

Revised Preliminary Comments on the ISA from Mr. George A. Allen

The second draft of Chapter 2 is substantially improved over the first draft. Sections 2.2 through 2.4 (Atmospheric Chemistry and Fate, Sources, and Measurement Methods) are appropriate in content and level of detail.

Section 2.5, Ambient Concentrations, is key to this revision due to the recent availability of NO₂ data (since the first draft) from some of the new near-road network monitoring sites. These new sites provide important additional information on both urban spatial variability from micro to neighborhood scales, and potential for exceedances of the 1-hour NO₂ NAAQS.

The summary of national scale variability in section 2.5.1 is appropriate. Table 2-4 provides summary information on NO_x as well. For sites located near sources (e.g. any urban site), this is very useful information. Some of the minimum values seem odd however, such as an annual average NO_x concentration of 0.1 ppb and NO of 0.01 ppb.

For urban scale variability (2.5.2), the use of the coefficient of divergence is appropriate, and shows substantial differences in spatial patterns across different urban areas.

Section 2.5.3, micro to neighborhood scale variability, appropriately gets the most analysis. The discussion and presentation of near-road gradients in section 2.5.3.1 is useful. Table 2-6 summarizes NO₂ gradients from available research. This table combines results from a wide range of averaging intervals. Many of the studies used passive samplers with days to weeks; the utility of these results is limited in the context of a 1-hour standard. It may help to separate results into 2 separate tables, one with averaging times > 6 hours and the other with 6 or fewer hours.

Even for studies with short averaging times the nearest concentration is often surprisingly low (< 50 ppb) except for the Los Angeles results. It is unclear if the data in Table 2-6 from studies with highly time-resolved data are long-term averages or some other metric. Some of the studies have a range of concentrations, while others have only a single value. Given the 1-hour NAAQS, a more detailed summary would be useful for studies with time-resolved data, such as that presented in figure 2-17 and 2-18 on pg. 2-58 and 59.

A key point regarding near-far ranges/ratios is made on pg. 2-55, line 9. If the larger (mid to neighborhood) scale concentration is low (e.g., for less urban areas), that is likely to drive the strength of the gradient - not the concentration near-road.

Section 2.5.3.2, Near-Road Monitoring. As this section notes, the near-road data summarized in this draft (data through March 2014) is only a small subset of what is now or will soon be available as the network is built-out. EPA/OAQPS released an update to the status of the near-road network build-out on May 20, 2015, posted on their Near-Road Monitoring web page at www.epa.gov/ttn/amtic/nearroad.html . This list of active sites includes meta-data about the sites and their target roads: <http://www.epa.gov/ttn/amtic/files/nearroad/nearroadsites.xlsx> .

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54 Near-Road sites are now operational out of an expected 75 phase 1 and 2 NO₂ sites. Two Phase 3 sites are operational, for a total of 56 sites. 36 NO₂ sites were operational by July 1, 2014.

Of the 70 sites with information on distance to the roadway, 11 are within 10 meters, and another 29 are within 20 meters. Only 9 are more than 30 meters from the road. Although the regulation requires sites to be within 50 meters, EPA has encouraged agencies to be within ~ 20 meters if possible, making the data more useful for estimation of curbside or on-road concentrations.

The final ISA should be updated to include as much of this additional data as possible, even if only for use in summary tables such as 2-7 on pg. 2-60 which compares near-road NO₂ with area wide NO₂ in the same urban area. This table is very useful and shows that the 98th percentile of 1-hour daily maximum NO₂ concentrations in an urban area is often not at the near-road monitoring site. It is worth noting that there are no exceedances of the 1-h NAAQS for the near-road data shown in tables 2-7 and 2-8.

Section 2.5.5 briefly discusses long-term NO₂ Trends. There is at least one long-term site that can be used to show trends of near-road NO₂. The Elizabeth Lab site at interchange 13 of the New Jersey Turnpike is not considered a near-road site by EPA's criteria; the NYC CBSA phase 1 near-road site is in Fort Lee, NJ. Although the Elizabeth Lab site does not technically meet EPA's near-road siting criteria, it is representative of near-road NO₂ and has data going back to 1980.

The Elizabeth Lab site location (circled):

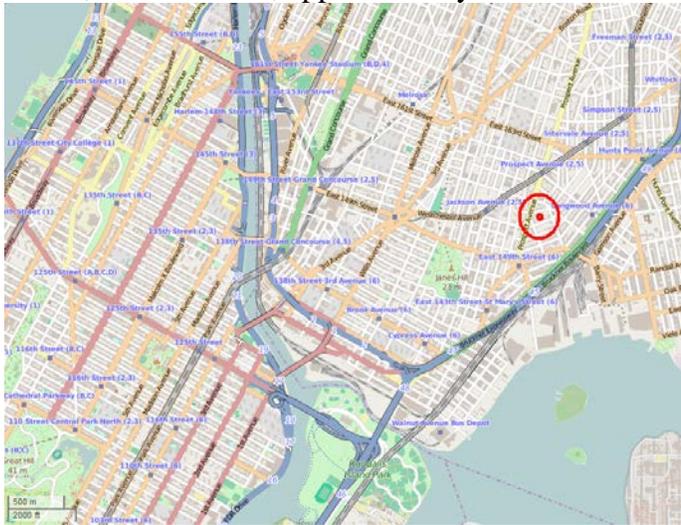


For context regarding the Elizabeth Lab site's value for looking at long-term near-road NO₂ trends, a significant inversion/stagnation NO₂ event occurred March 10, 2015 in the NYC metro area that resulted in exceedances (> 100 ppb NO₂ 1-hour average) at two sites. The Fort Lee near-road site did not have an exceedance during this event. A partial list of daily max NO₂ for this date at metro NYC sites follows.

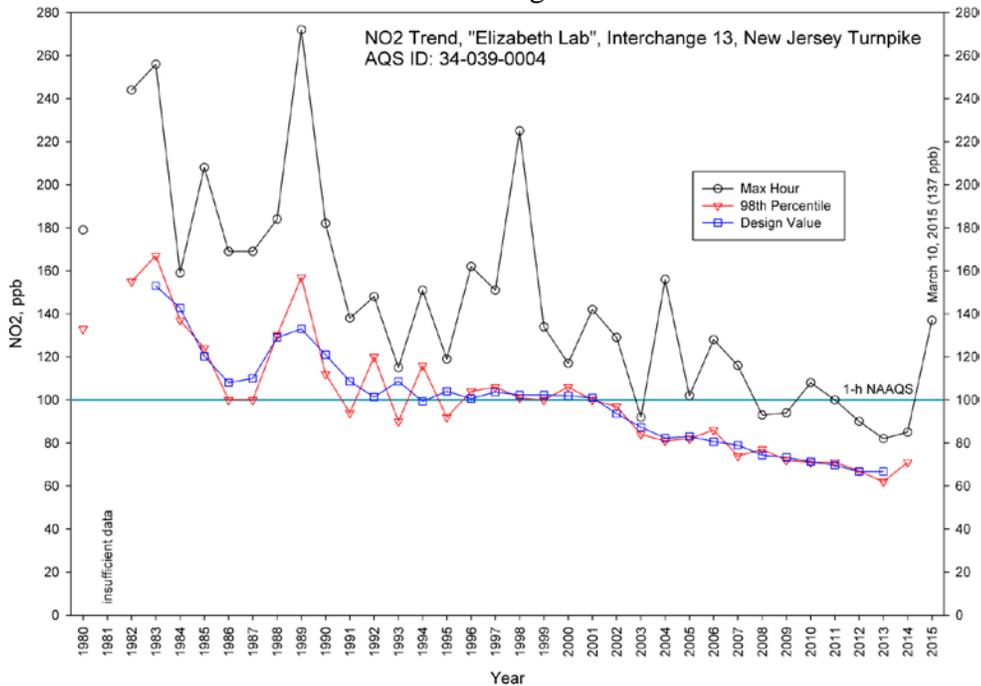
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Site	NO2 (1-h max)	AQS ID	Notes
Elizabeth Lab	137 (NOx=618)	34-039-0004	also known as "Elizabeth Trailer"
NYC IS-52	122	36-005-0110	NATTS site
Jersey City	100	34-017-1002	not in AQS - urban canyon
Queens Coll. NYC	98	36-081-0124	NCore site
Ft. Lee NJ	81	34-003-0010	NYC phase 1 near-road site

The 2nd site with an exceedance on this day is a neighborhood-scale site (681 Kelly St.) at a school in the Bronx, circled below, approximately 420 meters northwest of I-278/895, the Bruckner Expressway.



The 34-year trend of hourly NO2 for the Elizabeth Lab site shown below provides valuable context for near-road NO2 concentrations. I encourage EPA to include this site in their near-road analysis.



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The London near-road data presented in Tables 2-9a and b are useful despite the several differences noted in the text regarding fleet mix and other factors. The London roadside / kerbside monitors listed are all within 10 meters of the road, closer than most of the US near-road sites. Some of these sites such as Marylebone Rd. are very close to the road (~2 meters) and might be considered on-road measurements. This may explain the large difference between the roadside and urban background concentrations.

Typo pg 2-34, line 5: a word is missing?