Chapter 9
NOISE

- EXISTING AND FUTURE NOISE CONDITIONS
- NOISE COMPATILBILTY
- TRANSPORTATION NOISE
- NUISANCE NOISE

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Language identified with (LCP) is not restricted to the Coastal Zone; language which includes the (LCP) initials is part of the Local Coastal Program and applies countywide unless specifically stated that the policy, etc. is limited to the coastal zone.

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(Noise Element added with Resolution 197-2019)

INTRODUCTION

Noise affects how we respond and perceive the quality of the places in which we live, work and socialize. High levels of noise can have health and safety effects. For these reasons, noise requires careful consideration in maintaining public health and is considered in community planning and development permitting processes. It is important to consider noise exposure when planning locations for or permitting new land uses and developments. The General Plan and zoning maps consider compatibility of land uses, and permit processes ensure that impacts of unacceptable noise levels on future occupants are avoided and minimized, with different thresholds and mitigation strategies used for different types of land uses and developments.

This Noise Element examines noise sources in the unincorporated County. Strategies for reducing existing and potential noise impacts are identified. In particular, the Noise Element contains policies and programs to achieve and maintain noise levels compatible with various types of existing and future land uses and developments. Chapter 13.15 of the Santa Cruz County Code implements the goals, objectives and policies of this Noise Element related to the land use permitting process. While not all sound is noise, due to varying sensitivities and different expectations within different contexts, it is appropriate for a community to establish thresholds for when a sound becomes unacceptable noise and thus a nuisance that is subject to enforcement. The element therefore also establishes policies and programs oriented toward addressing noise associated with site-specific conditions or nuisance conditions. Chapter 8.30 of the Santa Cruz County Code further implements the goals, objectives and policies of this Noise Element related to offensive noise.

SCOPE AND CONTENT OF THE NOISE ELEMENT

The State of California, in recognition of the relationship between noise and noise-sensitive uses and the public health concerns associated with noise, has established requirements for Noise Elements in Government Code Section 65302(f). These requirements include defining current and projected future noise conditions in the form of noise exposure contours which present information in a manner similar to topographic map contours. This noise information serves as a basis for planning for appropriate distribution of land uses on the General Plan Land Use Maps, for policies considered when evaluating development applications, and for establishing appropriate design and development standards that are applied to new developments and uses.

Pursuant to State law, the requirements for a Noise Element are as follows:

> A noise element shall identify and appraise noise problems in the community. The noise element 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:
> (1) Highways and freeways.
> (2) Primary arterials and major local streets.
> (3) Passenger and freight online railroad operations and ground rapid transit systems.
> (4) 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.
> (5) Local industrial plants, including, but not limited to, railroad classification yards.
> (6) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

Noise contours are included within the Element and are used as a guide for establishing a pattern of land uses that minimizes the exposure of community residents to excessive noise. The Noise Element includes measures that address existing and foreseeable noise problems and serves as a guide for compliance with the State's noise insulation standards.

Several Federal and State Regulatory Agencies have created reports and information regarding mitigation of noise from transportation and other sources intended to minimize exposure of people to loud noise sources. These agencies and resources include:

- Federal Highway Administration: Construction Noise Handbook; Highway Traffic Noise: Analysis and Abatement Guide; Synthesis of Noise Effects on Wildlife Populations

- Federal Transit Authority: Transit Noise and Vibration Impact Assessment
- Federal Aviation Administration: Environment Noise and Emissions
- U.S. Department of Housing and Urban Development
- California Noise Insulation Standards (Title 24 of the California Code of Regulations)
- Caltrans: Traffic Noise Analysis Protocol; Quieter Pavement Research Plan; Transportation Noise and Vibration Studies; Technical Noise Supplement
- Caltrans: Airport Land Use Planning Handbook

Local regulations influencing noise levels or applicable within the unincorporated area with regard to noise, include:

- Watsonville Municipal Airport Master Plan
- County of Santa Cruz Land Use Element: Airport Land Use Compatibility and Safety
- County of Santa Cruz Noise Ordinance (Chapter 8.30)
- Various sections of the Santa Cruz County Code addressing various land uses and other regulated activities.

UNDERSTANDING NOISE AND HOW IT AFFECTS US

EVALUATION OF NOISE

Noise is commonly defined as annoying or unwanted sound. Health studies have shown that excessive noise can cause adverse psychological or physiological effects on human beings. The typical effects of environmental noise on people are summarized below.

- **Sleep interference** is a major concern with respect to transportation-generated noise. Studies have identified interior noise levels attributed to transportation noise as a key factor of sleep disturbance. Sleep disturbance does not only equate to awakening from sleep; rather, it can refer to disruption of the sleep pattern and stages of sleep. Train noise during sleep hours can be a common source of complaints.
- **Speech interference** is one of the primary concerns associated with environmental noise. Normal conversational speech is in the range of 60 to 66 dB (at 3 feet away). Steady elevated noise levels can interfere with speech. Depending on the distance between the speaker and the listener, raised voice levels may be required to overcome the background noise, such as with music in a nightclub.
- **Annoyance** is the most difficult of all noise responses to describe. Annoyance can vary widely from person to person. What one person considers acceptable can be objectionable to another of equal hearing capability. For example, some people like the sounds of trains or music, while others do not.
- **Physiological responses** are those measurable noise effects on the human body, such 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 a sign of harm is not known and can vary among individuals.

Defining thresholds over which noise can be considered of concern and establishing a fair and effective regulatory scheme to consider and address noise requires an understanding of some of the basic characteristics of sound and how it affects people and their activities.

"Sound" is defined as an oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium. Regarding human perception, "sound" is the auditory sensation evoked by such oscillation in air pressure. The description of sound may include several characteristics, including the frequency spectrum, the intensity or level, and the time-varying character of sound.

FREQUENCY SPECTRUM

The "frequency" of a sound refers to the number of complete pressure fluctuations per second. Subjectively, a sound that has more cycles per second than another is higher pitched. The unit of measurement is cycles per second (cps) or hertz (Hz). Most of the sounds heard in the environment do not consist of a single frequency but rather of a broad band of frequencies differing in level. The frequency and level content of a sound is called its sound spectrum.

To permit comparisons of sounds having quite different spectra, frequency weighting methods have been devised to correlate with human response (i.e.,perceived loudness). "A-weighting" progressively de-emphasizes the importance of frequency components below 1,000 Hz and above 5,000 Hz. This frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and at extreme high frequencies relative to the mid-range. The unit of A-weighted sound levels is sometimes abbreviated "dBA."

LEVEL OF SOUND

The intensity of sound is an important characteristic in our evaluation of sound. Subjectively, a sound is described as louder if it has greater amplitude (or level) than another sound. It has been found that the human ear responds logarithmically to changes in sound pressure levels. Therefore, sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing. A decibel is a logarithmic unit used to describe the intensity or level of a sound with respect to a standardized reference sound level. Table 9-1 (Typical Noise Levels) describes common noise sources for indoor and outdoor noise levels.

With regard to increases in environmental noise level, knowledge of the following relationships will be helpful:

- Except in carefully controlled laboratory experiments, a change of only **1 dB** in sound level cannot be perceived.
- Outside of the laboratory, a **3 dB** change is considered a just-noticeable difference.
- A change in level of at least **5 dB** is required before any noticeable change in community response would be expected.
- A **10 dB** change is subjectively heard as approximately a doubling in loudness and would almost certainly cause an adverse community response.

Table 9-1: Typical Noise Levels

Common Outdoor Activities	Noise Levels (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1,000 feet	105	
	100	
Gas lawnmower at 3 feet	95	
	90	
Diesel truck at 50 feet at 50 mph	85	Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime	75	
Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet
Commercial area	65	Normal speech at 3 feet
Heavy traffic at 300 feet	60	
	55	Large business office
Quiet urban daytime	50	Dishwasher in next room
	45	
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	35	
	30	Library
Quiet rural nighttime	25	Bedroom at night, concert hall (background)
	20	
	15	Broadcast/recording studio
	10	
	5	
	0	

Source: California Department of Transportation, Technical; Noise Supplement to the Traffic Analysis Protocol, September 2013

Sound levels do not combine arithmetically. Instead, they sum logarithmically in a manner similar to the Richter scale, which is used for measuring the intensity of earthquakes The following two examples illustrate this:

- If the existing noise level at a particular location is 60 dB, and a new source of sound with a similar spectrum is introduced that also measures 60 dB, the result is not 120 dB; it is 63 dB.
- If the existing noise level at a particular location is 60 dB, and a new sound source with a similar spectrum is introduced that measures 50 dB, the result is not 110 dB; it is still 60 dB. The new source is so much quieter than the existing one that it does not significantly contribute to the resulting sound level.

VARIATION OF SOUND WITH TIME AND DISTANCE

Although a single sound level value can adequately describe environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise is a conglomeration of distant noise sources which results in a relatively steady noise having no identifiable source. These distant sources could include traffic, wind in trees, or continuous industrial processes and are relatively constant from moment to moment but usually vary from hour to hour with community activities (e.g., traffic levels). Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These might include nearby activities such as single vehicle pass-bys, train horns, or aircraft flyovers that cause the environmental noise level to vary from moment to moment.

COMMUNITY NOISE LEVEL METRICS

To describe the time-varying character of environmental noise, statistical noise descriptors were developed. "L_{10}" is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period and is considered a good measure of typical maximum sound levels caused by discrete noise events. The "L_{90}" is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period and is often used to describe ambient noise.

A single number metric called "L_{eq}" is also widely used. The term "L_{eq}" originated from the concept of a so-called Equivalent Sound Level that contains the same acoustical energy as a varying sound level during the same time period. In other words, the L_{eq} is the average A-weighted sound level in a stated time period.

In determining the daily measure of environmental noise, it is important to account for the different response of people to daytime and nighttime noise. During the nighttime, exterior noise levels are generally lower than in the daytime. However, most household noise also decreases at night; thus, exterior noise intrusions become noticeable. Further, most people trying to sleep at night are more sensitive to noise. To account for human sensitivity to nighttime noise levels a special descriptor was developed. The descriptor is called the DNL (Day-Night Average Sound Level), which represents the 24-hour average sound level with a 10 dB "penalty" for noise occurring at night. A very similar metric, CNEL (Community Noise Equivalent Level) is also used. CNEL also includes a 5 dB penalty for noise occurring in evening hours.

SOUND PROPAGATION AND ATTENUATION

As sound propagates away from a source the level decreases (or attenuates) with increasing distance. In general, sound radiating from a single object (called a "point" source), like a train horn or equipment fan, is reduced by 6 dB for every doubling of distance. Noise radiating from a long single source or long continuous series of similar sources (called a "line" source) is attenuated by 3 dB for every doubling of distance. A roadway with varying levels of continuous traffic behaves similar to a line source with noise levels attenuated by between 3 and 4.5 dB per doubling of distance in typical conditions. Noise levels can also be reduced by intervening structures. For example, a noise barrier wall or even a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dB to 10 dB. Structures also act to insulate people inside these structures from exterior noise. Common home construction methods generally provide a reduction of exterior-to-interior noise levels of about 20 dB to 30 dB with closed windows.

EXISTING NOISE IN UNINCORPORATED SANTA CRUZ COUNTY

TRANSPORTATION-RELATED NOISE

Ambient noise levels vary throughout unincorporated Santa Cruz County, and differ between urban and rural settings. Noise sources in Santa Cruz County are primarily associated with transportation facilities, such as noise in the vicinity of major roadways, airports and railroads. These sources located within the County include the following:

Highway and Local Roadway Noise

The primary factors that determine roadway noise levels are traffic volume, the percentage of trucks and buses, average vehicle speed and the presence of noise attenuation features such as sound walls and terrain.

Highway Noise

Highways are a major noise source in many jurisdictions. As shown on Figures 9-1a and 9-1b, noise contours for the 60 CNEL can extend as far as 1,800 feet from Highway 1 between Soquel Drive and the Rio Del Mar Boulevard ramps. To address highway noise along long-established routes, the California Department of Transportation (Caltrans) has a priority program and a policy to put sound walls along freeways and highways located adjacent to residential areas. If a jurisdiction wishes to mitigate highway noise before scheduled and funded Caltrans improvements are planned, that jurisdiction can fund sound walls or other mitigating elements, with Caltrans later providing reimbursement in accordance with its priority plan. The majority of recently constructed sound walls have been along SR-1 within the cities of Santa Cruz and Capitola. Although sound walls reduce noise impacts, highway noise will remain an issue for noise-sensitive land uses, particularly for residential development.

Local Roadway Noise

During peak travel hours, heavy travel volumes on unincorporated Santa Cruz County streets result in higher noise levels compared to noise levels during non-peak hours. The most heavily traveled roadways include the Soquel Avenue/Drive corridor, Freedom Boulevard, San Andreas Road, State Park Drive, Rio Del Mar Boulevard, Graham Hill Road, Capitola Road, Eaton Street, Portola Drive, 7th Avenue, 17th Avenue, 41st Avenue, East Cliff Drive, Airport Boulevard, Green Valley Road and Holohan Road. Some but not all of these roadways have been designed to carry large volumes and long-established land use patterns have placed residential uses along some portions of these streets. Figures 9-1a and 9-1b provide existing roadway noise contours for the Year 2017.

Railroad Noise

Noise associated with railroad operations is caused by diesel engines, rolling wheels, switching operations and whistles. Generally, trains operate at low speeds through urban areas as a safety precaution and noise levels are lower at lower speeds. Switching operations usually occur at stations or depots. Whistles are usually blown in advance of at-grade crossings.

Although freight service is offered, railroad operations in Santa Cruz County consist primarily of seasonal and recreational passenger rail service provided by Santa Cruz Big Trees & Pacific Railway on the Felton Branch Rail Line, and the Santa Cruz and Monterey Bay Railway on the Santa Cruz Branch Line that is owned by the Santa Cruz County Regional Transportation Commission (RTC). Relatively few trains currently operate on either the Felton Branch Line or the Santa Cruz Branch Line due to the seasonal and recreational nature of the operations. These trains operate primarily during the summer and year-end holidays.

Passenger rail service could operate at some point in the future between Watsonville and Santa Cruz. However, this will depend on many factors including available funding for both construction and operations, and whether adequate ridership is anticipated for fiscal sustainability of the service. If passenger rail service occurs, then ground-borne vibration will be a planning and design consideration. Meanwhile, unincorporated Santa Cruz County residents living near either the Santa Cruz Branch Line or the Felton Branch line are both currently, and for the foreseeable future, expected to be exposed to minimal railroad noise and vibration due to infrequent rail operations.

Airport Noise

No commercial airports are located within unincorporated Santa Cruz County. The sole general aviation airport, Watsonville Municipal Airport, is located at the boundary of the unincorporated area within the City of Watsonville. Aircraft from airports in other counties also fly over the County of Santa Cruz. Thus, aircraft overflight noise is audible within the County.

Flight paths are determined by the Federal Aviation Administration (FAA). The State of California uses the CNEL descriptor to describe land use compatibility with respect to aircraft noise exposures. The California airport noise compatibility criterion for residential land uses is 65 dB CNEL. See Chapter 2 Land Use Element, Section 2.25 Airport Land Use Compatibility for a comprehensive set of policies, including policies addressing aircraft noise.

At the Watsonville Airport, the four runways (2-20 and 9-27) accommodate over 55,000 operations per year including an estimated 5,000 instrument approaches. According to the 2003 Watsonville Municipal Airport Master Plan, noise contours for both existing and forecasted operations for the year 2020 show the 65 CNEL contour to be mostly within airport property (Figures 9-3 and 9-4). However, the 65 CNEL contour line does encroach into certain residential areas located to the north and west of the Airport property within unincorporated Santa Cruz County residential areas (Figure 9-4). The Watsonville Municipal Airport is currently updating the adopted 2003 Airport Master Plan which is expected to be completed by 2020.

At residential receptors within Santa Cruz County noise levels from aircraft of all other airports located outside the County of Santa Cruz are below the State 65 dB CNEL standard (based on published noise contour maps for the nearest airports).

NON-TRANSPORTATION RELATED NOISE

Non-transportation-related noise generators are commonly called "stationary," "fixed," "area," or "point" sources of noise. These typically include noise generated by industrial, mining and commercial areas, as well as activities including construction and the operation of mechanical equipment. Several of these are described below:

Agricultural Operations

Noise perceived as disruptive by residents in proximity to existing agricultural operations may result from the operation of agricultural machinery in the evening or early morning hours. In addition, operation of exterior exhaust and cooling system equipment typically used in greenhouse operations can be a source of noise that may affect surrounding land uses. However, residents living within agricultural areas are typically either involved with the agricultural industry or were informed of and accepted the noise levels that occur within agricultural areas when they elected to live in an agricultural area. In Santa Cruz County, accommodation of the agricultural industry is a priority and residents are expected to accept the typical noise levels of the industry. Noise generated by winery operations is subject to special standards in the SCCC Chapter 13.10 Zoning Ordinance, and noise generated by normal and customary farming operations on Commercial Agricultural properties is exempt from regulations in the SCCC Chapter 8.30 Noise Ordinance pertaining to unlawful noise.

Mining

Extractive (mining) operations typically involve a range of noise-generating equipment, operations, and sometimes include blasting noise. Heavy equipment used in quarry and mining activities and blasting operations may generate noise levels that are incompatible with surrounding land uses. Off-site noise associated with the transportation of materials to and from the mining facility may also be generated. Santa Cruz County contains four active quarries (another three are in the process of reclamation and another has completed reclamation); each is operating in accordance with conditions of approval of their mining plans which include restrictions on time of operations and other site-specific noise reduction strategies. Noise generated by quarries and mining activities is subject to special standards in the SCCC Chapter 16.54 Mining Regulations.

Heavy Industrial Noise

Noise generated by industrial and commercial operations, maintenance, manufacturing, truck traffic (loading docks), and warehousing can affect surrounding noise sensitive land uses. Industrial operations often involve use of mechanical equipment, generators and vehicles that contribute to noise levels at industrial sites, particularly for outdoor activities. Santa Cruz County contains few heavy commercial operations; the CEMEX cement plant ceased making cement in 2010 and it is not expected that any other heavy industrial use will occur as site reuse.

Light Industrial and Commercial Noise

Noise generated by light industrial, heavy/service commercial operations and office workplace areas can include sounds associated with maintenance, manufacturing, truck traffic (loading docks), and warehousing, and these can affect surrounding noise sensitive land uses. In Santa Cruz County, these types of uses primarily occur on properties located along the Soquel Avenue/Drive corridor and Upper 41st Avenue, as well as in South County both within and near

agricultural areas. At some locations, residential areas exist adjacent to these commercial areas which requires careful attention to site planning, building design and operational conditions.

Construction Noise

Construction noise typically generates the loudest noise events commonly experienced by residents and is associated with building demolition, grading, construction, large diesel engines, truck deliveries and hauling. Construction activity, although temporary at any given location, can be substantially disruptive to adjacent uses during the construction period.

Some noise-generating activities, such as blasting or pile-driving as part of construction operations, may also result in excessive levels of ground-borne vibration that may affect nearby land uses.

Mechanical Equipment Noise

The motors, pumps and fans that cool and heat buildings produce point-source noise that most directly affects adjacent land uses. Frequently this equipment includes components of pure tone noise from the rotational frequency of motors. Although noise levels are generally low from these sources, the fact that such sources may operate continuously and may include pure tones that make them audible at a substantial distance creates potential for conflict.

Portable Power Equipment

Leaf blowers, lawn mowers, portable generators, electric saws and drills and other similar equipment frequently create noise during daylight hours. Such disruptions to the ambient sound environment are ubiquitous in the modern suburb and can, temporarily, produce very high noise levels at the location of the work.

Amplified Sound

Amplified sound includes noise from personal or home audio equipment, automotive audio equipment, outdoor loudspeakers, such as those used for paging, and amplified sound at music or theatrical performances. Because this sound typically includes music or speech, it is potentially more detectable and annoying to some people and sensitive receptors than other sounds of the same noise level. Careful consideration is needed when considering whether or not to allow amplified music at special events and for temporary uses.

The Santa Cruz County Noise Ordinance (SCCC 8.30) defines and prohibits offensive noise. The ordinance includes standards which provide the Sheriff with criteria to assess noise complaints and enforce excessive noise violations. While the Noise Ordinance provides the Sheriff with tools to address the thousands of noise-related complaints received annually, it is the responsibility of the Planning Department to ensure that new development is located and designed to be compatible with the existing and future noise environment and that new development does not cause significant degradation of the existing noise environment. The Noise Element provides general standards for new development and various sections of the County code include separate standards for specific type of land uses such as wineries and quarries, and areas around the Watsonville Municipal Airport. Santa Cruz County Code Chapter 13.15 Noise Planning implements the Noise Element by applying noise policies and standards in the land use permitting process.

FUTURE NOISE CONDITIONS

The most significant noise sources in unincorporated Santa Cruz County — local roadways, highways, railways, and the Watsonville Municipal Airport — will continue generating noise into the future. Figures 9-2a and 9-2b (2040 Traffic Noise) show the projected noise contours for the year 2040 largely attributable to roadway and highway traffic. Due to a reasonably foreseeable condition of continued limited railroad activity within the unincorporated County by 2040, projected noise contours from railroad activity have not been mapped. The noise contours in Figures 9-1a, 9-1b, 9-2a, and 9-2b provide information to assist the County in planning and permitting of new land uses and developments. Estimated future traffic noise increases are based on the adopted AMBAG 2014 Regional Growth Forecast (0.4% per year) for the unincorporated County and the Caltrans estimate of 1% growth per year on state highways. The estimates result in a projected increase in traffic noise of approximately 1 dB by the year 2040 over current levels.

COUNTY APPROACH TO NOISE CONTROL

Noise control in Santa Cruz County is addressed via planning, permitting, and enforcement processes. Primarily, the County will utilize the following standards in making land use planning and permitting decisions related to the County noise environment, including requiring mitigations or conditions of approval for new uses and developments as warranted.

- State of California Title 24 Noise Insulation Standards
- County Noise Compatibility Guidelines outlined in Table 9-2, *Acceptable through Unacceptable Ranges of Exterior Noise Exposure by Land Use*
- County Code Chapter 8.30 Noise Ordinance
- Related goals and policies of the County General Plan, such as the Airport Land Use Compatibility policies within the General Plan Land Use Element
- Various sections of the Santa Cruz County Code addressing land uses and other regulated activities

These standards will be used to address concerns of noise exposure on new development and from noise sources on existing noise-sensitive receptors.

NOISE SENSITIVE LAND USES

The term "noise-sensitive land uses" (also known as “sensitive receptors”) refers to land use types that are particularly sensitive to noise at levels commonly found in the urban environment. This category includes residential uses, schools and hospitals. Other uses also are carefully planned and designed to ensure appropriate sound levels for the use, including churches, convalescent care facilities, and hotels.

NOISE TO BE RECEIVED BY NEW DEVELOPMENT

The Noise Compatibility Guidelines in Table 9-2 provide exterior noise standards in terms of the DNL or the CNEL metrics. Levels of acceptable noise exposure are based on the sensitivity of specific land uses. The Noise Compatibility Guidelines recognize and respond to the many different noise environments that exist in the County e.g., the relative quiet within rural areas, the noise from equipment operating within agricultural areas that can occur within extended hours of operation, the sounds of suburban neighborhoods, and the sounds commonly generated within higher activity areas such as along transportation corridors.

Interior noise levels for new residential development, regardless of location, are required to comply with standards set forth in Title 24 of the State Building Code. New construction may need to incorporate special insulation, windows, and sealants in order to ensure that interior noise levels meet Title 24 standards. Non-residential development located near significant sources of environmental noise are also subject to interior noise standards, under the State of California Green Building Code (CALGreen).

New construction or development should generally not be undertaken unless it can be demonstrated that noise reduction requirements can be incorporated and employed to reduce noise impacts (noise to be received by the new development) to an acceptable level. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

NOISE TO BE GENERATED BY NEW DEVELOPMENT

The Noise Compatibility Guidelines also apply to noise that would be generated by a proposed new development that would be transmitted to nearby noise-sensitive receptors. Evaluation of the noise exposure would be based on the land-use category of the noise receptor.

New development also has the potential to increase ambient noise levels of the existing environment. Where the expected noise increase would be substantial, appropriate noise mitigation measures would need to be developed, as feasible.

Also, if a proposed use or development includes fixed noise sources that are subject to noise limits in the County Code, then noise impacts and appropriate mitigation will be identified and incorporated into project design to reduce noise to meet those limits and reduce impacts on nearby sensitive receptors.

NOISE GENERATED BY EVENTS AND ACTIVITIES IN THE COMMUNITY, INCLUDING NUISANCE VIOLATIONS

Less related to land use planning and permitting for new developments, is the matter of periodic noise events, both sanctioned (e.g. permitted under a special event permit) and unsanctioned (e.g. violations of the noise ordinance arising from noise disruptions or offensive and/or intrusive levels of noise generated at a property). Under certain conditions, periodic noises have the potential to violate established standards and thus be considered an unlawful violation of the noise ordinance. The County Noise Ordinance (SCCC Chapter 8.3) includes standards to determine if noise transfer across property lines is offensive noise. Conditions or events of unacceptable noise that violate the Noise Ordinance can lead to prosecution as a misdemeanor or as an infraction. Enforcement of the standards in the County Noise Ordinance addresses nuisance noise violations such as loud birds and animals, loud audio equipment, domestic power tools, vehicle repair and testing, powered motor vehicles and construction activities that are used or carried out in manners inconsistent with the noise ordinance.

Noise in the County of Santa Cruz is generated by a variety of sources. Evaluation of noise exposure may take into account the nature of the sources and receivers under consideration. For example, community uses and events within residential neighborhoods may be desirable features or occasionally acceptable, even though such uses may have an ongoing or periodic noise characteristic that varies from typical residential area conditions.

TRANSPORTATION-RELATED NOISE CONTROL

Certain noise sources within the unincorporated County, such as the Highway 1 and 17 corridors, are part of the fabric of the community and are here to stay. While noise from train operations is presently limited in season and duration, if the rail corridors were to be more heavily used in the future then noise and vibration impacts would be greater. However, due to funding constraints the County does not foresee this heavier-use rail noise and vibration condition will occur within the 2040 time horizon of this Element. The most efficient and effective means of controlling noise from transportation systems is to reduce noise at the source. However, the County has no direct control over noise produced by trucks, cars and trains because state and federal regulations preempt local laws. Given that the County cannot control transportation noise at the sources, County policies focus on reducing the impact of transportation noise along freeways, arterial roadways and rail corridors.

Strategic site planning, utilization of existing terrain, and the design and construction of noise barriers are the most common and effective methods of alleviating vehicular traffic and train noise impacts. Setbacks and buffers can also be used to achieve noise reduction. Noise-attenuating berms and barriers can be incorporated into new development projects to reduce noise exposure. The effectiveness of the barrier will depend upon 1) the relative height and materials of the barrier; 2) the noise source; 3) the affected area; and 4) the horizontal distance between the barrier and the affected area.

NOISE ELEMENT GOALS, OBJECTIVES AND POLICIES

GOAL N-1 NOISE COMPATIBILITY

Minimize noise impacts on human activity to ensure the health and safety of the community.

Objective 9.1 Noise Exposure of New Development and Activities

Promote land use compatibility by addressing noise exposure that new development and activities will be exposed to arising from existing and anticipated future noise sources.

Policies

9.1.1 Consider Table 9-2, *Acceptable through Unacceptable Ranges of Exterior Noise Exposure by Land Use* in the planning and permitting processes for new development to reduce noise exposure on future occupants of the new development to acceptable noise levels.

9.1.2 Where noise sensitive developments would be exposed to noise levels that exceed those considered "normally acceptable," require the incorporation of noise reduction design elements as recommended by a site-specific acoustical study or using prescriptive or performance methods to reduce interior noise levels to the standards set forth in Title 24 of the California Code of Regulations for both residential and non-residential uses.

9.1.3 Noise levels in common outdoor use areas in multi-unit residential development should not exceed DNL 60 dB. Where this goal cannot be met by reasonable measures, such as strategic site layout and noise barriers, DNL 65 dB might be considered acceptable. [Outdoor noise limits do not apply to private exterior balconies.]

9.1.4 Use the Federal Transit Administration and Federal Railroad Administration guidelines, where appropriate, to limit the extent of exposure that new sensitive uses may have to ground-borne vibration from trains.

Objective 9.2 Noise Exposure of Existing Sensitive Uses and Receptors

Minimize exposure of existing noise-sensitive land uses and receptors to excessive, unsafe, or disruptive noise that may be generated by new land uses and development projects.

Policies

9.2.1 Require acoustical studies for all new development projects that may affect the existing noise environment affecting sensitive land uses and receptors and that may not conform to the Normally Acceptable Noise Exposure in Table 9-2.

9.2.2 Require site-design and noise reduction measures for any project, including transportation projects, that would cause significant degradation of the noise environment due to project effects that could:

(a) Increase the noise level at existing noise-sensitive receptors or areas by 5 dB or more, where the post-project CNEL or DNL will remain equal to or below 60 dB;
(b) Increase the noise level at existing noise-sensitive receptors or areas by 3 dB or more, where the post-project CNEL or DNL would exceed 60 dB;

This policy shall not be interpreted in a manner that would limit the ability of the County to require noise-related mitigation measures or conditions of approval for projects that may generate lesser increases than the above. Special consideration may also be applied to special events or activities subject to permit requirements, or to land use development permits for uses and activities exempted from County noise control regulations.

9.2.3 Incorporate noise considerations into the site plan review process, particularly with regard to parking and loading areas, ingress/egress points and refuse collection areas.

9.2.4 For all new commercial and industrial developments which would increase noise levels above the normally acceptable standards in Table 9-2 or the maximum allowable standards in Table 9-3, the best available control technologies shall be used to minimize noise levels. In no case shall the noise levels exceed the standards of Table 9-3.

9.2.5 The following noise mitigation strategies are preferable to construction of conventional masonry noise barriers where these strategies are a feasible option to reduce impacts on sensitive uses:

- Avoid placement of noise sensitive uses in noisy areas.
- Avoid placement of significant noise generators in noise sensitive areas.
- Increase setbacks between noise generators and noise sensitive uses.
- Orient buildings such that the noise sensitive portions of a project (e.g. bedrooms) are shielded from noise sources (such as through careful design of floor plan).
- Use sound-attenuating architectural design and building features.
- Employ technologies that reduce noise generation, such as alternate pavement materials on roadways, when appropriate.
- Employ traffic calming measures where appropriate.

9.2.6 Require mitigation and/or best management practices to reduce construction noise as a condition of project approvals, particularly if noise levels would exceed 75 dB at neighboring sensitive land uses or if construction would occur for more than 7 days.

Objective 9.3 Noise Generated by Operations of Wineries, Quarries and Other Special Uses or Periodic Activities

Recognize special conditions and establish specialized maximum noise standards for certain uses and activities that can occur in rural and agricultural areas with potential to affect noise sensitive areas or receptors; such as for noise levels associated with winery operations, quarries and mining activities, and other special uses, temporary uses, periodic activities, or other similar situations as identified by County Code or land use permitting regulations.

Policies

9.3.1 Discretionary Use Permits which are approved administratively for wineries will recognize the following A-weighted sound schedule limitations measured twenty feet from the source: (a) maximum noise standard of 85 dB for a cumulative period of 15 minutes in any hour; (b) maximum noise standard of 90 dB for a cumulative period of 5 minutes in any hour; (c) maximum noise level of 100 dB at any time. These values apply during the day period and are reduced by 10 dB for the night period of 10 PM to 7 AM. Noise levels at the property line of any receiving land use shall conform to the standards in Tables 9-2 and 9-3.

9.3.2 Discretionary Use Permits involving proposed noise levels that exceed the limitations of Policy 9.3.1 shall only be considered for approval through a public hearing process before either the Zoning Administrator or Planning Commission, depending on the nature of the winery in accordance with other applicable use permit requirements. The limits of Policy 9.3.1 shall apply unless different limits are set by conditions of approval of the use permit based upon the individual merits of the location and surroundings of the winery and proposed operations.

9.3.3 Facilities and equipment associated with quarries and mining operations shall be constructed, maintained and operated in compliance with conditions of permit approval, and this Policy 9.3.3, with the maximum A-weighted noise level measured at the property boundaries to be no greater than 60 dB for a cumulative period of 15 minutes during any hour of operation. A lower noise level may be required by the Planning Commission if a health or safety effect or nuisance related to noise level is demonstrated. A higher noise level may be authorized by the Planning Commission if the increase in noise level is from construction related activity, the noise is generated only on a specified temporary basis, and all neighbors within 1,000 feet of the property boundaries have been notified in writing of the authorized increase in noise level by the operator.

9.3.4 The decision-maker or decision-making body taking action to approve a Special Event Permit, amplified sound permit, or other permit that authorizes special or periodic uses or activities that will generate noise that is not typical for the context of the proposed location, may impose conditions of approval that limit the maximum noise level, extent, duration, timing, operating hours, frequency, location or other aspect of the noise-generating use or activity. Special monitoring and reporting requirements regarding noise generation may also be imposed.

Table 9-2
Acceptable through Unacceptable Ranges of Noise Exposure by Land Use*
**Outdoor noise exposure measured at the property line of receiving land use*

	LAND USE	COMMUNITY NOISE EXPOSURE DNL or CNEL, dB					
		55	60	65	70	75	80
A	Residential/Lodging – Single Family, Duplex, Mobile Home, Multi Family,						
B	Schools, Libraries, Religious Institutions, Meeting Halls, Hospitals						
C	Outdoor Sports Arena or Facility, Playgrounds, Neighborhood Parks						
D	Office Buildings, Business Commercial and Professional						
E	Industrial, Manufacturing, Utilities, Agriculture						

NORMALLY ACCEPTABLE:
Specific land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements, and can meet the indoor noise standards.

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 to meet interior and exterior noise standards, where applicable.

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 to meet interior and exterior noise standards, where applicable.

CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.

Based on Draft General Plan Guidelines published by the California State Office of Planning and Research, 2014.

Table 9-3 Maximum Allowable Noise Exposure Stationary Noise Sources[1]		
	Daytime[5] (7 AM to 10 PM)	Nighttime[2,5] (10 PM to 7 AM)
Hourly Leq – average hourly noise level, dB [3]	50	45
Maximum level, dB [3]	70	65
Maximum level dB – Impulsive Noise [4]	65	60

dB = decibel

(1) As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures

(2) Applies only where the receiving land use operate or is occupied during nighttime hours

(3) Sound level measurements shall be made with "slow" meter response

(4) Sound level measurements shall be made with "fast" meter response

(5) Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced 5 dB if the ambient hourly Leq is at least 10 dB lower than the allowable level.

GOAL N-2 TRANSPORTATION NOISE

Reduce the effects of noise generated by transportation sources to the extent feasible.

Objective 9.4 Ground Transportation-Related Noise

Minimize ground transportation-related noise impacts.

Policies

9.4.1 Use speed limit controls on local streets as appropriate to minimize vehicle traffic noise.

9.4.2 Utilize the latest noise-reducing techniques for County road surfacing and maintenance.

9.4.3 Continue to consider noise concerns in evaluating all proposed development decisions related to roadway and other transportation projects.

Objective 9.5 Aircraft Noise

Minimize the adverse effects of Watsonville Municipal Airport-related noise through proper land use planning. See Chapter 2 Land Use Element, Section 2.25 Airport Land Use Compatibility for a comprehensive set of policies, including policies addressing aircraft noise.

Policies

9.5.1 Limit single-family residential development to no more than one dwelling and an accessory dwelling unit on an existing parcel or lot of record where the existing or future aircraft noise exceeds 65 CNEL or L_{dn} (see Figure 9-4).

9.5.2 Require all residential and non-residential development proposed within the 60 CNEL or L_{dn} aircraft noise contour (see Figure 9-4) to mitigate interior noise to 45 (CNEL or L_{dn}) or less, and to limit the maximum A-weighted noise level of single aircraft overflights to 50 dB or less.

GOAL N-3 NUISANCE NOISE AND ENFORCEMENT

Enforce adopted noise standards of a noise ordinance that clearly identifies offensive noise and that establishes parameters and criteria for determinations about violations of applicable regulations of the Noise Ordinance due to generation of offensive noise. Develop a separate noise planning ordinance that provides procedures and standards to apply in the land use permitting process.

Objective 9.6 Adopt and Enforce Noise Ordinances

Adopt and enforce a noise ordinance that implements this Noise Element and provides clear standards for enforcement of offensive noise, and which also provides for reasonable flexibility and noise exceptions to address agricultural activities and other activities regulated by other sections of the County Code. Adopt a separate noise planning ordinance.

Policies

9.6.1 Establish a set of factors in the noise ordinance for County enforcement officials to use in making determinations about offensive noise violations in order to support effective enforcement of the standards, including through the use of court action as warranted.

9.6.2 Enforce the County of Santa Cruz Noise Ordinance (County Code Chapter 8.30) to ensure that unlawful noise-generating activities and offensive noise are subject to enforcement.

9.6.3 Establish procedures and standards in a separate noise planning ordinance (County Code Chapter 13.15) to implement this Noise Element in the land use permitting process. Include a list of exempt activities including construction noise, standards for emergency generators, air conditioning and mechanical units, standards and procedures for project review of noise generating land uses, and protection of new development from existing noise. Require acknowledgement of potential impact from rail vibration.

9.6.4 Continue to enforce noise abatement and control measures that have been required, designed and incorporated into development projects, particularly within or adjacent to residential neighborhoods and sensitive receptors.

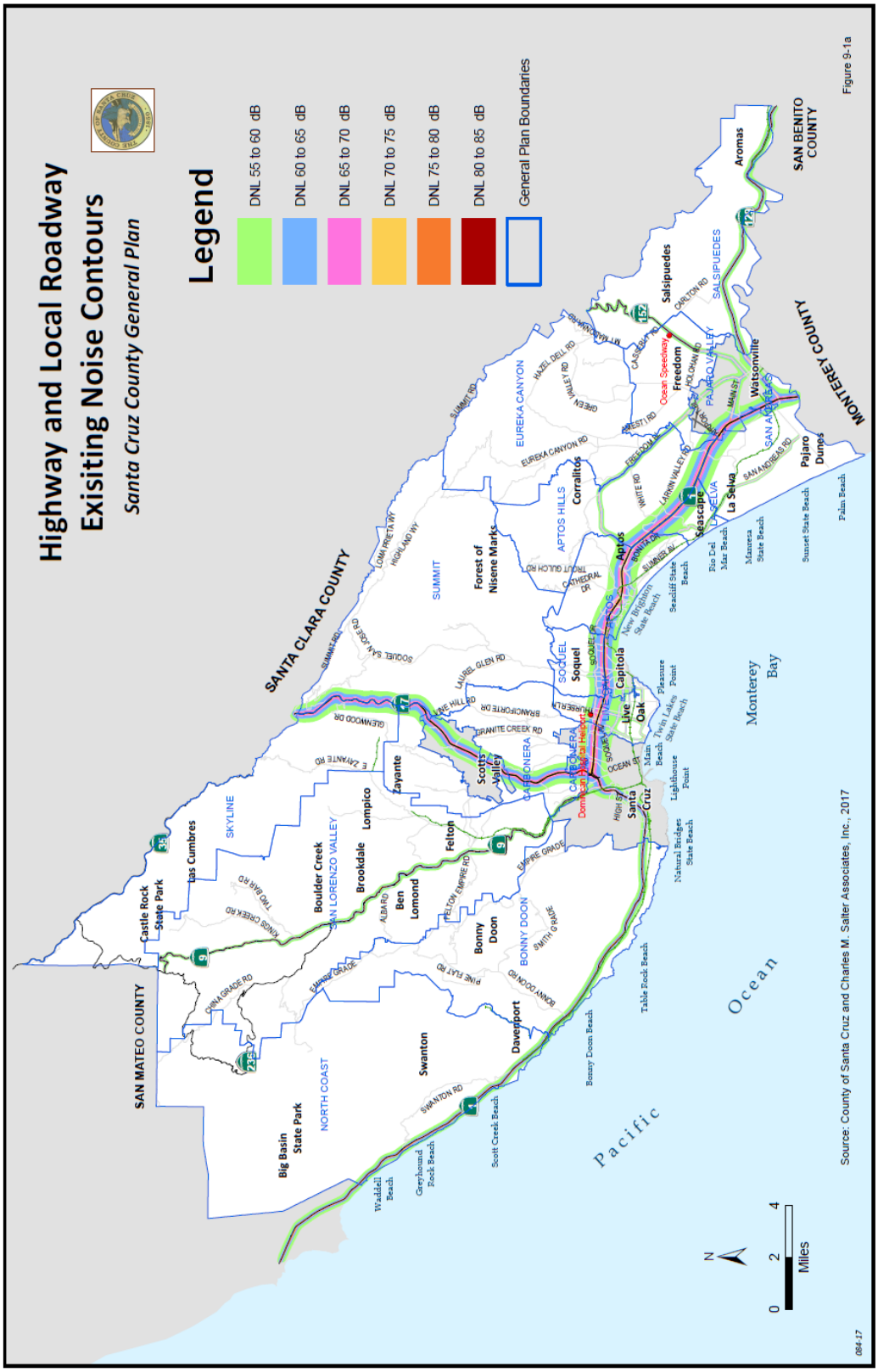

Figure 9-1a: Existing Highway and Roadway Noise Contours for the Year 2017

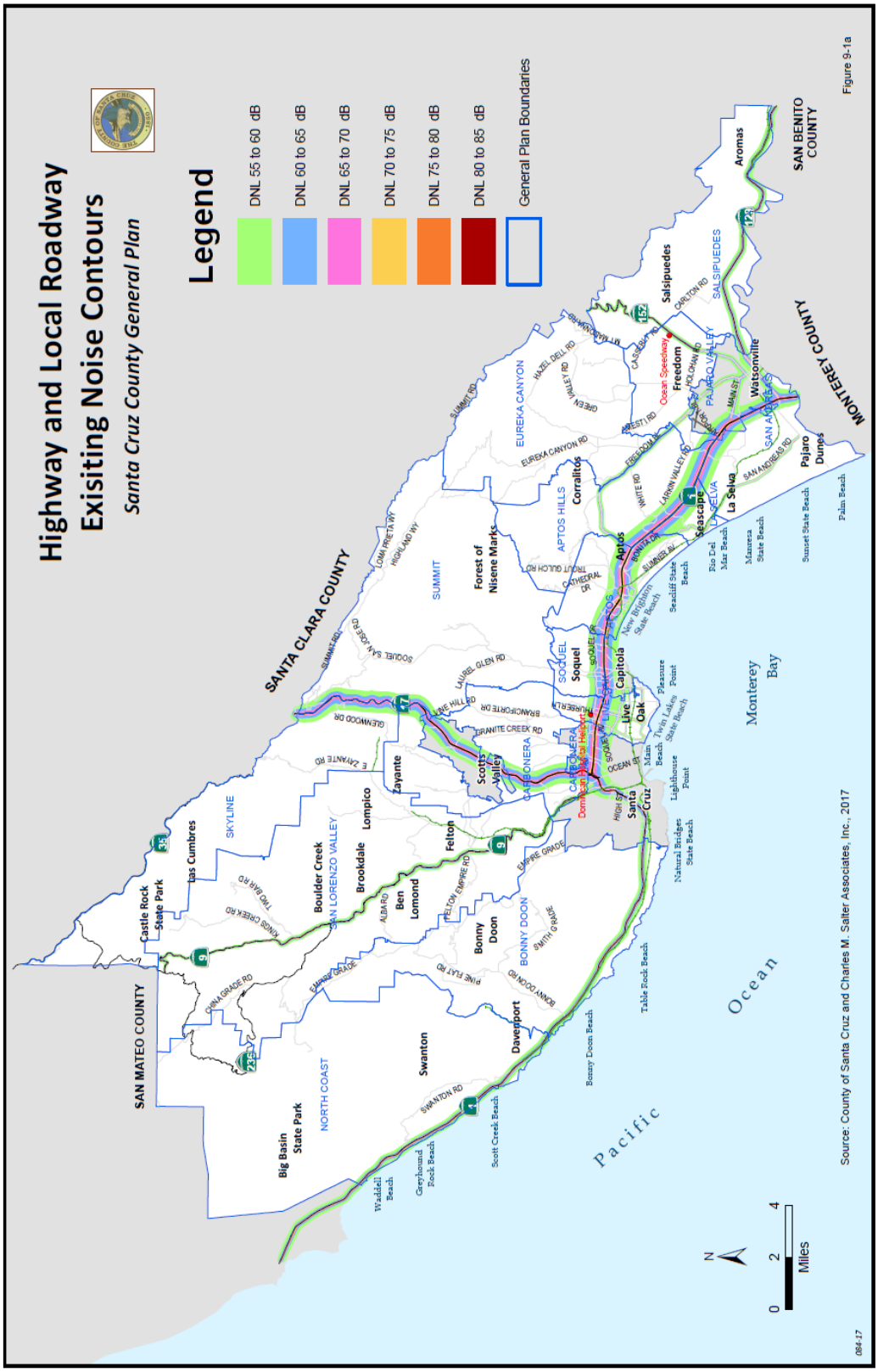

Figure 9-1b: Existing Highway and Roadway Noise Contours for the Year 2017 (Expanded)

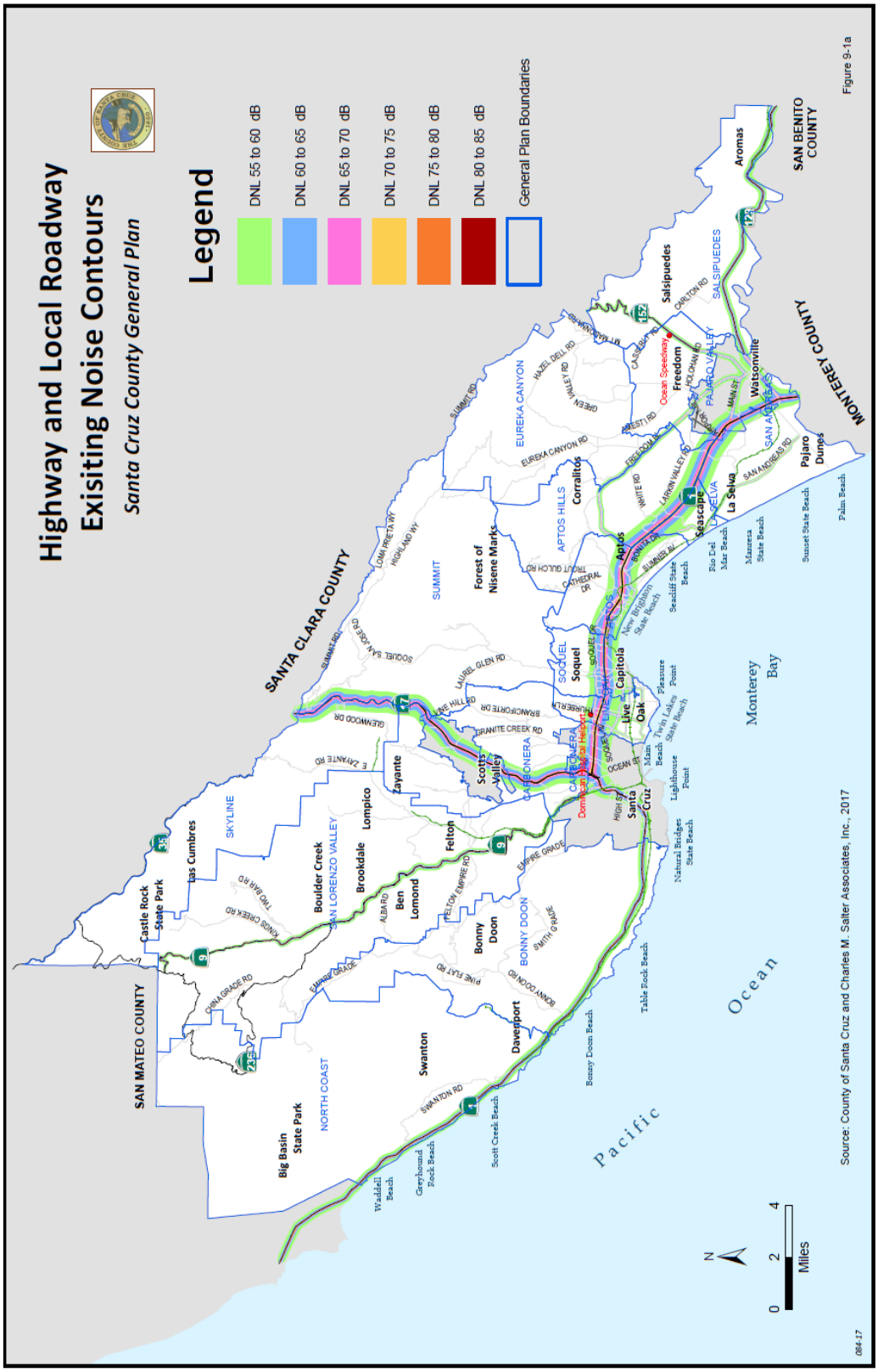

Figure 9-2a: Future (2040) Highway and Roadway Noise Contours

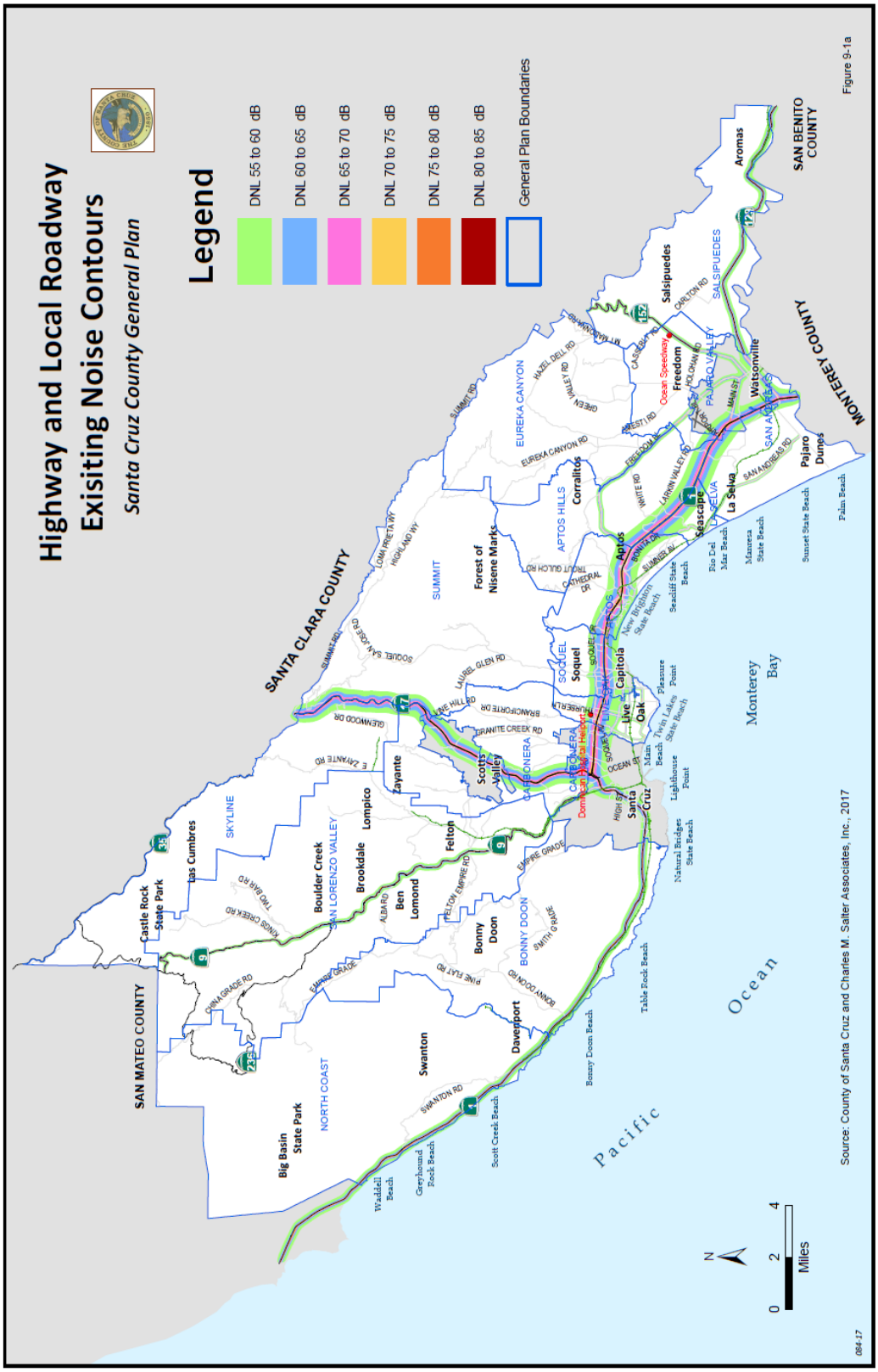

Figure 9-2b: Future (2040) Highway and Roadway Noise Contours (Expanded)

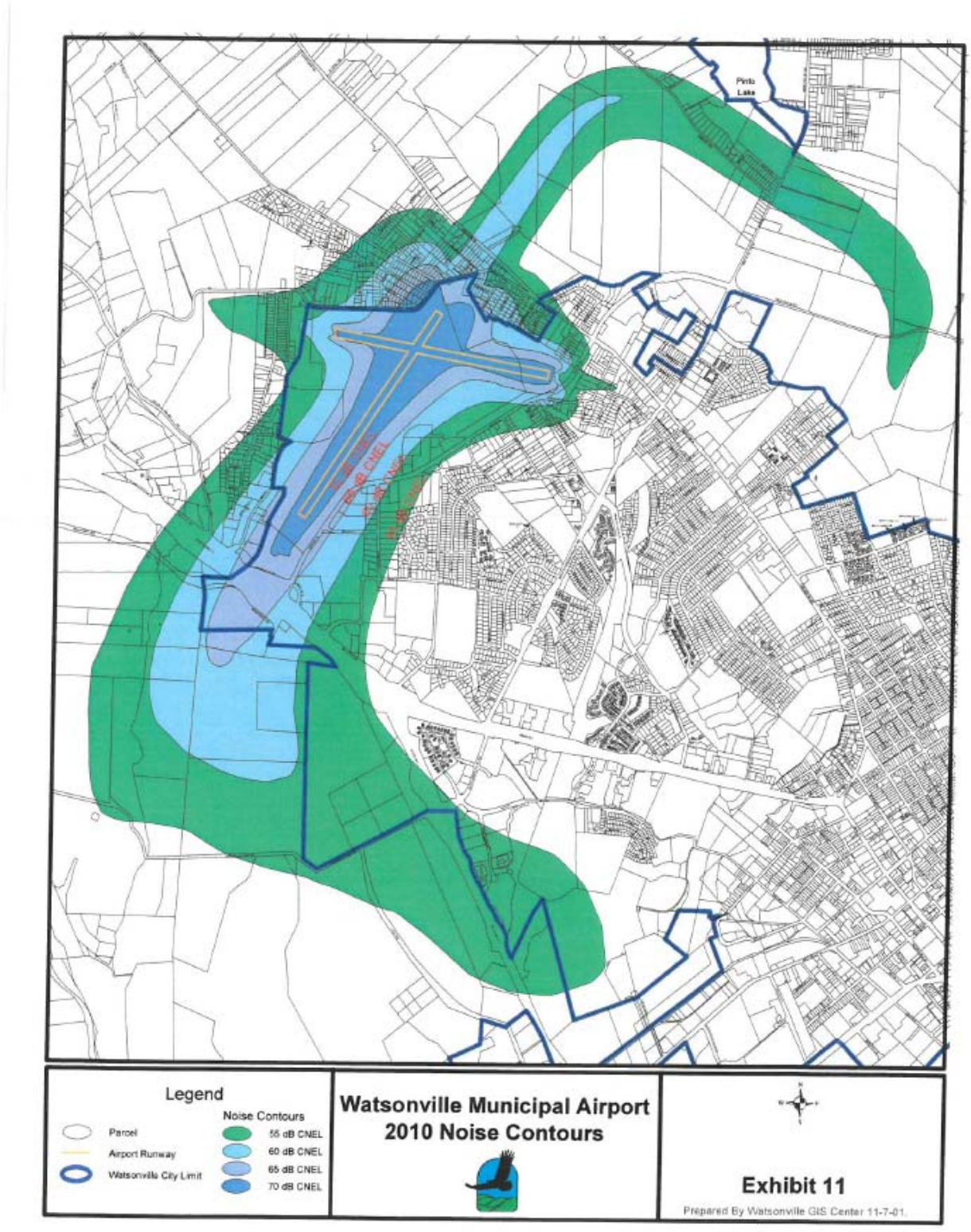

Figure 9-3: Existing Watsonville Municipal Airport Noise Contours for the Year 2010

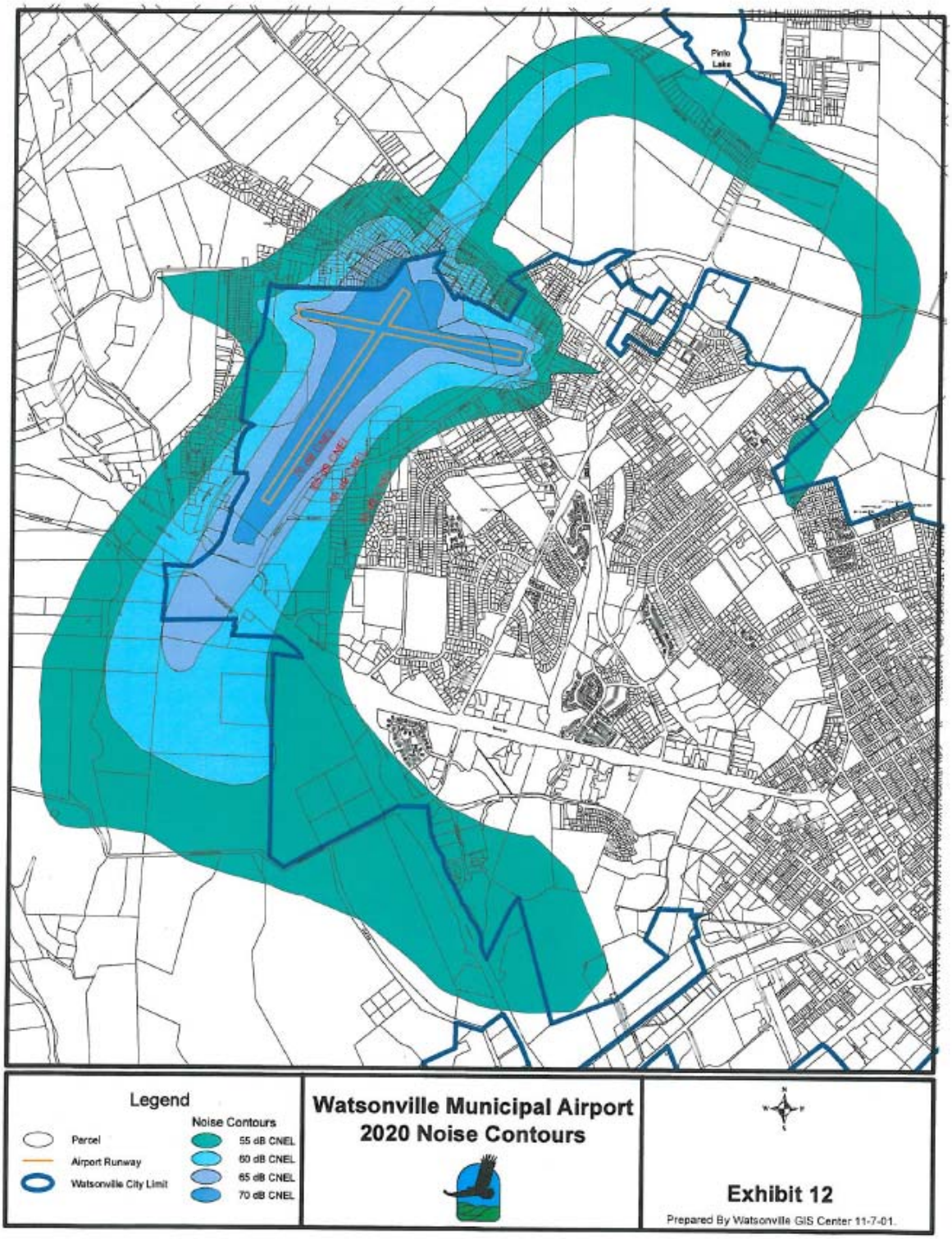

Figure 9-4: Future Watsonville Municipal Airport Noise Contours for the Year 2020