

Test of the Integrated Modelling Tool & Simulation of low carbon mobility solutions in Treviso

Session II: IMT and simulation of low carbon mobility solutions

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ARPAV

Outline:

- 1. Test of the IMT in Treviso**
- 2. Simulation of low carbon mobility solution in Treviso**
- 3. Health & Cost implementation**

Test of the IMT in Treviso

test of the applicability of the IMT to a real case

***Testing approach:
Application of the ITM on the present situation***

Main outputs of the test phase:

- **Robustness of the whole tool and its single modules**
 - **Soundness of the outcomes**
- **Feasibility of the data requirements**
- **Manual of the ITM end user oriented**

- Robustness of the whole tool and its single modules

Main features of the ITM have been discussed since the beginning with scientific PPs, considering the challenge that **the ITM must** be sensitive to detect differences when **soft actions** on mobility are applied on high congested roads

... quick reminder

AIR POLLUTANTS TRAFFIC EMISSIONS MODULE (APTEM)

- flexible for estimating project-level emission changes (for example changes in operating mode distribution, in driving patterns, in road design, such as synchronizing signals; replacing stop signs with rotaries –)
- based on “operating modes” that can account for different patterns of acceleration, cruising, deceleration, stop-and-go, short periods of idling
- for Heavy Duty Diesel vehicles: speed effects and crankcase, start, and extended idle emissions, large increase in emissions of PM at lower speeds
- integrating Greenhouse Gas Model, designed (from the ground up) as an energy consumption model (estimating methane, N₂O)
- Customizable for local vehicle fleet and traffic flows and ambient conditions
- ... other features? Please add

Quick reminder

AIR POLLUTION DISPERSION MODULE (APDM)

- Able to reach spatial high resolution for street scale application (*street canyon and complex urban terrain as well?*)
- **Suitable for very low wind (calm conditions)**
- Flexible to be applied also at urban level
- List of pollutants to be considered (CO, NO_x/NO₂, HC, PM₁₀/2.5, ...)
- Chemical scheme/algorithms to treat conversion from NO_x to NO₂
- *Other chemistry options (sulphate chemistry)?*
- customizable background concentrations (unique or different spatial values?)
- ... other features? Please add

Quick reminder

FREIGHT STREAMLINING MODULE (FSM)

- Able to describe the current freight flows differentiating the various duty vehicle typologies (→ input for APTEM) and fuel consumptions → for CFP/GHGs estimations
- Suitable to foresee future/hypothetical freight flows for various scenarios (implementation of a logistic service, policies on traffic restrictions, subsidies or local aids on freight logistic, ...)
- Suitable to conduct capacity analyses of the freight traffic demand from basic data/information up to more complex and detailed data/db
- Friendly integration of inputs/output into GIS platforms
- level of service (LOS)
- Roadway capacity
- Travel demand
- ... other features? Please add

Quick reminder

TRANSPORT ENERGY EFFICIENCY MODULE (TEEM)

- Sensitive to assess energy efficiency for actions of reducing traffic congestion and time savings
- modelling capability for scenarios of shifting mode in urban trips (reallocation of road space among cycling, walking, Public Transport, private cars, ...)
- modelling capability for scenarios on freight transport/demand within the urban area
- Sensitive to assess changes in operating mode distribution, in driving patterns, in road design
- ... other features? Please add

Quick reminder

NOISE MODULE (NM)

- Able to describe
- Suitable to
- ... other features? Please add

CARBON FOOTPRINT MODULE (CFM)

- Able to describe ...
- Suitable to ...
- Please insert your expectations/needs

COST MODULE (CM)

- Able to describe ...
- Suitable to ...
- ... Please insert your expectations/needs

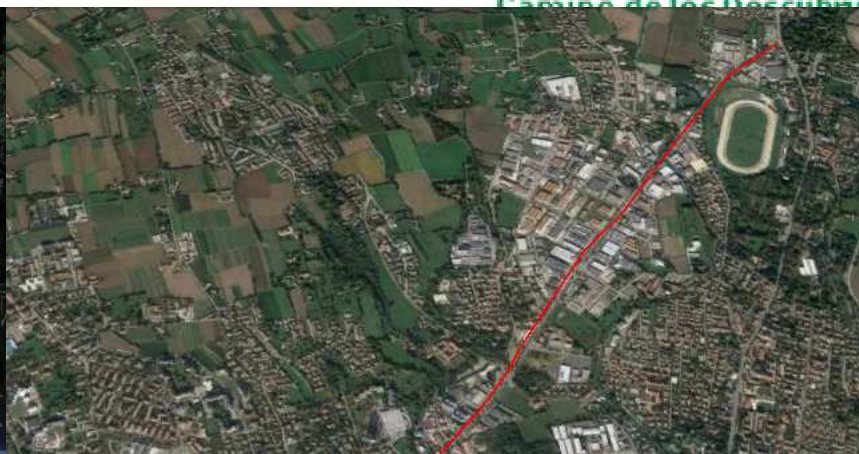
HEALTH IMPACT MODULE (HIM)

- Able to differentiating the exposure patterns of population living along the high congested road and the whole urban population
- Able to describe health risk due to air pollution exposure patterns with high short term peaks
- Able to reach spatial high resolution for street scale application
- Able to do scenario analysis
- Suitable to
- Please insert your expectations/needs

- Soundness of the outcomes

Outputs analysis on the real case of West Road in Treviso

**Confrontation with measurements of noise and air
pollution also taken by specific monitoring campaigns**



Contemporary measurements in 2 places:
hot spot positions close to the road (1 or 2)
the neighbor urban background station

Air pollutants:

- 1. NO/NO₂/NO_x**
- 2. BTX**
- 3. CO**
- 4. PM₁₀ (PM_{2.5})**
- 5. Metals on PM₁₀ (TBC)**

Frequency:

- High frequency (minutes/half an hour)**
- Daily**

Duration:

- 15 days (mobile LAB)/, since xxx (AQ station)**

Classified traffic counts
(thx to Treviso Municipality)

Noise measurements

Meteo parameters



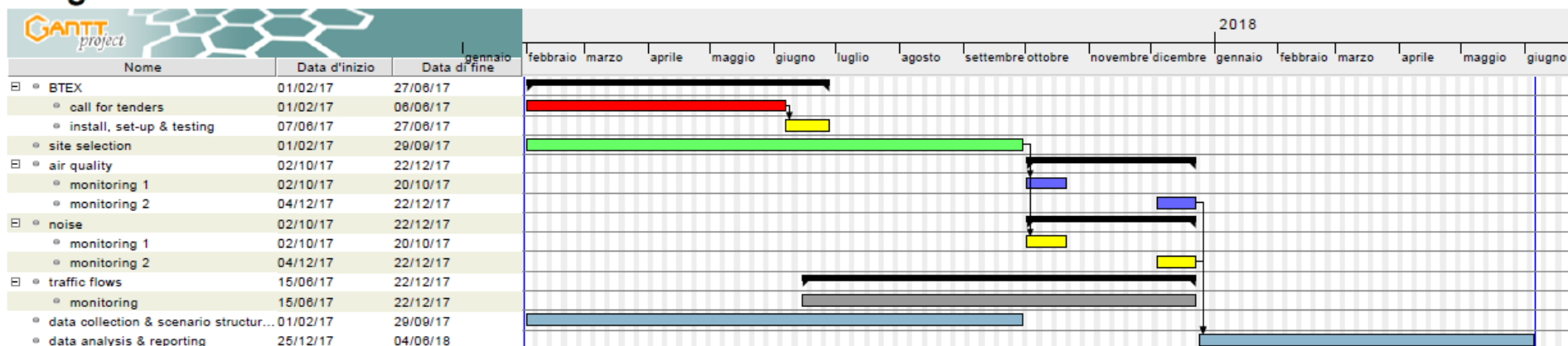
Timeplane of the test activities

REMEDIO - WP3 test

30-gen-2017

Diagramma di Gantt

3



Simulation of low carbon mobility solution

Scenario approach sources oriented:

- Identification of scenarios to analyze
- Input data recruitment
in collaboration with Treviso Municipality
- Run of the baseline scenario (present situation)
- Run of the scenarios
- Analysis of the differences:
*less energy consumptions, emissions, lower CFP and air
pollutant concentrations, lower cost and health risk,*

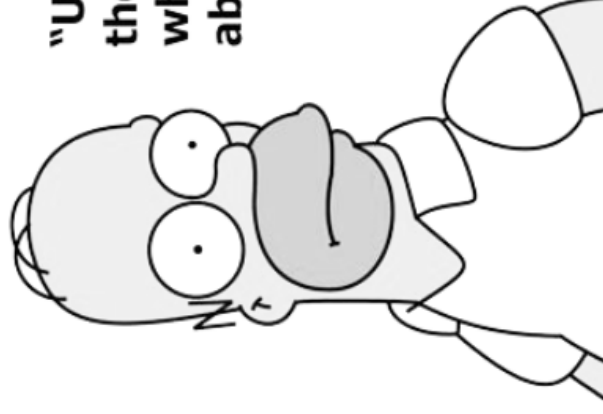
(possible) Soft mobility scenario to analyze:

- Less milages driven by private car due to the use of the bike sharing service -----within the road
- ----- for the whole urban area (?)
- Less milages driven by commercial vehicles (light and heavy duty) due the implemetation of a logistic service for freight
- Less milages driven by private car due to a wider use of Public Transport System
- Less milages driven by private car due to safer paths (walking and cycling) to schools and other urban sites
- **+ mid term/long term planning scenarios:**
- (S)UMP and other Transport scenarios at urban or larger scale

Title	Description	ARPAV	TV	AUTH	IST	USE	MDA	SPLIT	CML
TEEM	Transport Energy Efficiency Module					1			
FSM	Freight Streamlining Module				1				
NM	Noise Module					1			
APTEM	Air Pollutants Traffic Emissions Module			1					
CFP	Carbon Foot Print Module			1					
HM	Health Module	1							
CM	Cost Module	1							
APDM	Air Pollutants Dispersion Module				1				
Integration in FIWARE pl.						1			
First realise IMT						1			
Test in Treviso		1	2						
Final version IMT						1			
S LCMS in Treviso	Simulation of Low Carbon Mobility Solutions	1	2						
S LCMS in Split	Simulation of Low Carbon Mobility Solutions							1	
S LCMS in Loures	Simulation of Low Carbon Mobility Solutions				1				2
S LCMS in Thessaloniki	Simulation of Low Carbon Mobility Solutions			1			2		
Assessment Report				1					

Timeplane of the IMT & simulation activities

Activities		Timing of the activities (+ intermediate deadlines)																							
Id	Title	nov-16	dic-16	gen-17	feb-17	mar-17	apr-17	may-17	giu-17	lug-17	ago-17	set-17	ott-17	nov-17	dic-17	gen-18	feb-18	mar-18	apr-18	mag-18	giu-18	lug-18	ago-18	set-18	ott-18
	TEEM							First Draft																	
	FSM							First Draft							First Draft										
	NM							First Draft																	
	APTEM																								
	CFP														First Draft		Del								
	HM														First Draft		Del		Del						
	CM														First Draft			Del							
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	S LCMS in Thessaloniki																					Del			
	Assessment Report																								Del



**"Um, Can you repeat
the part of the stuff
where you said all
about the things?"**

