Appendix G

Existing Noise and Vibrations Conditions Memorandum

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MEMORANDUM

15 April 2009

To: John Cook, Circlepoint
From: Deborah A. Jue, Wilson, Ihrig & Associates, Inc.

Subject: Existing Noise and Vibration Conditions – Specific Plan and Environmental Assessment for the Central Estuary Area, Oakland, California

This memorandum provides some preliminary information regarding existing noise and vibration conditions, applicable noise and vibration criteria and potential noise and vibration issues to consider for the Central Estuary analysis.

The Central Estuary Specific Plan is one component of the broader area Estuary Plan developed in 1999 to revitalize Oakland's image as a waterfront city. The Central Estuary study area extends from Embarcadero Cove to the MLK Regional Shoreline Park, and the existing conditions includes areas of industrial use (commercial, warehouse, industrial), retail (office, store, restaurant), residential and educational/school land use.

Existing Setting and Noise Sensitive Receptors
The area noise and vibration environment is characterized primarily as an urban or industrial environment, dominated by the nearby freeway corridor with some contributions from local industrial uses. The dominant noise sources are expected to be traffic on I-880, truck activity on local area arterials, freight railroad activity, and equipment and process noise from existing industrial uses. Other sources of noise in the area include occasional airplane flyovers from Oakland International Airport. The dominant vibration sources are expected to be truck activity on local area arterials and freight railroad activity.

Within the Project area, existing residential land use is primarily clustered within the Jingletown neighborhood, with some residences extending along I-880 south of Fruitvale Avenue and to the north, above 29th Avenue. There are also some residential lofts near the Beacon Day School (Dennison and Livingston areas. These areas of residential land use are shown in Figure 1, highlighted in yellow.

The recently completed Oakland General Plan and Noise Element (2005) indicates that the existing noise environment is likely to range from 65 Ldn (MLK Park) to 70 or greater, with the noise levels increasing with closer proximity to I-880. These noise contours have been reproduced in Figure 2, including an *estimated* contour for 75 Ldn. According to the City of Oakland's Land Use Compatibility Matrix, this exterior environment is thus as follows for residential land use:

- Conditionally Acceptable (60 to 70 Ldn)
- Normally Unacceptable (70 to 75 Ldn)
- Clearly Unacceptable (75 to 85 Ldn)

For school land use, the study area is

- Conditionally Acceptable (60 to 70 Ldn)
- Normally Unacceptable (70 to 80 Ldn)

For office and commercial land use:

- Normally Acceptable (≤ 65 Ldn)
- Conditionally Acceptable (65 to 75 Ldn)
- Normally Unacceptable (75 to 85 Ldn)

For industrial land use:

- Normally Acceptable (≤ 70 Ldn)
- Conditionally Acceptable (70 to 80 Ldn)

For playgrounds and parks:

- Normally Acceptable (≤ 65 Ldn)
- Conditionally Acceptable (65 to 75 Ldn)

With regard to land uses such as residential, school and office, the compatibility of such uses within the Conditionally Acceptable or Normally Unacceptable environments typically depends on the noise control provided by the building envelope. Readily available construction methods can control outdoor noise up to 70 Ldn. Special measures are probably required for outdoor noise up to 75 Ldn. Noise environments which exceed 75 Ldn can be very expensive to control, but a combination of building massing and strategic siting of residential land use could be used in the Project area. Outdoor areas such as parks and school yards can be protected from environmental noise by buildings or sound barriers in some cases.

Since the Noise Element only incorporates one noise measurement location at the northern border of the Project area, specific details regarding "micro environments" of noise and vibration have not been documented. In particular, existing buildings may already provide some shielding of the I-880 traffic noise, but noise generated by existing industrial land use is probably not well documented. Further, the Noise Element only uses the Ldn, which is suitable as a single descriptor of environmental noise for comparison across many different environments, however the effects of late-night/early-morning noises, particularly those of a short duration which have the potential to cause sleep disturbance, are not well studied through use of the Ldn alone. A noise and vibration survey will be conducted with a visual survey at selected locations to measure the existing noise and vibration environments and activities near the existing and expected future noise sources, and at the existing and potential future residential, school and other noise and vibration sensitive receptors. The specific measurement locations will be determined when additional information is available regarding Plan alternatives.

Local Regulations

The Noise Element of the Oakland General Plan (adopted 2005), includes various policies to maintain land use compatibility:

> **POLICY 1** Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses but also with their surrounding noise environment.

ACTION 1.1: Use the noise-land use compatibility matrix in conjunction with the noise contour maps (especially for roadway traffic) to evaluate the acceptability of residential and other proposed land uses and also the need for any mitigation or abatement measures to achieve the desired degree of acceptability.

ACTION 1.2: Continue using the City's zoning regulations and permit processes to limit the hours of operation of noise-producing activities which create conflicts with residential uses and to attach noise-abatement requirements to such activities.

ACTION 1.3: Continue working with the Alameda County Community Development Agency (in its role as the county's airport land use commission) and with the Port of Oakland to ensure consistency with the county's airport land-use plan of the city's various master-planning documents, zoning ordinance and land-use development proposals near Oakland's airport.

POLICY 2 Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.

ACTION 2.1: Review the various noise prohibitions and restrictions under the City's nuisance noise ordinance and revise the ordinance if necessary.

ACTION 2.2: As resources permit, increase enforcement of noise-related complaints and also of vehicle speed limits and of operational noise from cars, trucks and motorcycles.

ACTION 2.3: Encourage the Port of Oakland to continue promoting its noise abatement office and programs for Oakland International Airport.

POLICY 3 Reduce the community's exposure to noise by minimizing the noise levels that are received by Oakland residents and others in the City. (This policy addresses the reception of noise whereas Policy 2 addresses the generation of noise.)

ACTION 3.1: Continue to use the building-permit application process to enforce the California Noise Insulation Standards regulating the maximum allowable interior noise level in new multi-unit buildings.

ACTION 3.2: Review the City's noise performance standards and revise them as appropriate to be consistent with City Council policy.

The Oakland Noise Ordinance[1], addresses noise limit requirements for industrial land use, including noise from construction activities and mechanical equipment noise. These noise limits are summarized in Tables 1 and 2 below.

TABLE 1 CITY OF OAKLAND NOISE ORDINANCE – General Noise

Activity	Allowable Noise Level (dBA) at Receiving Land Use

[1] Oakland Municipal Code, Chapter 17.120.050 (Ord. 11895 § 7, 1996)

	Daytime (7 AM to 10 PM)	Nighttime(10 PM to 7 AM)
General Noise	Residential: 20 minutes/hour – 60 10 minutes – 65 5 minutes – 70 1 minutes – 75 0 minutes – 80	Residential: 20 minutes/hour – 45 10 minutes – 50 5 minutes – 55 1 minutes – 60 0 minutes – 65
Energy Equivalent for a time-varying sound	Leq 67	Leq 52
General Noise	Commercial: 20 minutes/hour – 65 10 minutes – 70 5 minutes – 75 1 minutes – 80 0 minutes – 85	
Energy Equivalent for a time-varying sound	Leq 72	
General Noise	Industrial: 20 minutes/hour – 70 10 minutes – 75 5 minutes – 80 1 minutes – 85 0 minutes – 90	
Energy Equivalent for a time-varying sound	Leq 77	

- Residential Air Conditioning Units and Refrigeration Systems. The exterior noise level associated with a residential air conditioning unit or refrigeration systems shall not exceed fifty (50) dBA, with the exception that systems installed prior to the effective date of this section shall not exceed fifty-five (55) dBA.
- Commercial Refrigeration Units. Stationary and mobile commercial refrigeration units shall not produce a noise level greater than the noise level standards set forth in this section. Between the hours of ten p.m. and seven a.m., a mobile refrigeration unit shall not be located within two hundred (200) feet of any residential zone boundary unless such unit is within an enclosure which reduces the noise level outside the enclosure to no more than sixty (60) dBA and reduces vibration to a level below the vibration perception threshold set forth in Section 17.120.060.
- Commercial Exhaust Systems. Unnecessary noise caused by exhaust from ventilation units, or other air control device shall not produce a noise level greater than the noise

level standards set forth in this section between the hours of ten p.m. and seven a.m. and shall not be located within two hundred (200) feet of any residential zone boundary unless such unit is within an enclosure which reduces the noise level outside the enclosure to no more than sixty (60) dBA and reduces vibration to a level below the vibration perception threshold set forth in Section 17.120.060.

TABLE 2 CITY OF OAKLAND NOISE ORDINANCE – Construction Noise (dBA)

Construction	**Weekdays** **7 Am to 7 PM**	**Weekends** **9 AM to 8 PM**
Construction (short-term)	Residential: 80 Commercial/Industrial: 85	Residential: 65 Commercial/Industrial: 70
Construction (long-term)	Residential: 65 Commercial/Industrial: 70	Residential: 55 Commercial/Industrial: 60

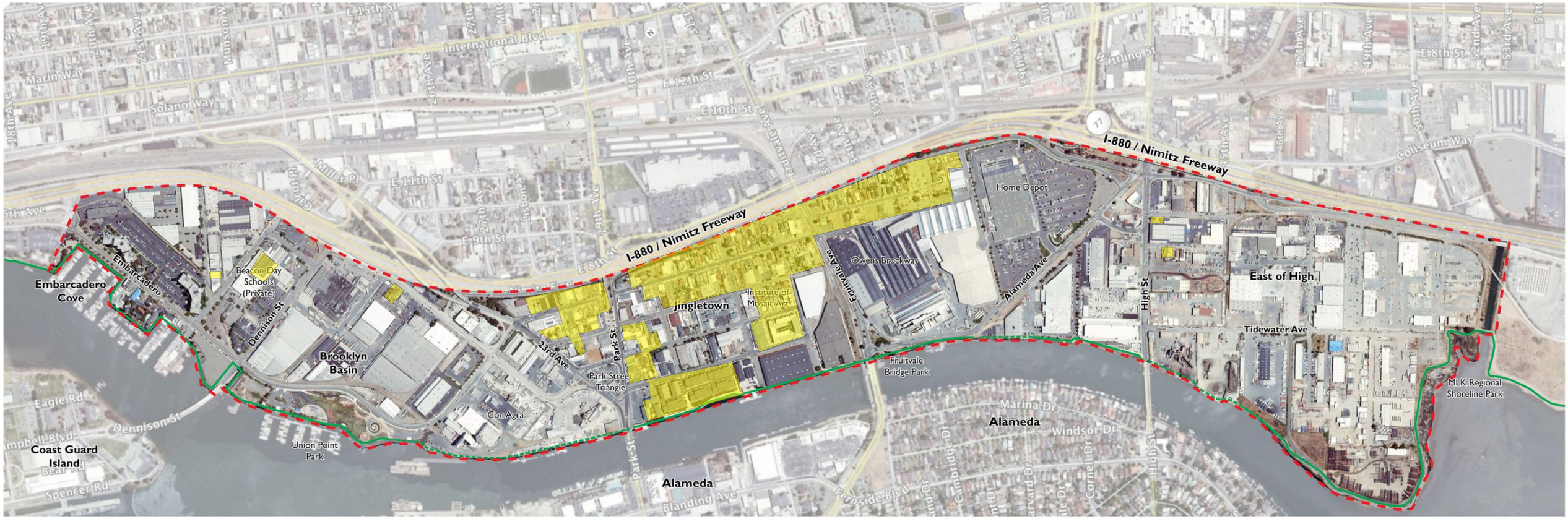
The Oakland Noise Ordinance also has a provision for vibration (Section 17.120.060):
All activities, except those located within the IG or M-40 zone, or in the IG or M-30 zone more than four hundred (400) feet from any residential zone boundary, shall be so operated as not to create a vibration which is perceptible without instruments by the average person at or beyond any lot line of the lot containing such activities. Ground vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard.
(Ord. 12875 § 2(part), 2008; Ord. 11895 § 8, 1996: prior planning code § 7711)

The noise levels in Table 1 are *exceedance* levels – in each hour, each level can be exceeded only for the number of minutes indicated in each hour. For time-varying noise, such as that from an industrial process, or loading/unloading of trucks, it is more useful to sum these exceedance levels to determine the equivalent energy noise level (Leq). The Leq and allowable number of minutes per noise are also shown in Table 1. Based on these Ordinance levels, the Ldn would thus be 66 Ldn from Residential land use, 79 Ldn from Commercial land use and 84 Ldn from Industrial land use. Thus, depending on the nature of the noise generated at commercial and industrial land uses, the zones of influence (e.g., distance to achieve noise levels of 66 Ldn) from existing commercial and industrial land use are shown in Figures 3 and 4, respectively. For most commercial and light industrial use, it has been assumed that the noise sources are primarily due to delivery trucks or activity 15 to 50 feet from the property line. For heavy industrial land use, it has been assumed that the noise sources are 15 to 100 feet from the property line.

Challenges and Constraints
Some constraints and challengers that should be addressed via Project alternatives include the following:

- Maintain at the same noise (and vibration) level or reduce the noise (and vibration) exposure at noise sensitive land uses (existing) such as residential, schools and medical facilities, etc.
- Maintain at the same noise level or reduce the noise generated by existing land use.
- Define buffer zones for existing noise (and vibration) generating facilities, assuming the current level of noise (and vibration) generation, or a reasonable assumption regarding future noise (and vibration) generation.

- For proposed land use changes (e.g., industrial or commercial to residential), the feasibility of such a rezoning will require
    - Appropriate (and feasible) noise (and vibration) control measures for the new uses within the rezoned area
    - Reasonable assumptions regarding the noise (and vibration) generated by existing and future tenants of the adjacent and nearby land uses
- Limit or prohibit the introduction of new noise (and vibration) sources near existing or proposed residential or sensitive land use.



Central Estuary Waterfront Specific Plan Area

- Plan Area Boundary
- Bay Trail (Existing)
- Bay Trail (Proposed Long-term Alignment)
- Existing Residential Areas

January 26, 2008

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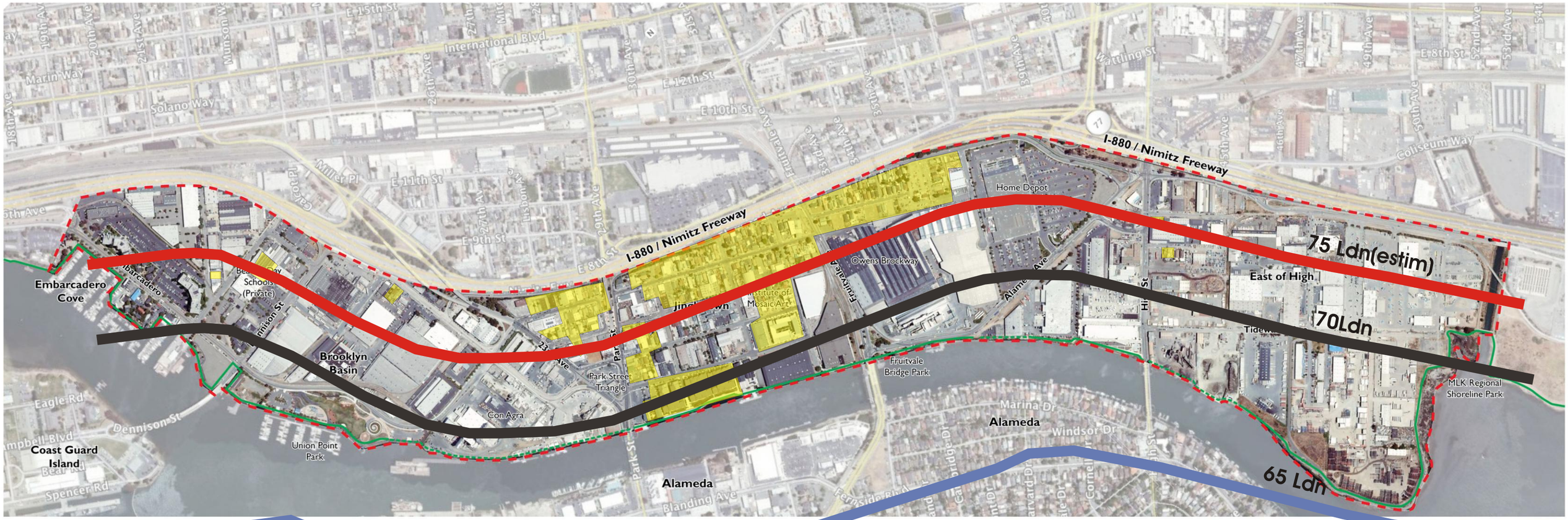
FIGURE 1



Central Estuary Waterfront Specific Plan Area

- Plan Area Boundary
- Bay Trail (Existing)
- Bay Trail (Proposed Long-term Alignment)
- Existing Residential Areas
- Traffic Noise - 75 Ldn (estimated)
- Traffic Noise - 70 Ldn
- Traffic Noise - 65 Ldn

January 26, 2008

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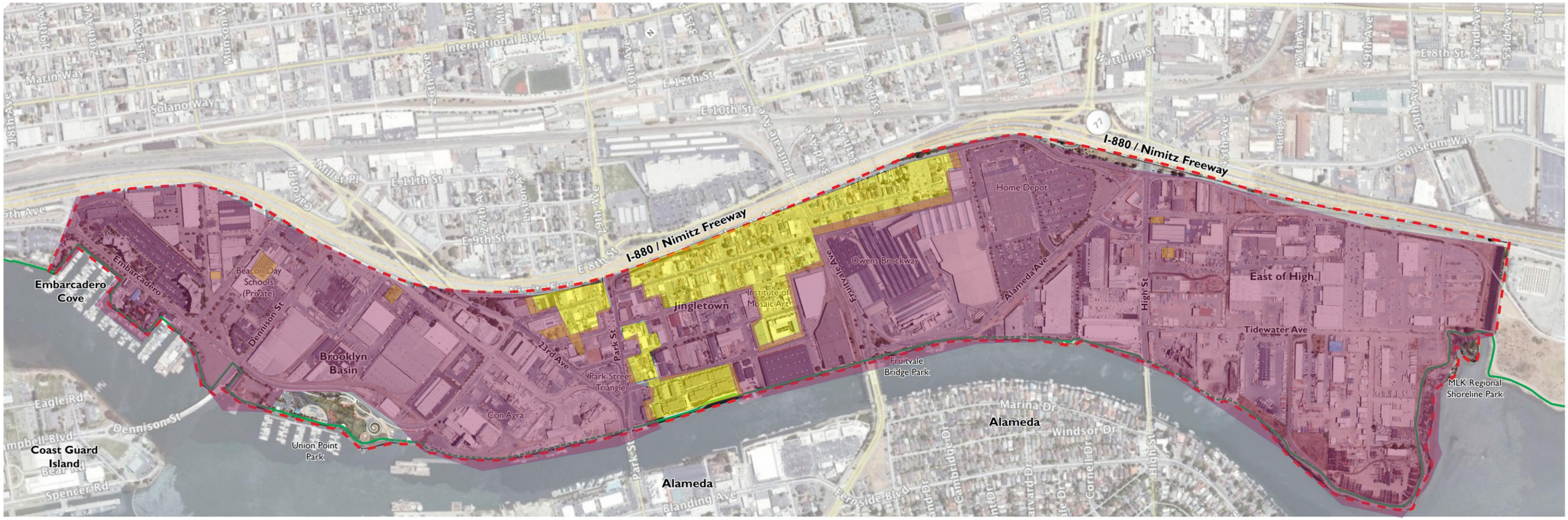
FIGURE 2



Central Estuary Waterfront Specific Plan Area

- Plan Area Boundary
- Bay Trail (Existing)
- Bay Trail (Proposed Long-term Alignment)
- Existing Residential Areas
- Zone of Influence, Commercial, Warehouse or Light Industrial - Existing Use

January 26, 2008

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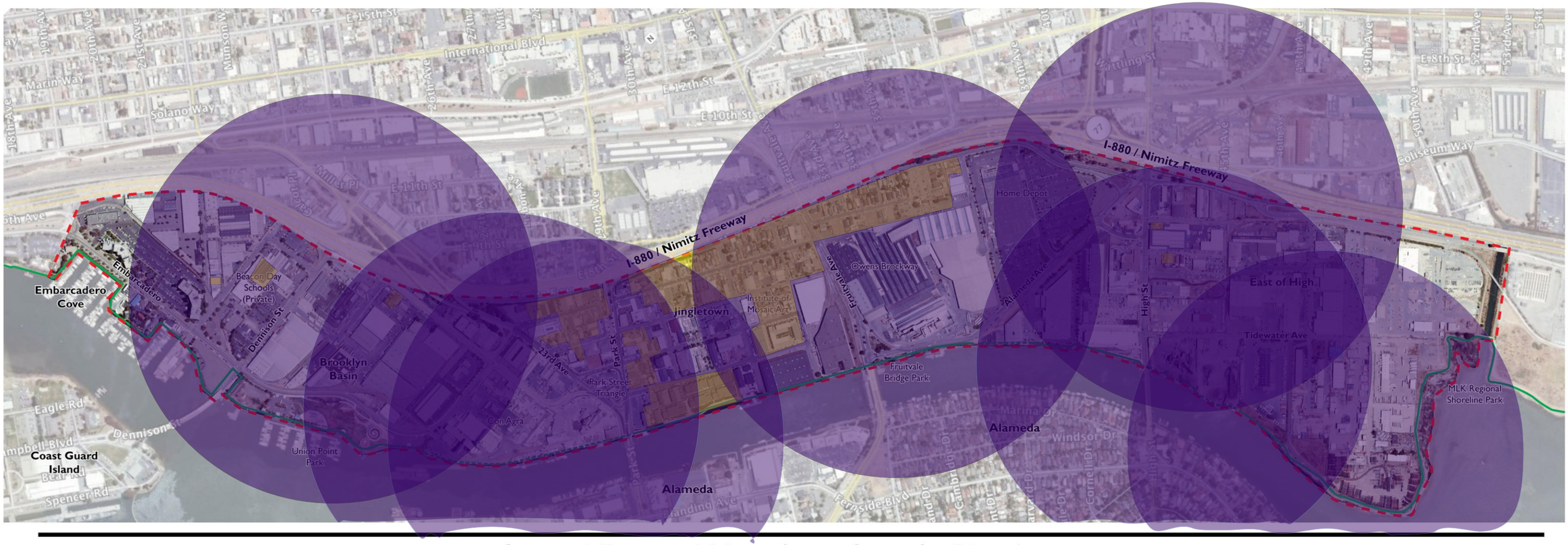
FIGURE 3



Central Estuary Waterfront Specific Plan Area

- Plan Area Boundary
- Bay Trail (Existing)
- Bay Trail (Proposed Long-term Alignment)
- Existing Residential Areas
- Zone of Influence, Heavy Industria - Existing Usel

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FIGURE 4