

Aircraft noise exposure and market outcomes in the U.S.

Massachusetts Institute of Technology

PIs: *R. John Hansman, Christopher Knittel, Jing Li, Steven Barrett, Florian Allroggen*

PM: *Sean Doyle*

Objective:

Provide empirical insights into:

- (i) The impact of noise exposure on house prices in communities surrounding U.S. airports.
- (ii) The heterogeneities associated with these impacts, which can be driven by factors such as time, location, or noise exposure patterns

Project Benefits:

1. Detailed noise modeling of real flight tracks
2. Updated understanding of impacts of aircraft noise on property prices, incl. heterogeneities
3. Comparison of revealed preference data with stated preference data

Research Approach:

Noise modeling

Model noise around U.S. airports with high spatial and temporal resolution.

Focus on locations with noise differences due to introduction of PBN procedures or new runway configurations

Real estate data

ZTRAX database of observed residential real estate transactions

Empirical model

Hedonic price model:

$$\Delta \text{Noise} \rightarrow \Delta P ?$$

Noise changes following introduction of RNAV procedures or new runway configurations to be analyzed using difference-in-difference approach

Major Accomplishments (to date):

- Set up AEDT to calculate noise based on real flight tracks from ASDE-X data; ran analysis for BOS and ORD for 2011 and 2016 and determined noise exposure changes
- Compiled dataset of real-estate transactions from 1987 to 2021 in MA and matched with noise exposure data.
- Employed hedonic price model to empirically investigate the impacts of noise exposure changes on property values around BOS

Future Work:

- Run noise analyses for additional airports
- Conduct robustness checks of the impacts of noise exposure on residential property values in Boston
- Study short-term and long-term dynamics of price impacts for Boston
- Roll-out the hedonic price model to other airports