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Airport Noise NIMBYism: An Empirical Investigation

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Every growing city encounters criticism from residents who will settle for little else but the status quo. Local governments intent on building or expanding infrastructure must contend with citizens opposed to the inconvenience and nuisance of increased construction, more neighbors, and heavier traffic. This hostility to expansion, called "NIMBYism" (not in my backyard), can be a barrier to denser development, lower housing prices, and ultimately economic growth.

But NIMBYism extends beyond opposition to urban development, and its consequences can hinder economic growth in nonobvious ways. In this policy brief, we explore a particular category of NIMBY complaints surrounding airport noise. Airport noise can be a nuisance, but it is also necessary for economic activity in the modern world. We evaluate noise complaint data from a selection of US airports to quantify opposition to airport noise. We find that the source of airport noise complaints is highly concentrated in a few dedicated complainers.

Airport noise policy must strike a reasonable balance between noise abatement and the economic benefits associated with noisy airplane takeoffs and landings. However, because the majority of noise complaints come from a small number of loud objectors, there is a danger that this balance has been tilted too far in the direction of noise abatement.[1] We hope that increasing awareness of the lopsided distribution of noise complaints can help promote noise standards that strike an appropriate balance and facilitate the advancement of faster and cheaper commercial flight.

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MANY COMPLAINTS COME FROM A SMALL NUMBER OF CALLERS

Most airports in the United States allow the public to submit noise complaints through dedicated hotlines and online portals. Nearly all of the country's largest airports publish data on the calls they receive, but this information varies in thoroughness. Some airport authorities, such as the Port of Seattle, allow public access to each complainant's name, their personal information, and a summary of the call. Others, like Boston's Massport, only publish the number of complaints received and the number of unique callers. But even this summary information is useful; data from Massport on Boston Logan International Airport still illustrate the distribution and origin of complaints.

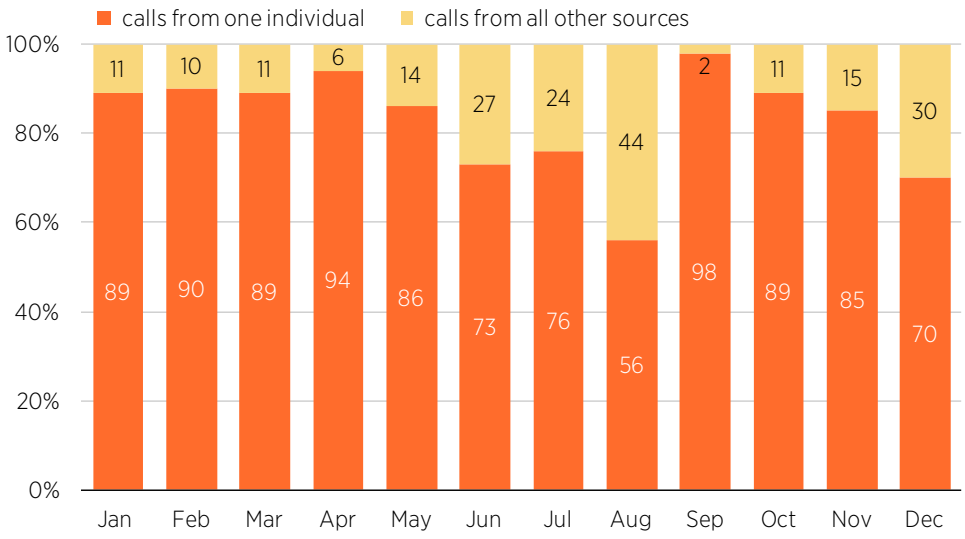
Generally, a very small number of people account for a disproportionately high share of the total number of noise complaints. In 2015, for example, 6,852 of the 8,760 complaints submitted to Ronald Reagan Washington National Airport originated from one residence in the affluent Foxhall neighborhood of northwest Washington, DC.[2] The residents of that particular house called Reagan National to express irritation about aircraft noise an average of almost 19 times per day during 2015. Other major airports report similar trends. In Seattle's detailed call-by-call lists, one individual complains so frequently that her grievances are not transcribed in full but simply tallied at the end of the month. While airport employees provide summaries of other calls, the description of this particular individual's calls is, "Same complaint over and over. Records a/c flying over."[3]

Relative to other large US airports, San Francisco International Airport receives an enormous number of complaints each year. In 2015, it registered 890,376 complaints. Predictably, we find that these complaints were not lodged by a correspondingly large number of people; rather, hundreds of thousands of calls came from just 9,561 callers. Even if calls were uniformly distributed among these callers, each would still have had to place 93 calls. But as with other US airports, San Francisco's complaint records show a high degree of concentration among a very small subset of total callers. In October 2015, 53 Portola Valley, CA, residents placed 25,259 calls to the airport—nearly 477 per person. Similarly, three residents of Daly City placed 1,034 calls in December 2015, and six Woodside callers complained 2,432 times in November.

TABLE 1. SUMMARY OF AIRPORT NOISE COMPLAINTS

Airport	Time period covered	Total number of complaints	Evidence of concentration
Ronald Reagan Washington National Airport (DCA)	2015	8,760	2 individuals at 1 residence in NW DC accounted for 6,852 complaints (78 percent).[4]
Denver International Airport (DEN)	2015	4,870	1 individual in Strasburg, CO, 30 miles from the airport, accounted for 3,555 complaints (73 percent). 4 callers accounted for 4,653 complaints (96 percent). A total of 42 households complained.[5]
Washington Dulles International Airport (IAD)	2015	1,223	1 individual in Poolesville, MD, 13 miles away from the airport, accounted for 1,024 complaints (84 percent).[6]
Las Vegas McCarran International Airport (LAS)	2015	3,963	1 individual accounted for 450 calls in September 2015 (98 percent of monthly total).[7]
Los Angeles International Airport (LAX)	2015	8,862	1 individual in Monterey Park, CA, accounted for 489 complaints during June 2015 (50 percent of monthly total). The top 3 callers accounted for 88 percent of June complaints.[8]
Portland International Airport (PDX)	2015	688	5 individuals accounted for 420 complaints (61 percent).[9]
Phoenix Sky Harbor International Airport (PHX)	2015	24,247	1,338 households in total lodged complaints. While data is not available by household, the airport received 3,814 complaints from 13 households in zip code 85258, for an average of 293 calls per household.[10]
Seattle-Tacoma International Airport (SEA)	2014	1,006	3 individuals accounted for 648 complaints (64 percent). Top caller accounted for 42 percent of total.[11]
San Francisco International Airport (SFO)	2015	890,376	53 Portola Valley, CA, individuals accounted for 25,259 complaints during the month of October 2015, for an average of 477 calls per person in that month.[12]

FIGURE 1. CONCENTRATION OF NOISE COMPLAINTS AT LAS VEGAS MCCARRAN INTERNATIONAL AIRPORT (LAS), 2015



Source: McCarran International Airport, "Noise Complaint Reports."

Table 1 summarizes the concentration of noise complaints registered at several large US airports. Figure 1 shows the monthly concentration of noise complaints over the course of 2015 at McCarran International Airport in Las Vegas.

SMALL NUMBER OF CALLERS HAVE DISPROPORTIONATE IMPACT

Airport noise complaint data paints a startling picture. A handful of individuals are responsible for most of the noise complaints at most airports we examine. Some of these individuals do not appear to live particularly close to the airports to which they are complaining. For example, one individual in Strasburg, CO, 30 miles from Denver International Airport, complained 3,555 times in 2015, an average of 9.7 times per day. One individual in La Selva Beach, CA, about *55 miles* from San Francisco International Airport, complained about airport noise 186 times during October 2015.

There are worrisome signs that this small, frustrated minority of citizens is affecting aviation policy. In recent decades, the Federal Aviation Administration (FAA) has imposed progressively more stringent noise standards on aircraft operating in US airspace.[13] While noise abatement is desirable, it can have significant costs—particularly on the fuel efficiency of aircraft—resulting not only in higher carbon emissions but also in higher ticket prices. It is troubling that a tiny but vocal group is potentially driving policy. While we do not have data on grievances lodged directly to the FAA or to members of Congress, it is probable that those airport noise complaints follow a similar pattern.

AIRPORT NOISE AND FUEL EFFICIENCY

Airport noise is entangled with fuel efficiency in at least two ways. First, the FAA's NextGen airspace modernization program will enable aircraft to travel along denser and more direct routes, particularly on approach for landing. NextGen will remove much of the need for circling above the airport in holding patterns, and it allows aircraft to descend more gradually, saving valuable fuel. However, denser and more gradual approaches also correspond to more noise on the ground under approach paths to the airport. Airports undergoing NextGen implementation have experienced a significant uptick in noise complaints.[14]

Second, airport noise standards are very important for fuel efficiency gains on potential new supersonic aircraft. Aircraft are more fuel efficient when they can take off at full throttle, and these gains in efficiency are of particular importance when aircraft are climbing to the high cruise speeds and altitudes of supersonic planes. Yet in the FAA's most recent policy statement on supersonics, the agency said it "would propose that any future supersonic airplane produce no greater noise impact on a community than a subsonic airplane."[15] Subsonic noise

type certification requirements are quite strict, and they will become stricter still in 2018. Holding supersonic aircraft to subsonic noise standards would hamper the viability of the new market. Insofar as the FAA is adopting such a strict stance in response to the volume of airport noise complaints, it is overweighting the opinions of a small, concentrated minority of citizens at the expense of the environment and of those who would benefit from affordable supersonic flight.[16]

OPTIONS FOR ADDRESSING AIRPORT NOISE

Policymakers can address airport noise in several ways. One option is for airports to acquire residential land below flight paths. Obviously, it would be impractical for airports to acquire land to address complaints originating from up to 50 miles away from the airport. Nevertheless, numerous airports have bought up nearby land to reduce the effect of noise on people nearby. A second approach is to make noise standards more severe, creating mandatory retirement of the existing fleet of airplanes. This was done in the 1990s as the Stage 2 noise standard was replaced with Stage 3. Economist Stephen A. Morrison and his coauthors estimate that the benefits of the phaseout, in terms of property values for homeowners, were $5 billion less than the costs to airlines, in terms of the reduced life of their capital.[17]

A third approach is to subsidize and otherwise support the installation of more and better insulation in homes affected by airport noise. Aerospace engineer Philip J. Wolfe and his coauthors estimate that this is more cost-effective than land acquisition or mandatory retirement.[18] There are a number of insulation programs run by airports around the country.[19]

Finally, a noise tax could help to efficiently discourage the production of noise without outright banning it, and revenues could be used to fund insulation programs. This is a better strategy than existing FAA policy of continuing to increase noise standards, perhaps in response to a high volume of complaints.

CONCLUSION

It would be a mistake to allow the preferences of a vocal but minuscule minority of citizens, however sympathetic their circumstances, to impede much-needed improvements in aviation. Airport noise standards are already quite strict, and they create real economic and environmental costs associated with lower aircraft fuel efficiency. While our analysis cannot recommend a precise noise standard, we are concerned that a handful of callers—who contact not only airports but also the FAA and congressional offices—have unduly influenced existing standards. Policymakers should be acutely aware of the distribution of calls before taking further action on airport noise.

NOTES

1. In other words, airport noise complaints could be a classic case of concentrated benefits and diffused costs. Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups*, 2nd ed. (Cambridge, MA: Harvard University Press, 1971).
2. Metropolitan Washington Airports Authority, "2015 Annual Aircraft Noise Report," accessed August 18, 2016.
3. Port of Seattle, "Public Records Request: Request #16-34," January 27, 2016.
4. Ibid.
5. Denver International Airport, "DEN Noise Report: January 1, 2015–December 31, 2015," accessed August 19, 2016.
6. Metropolitan Washington Airports Authority, "2015 Annual Aircraft Noise Report."
7. McCarran International Airport, "Noise Complaint Reports," July through September 2015 Noise Complaint Reports, October 22, 2015.
8. Los Angeles World Airports, "June 2015 ANCR Report," July 31, 2015.
9. Port of Portland, "2015 Year in Review," accessed August 19, 2016.
10. City of Phoenix Aviation Department, "Annual Noise Report 2015," accessed August 18, 2016.
11. Port of Seattle, "Public Records Request: Request #16-122," April 6, 2016.
12. San Francisco International Airport, "Noise Abatement Data," accessed August 19, 2016.
13. Federal Aviation Administration, "Details on FAA Noise Levels, Stages, and Phaseouts," June 10, 2016.
14. Pia Bergqvist, "NextGen Flight Paths Give Rise to Noise Complaints," *Flying Magazine*, June 23, 2016. Entire websites also exist to coordinate noise complaints against NextGen. See NextGenNoise, accessed September 26, 2016, http://nextgennoise.org/.
15. Federal Aviation Administration, Civil Supersonic Airplane Noise Type Certification Standards and Operating Rules, 73 Fed. Reg. 205 (October 22, 2008).
16. For subsonic aircraft, noise standards have in fact become stricter over time. In 2000, so-called Stage 3 noise requirements became mandatory. In 2006, the FAA stopped certifying aircraft under Stage 3 in favor of the more restrictive Stage 4 standards. In 2018, new Stage 5 standards will be required for certification. This continuous one-way ratchet in noise standards is at least circumstantial evidence that noise complaints are effective.
17. Steven A. Morrison, Clifford Winston, and Tara Watson, "Fundamental Flaws of Social Regulation: The Case of Airplane Noise," *Journal of Law and Economics* 42, no. 2 (1999): 723–44.
18. Philip J. Wolfe et al., "Costs and Benefits of US Aviation Noise Land-Use Policies," *Transportation Research Part D: Transport and Environment* 44 (2016): 147–56.
19. Jon Hilkevitch, "Midway-Area Homes to Get $10 Million More for Soundproofing," *Chicago Tribune*, August 5, 2015; Massachusetts Port Authority, "Sound Insulation Program," accessed August 19, 2016; Community Development Commission of the County of Los Angeles, "Residential Sound Insulation Program (RSIP)," accessed August 19, 2016.