



# Community for a Cultural Civic Center

John Aronovici

November 28, 2022

Tom Bates

Dear Landmarks Preservation, Civic Arts, Parks Recreation & Waterfront Commissioners,

Lisa Bullwinkel

We understand that designs for the Turtle Island Fountain, a monument to the Indigenous community located at the landmarked fountain in Martin Luther King Jr in Civic Center Park, are being presented to City commissions for review on December 1, 7 and 14 respectively.

Winston Burton

Ryan Call

John Caner

After 30 years of effort, this project at long last has been fully funded through City and community volunteer fundraising efforts from 2017 to 2022 totaling close to \$1,000,000, from numerous grants and other funding sources (see below). The project is being managed by Parks, Recreation & Waterfront and the Civic Arts Commission, in concert with the City-contracted design firm of PGA Landscape Design.

Wyndy Knox Carr

Karen Chapman

Erin Diehm

Deb Durant

WE ARE CONCERNED that a design proposal without a fully funded monument may be presented-- a design lacking its central features, which will get pushed off into 'later phases'. We are concerned that the city contract design team may be prioritizing the surrounding features-- namely, replacing the surrounding flagstone terrace pavers and restoring the Berkeley Peace Wall.

Claire Greensfelder

Loni Hancock

Ann Harlow

We strongly urge the commissions to support a design that includes a fully finished monument on time and on budget--using the substantial funds that have been raised, in the time frame designated by the grant funded parameters.

Kelly Hammargren

Deborah Matthews

With funding close to \$1,000,000--**money intended to *primarily* be spent on creating a monument to the Indigenous Community and *secondarily* to repairing its surrounding features--** we urge you to support a design that COMPLETES the monument AND requires no additional phases (or years of additional fundraising).

Sergio Mazariegos

Leila Moncharsh

George Petty

As per the attached rendering, a viable alternative was designed in collaboration with eminent landscape designer Walter Hood in 2019, along with a subsequent alternative design alteration proposed by Lee Sprague. These designs can be built with funding available and respects the integrity of the landmarked fountain. Moreover, the design was vetted with scores of indigenous community members and included in all prior grant applications and community meetings.

Mark Rhoades

Arlene Silk

David Snippen

Marc Steyer

The monument will become a newly recognized historic monument, honoring the Indigenous people and communities, located at the landmarked site of the already historically significant fountain. We support your approval of this well-vetted complete design to acknowledge Berkeley's original inhabitants who have lived on this land for thousands of years.

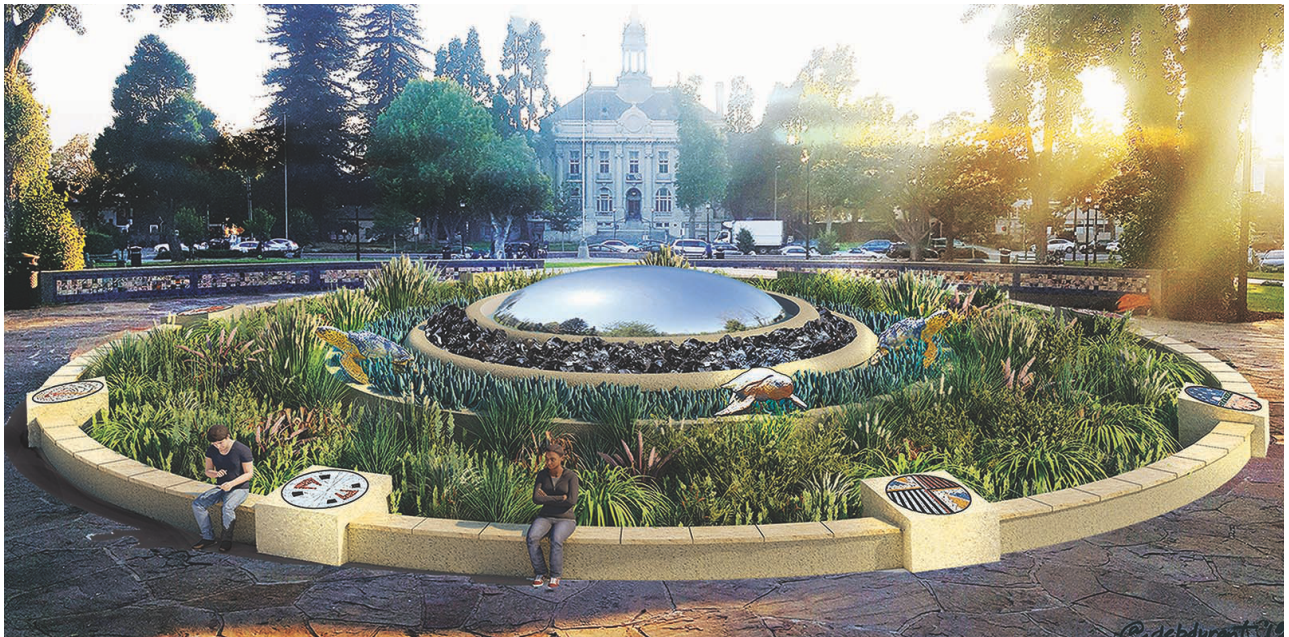
Many thanks for your attention,

John Caner

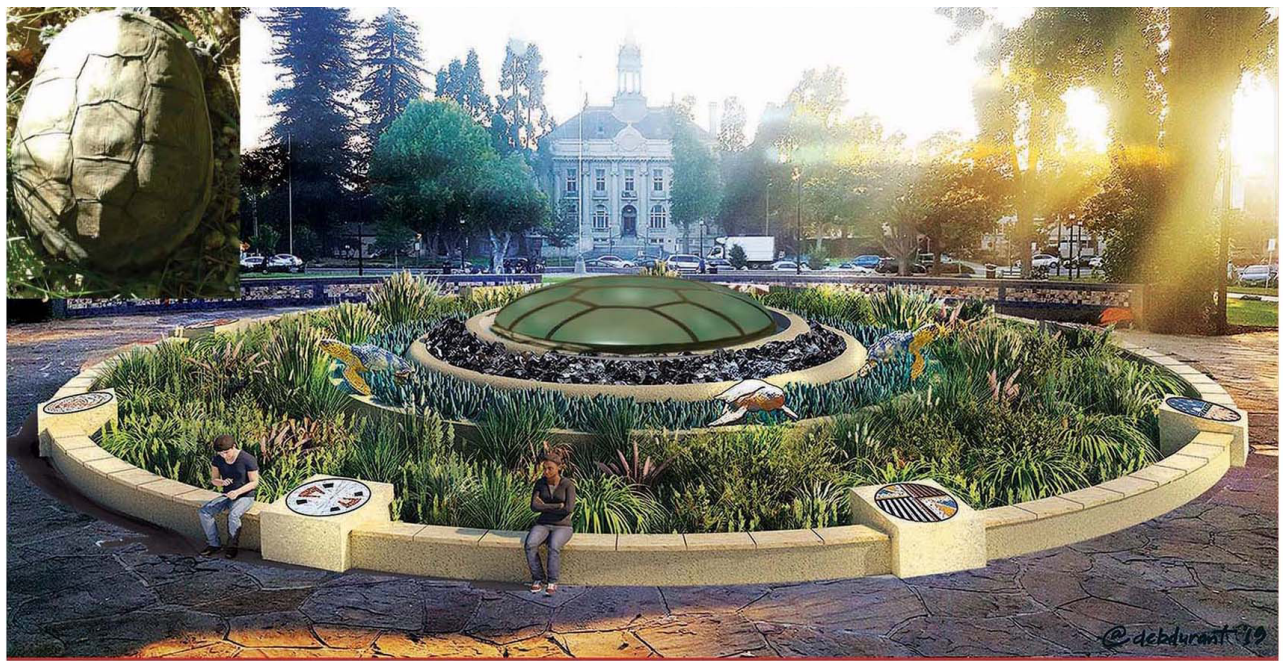
Convener, [Community for a Cultural Civic Center](#)

Cc: Mayor Jesse Arreguin, Vice-Mayor Kate Harrison, Turtle Island Monument Project Committee Attachment

**TURTLE ISLAND MONUMENT PROJECT DESIGNED IN COLLABORATION WITH WALTER HOOD**



**ALTERNATIVE DESIGN ALTERATION PROPOSED BY LEE SPRAGUE**



**FUNDS RAISED TO DATE FOR TURTLE ISLAND MONUMENT PROJECT: Totaling approximately \$946,666**

On March 1, 2022, CA Governor Gavin Newsom posted a [press release](#) announcing our project had been awarded a Clean California Grant thru Caltrans for underserved communities for **\$591,666**.

On January 20, 2022 the Civic Arts Commission confirmed that there is **\$25,000** being held in the Public Art funds dedicated to conserving and installing the medallions and turtles.

In January 2022 the Parks, Recreation & Waterfront Commission indicated committing **\$20,000-\$30,000** to the project.

In December 2020, the Berkeley City Council passed a resolution approving a list of final projects for the T1 Phase II Bond including funding **\$300,000** for the Civic Center Park Turtle Garden.

In 2019, the Turtle Island Fountain project was awarded a **\$5,000** UC Berkeley Chancellor's Community Partnership Fund Grant in collaboration with University Partner, recent MacArthur Fellowship awardee and Gish Prize winner, Walter Hood, College of Environmental Design professor of Landscape Architecture and Environmental Planning and Urban Design; alongside the project's Community Partner, Berkeley Partners for Parks.

(Additional in-progress grant from EBMUD, initially green-lighting potentially **\$15,000** - pending additional info from PR&W)

Received

NOV 30 2022

November 30, 2022

Land Use Planning

Dear Committee Members,

My name is Marisela Carvalho. I am a long-time Berkeley resident that currently resides at Oxford Plaza Apartments located at 2175 Kittredge Street. I write on behalf of myself, my 10-year-old son, and the dozens of deserving Berkeley residents living at the Oxford Plaza. It is this particular community that will be primarily affected by the project decision on the City Landmark: California Theater building (located on 2113-2115 Kittredge).

At best, the City of Berkeley and the University of California have been ignoring the special needs that apply to a population that is already under-resourced and vulnerable. Oxford Plaza Apartments is considered an affordable housing complex. Many residents do live on a fixed income. Most, however, are hard-working and taxpaying individuals. We **all** deserve better.

In recent years, the City and the UC have approved construction projects that have had severe negative impacts on the residents of Oxford Plaza. In 2019, the residents lived through the demolition of a structure located on the UC campus, on Oxford Street, right across the street from the Oxford Plaza building. This area has been turned into a parking lot.

There is current construction on Kittredge Street. Student housing is being built at 2150 Kittredge, on the same street as Oxford Plaza. Beginning with the removal of the Touchless Car Wash and Gasoline station, this project is already in its second year. It is expected to last at least another year. When it is all said and done, this new building will tower over ours, blocking the sun. Again, the long-term impact of this project will be felt only by the residents of Oxford Plaza.

I would like to highlight just some other problems that the City of Berkeley and the UC have created for the residents of Oxford Plaza:

**STREETS and SIDEWALKS:** The construction has made these streets more dangerous for individuals that are visually impaired and/or use mobility devices. I, myself, have brittle bones disease which requires me to use a power wheelchair. Downtown now has too many sidewalks and streets that are blocked, making it difficult for individuals with disabilities to maneuver around. There are potholes and cones to contend with. Having to find alternate (longer) routes in daily life hurt bodies that are already pushed to its limit. These are minor inconveniences, however, when compared to the actual possibility of death. Wheelchair users, children, short-statured individuals, and anyone who cannot react quick enough is in danger of being involved in a fatal accident. I fear for my safety in Downtown. It has changed for the worst in terms of being an accessible haven for the disabled.

On October 20, Mr. William Evans, a marine veteran, was crossing Bancroft street with his wheelchair, when he was struck by a truck that did not see him. [Police report is forthcoming].

**DELIVERIES:** Kittredge Street has become a one-way street. This has affected the delivery of essential goods, mail, and medical supplies that residents rely on. Furniture delivery is impossible on weekdays.

**DUST, GAS, & WATER:** Since construction at 2150 Kittredge Street, the residents of Oxford Plaza has had to deal with a gas leak, water shut-off, toxic water, and daily dust. The Oxford building does not have central air conditioning. In the summer, many do not have a choice but to leave windows open. This is physically harmful.

[See attached list of references]

**NOISE POLLUTION:** The noise pollution that residents experience is incessant. Monday through Saturdays, garbage and recycling trucks start as early as 3:55 a.m. Adding to that is the noise from the actual construction which does not sometimes obey the noise ordinance rules. Finally, I would like to address the newly added stress of the constant towing occurring on the parking lot owned by the UC. As mentioned earlier, this is directly across the street from the Oxford Plaza building. The towing occurs every home game, including last Friday's game against UCLA. This is a day typically reserved for resting and leftovers. That is not what Oxford residents were served. The towing went on for at least 5 hours. On weekdays, towing has started as early as 4:30 a.m. This is unacceptable.

There is extensive research concluding that noise pollution causes an increase in cardiovascular diseases; sleep disturbances; stress; type 2 diabetes; cognition problems (including memory impairment); childhood learning delays; low birth weight; and of course, hearing loss. It is also linked to a loss of productivity.

Research findings also show that individuals and households of lower socio-economic status (SES) are more susceptible to these adverse effects. A study conducted by Denham & Schell (2003) states that, "**Disproportionate pollutant exposure by socioeconomically disadvantaged groups exacerbates risk of poor health and well being**" (p. 111). Additionally, individuals who are undergoing tremendous stress are more likely to engage in risky behaviors such as tobacco use or substance abuse.

Was this information not available to one of the leading research institutes in the nation or was it simply ignored?

[See attached list of references]

Berkeley was the epicenter of the Disability Rights Movement. Leaders like Ed Roberts and Judy Heumann fought for access and independence. The first Center for Independence office was opened on Telegraph Avenue in 1972. I love that about Berkeley and it is why I moved here. I craved access and I craved community.

Over time, I have found community. It is this same community that I may be forced to leave because these are no longer sustainable living conditions. Due to the housing crisis and high cost of living, most residents are not able to move. The City should take this into consideration when making major project decisions that primarily affect this community. The City has provided this community with affordable housing but it has not provided a quality of life for its residents.

Oxford Plaza is comprised of mothers, grandmothers, educators, nursing students, Cal graduates, retired lawyers, Uber drivers, hospice caretakers, and most importantly, children.

Does the City of Berkeley care only about its Cal students and wealthy residents?

Thank you for your time and thoughtful consideration.

Sincerely,

*Marisela Carvalho*  
Marisela Carvalho

APPLICABLE MUNICIPAL CODES  
CITY OF BERKELEY

Title 11: ENVIRONMENTAL HEALTH

Title 12: HEALTH AND SAFETY

Title 13: PUBLIC PEACE, MORALS AND WELFARE

**\*\*Chapter 13.24**  
**DISCRIMINATION AGAINST FAMILIES WITH CHILDREN AND STUDENTS**  
**IN PROPERTY RENTAL**

**\*\*Chapter 13.40**  
**GENERAL NOISE**

Title 14: VEHICLES AND TRAFFIC

Title 16: STREETS, SIDEWALKS, AND OTHER PUBLIC PROPERTY

Title 19: BUILDINGS AND CONSTRUCTION

Full text available: <https://berkeley.municipal.codes/>

## References

Aluko, E. & Nna, V. (2014). Impact of Noise Pollution on Human Cardiovascular System. *International Journal of Tropical Disease & Health*, 6(2), 35-43.

Retrieved from <https://doi.org/10.9734/IJTDH/2015/13791>

Araújo Alves, J., Neto Paiva, F., Torres Silva, L., & Remoaldo, P. (2020). Low-Frequency Noise and Its Main Effects on Human Health—A Review of the Literature between 2016 and 2019. *Applied Sciences*, 10(15), 5205.

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Bolte, G., Dreher, S., Hilz, L. K., & Schule, S. A. (2019). Social Inequalities in Environmental Noise Exposure: A Review of Evidence in the WHO European Region. *International Journal of Environmental Research & Public Health*, 16(6), 1011.

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Crane, D. R., & Heaton, T. B. (2008). *Handbook of families & poverty*. SAGE Publications, Inc.

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Deng, R., Sun, Y., Yang, Y., Yao, G., & Wang, M. (2022). Exposure to construction dust and health impact—A review. *Chemosphere*, 311(1).

Retrieved from <https://doi.org/10.1016/j.chemosphere.2022.136990>

Denham, M. & Schell, L. M. (2003). Environmental Pollution in Urban Environments and Human Biology. *Annual Review of Anthropology*, 32(111-134).

Retrieved from <https://doi.org/10.1146/annurev.anthro.32.061002.093218>



Kwok, I. & Savidge, N. (2022, Nov. 02). Berkeley remembers William Evans, veteran hit and killed by truck driver. *Berkeleyside*.

Retrieved from <https://www.berkeleyside.org/2022/11/02/william-evans-veteran-killed-downtown-berkeley>

Filippo Crea, Light and noise pollution and socioeconomic status: the risk factors individuals cannot change, *European Heart Journal*, Volume 42, Issue 8, 21 February 2021, Pages 801–804

Retrieved from <https://doi.org/10.1093/eurheartj/ehab074>

McLoyd, V. C. (1997). The impact of poverty and low socioeconomic status on the socioemotional functioning of African-American children and adolescents: Mediating effects. In R. D. Taylor & M. C. Wang (Eds.), *Social and emotional adjustment and family relations in ethnic minority families* (pp. 7-34). Lawrence Erlbaum Associates Publishers.

<https://doi.org/10.4324/9781315045030>

November 30, 2022

Received

NOV 30 2022

Land Use Planning

To whom it may concern:

I am a ten year old living with his single mom at the Oxford apartments. I go to a bilingual school named Sylvia Mendez. One thing that I've noticed for a long time is that the city of Berkeley is being unfair to the 200 (give or take) Oxford residents. One major issue is that we live right next to construction. My mom (and all other residents who drive a car) find it very hard to make it out of the driveway. Sometimes I'm late to school because the construction is blocking our garage. There's cones everywhere and sometimes cars don't even see us crossing. Another big problem is that there's so much noise. Whenever I'm trying to do my homework, all that I can hear are cranes and hammers. Other loud beeps come from the tow trucks. I can always hear them going at it. Last time the noise went on till 9:00 p.m. They start so early that it wakes me up when it is still dark. Sometimes the water is shut off. When it comes back on it looks purplish and unsanitary. My mom says it is too unsafe to stay here anymore. I don't want to lose my friends but I also don't want to lose my mom.

-I hope you can make Berkeley a better place

Dylan Carvalho

**TRAINING FOR HEALTH CARE PROVIDERS**

*[Date ...Place ...Event...Sponsor...Organizer]*

**CHILDREN AND NOISE**



**Children's Health and the Environment**

WHO Training Package for the Health Sector

World Health Organization

[www.who.int/ceh](http://www.who.int/ceh)

WHO/HSE/PHE/AMR/09.01.05

<<NOTE TO USER: Please add details of the date, time, place and sponsorship of the meeting for which you are using this presentation in the space indicated.>>

This presentation on Children and Noise is part of a comprehensive set of training materials for health care providers on children, the environment and health.

<<NOTE TO USER: This is a large set of slides from which the presenter should select the most relevant ones to use in a specific presentation. These slides cover many facets of the problem. Present only those slides that apply most directly to the local situation in the region. It is also very useful if you present regional/local examples of noise prevention programs, if available, and choose local relevant pictures.>>

## VULNERABILITY OF CHILDREN

- ❖ Different perception of dangers of noise
  - Can not recognize the dangerous exposures
- ❖ Lack of ability to control the environment
  - Are not able to identify and avoid the source of noxious noise
  - Exposure *intra utero*
- ❖ Noise can interfere with communication of danger
- ❖ May be more exposed due to their behaviour
  - Exploratory or risk behaviour (in children and teenagers)

Special vulnerability of children to noise. The known increased risk is due to  
<<READ SLIDE>>

### ***Noise effects in children***

*"Children may be more prone to the adverse effects of noise because they may be more frequently exposed....and they are more susceptible to the impact of noise". (Tamburlini, 2002)*

### ***Reference:***

•Children's health and the environment: A review of evidence. Tamburlini G et al., eds. *EEA-WHO*, 2002 ([www.eea.europa.eu/publications/environmental\\_issue\\_report\\_2002\\_29](http://www.eea.europa.eu/publications/environmental_issue_report_2002_29))

## Children and noise

### VULNERABILITY OF CHILDREN

Why might children be more susceptible to noise effects?

- ❖ Possible increased risk due to immaturity
  - Increased cochlear susceptibility?
    - *In utero*
    - Animal data studies
- ❖ Critical periods in relation to learning
- ❖ Lack of developed coping repertoires
- ❖ Vulnerable tasks \ Vulnerable settings (schools, home, streets)

What might be the implications of noise effects?

- ❖ Lifelong impairment of learning and education
- ❖ Short-term deficit followed by adaptation
- ❖ Non intentional lesions

#### <<READ SLIDE>>

Exposure to excessive noise and vibration during pregnancy may result in high frequency hearing loss in the newborn, may be associated with prematurity and growth retardation, although the scientific evidence remains inconclusive.

The role of the amniotic fluid is not yet defined, nor when and which noises or vibrations can damage the fetal development of the auditory system (e.g. cochlea). Concern about synergism between exposure to noise and ototoxic drugs remains incompletely defined. There are studies on fetal audition dating from 1932 that explore the reaction of the fetus to external noises but even today this remains incompletely characterized.

#### References:

- Children's health and the environment: A review of evidence, Ed. Tamburlini G. et al, *EEA-WHO, 2002* ([www.eea.europa.eu/publications/environmental\\_issue\\_report\\_2002\\_29](http://www.eea.europa.eu/publications/environmental_issue_report_2002_29)).
- National Institute of Public Health Denmark. Health Effects of Noise on Children and Perception of the Risk of Noise. Bistrup ML, ed. *Copenhagen, Denmark: National Institute of Public Health Denmark*, 2001, 29.

## VULNERABLE GROUPS OF CHILDREN

- ❖ The fetus and babies
- ❖ Preterm, low birth weight and small for gestational age babies
- ❖ Children with dyslexia and hyperactivity
- ❖ Children on ototoxic medication

It is logical to consider certain subgroups of children (since conception) to be particularly at risk for harm from excess noise exposure. These include the fetus, babies and very young infants born preterm, with low birth weight or small for gestational age. Also, children who have learning disabilities or attention difficulties may be more likely to develop early problems with mild hearing loss compared to children without these challenges, and children on ototoxic medications may have higher likelihood of developing problems from exposure to excess noise.

*Reference:*

•Carvalho WB, et al. Noise level in a pediatric intensive care unit. *J Pediatr*, 2005, 81:495-8.

**OBJECTIVES:** The purpose of this study was to verify the noise level at a PICU. **METHODS:** This prospective observational study was performed in a 10 bed PICU at a teaching hospital located in a densely populated district within the city of São Paulo, Brazil. Sound pressure levels (dBA) were measured 24 hours during a 6-day period. Noise recording equipment was placed in the PICU access corridor, nursing station, two open wards with three and five beds, and in isolation rooms. The resulting curves were analyzed. **RESULTS:** A basal noise level variation between 60 and 70 dBA was identified, with a maximum level of 120 dBA. The most significant noise levels were recorded during the day and were produced by the staff. **CONCLUSION:** The basal noise level identified exceeds International Noise Council recommendations. Education regarding the effects of noise on human hearing and its relation to stress is the essential basis for the development of a noise reduction program.

## Children and noise

### ADVERSE EFFECTS FROM EXCESS NOISE EXPOSURE

- ❖ Direct ear damage
  - Noise induced hearing loss
  - Noise induced threshold shift
- ❖ Indirect adverse effects
  - Physiological effects
  - Psychological effects
- ❖ Impaired cognition

*Characteristics of the sound can modify effect*

Adverse effects can be divided into direct damage, indirect adverse effects and impaired cognition. Many effects of noise exposure are more thoroughly studied in adults than in children.

The degree of adverse effect is modified by the sound characteristics.

•**Vibration:** can be acute or chronic, audible or inaudible. Vibration can be transmitted to all the body directly through the skin or bones.

•**Frequencies:** lower and higher (ultra and infra sounds) can also damage the human hearing system, despite being imperceptible, and have important consequences for life (loss of hearing). These consequences can also be present after chronic exposure to low frequency non audible sounds (chronic back noise exposure). Incubators are an example of this exposure.

•**Intensity:** Direct blows to the ears, very loud noise (pneumatic hammer or drill, fire arms, rocket), and sudden but intense sounds can destroy the eardrum and damage the hair cells of the cochlea by bypassing the protective reflexes. Acute trauma can cause a lifelong lesion.

•**Periodicity and Duration:** Impulse noise is more harmful than continuous because it bypass the natural protective reaction, the damping-out of the ossicles mediated by the facial nerve. Loud noise may result in temporary decrease in the sensitivity of hearing and tinnitus, but repeated exposure may cause these temporary conditions to become permanent.

### INDIRECT ADVERSE EFFECTS

❖ Stress-related somatic effects

- Stress hormone
- Blood pressure
- Muscle spasm

❖ Psychological effects

- Annoyance / Isolation
- Sleep disturbance
- Mental health

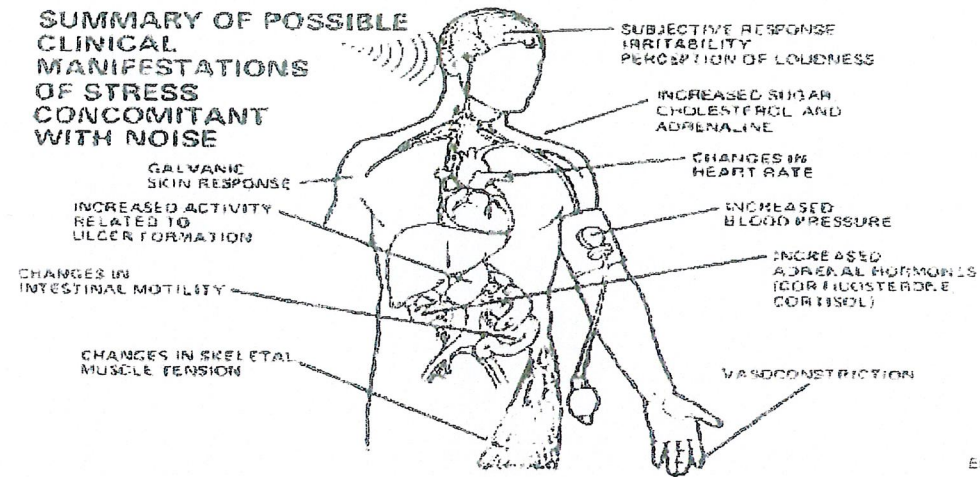
❖ Cognitive effects

- Reading, concentration, memory, attention

The next section will review the indirect adverse effects of noise listed here.



## PHYSIOLOGICAL EFFECTS OF NOISE



There might be harmful consequences to health during the state of alertness as well as when the body is unaware or asleep.

There are a variety of physiological effects that have been documented or postulated as a result of excess noise exposure.

<<READ SLIDE>>

*References:*

**Stress response:**

•Frankenhaeuser M. Immediate and delayed effects of noise on performance and arousal. *Biol Psychol*, 1974, 2:127-33

*Increased excretion of adrenaline and noradrenaline demonstrated in humans exposed to noise at 90 dBA for 30 minutes.*

•Henkin RI. Effect of sound on the hypothalamic-pituitary-adrenal axis. *Am J. Physiol*, 1963, 204:710-14

*Hypothalamic- pituitary- adrenal axis is sensitive to noise as low as 65 dBA (53% increase in plasma 17 HO corticosteroid levels).*

•Rosenberg J. Jets over Labrador and Quebec: noise effects on human health. *Can. Med. Assoc. J.*, 1991, 144(7):869-75.

*Biochemical evidence of the stress response was found in elevated urinary cortisol and hypertension accompanied a 30 minute exposure to 100dBA in 60 children aged 11 to 16 years.*

**Sleep derivation:**

*Noise levels at 40-50 dBA result in 10-20% increase in awakening or EEG changes*

•Falk SA. Hospital noise levels and potential health hazards. *Engl. J Med.*, 1973, 289(15):774-81

•Hilton BA. Quantity and quality of patient's sleep and sleep-disturbing factors in respiratory intensive care unit, *J Adv Nurs*, 1976, 1(6):453-68

•Thiessen GJ. Disturbance of sleep by noise. *J. Acoustic Soc. Am.*, 1978, 64(1):216-22

**Cardiovascular effects:**

•Etzet RA, ed. *Pediatric Environmental Health*. 2nd ed. American Academy of Pediatrics Committee on Environmental Health. Elk Grove Village, IL: American Academy of Pediatrics; 2003.

*Exposure to noise levels greater than 70 dBA causes increases in vasoconstriction, heart rate and blood pressure*

*Picture:*

•EPA (U.S. Environmental Protection Agency)

## PSYCHOLOGICAL DAMAGE

- ❖ Exposure to **moderate level of noise** can cause
  - Psychological stress
  - Annoyance, interference with activity, isolation
  - Headache, tiredness and irritability; may impair intellectual function and performance of complex tasks
- ❖ Exposure to **intense level of noise** can
  - Cause personality changes and aggressive/violent reactions
  - Reduce ability to cope
  - Alter work performance and intellectual function
  - May cause muscle spasm and also break a bone (when combined with strong vibration)
  - Sleep disturbance
  - Changes in mental health.
- ❖ Exposure to **sudden, unexpected noise** can cause
  - Startle reaction with stress responses
  - Cause non intentional injuries

Psychological effects correlate with intensity (or loudness) of the noise.

Exposure to **moderate levels of noise** can cause psychological stress.

Other effects can be:

- Annoyance (fear, anger, feeling bothered, feelings of being involuntarily and unavoidably harmed, and feelings of having privacy invaded), interference with activity.
- Headache, tiredness and irritability are also common reactions to noise.
- Possible impairment of intellectual function and performance of complex tasks. Depends on the nature of sound and individual tolerance.

Exposure to **intense level of noise** can:

- Cause personality changes and provoke aggressive and violent reactions.
- Reduce ability to cope.
- Alter work performance and intellectual function.
- Cause muscle spasm and also break a bone (when combined with strong vibration).
- Cause sleep disturbance.
- Provoke changes in mental health.

Exposure to **sudden, unexpected noise** can cause:

- Startle reaction with stress responses.
- Cause non intentional injuries.

Stress response consisting in acute terror and panic was described in children upon exposure to sonic booms.

### References:

- Kam PC. Noise pollution in the anaesthetic and intensive care environment. *Anaesthesia*, 1994, 49(11):982-6
- Kujala T, Brattico E. Detrimental noise effects on brain's speech functions. *Biol Psychol*. 2009, 81(3):135-43. Epub 2009 Apr 8.

### IMPAIRED COGNITIVE FUNCTION

- ❖ Chronic noise exposure impairs cognitive function
  - Reading comprehension
  - Long term memory
- ❖ Dose-response relationships
  - Supported by both laboratory and field studies
- ❖ Study of possible mechanisms and noise reduction interventions
  - Tuning out of attention / concentration
  - Impairment of auditory discrimination

The most robust area of study on noise and effects in children comes from studies which evaluate the effect of noise on learning and cognitive function; there are possible mechanisms, including noise-related changes in attention or distraction and impaired auditory discrimination.

<<READ SLIDE>>

### APARTMENT NOISE AND READING ABILITY

- ❖ 54 children living in apartments above interstate highway
  - 32<sup>nd</sup> floor: 55 dBA,
  - 20<sup>th</sup> floor: 60 dBA,
  - 8<sup>th</sup> floor: 66 dBA
- ❖ Measures of auditory discrimination and reading ability
- ❖ Correlations between floor level and auditory discrimination vary by duration of residence
- ❖ **Floor level correlates with reading-abolished by adjustment for auditory discrimination**
- ❖ Reading powerfully associated with mothers' education

Cohen S. *Journal of Experimental and Social Psychology* 1973, 9:407-22.

This study shows that street traffic noise measured on different floors of a multilevel apartment correlates inversely with auditory discrimination and reading ability. The higher floors were quieter and children scored better on reading ability and auditory discrimination. Correlations varied with duration of residence, and when reading level scores were adjusted for auditory discrimination measures, the floor level effect disappeared. Reading is also powerfully associated with mother's education.

*Reference:*

•Cohen S. Apartment noise, auditory discrimination, and reading ability in children. *Journal of Experimental and Social Psychology*, 1973, 9:407-22.

## Children and noise

### EFFECTS OF NOISE IN PRE-SCHOOL AND SCHOOL-AGED CHILDREN

- ❖ Hearing impairment
  - In isolated cases by toys or equipment
- ❖ Sleep disturbances
  - Earlier responses than adults (EEG awakenings)
- ❖ Somatic effects
  - Blood pressure and stress hormones
- ❖ Psycho-social effects
  - No studies on behaviour with high environmental noise levels
  - Cognitive tasks are impaired, like reading, long term memory, attention and motivation
- ❖ Vocal nodule

EEG: electroencephalogram

#### <<READ SLIDE>>

Children raise their voices and risk developing hoarseness and vocal nodules because of noise and relative overcrowding. The number of children screaming so much and so loudly that their voices are damaged and require treatment increased in Denmark during the 1990s. Noise in schools and day care institutions results in boys' voices getting hoarse and girls' voices squeaky. Children with vocal nodules can be difficult to understand and risk losing their voices altogether. Other children become so tired of screaming or of trying to make themselves heard that they give up saying anything at all and, for example, do not raise their hands in class. If children give up speaking, their voices do not develop properly and language learning is not reinforced.

#### References:

- Boman, E. The effects of noise and gender on children's episodic and semantic memory. *Scandinavian Journal of Psychology*, 2004, 45:407-416.
  - Bowen C. *Vocal nodules and voice strain in pre-adolescents*. 1997 (members.tripod.com/Caroline\_Bowen/teen-nodules.htm, accessed November 2009).
  - Clark C et al. Exposure-effect relations between aircraft and road traffic noise exposure at school and reading comprehension: the RANCH project. *Am J Epidemiol*. 2006, 163:27-37.
- Transport noise is an increasingly prominent feature of the urban environment, making noise pollution an important environmental public health issue. This paper reports on the 2001-2003 RANCH project, the first cross-national epidemiologic study known to examine exposure-effect relations between aircraft and road traffic noise exposure and reading comprehension. Participants were 2,010 children aged 9-10 years from 89 schools around Amsterdam Schiphol, Madrid Barajas, and London Heathrow airports. Data from The Netherlands, Spain, and the United Kingdom were pooled and analyzed using multilevel modeling. Aircraft noise exposure at school was linearly associated with impaired reading comprehension; the association was maintained after adjustment for socioeconomic variables (beta = -0.008, p = 0.012), aircraft noise annoyance, and other cognitive abilities (episodic memory, working memory, and sustained attention). Aircraft noise exposure at home was highly correlated with aircraft noise exposure at school and demonstrated a similar linear association with impaired reading comprehension. Road traffic noise exposure at school was not associated with reading comprehension in either the absence or the presence of aircraft noise (beta = 0.003, p = 0.509; beta = 0.002, p = 0.540, respectively). Findings were consistent across the three countries, which varied with respect to a range of socioeconomic and environmental variables, thus offering robust evidence of a direct exposure-effect relation between aircraft noise and reading comprehension.*
- Jessen B, Ruge G. Skolebørn skriger sig syge [Schoolchildren scream until they get sick]. *Berlingske Tidende*, 2000:26.

## ENVIRONMENTAL NOISE AND COGNITIVE DEVELOPMENT IN PRESCHOOL CHILDREN

- ❖ Children 6 months - 5 years
- ❖ Inverse associations between noise level at home and cognitive development

Wachs TD. Early Experience and Human Development. New York Plenum, 1982.  
Evans GW. Children's Environments, 1993, 10(1): 31-51

Effects of noise on cognitive development have been documented in preschool ages as well. Higher levels of noise at home are associated with decrements in cognitive development for age.

### References:

- Evans GW. Non-auditory effects of noise on children: A critical review. *Children's Environments*, 1993, 10(1):31-51.
- Maxwell LE et al. The effects of noise on pre-school children's pre-reading skills. *Journal of Environmental Psychology*, 2000, 20(1):91-97.
- Wachs TD. Early Experience and Human Development. *New York Plenum*, 1982.
- Yang W, Bradley JS. Effects of room acoustics on the intelligibility of speech in classrooms for young children. *J Acoust Soc Am*. 2009, 125(2):922-33.

## Children and noise

### PREVENTION AND INTERVENTION

- ❖ More research needed, especially in vulnerable groups
- ❖ Preventive action
  - Noise has to be controlled at the source
  - Hearing protection devices are a last resort
- ❖ Child hearing conservation programs
- ❖ Education and dissemination

#### Future research:

- Effects of noise on cognitive functions.
- Effects of noise on children's sleep.
- Magnitude/significance of noise annoyance.
- Children's perception and risk perception.
- Settings: home, schools, hospital, day care centres.
- Teenagers' attention when driving and listening to loud music.
- Effect of non-audible noise.
- Identification of more vulnerable groups!
- Intervention programs/best practices for preventing harmful effects.

#### Preventive actions

Noise has to be controlled at the source by:

- Reducing.
- Enclosing the vibrating surfaces.
- Placing sound absorbers and other protections.

Hearing protection devices are a last resort!

#### Child hearing conservation program

- Noise monitoring where children live, study and play.
- Hearing protection programs diffusion for teachers and parents.
- Vibration detection and protection.
- Protection of the pregnant woman.

#### Education and dissemination

#### References:

- Folmer RL, et al. Hearing conservation education programs for children: a review. *J Sch Health*. 2002;72:51-7.
- Prevalence of noise-induced hearing loss (NIHL) among children is increasing. Experts have recommended implementation of hearing conservation education programs in schools. Despite these recommendations made over the past three decades, basic hearing conservation information that could prevent countless cases of NIHL remains absent from most school curricula. This paper reviews existing hearing conservation education programs and materials designed for children or that could be adapted for classroom use. This information will be useful as a resource for educators and school administrators and should encourage further development, implementation, and dissemination of hearing conservation curricula. The overall, and admittedly ambitious, goal of this review is to facilitate implementation of hearing conservation curricula into all US schools on a continuing basis. Ultimately, implementation of such programs should reduce the prevalence of noise-induced hearing loss among children and adults.*
- Moeller. Environmental Health, Harvard University Press, 1992.

# The Effects of Noise on Health

Noise pollution is more than a nuisance. It's a health risk

BY STEPHANIE DUTCHEN 4 MIN READ

Received  
NOV 30 2022  
Land Use Planning

Airplanes pierce the night. Leaf blowers interrupt fall mornings. Quiet gives way to air conditioners, pounding music, construction equipment, street traffic, barking dogs, sirens.

For half a century, U.S. agencies such as the EPA have deemed noise pollution “a growing danger to the health and welfare of the Nation’s population.” The European Environmental Agency reports that noise ranks second only to air pollution as the environmental exposure most harmful to public health.

Yet, in sectors from government regulation to health care practice, the threats posed by noise remain “often underestimated,” according to the International Commission on Biological Effects of Noise.

Researchers and clinicians are trying to change this. They’ve shown that noise pollution not only drives hearing loss, tinnitus, and hypersensitivity to sound, but can cause or exacerbate cardiovascular disease; type 2 diabetes; sleep disturbances; stress; mental health and cognition problems, including memory impairment and attention deficits; childhood learning delays; and low birth weight. Scientists are investigating other possible links, including to dementia.

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Research also reveals how noise pollution connects with climate change. Many contributors to global warming generate noise, chief among them transportation and fossil fuel extraction and processing. Urban sprawl and deforestation destroy natural carbon absorption reservoirs while removing natural sound buffers. Technologies that help people deal with climate change, like air conditioners and generators, can be noisy. Conversely, certain climate mitigation strategies such as creating green spaces in concrete jungles offer opportunities to muffle noise.

## Wanted: better models

Estimates hold that chronic noise exposure contributes to 48,000 new cases of heart disease in Europe each year and disrupts the sleep of 6.5 million people. Quantifying



noise pollution's contribution to health problems and death in the United States, however, remains a challenge because of poor measuring and monitoring, says Peter James, an HMS associate professor of population medicine in Harvard Pilgrim Health Care Institute's Department of Population Medicine. This makes it harder to determine the best policies and medical practices for care.

"The U.S. hasn't really funded noise control or noise research since the 1980s," says James. "It's a big problem. We need to prioritize this so we can really pin down how noise affects health."

**"To say the onus is on the individual to fix their noise exposure is not feasible."**

James helps colleagues apply existing noise modeling data to large cohort studies, such as the Nurses' Health Study, to analyze participants' noise exposures and health outcomes. The models have low resolution, however, and working with them can be frustrating: researchers can't be sure whether a negative finding means noise doesn't contribute to a particular outcome, such as something as seemingly unrelated as menopause onset, or the data weren't robust enough to reveal a connection. James hopes to augment epidemiological data with input from participants using sensors and apps, which can deliver precise location and health information.

"Given what we do know, noise is too significant an issue for us to sit around and wait to have perfect data," he says.

James led a seminal 2017 study, published in *Environmental Health Perspectives*, which shows that people in neighborhoods with low socioeconomic status and higher proportions of residents of color bear the brunt of noise pollution in this country.

"We want our patients to reduce their exposure as much as possible, such as wearing ear plugs or investing in soundproofing insulation, but that's not possible for many who live in the noisiest areas," he says. "To say the onus is on the individual to fix their noise exposure is not feasible."

## Heart, felt

Another branch of inquiry focuses on how vibrations from noise can cause impairments. Part of the answer lies in the stress-response system. Researchers have found that the more people are bothered by noise, the greater the health risks they face from it. Yet, even those who tune out noise pollution, whether when awake or asleep, experience autonomic stress reactions.

Ahmed Tawakol, an HMS associate professor of medicine at Massachusetts General Hospital, and Michael Osborne, an HMS instructor in medicine at Mass General, have used advanced PET scanning to show that transportation noise is associated with heightened activity of the amygdala relative to regulatory cortical regions. Amygdalar activity can trigger stress pathways, including inflammation, that can lead to cardiovascular and metabolic diseases. Participants with a higher ratio of amygdalar to cortical activity had more risk for adverse outcomes in follow-up. The link persisted even after accounting for other disease risk factors.

In the clinic, Tawakol and Osborne say that evidence supports strategic intervention rather than trying to squeeze questions about noise into each patient encounter.

“If a patient mentions noise as a cause of stress, especially if they have or are at risk of cardiovascular disease, I’d certainly recommend personal noise mitigation strategies and stress reduction techniques,” Osborne says.

As researchers reveal the mechanisms and magnitude of noise-induced illness, clinicians will become better equipped to identify at-risk patients and prescribe effective solutions.

RETRIEVED FROM <https://hms.harvard.edu/magazine/viral-world/effects-noise-health>

December 1, 2022

Dear Landmark Preservation Commissioners,

We respectfully request your attention to our concerns regarding the current conceptual plan being presented for review for the Turtle Island Monument project to be located at the landmarked fountain in Martin Luther King Jr., Civic Center Park.

Our community group has worked diligently these past five years to help the City secure funding for the Turtle Island Fountain's completion, in order to bring to fruition this long-delayed monument to the Indigenous community.

Our primary goal is to support a design that can be **fully completed with the current funding of approximately \$1M, within the current funding's time schedule parameters, while remaining consistent with the Secretary of the Interior's Rehabilitation Standards.**

The current concept design presentation states:

"the proposed changes are consistent with the Secretary of the Interior's Rehabilitation Standard No. 4, which states that most properties change over time. Any changes that acquire historic significance in their own right should be retained and preserved."

The referenced Secretary of the Interior's Rehabilitation Standard document also states:

**"Rehabilitation** is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions *while preserving those portions or features which convey its historical, cultural, or architectural values.*" (italics added by us)

Per the below list, we believe the conceptual design being considered appears to be inconsistent with several of the Secretary of the Interior's Rehabilitation Standards including items 1, 2, 3, 5, 6, 9, and 10 :

#### The Secretary of the Interior's Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.\*
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

During the 2-day design charrette with the Indigenous design team (Aug 18-19, 2022), representatives from both the Parks, Recreation & Waterfront and Civic Arts Commissions directed all participants to discard the prior design and ignore all known parameters - including removing parts or the entire existing fountain structure - encouraging them to “think big” and “the sky’s the limit” while acknowledging that the new concept likely would require additional funding phases to complete along with substantial additional funding.

The prior Turtle Island Monument design features a substantial native planting habitat created in collaboration with eminent landscape architect Walter Hood. It endured through all approval and funding stages including the Dec 2018 City Council meeting where Mayor Arreguin directed the City Manager to work with our group through March 2022 when the project was awarded the Caltrans grant. It garnered significant and enthusiastic support from the community while remaining consistent with each of The Secretary of the Interior's Standards for Rehabilitation.

The prior design also had the full support of numerous Indigenous community members and groups, including Lee Sprague, Marlene Watson, and members of the Indigenous Peoples Day committee, all who were folded into the City process at our urging in May of 2022.

It also meets the standards of the newly instated City of Berkeley's March 9, 2022 Adopt a Resolution: [Native and Drought Resistant Plants and Landscaping Policy Update](#), authored by Councilmember Taplin, amending the Native Species/Bay-Friendly Landscaping Policy to require, when appropriate, the prioritization of native, non-invasive, and pollinator friendly plantings on City property.

Many thanks for your consideration of our concerns,  
Deb Durant, Elyce Klein, and David Snippen, Turtle Island Monument Committee  
[www.turtleislandfountain.org](http://www.turtleislandfountain.org)

\*ADDITIONAL NOTE re: The Secretary of the Interior's Standards for Rehabilitation item No. 9: While the prior Turtle Island Monument design's inspiration originated with the concept design by Lee Sprague (from the early 90's), it also incorporated two featured elements adapted from the original fountain design at the Golden Gate International Exposition on Treasure Island in 1939-1940;

- a central dome of reflection designed to echo the splay of the original fountain's central waterjets (eliminated in Dec 2018 per direction from City staff due to current drought conditions plus exorbitant restoration costs estimates received)
- the radial placement of the 8 City-owned waterjet cut inlay stone medallions, designed by Native American artists from across the country, echoing the 8 sculptural figures around the original fountain's perimeter

Below: original fountain for the Golden Gate International Exposition on Treasure Island, in 1939 (top); Walter Hood's concept (middle); rendering illustrating Lee Sprague's 5/22 proposed concept (bottom)

