

Reviewer's report

Title: The air quality impacts of road closures associated with the 2004 Democratic National Convention in Boston

Version: 1 **Date:** 7 December 2005

Reviewer: Rana Charafeddine

Reviewer's report:

General

The authors pose a timely and important question and the methods used to answer this question are well suited. Below are few comments that would clarify some sections of the article.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

No compulsory modifications are needed.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1-For all the maps, the authors need to add the scale. This is even more important as the scale changes from a map to another which may add ambiguity for the reader.

2-Figure 5: The last chart for PM_{2.5} has a range that reaches 80 µg/m³ ! What does this really mean? Does this correspond to the DustTrak measurements taken in Cambridge? If yes, then first it is not clear that it corresponds to the Cambridge site. Second, What is the meaning of these results? Are they in the same unit or is it a simple mistake?

Discretionary Revisions (which the author can choose to ignore)

3-For the result section in the abstract, it would be better to emphasize the principle results of the authors which are the nitrogen dioxide results. Thus, the authors can displace all the nitrogen dioxide section and place it before the continuous concentrations results. This would even be clearer, as in the methods, they mentioned nitrogen dioxide before the continuous measures.

4-Also in the results section: the sentence starting by "Continuous concentration results were ...major highways" needs revision (remove the "but" that is after "were mixed,").

Background

5-I would recommend displacing all the paragraph about the spatial heterogeneity of the different pollutants in p.4 (from "For primary pollutants" to "implying that a different monitoring strategy may be necessary") to p.6 where the authors are describing the monitoring strategy. Then, we would have after the sentence about the natural experiment, directly the description of the DNC event, while we will have description about the spatial heterogeneity of these pollutants after mentioning the importance of having a monitoring strategy with sufficient spatial coverage.

6-Does the authors have references to back-up their statements about the continuous and integrated samplers? (p.6)

7-On p.6, the sentence : "On the other hand, integrated samplers often..., but by their nature cannot

capture..." needs "they" before "cannot".

Methods

8-The methods section needs subtitles to become clearer. For instance the subtitles may be:

- A priori classification of DNC impacts
- Integrated nitrogen dioxide samplers (or Integrated monitoring strategy)
- Continuous monitoring strategy
- Traffic volume :Here I would suggest that the authors expand on this issue, for instance that there are no traffic counters on local roads where a traffic increase was hypothesized was stated in the limitations. This issue was only clear in the discussion section. Also, it may be useful to have an idea of where the traffic monitors are in relation to road closure.

9-For all the maps:

- It would be clearer if the legend is on the map (I don't know if this is a specification of the journal to include the legend and title separate from the table or map).
- Also the authors may get rid of the small roads as no information or data are mentioned about these. This will make the maps easier to read.
- Add the name of the highways on all the maps.

10-In page8, in the paragraph starting by "In addition, at three of these 40 sites, etc".. I would name the pollutants monitored and not say simply multiple pollutants, because the reader may not understand from the first reading that the authors monitor continuously EC and PM2.5 but not NO2. Also, in the same paragraph, the hypothesized direction of traffic change is not stated for Cambridge and South Boston.

11-The next section (results) will be clearer if the authors dedicate a section in the methods to describe their analysis strategy. For instance, in this section, the authors can describe the ratio they used to compare between during and before/after the DNC for traffic volume and the meaning of the results (e.g. what a ratio of 0.9 means for the change in traffic volume).

Results

12-Traffic volume: If the authors describe their analysis strategy in the methodology (see comment 13) then they don't need here to be specific. Otherwise, it is important that in the text, the authors describe their ratio and the meaning of the results in the text (e.g. what a ratio of 0.9 means for the change in traffic volume).

Figure 3: Besides adding the scale and legend on the map, I would recommend that the authors include either the values of the ratio or the circles, because there is no need for both. If they chose to use the circles, then they need to specify the categories in the legend. For instance, a small circles for ratio < 0.8 , a medium ...etc. Also, the differences in the sizes of the circles should be significant to be instantly clear to the reader.

Figure4: I propose that the authors standardize the scale for all the charts. For instance, the chart of I93 south, north of Boston has a scale that ranges from 0 to 35,000 vehicles per hour with intervals of 5000 vehicles per hour. This is different for I-93 North, north of Boston; for Route 1 north of Boston and for I95 South, south of Boston.

In the text commenting figure 3 and 4, I would relate the results to route closure.

13-After the traffic volume section, I would recommend displacing the Integrated nitrogen dioxide samples (or samplers?) to come before the continuous monitoring data. This is because the results from nitrogen dioxide sampling are the primary results.

14-Continuous monitoring data:

Figure 5: It is not clear which charts represent the continuous monitors and which are EPA monitors. If the label study site means that they are continuous monitors then this has to be mentioned in the legend.

Using the same terminology for naming the site of the monitors in the text and the graph would make it easier for the reader to understand the data. For instance, is the "Study site, on closed road" for PM2.5 the same as the site : "west of downtown (Cambridge)"? Also, I would include between bracket the name of the areas where the sites are e.g. Blue Hills, Lynn, Roxbury, etc. This would make it easier for the reader to understand which site the authors are referring to.

Also, relate the sites to road closure.

15-I doubt that the analysis about the local contribution of traffic to PM2.5 and EC is very useful, especially that is only the result from one site.

16- Figure 6: Again, I would recommend including the name of the site as it is in the text with the name of the area in bracket.

Also what do the black dots represent?

In the title, when selected sampling sites are mentioned, do they represent the 40 integrated sample? State it clearly.

17-Figure 7: The data here comes from the 40 integrated samples? If yes, state it clearly. (also we have less than 40 icons on the map, the authors did not include data from all the monitors? Why?)
-Put the name of the highway on the map.

-Also , as is the case for figure 3, I would suggest you clarify what are the meaning of the ratios in the text.

18-Figure 8: I would suggest a table instead of this figure. This table would include the single values and the median for instance. It would be much clearer for the reader.

Discussion:

No comments: the limitations stated and conclusions are all well stated and reasoned.

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests