

# PROJECT: ASTRA

*Data-Driven Real-Time Air Pollution  
Analytics & Pothole Detection Solution*

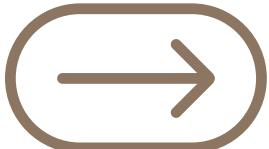


TEAM: VOIDFILLERS



# PROBLEM STATEMENT

CURRENT CHALLENGES



- Delayed identification of air pollution hotspots
- Manual and reactive road condition monitoring
- Lack of real-time, localized data
- Efficient decision-making by authorities

## WHY IT MATTERS

Health risks due to poor air quality

Road damage leads to accidents and higher maintenance costs

TEAM: VOIDFILLERS



# PROPOSED SOLUTION

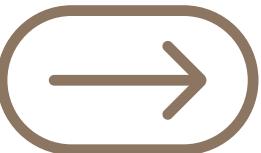
## OUR SOLUTION

- Sensor-based system for continuous data collection
- Bluetooth-enabled data transfer to mobile device
- Cloud-based analytics using machine learning
- Real-time severity detection & alerts



## KEY HIGHLIGHTS

- No heavy hardware dependency
- Low-cost & scalable
- Real-time insights



# DATA WORKFLOW

## COMPONENTS

**01**

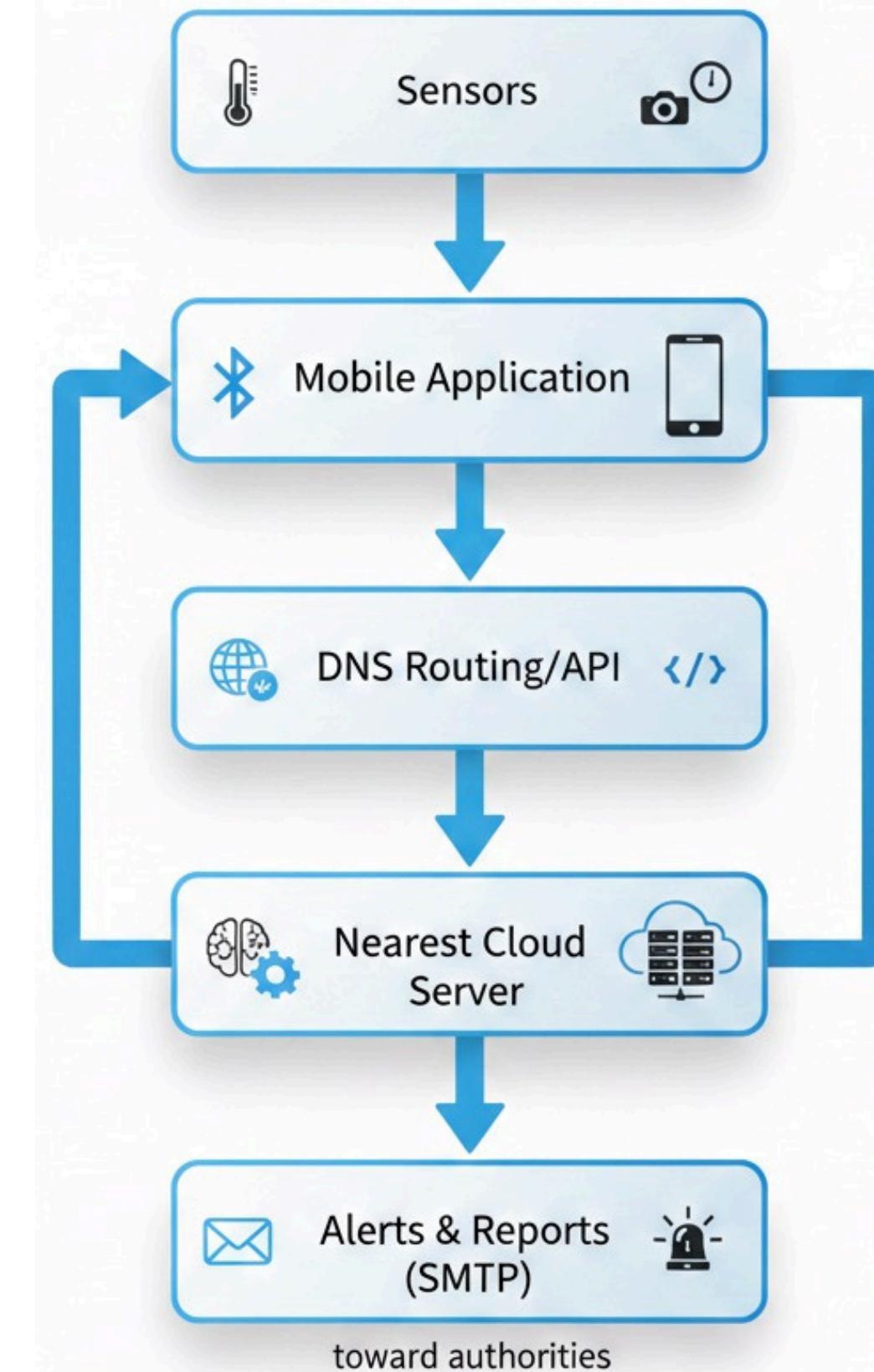
**SENSORS**

Environmental & road  
sensors

**02**

**MOBILE**

Mobile gateway



**03**

**SERVER**



**04**

**ML MODEL**

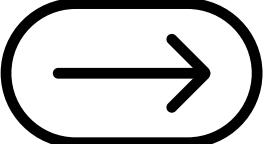
Machine Learning Model  
for analysis

**05**

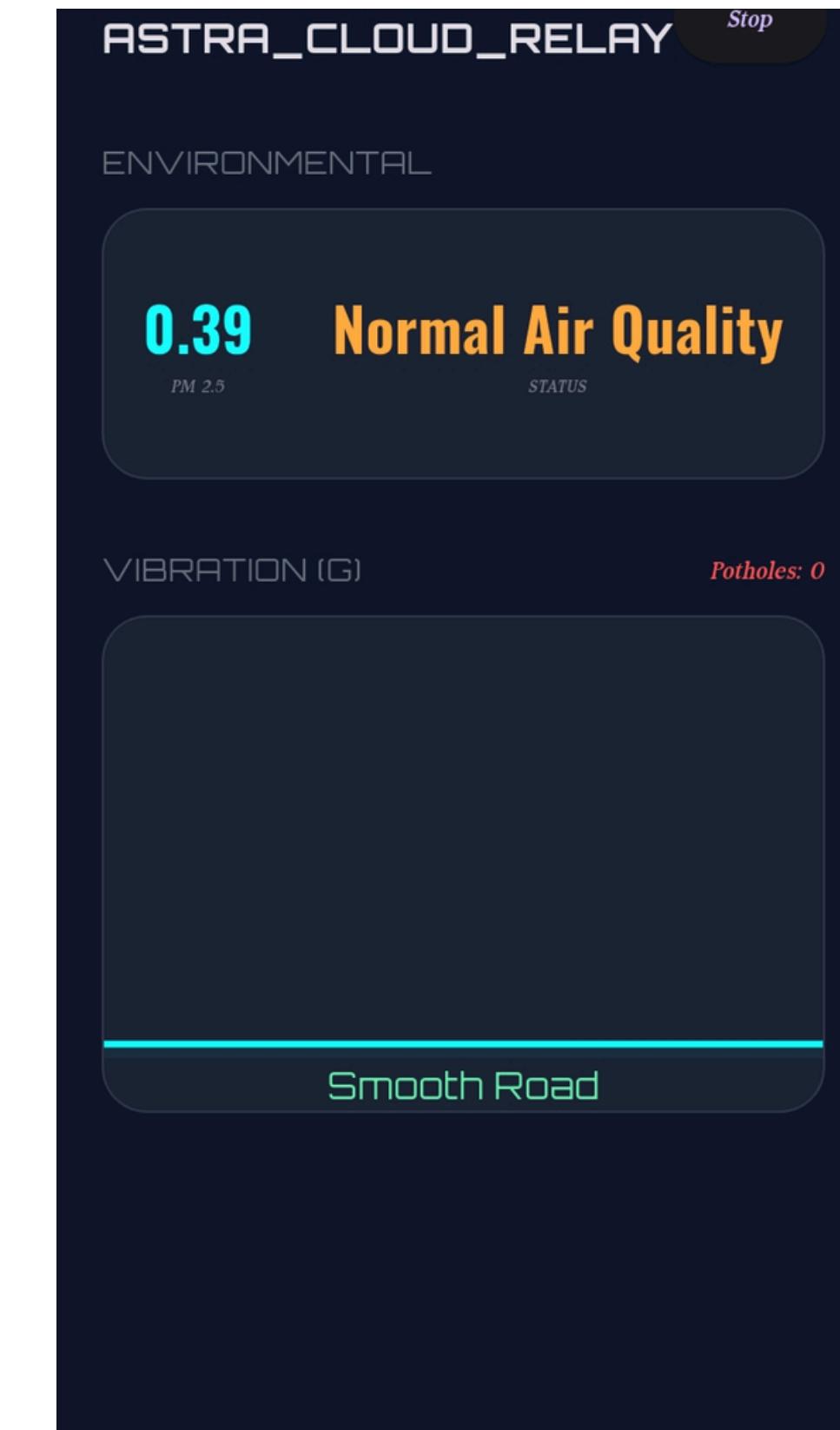
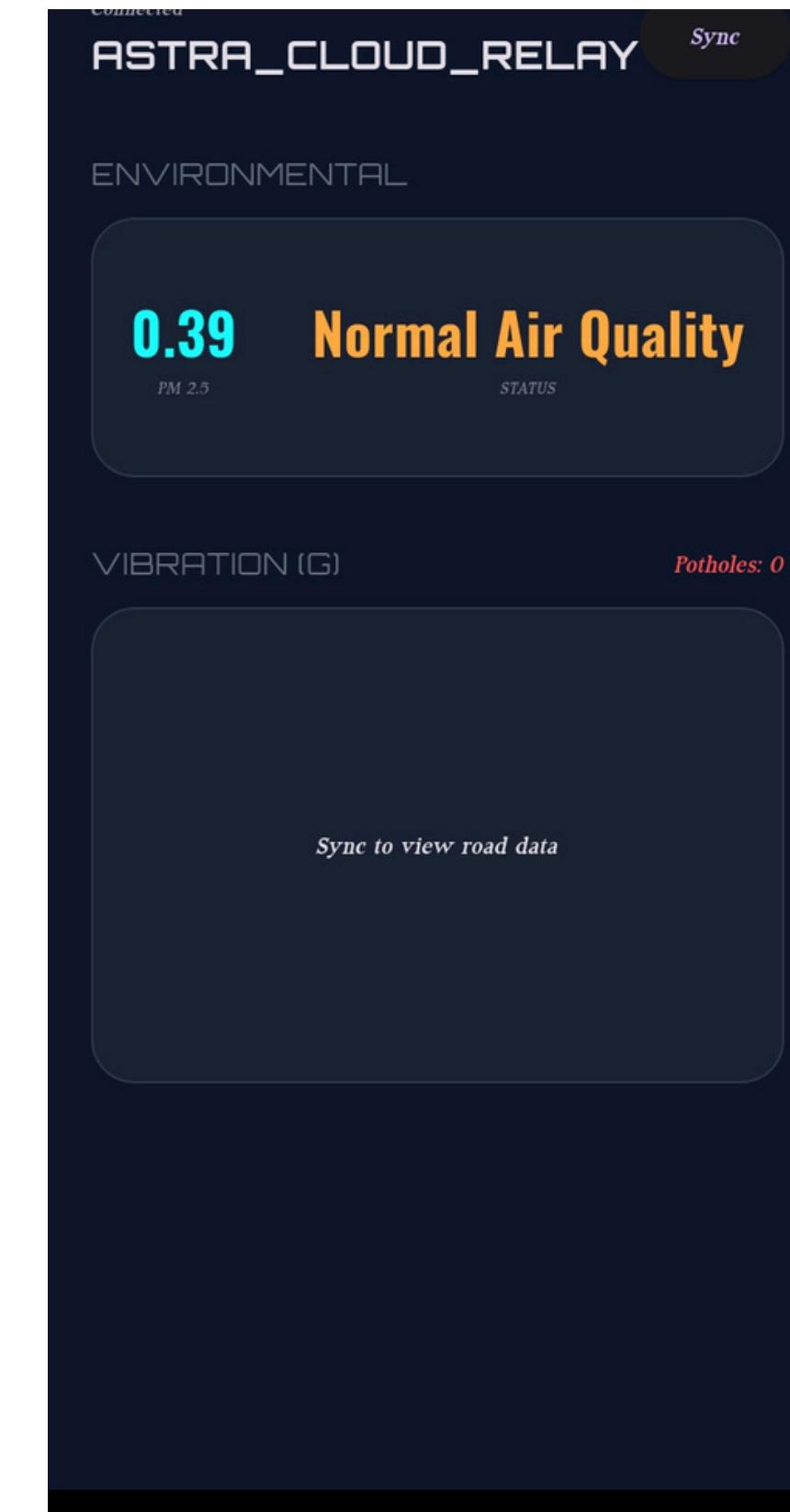
**ALERT SYSTEM**

Email / SMS Notificatioin

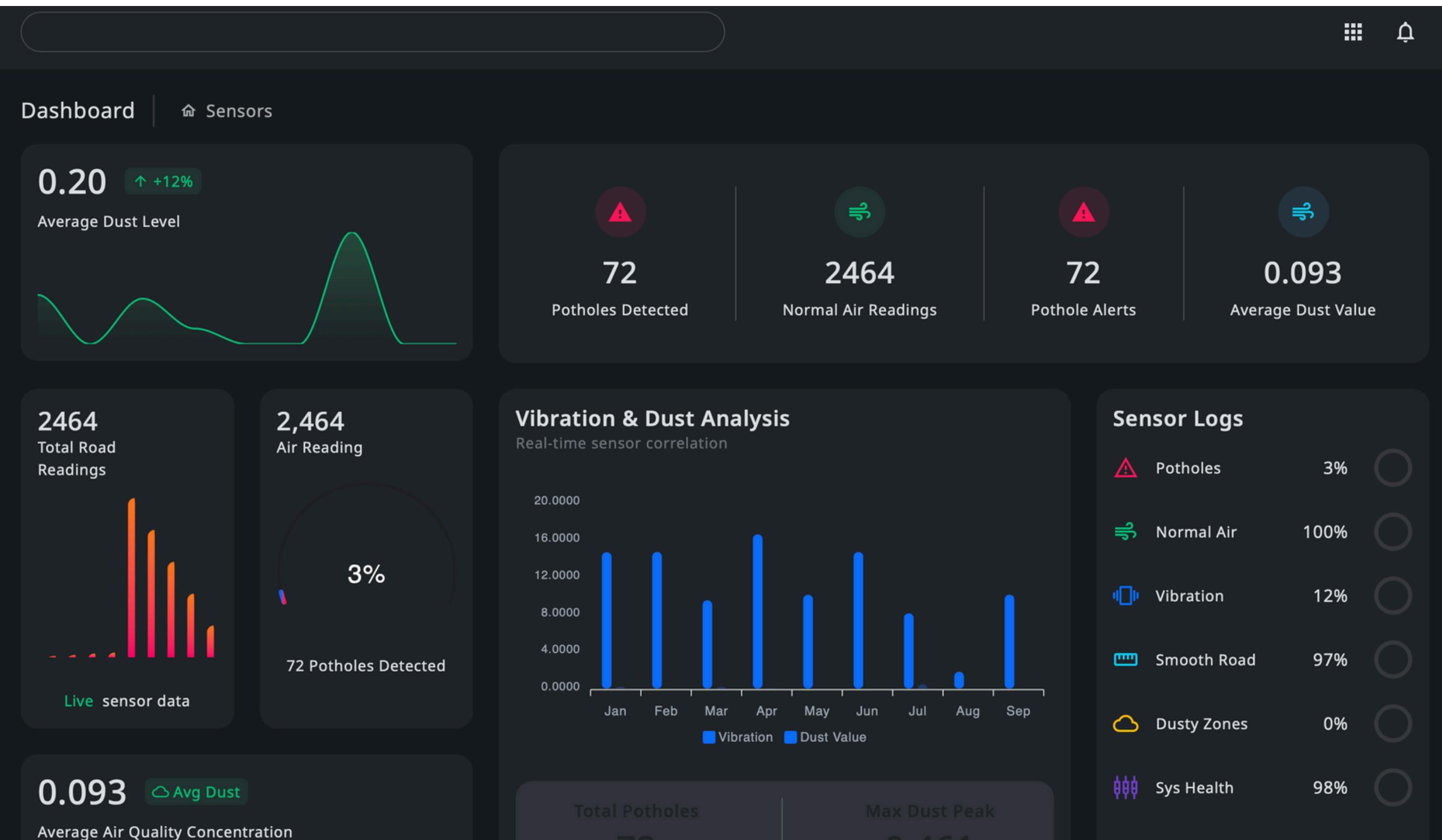
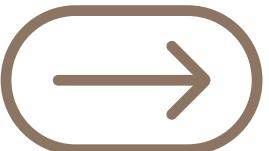
# MOBILE ASTRA



**IT SHOWS REAL-TIME AIR QUALITY STATUS, POTHOLE COUNT, AND ROAD CONDITION USING SENSOR DATA, CLOUD PROCESSING, AND ML-BASED ANALYSIS, PROVIDING QUICK AND ACCURATE MONITORING THROUGH A SMART INTERFACE.**



# ASTRA DASHBOARD



THIS DASHBOARD SHOWS REAL-TIME POTHOLE COUNT, AIR QUALITY READINGS, VIBRATION ANALYSIS, AND ALERTS, PROVIDING A CLEAR AND CENTRALIZED VIEW OF ROAD AND ENVIRONMENTAL CONDITIONS.

TEAM:VOIDFILLERS

# VOID AI



The screenshot shows the VoidPanelAI application interface. At the top, there's a navigation bar with icons for home, login, and a search bar labeled "VoidPanelAI". Below the navigation is a main content area with a dark background. On the left, a sidebar has "login" and "Dark/Light" theme switches. The main area features a large heading "Unleashing the Power of ChatAI/Automation". Below the heading is a message from a user ("You") saying "hello". To the right of the message is a reply from "VoidPanel AI" with a thumbs-up and thumbs-down icon, followed by the text "Hello! How can I assist you today?". A "Regenerate" button is located above a message input field containing "Send a message...". At the bottom of the main area is a "Create Website" button.

**THE CHAT AI  
FEATURE ALLOWS  
USERS TO CHAT  
WITH THE SYSTEM  
AND GET QUICK,  
AUTOMATIC  
REPLIES TO HELP  
AND GUIDE THEM  
EASILY.**

**TEAM: VOIDFILLERS**



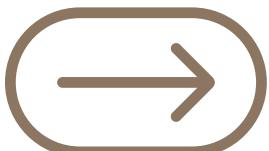
# FEASIBILITY & SCALABILITY

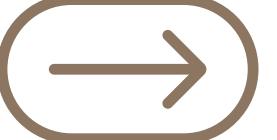
## FEASIBILITY

- Uses commonly available sensors & smartphones
- Minimal infrastructure requirements
- Software-driven implementation

## SCALABILITY

- Can be deployed city-wise or zone-wise
- Supports multiple sensor nodes
- Cloud-based expansion





# IMPACT & BENEFITS

## BENEFITS

- 01** IMPROVED AIR QUALITY MONITORING
- 02** EARLY DETECTION OF ROAD DAMAGE
- 03** REDUCED ACCIDENTS & HEALTH RISKS
- 04** COST-EFFECTIVE MAINTENANCE PLANNING



## HEALTH

## STAKEHOLDERS

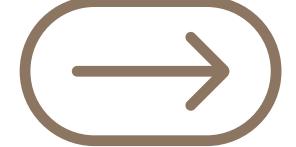
- 01** MUNICIPAL CORPORATIONS
- 02** TRAFFIC & ENVIRONMENT DEPARTMENTS
- 03** CITIZENS



## SAFETY



## ENVIRONMENT



# CONCLUSION

## 1 SUMMARY

- Real-time, data-driven urban monitoring system
- Efficient sensor-to-cloud architecture
- ML-based severity detection
- Reliable communication using SMTP & DNS

## 2 OUTCOME

- Smarter cities
- Safer roads
- Cleaner environment

# FUTURE SCOPE ENHANCEMENTS

## » PROJECT MILESTONE TIMELINE »



PREDICTIVE POLLUTION &  
ROAD DAMAGE FORECASTING

PUBLIC AWARENESS  
MOBILE APP

INTEGRATION WITH  
GOVERNMENT  
DASHBOARDS

ADVANCED ANALYTICS &  
REPORTING