Field Assessment of Vehicle Idling Behavior to Inform Anti-Idling Strategies in Cleveland, Ohio

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CITY OF CLEVELAND
Mayor Justin M. Bibb
PUBLIC HEALTH



Source: Cleveland Division of Air Quality

BACKGROUND

- Cleveland limits vehicle idling to **5 minutes per hour**.
- After the 2025 amendments, the Division of Air Quality (Cleveland Department of Public Health) launched an awareness campaign with signs at City properties.

POPULATION

Drivers using City parking lots and recreation centers.

LEARNING OBJECTIVES

- Apply observational methods to assess idling.
- Evaluate idling patterns and air quality.
- Develop recommendations for the City's campaign.

ACTIVITIES

- Co-developed a field observation protocol and data sheet.
- Observed idling at 11 City sites.
- Measured on-site $PM_{2.5}$ with portable PurpleAir monitors.
- Documented signage and priority sites for new signs.

METHODS

- Observed vehicles idling more than 5 minutes at City lots and recreation centers.
- Recorded vehicle type, idling duration, lot occupancy, weather, and regional AQI.
- Calculated idling rates by site and time of day; estimated fuel use and emissions.

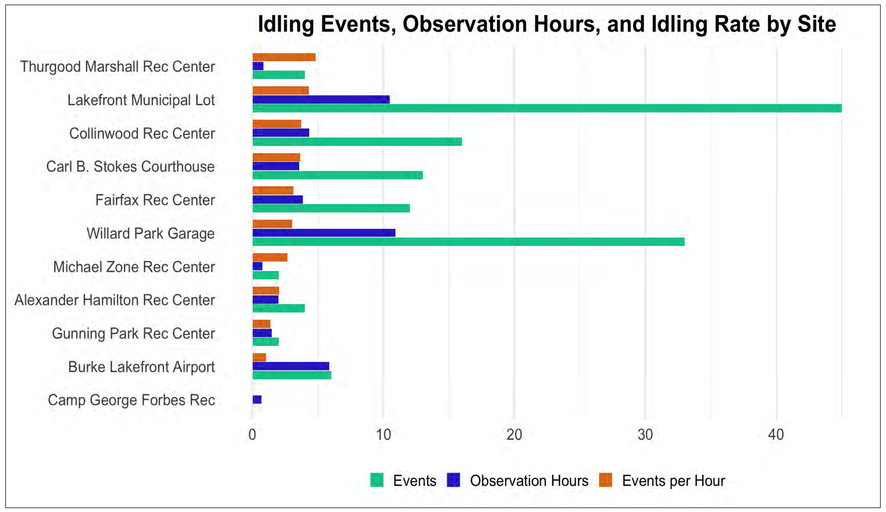


Image: PurpleAir Flex air quality sensor. Source: PurpleAir, Inc. (purpleair.com)

RESULTS

- **148** vehicles idled beyond the 5-minute limit.
- **11.7 minutes:** median idling time, nearly twice the limit.
- **At least 1725 minutes** of idling beyond the limit.
- **1.9×** more idling in the morning than in the afternoon.
- City lots and recreation centers had **similar** idling rates.
- On-site $PM_{2.5}$ followed **regional air quality**, not idling.
- **≈10.6 gallons** of fuel burned while idling (minimum estimate)

Site	Events/hour	Hours observed
Lakefront Municipal Parking lot	4.4	10.5
Fairfax Recreation Center	4.4	3.9
Collinwood Recreation Center	4.2	4.3
Carl B. Stokes Courthouse	3.6	3.6
Willard Park Garage	3.1	11.7
Burke Lakefront Airport	1.0	5.9



DELIVERABLES

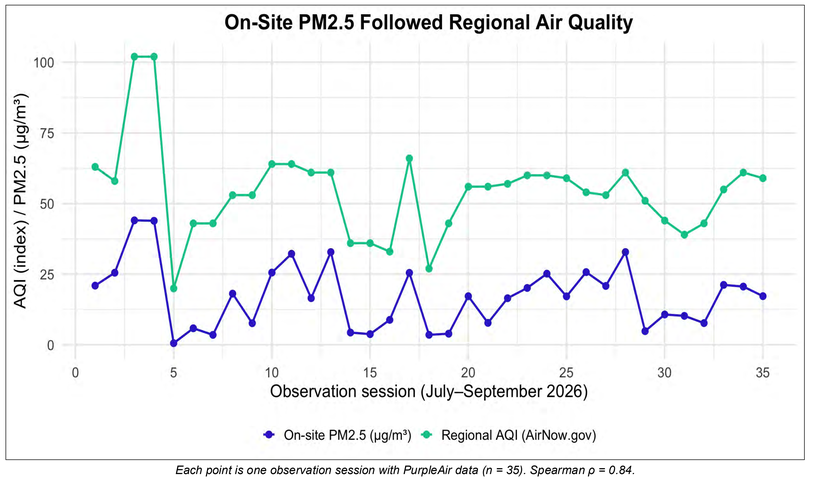
- Observation tool and dataset
- Site and signage map
- Fuel and emissions estimates
- Signage and outreach recommendations

PUBLIC HEALTH IMPLICATIONS

- Address **where and why** drivers wait; signs alone aren't enough.
- Target morning arrivals.
- Tailor messages: City policy for employees, education for the public.
- Standardized monitoring can track campaign impact.



Observation sites and signage priority locations. Base map: Map data © 2026 Google.



Each point is one observation session with PurpleAir data (n = 35). Spearman ρ = 0.84.

LESSONS LEARNED

- Consistent procedures make sites comparable.
- Rates ensure fair site comparisons.
- Observations show behavior, not motivation.
- Portable monitors can't attribute PM to individual vehicles.

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