

NEW FINDINGS ON ASPEN AIRPORT, AIR POLLUTION, AND PUBLIC HEALTH



Photo by Pete McBride

Every day hundreds of planes take off or land at the Aspen Airport, 99% in opposite directions. ASE is known as one of the most dangerous airports in the country.

The community and its elected officials have long heard anecdotal reports of—and many have personally experienced—throat and eye irritation, organic vapors, respiratory symptoms, and other signs of air pollution around the Airport. However, no *ground-level air quality measurements have ever been taken at or downwind of the Airport.*

On a busy fine day, up to 300 aircraft land or take off at Aspen Airport. Takeoff jet-blast points almost exactly toward the ski-school building at the base of Buttermilk, 640 meters or 2100 feet south. The prevailing winds blow the same way. Yet any air pollutants carried to that heavily used area—or the X Games and World Cup zones, or the ski slopes and downtown areas beyond—have never been measured. The County’s air-pollution consultant saw no need.

Today’s scientific understanding of what jet engines emit, how it travels, and how it can affect human health now invites reexamination based on real data.

Enter Aspen Fly Right. To stimulate and inform rigorous tests, over the Presidents’ Day weekend on 17–21 February 2023, our 12-citizen team performed tens of thousands of air measurements. We used 14 instruments to measure those jet plumes’ dynamics and where they may have delivered five air pollutants during the main ski periods. We’re still analyzing a gigabyte of data, but some preliminary results look instructive.

Preliminary Findings

Jet blasts, twisted by the rotating gas turbine, form stable vortices that can carry pollutants for at least 700-1,000 meters. We tried to track specific takeoff pulses from near the airplane through a midpoint to the base of Buttermilk. Such jet-plume travel is physically plausible: the pollutants are being powerfully blasted that way, even if errant breezes turn them a little sideways.

Jet exhaust from planes points *directly*—within a few degrees —across a smooth, snowy field and two parking lots to the front door of the Hideout, where Aspen’s children gather for ski lessons on the slope behind that building complex.

Jet-engine pollutants include acrid nitrogen oxides and burned or unburned hydrocarbons, but are mostly fine particles, far smaller than road-vehicle exhaust. We measured three particle size ranges at three locations. They often showed large, sharp spikes due to specific events—some from nearby road vehicles, but others probably from jets taking off. These fine particulates then grow and react as their plume travels and ages. Many become coated with highly reactive organic compounds (some carcinogenic) or metals. Inhaled, the finest particles enter the bloodstream and go throughout the body, delivering toxins to every organ and tissue.

Potential Health Impacts

Even more mobile, penetrating, reactive, and concerning—as medical science is now finding—are “ultrafine” particles as much as a hundred times smaller still. These invisible nanoparticles are hard to measure and too small for our instruments to detect, but they make up almost all emissions from jet engines. Burning a kilogram of fuel at full throttle can emit up to hundreds of quadrillions of ultrafine particles, with immense surface area to deliver toxins.

In April 2020, Aspen Journalism and *The Aspen Times* published an important feature, “Airport expansion may not resolve pollution and noise problems.” It noted longstanding local “concerns about toxic smells, roaring engines and carbon emissions”—overridden in the ASE Vision process by “the threat of losing commercial [air] service.”

That threat turned out to be [mythical](#), but we know this for certain: *Burning fuel causes these worrisome transport emissions.* Next-generation road and air vehicles burn nothing and are evolving swiftly. Public health is now another reason to bring them on sooner—and not to slow or preempt their arrival by mis-investing to expand obsolete fossil-fueled infrastructure instead.



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