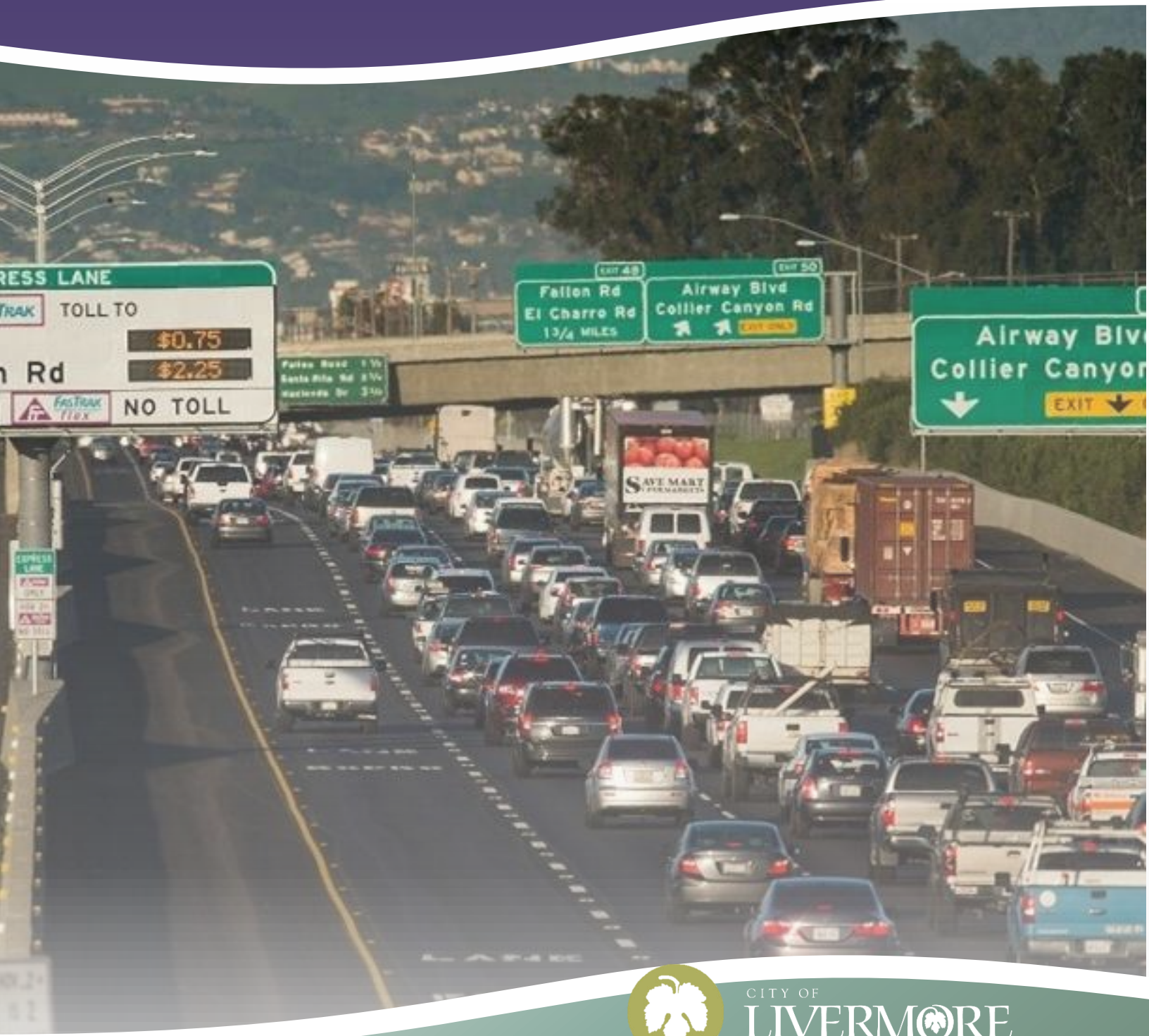
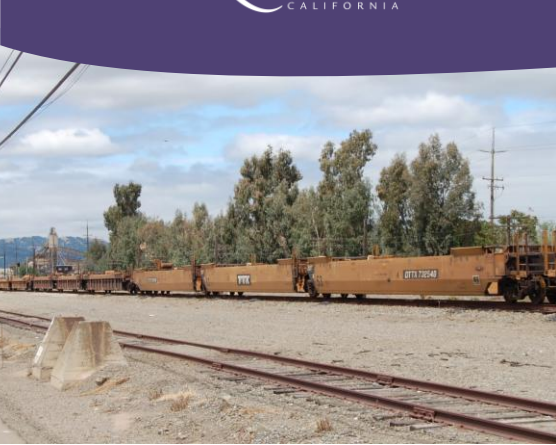


# 10 Noise Element



CITY OF  
**LIVERMORE**  
CALIFORNIA



## 10. NOISE ELEMENT

*This Noise Element provides the policy framework for limiting, managing, and mitigating excessive exterior noise in the city. These policies ensure land uses that are sensitive to noise, such as homes, schools, and libraries, are less likely to be disturbed by noise. The Noise Element identifies noise sources in the community to minimize intrusive noise and prevent new development from exposing people to excessive noise levels.*

The Noise Element contains goals and policies addressing the following topics:

### **Sensitive Receptors**

Identifies land uses and populations sensitive to the effects of noise.

### **Noise Mitigation**

Minimizes the effects of noise through land use planning and policy regulation.

### **Noise Sources**

Identifies major noise sources in Livermore.

## Relevance to General Plan Vision and Guiding Principles

The Noise Element advances the 2045 General Plan Vision and Guiding Principles by protecting the community from excessive noise exposure and ensuring that noise-sensitive land uses can coexist with necessary urban activities. This element expresses the following Guiding Principles:



### **Homes**

- Maintaining land use patterns and attenuation measures that separate noise-sensitive residential uses from major noise sources to protect residential quality of life.
- Requiring noise mitigation measures, such as wider setbacks, building orientation, and sound insulation for new residential development.



### Equity

- Ensuring all community residents receive protection from excessive noise exposure regardless of location.
- Requiring professional noise analysis and mitigation for development in areas that may disproportionately affect sensitive populations.
- Encouraging affordable noise mitigation measures that don't create barriers to housing development.



### Mobility

- Designing streets and traffic controls to minimize transportation noise impacts on adjacent communities.
- Supporting legislation and new technologies to reduce motor vehicle and transit noise.
- Requiring noise analysis for future transit systems to protect existing residents while enabling mobility improvements.

#### Measuring Environmental Noise

Sound is a pressure wave transmitted through the air. Sound is measured in several different ways:

- Loudness or amplitude, measured in decibels (dB)
- Frequency or pitch, measured in Hertz (Hz) or cycles per second
- Duration (measured in seconds or minutes)

#### A-Weighted Decibels

The human ear is not equally sensitive to all frequencies. The A-weighted decibel scale (dBA) weights frequencies in a manner approximating the sensitivity of the human ear.

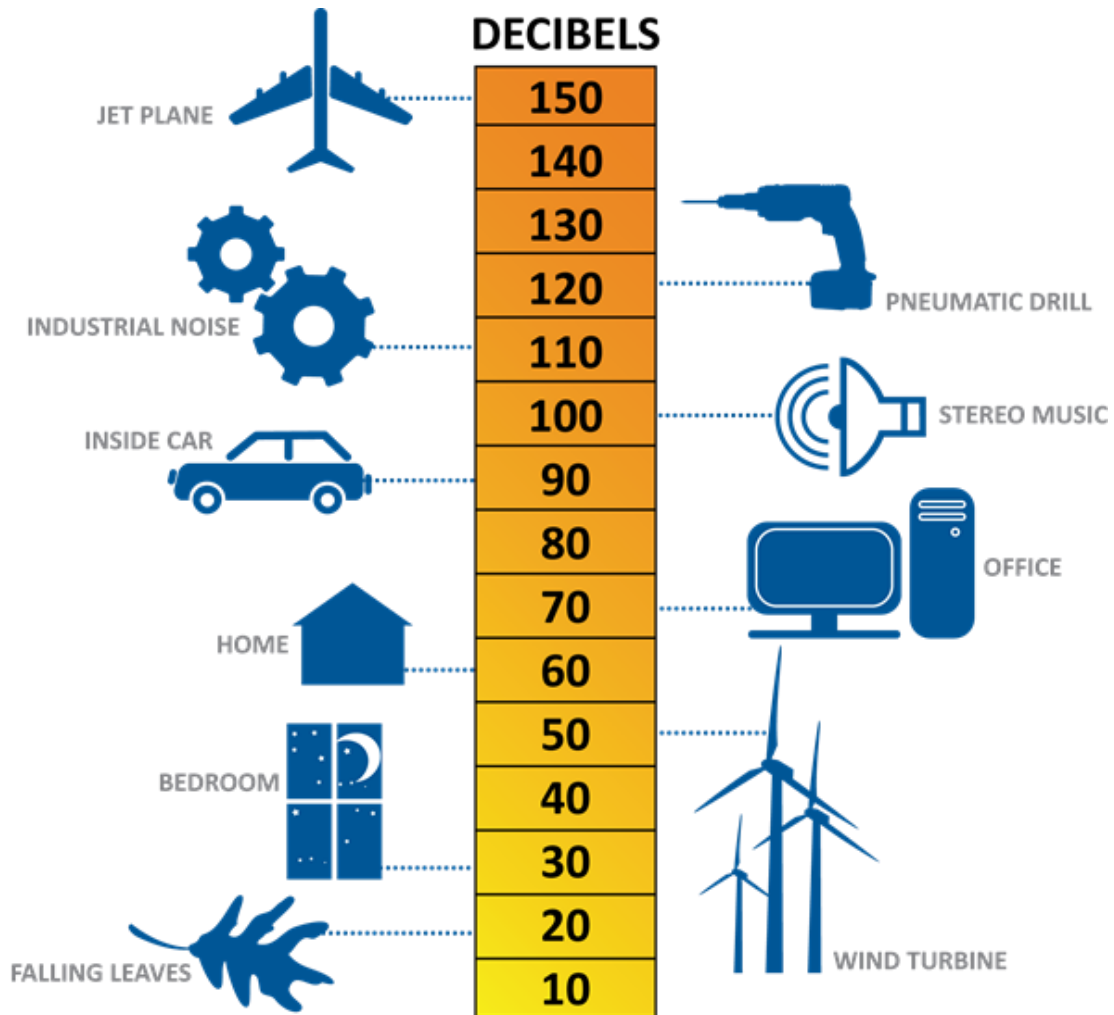
Decibels are measured on a logarithmic scale. On a logarithmic scale, an increase of 10 dBA is 10 times more intense than 1 dBA, while 20 dBA is 100 times more intense. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud).

- Changes of less than 1 dBA are usually not noticeable.
- Changes of 1 to 3 dBA are detectable under quiet, controlled conditions.
- A 3 dBA change is considered the minimum change detectable in outside environments.
- A change of 5 dBA is readily discernable to most people in an exterior environment.

**Noise Over Time**

This Noise Element uses two measurements for exterior noise:

1. The Community Noise Equivalent Level (CNEL) is a scale of the average sound over a 24-hour period. CNEL is used in the Compatibility Guidelines for Exterior Noise in **Table N-1**.
2. Leq (Equivalent Sound Level) is an hourly measurement that measures the average loudness of a location over time, rather than measuring the loudest sounds or quietest moments. Leq is used for noise standards and regulations that apply to part of a 24-hour day, such as the mechanical noise methodology.



## SENSITIVE RECEPTORS

Sensitive receptors are land uses or populations that are particularly vulnerable to the effects of noise. These typically include:

- Residences
- Schools and daycare centers
- Hospitals and nursing homes
- Libraries
- Parks and other passive recreational areas

Protecting sensitive receptors from excessive noise exposure is a key objective of this Noise Element.

### Sensitive Receptors



## NOISE SOURCES



*Traffic on local roadways is a significant source of noise in Livermore.*

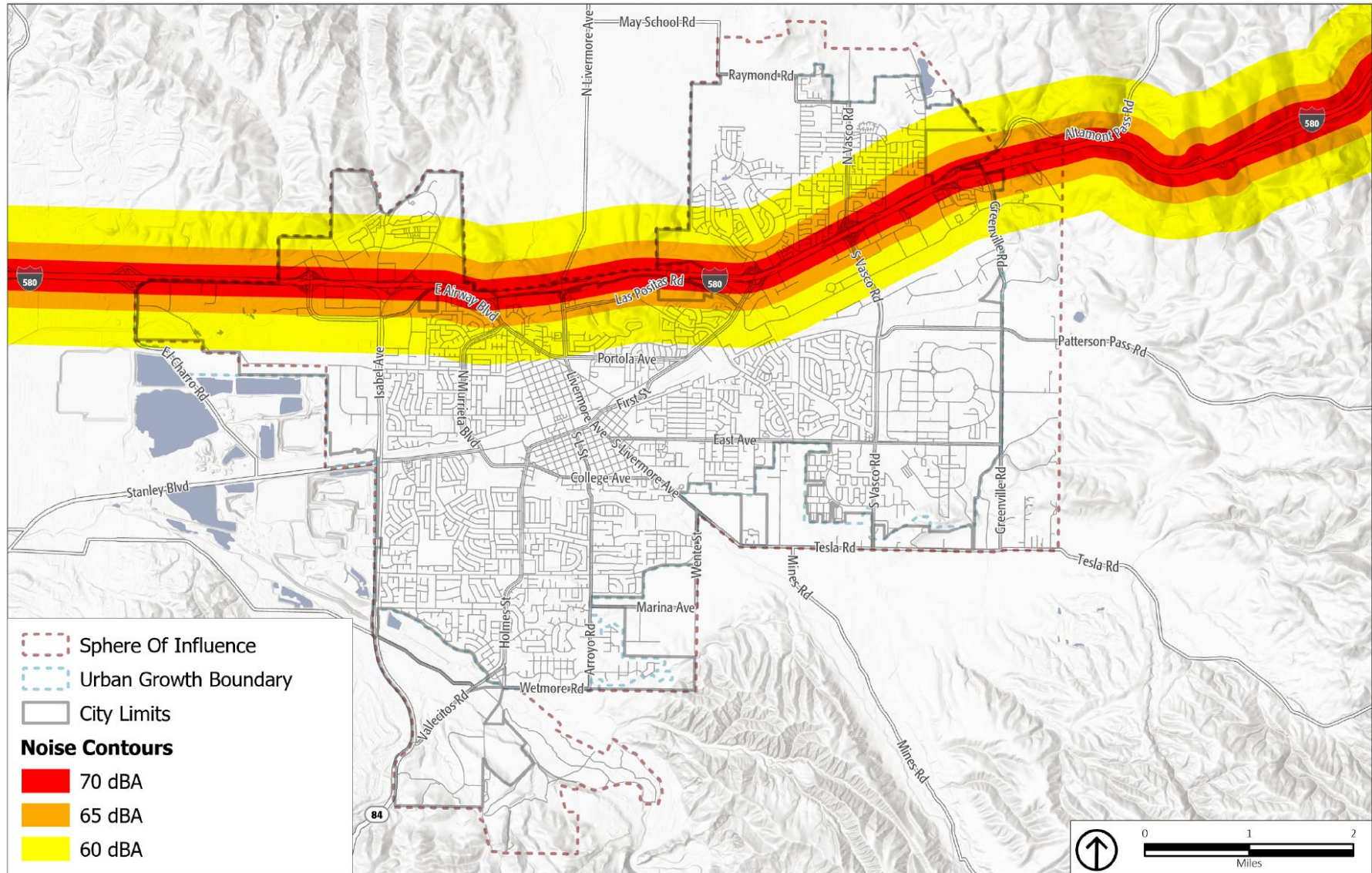
### Traffic Noise

Traffic is a major source of noise in the City of Livermore. Vehicles generate noise through engine sounds, especially at high speeds and during acceleration; the contact of tires on the roadway surface; and honking. This means that Interstate (I-) 580, State Route 84, and major arterial roadways like East Stanley Boulevard, Holmes Street, South Livermore Avenue, and East Avenue are significant noise sources. Traffic noise from I-580 is shown on **Figure N-1**. Existing and future traffic noise levels in Livermore are shown on **Figures N-2** and **N-3**.

### Railroad Noise

The Union Pacific Railroad (UPRR) owns and operates freight traffic through Livermore, connecting Stockton and Oakland via the Altamont Pass. There is one main track and one siding track throughout most of the city. The Altamont Corridor Express (ACE) also operates commuter trains along this line. There are two at-grade crossings in the city, at L Steet and Junction Avenue; all other rail crossings are grade separated by overpasses or underpasses. According to federal regulations, trains are required to blow their horns as they approach at-grade crossings as a safety measure to alert motorists and pedestrians. Existing rail noise levels in Livermore are shown on **Figure N-4**.

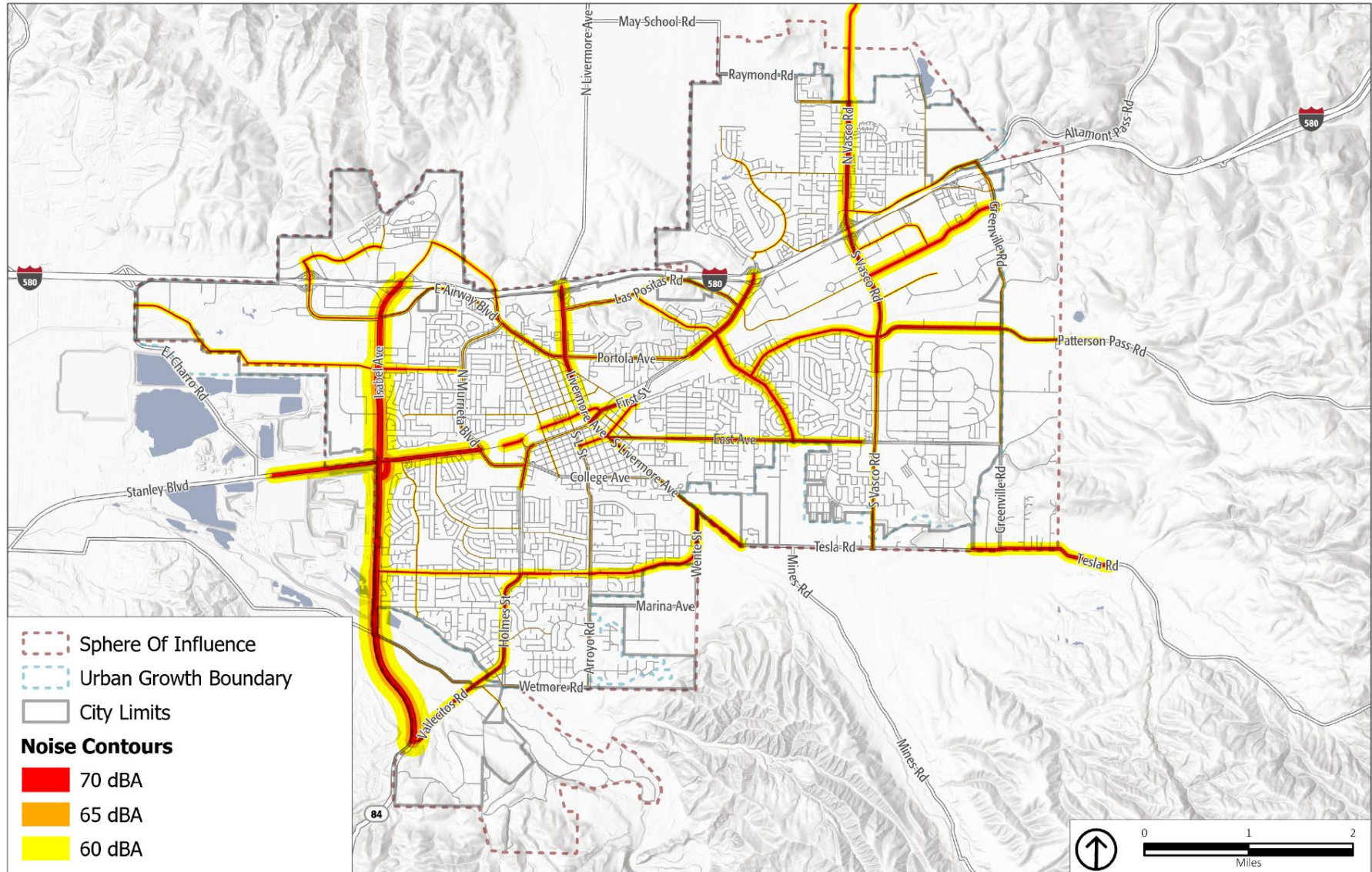
Figure N-1 Existing I-580 Traffic Noise Contours



Source: City of Livermore, 2021; Esri, 2025; PlaceWorks, 2025

Note: This map is included for informational purposes and is not adopted as part of this General Plan.

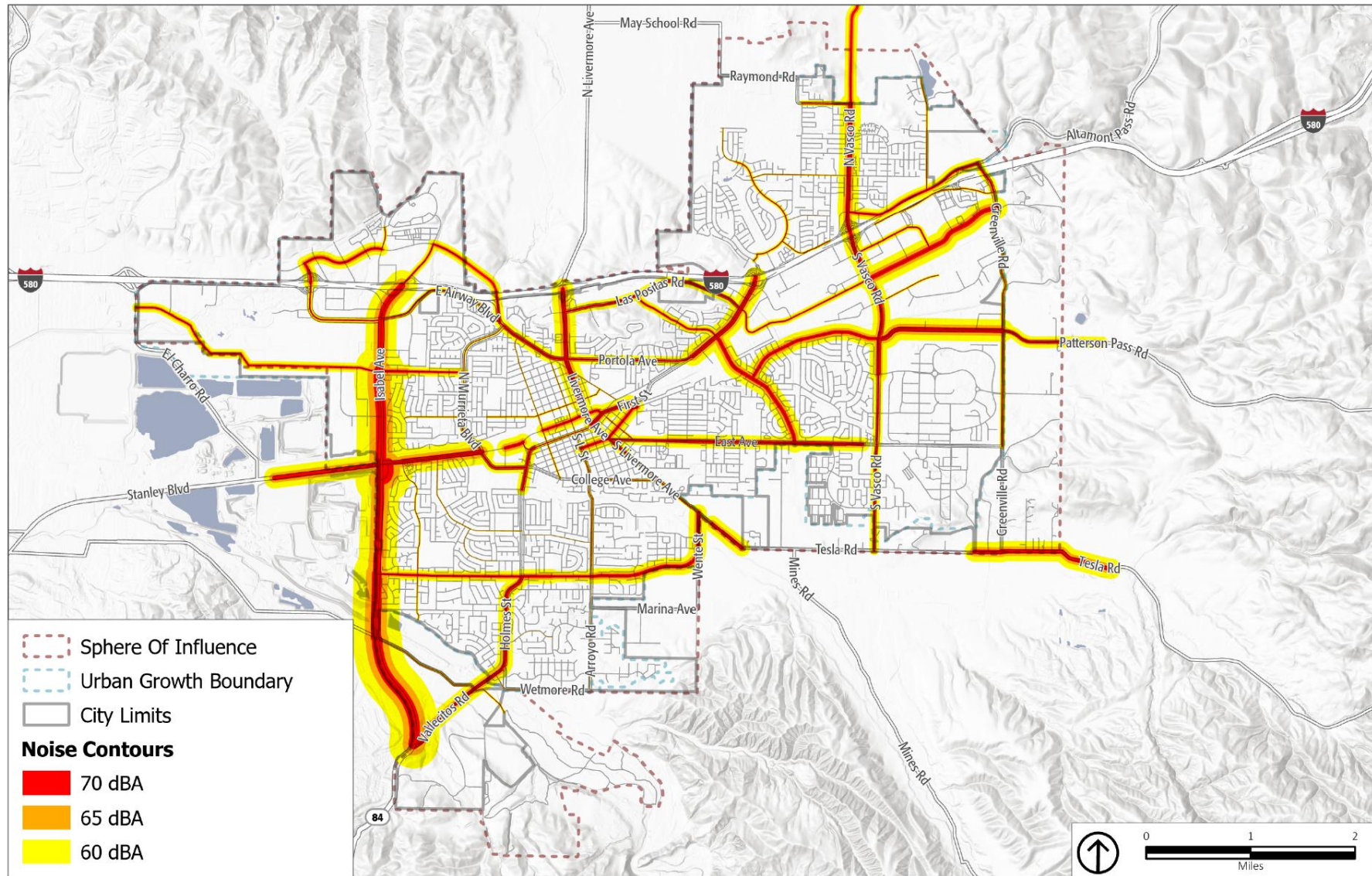
Figure N-2 Existing Roadway Traffic Noise Contours



Source: City of Livermore, 2021; Esri, 2025; PlaceWorks, 2025

Note: This map is included for informational purposes and is not adopted as part of this General Plan.

Figure N-3 Future Roadway Traffic Noise Contours



Source: City of Livermore, 2021; Esri, 2025; PlaceWorks, 2025



## Aircraft Noise

Livermore Municipal Airport is near the western edge of Livermore's city limits. The Livermore Municipal Airport is a public airstrip with supporting general aviation activities. Airport noise contours (see **Figure N-4**) from the 2012 Livermore Municipal Airport Land Use Compatibility Plan extend west to the city of Pleasanton. The 60 CNEL noise contour extends slightly beyond Stealth Street, and the 55 CNEL contour extends approximately 0.6 miles east of the 60 CNEL noise contour, encompassing neighborhoods in both Livermore and Pleasanton. Aircraft noise comes from local flights using the Livermore Municipal Airport, as well as higher-elevation overflights to and from San Francisco International Airport, Oakland International Airport, and San Jose International Airport.



*Flights in and out of the Livermore Municipal Airport (LVK) create noise in Livermore.*

## Stationary Noise Sources

Stationary (non-transportation) noise sources are associated with a variety of land uses and can vary significantly in intensity, frequency, and duration:

**Residential areas** typically include noise sources like landscaping and property maintenance activities, garbage collection, heating, ventilation, and air conditioning (HVAC) systems, pet noise, and human voices. These sources are generally intermittent and occur during daytime hours.

**Commercial and retail uses** generate noise from HVAC systems, emergency generators, loading docks, truck deliveries, and customer or employee activity. Other common sources across commercial and retail activities include nightclubs and amplified music, outdoor dining areas, gas stations and car washes, drive-through facilities, and athletic and music events.

**Mixed-use developments** combine residential and commercial noise sources, potentially increasing the frequency and diversity of noise events.

**Industrial uses** often produce more continuous and higher-intensity noise due to the operation of HVAC systems, heavy trucks, loading docks, employee activity, and industrial machinery or equipment. These sources may operate during extended hours or continuously, depending on the nature of the facility.

**Agricultural and mining operations** may also generate localized stationary noise from equipment and machinery.

**Public and community uses**, including fire stations, swimming pools, schools, parks, and playgrounds also include noise sources that are generally intermittent and occur during daytime hours.

Understanding the distribution and characteristics of these noise sources is essential for effective land use planning and noise mitigation strategies.



*The City of Livermore requires that construction noise be minimized to limit impacts to surrounding land uses.*

# NOISE MITIGATION

**Land use planning** considers the existing and future noise environment when reviewing proposed development, locating new noise-sensitive uses in areas that minimize exposure to excessive noise.

**Physical mitigation** reduces noise levels by locating buildings or other features on a project site to shield a noise source. Buildings could include sound-absorbing materials to reduce noise, upgraded wall assemblies or window packages to reduce the noise indoors, or noise barriers adjacent to noise sources that produce excessive noise, such as freeways or rail lines. Noise barriers might include soundwalls, fencing, earthen berms, or landscaped buffers of trees and shrubs.

**Administrative regulation** limits activities that result in noise. Chapter 9.36 of the Livermore Municipal Code specifies the operating hours and duration of noise sources by decibel level. For example, construction activities are restricted to daytime hours. Chapter 9.36 prohibits the creation of excessive noise adjacent to schools, courts, churches, and hospitals. Disturbances that violate the Noise Ordinance, such as loud events late at night, are typically handled by the Building Neighborhood Preservation Division or the Livermore Police Department.



**Goal N-1**

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**Minimize the exposure of community residents to excessive noise.**



**Policies**

**Policy N-1.1 Land Use Planning for Noise Mitigation**

Maintain a pattern of land use planning, site design standards, and noise-reduction techniques to ensure the noise compatibility of land uses. Separate noise-sensitive land uses from major noise sources with spatial buffers.

**Policy N-1.2 Noise Sensitive Uses**

Maintain acceptable noise levels at existing noise-sensitive uses. Apply the interior and exterior noise standards, measured in dBA CNEL, contained in **Table N-1**. Evaluate potential noise impacts and recommend mitigation measures through review of permit submittals.

**Policy N-1.3 Airport Noise Contours**

Within the 2030 Airport Community Noise Equivalent Level Noise Contours illustrated in **Figure N-4**, apply the Noise Compatibility policies in Section 3.3.1 et seq. of the Livermore Airport Land Use Compatibility Plan, dated August 2012, in conjunction with citywide General Plan Noise Element policies. Evaluate potential noise impacts and recommend mitigation measures through discretionary review procedures such as environmental review, design review, and evaluation of use permits.

**Policy N-1.4 Downtown Noise Standards**

To support active uses in Downtown Livermore, apply separate noise standards to the Downtown Plan area than to the rest of the city.

**Table N-1. Interior and Exterior Noise Standards for Sensitive Uses**

Use	Land Use Category	Interior <sup>1</sup> (dBA CNEL)	Exterior <sup>2</sup> (dBA CNEL)
Residential	Low-Density, Single-Family,	45 <sup>3</sup>	60
	Multifamily, Duplex,	45 <sup>3</sup>	65
Institutional	School, Library, Church, Hospital, Nursing Home	45	65
Commercial	Transient Lodging, Hotels, Motels	45	70
	Office, Business, Professional, Retail	50	70
Open Space	Playground, Neighborhood Park	--	70
Industrial	Manufacturing, Utilities, R&D	--	75

Notes:

1. Interior areas, including, but not limited to, bedrooms, living rooms, dining rooms, private offices, and conference rooms.
2. Exterior areas shall be measured at: the property line of single-family homes, the common outdoor activity area of multifamily housing, park picnic areas, and/or school playgrounds.
3. Interior noise level requirements assume a closed-window condition. Mechanical ventilation system or other means of natural ventilation shall be provided, as necessary.

## Goal N-2

Minimize noise generated by mechanical and other noise-generating equipment.



### Policies

#### Policy N-2.1 Industrial and Commercial Noise

Require that industrial and commercial uses be designed and operated to avoid generating noise effects on surrounding sensitive land uses, as defined in **Table N-1**, from exceeding the following noise levels for exterior environments:

- 55 dBA Leq (7:00 a.m. to 10:00 p.m.)
- 45 dBA Leq (10:00 p.m. to 7:00 a.m.)

#### Policy N-2.2 Mechanical Noise Measurement Methodology

Industrial and commercial noise sources shall be measured at the property line of single-family uses and at the common outdoor activity area of multifamily uses. Noise measurements shall be conducted using A-weighted Equivalent Continuous Sound Level (dBA, Leq), as defined in this element.

#### Policy N-2.3 Noise Standard Exemptions

Allow exemptions to noise standards specified in Policy N-2.1 as specified in the Livermore Municipal Code Section 9.36.110, *Exceptions*.

## Goal N-3

Minimize noise levels from traffic, which is the single largest continual source of unacceptable noise in the city.



**Policies**

- Policy N-3.1 Noise Legislation**  
Support federal and State legislation to reduce noise levels from motor vehicles.
- Policy N-3.2 Traffic Noise**  
Design streets and traffic-control measures to minimize potential transportation noise. Consider reduced speed limits, improved paving texture, and traffic controls to reduce roadway noise to normally acceptable levels.
- Policy N-3.3 Truck Noise**  
Separate truck access routes from residential areas to the maximum feasible extent.
- Policy N-3.4 Transit Noise**  
Prior to construction or implementation of future transit systems, require project proponents to quantify noise levels and assess impacts generated by transit vehicle noise on existing development. In coordination with transit service providers, identify mitigation measures to ensure that existing developed areas are not subject to excessive noise levels above city standards from proposed transit improvements.
- Policy N-3.5 Bus Noise**  
Encourage the Livermore-Amador Valley Transit Authority to reduce bus noise through new vehicle technologies to reduce transportation noise.
- Policy N-3.6 Train Horn Noise Reduction**  
Explore strategies to reduce the impact of train horn noise on surrounding neighborhoods and sensitive land uses by studying feasible mitigation measures in coordination with rail operators and regulatory agencies.

## Goal N-4

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**Adopt design standards and identify effective noise attenuation measures to prevent or reduce noise to acceptable levels.**



**Policies****Policy N-4.1 Noise Mitigation**

When drafting mitigation measures for adverse noise exposure from new development, encourage the use of noise attenuation measures that avoid constructing sound walls, such as wider setbacks, building orientation, and construction methods such as double-pane windows and other noise insulation materials. Consider sound walls as a means of noise mitigation along proposed and existing roadway segments and railroad rights-of-way only after other noise attenuation programs, such as building construction, larger landscaped berms, and distances have been considered to reduce noise to appropriate levels in residential areas.

**Policy N-4.2 Acoustical Analysis**

New noise-sensitive land uses, as identified in **Table N-1**, proposed in areas where ambient noise levels exceed 65 dBA CNEL, shall be supported by a technical acoustical analysis prepared by a qualified acoustical engineer. The analysis shall identify appropriate noise mitigation measures to ensure interior and exterior noise levels are reduced to meet the standards in **Table N-1**.

**Policy N-4.3 Noise Control at the Source**

New development should minimize noise impacts through measures such as site layout, building design, landscaping, limits on hours of operation, and other effective techniques.

**Policy N-4.4 Construction Noise and Vibration**

During all phases of construction, minimize the exposure of neighboring properties to excessive noise and vibration levels from construction-related activity to meet acceptable levels, as established by the Federal Transit Administration or the City.

**Policy N-4.5 Airport Voluntary Noise Abatement**

Encourage voluntary compliance with noise abatement procedures, including the avoidance of nighttime operations between 10 p.m. and 6 a.m., particularly by jet aircraft.

**Policy N-4.6 Temporary Noise Sources**

Minimize noise impacts on surrounding areas for temporary land uses. The noise level from the temporary use should be in conformance with the noise level standards in **Table N-1** for nearby land uses to the extent feasible.

**Policy N-4.7 Groundborne Vibrations**

Reduce impacts from groundborne vibrations associated with rail operations by requiring that habitable buildings are sited at least 100 feet from the centerline of the tracks, whenever feasible. For habitable buildings within 100 feet from the centerline of railroad tracks, require applicants to provide a study demonstrating that groundborne vibration issues associated with rail operations adhere to Federal Transit Administration standards.

**Policy N-4.8 Vibration Study**

Require new projects that have the potential to generate substantial vibration to provide a vibration study to determine vibration levels due to operation, prior to approval of the project, when in close proximity to vibration-sensitive receptors, and, if levels are above applicable standards, include attenuation measures to reduce such vibration to adhere to applicable standards.



*Both freight trains and commuter trains along the UPRR tracks generate noise. Photo credit: Jim Maurer*

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