

Comments on Environmental Science & Technology Manuscript

“Contribution of Lubricating Oil to Particulate Matter
Emissions from Light-duty Gasoline Vehicles in Kansas City”

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While there is some merit in what the authors have done, I have a problem with many parts of this paper. Fundamentally, there should be better presentation of structure and results. For instance, ‘Kansas City Light-Duty Vehicle Emissions Study’ should be part of method section; figures in SI could be moved into the main text. The text tries to be too much of KCVES instead of a clear and well developed story line. One of the main issues with the presentation is that there is insufficient description of hopanes, steranes, and PAHs analysis –Which method was used for the analysis? A Standard one or an in house method? There are assumptions for ‘multiple regression analysis’-how were correlations between fuel/oil markers and EC, OC, TC and PM? While the manuscript could be a contribution in this area, I still feel it requires major revision before publication. Below are some specific comments that the authors could utilize in revising their manuscript.

1. Introduction – Line 12–20 in page 4, ‘In addition to……(16,17,18)’ the author should extend the discussion in the paragraph.

Line 21–50 in page 4, the author may focus on findings of previous studies, such as development methods and validating markers for apportioning PM emissions.

2. Experimental Methods – line 19–39 in page 6, as mentioned above, the

author should provide detail methods of PAHs and SVOC analysis.

Line 36 in page 6, 'the compositing reduced the 102 individual vehicle tests to 26 individual.....' how were those 26 selected? Were they typical? How many tests for each vehicle type and age group? 26 for both PAHs and SVOC or for each?

3. Results and discussion – What are the assumptions for multiple regression analysis used in this study? e.g. were the variables correlated? were they normal distributed?

Section 'Elemental Carbon' and 'Organic Carbon' – there is not sufficient discussion of the results in terms of comparisons with other studies.

Presentation – images can demonstrate results more efficiently, hence, figures in SI could be moved into the main text

Section 'Estimate from Continuous PM Emission Data' in page 18 – is this another method of estimation? It hasn't been mentioned in the early sections, especially the section of method. What's the relation between these two approaches? Photoacoustic instrument is based on optical method to measure BC concentrations. I've seen a lot of studies on the comparison of optical methods and IMPROVE for BC measurements, which indicated that big differences between these two methods. Then, how can these two estimates be evaluated?