

2.2 PHYSICAL ENVIRONMENT

2.2.6 NOISE

This section discusses the noise environment and the existing land uses within the project area, and will examine the extent to which the project would increase noise levels within the project area and evaluate noise abatement measures at locations where post-project noise levels are predicted to exceed applicable noise standards.

REGULATORY SETTING

Federal and State

FHWA/Caltrans:

The criteria for evaluating noise impacts that are used by the Federal Highway Administration (FHWA) and Caltrans are contained in the Caltrans Traffic Noise Analysis Protocol (The Protocol), and the analysis methodology is described in the Technical Noise Supplement (TeNS).

The Protocol establishes Noise Abatement Criteria (NAC) for various land uses, which have been categorized based upon activity. Land uses are categorized on the basis of their sensitivity to noise. The NAC are cited below in **Table 2.2.6-1**.

TABLE 2.2.6-1
FEDERAL NOISE ABATEMENT CRITERIA [HOURLY A-WEIGHTED SOUND LEVEL--DECIBELS (dBA)]

| Activity Category | L _{eq} (h), dBA | Activity Category Description |
|-------------------|--------------------------|---|
| A | 57 (Exterior) | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 (Exterior) | Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. |
| C | 72 (Exterior) | Developed lands, properties, or activities not included in Categories A or B above. |
| D | --- | Undeveloped lands. |
| E | 52 (Interior) | Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums. |

Source: 23-CFR-772

Under FHWA regulations (23 CFR 772), noise abatement must be considered for Type 1 projects when the project results in a substantial noise increase or when the predicted noise levels approach or exceed the NAC in **Table 2.2.6-1**. Because this project involves the physical alteration of an existing highway that increases the number of through traffic lanes, it is considered a Type 1 project.

Local

City of Elk Grove General Plan

The City of Elk Grove Noise Element contains two policies, NO-5 and NO-6, which relate to noise from traffic sources. Policy NO-5 relates to noise from new transportation noise sources, and establishes a maximum allowable noise exposure of 60 dB L_{dn} /CNEL in outdoor activity areas of residential land uses, and a maximum allowable noise exposure of 45 dB L_{dn} /CNEL for interior spaces of residential land uses. The policy establishes that, where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} /CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} /CNEL may be allowed, provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with the 45 dB L_{dn} /CNEL standard.

Policy NO-6 relates to standards of significance, for purposes of CEQA, for noise increases resulting from improvements to existing roadways. The policy acknowledges that existing noise-sensitive receptors (such as residences) may be exposed to increased noise levels due to roadway improvement projects as a result of increased roadway capacity, increases in travel speeds, etc., and that it may not be practical to reduce increased traffic noise levels consistent with those described above in policy NO-5. Therefore, the City uses the following criteria to measure the impact of roadway improvement projects that are not directly tied to a development project:

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant under CEQA; and
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to a roadway improvement projects will be considered significant under CEQA; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in noise levels due to roadway improvement projects will be considered significant under CEQA.

The specific noise level standards for the land uses in the project vicinity are provided in **Table 2.2.6-2**.

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**TABLE 2.2.6-2
CITY OF ELK GROVE NOISE ELEMENT INTERIOR NOISE STANDARDS**

| Land Use Category | Acceptable Noise Level, dB |
|--|---|
| Residential Uses, Transient Lodging, Hospitals and Nursing Homes | 60 ¹ dB L _{dn} /CNEL Outside, 45 L _{dn} /CNEL Interior |
| Churches and Meeting Halls | 60 ¹ dB L _{dn} /CNEL Outside, 40 dB L _{eq} Interior |
| Offices, Schools, Libraries, and Museums | 45 L _{eq} Interior |

Source: City of Elk Grove General Plan Noise Element

¹ Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

City of Sacramento General Plan

The City of Sacramento Noise Element states that noise created by transportation sources shall not exceed 60 dB L_{dn} at backyards of residential uses. The specific noise level standards for the land uses in the project vicinity are provided in **Table 2.2.6-3**.

**TABLE 2.2.6-3
CITY OF SACRAMENTO NOISE ELEMENT NOISE STANDARDS**

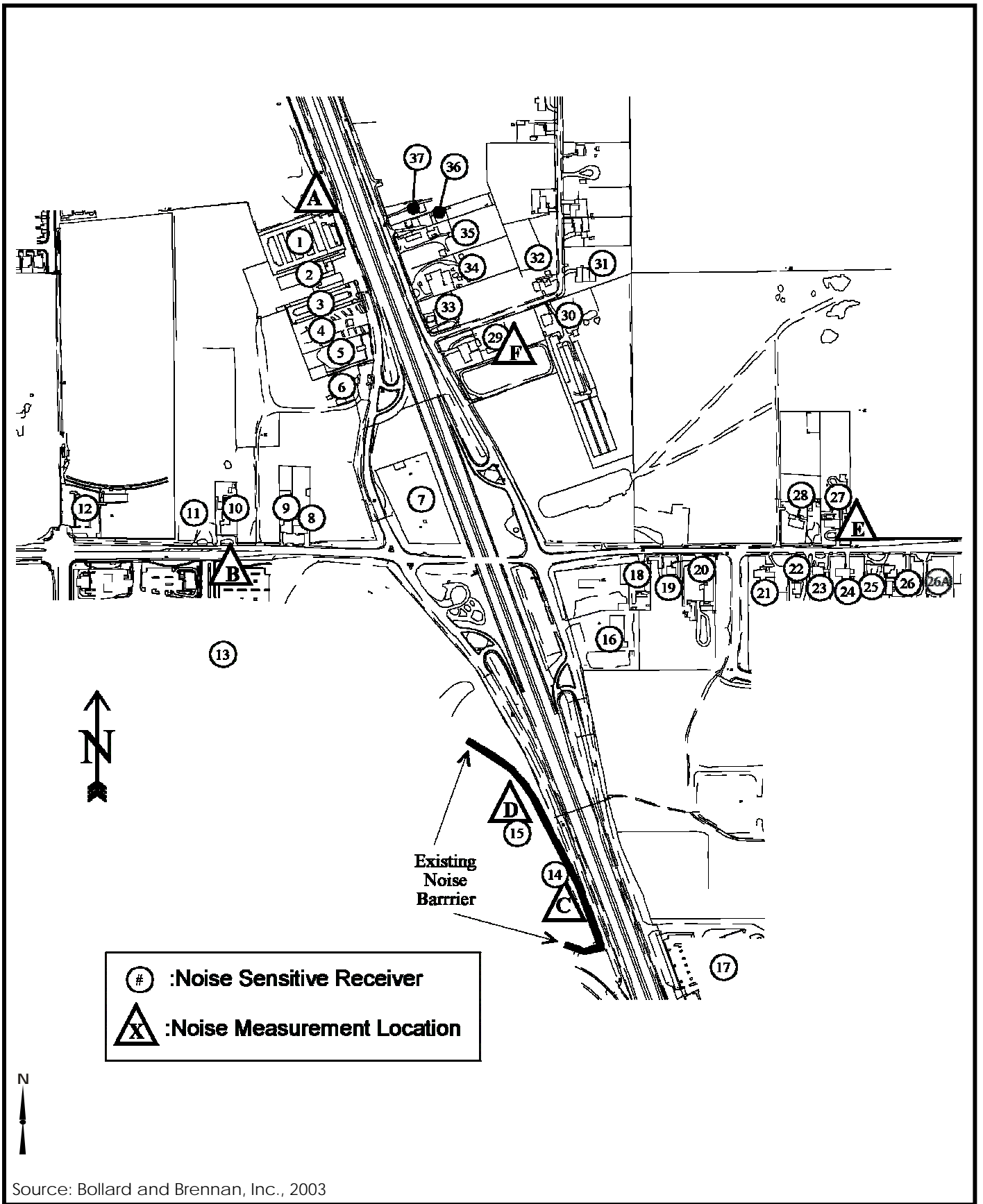
| Noise Source | Land Use | Applicable Area | | State Requirements | Noise Element Requirements |
|--|---------------------------|-----------------|----------|-------------------------|---|
| | | Interior | Exterior | | |
| Traffic or fixed source (Industrial, plants, etc.) | Single-Family | X | | None | L _{dn} ≤ 45 db ² |
| | Single-Family | | X | None | L _{dn} ≤ 60 db in backyards |
| | Multi-Family ¹ | X | | L _{dn} ≤ 45 db | L _{dn} ≤ 45 db |
| | Multi-Family | | X | None | L _{dn} < 60 db in common outdoor use areas |
| | Schools | X | | None | Noisiest hourly L _{dn} < 40 db during school day |
| | Schools | | X | None | L _{dn} < 60 db |
| | Libraries | X | | None | Noisiest hour L _{dn} < 45 db |
| | Libraries | | X | None | None |

¹ Multi-family includes hotel, motel, apartment houses, and dwellings other than detached single-family dwellings as defined by title 24, Part 2 California Administrative Code.

² The requirement for interior noise exposure is triggered when the exterior L_{dn} exceeds 60 dB.

AFFECTED ENVIRONMENT

Figure 2.2.6-1 shows the existing interchange configuration and the existing receptors located within the project study area. **Table 2.2.6-4** identifies the existing land uses, which are numbered in **Figure 2.2.6-1**.



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TABLE 2.2.6-4
EXISTING LAND USES IN SHELDON ROAD/SR 99 VICINITY

| Receptor Number | Type of Use |
|------------------------|----------------------------------|
| 1 | Commercial - Mini Storage |
| 2 | Commercial - Honda of Sacramento |
| 3 | Commercial- Mini Storage |
| 4 | Trailer Park |
| 5 | Commercial - Unknown Type |
| 6 | Commercial - SKM Market |
| 7 | Cemetery |
| 8 | Residence |
| 9 | Residence |
| 10 | Residence |
| 11 | Residence |
| 12 | Commercial - Golf Driving Range |
| 13 | Commercial - Winco Foods, Etc. |
| 14 | Residence |
| 15 | Residence |
| 16 | Commercial – Stockman’s Supply |
| 17 | Church |
| 18 | Commercial - Fence Company |
| 19 | Residence |
| 20 | Church |
| 21 | Residence |
| 22 | Residence |
| 23 | Residence |
| 24 | Residence |
| 25 | Residence |
| 26 | Residence |
| 26a | New Residences on cul-de-sac |
| 27 | Residence |
| 28 | Residence |
| 29 | Residence |
| 30 | Residence |
| 31 | Residence |

| Receptor Number | Type of Use |
|-----------------|-------------|
| 32 | Residence |
| 33 | Residence |
| 34 | Residence |
| 35 | Residence |
| 36 | Residence |
| 37 | Residence |

Note: Receptor locations are shown on Figure 2.2.6-1

Northwest Quadrant Receptors:

The existing land uses in the project study area vary. In the northwest quadrant, the existing uses consist mainly of commercial uses and a trailer park along West Stockton Boulevard, and a cemetery, a golf driving range, and four residences on Sheldon Road. Only the trailer park (receiver 4) and single-family residences (receivers 8-11) are identified as being sensitive to noise.

The trailer park (receiver 4) has direct access to West Stockton Boulevard, and SR 99 is partially shielded at this location due to its depressed position under the Sheldon Road overcrossing.

The Sheldon Road residences (receivers 8-11) are substantially removed from SR 99, and the back yards of these residences are generally shielded from view of Sheldon Road by the residences. The back yard areas are considered to be the primary outdoor activity areas. Access to these residences is via Sheldon Road.

Southwest Quadrant Receptors:

The existing receptors in the southwest quadrant of this project consist of new commercial uses (receiver 13) at the corner of Lewis Stein and Sheldon Road (Winco Foods, gas station, etc.), and a new single-family residential development (receivers 14-15).

The commercial development (receiver13) is not considered to be noise-sensitive. The new residential development (receivers 14-15) is considered to be noise sensitive. Receivers 14 & 15 are shielded by the existing property line noise barrier, which ranges in height from 2.4 to 3.6 meters (8-12 feet). This noise barrier was accounted for in the prediction of future noise levels at receivers 14 & 15.

Southeast Quadrant Receptors:

The existing receptors in the southeast quadrant of this project consist of two churches, two commercial uses, and seven existing single-family residences. The interior areas of the churches, as well as the interior and exterior areas of the residences are considered to be noise-sensitive.

The existing Stockman's Supply Company (receiver 16) will be removed under both design alternatives to accommodate the proposed northbound SR 99 off-ramp.

Receptor 18 is a fence company, which appears to be on the same Assessor's Parcel Number (APN) as Stockman's supply (receiver 16), and this use is not considered to be noise-sensitive.

The single-family residences (receivers 19, and 21-26), have access directly from Sheldon Road, and are setback varying distances from SR 99. The back yards of these residences are considered the primary outdoor activity areas, and these areas are generally protected from Sheldon Road by the residential structures.

Northeast Quadrant Receptors:

All of the identified receptors in the northeast quadrant are existing residences (receivers 27-37). These single-family residences have access from Sheldon Road, East Stockton Boulevard, and Bow Street, and have varying degrees of exposure to the local roadway noise. The back yards of each residence are considered the primary outdoor activity areas.

IMPACTS

Traffic Noise Prediction

To describe existing and projected traffic noise levels for this project, the SOUND2000 version of the FHWA traffic noise prediction model (RD-77-108) was used. The SOUND2000 model is an updated version of Sound 32, which was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and reports noise levels in L_{eq} . The SOUND2000 Model was used for comparison to the FHWA and Caltrans noise level criteria.

To predict L_{dn} values for assessment of noise impacts relative to City of Elk Grove/City of Sacramento noise criteria, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

No Build Alternative

Under the No Build alternative, noise increases resulting from the implementation and construction of the project, or the proposed realignment of East and West Stockton Boulevards, would not take place because the project would not be implemented.

Build Alternatives (2A and 3A) ImpactsPermanent Impacts*Existing and Future Noise Levels*

Table 2.2.6-5 shows existing L_{eq}/L_{dn} levels for all receptors in the project area, and the predicted future noise levels under both design alternatives.

**TABLE 2.2.6-5
EXISTING AND PREDICTED NOISE LEVELS**

| Receptor | Type of Use | NAC | Existing L_{eq} / L_{dn} ¹ | Future Alt. 2A ² | Future Alt. 3A ² | Impact Type ³ |
|----------|---------------------------------|--------|--|--------------------------------|--------------------------------|-----------------------------|
| 1 | Commercial – Mini Storage | C (72) | 75 | 77 | 76 | A/E |
| 2 | Commercial – Honda of Sacto | C (72) | 74 | 76 | 76 | A/E |
| 3 | Commercial- Mini Storage | C (72) | 74 | 76 | 76 | A/E |
| 4 | Trailer Park | B (67) | 74 | 75 | 75 | A/E |
| 5 | Commercial – Unknown Type | C (72) | 73 | 75 | 75 | A/E |
| 6 | Commercial – SKM Market | C (72) | 71 | 73 | 73 | A/E |
| 7 | Cemetery | C (72) | 68 | 70 | 70 | None |
| 8 | Residence | B (67) | 66 | 70 | 71 | A/E |
| 9 | Residence | B (67) | 66 | 70 | 70 | A/E |
| 10 | Residence | B (67) | 66 | 71 | 72 | A/E |
| 11 | Residence | B (67) | 64 | 69 | 70 | A/E |
| 12 | Commercial – Golf Driving Range | C (72) | 61 | 65 | 65 | None |
| 13 | Commercial – Winco Foods, Etc. | C (72) | 59 | 62 | 62 | None |
| 14 | Residences | B (67) | 64 | 65 | 65 | A/E |
| 15 | Residences | B (67) | 59 | 60 | 61 | None |
| 16 | Commercial – Stockman’s Supply | C (72) | | 66 | | To be Acquired |
| 17 | Church | B (67) | 69 | 70 | 70 | A/E |
| 18 | Commercial – Fence Company | C (72) | 68 | 72 | 72 | None |
| 19 | Residence | B (67) | 69 | 73 | 73 | A/E |
| 20 | Church | B (67) | 67 | 71 | 71 | A/E |
| 21 | Residence | B (67) | 66 | 70 | 70 | A/E |
| 22 | Residence | B (67) | 66 | 69 | 69 | A/E |
| 23 | Residence | B (67) | 67 | 70 | 70 | A/E |

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| Receptor | Type of Use | NAC | Existing L _{eq} / L _{dn} ¹ | Future Alt. 2A ² | Future Alt. 3A ² | Impact Type ³ |
|----------|----------------------------|--------|--|--------------------------------|--------------------------------|-----------------------------|
| 24 | Residence | B (67) | 67 | 70 | 70 | A/E |
| 25 | Residence | B (67) | 66 | 72 | 70 | A/E |
| 26 | Residence | B (67) | 63 | 67 | 67 | A/E |
| 26a | Residences on Alberton Pl. | B (67) | 57 | 61 | 61 | None |
| 27 | Residence | B (67) | 65 | 70 | 70 | A/E |
| 28 | Residence | B (67) | 65 | 70 | 70 | A/E |
| 29 | Residence | B (67) | 72 | 75 | 77 | A/E |
| 30 | Residence | B (67) | 64 | 66 | 66 | A/E |
| 31 | Residence | B (67) | 63 | 65 | 65 | A/E |
| 32 | Residence | B (67) | 64 | 66 | 66 | A/E |
| 33 | Residence | B (67) | 77 | 78 | 78 | A/E |
| 34 | Residence | B (67) | 74 | 77 | 77 | A/E |
| 35 | Residence | B (67) | 74 | 77 | 77 | A/E |
| 36 | Residence | B (67) | 73 | 75 | 75 | A/E |
| 37 | Residence | B (67) | 71 | 73 | 73 | A/E |

Notes:

¹ Receptor locations for existing scenario are shown on Figure 2.2.6-1

² Receptor locations for future scenarios are shown on Figures 2.2.6-2 and 2.2.6-3

³ Impact Type: S = Substantial Increase, A/E = Approach/Exceed NAC

The **Table 2.2.6-5** data indicate that traffic noise levels are predicted to vary, depending primarily on proximity to the roadways. In general, the predicted future plus project traffic noise levels are expected to exceed the Caltrans NAC at 30 locations within the project study area. These locations include Receptor Sites 1 through 6, 7 through 11, 14, 17, and 19 through 37. Receptor Sites 1 through 6 are primarily commercial uses, with one trailer park at Site 4. All remaining Receptor Sites are residences, with the exception of Sites 17 and 20, which are churches.

Although the noise levels increase due to the project is predicted to be relatively low due the preponderance of existing noise from SR 99, the predicted exceedance of the applicable NAC warranted consideration of noise abatement measures for this project. The noise mitigation measures considered for this project were determined to be infeasible and unreasonable under the Federal Highway Administrations and Caltrans criteria for the Traffic Noise Analysis Protocol (The Protocol).

Impact 2.2.6-1 The predicted future plus project traffic noise levels are expected to exceed the Caltrans NAC at 30 locations within the project study area.

MITIGATION MEASURES CONSIDERED

Abatement Feasibility and Reasonableness

For noise abatement to be implemented, it must be determined to be both feasible and reasonable. Noise abatement feasibility involves many engineering considerations. A minimum 5dBA noise reduction must be achieved to be considered feasible. However, feasibility may also be restricted by topography, access requirements, presence of local cross streets, other noise sources in the area, and safety considerations.

The Protocol states that that reasonableness of noise abatement considers: cost of the abatement, absolute noise levels, changes in noise levels, noise abatement benefits, development along the highway, life cycle of the proposed noise abatement, environmental impacts of the proposed noise abatement, opinions of impacted residents, input from the reviewing public agencies, and the social, economic, environmental, legal, and technological factors.

There are several properties in the project area with driveway openings onto Sheldon Road, and East and West Stockton Boulevards. At those locations, noise barriers were not considered to be feasible, because the gaps in the barriers required for those openings (and safe sight distances) would make it difficult to achieve a 5 dB traffic noise reduction from such barriers. As a result, the evaluation of the feasibility and reasonableness of noise barriers focused on those receptors at which noise barriers could be constructed to provide a 5 dB decrease in traffic noise.

Noise Abatement

The noise abatement measures considered for this project were determined to be infeasible and unreasonable under the Federal Highway Administrations and Caltrans criteria for the Traffic Noise Analysis Protocol.

Figures 2.2.6-2 and 2.2.6-3 show locations where noise barriers were considered feasible for this project under both build alternatives, as well as the receptors that may be shielded by those barriers. A summary of the noise barriers considered is contained below in **Table 2.2.6-6**.

TABLE 2.2.6-6
ANALYSIS OF NOISE BARRIERS

| Receptor | Type of Use | Future L_{eq}/L_{dn} | Barrier Analyzed | Barrier Number |
|----------|----------------------------|---------------------------|------------------|----------------|
| 1 | Commercial - Mini Storage | 76 | Yes | 1 |
| 2 | Commercial - Honda of Sac. | 76 | Yes | 1 |
| 3 | Commercial- Mini Storage | 76 | Yes | 1 |
| 4 | Trailer Park | 75 | Yes | 1 |
| 5 | Commercial - Unknown Type | 75 | Yes | 1 |
| 6 | Commercial - SKM Market | 73 | No ^a | None |
| 7 | Cemetery | 70 | Yes | 1 |

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| Receptor | Type of Use | Future L_{eq}/L_{dn} | Barrier Analyzed | Barrier Number |
|----------|--------------------------------|------------------------|------------------|----------------|
| 8 | Residence | 71 | No ^b | None |
| 9 | Residence | 70 | No ^b | None |
| 10 | Residence | 72 | No ^b | None |
| 11 | Residence | 70 | No ^b | None |
| 12 | Commercial - Driving Range | 65 | No ^a | None |
| 13 | Commercial - Winco Foods, Etc. | 62 | No ^a | None |
| 14 | Residential | 65 | No ^c | None |
| 15 | Residence | 61 | No ^a | None |
| 16 | Commercial – Stockman’s Supply | To be Acquired | | |
| 17 | Church | 70 | No ^c | None |
| 18 | Commercial - Fence Company | 72 | No ^a | None |
| 19 | Residence | 73 | No ^b | None |
| 20 | Church | 71 | No ^b | None |
| 21 | Residence | 70 | No ^b | None |
| 22 | Residence | 69 | No ^b | None |
| 23 | Residence | 70 | No ^b | None |
| 24 | Residence | 70 | No ^b | None |
| 25 | Residence | 72 | No ^b | None |
| 26 | Residence | 67 | No ^b | None |
| 26a | Residences on Alberton Pl. | 61 | No ^a | None |
| 27 | Residence | 70 | No ^b | None |
| 28 | Residence | 70 | No ^b | None |
| 29 | Residence | 77 | Yes | 2 |
| 30 | Residence | 66 | Yes | 2 |
| 31 | Residence | 65 | Yes | 2 |
| 32 | Residence | 66 | Yes | 2 |
| 33 | Residence | 78 | Yes | 2 |
| 34 | Residence | 77 | Yes | 2 |
| 35 | Residence | 77 | Yes | 2 |
| 36 | Residence | 75 | Yes | 2 |
| 37 | Residence | 73 | Yes | 2 |

Notes: No^a = Barrier not evaluated, since NAC criteria not approached or exceeded.

No^b = Barrier not evaluated since site access requirements would affect barrier performance (i.e. 5 dB attenuation not believed to be attainable).

No^c = The existing 12' barrier at this receiver was taken into account during modeling. It is not likely that a modification of the existing barrier would result in an additional 5 dB attenuation.

Table 2.2.6-7 shows the predicted noise levels and noise barrier insertion loss under Alternative 2A after mitigation at the locations where mitigation is considered feasible. **Table 2.2.6-8** shows the predicted noise levels and noise barrier insertion loss under Alternative 3A after mitigation at the locations where mitigation is considered feasible.

TABLE 2.2.6-7
PREDICTED NOISE LEVELS AND NOISE BARRIER INSERTION LOSS
SHELDON ROAD/SR 99 INTERCHANGE IMPROVEMENT PROJECT ALTERNATIVE 2A

| Receptor | Barrier Number | Predicted Leq without Soundwall ¹ | Alt. 2A | | | | | | | | | |
|----------|----------------|--|--|----------------|--|----------------|---|----------------|---|----------------|---|----------------|
| | | | With 1.8-meter (6-foot) Soundwall ² | | With 2.4-meter (8-foot) Soundwall ² | | With 3.0-meter (10-foot) Soundwall ² | | With 3.7-meter (12-foot) Soundwall ² | | With 4.3-meter (14-foot) Soundwall ² | |
| | | | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss |
| 1 | 1 | 77 | 74 | 3 | 73 | 4 | 72 | 5 | 71 | 6 | 70 | 7 |
| 2 | 1 | 76 | 73 | 3 | 72 | 4 | 71 | 5 | 70 | 6 | 69 | 7 |
| 3 | 1 | 76 | 73 | 3 | 72 | 4 | 71 | 5 | 70 | 6 | 69 | 7 |
| 4 | 1 | 75 | 72 | 3 | 71 | 4 | 70 | 5 | 69 | 6 | 69 | 6 |
| 5 | 1 | 75 | 72 | 3 | 72 | 3 | 71 | 4 | 70 | 5 | 69 | 6 |
| 6 | 1 | 73 | 71 | 2 | 70 | 3 | 69 | 4 | 68 | 5 | 67 | 6 |
| 7 | 1 | 70 | 70 | 0 | 69 | 1 | 69 | 1 | 69 | 1 | 69 | 1 |
| 29 | 2 | 75 | 73 | 2 | 72 | 3 | 72 | 3 | 72 | 3 | 71 | 4 |
| 30 | 2 | 66 | 66 | 0 | 65 | 1 | 65 | 1 | 64 | 2 | 64 | 2 |
| 31 | 2 | 65 | 64 | 1 | 64 | 1 | 63 | 2 | 63 | 2 | 63 | 2 |
| 32 | 2 | 66 | 66 | 0 | 65 | 1 | 65 | 1 | 64 | 2 | 64 | 2 |
| 33 | 2 | 78 | 78 | 0 | 78 | 0 | 78 | 0 | 78 | 0 | 78 | 0 |
| 34 | 2 | 77 | 75 | 2 | 74 | 3 | 73 | 4 | 73 | 4 | 73 | 4 |
| 35 | 2 | 77 | 74 | 3 | 73 | 4 | 73 | 4 | 72 | 5 | 72 | 5 |
| 36 | 2 | 75 | 72 | 3 | 71 | 4 | 71 | 4 | 70 | 5 | 69 | 6 |
| 37 | 2 | 73 | 71 | 2 | 70 | 3 | 70 | 3 | 69 | 4 | 68 | 5 |

Notes:

¹ Receptor locations for future scenarios are shown on Figure 2.2.6-1

² Noise barriers considered are shown on Figure 2.2.6-2

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**TABLE 2.2.6-8
PREDICTED NOISE LEVELS AND NOISE BARRIER INSERTION LOSS
SHELDON ROAD/SR 99 INTERCHANGE IMPROVEMENT PROJECT ALTERNATIVE 3A**

| Receptor | Barrier Number | Alt. 3A | | | | | | | | | | |
|----------|----------------|--|--|----------------|--|----------------|---|----------------|---|----------------|---|----------------|
| | | Predicted Leq without Soundwall ¹ | With 1.8-meter (6-foot) Soundwall ² | | With 2.4-meter (8-foot) Soundwall ² | | With 3.0-meter (10-foot) Soundwall ² | | With 3.7-meter (12-foot) Soundwall ² | | With 4.3-meter (14-foot) Soundwall ² | |
| | | | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss | Leq | Insertion Loss |
| 1 | 1 | 76 | 72 | 4 | 70 | 6 | 69 | 7 | 68 | 8 | 67 | 9 |
| 2 | 1 | 76 | 71 | 5 | 70 | 6 | 68 | 8 | 67 | 9 | 66 | 10 |
| 3 | 1 | 76 | 71 | 5 | 69 | 7 | 68 | 8 | 66 | 10 | 65 | 11 |
| 4 | 1 | 75 | 71 | 4 | 69 | 6 | 67 | 8 | 66 | 9 | 65 | 10 |
| 5 | 1 | 75 | 70 | 5 | 68 | 7 | 66 | 9 | 65 | 10 | 64 | 11 |
| 6 | 1 | 73 | 68 | 5 | 67 | 6 | 66 | 7 | 64 | 9 | 63 | 10 |
| 7 | 1 | 70 | 70 | 0 | 70 | 0 | 70 | 0 | 70 | 0 | 70 | 0 |
| 29 | 2 | 77 | 76 | 1 | 76 | 1 | 75 | 2 | 75 | 2 | 75 | 2 |
| 30 | 2 | 66 | 66 | 0 | 66 | 0 | 65 | 1 | 65 | 1 | 64 | 2 |
| 31 | 2 | 65 | 64 | 1 | 64 | 1 | 64 | 1 | 63 | 2 | 63 | 2 |
| 32 | 2 | 66 | 66 | 0 | 65 | 1 | 65 | 1 | 64 | 2 | 64 | 2 |
| 33 | 2 | 78 | 78 | 0 | 78 | 0 | 78 | 0 | 78 | 0 | 78 | 0 |
| 34 | 2 | 77 | 75 | 2 | 74 | 3 | 74 | 3 | 73 | 4 | 73 | 4 |
| 35 | 2 | 77 | 74 | 3 | 74 | 3 | 73 | 4 | 73 | 4 | 72 | 5 |
| 36 | 2 | 75 | 72 | 3 | 72 | 3 | 71 | 4 | 70 | 5 | 70 | 5 |
| 37 | 2 | 73 | 71 | 2 | 71 | 2 | 70 | 3 | 69 | 4 | 68 | 5 |

Notes:

¹ Receptor locations for future scenarios are shown on Figure 2.2.6-1

² Noise barriers considered are shown on Figure 2.2.6-3

Table 2.2.6-9 shows the analysis of reasonableness calculations performed of the two feasible soundwalls.

TABLE 2.2.6-9
REASONABLENESS OF FEASIBLE NOISE BARRIERS
HIGHWAY 99 / SHELDON ROAD INTERCHANGE IMPROVEMENT PROJECT
ALTERNATIVE 2A AND 3A

| Receptor | 2025 Leq | Required Barrier Height | Approx. Barrier Length | Approx. Barrier Cost \$ | Base Cost Allowance | Absolute Noise Level | Noise Increase | Barrier Noise Reduction | Receiver Pre-1978 | Reasonable Allowance Per Residence \$ | Allowance Greater than Barrier Cost? | Barrier Cost Reasonable? |
|----------|----------|-------------------------|------------------------|-------------------------|---------------------|----------------------|----------------|-------------------------|-------------------|---------------------------------------|--------------------------------------|--------------------------|
| 1 | 75 | 12' | 300' | 50K | 15K | 6K | 0K | 0K | 10k | 31K | N | N |
| 2 | 76 | 12' | 300' | 50K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 3 | 76 | 12' | 300' | 50K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 4 | 75 | 12' | 300' | 50K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 5 | 75 | 12' | 300' | 50K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 6 | 73 | 12' | 300' | 50K | 15K | 4K | 0K | 0K | 10K | 29K | N | N |
| 35 | 77 | 14' | 400' | 78K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 36 | 75 | 14' | 400' | 78K | 15K | 6K | 0K | 0K | 10K | 31K | N | N |
| 37 | 73 | 14' | 400' | 78K | 15K | 4K | 0K | 0K | 10K | 31K | N | N |

Notes:

- Year 2025 Leq predicted at identified outdoor activity area (OAA).
- According to Caltrans Protocol, barriers should intercept line of sight to 11.5 foot heavy truck exhaust stack height, and that 10 foot tall barriers are usually required to accomplish this.
- Barrier costs are based on the heights and lengths shown using Caltrans factor of \$14 per square foot of barrier.
- Base allowance and adjustments to base allowance are taken from Caltrans Protocol.
- Since the noise abatement costs would be well below 50% of the total project costs, the base allowances plus adjustments were used to derive the reasonable allowance per residence.
- If the estimated barrier costs exceed the reasonable allowances per residence, then the barriers are not considered to be cost effective.

Other Exterior Noise Abatement Options Considered

Other exterior noise abatement options were considered to reduce the project's potential noise impacts to sensitive receptors. Following is a discussion of the options considered, and the explanation of why they were not selected as abatement for potential project noise impacts.

Traffic Management Measures

Traffic management measures include traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations.

It is infeasible to implement traffic management measures on SR 99. Additionally, traffic management measures on Sheldon Road would be infeasible, due to the fact that Sheldon Road is, and will continue to be, a major roadway serving a large geographic area. Although limitations on truck usage and reductions of speeds could result in a noticeable decrease in traffic noise along this

2.2 PHYSICAL ENVIRONMENT

roadway corridor, the nature of this roadway is such that these restrictions would not be feasible for this project. (The reasons being that the roadway designation is such that trucks cannot be restricted from utilizing it and that the speed limits are based on standard formulas for setting safe vehicle speeds.) Therefore, this abatement alternative is not considered feasible for this project.

Alteration of Horizontal and Vertical Alignments

With the exception of the re-alignment of East and West Stockton Boulevards, and the creation of SR 99 access ramps, the project alternatives generally do not propose substantial shifts in either vertical or horizontal alignments of SR 99 or Sheldon Road. Because the project area noise environment is dominated by SR 99 and Sheldon Road, the noise generation of East and West Stockton Boulevards and the SR 99 access ramps is secondary. Because the alignments of SR 99 and Sheldon Road are, for all practical purposes, fixed, alterations to those alignments of the magnitude required to achieve an appreciable change in noise levels would be infeasible. With respect to East and West Stockton Boulevards, substantial shifts in the proposed alignments may result in reduced traffic noise levels at selected receptors, but could result in corresponding increases at others. Due to the general constraints associated with existing roadways and land uses in the project area, modifications to roadway alignments do not appear to be feasible noise mitigation options for this project.

Construction Impacts

During the construction phase of the project, noise from construction activities would increase the noise environment in the immediate area; however, the presence of SR 99 traffic is expected to remain the dominant noise source in the area. Activities involved in construction would generate noise levels ranging from 70 to 90 dB at a distance of 15 meters (50 feet). Construction activities would be temporary in nature, typically occurring during normal working hours.

Construction noise impacts could be substantial if nighttime operations or use of unusually noisy equipment were to occur, particularly if it results in annoyance or sleep disruption within residential areas. Due to the presence of constant elevated SR 99 traffic noise levels, such annoyance is not expected.

Construction noise is regulated by Caltrans standard specification Section 7-1.011 "Sound Control Requirements." These requirements state that noise levels generated during construction shall comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers specifications. The City of Elk Grove General Plan Policy NO-3, Action 1 limits construction activity to the hours of 7:00 a.m. to 7:00 p.m., whenever construction activity is adjacent to residential uses. Based on this, annoyance or sleep disruption from construction activities is not expected.

During the construction phase of the project, noise from construction activities would increase the noise environment in the immediate area. Activities involved in construction would generate noise levels ranging from 70 to 90 dB at a distance of 15 meters (50 feet). However, construction activities would be temporary in nature, typically occurring during normal working hours.

CEQA FINDINGS

Under CEQA, the proposed project would result in significant noise impacts if it would result in:

- A +5 dB L_{dn} increase in noise levels due to roadway improvement projects, where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses;
- A +3 dB L_{dn} increase in noise levels due to roadway improvement projects, where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses;
- A +1.5 dB L_{dn} increase in noise levels due to roadway improvement projects, where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses; or
- Annoyance or sleep disruption at residential areas during project construction activities.

Permanent Impacts

Implementation of the proposed project would result in an exceedance of the Caltrans NAC at 30 locations. No feasible abatement measures have been identified that would effectively reduce the projected noise impacts. Therefore increases to noise are a **significant and unavoidable impact**.

Construction Impacts

During construction, noise levels would temporarily be elevated in association with operation of heavy equipment. Because this impact would occur for a short duration and would not result in a permanent increase, it is considered **less than significant**.