

Health, Safety and Livability Impacts of Train Horn Noise

Compiled for the HAND Neighborhood 1/30/09

Noise is defined in research literature as “unwanted, unpredictable and uncontrollable sound.” The negative effects of loud, uncontrollable noise on people’s health and on the livability of a community are well documented, with some of the major effects listed as follows.¹

1. Noise interrupts sleep.

Sleep disturbance is one of the most serious effects of environmental noise. World Health Organization guidelines say that for good sleep, sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events should not exceed 45 dB(A).²

While night noise usually the concern, the young, old and infirm often sleep in the day, and day-time noise can be intrusive. Even noises that may not awaken people may disrupt sleep quality.³

Sleep difficulty may have long-term health consequences. The inability to sleep may also cause people to turn to tranquilizers and other drugs, which may have harmful health implications.⁴

2. Interrupted sleep harms health.

Effects as serious as elevated blood pressure are attributed to typical road noise levels. Sleep disturbance occurs with levels as low as the sound of a refrigerator (40 decibels). Noise can delay falling asleep, or cause repeated awakening which a person may not recall, but which affects health by contributing to tiredness and stress-related conditions such as high blood pressure, coronary disease, ulcers, colitis, and migraines. Chronic interference with sleep can affect cognitive performance, reading and memory, and elevate stress hormone levels.

3. Loss of sleep decreases community safety.

An estimated hundred thousand car crashes a year occur as a result of drowsiness. Sleep deprived drivers are equal to drunk drivers as a serious threat to themselves and everyone else on the road.⁵

4. Loss of sleep increases the risk of getting sick.

While research has shown that sleep boosts the immune system at the cell level, a recent study shows that even small sleep disturbances increase the risk of getting sick. People who tossed and turned as few as 25 minutes a night were five times more likely to get sick from a cold.⁶

5. Continued exposure to noise constitutes a serious health risk.

Noise acts like other stressors and can result in heart rate increases, blood pressure rises, mouth dryness, rises in blood cholesterol levels, and excessive secretion of hormones. If the noise exposure is sustained over a period of time, these stress reactions can result in high blood pressure, cardiovascular disorders, or insomnia.⁷ There is evidence that sleep loss may lead to premature death, cardiovascular disease, and the development of diabetes.⁸

6. Noise increases mental stress.

Noise has been linked to mental stress and distress. Individuals identify six emotional responses to noise, with 72% being annoyed, 40% angry, 30 % feeling helpless or upset, and 12% made physically ill.⁹ These emotions, if sustained, may lead to illness, a fact confirmed by a growing body of studies linking noise and illness.¹⁰

7. Noise affects the whole body.

Women who don't get seven hours of sleep erase much of the health benefit from exercising regularly, at least in preventing cancer. Exercise and sleep both affect body systems including hormone levels, the immune system, and weight.¹¹

8. Noise increases obesity.

Increasing sleep deficits (or interrupted sleep) brings about physiologic changes in the hormonal signals that promote hunger and therefore likely contribute to obesity.¹²

9. Noise damages hearing.

Loud sounds may damage hearing.¹³ Sounds that come in unpredictable and uncontrollable bursts can have dire consequences for the listener, especially if the intrusive sounds occur over a period of time.¹⁴

10. Noise has negative effects on children.

Noise in the home or school affects the mental development of children.¹⁵ Children's language development, cognition and learning are impaired by noise.

11. Noise increases the community-wide burden of disease.

The burden of disease of noise exposure is being studied. Health effects of noise and noise-related health outcomes may include cardiovascular disorders, cognitive impairment, hearing loss, tinnitus, sleep disturbance and annoyance. Considering various types of noise, WHO experts cited:¹⁶

- "There is sufficient evidence for the association between community noise and ischemic heart diseases, and limited/sufficient evidence for the association [with] hypertension."
- "The burden of disease caused by community noise induced tinnitus has probably been so far largely underestimated."
- "There are four components of cognitive impairment related to noise – reading, recall, recognition, and attention showing consistent relationship with noise exposure."

12. Noise reduces quality of work.

Unpredictable and uncontrollable high intensity noise leads to degradation in quality of task performance, health risks, and reduction in quality of life.¹⁷ Sleep loss may impair task performance, rendering individuals less productive in the workplace.¹⁸

13. Noise reduces quality of life.

Individuals living near a constant noise source may not yet have measurable physiological symptoms but their quality of life may be substantially diminished. A higher percentages of people exposed to aircraft noise indicated that they could not open their windows, talk on the telephone, converse with others in their homes, or listen to their radios and televisions, or sleep well.¹⁹

People coping with noise intrusions perceive themselves to be in poorer health and experience a lesser quality of life. Perception of health is a valid indicator that has proven useful in detecting health outcomes.²⁰

*For more information on combating train horn noise in SE Portland,
see the Hosford Abernathy Neighborhood Development website: www.handpdx.org*

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