
EMISENS

Road traffic related emissions model

R. Le Frioux[†]

2024-06-05

METROPOLIS2 Online Course Spring 2024

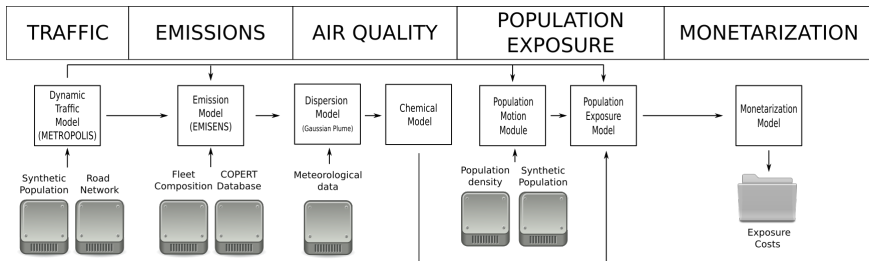
[†] *CY Cergy Paris Université and ThEMA, Cergy, France*

METRO-TRACE

METRO-TRACE (METROPOLIS - Traffic Related Air pollution Costs Evaluation) is an integrated chain of models for population exposure to road traffic pollution (Le Frioux, de Palma, and Blond; 2023).

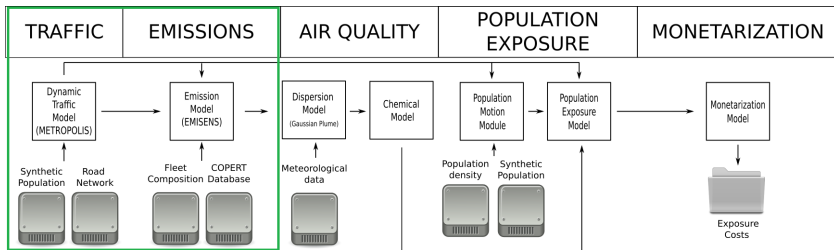
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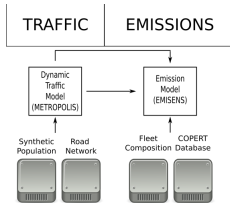
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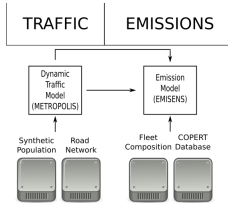


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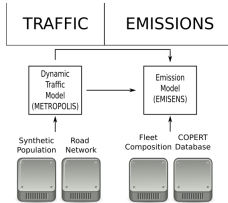
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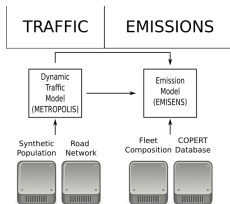


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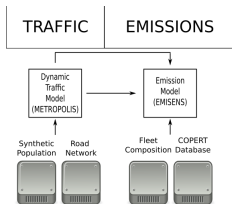
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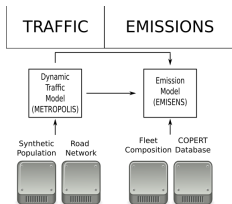
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- It has the ability to compute emission for NO_x , $PM_{2.5}$, CO , and CO_2 , as well as fuel consumption.
- It has the ability of computing hot, cold, and non-exhaust emissions.

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■ Inputs:

- Fleet composition: *This file stores the information about the composition of the National fleet generally based on European Standard*
- COPERT Database: *This file stores the emission factor for each types of vehicle (fuel types, segment, European standards)*

EMISENS: Inputs

In case of Île-de-France and France, we provide a file that can be used without having to make use further information than METROPOLIS2

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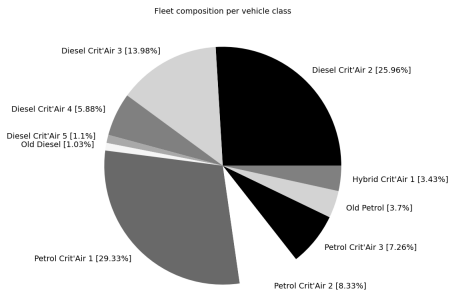
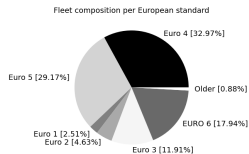
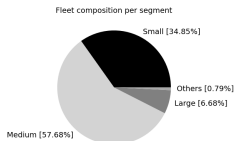
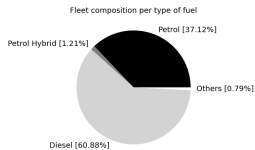
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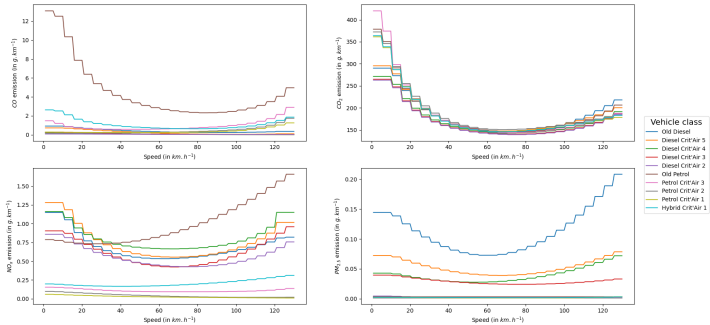
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Recall: The types of vehicle are assign to agent when creating the population (see session 6)

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EMISENS: Emissions computation

Hot emission of pollutant k emitted by agent n with vehicle of Crit'air l entering on directed road r_i at time t is given by:

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Remark: Average speed is equal to the time to cross the road divided by its length and it is agent specific

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■ Non-exhaust emissions:

There are automatically computed for $PM_{2.5}$. They represent the emission from tyre wear, brake wear and road abrasion (e.g electric vehicle do not have null emissions)

romuald.lefrioux18@gmail.com

Vignette	Crit'air	Fuel types	EURO Standard
Crit'air 1		Petrol	EURO 5 & EURO 6
Crit'air 2		Petrol	EURO 4
Crit'air 2		Diesel	EURO 5 & EURO 6
Crit'air 3		Petrol	EURO 2 & EURO 3
Crit'air 3		Diesel	EURO 4
Crit'air 4		Diesel	EURO 3
Crit'air 5		Diesel	EURO 2
Not classified		Petrol	EURO 1
Not classified		Diesel	EURO 1

- [1] R. Le Frioux, A. de Palma, and N. Blond. *Assessing the Economic Costs of Road Traffic-Related Air Pollution in La Reunion*. Tech. rep. THEMA (THéorie Economique, Modélisation et Applications), Université de Cergy-Pontoise, 2023.