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COEH

March 3, 2006

Colland Jang
Chair, Oakland Planning Commission
Community Economic Development Agency
City of Oakland
250 Frank Ogawa Plaza, Suite 3315
Oakland CA 84612

Re: Analysis of Pedestrian Injuries Resulting from the Oak to Ninth Avenue Project; Oakland FEIR; Case ER 04-0009

Dear Chairperson Jang:

At the public hearing on the DEIR of the Oak to Ninth Development Proposal, you raised the important issue of pedestrian safety and requested the City to conduct in the EIR an adequate analysis of project related impacts on pedestrian safety impacts. As a member of the public health community, I appreciate your concern about this issue.

Adverse environmental impacts on humans and public health must be addressed under CEQA, including but are not limited to impacts on pedestrian safety, noise, air quality, and hazardous materials.[1] Several stakeholders identified deficiencies in the DEIR analysis of project effects on pedestrian injuries in the neighborhoods surrounding the proposed Oak to Ninth development. Unfortunately, the FEIR analysis of pedestrian safety remains inadequate; furthermore, I believe, many City of Oakland FEIR responses to comments on the DEIR are not based on evidence.

This letter provides additional evidence and original analysis demonstrating that pedestrian injuries will increase significantly directly due to project-related increases in traffic volume in several neighborhoods of Oakland surrounding the project. The evidence and analysis includes the following key points:

- **The definition and use of the term *pedestrian injury rate* in the DEIR and FEIR is neither accurate nor consistent with definitions used by the Federal Government or those used in epidemiologic investigations.**
- **Oakland has a rate of pedestrian injuries several times higher than Federal public health standards. The neighborhoods surrounding the project have a disproportionate share of pedestrian injuries relative to other neighborhoods in Oakland.**
- **Project-related impacts on pedestrian injuries are significant. Quantitative forecasting of changes to Oakland's pedestrian injury rate based on project related changes in traffic flows and a baseline injury rate of 100 injuries/year in the area of influence estimates that the project's traffic alone will contribute about 5.4 additional injuries per year or 268 pedestrian injuries in the years 2025-2075. The cumulative impact of increased traffic in the area by 2025 forecasts 20 additional injuries per year with a total of 1000 growth related additional injuries in the years 2025-2075.**
- **The DEIR and FEIR have not proposed or evaluated the feasibility of sufficient pedestrian safety improvements including circulation changes and street and intersection facility improvements, available to prevent increases in traffic related injuries.**

1 Section 15065 of the regulations for the California Environmental Quality Act (CEQA) mandates an environmental impact report (EIR) to analyze any "...environmental effects of a project [that] will cause substantial adverse effects on human beings, either directly or indirectly. CEQA guidelines section 15126.2, subdivision (a) requires an EIR to discuss "health and safety problems caused by the physical changes" that the proposed project will precipitate. Bakersfield Citizens for Local Control vs. the City of Bakersfield reaffirmed the necessity of health analysis in an EIR prepared under CEQA. Environmental Justice also demands a full analysis of the health impacts on low-income and minority populations.

Significance of Pedestrian Injuries, National Injury Standards, and Inadequacies in the Oak to Ninth FEIR

A significant error in the FEIR is the inaccurate definition of the term, *rate of injury*. The FEIR inaccurately defines "rate of injury" as "accidents per number of vehicles." Using this definition, the City of Oakland argues that *the project will not affect the rate at which motor vehicle accidents occur because it will not affect the roadways*. This statement is misleading. The number of accidents per vehicle and the number of accidents per mile might reflect the relative safety of vehicle and roadways, respectively, but these measures do not reflect the impacts to human health. With regard to human health impacts, an appropriate measure of adverse impact is the increase in the number of injuries or the increase in the rate of injuries ***defined as the number of injuries per unit time***. This definition is the one used by the Federal Department of Health and Human Services in pedestrian injury objectives for the Nation. Holding the number of accidents per vehicle trips constant, the rate of injuries will increase simply because the number of vehicle trips will increase.

The US Department of Health and Human Services (USDHHS) has established National objectives for the **rate of pedestrian injuries**.[2] Much like National Air Quality Standards, these objectives or standards can serve as thresholds for significance for pedestrian injuries within CEQA analysis. These objectives include:

- A rate of non-fatal vehicle injuries to pedestrians no greater than 19 injuries per year per 100,000 people.
- A rate of fatal vehicle injuries to pedestrians no greater than 1 injury per year per 100,000 people.

According to Oakland's Pedestrian Master Plan, Oakland residents suffer approximately 85.5 vehicle injuries to pedestrians per 100,000 every year including 3 pedestrian fatalities per 100,000 per year.[3] **This rate of injuries is about 4 times the USDHHS standards. The published rate of fatal injuries in Oakland is 3 times the USDHHS standard.** Based on current rates and national standards, any increase in pedestrian injuries should be considered a significant adverse effect.

A significant number of Oakland pedestrian injuries occur in the neighborhoods and streets (e.g., Downtown, Jack London Square, Chinatown, Lakeshore, East Lake, Lower San Antonio, International Blvd) surrounding the proposed project. Based on population and the intensity of pedestrian injuries, this impact analysis estimates a baseline injury rate of at least 100 pedestrian injuries per year in the area affected by the Oak to Ninth Project.[4] Furthermore, the neighborhoods surrounding this project contain sensitive populations more vulnerable to impacts on pedestrian safety, including children, the elderly, walking-dependent, and the low-income transit-dependent.

Vehicle injuries to pedestrians have significant economic costs beyond their physical toll on victims. A recent analysis of California data concludes that in 1999 economic costs resulting from 5634 fatal and non-fatal vehicle injuries to pedestrians resulted in over $3.9 billion in direct and indirect costs ($692,000 per injury). California Highway Patrol estimates of economic costs of vehicle injuries to pedestrians disaggregated by injury severity are provided in the table below.

Pedestrian Injury Severity	Economic Cost per Injury
Fatal Injury	$2,709,000
Severe Injury	$180,000
Visible Injury	$38,000
Complaint of Pain	$20,000

Environmental Factors Affecting Pedestrian Injuries

2 U.S. Department of Health and Human Services. Healthy People 2010 Objectives.

3 Oakland Pedestrian Master Plan. Page 30.

4 The author of this analysis has requested a map of counts of pedestrian injuries from the City of Oakland. A more precise estimate of pedestrian injuries in the area of influence of the Oak to Ninth project is pending this data.

The rate of pedestrian injuries in an area is dependent on several **environmental factors** such as vehicle volume, vehicle type (truck vs. car), vehicle speed, pedestrian volume, roadway width, vehicle speed, pedestrian facilities (sidewalk width, driveway conflicts, buffers), intersection design (crossing distance, signal phasing and timing, corner radii, cross walk treatments, median islands, curb extensions), lighting, and weather.[5] [6] [7] [8] [9]

Vehicle speeds are the most important predictor of the **severity** of pedestrian injuries. Below 20mph the probability of serious injury or fatal injury is generally less than 20%; this proportion rapidly increases with increasing speed and above 35mph, most injuries are fatal or incapacitating.[10] With regards to sensitive populations, the elderly and the very young populations are more vulnerable to vehicle injuries while walking because of slower walking speeds or slower reaction times.

Public health and transportation safety research consistently demonstrates that **vehicle volumes** are an **independent environmental predictor of pedestrian injuries**.[11] [12] [13] [14] In other words, all things being equal, when the number of vehicle trips increases, the number of vehicle injuries to pedestrians will also increase. A national study of pedestrian injuries and crosswalks that included data from Oakland also found that higher average daily traffic and multi-lane roads were significant and independent environmental risk factors for vehicle-pedestrian crashes in multi-variate analysis.[15] One recent study found that traffic volume, traffic speed and lateral separation between pedestrians and traffic explained 85% of the variation in perceived safety and comfort for pedestrians.[16] The City of Oakland Pedestrian Master Plan also highlights the negative effect of high volumes on safety.[17] The magnitude of effect of vehicle volume on injuries is significant. For example, a study of nine intersections in Boston's Chinatown, researchers calculated an increase in 3-5 injuries per year for each increase in 1000 vehicles.[18]

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5 La Scala EA, Johnson FW, Gruenewald PJ. Neighborhood Characteristics of Alcohol-related Pedestrian Injuries. Prevention Science. 2001: 2:123-134.

6 Taylor M, Lynam D, Baruay A The effects of drivers speed on the frequency of road accidents. Transport Research Laboratory. TRL Report 421 Crowthorne, UK, 2000.

7 Morrison DS, Petticrew M, Thomson H. What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews. Journal of Epidemiology and Community Health 2003:57:327-333.

8 Evidence shows that pedestrian and bicycle injuries vary with the 0.4 power of the proportion of trips made by walking or bicycle. Jacobsen PL. Safety in numbers: more walkers and bicyclists, safer walking and bicycling. Injury Prevention. 2003: 9: 205-209.

9 Leden L. Pedestrian risk decrease with pedestrian flow. A case study based on data from signalized intersections in Hamilton, Ontario. Accident Analysis and Prevention. 2002: 34:457-464.

10 National Highway Traffic Safety Administration. Literature Review on Vehicle Travel Speeds and Pedestrian Injuries. Washington DC: USDOT, 1999.

11 LaScala EA, Gerber D, Gruenewald PJ. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. Accident analysis and Prevention. 2000; 32:651-658.

12 Roberts I, Marshall R, Lee-Joe T. The urban traffic environment and the risk of child pedestrian injury: a case-cross over approach. Epidemiology 1995; 6: 169-71.

13 Stevenson MR, Jamrozik KD, Spittle J. A case-control study of traffic risk factors and child pedestrian injury. International Journal of Epidemiology 1995; 24: 957-64.

14 Agran PF, Winn DG, Anderson CL, Tran C. Del Valle CP. The role of the physical and traffic environment in child pedestrian injuries. Pediatrics. 1996; 98: 1096-1103.

15 Zegeer CV, Steward RJ, Huang HH, Lagerwey PA. Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines. Federal Highway Administration, 2002.

16 Landis BW, Vatttikuti VR, Ottenberg RM, McLeod DS, Guttenplan M. Modeling the Roadside Walking Environment: A Pedestrian Level of Service. TRB Paper -1-0511 Tallahassee. 2000.

17 City of Oakland. Pedestrian Master Plan. Page 18.

18 Brugge D, Lai Z Hill C, Rand W. Traffic injury data, policy, and public health: lessons from Boston Chinatown. Journal of Urban Health 2002; 79: 87-103.