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September 12, 2008

Mr. Charlie Knox
Community Development Manager
Community Development Department
City of Benicia
250 East L Street
Benicia, CA 94510

Re: Addendum to Final Environmental Impact Report
Benicia Business Park
Comments by Benicia Unified School District
Our File No.: 1375.10308

Dear Mr. Knox:

The Benicia Unified School District ("District") has asked this office to provide the District's comments to the Addendum to the Final Environmental Impact Report ("Addendum" and "FEIR", respectively) for the proposed Benicia Business Park ("BBP") in the City of Benicia ("City"). The Addendum was prepared to analyze the environmental impacts of the changes proposed by the project sponsor (the "Mitigated Project") in contrast to the 2007 project ("2007 Project") that was analyzed in the FEIR.

GENERAL OBSERVATIONS

The District is concerned with the following issues that it has previously brought to the City's attention, which remain unaddressed in the Addendum. Additionally, the District raises issues that should have been addressed in the Addendum but were not:

- The District has previously communicated to the City its concerns regarding the BBP project. In or about March 4, 2007, Dirk Fulton, on behalf of the Board of Trustees provided extensive comments on the impacts to the District. We reiterate those comments and provide an additional copy of that correspondence. The District believes that these issues have not been properly addressed in the FEIR or the Addendum.

- The Mitigated Project's impact on air quality for the District's students and staff in general, and most particularly those attending at working at the Robert Semple Elementary School ("Semple School"), 2015 East Third Street, Benicia, was not addressed in the Addendum.

- The proposed traffic calming measures and the potential impacts of the increased vehicular traffic created by the Mitigated Project, although reduced from the 2007 Project, remain at a significant threshold for the students and staff at Semple School and have not been addressed in any meaningful way in the Addendum. The District will provide more extensive comments on the traffic safety issues presented by the BBP in separate correspondence.

- The Mitigated Project's impact of increased noise level at Semple School was not addressed in the Addendum and as a result, it is unclear as to whether the City is asserting that the Mitigated Project no longer has noise level impacts at this location.

- The FEIR and the Addendum conclude that the Mitigated Project's impacts have been reduced to a less than significant level based in part on vaguely defined site uses. The generalized approach in the FEIR and the Addendum, which is appropriate for a "program" or "tiered" EIR, is inadequate for a project EIR. These documents do not rise to the level of analysis required under CEQA for a project EIR. Since there has been inadequate analysis of a "project" and its impacts, there cannot be defensible conclusions as to whether mitigation of impacts has been achieved until specific project data is available.

COMMENTS ON SPECIFIC SECTIONS OF THE ADDENDUM

A. The Addendum fails to analyze the cumulative impacts of increased vehicle traffic on air quality at Semple School. (Addendum Section 8.)

1. Section 8 c. Toxic Air Contaminants. The Addendum reaches the conclusion that no new sources of toxic air contaminants will be present as a result of the Mitigated Project. No evidence is provided by which this conclusion is reached. The District requests that this issue be addressed in a more comprehensive manner.

2. Section 8 d. Operational Emissions – CO Analysis. The Addendum concludes that since the Mitigated Project contains fewer square feet of industrial development that it will be expected to produce less CO and

not contribute cumulatively to CO concentrations. There is no reduction in the square footage of commercial development and the fact that the mix of industrial and commercial occupants has not been determined precludes the conclusion that less CO will be produced.

The District again provides the City a copy of the "Traffic–Related Air Pollution Near Busy Roads Study" (May 31, 2004), attached to the letter from Dirk Fulton, which indicates that children attending schools that are located within 500 feet of a road with more than 25,000 cars will suffer a 7% increase in respiratory problems associated with asthma and asthma precursor type symptoms. (American Thoracic Society, Traffic-related Air Pollution near Busy Roads (2004) American Journal of Respiratory and Critical Care Medicine, Vol. 170, pp. 520-526.)

The District reiterates its request, made March 9, 2007, for long term health assessments to ensure student health is maintained and not negatively impacted while attending Semple School.

3. Section 8 e. Demolition and Construction Emissions. The Addendum concludes that due to the lesser amount of grading (from 9 million cubic yards down to 4 million cubic yards of grading) proposed under the Mitigated Project that construction-period air quality impacts would be reduced to a less than significant level.

   The District asserts that stating that the reduction in size of the project in conjunction with the implementation of the mitigation measures is not sufficient analysis to support the conclusion reached in the Addendum.

4. Section 8 f. Long-term Emissions Impacts. The Addendum concludes that the Mitigated Project's size, not its design features, results in significant unavoidable emissions of ozone precursors.

   The District requests that the City refrain from certifying the Addendum based on the finding made in the FEIR that there will be a significant and unavoidable impact to the regional air quality. The FEIR states that "the potential [is small] for an individual project to significantly deteriorate regional air quality or contribute to significant health risk…" (FEIR at 269.) However, the Addendum states that it is the project's size that is the reason for its result in "significant unavoidable emissions of ozone precursors." (Addendum at 39.) The Addendum, in essence, contradicts the FEIR's finding that it is unlikely that regional air quality or health risk would worsen from the current condition due to emissions from an individual project. (FEIR at 269.) That statement is not analyzed in the FEIR and no supporting documentation is provided. While the

Addendum reaches the same result (approval of the Mitigated Project) as the FEIR does for the 2007 Project, the Addendum makes a contradictory assertion. The similarity between the two environmental documents is that neither contains appropriate analysis to support the conclusion reached.

B. The Addendum fails to analyze the impacts of increased noise on the learning environment at the Semple School. (Addendum Section 9.)

1. Section 9 c. Construction Period Impacts. The Addendum reaches the conclusion that the Mitigated Project will result in similar construction period noise impacts as would the 2007 Project. The FEIR has determined that the 2007 Project could have a significant impact for a short term along 2nd Street.

   The District reiterates its previous request (March 9, 2007) that further analysis of potential noise is conducted and that all proposed mitigations be required of the project sponsor.

2. Section 9 d. Operation Impacts. The Addendum concludes without analysis that the reduction in the size of the Mitigated Project and the implementation of Mitigation Measure NOI-2a, 2b, and 2c will ensure that noise impacts are reduced to a less than significant level. The Addendum acknowledges this while stating that transportation modeling data was unavailable at the time the Addendum was written. The District asserts that the Addendum, like the FEIR before it, has failed to properly analyze the cumulative impacts of the increased traffic noise on the students and staff at Semple School.

   The proposed Mitigation Measures (FEIR at 285), for the siting of a hotel with proposed outdoor activity (FEIR at 284) may be minimally adequate for a hotel however, the District believes that additional noise mitigation measures may be necessary for students and staff at the Semple School. The proposed and minimally acceptable mitigation measures include construction of a noise barrier, sound wall or sound wall/berm combination around all outdoor activity areas (FEIR at 285). Further, the City standards for "office/industrial facilities with areas that require good speech intelligibility… must be constructed to maintain an interior noise level of 45 dBA CNEL." (FEIR at 285.) To achieve this interior noise level, installation of noise-attenuated ventilation systems should be required of the project applicant to attain mitigation of the impacts of the Mitigated Project on the students and staff at Semple School.

The FEIR acknowledges that the City's General Plan prohibits noise levels in excess of 65dBA CNEL for schools (among other uses). However, no measurement is made of the location of the Semple School despite being recognized as a sensitive receptor under the General Plan. The Addendum concludes, without analysis, that implementation of the four-part Mitigation Measure will ensure that the Semple School is not negatively impacted by the increase in noise from vehicular traffic.

C. FEIR and Addendum include elements of a Program EIR while reaching conclusions as a Project EIR.

1. The CEQA Guidelines define a "program" as "a series of actions that can be characterized as one large project" and related, in pertinent part and applicable here, geographically and as logical parts in the chain of contemplated actions. (CEQA Guidelines, § 15168, subd. (a).) A program EIR is intended to be supplemented with later, more specific, detailed analysis.

    a. The District asserts that the City has not made clear whether the FEIR is intended to be a program EIR or a project EIR and as a result fails to provide the reader with sufficient information with which to read and evaluate the document.

    b. Several examples of ambiguous nature of the analysis in the Addendum are: 1) the variety of types and sizes of specific land uses that are assumed for inclusion in the Mitigated Project (Addendum at 6); 2) the lack of specific site plans for the proposed 857,000 square feet of commercial and industrial construction (Addendum at 7); and, 3) infrastructure, such as interior streets, that would not be connected until final phase of development adjacent to the road (Addendum at 9-10).

    c. CEQA Guidelines, § 15168, subd. (c)(5), states that "A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible."

2. CEQA Guidelines, §15378, subd.(c) states that the term "project" refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. Based on this, it is unclear exactly what has been approved by the City due to the

vague nature of the uses proposed and the wide-ranging possible uses that could be constructed within the BBP. Therefore, the District must reiterate its prior comments as to the lack of in-depth analysis of the impacts of noise, air pollution, and traffic on the students and staff at the Semple School.

D. Conclusion

For the foregoing reasons, we believe that the FEIR and the Addendum have failed to meet the requirements of CEQA in that they have not properly considered the impacts of the BBP on the students and staff of the District and in particular, the Semple School. In addition, the FEIR and the Addendum fail to provide adequate mitigation for the impacts on an elementary school, which is recognized as a sensitive receptor to both noise and air pollutants.

Very truly yours,

MILLER BROWN & DANNIS

Mark W. Kelley

Enclosure

cc: Board of Trustees, Benicia Unified School District
Elizabeth Patterson, Mayor, City of Benicia

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Letter A7

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March 9, 2007

Mr. Charles Knox
Planning Director
City of Benicia
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Benicia, CA 94510

Re: Comments on Draft EIR for Seeno Project @ E. 2nd Street and Lake Herman Road (the "Project") –

Dear Mr. Knox,

I write as President of the Board of Trustees for the Benicia Unified School District ("BUSD") in connection with the Project as referenced above.

This letter addresses several student and community health safety issues raised by the draft Environmental Impact Report ("EIR") for the Project. These health and safety concerns are as follows:

Traffic-Generated Air Pollution. The EIR shows that 35% of the traffic generated by the Project will use E. 2nd Street, which abuts the Robert Semple Elementary School Health effects of traffic-generated air pollution are not thoroughly reviewed in the EIR (pages 265-268). This is so despite the fact that traffic flows on East 2nd Street greatly increase from 11,100 existing ADT to 37,900 ADT at build-out (See EIR Appendix D). The attached health study ("Traffic-Related Air Pollution Near Busy Roads" – see Attachment) shows that children attending schools that are located within 500 feet of a road carrying more than 25,000 cars will suffer a 7% increase in respiratory problems associated to asthma and asthma precursor type symptoms. Lung development in children who show no acute symptoms or respiratory distress can also be affected, with chronic daily exposure to such high levels of air pollutants: PM 2.5 and PM 10, e.g., tiny particle material tailpipe emissions, especially diesel, that can penetrate lung tissue. 1

Such impacts will directly and immediately affect our young elementary students playing on fields and working in classrooms. These impacts are material and possibly unmitigaiable. Extensive long term health assessments are needed to assure student safety.

Traffic Control Issues. During the peak commute hours for the Project, BUSD parents will be dropping-off and delivering their children to and from Robert Semple. The Project, by itself, will generate 2,300 new trips during the morning school "drop-off" 2

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hour. (See EIR Figure IV 6-7). Yet, no changes are proposed for the intersections at East Second Street and merging arterials of Hillcrest, Seaview, East Tennys and Rankin Way. This adverse and potentially dangerous situation also occurs during the afternoon "pick-up" hour. Accordingly, further traffic studies are needed to guarantee that our safe routes to school are maintained. 2 cont.

Noise Impacts. Robert Semple is already impacted from noise by the 55,000 cars per day on I-780 and the existing 11,000 on East 2nd Street. No mitigations are proposed to protect the children from additional noise generated by this Project (EIR pages 279-282.). Noise studies and mitigations are required to protect the Robert Semple School site as a safe learning community. 3

Cumulative Impacts. The Project presents significant and material cumulative environmental impacts as to Robert Semple and the health and safety of its students. The school is fronted by I-780 (55,000 ADT) and is within ¼ mile of the Benicia Valero Refinery. Neither the air quality impacts of the adjacent freeway or of the refinery have ever been adequately studied by any government entity, including the City of Benicia. In combination with the impacts of the Project, these cumulative air, noise, and general safety impacts are weighty. Such impacts must be closely studied over extensive time periods to determine whether or not said impacts may be mitigated. Only then can the community be assured that the health of our children will remain protected. 4

Thank you for the opportunity to provide these comments. I look forward to your detailed response.

Very truly yours,

Dirk A. Fulton, President
Benicia Unified School District

DAF:bt

Letter
A7
cont.

ATTACHMENT

Traffic-related Air Pollution near Busy Roads

The East Bay Children's Respiratory Health Study

Janice J. Kim, Svetlana Smorodinsky, Michael Lipsett, Brett C. Singer, Alfred T. Hodgson, and Bart Ostro

Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, Oakland; and Atmospheric Sciences Department and Indoor Environment Department, Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, California

Recent studies, primarily in Europe, have reported associations between respiratory symptoms and residential proximity to traffic; however, few have measured traffic pollutants or provided information about local air quality. We conducted a school-based, cross-sectional study in the San Francisco Bay Area in 2001. Information on current bronchitis symptoms and asthma, home environment, and demographics was obtained by parental questionnaire ($n = 1,109$). Concentrations of traffic pollutants (particulate matter, black carbon, total nitrogen oxides [NO_X], and nitrogen dioxide [NO_2]) were measured at 10 school sites during several seasons. Although pollutant concentrations were relatively low, we observed differences in concentrations between schools nearby versus those more distant (or upwind) from major roads. Using a two-stage multiple-logistic regression model, we found associations between respiratory symptoms and traffic-related pollutants. Among those living at their current residence for at least 1 year, the adjusted odds ratio for asthma in relationship to an interquartile difference in NO_X was 1.07 (95% confidence interval, 1.00–1.14). Thus, we found spatial variability in traffic pollutants and associated differences in respiratory symptoms in a region with good air quality. Our findings support the hypothesis that traffic-related pollution is associated with respiratory symptoms in children.

Keywords: air pollution; asthma; bronchitis; epidemiology; vehicle emissions

Numerous epidemiologic studies have documented adverse effects of air pollution on health (1). The majority of these population-based studies have used pollutant concentrations measured at central monitoring sites to estimate exposures and have not, in general, considered local spatial variability in pollutant levels. However, motor vehicle emissions, the principal source of ambient air pollution in most urban areas, are likely to vary substantially within a given community, and researchers have begun to document differences in traffic-related pollutants on a neighborhood scale (2, 3).

Recently, a number of epidemiologic studies have reported associations between residential proximity to busy roads and a variety of adverse respiratory health outcomes in children, including respiratory symptoms, asthma exacerbations, and decrements in lung function (4–12). In some reports, truck traffic has been more strongly associated with these adverse outcomes than total vehicular traffic (6, 7, 10, 11).

Most studies have used metrics of proximity to traffic as surrogates of exposure to traffic pollution (e.g., residential proximity to major roads, traffic volume at the nearest road, or modeled levels of traffic pollution). Few have measured pollutant concentrations as part of the exposure assessment or provided information on local air quality (7, 10–12). The majority of studies have been conducted in Europe and Japan, where fleet composition (diesel versus gasoline), emissions factors, fuel specifications, land use, and population distributions near busy roads differ from those in the United States. Regional and microenvironmental concentrations of particulate matter (PM) may be higher in European cities compared with many parts of the United States (13). Therefore, it is important to evaluate the extent to which proximity to traffic may be associated with health impacts in the United States. Previous studies in the United States were conducted in areas of Southern California and the Northeast with significant local air-quality problems; both used metrics of proximity to traffic, not measured pollutant concentrations (8, 14).

The objective of this study was to explore associations between respiratory symptoms and exposures to traffic-related air pollutants among children living and attending schools near busy roads in an urban area with high traffic density but good regional air quality. Some of the results of this study have been previously reported in the form of abstracts (15).

METHODS

Study Design and Health Assessment

We conducted a school-based, cross-sectional study in the San Francisco metropolitan area (Alameda County, CA) in 2001. The study area was comprised of 10 neighborhoods that span a busy traffic corridor. School sites were selected to represent a range of locations upwind and downwind of major roads (Figure 1).

In spring 2001, we enrolled children (grades 3–5) in participating classes ($n = 64$) using methods similar to those used in other school-based studies (16–18). We obtained information on health outcomes (bronchitis symptoms in the past 12 months and physician-confirmed asthma in the past 12 months), demographics, home environmental factors, and activity factors using parental questionnaires (English and Spanish) (for additional information on the study design and health assessment, *see the online supplement*). The study protocol was approved by the Committee for the Protection of Human Subjects, California Health and Human Services Agency.

Air Pollution from Traffic

We measured concentrations of traffic pollutants (particulate matter [PM_{10}, $PM_{2.5}$], black carbon [BC], total nitrogen oxides [NO_X], and nitrogen dioxide [NO_2]) at the school sites. PM_{10} and $PM_{2.5}$ mass concentrations were measured using filter-based samples, whereas BC concentrations were determined on the PM_{10} filter samples using an established light attenuation method that we validated for fiberfilm filters (19, 20). NO_X and NO_2 concentrations were determined with passive diffusion samplers (Ogawa, Inc., Pompano Beach, FL). Nitric oxide (NO) concentrations were calculated as the difference between NO_X and NO_2.

Pollutant monitoring was conducted simultaneously at all school sites for 11 1-week intervals in the spring (March–June) and for 8 weeks

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This article has an online supplement, which is accessible from this issue's table of contents online at www.atsjournals.org

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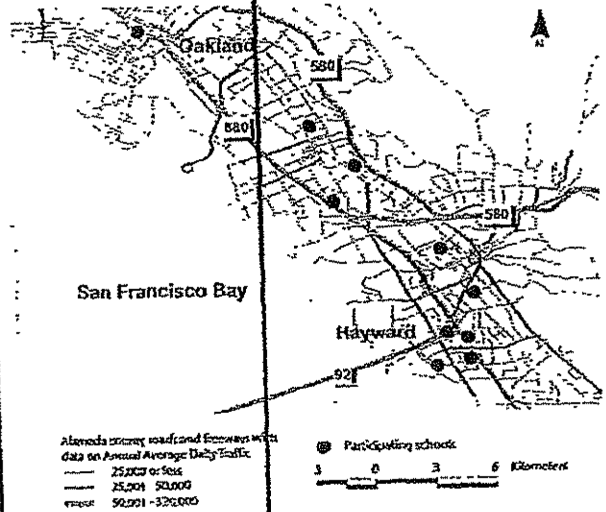

Figure 1. East Bay Children's Respiratory Health Study area. The study region is to the east and across the bay from the city of San Francisco.

in the fall (September–November) of 2001. NO_X and NO_2 were sampled during all weeks at each school. PM_{10} and $PM_{2.5}$ and the BC concentrations were not measured every week. Study-averaged air pollution concentrations were calculated at each school by first normalizing the data to account for occasional missing values. Additional details are described in the online supplement and elsewhere (21). In preliminary analyses, we also used school location in relationship to prevailing winds and proximity to busy roads as an additional traffic metric.

Data Analysis

We examined associations between pollutants and health outcomes using a two-stage hierarchical modeling strategy. This method has been used in other epidemiologic studies of air pollution when pollutants were measured at the group level (18, 22). In our study, the exposure groups were represented by the neighborhood schools. In the first stage, we initially identified potential confounders (demographic, host, or home environmental variables) associated with health outcomes in this dataset. We then performed exploratory stepwise logistic regressions to develop a model in which individual-level characteristics best predicted the odds of each health outcome. Explanatory variables that remained significant at $p < 0.15$ were retained in the model. We then fit a logistic regression model that included an indicator variable for each school in addition to the individual-level covariates.

In the second stage, the adjusted school-level logits or prevalence rates determined in the first stage were regressed on the school-specific ambient pollutant concentrations. In this manner, we obtained the log odds ratios (ORs) relating asthma or bronchitis symptoms to air pollution, after adjusting for individual-level risk factors.

We calculated adjusted ORs for a change in measured pollutant concentration equal to the interquartile ranges of the pollutant distributions. Analyses were conducted using SAS version 8.2 for Windows (Cary, NC) and STATA, version 8 (College Park, TX).

RESULTS

We distributed 1,574 questionnaires in 64 participating classrooms in the 10 schools. Three children were excluded because their parents spoke neither English nor Spanish. Among the remaining students, there was a response rate of 70.7% (1,111/1,571). Participation rates across schools ranged from 61–83%. Approximately 30% completed the questionnaire in Spanish. Two children with reported cystic fibrosis were excluded from the analysis. The final analysis sample consisted of 1,109 questionnaires.

Table 1 summarizes the participants' demographic characteristics, prevalence of selected personal and home environmental characteristics, and respiratory health outcomes. Our study population was racially diverse. Approximately 30% of households had incomes below the federal poverty line. Fourteen percent of the parental respondents reported having been told by a doctor that their child had asthma in the preceding 12 months. This represents a measure of period prevalence of asthma and would include some incident cases. Twelve percent of children had bronchitis symptoms in the past year. Of those reporting bronchitis symptoms in the past 12 months, 43% also reported having asthma. Using a slightly different definition of asthma (physician-diagnosed ever, and asthma symptoms, including wheezing, in the past 12 months), 11% of our study population had current asthma.

The estimated pollutant concentrations at the schools are summarized in Table 2. Concentrations of several pollutants (i.e., BC, NO_X, NO, and, to a lesser extent, NO_2) were higher at schools located within 300 m downwind of a freeway compared with those at schools upwind or further from major traffic sources. There was less variation in $PM_{2.5}$ and PM_{10}. Concentrations of BC, NO_X, and NO were highly correlated (r^2 = approximately 0.9 for each interpollutant correlation). The study average $PM_{2.5}$ (12 $\mu g/m^3$) was similar to the annual average concentration of $PM_{2.5}$ at the central monitoring station, located approximately 15 km south of the study area. NO_X and NO_2 measurements at the school sites away from traffic were similar to levels measured at the regional site (21).

Table 3 summarizes the results of the two-stage hierarchical logistic regression models of the odds of asthma and bronchitis symptoms in the previous year in relationship to six different pollutants, each examined in separate regressions. Results are shown for all subjects, for long-term residents only (1 year or longer at the current address), and for the latter group stratified by sex. In addition to the traffic metric, explanatory variables

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TABLE 1. DEMOGRAPHIC, FAMILY, AND HOME CHARACTERISTICS OF THE EAST BAY CHILDREN'S RESPIRATORY HEALTH STUDY RESPONDENTS

Characteristics	All Subjects (n = 1,109) (%)	Subjects Attending Schools: Near and Downwind of Major Roads (Four Schools, n = 402) (%)	Subjects Attending Schools: Far or Upwind of Major Roads (Six Schools, n = 707) (%)
Sex			
Female	52.6	51.8	53.1
Race/ethnicity			
White	12.6	11.0	13.5
Black, African American	11.1	7.0	13.4
Hispanic	43.5	47.6	41.2
Asian	14.0	15.5	13.1
Other/multiracial	18.9	18.8	18.9
SES indicators			
Household at/below federal poverty level	31.3	31.8	31.0
Parent's education: high school or less*	48.7	51.4	47.1
Family history			
Biological mother with asthma	12.2	9.5	13.7
Maternal smoking during pregnancy	10.3	7.8	11.7
Home indoor environment			
Smoker in the household, since child's birth	17.9	13.1	20.6
Smoker in the household, current	7.2	3.2	9.5
Furry pet	37.3	36.0	38.1
Pests, past 12 mo	63.1	65.4	61.8
Gas stove	63.1	63.6	62.9
Indicator of mold/mildew presence, past 12 mo	44.6	43.5	45.3
Health outcomes			
Chest illness before age 2	23.3	18.8	25.9
Asthma, past 12 mo	14.0	13.9	14.1
Bronchitis, past 12 mo	12.1	13.2	11.5

* Parent responding to the questionnaire.

retained in all of the final models for asthma and bronchitis included chest illness before age 2 years, household mold/moisture, and pests observed in the home in the preceding 12 months. The final models for asthma also included maternal history of asthma. The addition of other potential confounders such as race/ethnicity, socioeconomic variables, maternal smoking during pregnancy, current smoker in the home, air conditioning, and gas stove use yielded similar pollutant effect estimates.

For the full sample, associations were observed between both asthma in the past 12 months and bronchitis symptoms in the past 12 months and the pollutants, especially NO_X, NO, and BC. The effect estimates for $PM_{2.5}$ and PM_{10} were smaller, which may have been due in part to the smaller concentration ranges among the 10 sites for these pollutants. No multipollutant models were evaluated because of the high interpollutant correlations. Restricting the analysis based on duration of residence (i.e., at

TABLE 2. NEARBY TRAFFIC SOURCES AND AVERAGE POLLUTANT CONCENTRATIONS AT TEN SCHOOLS

School	Major Traffic Source†	AADT (#/d)	Distance‡ (m)	< 300 m Downwind	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	BC ($\mu g/m^3$)	NO_X (ppb)	NO_2 (ppb)	NO§ (ppb)
[illegible]	No				30	12	0.7	42	22	19
[illegible]	Yes	[illegible]0,000	230	Yes	29	13	0.9	55	24	31
[illegible]	Yes	2[illegible]0,000	360	No	32	12	0.8	49	21	29
[illegible]	No				30	12	0.8	41	19	22
[illegible]	Yes	2[illegible]0,000	130	Yes	30	12	0.9	62	26	36
[illegible]	No				30	12	0.7	39	21	17
[illegible]	No				29	11	0.7	33	20	11
[illegible]	Yes	1[illegible]0,000	350	No	29	12	0.7	45	23	21
[illegible]	Yes	2[illegible]0,000	200	Yes	30	12	0.9	57	26	31
[illegible]0*	Yes	1[illegible]0,000	60	Yes	32	15	1.1	69	31	38
Study average					30	12	0.8	49	23	25

Definition of abbreviations: AADT = annual average daily traffic; BC = black carbon; NO = nitric oxide; NO_X = total nitrogen oxides; NO_2 = nitrogen dioxide; $PM_{2.5}$ = particulate matter of aerodynamic diameter 2.5 μm or less; PM_{10} = particulate matter of aerodynamic diameter 10 μm or less.

Estimated average pollutant concentration at each school based on normalized concentrations (see text). Monitoring was conducted for 11 weeks in the spring (March–June) and 8 weeks in the fall (September–November of 2001). The number of weeks underlying our estimates of chronic exposure varied for each measured pollutant: NO_X (18), NO_2 (19), BC (11), $PM_{2.5}$ (10), and PM_{10} (9).

* There is also a shopping center and a parking lot abutting the school grounds to the south and a freeway off ramp less than 50 m to the northwest.

† Includes roads with AADT above 50,000 vehicles per day located within 1,000 m of school. AADT estimate provided by the California Department of Transportation (Cal Trans).

‡ Distances were estimated using a geographic information system. Latitude and longitude of the monitors were determined using a global-positioning system device (Garmin GPS II). In some cases, distances were estimated using aerial photographs or measured using a distance wheel.

§ NO = NO_X − NO_2

TABLE 3. ODDS RATIOS (95% CONFIDENCE INTERVAL) OF RESPIRATORY ILLNESS BY SCHOOL-BASED AMBIENT AIR POLLUTANT CONCENTRATIONS USING TWO-STAGE MODEL

	Exposure	All Subjects (n = 1,109) OR	All Subjects CI	LTR Subjects (n = 877) OR	LTR Subjects CI	LTR Females (n = 462) OR	LTR Females CI	LTR Males (n = 403) OR	LTR Males CI
Bronchitis*		n = 93/797		n = 79/635		n = 38/341		n = 41/291	
	NO_x	1.05	(1.01, 1.08)	1.06	(1.03, 1.09)	1.07	(1.03, 1.11)	1.03	(0.98, 1.09)
	NO_2	1.02	(0.99, 1.06)	1.03	(1.00, 1.06)	1.04	(1.01, 1.08)	1.02	(0.98, 1.06)
	NO	1.05	(1.02, 1.09)	1.06	(1.03, 1.09)	1.07	(1.03, 1.11)	1.04	(0.98, 1.10)
	PM_{10}	1.03	(0.99, 1.07)	1.02	(0.98, 1.07)	1.04	(1.01, 1.09)	1.01	(0.95, 1.06)
	$PM_{2.5}$	1.02	(1.00, 1.05)	1.03	(1.01, 1.05)	1.04	(1.02, 1.05)	1.02	(0.99, 1.05)
	BC	1.04	(1.00, 1.08)	1.05	(1.01, 1.08)	1.06	(1.02, 1.10)	1.03	(0.98, 1.08)
Asthma†		n = 101/705		n = 78/562		n = 42/297		n = 36/263	
	NO_x	1.04	(0.97, 1.11)	1.07	(1.00, 1.14)	1.17	(1.06, 1.29)	1.02	(0.93, 1.11)
	NO_2	1.02	(0.97, 1.07)	1.04	(0.98, 1.10)	1.09	(1.03, 1.15)	1.00	(0.94, 1.07)
	NO	1.05	(0.98, 1.12)	1.08	(1.00, 1.15)	1.19	(1.03, 1.36)	1.02	(0.94, 1.12)
	PM_{10}	1.02	(0.96, 1.09)	1.04	(0.97, 1.12)	1.09	(0.92, 1.29)	1.02	(0.94, 1.10)
	$PM_{2.5}$	1.00	(0.97, 1.04)	1.01	(0.97, 1.06)	1.06	(0.99, 1.15)	0.99	(0.95, 1.04)
	BC	1.02	(0.96, 1.09)	1.05	(0.99, 1.13)	1.12	(0.95, 1.33)	1.00	(0.93, 1.09)
Asthma (no outlier, school 5)†		n = 96/641		n = 73/507		n = 38/271		n = 35/233	
	NO_x	1.08	(1.00, 1.17)	1.10	(1.00, 1.20)	1.14	(1.02, 1.28)	1.07	(0.96, 1.19)
	NO_2	1.06	(0.99, 1.13)	1.07	(0.98, 1.17)	1.09	(0.97, 1.22)	1.05	(0.96, 1.16)
	NO	1.08	(1.00, 1.17)	1.09	(1.00, 1.19)	1.14	(1.03, 1.26)	1.07	(0.96, 1.18)
	PM_{10}	1.06	(0.97, 1.16)	1.08	(0.98, 1.19)	1.09	(0.96, 1.24)	1.08	(0.97, 1.19)
	$PM_{2.5}$	1.04	(0.96, 1.12)	1.03	(0.94, 1.13)	1.03	(0.91, 1.17)	1.03	(0.94, 1.14)
	BC	1.07	(0.98, 1.17)	1.09	(0.99, 1.19)	1.14	(1.02, 1.27)	1.06	(0.95, 1.18)

Definition of abbreviations: BC = black carbon; CI = confidence interval; LTR = long-term resident; OR = odds ratio; NO = nitric oxide; NO_x = total nitrogen oxides; NO_2 = nitrogen dioxide; $PM_{2.5}$ = particulate matter of aerodynamic diameter 2.5 μm or less; PM_{10} = particulate matter of aerodynamic diameter 10 μm or less.

Odds ratios are calculated per IQR of average pollutant concentrations as follows: NO_x = 14.9 ppb; NO_2 = 3.6 ppb; NO = 11.6 ppb; PM_{10} = 1.4 μg/m³; $PM_{2.5}$ = 0.7 μg/m³; BC = 0.15 μg/m³.

For hierarchical analyses of asthma in long-term residents (current address for 1 year or more), only 9 schools were included in the analysis; one school had no cases (due to low numbers and missing values).

* First stage model adjusted for: child's respiratory illness before age 2; pests, indicator of mold presence.

† First stage model adjusted for: child's respiratory illness before age 2; pests, indicator of mold presence; maternal history of asthma.

least 1 year at current residence) tended to increase the effect estimates slightly in relationship to asthma, especially when the sample was restricted to girls. Stratification by duration of residence or sex did not change the results for bronchitis. Results were similar when nonnormalized pollution values were used (data not shown).

We conducted additional sensitivity analyses, including (*1*) dropping the one school that was an outlier with respect to the proportion of Hispanic students (89% vs. 21–53% at other schools), (*2*) using a different definition for current asthma, and (*3*) stratifying bronchitis by a reported history of asthma. When the "outlier" school was dropped, the magnitude of the ORs for bronchitis did not change much, but the confidence intervals were wider. In the asthma analyses, dropping the outlier school resulted in similar or slightly greater effect estimates. Applying different questionnaire-based asthma definitions showed little change but slightly larger confidence intervals. After stratifying students by whether they also "ever" had asthma, the results suggested that those with a history of asthma were driving the results for bronchitis, but the sample size became too small to make clear inferences. Figures 2 and 3 depict the associations between BC and bronchitis and asthma.

DISCUSSION

To our knowledge, this is the first epidemiologic study in the United States to evaluate relationships between measured traffic-related pollutants and respiratory symptoms. For children residing at their current address for at least 1 year, we found modest but significant increases in the odds of bronchitis symptoms and physician-diagnosed asthma in neighborhoods with higher concentrations of traffic pollutants. These results are consistent with previous reports of positive associations between proximity to traffic and various respiratory outcomes (4–12). Furthermore, our findings were observed in a region with relatively clean air (low concentrations of ozone and PM) (see the online supplement for details). Although previous epidemiologic studies in the United States exploring chronic respiratory effects of air pollution in children have shown inconsistent results, this might be due in part to exposure misclassification, as these studies used air quality measurements conducted at single fixed-site monitors in each city (17, 18, 22, 23).

Our findings were robust to multiple sensitivity analyses using different questionnaire-based definitions of current asthma and wheezing in the past 12 months. The slight increase in effect estimates for associations between asthma after restricting the analysis to those with longer duration at current residence may be due to a reduction in exposure measurement error. Our study population was very mobile (23% had moved in the preceding 12 months, and only 32% had lived at the same address since before the age of 2 years).

We considered whether there might be bias due to nonresponse or self-reporting. We saw no significant difference in proportions of questionnaires returned in Spanish versus English by school, but there was a modest inverse correlation between pollution concentrations measured at each school and response rate. However, the response rate for individual classrooms within each school varied as well and appeared to depend on the willingness of teachers to encourage participation. Dropping the school closest to a freeway (which also had the highest measured pollutant concentrations, a high percentage of Hispanic students, and the lowest response rate) did not change the effect estimates for

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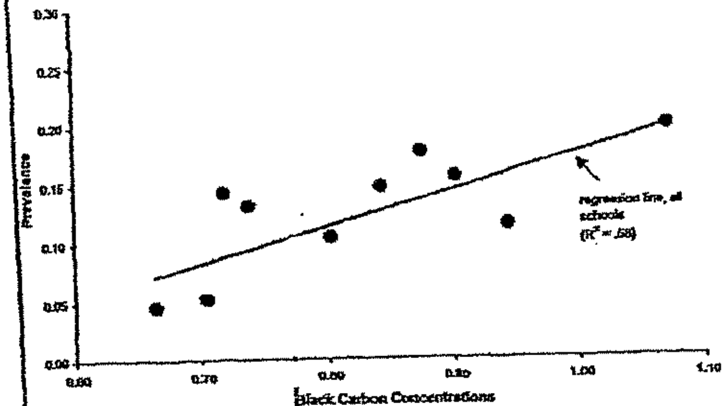

Figure 2. Adjusted school-specific bronchitis prevalence rates versus black carbon, long-term residents.

bronchitis and increased the estimates for asthma. This would suggest that knowledge of potential high traffic exposure probably did not affect parental reporting of the children's respiratory histories. This study was not undertaken in response to public concerns about traffic nor, at the time the study was conducted, was there much local interest in potential health hazards of proximity to traffic. Therefore, reporting and nonresponse biases were unlikely to have unduly influenced our results.

We found increased association with asthma (but not bronchitis) with exposure to traffic air pollutants for girls who had lived at their current addresses at least 1 year compared with boys (Table 3). Several investigators have also reported greater traffic-associated effect estimates for girls versus boys (7, 8, 10, 24, 25). Previous air pollution studies examining the sex-specific effects of air pollution on lung function and lung function growth have been mixed (26, 27). The reasons for the observations in our study are unclear and deserve attention in future studies.

Exposures

We found spatial variability in exposure due specifically to roads with heavy traffic within a relatively small geographic area for BC, NO_X, NO, and to a lesser extent NO_2. There was less variation in $PM_{2.5}$ across schools; this is consistent with previous observations that $PM_{2.5}$ is more likely to reflect regional air quality (2). The higher effect estimates with BC, NO_X, and NO compared with NO_2 and $PM_{2.5}$ suggest that primary or fresh traffic emissions may play an etiologic role in these relationships. Although NO_X, NO, and BC may serve as indicators of exposure to traffic-related pollutant mixtures, they may also act as etiologic agents themselves (28).

We found that downwind direction was an important determinant of increased exposure to traffic pollutants and that a simple traffic indicator (school location downwind and < 300 m from a major road) gave estimates of ORs similar to or greater than pollutant measurements in preliminary analyses using a one-stage model (data not shown). Within a geographic area with flat terrain and low-rise buildings, the direction of wind in relationship to the traffic source is the most important weather parameter. Other parameters important in air dispersion of traffic pollutants (e.g., atmospheric stability, wind speed, and surface topography) would be relatively similar at the different school sites.

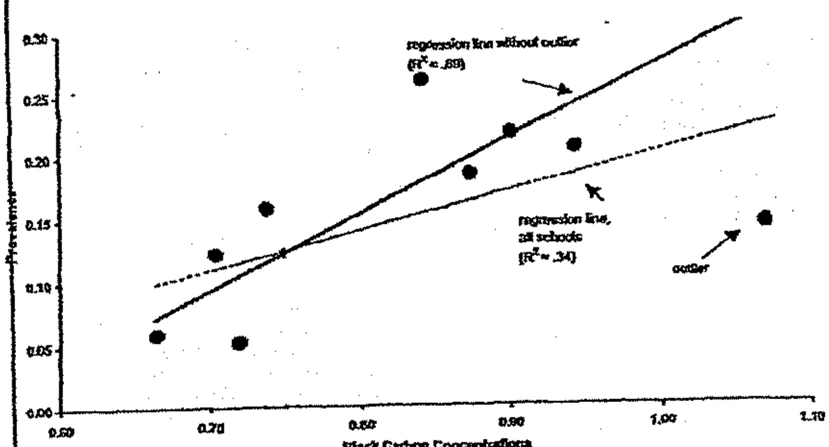

Figure 3. Adjusted school-specific asthma prevalence rates versus black carbon, long-term residents.

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A simple single-stage logistic model using pollutant measurements also yielded positive associations between pollutants and symptoms with a much larger effect estimate and smaller confidence intervals.

We assumed that traffic-related pollutants measured at the neighborhood schools would be a good proxy for the children's overall exposure to such pollutants. Children attending the schools in this study generally lived within walking distance and did not use school buses. Therefore, pollutant concentrations in the children's neighborhoods probably tracked those at their schools. The most plausible exposure error in an urban setting would be that subjects who attend schools with very high traffic exposures from a nearby freeway would tend to have similar or lower home exposures, whereas children with low school exposures would tend to live in homes with similar or only slightly higher traffic exposures. This pattern of measurement error would tend to underestimate the association between exposure and outcome (29).

Alternatively, repeated daily exposures for 6–8 hours during the school year may themselves represent biologically important influences on some children's respiratory health, analogous to occupational exposures for susceptible adults. In a recent study of proximity to traffic and respiratory health, Janssen and colleagues found that effect estimates based on the school-to-highway distance were comparable or greater than those based on residence-to-highway distance (11).

The average measurements at each school were used to estimate long-term average traffic air pollutant concentrations. We measured pollutants at each of the 10 sites concurrently (to avoid concerns of week-to-week variability) in two different periods that reflect the major seasonal wind patterns for the area. We found that the rank order (relative values) of the schools did not vary from week to week or season to season, supporting the validity of this approach. Additionally, the NO_x and NO_2 concentrations at schools upwind or further from high traffic roads were similar to NO_X and NO_2 concentrations measured at the closest fixed-site monitor (21). Although there may have been some changes in the absolute traffic volume on major roads in recent years, the principal traffic patterns in the area have not changed. Thus, the relative values (rank order) of the site-specific pollutant concentrations measured in our study are likely to be representative of those in recent years.

The cross-sectional nature of our study design is a further limitation on causal inference, but we observed the same or modest increase in effect estimates for current asthma and bronchitis when we restricted our analysis to those who had lived at their present address for at least a year. Most studies on proximity to traffic and respiratory symptoms have been cross-sectional, and further longitudinal studies are needed to elucidate the role of traffic-related air pollution in the development and exacerbation of asthma and other respiratory symptoms.

Another limitation was that the exposures were assigned at the group level (n = 10); however, the multilevel analysis allows adjustment for individual confounders in the first stage of analysis. Moreover, in this respect, this study is comparable with other epidemiologic investigations (e.g., the Harvard Six Cities Study and the Children's Health Study in Southern California) (n = 12 communities). Another recent cross-sectional study of traffic-related air pollution and respiratory symptoms included 13 schools (18, 22, 23).

We also lacked information on indoor measurements of traffic-related pollutants. However, recent studies have found high correlations between personal exposures to NO_2 and traffic parameters (30). Others have found that indoor concentrations and exposure to soot (PM from diesel exhaust) is highly correlated with outdoor levels (2).

Other Covariates

Maternal asthma, household mold/moisture, pests, and chest illness before the age of 2 years were important explanatory variables in the final model for current asthma, consistent with previous studies (31–33). We explored whether current levels of traffic pollution could modify the risk of current asthma symptoms depending on past history of chest illness; however, there was not sufficient power to explore interactions based on early medical history. Race/ethnicity and indicators of socioeconomic status were not important predictors of health outcomes in our study. This may be due, in part, to our study design (i.e., the schools were selected to have relatively similar measures of socioeconomic status).

We did not find associations between exposure to environmental tobacco smoke and current asthma; the results of previous cross-sectional studies in school-aged children have been mixed (34). The prevalence of current household smokers in our study was small, however, limiting study power. It is possible that there is some underreporting of household smoking (7% in our study vs. 19% statewide). (35) Alternatively, a substantial portion of our study population was less acculturated Hispanics (30% of parents responded in Spanish), and only 3.6% of Hispanic households reported a history of maternal smoking. Other investigators have also observed very low smoking rates (less than 5%) among less acculturated Hispanics (B. Eskenazi, personal communication) (36). If underreporting does exist, it is possible that residual confounding might have affected our estimates of pollutant/respiratory health outcome relationships. However, the addition to the regression model of variables correlated with exposure to environmental tobacco smoke (e.g., socioeconomic status and race–ethnicity) did not change the pollutant effect estimates, suggesting that significant confounding by environmental tobacco smoke was not likely.

In summary, we found associations between traffic-related pollutants and asthma and bronchitis symptoms in the past 12 months in a highly urbanized region of the United States with good regional air quality, where local air pollution is dominated by vehicular sources. Although the cross-sectional study design, exposure assignment at the group level, small geographic area, and possible unmeasured covariates may limit the generalizability of the study, our findings are consistent with previous investigations in Europe and the United States (11, 14, 37). In addition, our results underscore the limitations of using central air monitoring stations for assigning population exposures. Concentrations of air toxics such as diesel exhaust particles or surrogates such as BC or soot should be more widely monitored. Measurement of personal exposures to traffic pollutants is not feasible in large population-based studies; the use of geographic modeling approaches to estimate exposures for individuals may be a good alternative (38). Future studies that can better characterize exposures to traffic pollutants, and their sources (i.e., diesel versus gasoline engines) will be important to understand better the public health impacts of motor vehicle emissions.

Conflict of Interest Statement: J.J.K. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; S.S. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; M.L. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; B.C.S. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; A.T.H. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript; B.O. does not have a financial relationship with a commercial entity that has an interest in the subject of this manuscript.

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COMMENTOR A7
Benicia Unified School District Board of Trustees
Dirk A. Fulton, President
March 9, 2007

A7-1: The Draft EIR addresses traffic emissions impacts in Section IV.H.2.b. (4) Operational Emissions – CO Analysis, and lists the 1-hour and 8-hour CO concentrations for Existing, Existing Plus Project, and Future (2025) Plus Project Conditions for 11 intersections in the project area in Tables IV.H-6, IV.H-7, and IV.H-8 (pages 261 to 264 of the Draft EIR).

The Future (2025) Plus Project peak hour CO concentrations shown in Table IV.H-8, show that the 1-hour CO concentrations at all analyzed intersections (i.e., the intersections that have the potential for the most severe project impacts) are well below State and federal standards. The Future Plus Project 1-hour CO concentrations at the East 2nd.Street and Rose Drive and East 2nd Street and Military Street intersections would range from 4.2 parts per million (ppm) to 4.4 ppm, much lower than the State standard of 20 ppm. The 8-hour CO concentrations for these intersections on East 2nd Street would range from 4.3 ppm to 4.7 ppm for future plus project conditions. This too is well below the State standard of 9 ppm. Intersections in the vicinity of Robert Semple Elementary School would be expected to be exposed to similar or lower CO concentrations. The State standards used to evaluate impacts in the Draft EIR take into consideration all types of sensitive receptors, including schools and residences.

The *Air Quality and Land Use Handbook: A Community Health Perspective,* April 2005, by the California EPA and ARB, establishes guidelines for siting sensitive land uses near air pollutant sources. This handbook references the study *Traffic-Related Air Pollution and Respiratory Health: East Bay Children's Respiratory Health Study* by Kim, J., et al, 2004, for establishing these guidelines. State law restricts the siting of new schools within 500 feet of a freeway, urban roadways with 100,000 vehicles/day, or rural roadways with 50,000 vehicles/day, with some exceptions. The handbook recommends that new sensitive land uses not be sited within these boundaries. The modeled future plus project Average Daily Trips (ADT) would be 37,900 along East 2nd Street and 55,000 ADT on I-780. These traffic volumes are below the threshold set by the California EPA and ARB for locating schools near busy roadways. Therefore, the project would not be expected to expose sensitive receptors – including elementary school children at Robert Semple School – to hazardous levels of vehicle emissions, including emissions of CO and particulate matter.

A7-2: See Response to Comment A6-1.

A7-3: The Draft EIR addresses off-site traffic noise impacts on pages 279 to 283. As shown in Impact NOI-2 and in Tables IV.I-8 and IV.I-10, a significant traffic noise impact is identified for sensitive receptors along East 2nd Street under Existing Plus Project and Cumulative Plus Project conditions. The analysis shows that traffic noise levels 50 feet from the centerline of the outermost travel lane would increase by 3.5 dBA and 4.0 dBA respectively.

During review of the Draft EIR, minor typographical errors were identified in the traffic noise modeling values used in the analysis. However, after correction of these minor topographical errors, the noise modeling outputs, as well as the identified significant impacts, remain the same.

To further address the concerns for identified impacts for sensitive receptors located along the segment of East 2nd Street from I-780 to Rose Drive, the following changes will be made to pages 282 to 283 of the Draft EIR. The following revisions do not identify a new environmental impact of the project or introduce a new mitigation measure that would not be adopted by the project sponsor. Therefore, recirculation of the Draft EIR would not be required.

> ~~In summary, because there are no noise-sensitive receptors within the noise contour areas for these roadway segments, the increased traffic noise levels would result in a less than significant impact for off-site receptors.~~
>
> <u>The segment of East 2nd Street from I-780 to Rose Drive could also experience a significant increase in traffic noise levels. The cumulative noise model for the project shows that traffic noise levels along East 2nd Street could increase to 71.6 dBA CNEL at 50 feet from the centerline of the outermost travel lane, a 4.0 dBA increase over the Cumulative Without Project scenario. Construction of a sound barrier at least 8 feet high along the property/right-of-way line would reduce the traffic noise impacts to sensitive receptors along this roadway segment to a less-than-significant level. The use of rubberized asphalt along the roadway segment, as an alternate mitigation measure, would also be effective in reducing traffic noise levels to a less-than-significant level. Rubberized asphalt reduces traffic noise through its porous and ductile qualities (refer to the following study for more information: Bollard and Brennan, Inc., 1999. *Report on the Status of Rubberized Asphalt., Traffic Noise Reduction in Sacramento County*. Prepared for Sacramento County Public Works Department.).</u>
>
> <u>Mitigation Measure NOI-2c: For existing unprotected residential and school land uses along East 2nd Street from I-780 to Rose Drive, one (or more) of the following measures shall be implemented:</u>
>
> - <u>A sound barrier at least 8 feet high shall be constructed along the property/right-of-way line of sensitive receptors along this roadway segment; or</u>

- Rubberized asphalt shall be used to resurface the entire identified roadway segment. (LTS)

Tables IV.I-8, IV.I-9, and IV.I-10 are revised as follows:

Table IV.I-8: Existing Plus Project Traffic Noise Levels

~~Roadway Segment~~	ADT	Center line to 70 CNEL ~~(feet)~~	Center line to 65 CNEL (feet)	Center line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
East 2nd St. - Lake Herman Rd. to Park Rd.	19,300	~~54~~ 56	116	248	~~69.4~~ 68.7	~~5.5~~ 4.8
East 2nd St. - Park Rd. to Industrial Way	11,700	< 50[a]	~~83~~ 84	178	~~67.3~~ 66.5	~~2.9~~ 2.1
East 2nd St. - Industrial Way to Rose Dr.	31,700	77	161	345	70.8	6.3
East 2nd St. - Rose Dr. to I-780 WB On Ramp	25,000	66	138	295	69.8	3.5
East 2nd St. - I-780 EB On Ramp to Military St.	13,300	< 50	~~60~~ 62	~~128~~ 129	~~65.1~~ 64.4	~~0.0~~ -0.7
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	13,800	< 50	~~93~~ 94	199	~~68.0~~ 67.2	~~10.3~~ 9.5
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	15,900	< 50	102	218	68.6	7.2
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	16,000	< 50	102	219	68.6	7.0
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	11,200	< 50	81	173	67.1	7.7
Industrial Way - East 2nd St. to Park Rd.	7,400	< 50	< 50	~~87~~ 88	~~62.6~~ 61.8	~~3.7~~ 2.9
Park Rd. – East 2nd St. to Industrial Way	2,400	< 50	< 50	< 50	57.7	5.4
Park Rd. - Industrial Way to Bayshore Rd.	13,300	< 50	60	128	65.1	2.5

[a] Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

Table IV.I-9: Cumulative Without Project Traffic Noise Levels

Roadway Segment	ADT	Center line to 70 CNEL (feet)	Center line to 65 CNEL (feet)	Center line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
East 2nd St. - Lake Herman Rd. to Park Rd.	7,800	< 50[a]	64	136	~~67.7~~ 65.5
East 2nd St. - Park Rd. to Industrial Way	8,300	< 50	66	142	~~67.7~~ 65.8
East 2nd St. - Industrial Way to Rose Dr.	10,100	< 50	77	162	~~67.8~~ 65.9
East 2nd St. - Rose Dr. to I-780 WB On Ramp	15,000	< 50	99	210	~~69.5~~ 67.6
East 2nd St. - I-780 EB On Ramp to Military St.	18,000	< 50	73	157	~~68.4~~ 66.4
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	1,800	< 50	< 50	52	~~61.4~~ 59.1
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	4,300	< 50	< 50	92	~~65.2~~ 62.9
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	4,500	< 50	< 50	94	~~65.3~~ 63.1
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	2,700	< 50	< 50	67	~~63.0~~ 60.9
Industrial Way - East 2nd St. to Park Rd.	4,500	< 50	< 50	63	~~62.4~~ 60.4
Park Rd. – East 2nd St. to Industrial Way	900	< 50	< 50	<50	~~55.4~~ 53.4
Park Rd. - Industrial Way to Bayshore Rd.	10,500	< 50	52	~~11~~ 110	~~66.1~~ 64.1

[a] Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

Table IV.I-10: Cumulative Plus Project Traffic Noise Levels

Roadway Segment	ADT	Center line to 70 CNEL (feet)	Center line to 65 CNEL (feet)	Center line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Cumulative Conditions
East 2nd St. - Lake Herman Rd. to Park Rd.	~~26,800~~ 21,000	~~57~~ 59	~~122~~ 123	263	~~69.8~~ 69.0	~~4.5~~ 3.5
East 2nd St. - Park Rd. to Industrial Way	~~18,500~~ 16,500	< 50[a]	~~104~~ 105	224	~~68.8~~ 68.0	~~3.0~~ 2.2
East 2nd St. - Industrial Way to Rose Dr.	~~40,200~~ 36,100	83	176	377	71.4	5.5
East 2nd St. - Rose Dr. to I-780 WB On Ramp	~~37,300~~ 37, 900	86	181	389	71.6	4.0
East 2nd St. - I-780 EB On Ramp to Military St.	~~28,100~~ 18,000	< 50	~~73~~ 75	~~157~~ 158	~~66.4~~ 65.7	~~0.0~~ -0.7
Lake Herman Rd. - East 2nd St. to Reservoir Rd.	~~15,500~~ 13,800	< 50	~~93~~ 94	199	~~68.0~~ 67.2	~~8.9~~ 8.1
Lake Herman Rd. - Reservoir Rd. to Sky Valley Rd.	~~20,000~~ 17,100	< 50	107	229	68.9	6.0
Lake Herman Rd. - Sky Valley Rd. to Columbus Pkwy	~~20,300~~ 15,000	< 50	98	210	68.3	5.2
Reservoir Rd. - Lake Herman Rd. & East 2nd St.	~~2,700~~ 12,000	< 50	84	181	67.4	6.5
Industrial Way - East 2nd St. to Park Rd.	~~11,300~~ 8,700	< 50	< 50	~~97~~ 98	~~63.3~~ 62.5	~~2.9~~ 2.1
Park Rd. – East 2nd St. to Industrial Way	~~3,100~~ 2,100	< 50	< 50	< 50	57.1	3.7
Park Rd. - Industrial Way to Bayshore Rd.	~~22,700~~ 13,800	< 50	62	132	65.3	1.2

[a] Traffic noise within 50 feet of the roadway centerline requires site-specific analysis.
Source: LSA Associates Inc., September 2006

A7-4: See Responses to Comments A7-1 and A7-3. The project would not result in significant cumulative traffic, noise, and air quality-related impacts beyond those identified in the Draft EIR.