Leveraging Citizen Science for NYC's Real-Time Monitoring and Communication – Using Noise App as Case Study

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Sponsor Vision

To explore how citizen-generated noise data, collected through smartphone-based reporting tools such as the Noise App, could be validated and potentially incorporated into the City's environmental monitoring workflows.

Value Proposition

A validated citizen science approach can provide early screening, identify hotspots, and support resource allocation while engaging communities in environmental governance.

Proposed Validation Considerations

- Collect essential metadata (device model, GPS accuracy, motion state, noise type)
- Incorporate device-specific calibration or backend correction
- Use quality filters and confidence flags rather than accepting all submissions equally
- Leverage contributor behavior patterns
- Cross-validate citizen submissions with fixed sensors

Project Milestones

Phase 1: Understanding DEP phone app project, FloodNet, HeatNet, SONYC; Research on data validation & dashboards

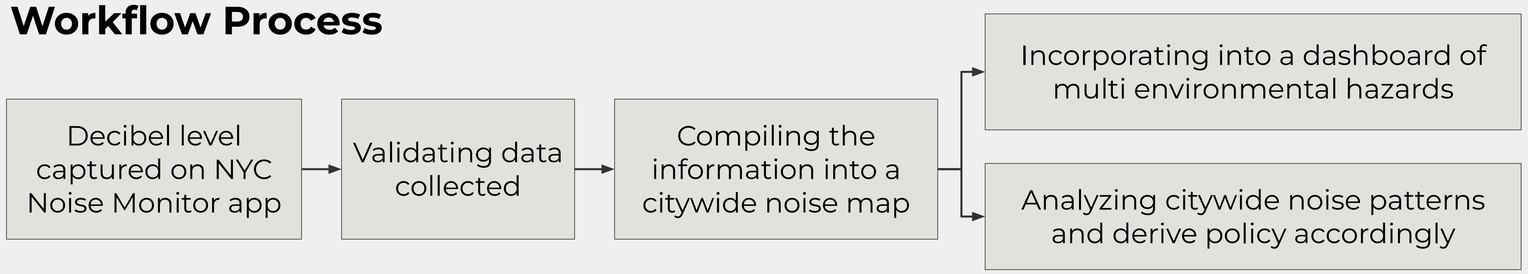
Phase 2: Develop a plan for validating the DEP phone app data types and for a citywide dashboard that could in the future be expanded to include other citizen data sets.

Phase 3: Putting Phases 1 and 2 together.

Methodology

1. **Literature Review:** Identified challenges in citizen-generated noise data, including device variability, calibration needs, metadata requirements, and sampling bias.
2. **Interviews:** Interviewed academic experts, public-sector partners, and private-sector practitioners to understand practical constraints, workflow needs, and user engagement considerations.
3. **Insights Synthesis:** Compared findings across sources to define key requirements for a reliable validation framework and recommendations.

Workflow Process



Insights from User Interviews

- **Data Quality:**
  - Smartphone data varies widely across users
  - Requires calibration, metadata, and filters
  - Hybrid sensing (citizens + sensors) works
- **User Behavior & Participation:**
  - Contributions are inconsistent
  - Clear instructions improve data reliability
  - Trust, transparency, and engagement matter
- **Workflow Integration:**
  - Agencies need actionable, not raw, data
  - Citizen reports must map to existing steps
- **Overall Message:**
  - Citizen science works when technology, users and agency processes align toward a shared goal: reliable, context-rich environmental information for NYC.

Future Directions

- Scale citizen participation
- Support the new DEP Noise App rollout
- Pair citizen reports with fixed sensors
- Move toward a unified environmental dashboard
- Adopt emerging validation tools

NYC Noise Monitor App (iOS):

NYC Noise Monitor App (Android):

Project Report & Interview Summary: