

APPROACHES TO SURVEYING RESIDENTS' EXPERIENCES WITH AIRPLANE NOISE IN MILTON, MA



METROBRIDGE



ABOUT THIS REPORT

This report is a compilation of work completed in Spring 2019 by undergraduate students in the Public Opinion in American Politics course at Boston University taught by Spencer Piston, Assistant Professor of Political.

The final version of this report was compiled and edited by students Amber Born and Connor Cox, with support from Emily Robbins, MetroBridge Program Manager and Associate Professor David Glick, MetroBridge Faculty Director. The report was designed by Fatima Blanca Munoz, Program Manager at the Initiative on Cities.



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ABOUT BU METROBRIDGE

MetroBridge empowers students across Boston University to tackle urban issues, and at the same time, helps city leaders confront key challenges. MetroBridge connects with local governments to understand their priorities, and then collaborates with Boston University faculty to translate each city's unique needs into course projects. Students in undergraduate and graduate classes engage in city projects as class assignments while working directly with local government leaders during the semester. The goal of MetroBridge is to mutually benefit both the Boston University community and local governments by expanding access to experiential learning and by providing tailored support to under-resourced cities. MetroBridge is funded by the College of Arts and Sciences and housed at Boston University's Initiative on Cities.



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EXECUTIVE SUMMARY

The Town of Milton collaborated with the MetroBridge program during the Spring 2019 semester to explore the various methodological approaches available to more effectively measure Milton residents' experiences with aircraft noise. Previous efforts to assess community disruption caused by low-flying airplanes proved to be insufficient, according to town officials.

Within this report, there are several sections of information for the Town of Milton to consider as it plans next steps for understanding the impact of airplane noise:

- **Resident Survey Questions:** A complete survey instrument of recommended questions is included for the Town to use in future community outreach efforts. The survey questions are compiled from student research as well as consultations with noise experts.
- **Review of Methodological Approaches:** Summaries of student research and recommendations for how the Town of Milton could best collect data about residents' experiences, including both quantitative and qualitative approaches.
- **Summary of the Community Noise Lab at Boston University:** An overview of Dr. Erica Walker's work at the Community Noise Lab, an interdisciplinary research lab devoted to developing a more nuanced and creative inquiry into community noise issues and corresponding health impacts.
- **Summary of Sounds in the City at McGill University:** An overview of Dr. Daniel Steele's work at Sounds in the City that is taking a new approach to shaping the future of urban noise management. (Dr. Steele is based in the Boston area and is a visiting fellow at Boston University's Initiative on Cities.)

This report is intended to provide the Town of Milton with research, tools, and information to address community complaints about low-flying airplanes heading into and out of nearby Logan Airport. The survey tool can be fielded in the community, and both the Community Noise Lab and Sounds in the City are resourceful partners to collaborate with, should the town choose to do so.

RESIDENT SURVEY QUESTIONS

Below is a 26-question survey instrument compiled by students using guidance from public opinion literature and expert guidance from Dr. Erica Walker (Community Noise Lab) and Dr. Daniel Steele (Sounds in the City).

1. Do you work outside of Milton?
 - Yes
 - No
 - Other (explain)

2. On a typical day, how many hours would you spend in Milton?
 - 1-5 hours
 - 5-15 hours
 - 15-24 hours

3. In a typical week, how many days would you spend in Milton?
[Open-Ended Response]

4. When was the last time you heard an airplane flying over Milton?
 - Within the last 24 hours
 - Within the last 48 hours
 - Within the last week
 - I haven't noticed it recently

5. When do you feel disturbed by aircraft noise? (Check all that apply)
 - Early morning
 - Mid-day
 - Afternoon
 - Evening
 - During the nighttime
 - Never

6. In which of these settings has airplane noise ever distracted your attention from what you were trying to do?

- Home
- School
- Workplace
- Outdoors
- Other (fill in the blank)
- None

7. How disturbed are you overall by airplane noise over Milton?

[Not disturbed at all 1 2 3 4 Very disturbed]

For the following four questions, please indicate the degree to which airplane traffic Milton has affected your personal activities on a scale of 1 to 5 with 1 being no effect and 5 being the highest effect.

8. Airplane traffic over Milton has affected my sleep.

[No Effect] 1 2 3 4 5 [Highest Effect]

9. Airplane traffic over Milton has affected my overall health.

[No Effect] 1 2 3 4 5 [Highest Effect]

10. Airplane traffic over Milton has affected my performance at work.

[No Effect] 1 2 3 4 5 [Highest Effect]

11. I have had to make adjustments to my daily life/routine due to noise from passing airplanes.

[No Effect] 1 2 3 4 5 [Highest Effect]

12. Would you be willing to participate in upcoming town halls and/or public demonstrations concerning airplane noise in your community?

- Yes
- No

13. In general, how sensitive are you to noise?

[Not Sensitive at All] 1 2 3 4 5 [Very Sensitive]

Demographic Questions (US Census)

14. What is your address?
15. How long have you lived at this address?
16. What is your age and date of birth?
17. What is your race?
18. Are you Hispanic/Latino?
19. What is your gender?
20. What is your highest level of education?
21. What is your average annual household income?
22. How many people live in your household?
23. Do you have children?
24. What type of home do you live in?
25. Do you rent or own your home?
26. Would you like to tell us anything about your experience with airplane noise that was not covered in this questionnaire?
[Open-Ended Response]

REVIEW OF METHODOLOGICAL APPROACHES

Several students developed a set of recommendations for the Town of Milton on measuring public opinion about airplane noise.

Each student designed their own research question (e.g., “How concerned are Milton residents about airplane noise?” or “How does airplane noise impact the lives of Milton residents?”) and provided guidance on how public opinion should be measured (e.g., through surveys, interviews, focus groups, or other methods), who to include in the hypothetical study, and how to design the study such that its results would accurately answer the chosen research question, while minimizing bias and measurement or design errors.

The papers drew heavily from scholarly readings on public opinion that had been covered over the course of the semester, as well as from guest speakers (including Dr. Cindy Christiansen and Dr. Daniel Steele) who visited the class and shared their research and perspectives on the issue.

The research questions and methods proposed in each of the eight papers are outlined below.

Paper 1:

The research question for paper 1 is “What impact does airplane noise have on the residents of Milton?” Its authors propose holding several informal conversations with small groups of Milton residents. Participants will be asked to share their experiences with airplane noise in Milton and its effects on their lives, but the conversations will be largely unguided otherwise, covering whatever the individual participants feel is relevant. The authors argue that although all residents should be included, the most significant opinions will come from newer residents of Milton who live directly under flight paths, and these residents should represent a significant percentage of participants. However, they do recommend that “longtime Milton residents and residents who do not live near the arrival paths” should also be included in order to have something to compare their responses to.

Paper 2:

Paper 2 seeks to answer two questions. The first is “How strongly do the citizens of Milton feel about the airplane initiative?” and the second is “How many of them are truly

affected by it?" The author(s) hope to determine from these questions two outcomes: the likelihood that the answers will change air traffic patterns, and what would need to happen to cause a change.

The paper advocates for the simultaneous use of several different methods for gathering public opinion. First, a poll conducted through questionnaires administered via mail, phone, and in public spaces. Second, personal interviews which will ask Milton residents general questions about issues facing the town, where airplane noise will not be specifically covered unless the participant mentions it. Finally, group interviews that are monitored but not prompted or guided, so that citizens can discuss issues facing Milton (including airplane noise) as a group in an unstructured conversation.

The paper also notes the importance of gauging participants' political affiliation and level of political involvement, in order to determine whether or not larger political stances can predict airplane noise views, so survey questions will ask about local news awareness, involvement in the political process, and party identification, among other identifiers. The paper suggests that using different types of measures of public opinion and then comparing the information gathered in each setting will provide a more nuanced and accurate picture of Milton public opinion than a single method would.

Paper 3:

Paper 3 assumes that airplane noise does exist and is noticeable for the town of Milton, and is therefore looking to determine how tolerant people are of it and how much it concerns them. The paper proposes surveying not only Milton residents, but also residents of surrounding towns (i.e. Winthrop, Quincy, and Chestnut Hill) similar to Milton. If the polling of non-Milton residents yields similar results to those found in Milton, it will strengthen the findings of the Milton survey in the political process, making the findings more difficult for the government or other skeptical groups to ignore. If the findings are vastly different, Milton's complaints will be somewhat discounted.

The paper proposes conducting both interviews and a poll, recruiting participants through flyers, cold-calling, knocking on doors, and sharing posts on social media with material incentives (e.g. a raffle ticket). The paper also proposes using focus groups, telling one group that airplane noise only affects the wealthiest inhabitants of Milton, and telling the other that it affects all classes, and seeing whether or not this changes survey outcomes.

The survey includes a background section to learn about the respondent's

socioeconomic status and political affiliation, as well as a section specifically about airplane noise, which areas of life it impacts for the participant, and how strongly the participant feels about it.

Paper 4:

The research question for paper 4 was “Is airplane sound a primary concern among residents of Milton?” with a goal of determining if airplane noise is a problem that residents want to see addressed, as opposed to simply surveying whether or not it is a problem. The authors believe that the most effective method to determine this is through both polling a large number of Milton residents and conducting discussions with smaller numbers of residents.

The authors hope to compare the outcomes to outcomes of similar surveys conducted elsewhere in Massachusetts in order to determine how much of an issue airplane noise is for Milton compared to the rest of the state. The large sample size provided by the survey should provide general trends and an overall accurate measure of public opinion, while the focus group will provide depth and context for the survey.

In theory, the results of the survey and focus groups should complement each other. The authors also advocate for the use of the word “sound” rather than “noise” in the survey design, because “noise” can have an inherently negative connotation that may encourage respondents to respond more negatively than they would to questions with more balanced wording.

Paper 5:

The stated objective of this paper and survey design is “to accurately measure public opinion about flyover noise in Milton, with the overarching goal of determining how disruptive these airplane patterns are in the daily lives and activities of Milton residents.” The paper proposes conducting a survey online, promoting it through both social media and physical mail. It would have no material incentive for response, but the authors will emphasize that a complete response is an effective way to bring about change if a participant feels that airplane noise has a negative impact.

The survey will be accompanied by an informational page about FAA noise standards, and will primarily ask questions about respondents’ observations about airplane noise frequency, disruption, and timing, rather than opinion questions that rely on value judgments. Some questions involve ranking levels of agreement with statements, one asks about political affiliation, and there will be an optional free response question where

respondents can share opinions or experiences. All of the main questions will include an option for “no opinion” or “neutral” in order to avoid responses based on false awareness.

Paper 6:

The research question for this paper is “To what extent do Logan Airport flight patterns impact the lives of Milton residents?” and the proposed method is an online survey, primarily multiple choice and with an optional free-response section. Anyone living in Milton may take the survey, although demographic information will be collected as part of the survey (e.g. how long the respondent has lived in Milton, respondent age, respondent address).

Several questions relate to the respondent’s activities in Milton, such as whether they work outdoors or in their home and how much time they spend away from Milton. These questions aim to determine to what degree the respondent would be affected by airplane noise, and thus can provide weighting to responses, with responses being weighted more heavily the more time a respondent spends in Milton, whether at home or outdoors. The paper also notes the significance of the political process in the town and determining the source of the increasing number of complaints about airplane noise in Milton, therefore asking in the survey whether a respondent has filed a complaint about airplane noise or knows people who have.

Paper 7:

Paper 7 asks “To what degree is the town of Milton actually bothered by airplane noise?” and specifically how airplane noise affects the lives of Milton residents, and residents’ desired outcome from the research. The paper proposes a 12-question survey administered monthly over the course of a year, given to random households in Milton each time. This design aims to prevent skewed results based on unusual travel patterns or geographic location within Milton, as might be the case if the survey was only conducted once. The paper proposes comparing the survey results to similar studies conducted in Milton or similar towns. The survey will be accompanied by a website with information about the issue so as to yield more informed and credible results. It consists of demographic questions (e.g., gender, race, living situation) and a series of statements about noise levels in Milton, where respondents can mark the extent to which they agree or disagree.

Paper 8:

The final paper asks “Is airplane sound a problem in Milton, and if so, is it one that needs

to be prioritized above all else?” There are five flight path groups in Milton, and the paper proposes that all five groups should be represented about equally in the survey, which can include any adult resident and should ultimately be a random sample of around 3,600 households. The survey assumes that noise is disruptive to residents, and therefore tries to “determine if the noise has a serious negative effect on the lives of Milton residents.” The survey will be administered online, and the order of the answer choices will be randomized each time to avoid “satisficing” on the part of the respondents.

The survey itself includes questions about the respondent’s living situation and demographics, and also has ranking and rating tasks. Participants rank a series of choices for the biggest issues facing Milton, rate what terms come to mind when they think of “sound in Milton,” and a series of other questions about which areas of their lives have been affected by sound generally, as well as how airplane noise specifically has affected them. There is also an optional free response to share any other information or opinion.

SUMMARY OF THE COMMUNITY NOISE LAB AT BOSTON UNIVERSITY

MISSION

The Community Noise Lab at Boston University's School of Public Health is an interdisciplinary research lab devoted towards a more nuanced and creative inquiry into community noise issues and corresponding health impacts. According to its website, the Lab utilizes a two-fold mission: 1) to document and describe the community soundscape and examine its impact on human health – both physically and mentally and 2) to provide free, accessible, and dynamic advocacy tools, data, and resources to aid communities in understanding and addressing their specific noise issues.¹

Through strategies and tools that revolve around a unique coupling of precise, cutting edge sound measurements with residents' perception of sound within communities, the Community Noise Lab's research finds its center in area-specific data that encapsulates both the statistical and personal effects of individual noise issues within a given community.²

HISTORY

Erica Walker founded Noise and the City in 2015 as a place to house both the former Greater Boston Neighborhood Noise Survey and to document her dissertation as a doctoral candidate at Harvard's T.H. Chan's School of Public Health. Initially, Noise and the City acted simply as a research organization focused on further developing a more in depth understanding of the relationship between community noise and health. However, as the extent of Noise and the City's research grew with the additions of Boston's first Neighborhood Noise Report Card and Walker's NoiseScore smartphone application, she launched the Community Noise Lab in the winter of 2018.

Operating within the Boston University School of Public Health, the Community Noise Lab immediately began research that confronts the challenges facing the subjective nature of differentiating between noise and sound. While some may view certain sounds as pleasant, others may interpret them as cumbersome noise, and these varying interpretations can cause problems for a research lab aimed at determining the effects of noise on public health.

¹ <http://noiseandthecity.org/about-noise-and-the-city/>

² <http://noiseandthecity.org/about-noise-and-the-city/>

In an effort to address such a problem, the Lab chose to engage in direct work with individual communities affected by noise pollution in the Greater Boston area. By taking such a specific, individually-based approach to their research, the Community Noise Lab became able to measure and analyze both the volume of sound and the irritation caused by that noise, allowing for research that very well could answer some of the most important questions surrounding the relationship between noise and public health.

PURPOSE

The Lab states that its overarching goal is to more deeply understand the relationship between community noise and health, although its approach to doing so probably differs from what many might expect.³ The Lab begins with a basic hypothesis – that environmental noise is detrimental to human health, and while this may seem to contradict the purely exploratory nature of the Lab’s goal of understanding the relationship between noise and health, it actually serves as a fantastic starting point for the rest of their research.

Community Noise Lab researchers begin their work in proving (or disproving) that hypothesis by working directly with communities on specific noise issues. By utilizing research tools within the Lab as well as Walker’s NoiseScore smartphone application and art exhibits of audio, video, and photographic stories of residents and their soundscapes compiled into Community Sound Portraits, the Lab gathers extensive data covering the extent of noise in selected areas. Then, the Lab attempts to leverage that data to positively impact community noise issues. Finally, they publish that work on their website.⁴

Furthermore, as the Lab partners with individual communities to work on combatting specific noise issues, it also works towards a larger, much farther reaching ideal. By publishing the results of its work within those communities and its subsequent advocacy for positive change, the Community Noise Lab extends the breadth of its work to encompass cities and towns across the nation. They gather data and share it with others who may be affected by noise in communities far beyond Greater Boston. This results in a purpose rooted in creating a just and equitable soundscape for the communities with whom the Lab works that also aims at improving community noise situations everywhere.

³ <http://communitynoiselab.org/community/>

⁴ <http://communitynoiselab.org/community/>

OVERVIEW OF CURRENT RESEARCH

The Community Noise Lab is currently working on research concerning four distinct communities in Boston or its surrounding areas, each with their own noise issues and solutions. Their work within each of these communities is detailed below:

Fenway (Boston, MA)

The Community Noise Lab's work with the Fenway neighborhood centers around the issue of noise stemming from Live Nation's summer concerts at Fenway Park. According to the Lab's website, these concerts have increased in number each summer, regardless of their impact on the health of the community's numerous residents.

The Lab will be conducting an independent, objective, and scientifically rigorous study of the environmental impacts Live Nation's summer concert series has on Fenway's soundscape. Once the research is completed, the Community Noise Lab plans to leverage this data to support the construction of a Good Neighbor Agreement that includes a section devoted entirely to noise levels and their relationship with the health of the community's residents.⁵

East Boston (Boston, MA)

The Community Noise Lab's work with the communities of East Boston focuses on noise levels coming from Boston's Logan International Airport. Specifically, residents and public officials are interested in gaining a better understanding of popular noise metrics, especially those that are used as criteria for determining eligibility for Massport's sound insulation program.

The Lab will be conducting an independent, objective, and scientifically rigorous study of the environmental impacts Logan International Airport has on the East Boston community along domains beyond the typically reported A-weighted decibel system. Researchers also plan to take a deeper look into the soundproofing eligibility requirements for Massport's sound insulation program and will publish a community report to summarize their findings and potential policy recommendations.⁶

⁵<http://communitynoiselab.org/fenway-boston-ma/>

⁶<http://communitynoiselab.org/east-boston-boston-ma/>

Mission Hill (Boston, MA)

The Community Noise Lab's work with the community of Mission Hill broadly centers around the overall loudness of the neighborhood soundscape and its impact on the health and well-being of its residents. Furthermore, researchers will be focusing on 1) understanding how sound levels from emergency vehicles, MEDIVAC helicopters, and local hospital HVAC equipment impact their environmental soundscape of a neighborhood just steps away from Longwood Medical Area and 2) understanding how rapid development in this neighborhood is transforming its sound levels.

The Lab will be conducting an independent, objective, and scientifically rigorous study of the environmental impacts hospital activity and rapid development has on the environmental soundscape of Mission Hill. Researchers will carry out this aim by using real-time sound monitoring using the Lab's sound monitoring station network and by gauging community noise perception via the NoiseScore smartphone application in conjunction with a series of visual and aural case studies from the vantage point of actual residents.⁷

Andover, MA

While the Community Noise Lab has not published updates on their research about noise issues in the town of Andover, it can be fairly deduced that their research will focus on a specific problem within that community and that the Lab will utilize research strategies and tools similar to those they use in other projects to gather data and subsequently leverage that data to create a safer, healthier, and more equitable soundscape for the residents of Andover.⁸

⁷ <http://communitynoiselab.org/mission-hill-boston-ma/>

⁸ <http://communitynoiselab.org/andover-ma/>

SUMMARY OF SOUNDS IN THE CITY AT MCGILL UNIVERSITY

PROJECT OVERVIEW

Traditionally, urban noise mitigation revolves around lessening the negative effects of the noise, and while this approach does help to address the issues surrounding the hazardous effects of the noise, it fails to replace those negatives with positives. However, Daniel Steele and the rest of the researchers at Sounds in the City are attempting to correct this by taking a new approach to shaping the future of urban noise management.

Sounds in the City is a research project dedicated towards what they refer to as the soundscape approach to mitigating urban noise issues. Daniel Steele, the Project Manager, works with the rest of his team of researchers, designers, investigators, and students to In essence, this approach relies upon the idea that appropriate sound levels can be used to positive effect, and while traditional soundscape research focuses solely on the perspective of city users, Sounds in the City extends that relationship to include and understand the role that city makers play on perception of urban sounds by city users.

Through a team assembled of experienced researchers as well as partners from McGill University, the City of Montreal, and the professional realm, the Sounds in the City project aims to position Montreal as a leader in urban noise management and soundscape by connecting research with practice through a climate characterized by collaboration.

The project aims to influence three main areas: alterations to city noise regulations, implications for noise inspections, and soundscape training programs for urban planners and other decision makers. In addition to its research, Sounds in the City also puts on educational events for citizens and policymakers alike to promote a positive and productive dialogue surrounding urban sounds that enables and empowers residents to better understand and subsequently shape their environment.

CURRENT RESEARCH

Sounds in the City defines itself as a cross-sector partnership to make cities sound better, and through a deep dive into their current research, it becomes clear that the

project is committed to being exactly that.

Sounds in the City's philosophy towards its research is based in understanding the commonalities and differences that span noise regulations across the globe. Thus, their work begins with the development of a database of noise regulations from cities around the world. By filling the database and then analyzing the similarities and differences within it, Sounds in the City hopes to gain an unflinchingly honest understanding of the factors that drive these regulations.

To make sense of the database, Sounds in the City is developing an iterative coding scheme that tracks various elements of noise regulations. For example, the project aims at answering questions like differences in day versus night, exceptions for musical performances, or at which point in the planning process noise is considered.

By developing a database that will be the first of its kind, Sounds in the City aims to aid researchers and practitioners alike who wish to engage in comparative studies of noise regulation and to shed light on how other cities have dealt with similar issues. Therefore, the database finds its roots in collaboration between researchers experienced in Information Studies, Acoustics, Regulations, and Noise Inspection, and it acts as a microcosm of the projects most central ideal: building the relationships between city planners, researchers, and residents in a spirit of collaboration towards the goal of positively shaping the soundscape of cities everywhere.

Besides the Noise Regulations Database, Sounds in the City also engages in other projects focused more on educating residents about their sound environments. Musikiosk is an interactive music installation and environmental monitoring station developed for urban parks by Sounds in the City researchers and other partners in both the public and private sectors of Montreal. Additionally, Sounds in the City has worked to develop their Global Sustainable Soundscapes Network, whose overarching objective is to bring together ecologists, acoustic ecologists, acousticians, and psychoacousticians to coordinate studies in diverse soundscapes around the world.

Sounds in the City also organized soundwalks in Montreal, Amsterdam, and Boston. These soundwalks are walks designed to help citizens listen to and reflect on the soundscapes in which they are embedded in the hopes of developing residents who are more aware of the sounds and sound levels that play an enormous role in defining their urban environments.

The project also lends support and promotion to two citizen projects: the Montreal Sound Map and Écouter le monde. The Montreal Sound Map is a web-based soundscape project that allows users to upload field recordings to a Google Map of Montreal, and Écouter le monde takes you around the world through sounds.

All of Sound in the City's research projects, as well as those conducted by citizens, are made available on their website, lending even further credence to their commitment to fostering a collaborative and open environment surrounding the discussion of positively mitigating urban noise issues in not only Montreal, but also cities across the globe.

DANIEL STEELE

Daniel Steele currently serves as the research lead and project manager for Sounds in the City. Previously, he led the Muskiosk project in 2015, which featured a musical soundscape intervention. His work centers around bringing knowledge about sound to non-expert decision makers and the public, and he does so by co-organizing a series of Montreal and Amsterdam soundwalks and by leading workshops with local Montreal stakeholders on topics like the sounds of pedestrianization.

Sounds in the City website: <https://www.sounds-in-the-city.org/en/overview/>