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Interactive comment on "Chemical and physical characterization of traffic particles in four different highway environments in the Helsinki metropolitan area" *by* J. Enroth et al.

Anonymous Referee #2

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General comments This paper presents the finding of a multi week field study performed in Helsinki, Norway that focussed on emissions from traffic and how those emissions impacted nearby ambient air and changed with distance from the traffic sources. Much of the data were collected with an instrumented mobile van that slowly transited from the road side of several roads. High time resolution instrumentation was included to allow one second collection of particle size composition, particle numbers, and common traffic-generated gaseous and particle phase chemistry. Changes in particle size distribution and composition were also assessed with distance from the roadway. Finally, emission factors were developed for common traffic related pollutants. The information presented makes a very important contribution to the complex issues

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Discussion paper

of the dynamic processes that occur once pollutants are emitted and moves from the roadway to the community. It is quite comprehensive and only a few technical question appeared as it was reviewed. Upon consideration of these comments and others from the reviewing community the paper should prove quite useful.

Specific comments Page 6, line 5âĂŤthe weather was described as “rather mild”. The conditions include data collection under what most researchers might consider quite cold and wet. It appears that sampling was conducted in sub-freezing at one site and most all was performed when temperatures were below 5 degrees C. Average humilities were approximately 90% at one site. The terminology of “mild” is important for clarification, however, much more important is that the nature of the study was to consider the dynamic processes that occur between tailpipe and the first few hundred meters from a roadway. It is well known that temperature plays a key role along with concentration in these processes. It is likely that humidity is also important. It clearly critical for PM related factors, but could even play a role in NOx conversions observations. Thus one very key point for further including in the paper is a science-based appraisal of the somewhat extreme conditions should be viewed, how they might impact particle and gas dynamics how others might use the data collected and conclusions drawn. Page 6, line 28âĂŤPM 2.5 mass data were produced by a DustTrak. The operational conditions of this unit were not described beyond inclusion of a mass calibration factor from a prior study published in 2012. The calibration factor reported in that study was 1.46. This is a critical correction factor and the findings related to PM 2.5 would be far more supportable had a proper contemporary calibration factor been made. Further, there is no mention of whether humidity was considered as the data were used while average humilities at one site were 89%. The authors are suggested to raise this point for caution to reader and if possible, should address what was done and perhaps quickly determine a mass calibration for the instrument to either confirm it is appropriate, to correct the data or perhaps consider elimination of PM mass data entirely. It is not a key factor in this study. Some data from nearby ambient monitoring stations may also be used to evaluate the correction factor in the paper. Page 17, line 28âĂŤrelated

to the PM2.5 points aboveâĂŤshould either the calibration or Rh considerations prove troublesome to correct It is at least important to inform the reader of possible problems with this data.

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