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Interactive comment on “Weekly patterns of México City’s surface concentrations of CO,NO_x, PM₁₀ and O₃ during 1986–2007” by S. Stephens et al.

Anonymous Referee #1

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General comments

This paper presents an analysis of day-of-week patterns of major pollutants in Mexico City, with the goal of assessing the sensitivity of ozone formation. The paper is very well written, and the results are clearly presented. One novel contribution of the work is the analysis of the fraction of radical loss due to NO_x chemistry, L_N/Q, in the context of evaluating the weekend effect. A few minor revisions, suggested below, will help strengthen the paper.

Specific comments

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1. (p. 8360, line 22) The use of CO as a proxy for VOCs, while necessary, may be a significant source of uncertainty in the work. CO and VOC emissions from mobile sources tend to be correlated over time, but vehicles' contribution to emissions of each differs. In Mexico City, mobile sources are thought to be responsible for 99% of CO emissions but less than half of VOC emissions. Therefore, a reduction in CO and VOC emissions from mobile sources only would result in an increase in the VOC/CO ratio if other sources (point, area, biogenic) did not change. A long-term trend in the VOC/CO ratio may exist, and further documentation of VOC/CO ratios in Mexico City should be presented, if available.

2. (p. 8362, lines 22-23) The authors note a secondary maximum from the evening rush hours in CO, NO_x, and PM₁₀. The magnitude of the secondary maximum relative to the morning rush hour maximum is much higher for PM₁₀ than for CO or NO_x. Why might this be?

3. (p. 8364, line 2) A great deal of land development on the outskirts of Mexico City has probably taken place between 1986 and 2007. Mention of such change and its impacts on emissions and chemistry is warranted in the discussion of long-term trends in day-of-week concentration patterns.

4. (p. 8364, line 2) Following up on the previous comment, the authors should address in Section 2 the completeness of the data record and whether the addition or removal of monitoring sites could bias the results.

5. (p. 8364, line 23) Figures 6-7 show seasonal behavior over 2001-2007. Are the results similar over the other blocks of years?

Technical corrections

6. (p. 8363, line 24) The words, "...either on...", " appear to be transposed.

7. (p. 8366, line 19) "...consistently..." should be "...consistent..."

8. (pp. 8367-8368) The formatting, or lack thereof, of the equations makes them harder

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to read than necessary.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 8357, 2008.

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S2725

