

SONYC: A Cyber-Physical System for Monitoring, Analysis and Mitigation of Urban Noise Pollution

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<https://wp.nyu.edu/sonyc>

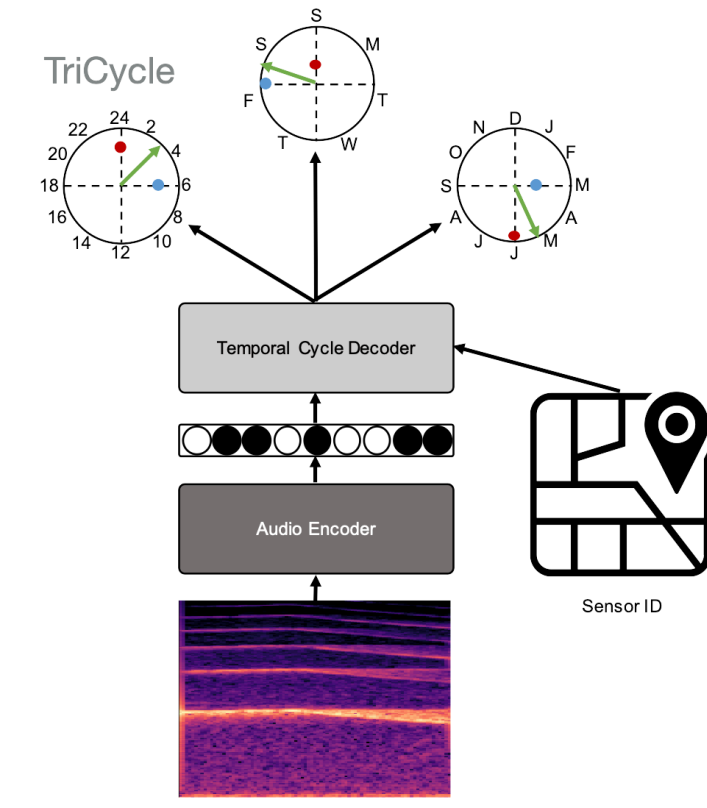
“311 is a lesson in frustration. You make a report and then you don’t see any immediate action”

“And I’m pretty sure it’s automatic, because I’m going to say 99% of the time, the reports are just dismissed immediately. They’re not even looked at. Like as soon as I file, I get a text saying the report has been a closed.”

The challenge

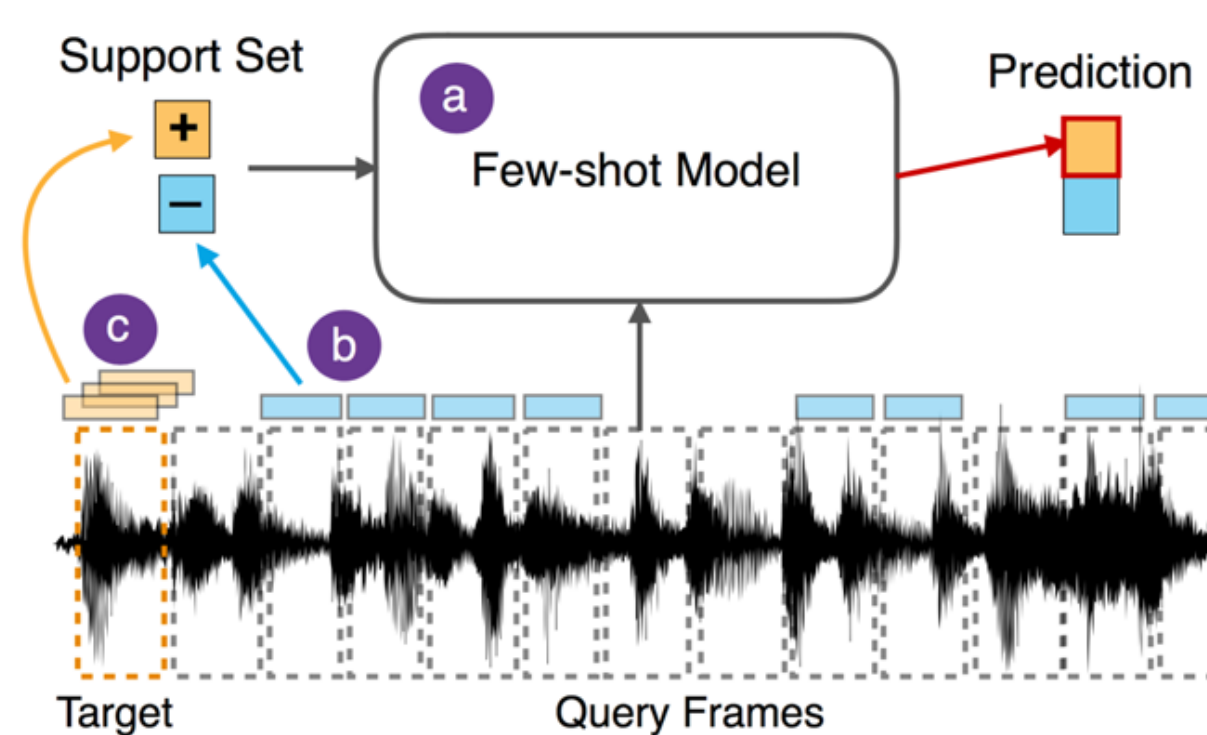
- Estimated that 70-100 million affected by harmful levels of noise in US.
- 802,376 noise related calls to NYC 311, the primary mechanism for monitoring and mitigation, in 2020 (source: data.cityofnewyork.us)
- **SONYC** develops technical solutions to help monitoring and support mitigation

Machine listening



TriCycle

SONYC is moving from fully-supervised models with a closed vocabulary, towards self-supervised (TriCycle) and human-in-the-loop (Few-shot) open-vocabulary models



Few-shot learning

Sensing

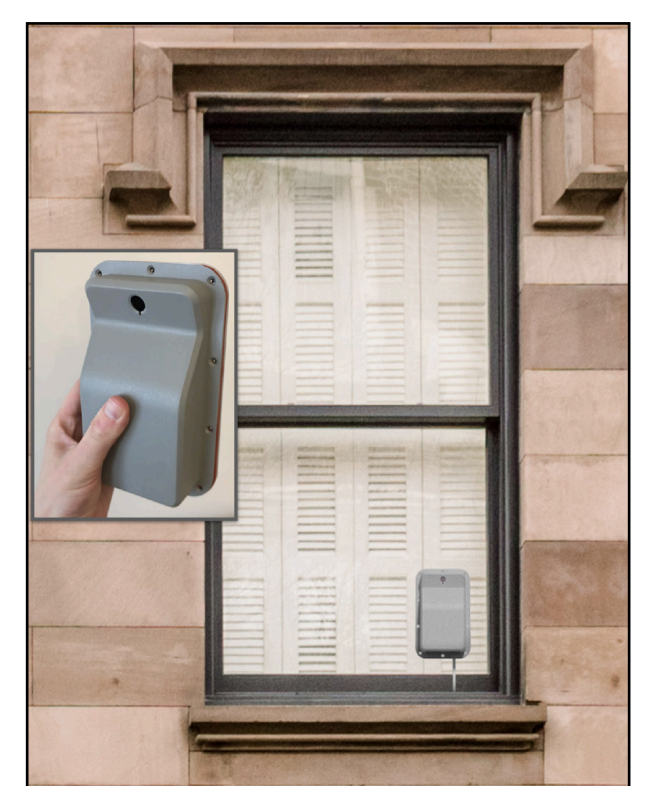


SONYC MK1

SONYC has developed new sensors, moving from an agency and infrastructure centric model (MK1), to one that is low-resource (MK2) and citizen-centric (TTP)



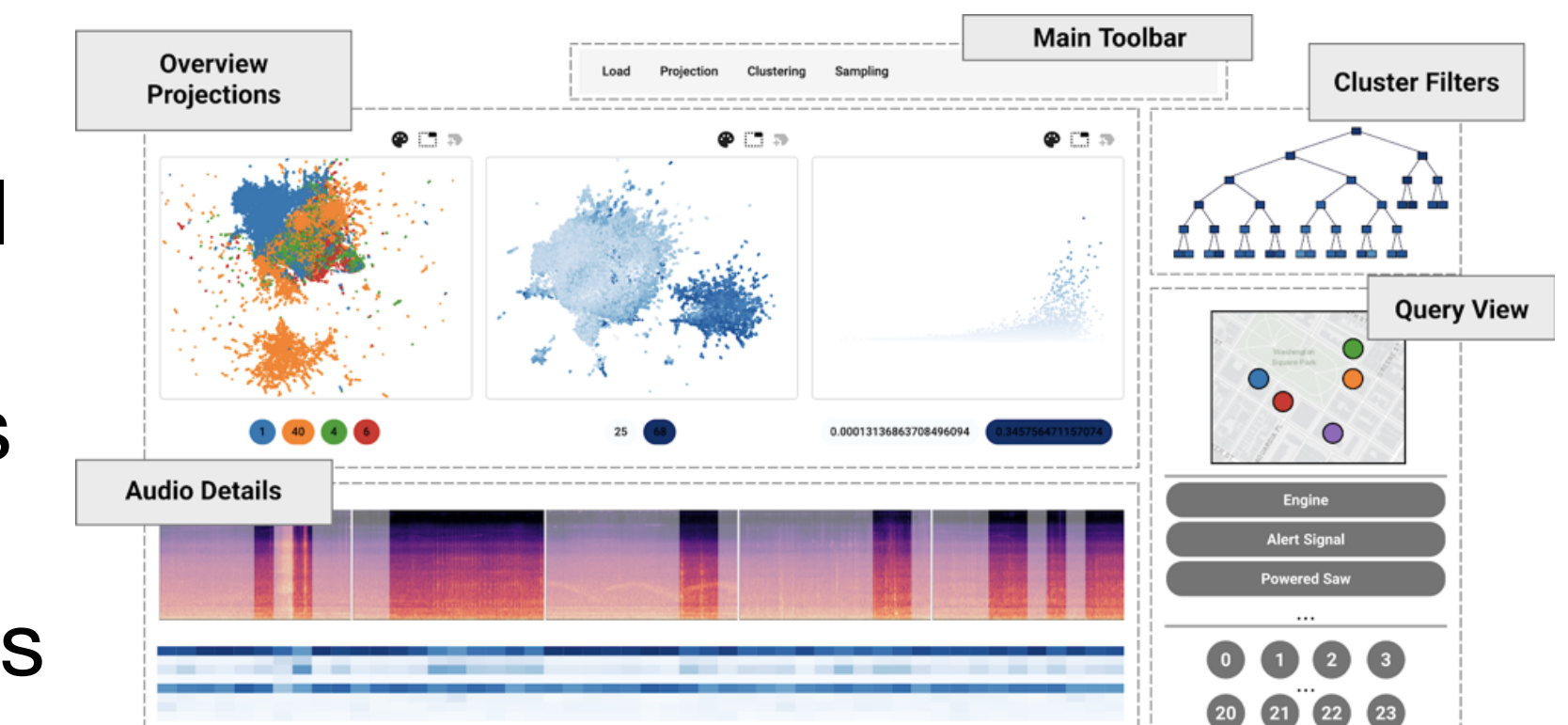
SONYC MK2



SONYC TTP

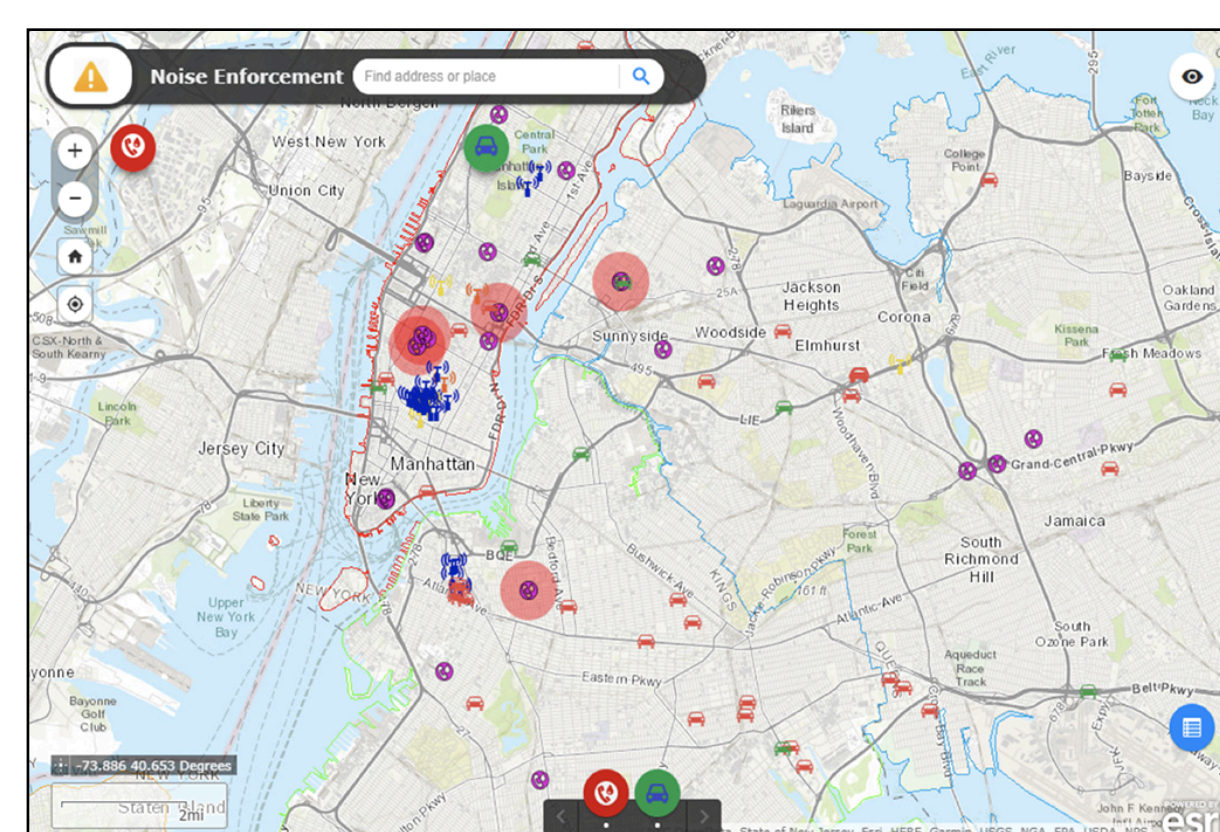
Data analytics

SONYC has developed interactive visualization tools for large-scale spatial temporal analysis of urban data (Time Lattice); and to explore large collections of complex audio, guided by features extracted from machine listening models (Urban Rhapsody)

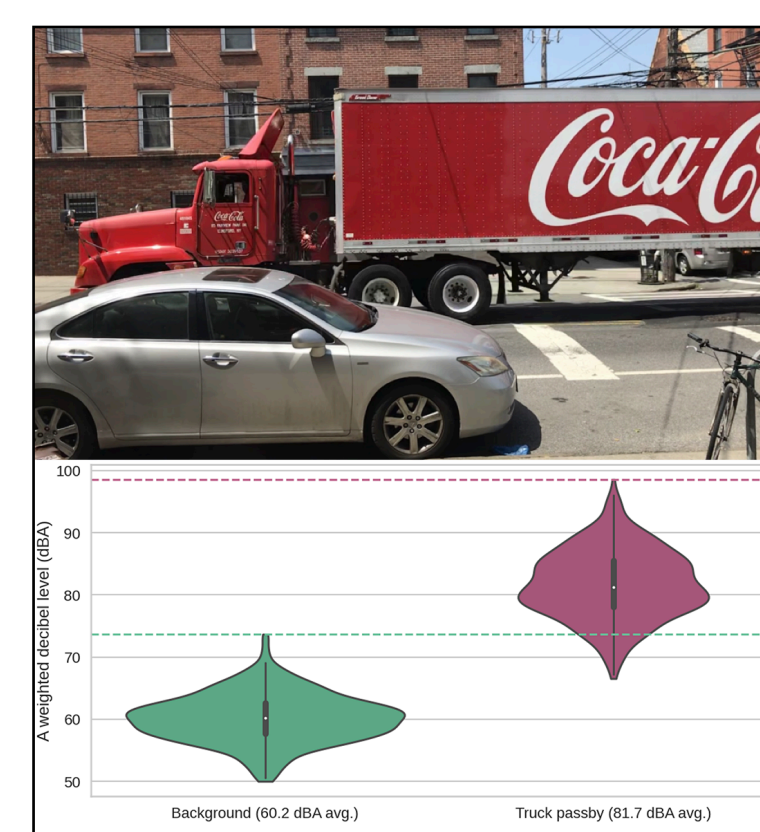


Urban Rhapsody

Broader impact

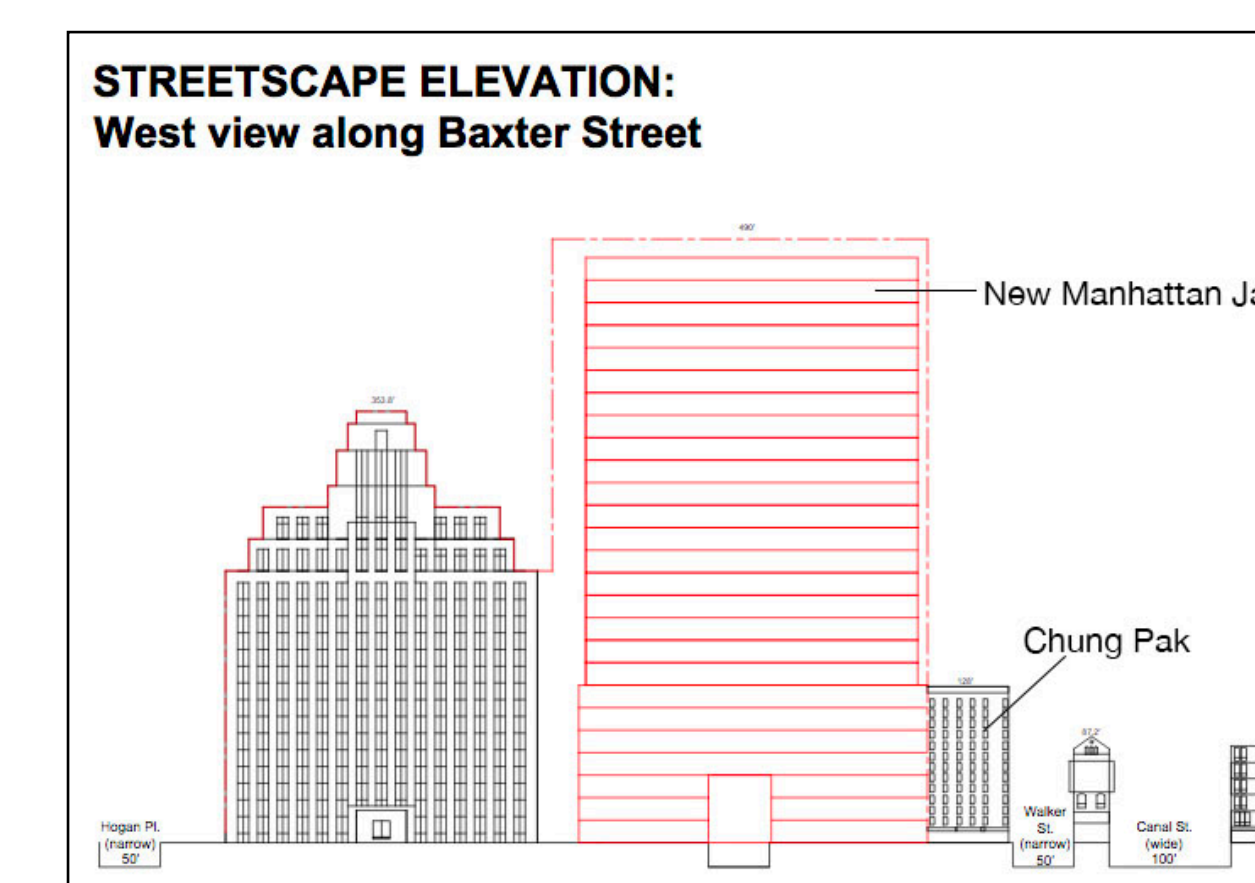


NYC DEP Rapid Response

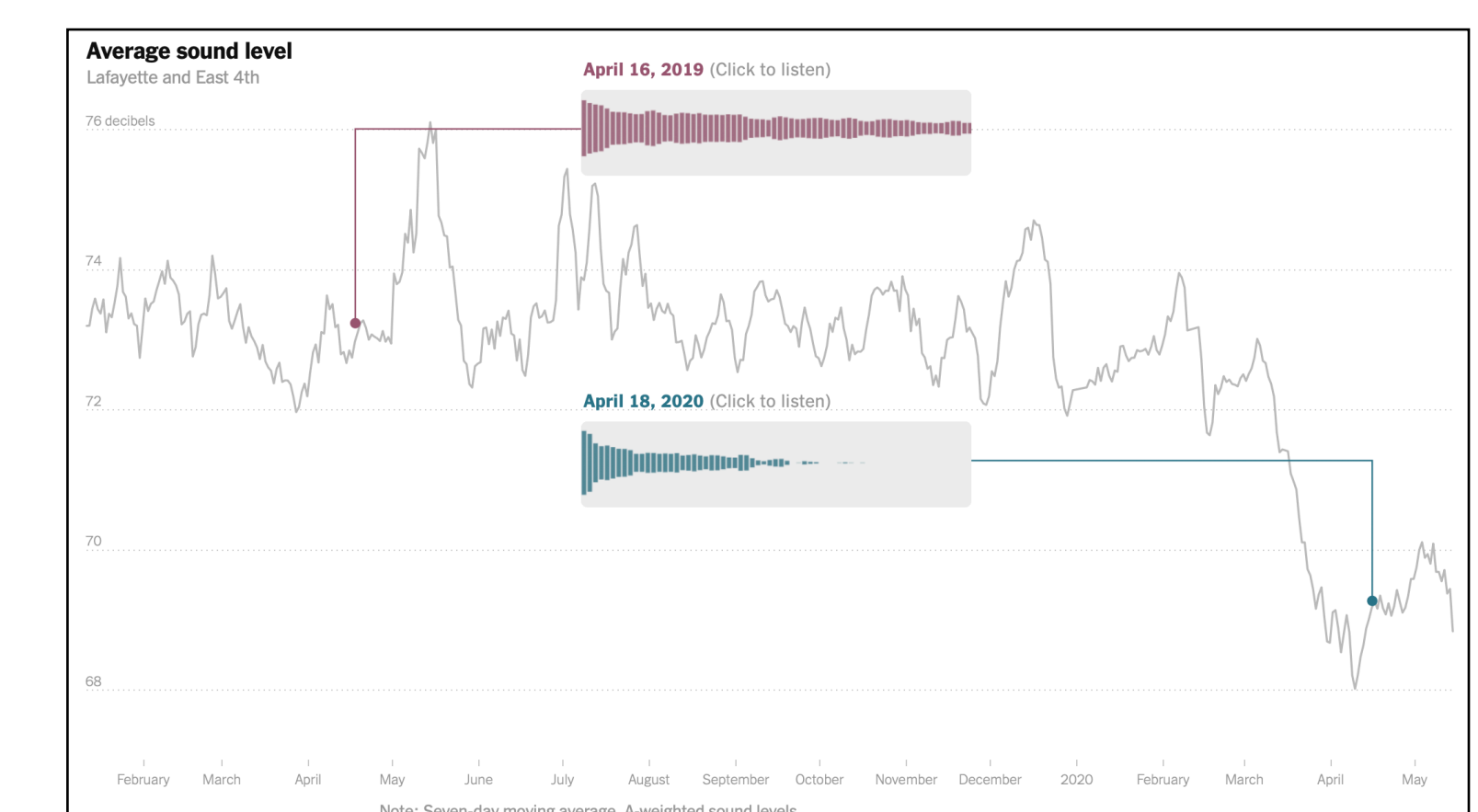


Red Hook trucks

SONYC has facilitated responsive noise mitigation with NYC DEP; helped residents advocate for new trucking routes in Red Hook, Brooklyn; supported public health research in Chinatown with NYU CSAAH; and helped the New York Times explain how the city was changed by the COVID-19 pandemic and lockdown



Chung Pak senior housing, Chinatown



NY Times COVID-19 feature