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INSTANTANEOUS ROAD TRAFFIC EMISSIONS MODELLING SYSTEM PROJECT: A SYSTEM TO MODEL HIGH-RESOLUTION ROAD TRAFFIC EMISSIONS FOR CITIES

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Project introduction

IRTEMS (Instantaneous Road Traffic Emissions Modelling System for cities) is a scientific programme funded by the European Commission (H2020-MSCA-IF-2019 GA896417). This research project aims to contribute to drastically improve our knowledge to estimate the contribution of road traffic to atmospheric emissions at the city level and in great detail. The expected output from this research effort is a significant contribution to atmospheric science with a decided focus on providing useful information and tools to air quality managers and decision-makers, so that the project is also relevant policy-wise, providing knowledge-based answers for measures to be implemented for good air quality in cities. The project is been coordinated by Universidad Politécnica de Madrid (UPM) located in Madrid (Spain) with North Carolina State University (NCSU) located in Raleigh (USA) as a partner organization. The project duration is of 3-years from Feb 15, 2021 to Feb 14, 2024.

Road transport emissions background

According to the World Health Organization (WHO), outdoor air pollution causes 4.2 million premature deaths annually, most of them in urban areas where both, emission sources and population concentrate. Therefore, tackling urban air quality constitutes a pressing priority from the social and political point of view. Road transport is often the main source of air pollution in urban areas worldwide. There are several methods and approaches that are useful for different scales of analysis. Usually, regional traffic emission models based on average speed or on traffic situations are commonly used at the city scale for the compilation of urban inventories. Still, this level of detail is not enough to understand the high pollutant concentrations that occur in specific urban environments generally associated to high traffic intensity and usually referred to as hot-spots. An integrated approach that provides city-wide traffic emission estimations with high resolution in time and space for hot-spots poses a major scientific challenge.

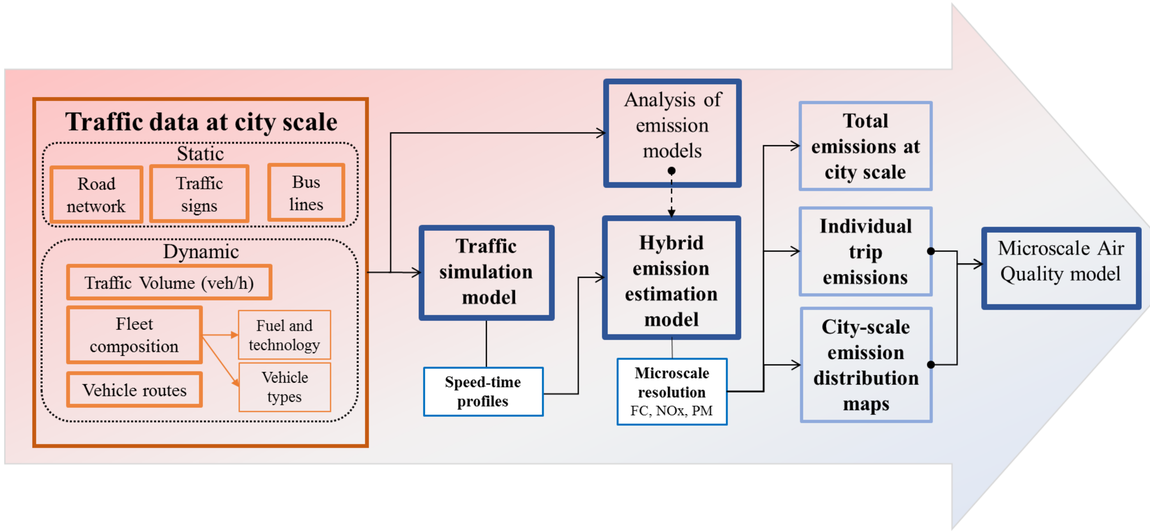
Main goal

Develop an instantaneous road traffic emission modelling system for its application at city scale by coupling a hybrid traffic model with an microscale emission model to provide highly detailed data for air quality simulations.

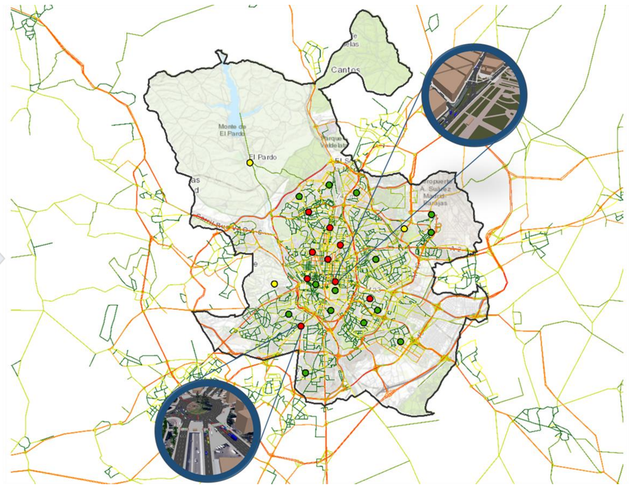
Objectives

- Quantify individual vehicle trip emissions at high resolution by means of an instantaneous road traffic emission modelling system.
- Validate modelled vs. measured individual trip emissions.
- Quantify spatial and temporal variation of emissions for selected cities.
- Quantify total emissions at city scale including non-exhaust.
- Integrate city scale road traffic emissions into microscale air quality models.

Methodology



Results



Conclusion

Useful modelling system to analyze road traffic emissions at city scale with great detail to help to provide knowledge-based answers for measures to be implemented for good air quality in cities.

For more information, please visit our website: **irtems.industriales.upm.es**

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