Near-Road Air Monitoring in Washington
2024 Summary

DEPARTMENT OF ECOLOGY
State of Washington

Near-road monitoring network

The Washington Department of Ecology (Ecology) operates two air monitoring sites adjacent to high-traffic segments of I-5 as part of the federal near-road monitoring program. The near-road monitoring program provides high-quality, nationally-comparable datasets of key traffic-related air pollutants next to the most heavily-trafficked roadways in major metropolitan areas. Since these sites are adjacent to interstates with the highest traffic volumes, they are considered a "worst case" environment representing the highest concentrations of traffic-related pollutants any person is likely to experience.

Washington's near-road monitoring sites are located in Seattle (10th Ave S & S Weller St) and Tacoma (S 36th St & S Hosmer St), both adjacent to I-5 and within 15 meters of the nearest lane of highway traffic. The Seattle-10th & Weller site monitors nitrogen dioxide (NO_2), carbon monoxide (CO), and fine particulate matter ($PM_{2.5}$). The Tacoma-S 36th St site measures NO_2 and $PM_{2.5}$. The near-road monitoring sites reflect significant infrastructure and resource investments by Ecology and the U.S. Environmental Protection Agency (EPA) to install, operate, and maintain.

Figure 1. Seattle near-road air monitoring site (left) and view of I-5 from site roof (right).

Data summary

Hourly data are publicly available both historically and in near-real time from Ecology and EPA. Despite the proximity to high traffic volumes, concentrations of CO and NO_2 measured at these sites are relatively low and rarely deviate from the Good range of EPA's Air Quality Index (AQI). The tile plots below show daily AQI values for NO_2 and CO at these sites, which have not exceeded federal health-based standards in the 8 years that both sites have been operational. The $PM_{2.5}$ data collected at these sites are less applicable to questions of traffic pollution impacts because vehicle emissions account for a smaller fraction of Seattle- and Tacoma-area $PM_{2.5}$ emissions than sources of smoke, such as wildfires and residential wood combustion.

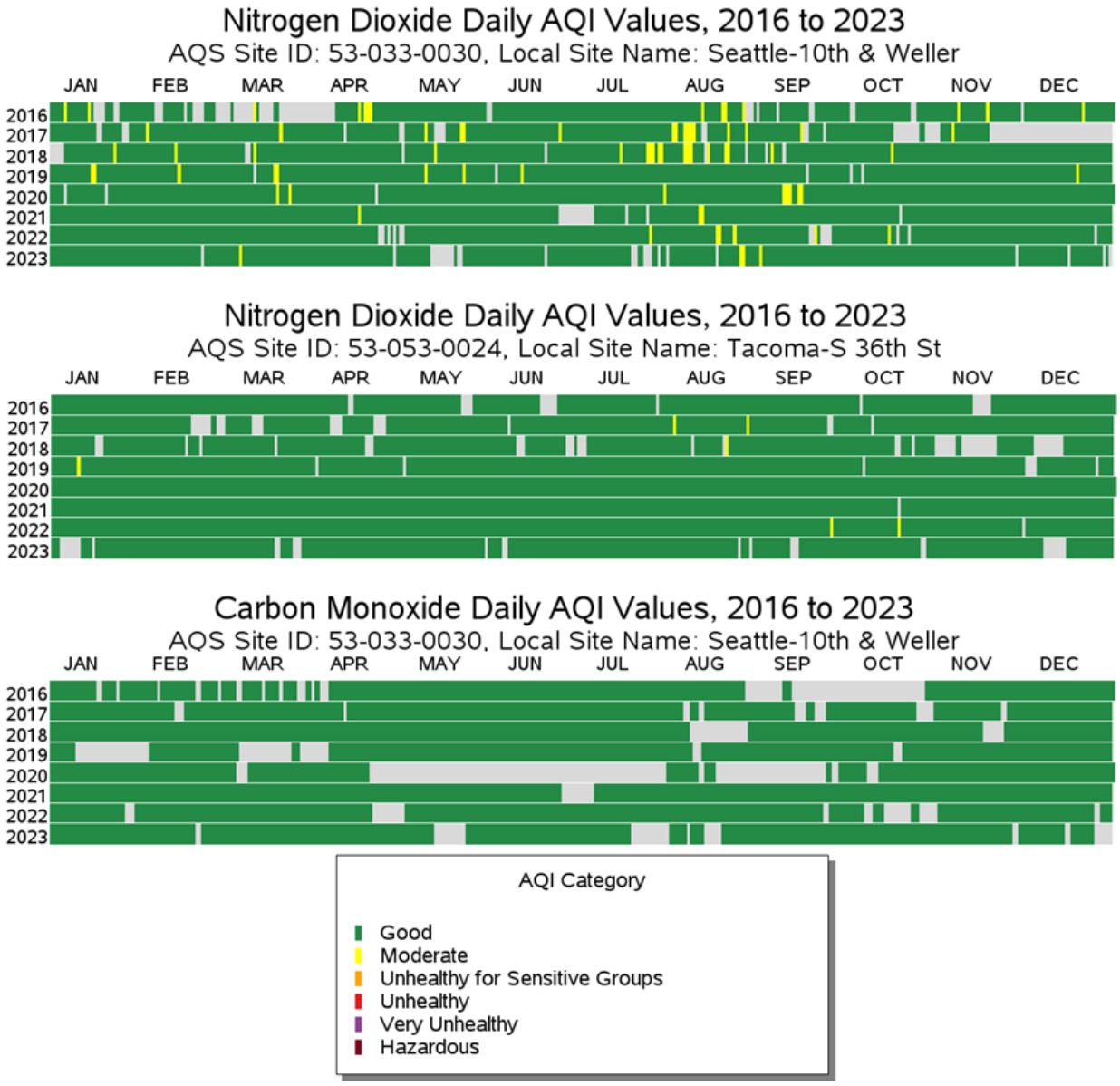

Figure 2. Tile plots of Air Quality Index (AQI) values for the key traffic-related pollutants NO2 and CO, 2016-2023, Seattle and Tacoma near-road monitoring sites. Source: EPA Outdoor Air Data https://www.epa.gov/outdoor-air-quality-data

Discussion and interpretation

The primary purpose of the near-road monitoring network is to improve our understanding of air pollution exposure in near-road environments for public health protection. While reducing tailpipe emissions is expected to improve air quality in general, the complexities of air pollution fate and transport should be considered when interpreting these data for other purposes, such as assessing fleet composition impacts. Air pollution is a complex science; ambient concentrations depend upon a wide range of factors beyond just emissions, including topography, meteorology, regional background, and secondary chemistry. Impacts of tailpipe emission reductions may also be more difficult to detect given the already-low levels of NO_2 and CO typical of Washington's relatively clean air.

Publication information

This report is available on the Department of Ecology's website at
https://apps.ecology.wa.gov/ecy/publications/SummaryPages/2402043.html

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