



ECOLOGICAL SUPPORTING FOR TRAFFIC MANAGEMENT
IN COASTAL AREAS BY USING AN INTELLIGENT SYSTEM



AXIS 4: Maritime Transport
Objective 4.1: Improve the
quality, safety and
environmental sustainability of
marine and coastal transport
services and nodes by
promoting multimodality in the
Programme area

Common and harmonized data collection

PP1 – Veneto Region

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WP4: Environmental data collection

ACT 4.1: Set-up a common and harmonized data collection

RELATED TO

Activity 4.1 Set-up of common and harmonized data collection

Project ECOMOBILITY (ECOLOGical supporting for traffic Management in cOastal areas By using an IntellIgenT sYstem) 01/01/2018 - 30/06/2019

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INTRODUCTION

As decided within the Kick-off meeting, held on 1st of March 2018, has been organized a technical Skype meeting focused on the transfer of real-time environmental data to the management system.

The Skype meeting was held on Tuesday, April 17, 2018 at 11 a.m. with the following agenda:

1. What kind of data the monitoring stations will produce;
2. The problem of the delayed transferring of data in Rijeka;
3. The problem of the quantity of data. Are they too sparse or not?
4. The possibility of use models to have more distributed quantity of data; eventually, which models?
5. In the case of using models, the problem of the resolution and of the different quality of experimental and modelled data.

To ensure this was a fruitful meeting, the following institutions have been invited:

- Veneto Region (PP1), as partner responsible of WP4;
- Veneto regional environmental prevention and protection agency (ARPAV), as external expert. It will provide the environmental data in Venice;
- University of Rijeka (PP3). It will provide the environmental data in Rijeka;
- ISAC-CNR (PP2), for its experience in using diffusion models.

The skype meeting was held in the presence of the representatives of the Ca 'Foscari University of Venice (LP of the project), Veneto Region (PP1, Partner responsible of the WP4), University of Rijeka (PP3), and ISAC – CNR (PP2).

POLLUTANTS

Within the kick-off meeting two types of pollutants were chosen for the collection of real time data: PM₁₀ and NO_x. These two specific pollutants have been chosen because it has been demonstrated they are the most dangerous ones for human health. The choice was confirmed within the Skype meeting.

MONITORING STATIONS

Rijeka

The monitoring stations active in Rijeka are reported in the following map (Figure 1) that can be found at the link: <http://www.zzjzpgz.hr/zrak/index.php>.



Figure 1 Map of the monitoring stations of air pollutants in Rijeka.

The details of the monitored pollutants of each station in Rijeka are reported in the table 1.

Table 1 Air monitoring stations in Rijeka with the monitored pollutants.

Monitoring Station	SO ₂	NO ₂	NH ₃	O ₃	CO	PM ₁₀	H ₂ S	C ₆ H ₆	CH ₄
RIJEKA - MLAKA	✓	✓		✓	✓				
RIJEKA - KREŠIMIROVA 52 a	✓	✓							
RIJEKA - KREŠIMIROVA 38						✓			
OPATIJA - GOROVO		✓		✓					
BAKAR - LUKA						✓			
KOSTRENA - MARTINŠĆICA						✓			
KOSTRENA - VRH MARTINŠĆICE							✓	✓	
KOSTRENA - URINJ	✓	✓	✓		✓	✓	✓	✓	
KOSTRENA - PAVEKI	✓	✓		✓	✓	✓	✓	✓	
KRASICA	✓	✓		✓			✓	✓	
VIŠKOVO-MARIŠĆINA	✓	✓	✓	✓	✓	✓	✓	✓	
VIŠKOVO - VIŠEVAC			✓		✓	✓	✓		✓

Summarising in Rijeka there are globally eight monitoring stations for the chosen pollutants PM₁₀ and NO_x:

- four monitoring stations measuring both PM₁₀ and NO_x;
- two monitoring stations measuring only PM₁₀;
- two monitoring stations measuring only NO_x.

Venice

Here following the map of the monitoring stations in the Veneto Region territory.

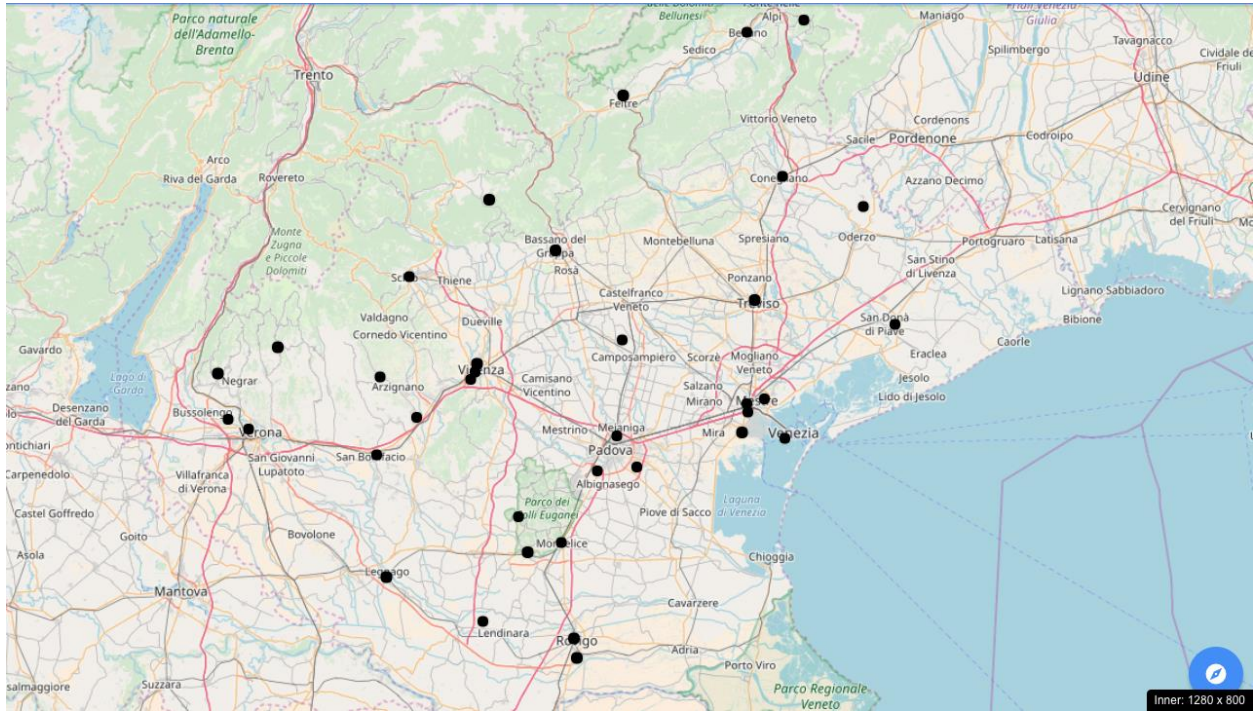


Figure 2 Map of the monitoring stations of air pollutants in Veneto Region.

In the Venice province there are globally seven monitoring stations of air pollutants.

The details of the monitored pollutants of each station in the Venice province are reported in the table 2.

Table 2 Air monitoring stations in The Venice province with the monitored pollutants.

Monitoring Station	NO ₂	PM ₁₀	O ₃	SO ₂	CO
VE – RIO NOVO	✓	✓	✓		✓
VE – VIA BECCARIA	✓	✓	✓		✓
VE – SACCA FISOLA	✓	✓	✓	✓	
SAN DONÀ DI PIAVE	✓		✓		
VE – PARCO BISSUOLA	✓	✓	✓	✓	
VE – MALCONTENTA	✓	✓		✓	
VE – VIA TAGLIAMENTO	✓	✓			

Among them:

- five monitoring stations measuring both PM₁₀ and NO_x (and directly located in the Venice area);
- two monitoring station measuring only NO_x.

The partners then decided to use only the monitoring stations collecting both the two types of pollutants: four in Rijeka and five in Venice.

The time resolution could be for all pollutants and for both cities of one hour.

In Rijeka raw data of pollution and meteorological data feed a database.

University of Rijeka needs a few weeks in order to prepare data for automatic downloading.

In Venice, Ca' Foscari and ARPAV organized a separate meeting in order to discuss about the transferring of raw data to the server. It is necessary to agree, through contacts between ARPAV, the University of Rijeka and the University of Venice, on a common structure of the data to be exported so that they can be easily compared.

For both cities raw data will be transferred starting from 1 May 2018.

MODELLED DATA

The Skype meeting had also the aim of understand if adding modelled data is necessary and how we can do that.

In the two cities two different models will be used to extrapolate the data.

Venice

In Venice modelled data could be produced with CAMx daily during the whole period of real-time data collecting activity, as a forecast of the current day and of the following two days, with a spatial resolution of 4x4 km. Ca' Foscari University and ARPAV will verify the necessity of a more dense resolution to run the application. This is because the application, which must advise a route avoiding the most polluted areas, needs a very dense resolution. ARPAV could not add further data to their models, because the capacity of their server is not large enough.

Rijeka

University of Rijeka has no possibility of run the model for the whole period, due to lack of regional emission data in adequate format. In Rijeka no emission inventory is available in order to feed the model and it will take time to create the emission inventory and consequently to run efficiently the

model. However, in the preparation phase the use of modelling was not foreseen, but it emerged as a possibility only after collecting information regarding the distribution of monitoring stations around the cities. It could be a good possibility in order to obtain a better air quality characterisation of the cities, but the intelligent system for managing traffic could be tested in Rijeka also using only the measured data.