



Noise Abatement and Control: The Federal Role

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Summary

Community perceptions of increasing exposure to noise from a wide array of sources have raised questions about the role of the federal government in regulating noise, and the adequacy of existing standards. The role of the federal government in regulating noise has remained fairly constant overall since the enactment of the Noise Control Act in 1972 (P.L. 92-574). With authorities under this and other related statutes, the federal government has established, and enforces, standards for maximum sound levels generated from aircraft and airports, federally funded highways, interstate motor carriers and railroads, medium- and heavy-duty trucks, motorcycles and mopeds, workplace activities, and portable air compressors. The federal government also regulates human exposure to noise in federally funded housing. In more recent years, the federal role has expanded to include regulation of noise generated by human activities on public lands, including National Parks. State and local governments determine the extent to which other sources of noise are regulated, including commercial, industrial, and residential activities. Although noise standards generally provide a level of protection sufficient to prevent human hearing loss, they vary among individual sources in terms of what level of sound is permissible. This report explains potential effects of various sound levels, describes the role of the federal government in regulating noise, characterizes existing federal standards, discusses the role of state and local governments, and examines relevant issues.

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Introduction

According to the National Institute on Deafness and Other Communication Disorders, exposure to loud sounds is responsible for hearing impairment in 10 million of the nearly 30 million people with hearing loss in the United States, and another 30 million people are daily exposed to dangerous noise levels. Many individuals are also regularly exposed to sound levels that may not lead to hearing loss, but can be intrusive and impair one's quality of life. Several federal laws require the federal government to maintain standards for various sources of noise. However, the standards do vary in stringency among individual sources. Although there is some variance among the standards, all of them limit sound levels at least to a degree that would prevent human hearing loss.

The responsibility for setting and enforcing noise control standards is divided among multiple federal agencies. In the past, the Environmental Protection Agency (EPA) coordinated all federal noise control activities through its Office of Noise Abatement and Control. However, Congress phased out the office's funding in FY1983 as part of a shift in federal noise control policy to transfer the primary responsibility for regulating noise to state and local governments. Although EPA no longer plays a prominent role in regulating noise, its past standards and regulations remain in effect, and other federal agencies continue to set and enforce noise standards for sources within their regulatory jurisdiction.

Public interest in the federal regulation of noise and the adequacy of existing standards continues to be strong, especially among communities where sources of noise have proliferated, and as residential development has resulted in people living closer to sources of noise. Considering that existing standards generally are protective against hearing loss, the primary concern among the public has been whether the standards should be tightened to protect the quality of life in communities where sound levels may be perceived as annoying or intrusive, but not necessarily harmful to human hearing. Potential effects of various sound levels, and the roles of federal, state, and local governments in regulating individual sources of noise, are discussed below.

How Loud Is Too Loud?

Sound is measured in units of decibels (dbA), and an increase of 10 dbA represents sounds that are perceived to be twice as loud. There is broad consensus among regulators in the United States that constant or repeated exposure to sound levels in the vicinity of 90 dbA and higher can lead to hearing loss. Exposure to sounds significantly below these levels are generally not considered harmful to human hearing. However, most individuals perceive unwanted sound above 65 dbA to be intrusive, which can impair one's quality of life, depending on the sensitivity of the individual and the frequency and duration of exposure. Some also argue that persistent exposure to intrusive sound may have certain physiological effects, such as headaches or nausea, even though one's hearing ability may not be impaired. There also have been some questions about the vibration-induced effects of low frequency sound, which can be felt but not heard.

What Sources of Noise Are Subject to Federal Regulation?

The Noise Control Act of 1972 (P.L. 92-574) and several other federal laws require the federal government to set and enforce noise standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, engines and certain types of equipment, federally funded highway projects, and federally funded housing projects. The Noise Control Act also requires federal agencies to comply with all federal, state, and local noise requirements. Various federal laws and regulations governing the administration of park and recreational lands owned by the federal government also provide authorities for agencies to regulate noise that would be generated from human activities on, and in the vicinity of, these lands.

Most federal noise standards focus on preventing hearing loss by limiting exposure to sounds of 90 dbA and higher. Some federal standards are stricter and focus on limiting exposure to lower levels of around 65 dbA to protect quality of life. Whether “quality-of-life” standards should be tightened has been an ongoing issue, particularly among communities located near transportation sources such as airports and highways, where exposure to noise is a daily or routine occurrence. As noted above, there also have been some questions about the effects of low frequency sound, but so far, noise standards in the United States have not regulated low frequency sound below the threshold of human hearing. Major existing federal standards that regulate human exposure to noise, and the agencies responsible for setting and enforcing them, are discussed below.

Aircraft and Airports

The Aircraft Noise Abatement Act of 1968 (P.L. 90-411) requires the Federal Aviation Administration (FAA) to develop and enforce standards for aircraft noise.¹ In developing these standards, the FAA generally follows noise limits recommended by the International Civil Aviation Organization (ICAO). Federal noise regulations define aircraft according to four noise classes: Stage 1, Stage 2, Stage 3, and Stage 4. Stage 1 aircraft are the loudest, and Stage 4 are the quietest. All Stage 1 aircraft have been phased out of commercial operation, and all unmodified Stage 2 aircraft over 75,000 pounds were phased out by December 31, 1999, as required by the Airport Noise and Capacity Act of 1990 (P.L. 101-508, Title IX, Subtitle D).² Stage 3 aircraft must meet separate standards for runway takeoffs, landings, and sidelines, ranging from 89 to 106 dbA depending on the aircraft’s weight and its number of engines.³ Stage 4 standards are stricter and require a further reduction of 10 dbA overall relative to Stage 3 standards.

The Stage 4 standards are relatively new and are based on standards that the ICAO adopted in June 2001 (referred to as “Chapter 4” in ICAO parlance). The FAA finalized these standards in July 2005,⁴ adopting the ICAO standards by reference. The Stage 4 standards apply to newly manufactured subsonic jet airplanes, and subsonic transport category large airplanes, for which a new design is submitted for airworthiness certification on or after January 1, 2006. As the

¹ 49 U.S.C. 44715.

² 49 U.S.C. 47528.

³ 14 C.F.R. 36.

⁴ 70 *Federal Register* 38742.

majority of jet aircraft designed in recent years are already quiet enough to attain the Stage 4 standards, some have commented that the impact of the stricter standards on most aircraft manufacturers may be less significant than otherwise. The ICAO also had recommended separate standards for propeller-driven, small airplanes. The FAA finalized these standards in January 2006.⁵ They apply to newly manufactured, propeller-driven, small aircraft for which a new design is submitted for airworthiness certification on or after February 3, 2006.

In addition to aircraft certification standards, airports receiving federal funds are required to meet noise control standards for their operation. The standards range from 65 dbA for airports adjacent to residential areas to over 85 dbA for those adjacent to lands used for agricultural and transportation purposes.⁶ The Airport and Airway Improvement Act of 1982 (P.L. 97-248) established the Airport Improvement Program (AIP) to provide federal assistance for airport construction projects and to award grants for mitigating noise resulting from the expansion of airport capacity. Airport operators applying for such grants must design noise exposure maps and develop mitigation programs to ensure that noise levels are compatible with adjacent land uses.

Interstate Motor Carriers

The Noise Control Act required EPA to develop noise standards for motor carriers engaged in interstate commerce, and it authorized the Federal Highway Administration to enforce them.⁷ All commercial vehicles over 10,000 pounds are subject to standards for highway travel and stationary operation, but the standards do not apply to sounds from horns or sirens when operated as warning devices for safety purposes.⁸ For highway travel, the standards range from 81 to 93 dbA, depending on the speed of the vehicle and the distance from which the sound is measured. The standards for stationary operation are similar and range from 83 to 91 dbA, depending on the distance from the vehicle. The standards apply at any time or condition of highway grade, vehicle load, acceleration, or deceleration.

Interstate Railroads

The Noise Control Act required EPA to establish noise standards for trains and railway stations engaged in interstate commerce, and the law authorized the Federal Railroad Administration (FRA) to enforce those standards.⁹ There are separate standards for locomotives, railway cars, and railway station activities such as car coupling.¹⁰ For locomotives built before 1980, noise is limited to 73 dbA in stationary operation and at idle speeds, and is limited to 96 dbA at cruising speeds. The standards for locomotives built after 1979 are stricter, and limit noise in stationary operation and at idle speeds to 70 dbA and at cruising speeds to 90 dbA. Noise from railway cars must not exceed 88 dbA at speeds of 45 miles per hour (mph) or less, and must not surpass 93 dbA at speeds greater than 45 mph. Noise from car coupling activities at railway stations is limited to 92 dbA.

⁵ 71 *Federal Register* 528.

⁶ 14 C.F.R. 150.

⁷ 42 U.S.C. 4917.

⁸ 49 C.F.R. 325.

⁹ 42 U.S.C. 4916.

¹⁰ 49 C.F.R. 210.

There are no uniform noise standards that control sounds from locomotive horns, whistles, or bells when they are operated as warning devices for safety purposes. However, in response to concerns about noise from horns in communities located near railways, the FRA finalized regulations in 2005,¹¹ and modified them in 2006,¹² allowing such communities to designate “quiet zones.” Within these zones, communities could prohibit the routine sounding of locomotive horns. Designation of these zones is subject to certain conditions, including that there would be no significant risk of loss of life or risk of serious personal injury resulting from the lack of a horn sounding.

Workplace Activities

The Occupational Safety and Health Act of 1970 (P.L. 91-596) required the Occupational Safety and Health Administration (OSHA) to develop and enforce safety and health standards for workplace activities.¹³ To protect workers, OSHA established standards which specify the duration of time that employees can safely be exposed to specific sound levels.¹⁴ At a minimum, constant noise exposure must not exceed 90 dbA over 8 hours. The highest sound level to which workers can constantly be exposed is 115 dbA, and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dbA. If noise levels exceed these standards, employers are required to *provide* hearing protection equipment to workers in order to reduce sound exposure to acceptable limits. In April 2007, the Department of Labor proposed regulations that would *require* minors to wear hearing protection devices when working with wood processing machinery.¹⁵

Engines and Certain Types of Equipment

The Noise Control Act directed EPA to set and enforce noise standards for motors and engines, and transportation, construction, and electrical equipment.¹⁶ With this authority, EPA established standards for motorcycles and mopeds, medium and heavy-duty trucks over 10,000 pounds, and portable air compressors. The standards for motorcycles only apply to those manufactured after 1982 and range from 80 to 86 dbA, depending on the model year and whether the motorcycle is designed for street or off-road use.¹⁷ Noise from mopeds is limited to 70 dbA. The standards for trucks over 10,000 pounds only apply to those manufactured after 1978 and range from 80 to 83 dbA depending on the model year.¹⁸ These standards are separate from those for interstate motor carriers. Noise from portable air compressors is limited to 76 dbA.¹⁹

¹¹ 70 *Federal Register* 21844.

¹² 71 *Federal Register* 47614.

¹³ 29 U.S.C. 655.

¹⁴ 29 C.F.R. 1910.95.

¹⁵ 72 *Federal Register* 19337.

¹⁶ 42 U.S.C. 4905.

¹⁷ 40 C.F.R. 205, Subparts D and E.

¹⁸ 40 C.F.R. 205, Subpart B.

¹⁹ 40 C.F.R. 204.

Federally Funded Highway Projects

The Federal-Aid Highway Act of 1970 (P.L. 91-605) required the Federal Highway Administration (FHWA) to develop standards for highway noise levels that are compatible with adjacent land uses.²⁰ The law prohibits the approval of federal funding for highway projects that do not incorporate measures to attain these standards, which range from 52 to 75 dbA depending on adjacent land use.²¹ Among the most common method to attain these standards is to erect a physical barrier (i.e., a noise wall) between the highway and the adjacent land.

Federally Funded Housing Projects

Under general authorities provided by the Housing and Urban Development Act of 1968 (P.L. 90-448), the Department of Housing and Urban Development (HUD) has established standards for federally funded housing projects located in noise-exposed areas.²² The standards limit interior noise to a daily average of 65 dbA.²³ Possible methods to mitigate noise in housing include the installation of doors and windows designed to diminish the transmission of sound, the insertion of noise-blocking insulation within walls, and the use of thicker walls and floors in new construction.

Federal Park and Recreational Lands

Various federal laws and regulations governing the administration of park and recreational lands owned by the federal government also provide authorities for agencies to regulate noise that would be generated from human activities on, and in the vicinity of, these lands. For example, the National Park Service has included noise standards in its regulations governing the operation of vessels on waters within all National Parks.²⁴ Certain regulations also govern noise from specific sources in particular parks and recreational areas. For example, the FAA has promulgated regulations limiting noise from aircraft operations in the vicinity of Grand Canyon National Park.²⁵ These and other restrictions have been motivated by rising interest among recreational users in maintaining the serene qualities of public lands for their enjoyment. However, there have been conflicting desires between recreational users who seek a quieter environment and those users whose preferred recreational activities would be restricted because of the noise those activities would generate.

Noise Reduction Devices

The federal government also is responsible for rating consumer devices designed to be worn by individuals to reduce exposure to potentially harmful or intrusive sound levels. The Noise Control Act authorized EPA to require labels for products that reduce noise.²⁶ Under this authority, EPA

²⁰ 23 U.S.C. 109(i).

²¹ 23 C.F.R. 772.

²² 42 U.S.C. 3535(d).

²³ 24 C.F.R. 51, Subpart B.

²⁴ 72 *Federal Register* 13694.

²⁵ 70 *Federal Register* 16084.

²⁶ 42 U.S.C. 4907.

established Noise Reduction Ratings for noise reduction devices, such as head gear and ear plugs. Manufacturers are required to use these ratings to identify the reduction of sound in decibels that the user would experience when wearing these devices.²⁷

What Is the State and Local Role in Controlling Noise?

The federal role in regulating noise is primarily limited to transportation, workplace activities, certain types of equipment, and human activities on public lands owned by the federal government. State and local governments determine the extent to which other sources of noise are controlled, and regulations for such sources can vary widely among localities. Further, some states do not directly regulate noise, but allow local governments to play the primary role. Sources of noise commonly regulated at the state and local level include commercial, industrial, and residential activities. Regulations for such sources typically control the public's exposure to noise by limiting certain activities to specific times, such as construction noise only during business hours. Public concern about differing state and local control of noise has led some to suggest that the federal role should be expanded to regulate a greater variety of sources uniformly across the country.

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²⁷ 40 C.F.R. 211.

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