Problem

A lack of awareness about the long-term implications of noise exposure
15% of Americans between the ages of 20 and 69 experience hearing loss that may have been caused by noise at work or during leisure activities.

Studies on the health consequences of noise have indicated that noise elevates heart rate, blood pressure, vasoconstriction, and stress hormone levels.
Meditation produces long-lasting changes in brain activity.

Areas involved in attention, working memory, learning, and conscious perception are improved.
Noise exposure is cumulative; Awareness is key.
Contextual Inquiry
Moderately noisy work environment

Lacks control of his noise exposure

Very noisy work environment

Some control over exposure levels

Dartmouth student who is exposed to noisy social environments multiple days per week

Has control over exposure levels
Takeaways

Users **don’t want an external device** that would inhibit normal work tasks

Generally aware of risks, **unaware of implications**

**Varying levels of control** over exposure

Interested in understanding **patterns of exposure** and knowing implications
Tasks
Measure and Record

Measure noise level at frequent and regular intervals throughout the day.
Display Current “Soundscape”

Display the current noise level and report safe exposure time.
Display Data Over Time

Display noise exposure data over an **extended timescale** (day/month/year).

Indicate **patterns in behavior**.
Adapt Behavior

Make effort to **minimize risky exposure** and maximize "zen time".
Integrate crowd-sourced data

Gain *environmental awareness* using data from user base.
Analysis + Implications

Analyze noise data and communicate the long-term effects of exposure.
Designs
Design #1

- Microprocessor that calculates and limits dB levels
- Small dynamic adaptive microphone that measures dB levels
- Standard 3.5mm input jack
Design #2:

4:38
Notification
- warning, >80 dB
- swipe to learn more
  show more related info on screen

Statistics
24hr | 1 wk | 1 month
- select time
- rotate to see more
- quietest day & worst day
- show noise exposure levels in heat map
Design #3
Storyboards
Tracking Zen

1. Jimmy goes through his day while passively recording the sound of his environments.

2. At the end of the day, he checks the data he's gathered and sees he needs to have more "zen" in his day.

3. Jimmy makes some adjustments the next day in his routine to lessen the amount of noise he encounters.

4. He is happy to see that his efforts to reduce the noise in his environment have paid off!
Exposure Analysis

- Day
- Week
- Mon - Fri
- Sat - Sun

- 0-2 hr
- 2-6 hr
- 1 hr

- Time > 100 dB
- Time < 50 dB

- 85 min avg/day
- 53 min avg/day
- 85 min avg/day

GREAT JOB FINDING SOME REN TIME EVERYDAY!

INTEGRATING MORE QUIET MOMENTS INTO YOUR DAILY LIFE CAN REDUCE STRESS AND INCREASE FOCUS — KEEP IT UP!
Questions?