



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

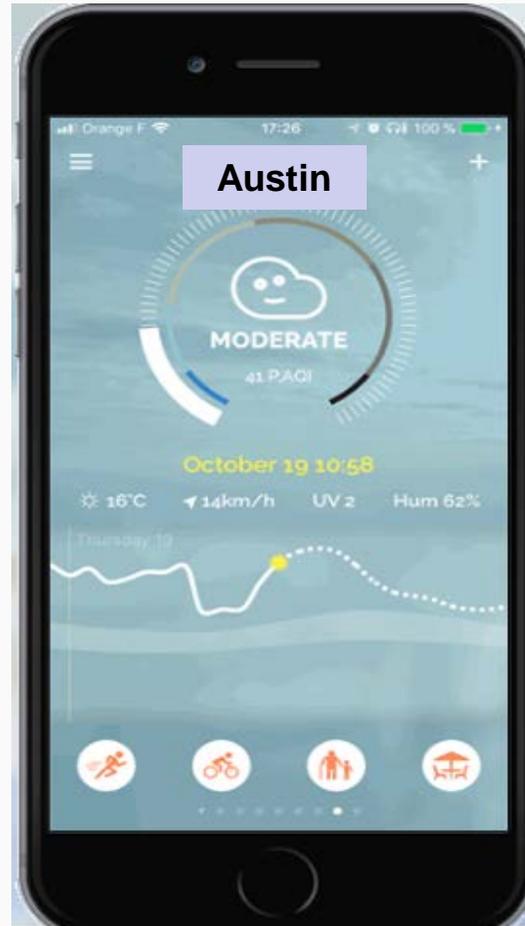
Ozone	29	Good
Particles (PM2.5)	18	Good

Air Quality Forecast

Today	Tomorrow
Air Quality Index (AQI) Good	Air Quality Index (AQI) Good
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 "Village Green Project" sign. Overlaid on this image is a "Local Pollution Levels" widget showing: Ozone at 21 ppb (Very High), PM_{2.5} at 8 µg/m³ (High), 60°F, 70% humidity, and 2 mph S. Below this is a "Current Area Air Quality Index" widget showing a "Good" level. A smartphone in the foreground displays the same data. The website footer includes "Welcome to the Village Green Project" and three icons representing: "Measuring and communicating on-the-spot air quality and weather conditions for research and awareness", "Developing small and rugged data collection systems that can be powered by the wind and sun", and "Partnering with community organizations to use smart technology in outdoor communities". A footer note states: "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 O₃/PM_{2.5} 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

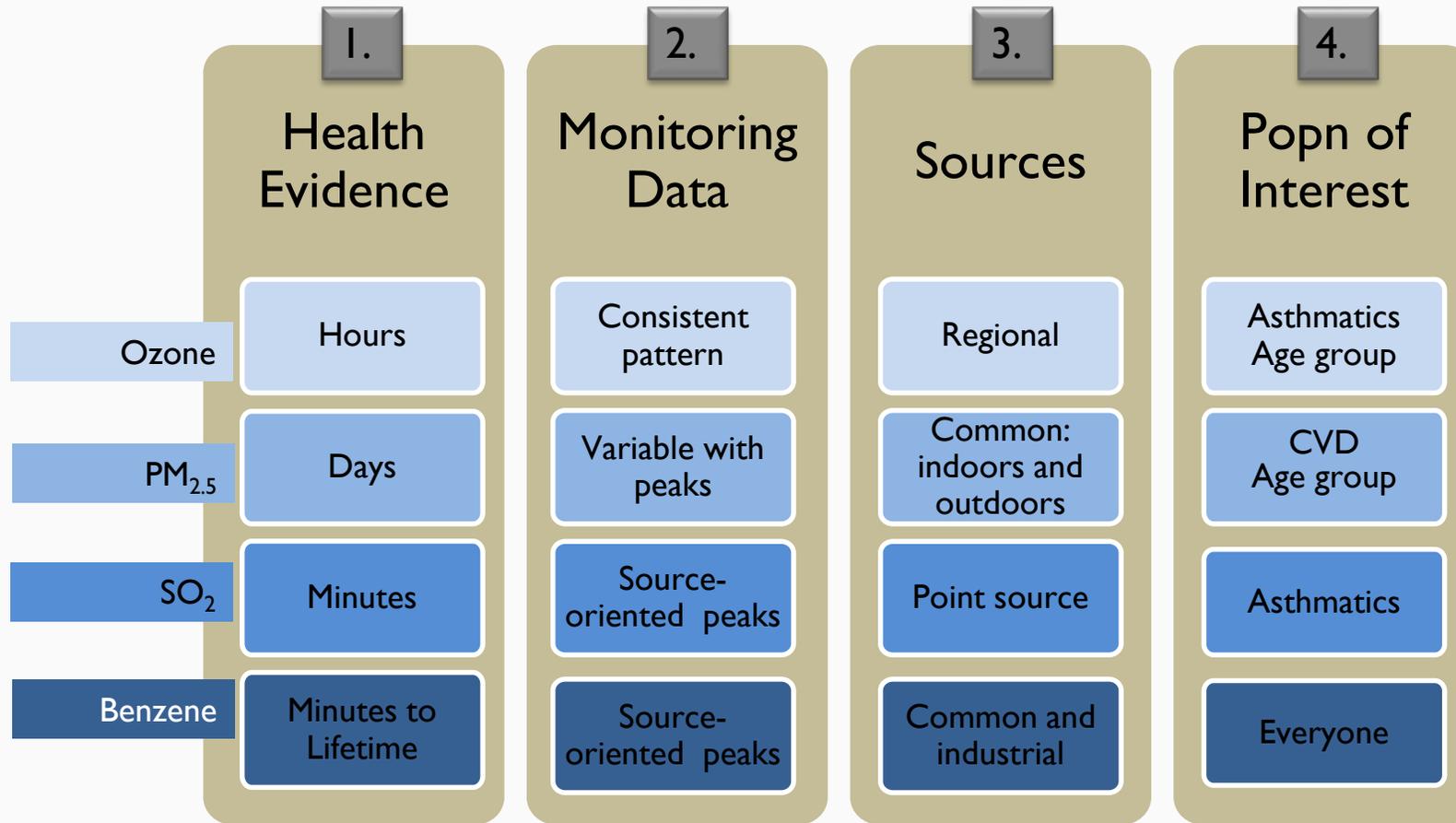
----- (other feedback we couldn't address at this point)

- 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>

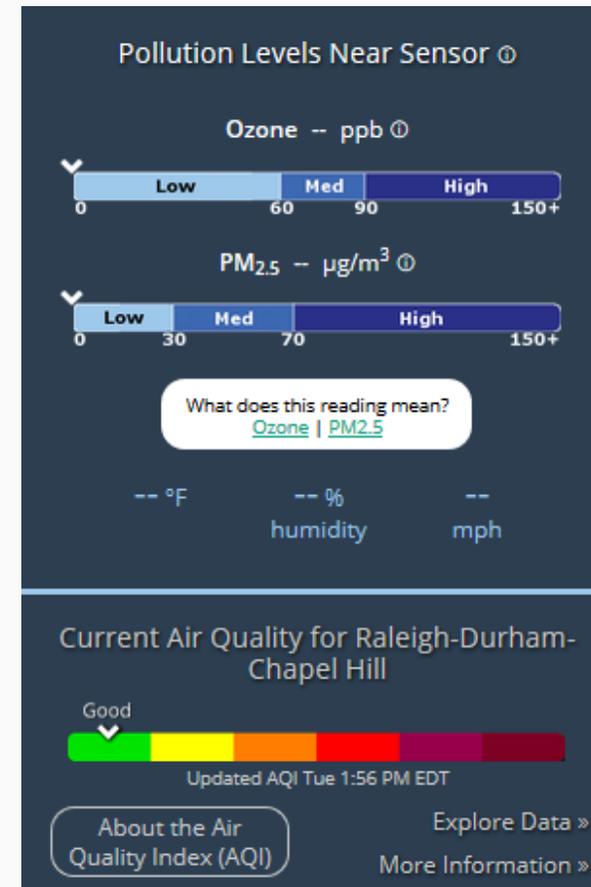
Sensor Scale Project



Communication Materials Update



- Finalizing PM_{2.5} and O₃ 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 SO₂, NO₂, 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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