Recent development and perspectives of the VEIN model

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The VEIN model consists in a R package designed to produce bottom-up vehicular emissions inventories. This model has been used in seeral cities of Brazil which can arrange vehicular traffic data, arrange emissions factors, estiamte emissions and process the emissions.
Currently the model depends on the R package "sp" which provide methods and classes of Spatial Objects. However, the VEIN classes are not spatial being data-frames or lists.
Also, VEIN imports spatial functions from other models such as "raster" and "rgeos". Thi study presents the spatial migration of VEIN with the new R package "sf" which provides fast bindings
with the C++ libraries GEOS, GDAL and UDUNITS. With this, the new VEIN classes are also spatial objects including excplicitly the respective units.
We alre presents new speciation for Non Methanic Hydro Carbons, Particulate Matter, the new vein function and more. With these updates, we believe VEIN will be more user-friendly and ready to be
used in any city of the world.