**Supplement of the GMD manuscript “Comprehensive Automobile Research System (CARS) – a Python-based Mobile Emissions Inventory Model”**

Bok H. Baek1, Rizzieri Pedruzzi2, Minwoo Park3, Chi-Tsan Wang1, Younha Kim3, Chul-Han Song4, and Jung-Hun Woo3

1Center for Spatial Information Science and Systems – George Mason University, Fairfax, VA, USA.

2Department of Sanitary and Environmental Engineering, Federal University of Minas Gerais, Belo Horizonte, Brazil.

3Department of Advanced Technology Fusion, Konkuk University, Republic of Korea

4School of Earth and Environmental Engineering, Gwangju Institute Science and Technology, Republic of Korea

*corresponding to:* Jung-Hun Woo (jwoo@konkuk.ac.kr)

# Supplement:

The Figure and Table supplementary materials and process code "CARS\_plot\_publication.R".

Figure 2: generated by R script "CARS\_plot\_publication.R" with the input file "Total\_VKT.csv" and "numbers\_of\_vehicle.csv"

Figure 3: generated by R script "CARS\_plot\_publication.R" with four files "EmisFact\_by\_YR\_SPD.csv","EmisFact\_by\_YR\_SPD\_25.csv,"EmisFact\_by\_YR\_SPD\_0005.csv,"EmisFact\_by\_YR\_SPD\_0\_10.csv

Figure 4: generated by CARS\_plot\_publication with file "avgSpeedDistribution\_rev\_05\_CTWv2"

Figure 8: generated by R script "CARS\_plot\_publication.R" with the input file "CARS\_CAPSS.csv"

Figure 9: generated by R script "CARS\_plot\_publication.R" with the input file "Pollutant\_Total\_Emis\_by\_Road\_CTWv2\_SSD.csv" and "Pollutant\_Total\_Emis\_by\_Road\_CTWv2.csv"

Table 3: generated by R script "CARS\_plot\_publication.R" with the input file "Pollutant\_Total\_Emissions\_Tons\_per\_Year\_CTWv2.csv", which is form the output data of CARS. The R code can generate the annual emission file "evf\_XXX.csv" for individual species XXX. We calculated all numbers in Table 3 in excel table 3.