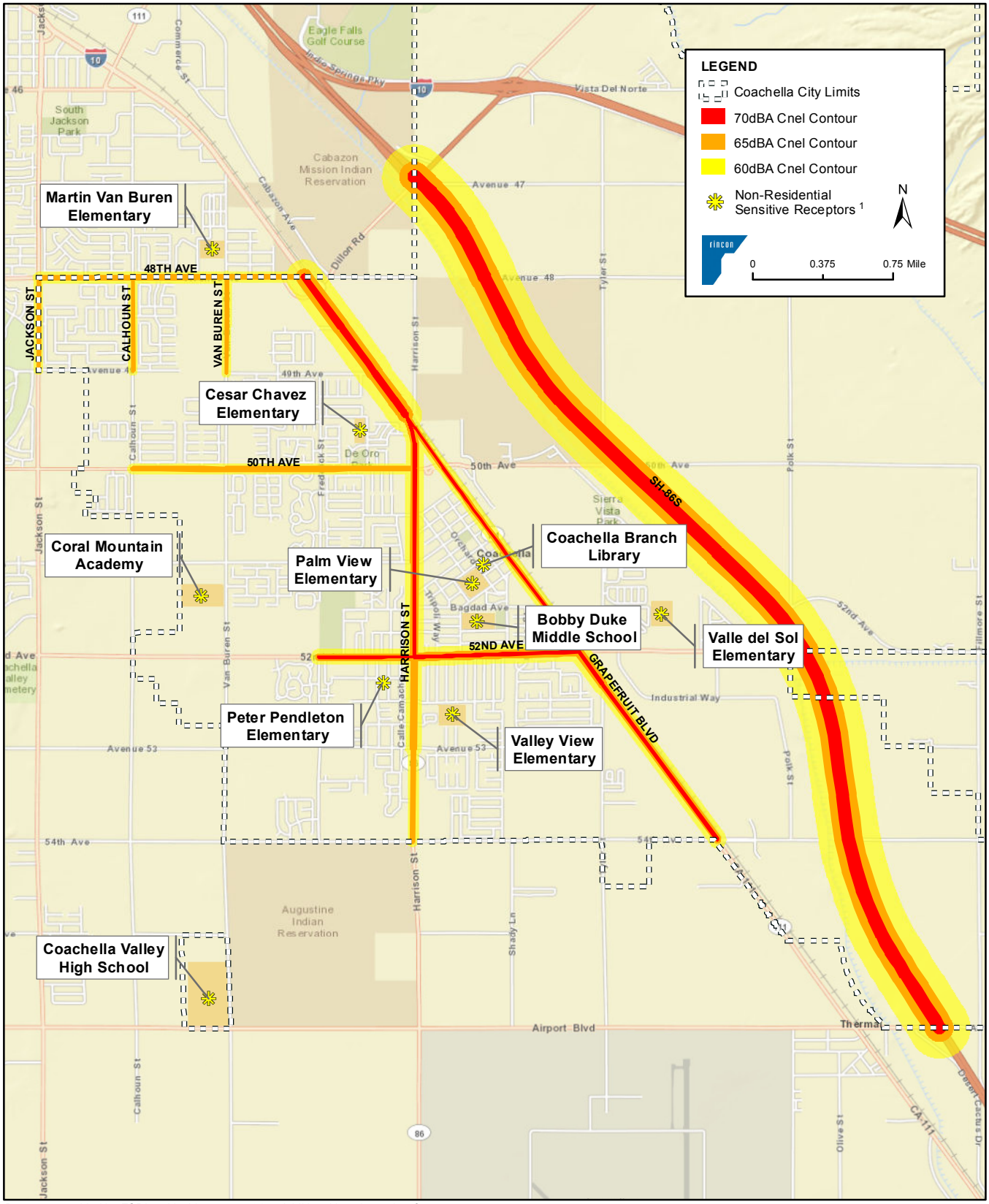
Roadway	Road Segment	ADT	Peak Hour Trips	Distance from Centerline (feet)	Average Speed	Leq (dBA)	Equivalent field reading	Dist. (feet) to 70 dBA CNEL contour (feet)	Dist. (feet) to 65 dBA CNEL contour (feet)	Dist (feet) to 60 dBA CNEL contour (feet)
SR-86S	I-10 to Ave 48	26,500	2,650	100	65	74.4	None	196	423	912
	Ave 48 to Ave 52	25,000	2,500	100	65	74.1	None	188	404	871
	Ave 52 to Airport Blvd	25,000	2,500	100	65	74.1	None	188	404	871
	South of Airport Blvd	16,300	1,630	100	65	72.2	None	140	302	651
I-10	West of Dillon Road	24,000	2,000	100	65	73.9	None	182	392	845
	East of Dillon Road	22,000	2,200	100	65	73.5	None	171	369	794
Grapefruit Blvd	Ave 48 to Ave 49	32,900	3,290	50	50	75.1	74.2	100	236	508
	Ave 49 to Harrison Street	30,000	3,000	50	50	74.7	None	103	222	477
	Harrison Street to Ave 50	12,500	1,250	35	40	70.7	None	39	84	181
	Ave 50 to Ave 52	14,000	1,400	35	40	71.2	72.0	42	91	195
	Ave 52 to Tyler St	14,500	1,450	35	50	73.9	None	64	137	296
	Tyler St to Ave 54	11,200	1,120	35	50	72.8	None	54	116	250
	Ave 54 to Airport Blvd	10,700	1,070	35	50	71.2	None	42	91	195
Harrison Street	Grapefruit Blvd to Ave 50	21,900	2,190	50	40	70.6	None	55	118	254
	Ave 50 to Ave 51	23,700	2,370	50	40	70.9	None	57	124	266
	Ave 51 to Ave 52	21,900	2,190	50	40	70.6	68.1	55	118	254
	Ave 52 to Ave 53	19,300	1,930	50	45	70.0	68.6	50	108	232
	Ave 53 to Ave 54	11,200	1,120	50	45	67.7	None	35	76	163
Van Buren Street	Ave 48 to Ave 49	10,600	1,060	30	50	68.8	None	29	63	135
Calhoun Street	Ave 48 to Ave 49	10,600	1,060	30	50	68.8	None	29	63	135
Jackson Street	Ave 48 to Ave 49	11,200	1,120	30	50	69.0	None	30	65	139
Dillon Road	Grapefruit Blvd to SR- 86S	15,300	1,530	35	45	71.8	None	46	99	214
	SR-86S to I -10 northbound	11,300	1,130	35	45	71.8	None	46	81	175
	SR-86S to I-10 southbound	17,000	1,700	35	45	72.3	None	50	107	231
Avenue 48	Jackson St to Calhoun St	10,400	1,040	30	45	70.1	None	36	77	165

	Calhoun St to Van Buren St	11,800	1,180	30	45	70.7	None	39	84	181
	Van Buren St to Grapefruit Blvd	9,900	990	35	45	69.9	None	34	74	160
Avenue 50	Calhoun St to Van Buren St	10,000	1,000	40	45	69.5	None	37	80	172
	Van Buren St to Frederick St	10,900	1,090	40	45	69.9	None	39	85	183
	Frederick St to Harrison St	10,200	1,020	40	45	69.6	None	38	81	175
Avenue 52	Frederick St to Harrison St	10,400	1,040	50	45	69.8	None	48	104	225
	Harrison St to Grapefruit Blvd	13,600	1,360	50	45	71.0	62.7	58	126	271

Sources: City-wide traffic study conducted by Urban Crossroads on March 20, 2007; Equiv. field readings from April 2013 field visit using ANSI Type II Integrating sound level meter;.

Grayed out cells are within the right-of-way. See the end of this appendix for noise monitoring data sheets.

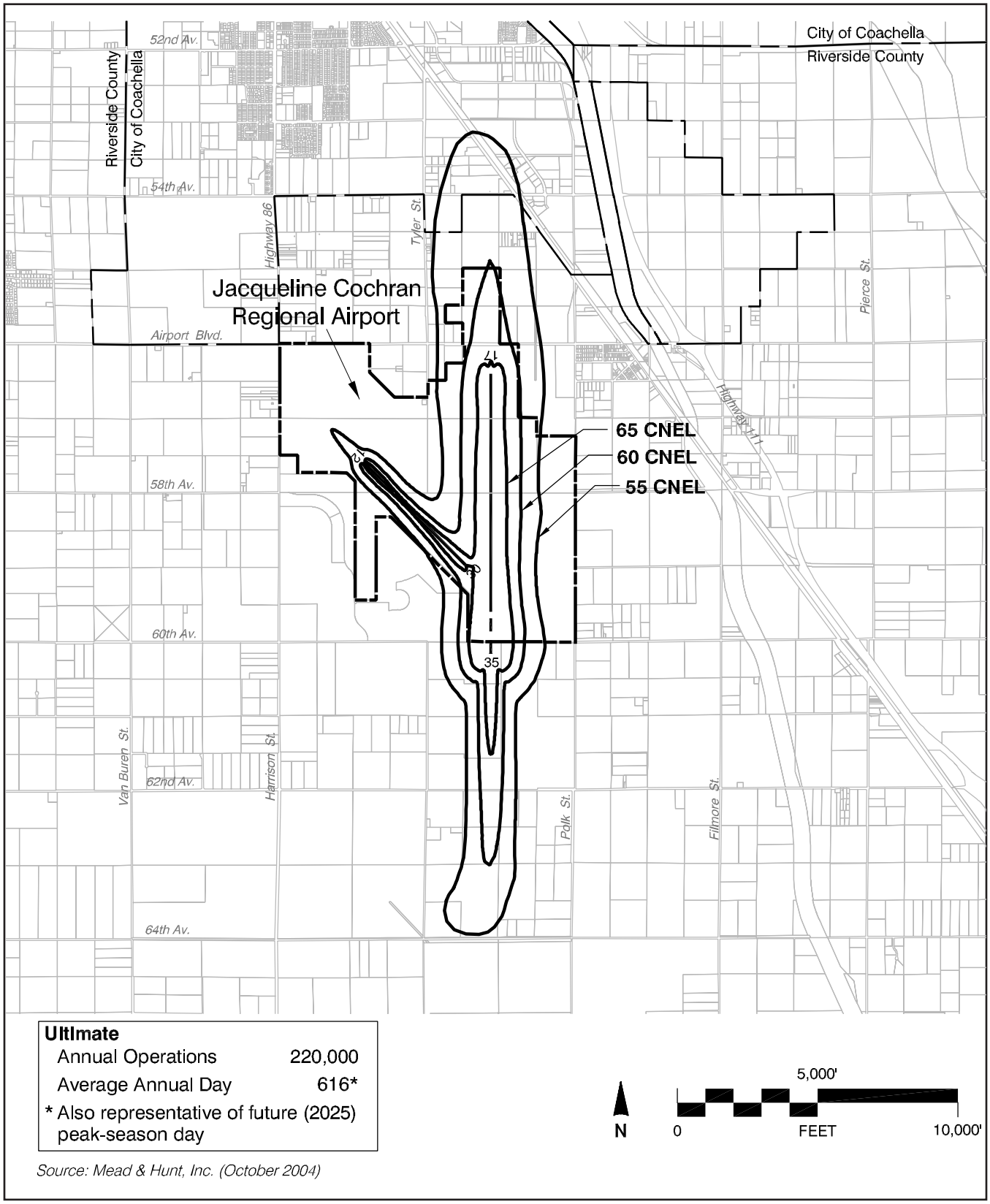
FIGURE 4 - EXISTING NOISE CONTOURS



Basemap provided by ESRI and its Licensors, 2013. Additional baselayer data from Riverside County Transportation & Land Management Agency, January 2013.

[1]*The location of noise-sensitive residential receptors is not shown because residential neighborhoods are located throughout Coachella. Please refer to the Land Use section of this General Plan for a map of different land uses with the community.*

FIGURE 5 - AIRPORT NOISE COMPATIBILITY CONTOURS



Source: Mead & Hunt, Inc. (October 2004)

Source: Riverside County Airport Land Use Compatibility Plan Policy Document (Adopted June 2005)

FUTURE NOISE ENVIRONMENT

This section describes the future noise environment in Coachella. The location of future noise sources and noise-sensitive receptors was determined by extrapolating the findings of the analysis of the existing noise environment to future conditions. Because traffic noise is expected to remain the primary source of noise in the community, the same calibrations that were made to the results of the computer noise modeling of existing traffic noise based on the results of the community noise survey were also used to calibrate the results of computer noise modeling of future traffic noise based on future (2035) traffic volumes. The results of the computer noise model were then used to produce future noise contour maps of the community. It should be noted that 2035 traffic volumes were in some cases for slightly different street segments than for Existing (2007) conditions. Also, average speeds were reduced within the computer noise model along certain roadway segments projected to have heavy traffic levels and levels of service (LOS) of E or F in order to account for peak hour congestion along these segments.

The results of the noise modeling for future conditions are shown in Table 4 and Figure 6. As shown in Table 4 and Figure 6, by the year 2035, peak noise levels along SR-86S, as well as certain segments of Grapefruit Boulevard and Avenue 52, are expected to exceed 75 dBA CNEL. Peak noise levels along all modeled segments except one portion of Avenue 50 are expected to exceed 70 dBA CNEL, and all modeled segments are expected to exceed 65 dBA CNEL, with the 65 dBA CNEL contour expected to extend over 100 from the centerline of the roadway in all but one case. Comparing these noise levels to the City's exterior noise standards shown in Table 1 reveals that noise-sensitive land uses in very close proximity to these roads, including residences and parks, are expected to be exposed to noise levels exceeding the City's 65 dBA CNEL exterior noise standard for residential uses. As shown in Figure 6, the only school that might be within the 65 dBA CNEL contour would be Coachella Valley High School, and only in the area immediately bordering Van Buren Street.

Noise sources in Coachella can be divided into two basic categories, transportation sources (primarily traffic) and non-transportation sources. Transportation sources are by far the largest contributor to noise in Coachella. A local government has little direct control of transportation noise at the source. State and Federal agencies have the responsibility to control vehicle noise emission levels. The most effective methods local governments have to mitigate transportation noise is through land use planning that reduces vehicle trips and physical interventions that reduce the impact of the noise on the community (e.g., building and site design that shields sensitive receivers from noise sources).

Although noise barriers and setbacks have historically been common methods of protecting noise-sensitive land uses from excessive transportation-related noise in many communities, recent attempts to emphasize pedestrian-friendly design and mixed use development have led to consideration of alternative strategies for dealing with transportation-related noise sources. These alternative strategies include land use planning to reduce and slow (or "calm") vehicle trips, and incorporation of noise-attenuating features into the architectural design of projects.

Table 4
NOISE MODELING RESULTS, FUTURE CONDITIONS (2035)

Roadway	Road Segment	ADT	Peak Hour Trips	Distance from Centerline (feet)	Average Speed	Leq (dBA)	Dist. (feet) to 75 dBA CNEL contour (feet)	Dist. (feet) to 70 dBA CNEL contour (feet)	Dist. (feet) to 65 dBA CNEL contour (feet)	Dist (feet) to 60 dBA CNEL contour (feet)
SR-86S	North of Airport Blvd	82,290	8,229	100	55	77.1	138	297	641	1,380
	South of Airport Blvd	82,590	8,259	100	55	77.1	138	297	641	1,380
I-10	West of Dillon Road	87,000	8,700	100	55	77.3	142	307	661	1,423
	East of Dillon Road	78,000	7,800	100	55	76.8	132	284	612	1,318
Grapefruit Blvd	Ave 48 to Ave 49	55,100	5,510	50	45	76.0	58	126	271	583
	Ave 49 to Harrison Street	65,980	6,598	50	45	76.8	66	142	306	659
	Harrison Street to Ave 50	32,220	3,222	35	40	74.8	34	73	158	339
	Ave 50 to Ave 52	24,000	2,400	35	40	73.6	28	61	131	282
	Ave 52 to Tyler St	42,300	4,230	35	45	77.3	50	107	231	498
	Tyler St to Ave 54	21,010	2,101	35	50	75.5	38	81	175	378
	Ave 54 to Airport Blvd	18,810	1,881	35	50	75.5	35	75	162	350
Harrison Street	Grapefruit Blvd to Ave 50	27,530	2,753	50	40	71.6	30	64	138	297
	Ave 50 to Ave 51	27,610	2,761	50	40	71.6	30	64	138	297
	Ave 51 to Ave 52	63,700	6,370	50	35	73.7	41	88	190	410
	Ave 52 to Ave 53	29,320	2,932	50	40	71.8	31	66	142	306
	Ave 53 to Ave 54	36,550	3,655	50	35	71.3	28	61	132	283
Van Buren Street	Ave 48 to Ave 49	27,720	2,772	35	40	73.0	26	55	120	257
	Ave 50 to Ave 52	27,830	2,783	35	40	73.	26	55	120	257
	Ave 52 to Ave 54	36,670	3,667	35	40	74.2	31	67	144	310

	Ave 54 to Ave 56	40,960	4,096	35	40	74.7	33	72	155	334
Avenue 48	Jackson St to Calhoun St	31,930	3,193	35	45	75.0	35	75	162	350
	Calhoun St to Van Buren St	41,020	4,102	35	45	76.1	41	89	192	414
	Van Buren St to Grapefruit Blvd	25,980	2,598	35	45	74.1	30	66	141	305
Dillon Road	Grapefruit Blvd to SR-86S	55,680	5,568	35	45	77.4	51	109	235	506
	SR-86S to I-10	49,600	4,960	35	45	76.9	47	101	217	469
Avenue 50	Calhoun St to Van Buren St	11,070	1,107	40	45	70.0	19	40	86	186
	Van Buren St to Harrison St	18,960	1,896	40	45	72.3	26	57	123	264
	Harrison St to Grapefruit Blvd	17,540	1,754	40	45	72.0	25	54	117	252
	Grapefruit Blvd to SR-86S	35,110	3,511	40	40	73.5	32	68	147	318
Avenue 52	Van Buren St to Harrison St	19,070	1,907	50	45	72.5	34	73	158	341
	Harrison St to Grapefruit Blvd	20,430	2,043	50	45	72.8	36	77	166	357
	Grapefruit Blvd to Enterprise Way	48,480	4,848	50	45	76.5	63	136	292	629
	Enterprise Way to SR-86S	21,030	2,103	50	45	72.9	36	78	168	362

Sources: Fehr & Peers, April 2013. Note that grayed out cells are within the right-of-way. See the end of this appendix for noise monitoring data sheets.

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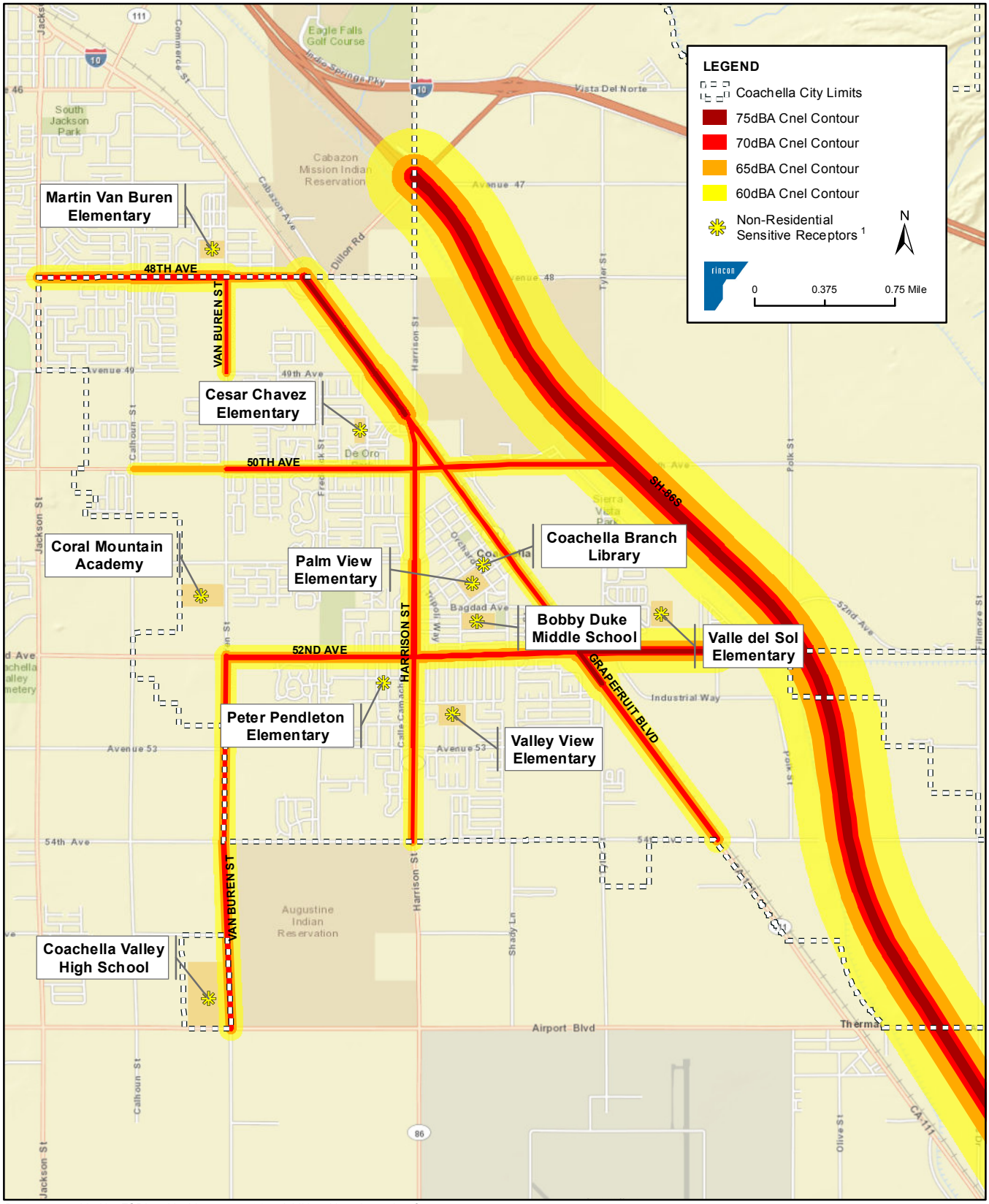
FIGURE 6 - FUTURE NOISE CONTOURS



Basemap provided by ESRI and its Licensors, 2013. Additional baselayer data from Riverside County Transportation & Land Management Agency, January 2013.

[1]*The location of noise-sensitive residential receptors is not shown because residential neighborhoods are located throughout Coachella. Please refer to the Land Use section of this General Plan for a map of different land uses with the community.*

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