

IRTEMS PROJECT: A SYSTEM TO MODEL INSTANTANEOUS ROAD TRAFFIC EMISSIONS FOR CITIES

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Abstract - 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.

Goals

Main goal is to 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. This is done by means of:

- Quantify individual vehicle trip emissions at high resolution by means of an road traffic emission modelling system.
- Validate modelled vs. measured individual trip emissions.
- Quantify spatial and temporal variation of emissions at the city level.
- Integrate city scale road traffic emissions into microscale air quality models.

Methodology

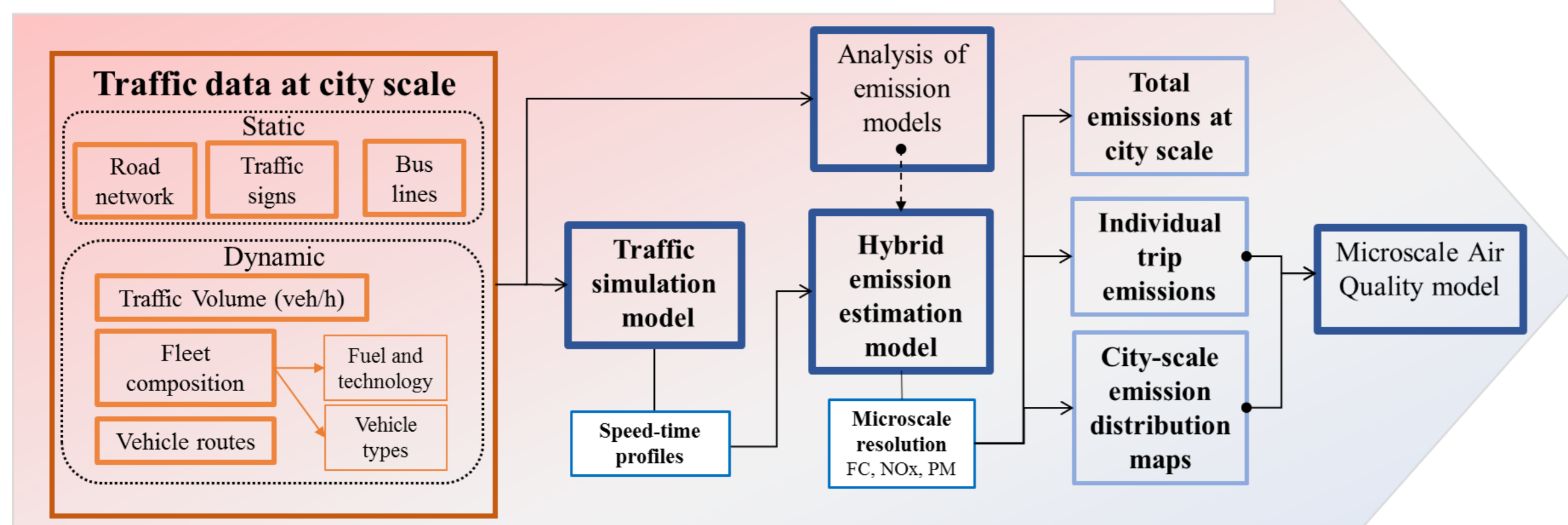


Fig.1: Methodology flowchart: traffic data for traffic and emission simulation at high resolution to obtain emission results at city scale to be introduced in microscale air quality models.

Results

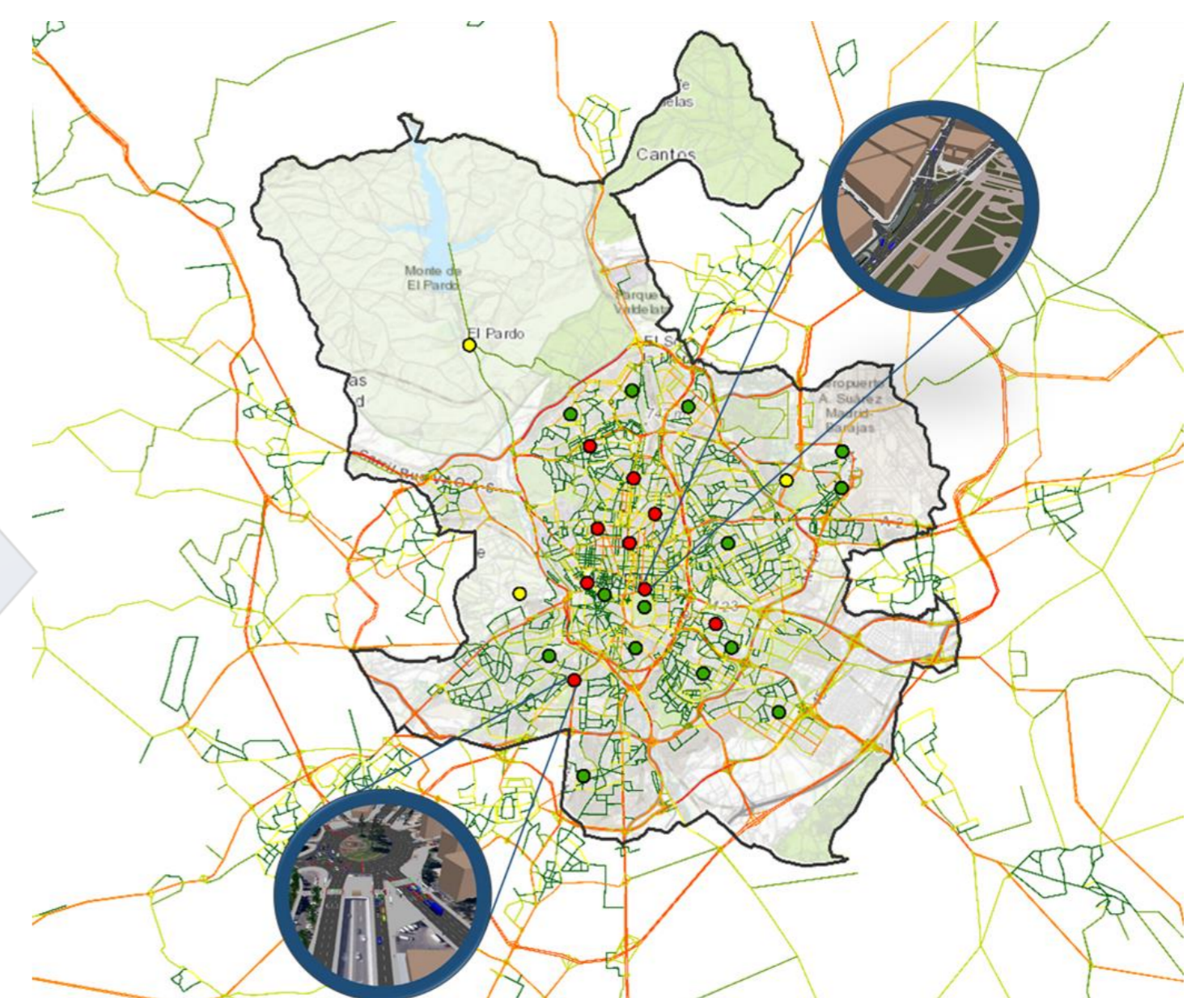


Fig.2: Hybrid emission results at city scale with areas of interest for air quality at high resolution.

Conclusion

Ongoing project to generate an 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.

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References

1. Quaassdorff, C., Smit, R., Borge, R., Hausberger, S. (2022). Comparison of microscale traffic emission models for urban networks. Environmental Research Letters. Volume 17:094030.
2. Quaassdorff, C., Khan, T., Frey, H. C. Accuracy of the predictions of modeled emission hotspots based on real-world measured vehicle activity and emissions. CRC Real-World Emission Workshop. San Diego, California, USA. March 13-16, 2022.