



# **Emerging Technologies: Communicating Air Quality in a Changing World**

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**Disclaimer:** Material presented is for informational purposes only. EPA does not recommend nor endorse any particular sensor product or data management platform.



**Bring an Object  
Share Its Story**

# Data Interpretation – Current State



- Flo has some competition...
  - Meet “Flow”
    - <https://www.youtube.com/watch?v=Fs73rh-vNPY>
  - And others...
    - <https://breezometer.com/>





**Creating millions of data points from thousands of new monitors...**



# Communication Platforms



Data and Forecasts courtesy of:  
Texas Commission on Environmental Quality (TCEQ)

### Current Conditions

Air Quality Index (AQI)  
observed at 13:00 CST

**29 Good**

Health Message: None

Note: Values above 500 are considered Beyond the AQI. Follow recommendations for the Hazardous category. Additional information on reducing exposure to extremely high levels of particle pollution is available [here](#).

### AQI - Pollutant Details

Ozone	29	Good
Particles (PM2.5)	18	Good

### Air Quality Forecast

Today	Tomorrow
Air Quality Index (AQI) <b>Good</b>	Air Quality Index (AQI) <b>Good</b>
Health Message: None	Health Message: None

### AQI - Pollutant Details

Today		Tomorrow	
Ozone	Good	Ozone	Good
Particles (PM10)	Good	Particles (PM10)	Good
Particles (PM2.5)	Good	Particles (PM2.5)	Good



On Tue Jan 16 2018 15:16:18 GMT-0500 (Eastern Standard Time)

Short-term PM2.5 is LOW at 3µg/m3  
Enjoy your activities.

## Short-term AQI 14

**Lost Creek Good**

Good Moderate Warning Unhealthy Very Unhealthy Hazardous

0-50: Air quality is considered satisfactory, and air pollution poses little or no risk.

### Trends

Particles Sensor Current Weather

#### Channel A Running Averages

Real Time	Short-term	30 minute	1 hour	6 hour	24 hour	One week
12	15	16	18	26	34	46
3µg/m3	4µg/m3	4µg/m3	4µg/m3	6µg/m3	8µg/m3	11µg/m3

#### Channel B Running Averages

Real Time	Short-term	30 minute	1 hour	6 hour	24 hour	One week
11	14	15	17	25	33	46
3µg/m3	3µg/m3	4µg/m3	4µg/m3	6µg/m3	8µg/m3	11µg/m3

\* Laser Temperature: 34°F \* Laser Humidity: 35%

\* Approximate conditions the laser is exposed to. Readings are affected by the electronics, sunlight or wind. Temperature may be elevated and humidity under estimated.

### Real Time

Short-term Average One Hour Average 24 Hour Average

Map data ©2018 Google, INEGI Terms of Use Report a map error

3:16 PM  
1/16/2018

Current Conditions in Austin, TX ~3pm on 1/16/18

# Sensor Scale Project



- What information can we provide about short-term sensor readings?
  - Developed numerical breakpoints and actionable messages that are not health-based to help explain the results.
  - In general, the science on air pollution and health doesn't tell us what a few minutes of exposure to an elevated level of pollution means for an individual.
- Current Village Green Website
  - <https://www.airnow.gov/index.cfm?action=airnow.villagegreen>
- Revised Village Green Website
  - <http://24.104.117.6/welcome?siteID=24291>

A screenshot of a web browser displaying the Village Green Project website. The browser address bar shows "24.104.117.6/welcome". The website header includes "Select a City" and "Philadelphia, PA". The main content area features a large image of a park with a solar panel structure. Overlaid on this image is a data panel titled "Local Pollution Levels" with a red circle around it. The data panel shows: Ozone at 21 ppb (Very High), PM<sub>2.5</sub> at 8 µg/m<sup>3</sup> (High), 60°F, 70% humidity, and 2 mph S. Below this is a "Current Area Air Quality Index" section with a color scale from Good (green) to Very Unhealthy (red), and a note "observed Mon 8:31 AM EDT". A smartphone in the foreground displays the same data panel. The website footer includes "Welcome to the Village Green Project" and "About Village Green" with a right-pointing arrow. A small disclaimer at the bottom reads "Data shown on these pages are preliminary and subject to change."

# Feedback on Pilot Project



- Valuable, positive feedback.
- Focus group participants had limited knowledge about air pollutants and measurements – added additional explanations about O<sub>3</sub>/PM<sub>2.5</sub> and units.
- However, there is familiarity with stop light colors and what they mean (identified red as a “panic color”) – important to differentiate from AQI colors.
- Made changes to pilot to address specific feedback:
  - Explain personal vs. area-wide information
  - Specify whether message applies indoors, outdoors, or both
  - Display trends

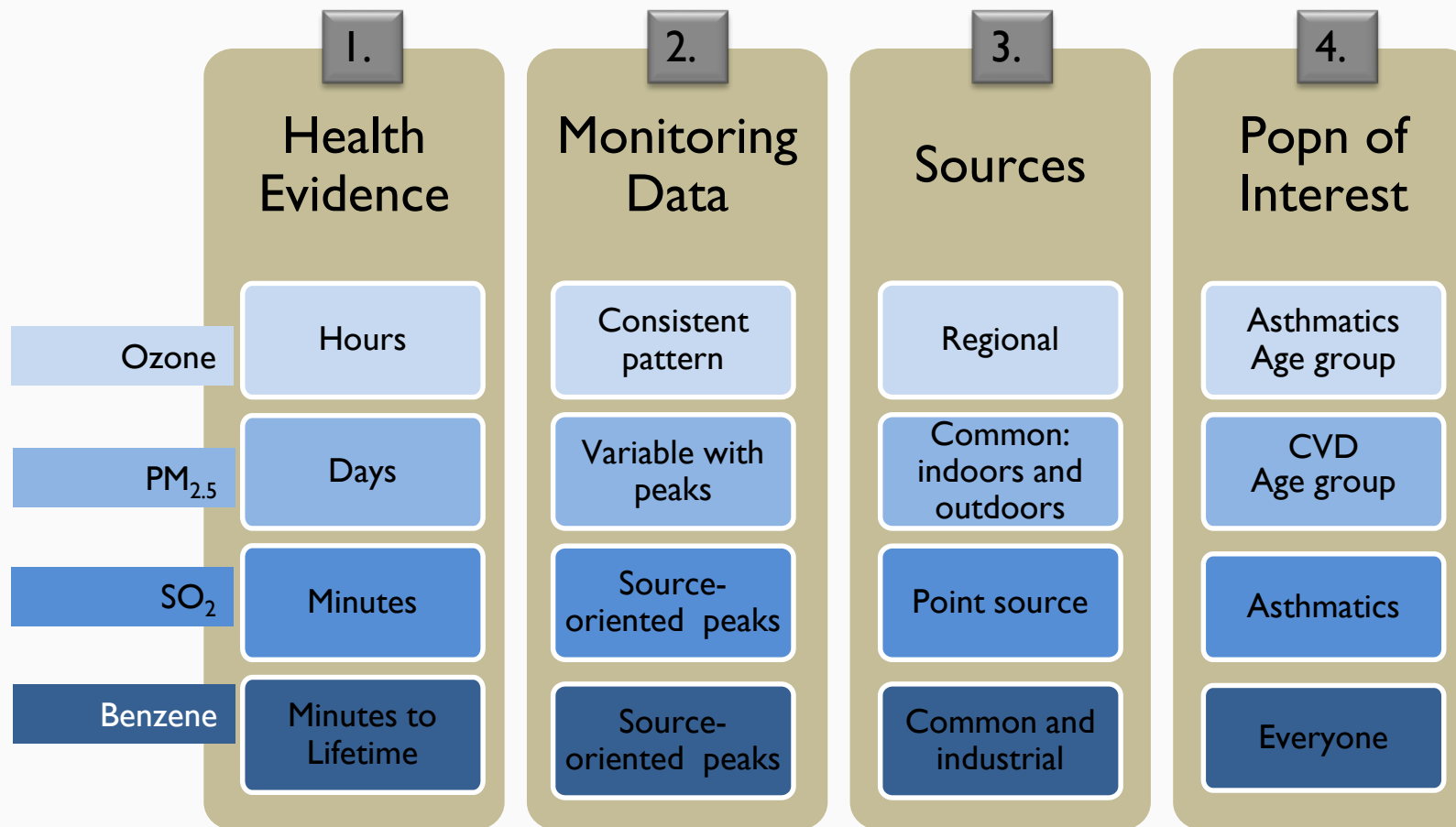
----- (other feedback we couldn't address at this point)

- Customize website and push alerts when levels changed (esp. to “high”).
- Use location services and include a map.
- Provide an option for crowdsourcing data.



<https://www.epa.gov/air-sensor-toolbox>

# Sensor Scale Project

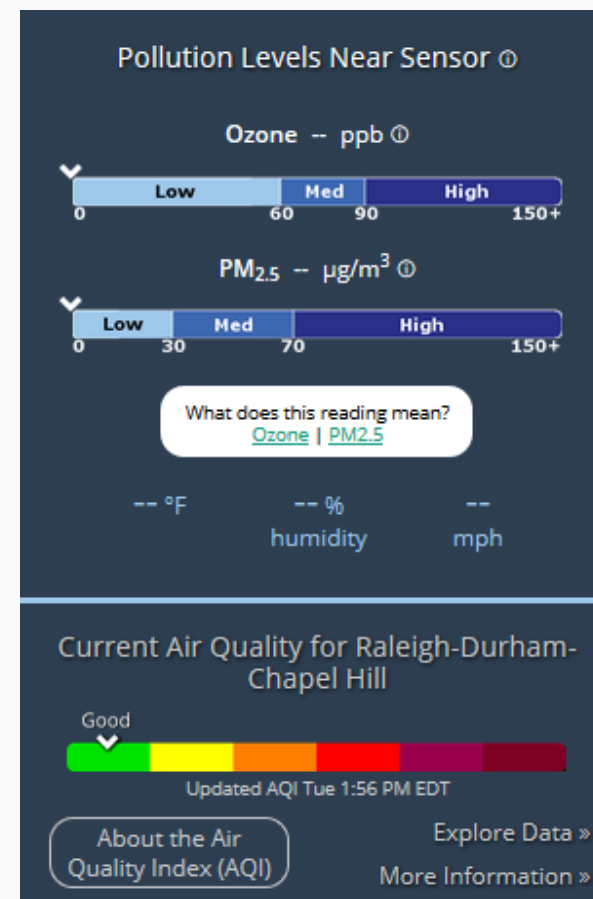




# Communication Materials Update



- Finalizing PM<sub>2.5</sub> and O<sub>3</sub> sensor scale
  - <https://www.epa.gov/air-sensor-toolbox>
- Launching revised Village Green website
  - FY 2018
- Developing communication materials and fact sheets for developers and sensor users
- Drafting SO<sub>2</sub>, NO<sub>2</sub>, CO, and benzene sensor scale
- Piloting interpretation of Purple Air monitoring data alongside data from regulatory monitors through partnership w/ South Coast



Beta Version of Revised VG Website

(do not cite or quote)



it's DEMOtime!

<https://sandbox-apps.s3.amazonaws.com/SensorsMap/index.html>



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