



EMILIA-ROMAGNA REGION

“Recommendations for the internalization of external costs of transport”

Paolo Ferrecchi - Head of Transport Planning Office



ECOTALE FINAL CONFERENCE –
14 May 2014 - Poznan, Poland



This project is co-financed by the ERDF and made possible by the INTERREG IVC programme.

Legislative framework

As a consequence of the power devolution process launched in Italy some years ago, the **competences in the field of transport** and the powers exerted by the Central Government, have been redesigned.

Today, at the government level, it is re-evaluating this process, and there is an intention to re-centralize certain powers, changing the role of the Regions and Provinces.

In the current state, however, the role of Emilia-Romagna Region is to plan the mobility regional system, defining the main strategies and giving directives and guidelines to other public authorities:

- Municipalities
- Provinces
- Infrastructures management institutions and Public Transport Agencies

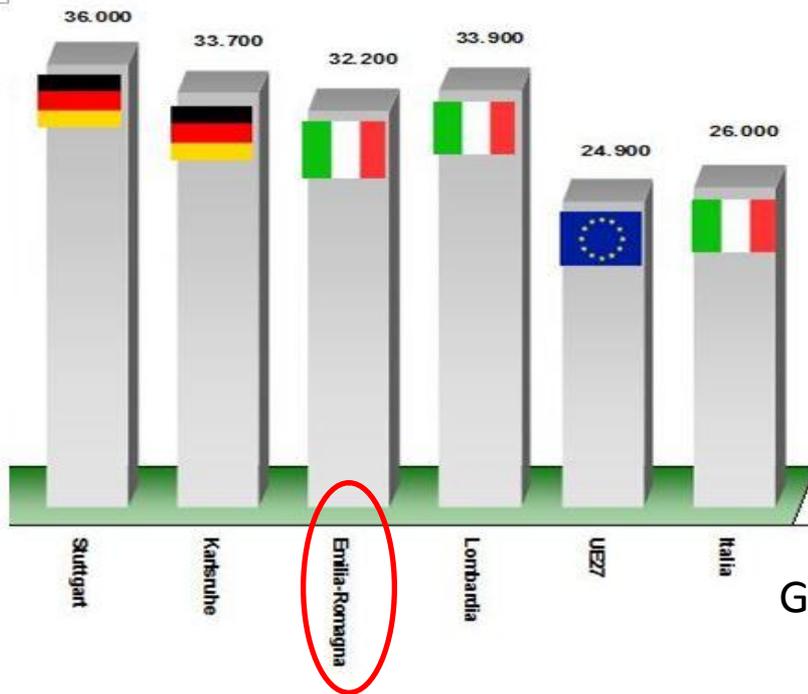
which have the direct responsibility for specific matters, such as traffic restrictions, parking policies, low emission zones.

Local context

Emilia Romagna region is characterized as a **wide area in a strategic area for national mobility** of people and goods, with a crucial role and function in the Italian economic and infrastructural system

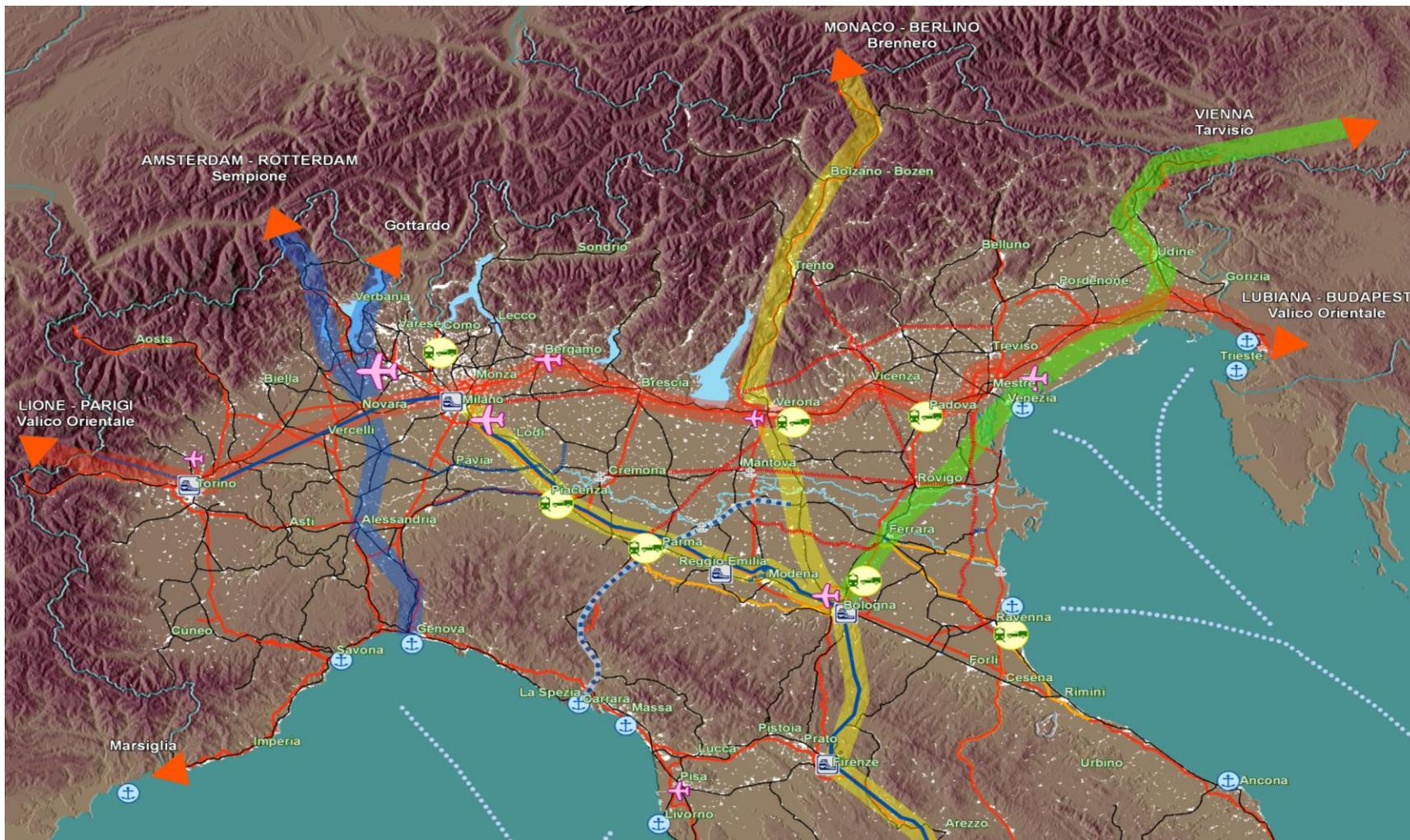


Italy: 60.000.000 inhabitants
Emilia Romagna: 4.400.000 inhabitants



GDP 2010: Italy = 1,00;
E-R = 1,35;

Infrastructural frame



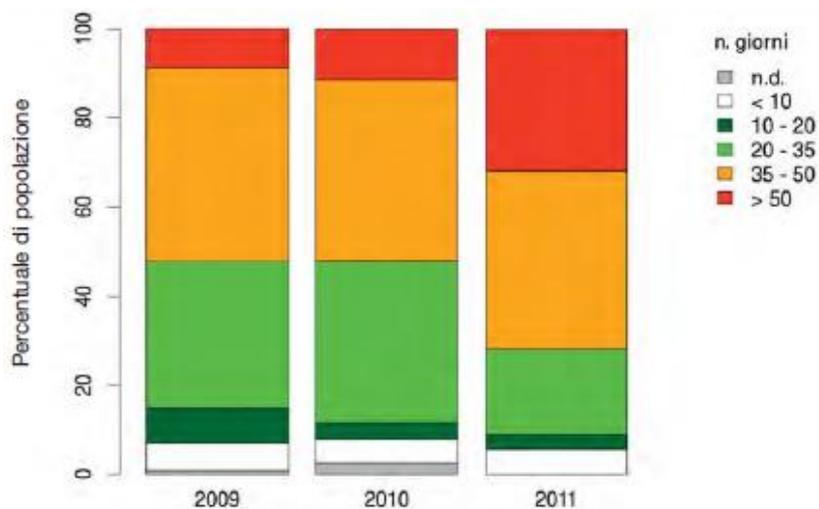


Environment and transport

- Environmental and social problems of transport are well known: air pollution, pollution due to production and disposal of vehicles and infrastructure, noise, effects on the landscape, climate change, etc.
- Moreover, inefficiencies and welfare losses are due to excessive use of scarce resources, as the **urban space**, congestion and accidents.
- In northern Italy and in Emilia-Romagna these problems are very relevant, both as for geographical reasons (a plain surrounded by mountains) and for level of industrialisation and urbanisation of the country.

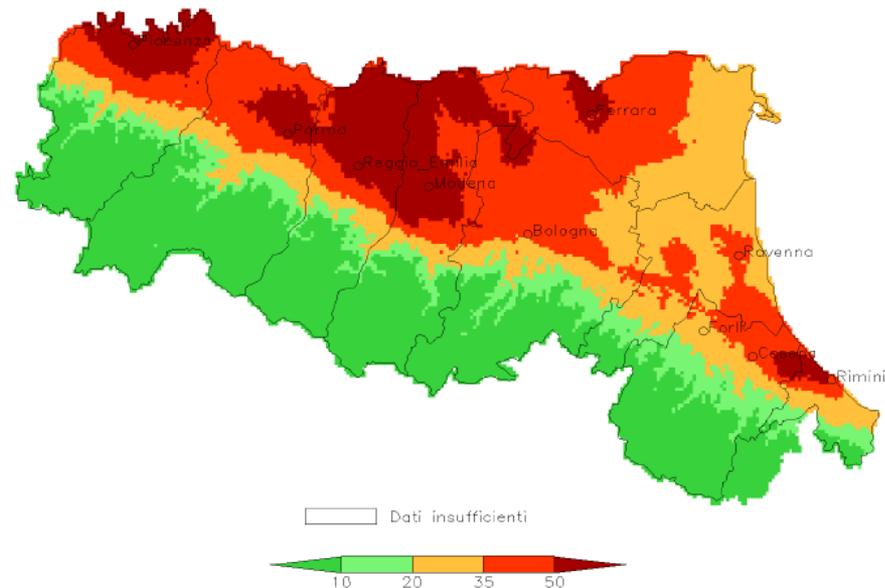
Environmental framework

PM10 - exposed population



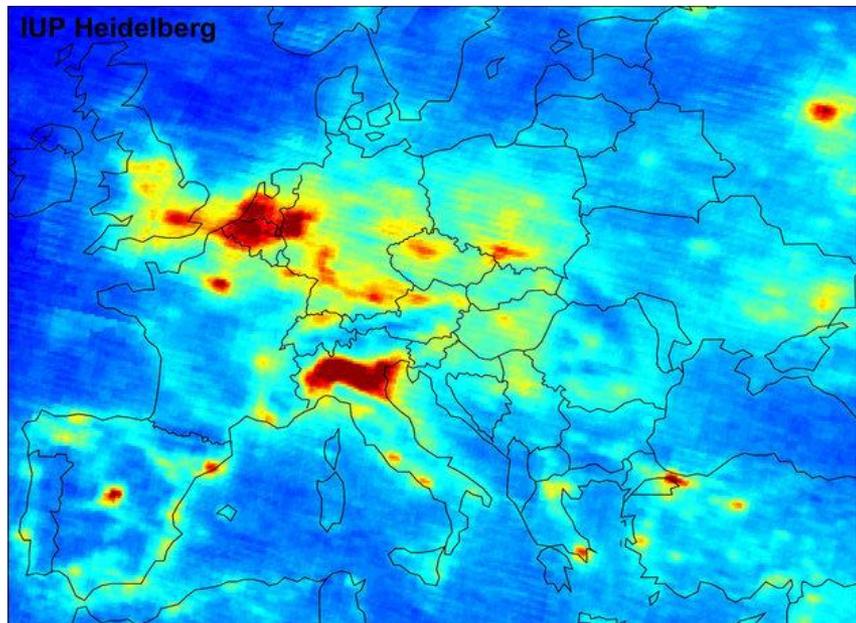
PM 10 Level – excesses 2011

PM10 di fondo: stima del numero di superamenti della soglia di $50 \mu\text{g}/\text{m}^3$ nel periodo 01JAN2011–31DEC2011 (dati validi 336) lontano da emissioni dirette (parchi, zone pedonali, aree rurali)



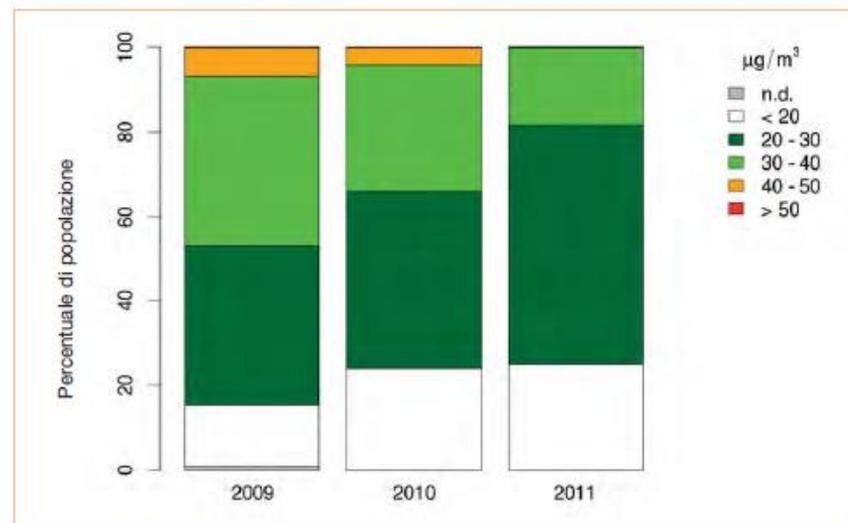
Source: Arpa, “Report on air quality” Regione Emilia Romagna 2012

Environmental framework



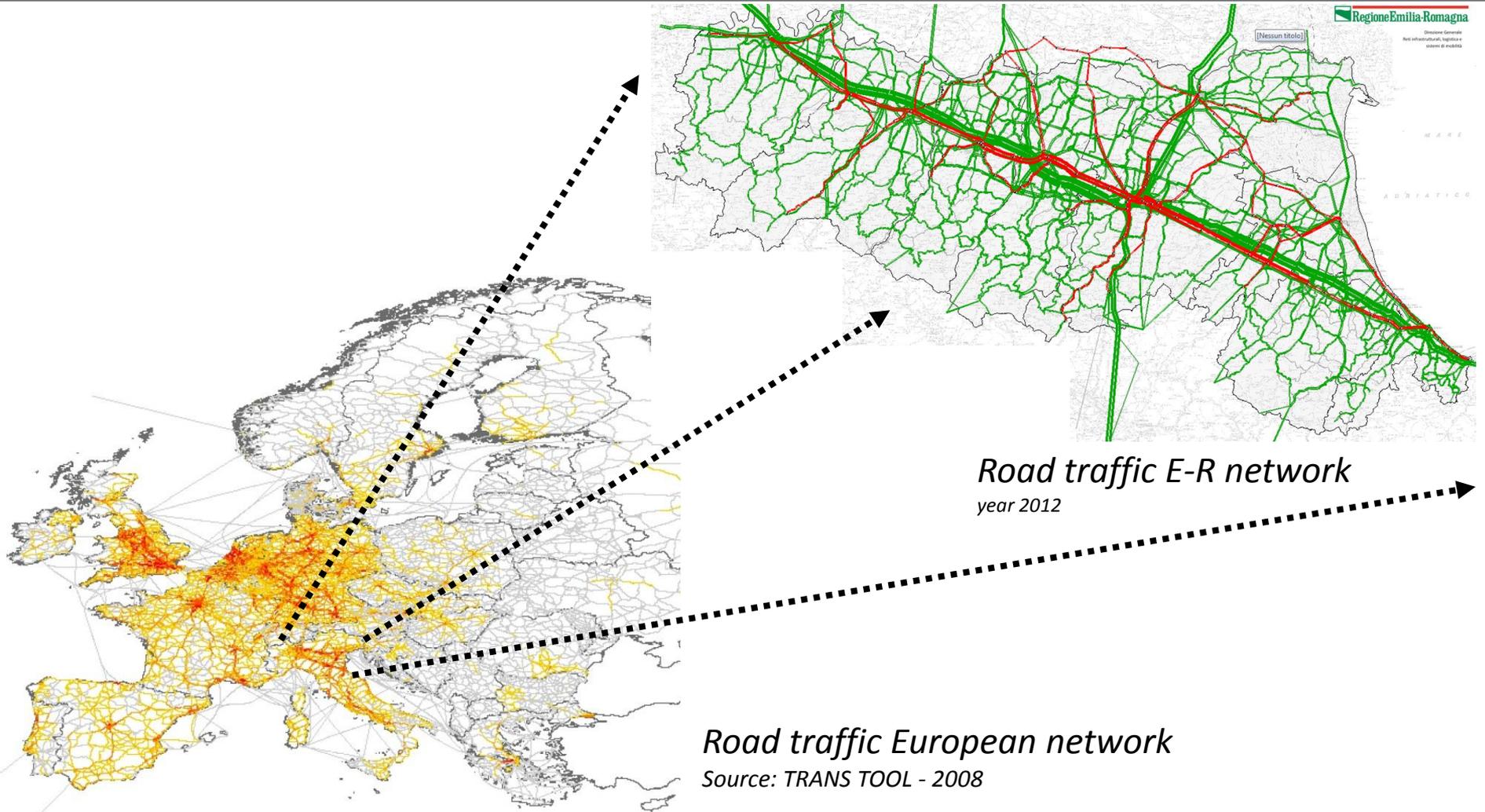
NO₂ Level

NO₂ - exposed population



Source: Arpa, "Report on air quality"
Regione Emilia Romagna 2012

Mobility framework



Local policy actions 1/2

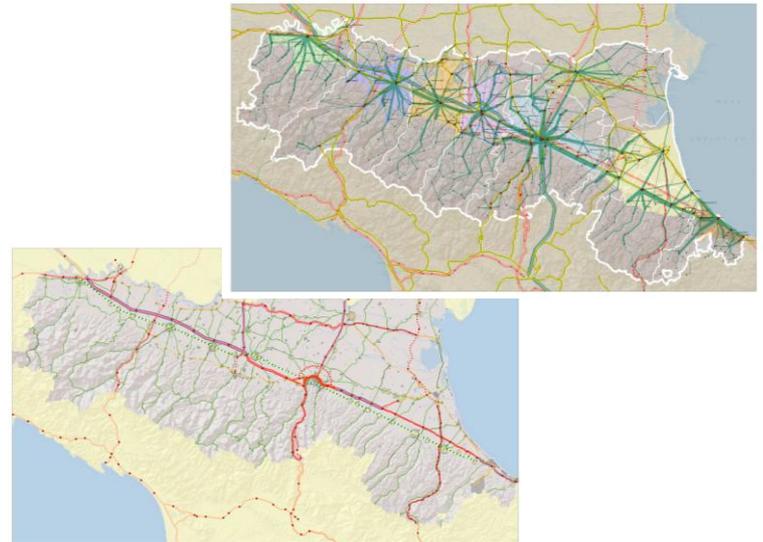
Regional Integrated Transport Plan (PRIT 2020)

The main transport planning tool for Emilia-Romagna Region.

It provides the overall regional policy framework, for both infrastructures and mobility demand governance actions.

Main objectives:

- to ensure high levels of accessibility for people and goods
- to promote public transport services
- to minimize general mobility costs
- to reduce environmental pollution levels.



Local policy actions 2/2

Agreement for air quality improvement

Signed every year since 2002 by Emilia-Romagna Region, Provinces and over 90 Municipalities, this involves the 40% of the regional surface and 60% of the population:

- to achieve the air quality clean-up and in particular the reduction of PM10 and NO2 concentration in the region;



Regional Integrated Air Plan (PAIR 2020)

Still under discussion:

to reconcile the objectives of improvement of air quality (at local and regional level) with those aimed at combating climate change (at global scale).





Ecotale point of view

In accordance with European policies, we consider extremely important to act on the external costs of transport, or reducing them or by applying the principle of "**the polluter pays**".

Usually we can act in :

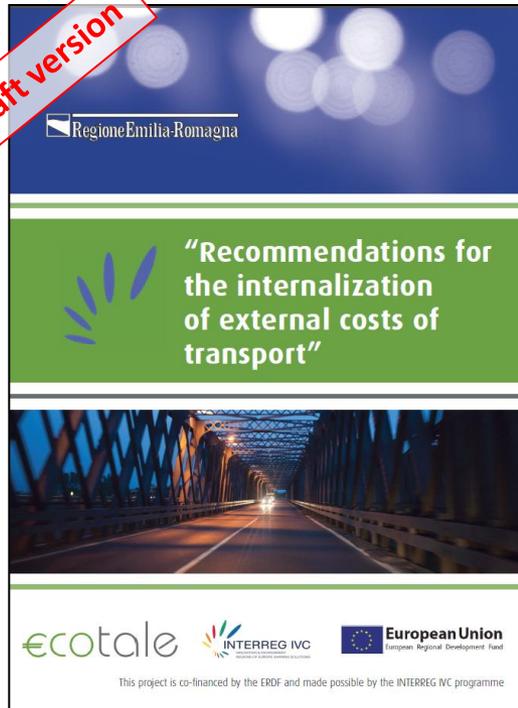
a **direct way**, that is increasing perceived costs by means of taxes and tolls;

an **indirect way**, that is to change wider policy conditions so that the values of perceived and social costs get closer.

The Ecotale point of view, very interesting for us, focuses on the enhancement of the planning method, a perspective very in tune with our government role.

Recommendations for the internalization of external costs of transport

Draft version



The role of the regional **“Recommendations for the internalization of external costs of transport”** is:

- to promote planning of actions on transport systems and to coordinate them among other public authorities directly involved in order to internalize and minimize externalities and spread benefits to all users;
- to achieve a general reduction of transport externality at regional level.
- to underline the key role of planning in formulating and introducing an internalization measure

Considerations on different policies

	Parking regulation	Vehicle technology	Modal shift	Access regulation	Mobility credits	Speed limits	Vehicle sharing
Implementation	Easy	Difficult	Average	Average	Difficult	Easy	Average
acceptability	Difficult	Easy	Easy	Difficult	Average	Average	Average
efficacy	Limitations: Yes	Yes	Partially	Limitations: Yes	Yes	Yes	Average. Only in urban areas
	Tolls: partially			Tolls: partially			
efficiency	Limitations: No	Yes	Not always	Limitations: No	Yes	Yes	Yes, in urban areas
	Tolls: Yes			Tolls: Yes			
equity	Partially	Yes	Not always	Partially	Yes	Yes	Yes
solution of the problem	Yes (congestion) Partially (space consumption)	Yes (pollution)	Yes (pollution)	Limitations: Yes	Partially (pollution and congestion)	Yes (pollution)	Partially (pollution and congestion)
				Tolls: partially			



Actions and Good Practice

The “Recommendations” are not about “how to do a parking policy” or “how to do a good ZTL”, or “how to replicate the Berlin ZTL”,

but they are related to “some planning aspects and internalisation effects that should be considered”, valuing lessons learnt from selected GP or from “Ecotale Guidelines”, because we want to underline planning as a method of internalisation.

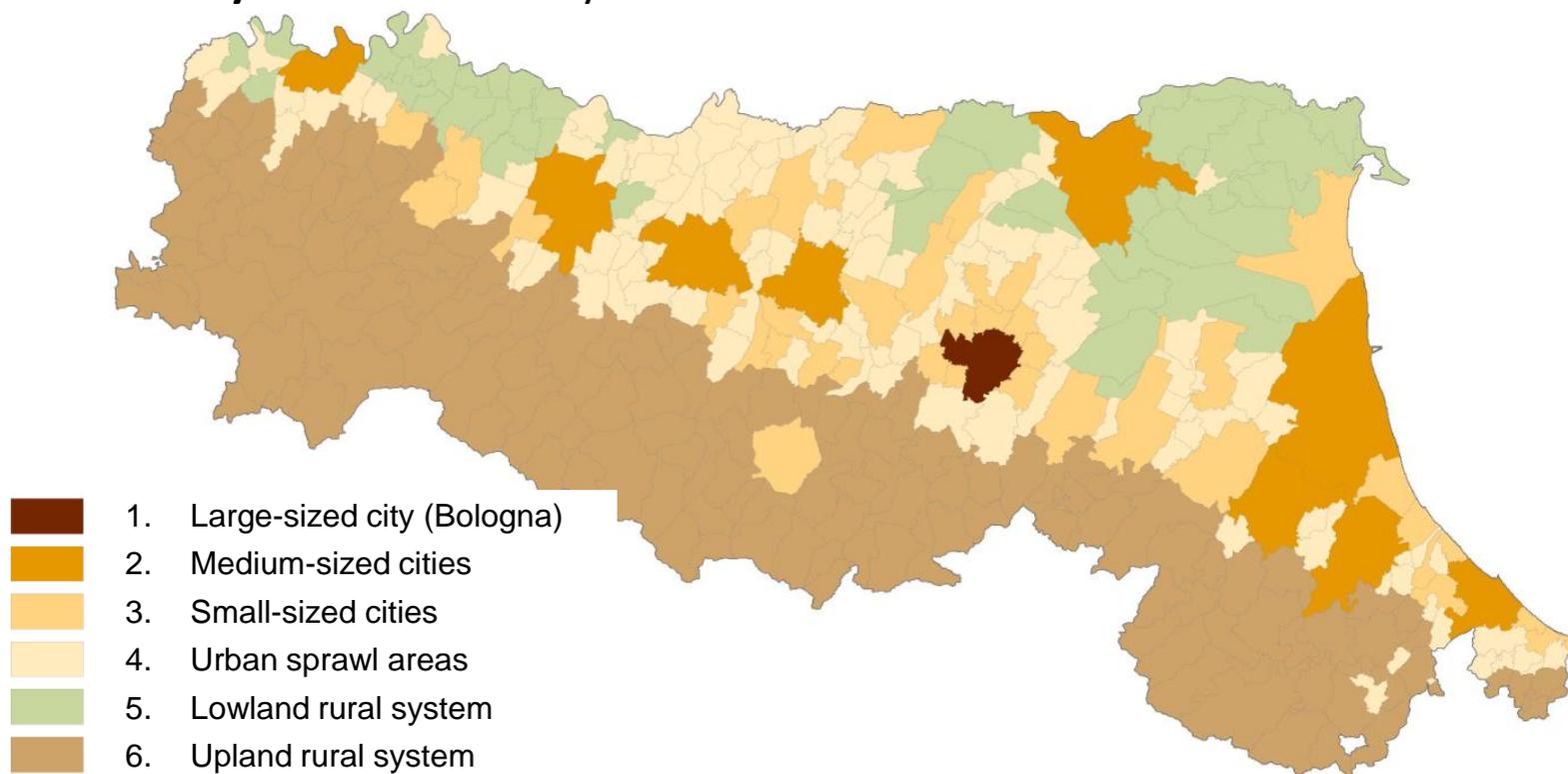
We have done simulations to verify these practices in the context of the Emilia Romagna region and to give advice on how and where to apply them: big city; average city, low-density areas or rural areas.

It is highlighted the need to apply them in conjunction with other planning tools in order to improve them and / or reduce undesirable effects, related to failure of pricing or of the market.

Benefit and improvements

The Recommendation evaluates:

- **where the actions should be implemented** in order to maximize their positive effects (e.g. territorial zone, type of road, etc.);
- **how they act** and how they are related to the land use.

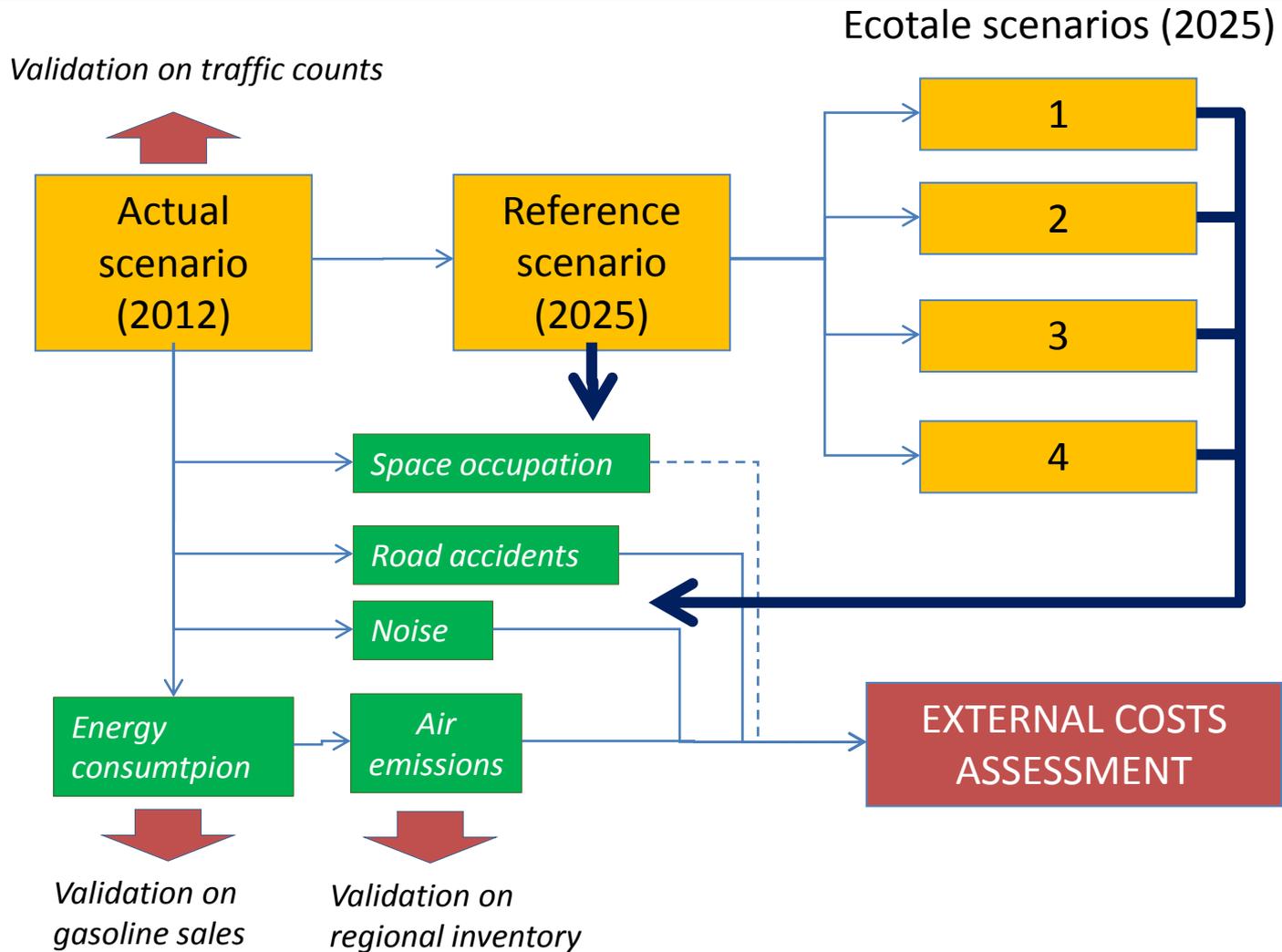




Ecotale scenarios

- Park pricing (city centers and consolidated urban areas)
- Enforcing of LTZ (Limited Traffic Zone)
- HOV lanes (on regional motorway network / bus lane in Bologna)
- Speed management (on primary and distributor roads throughout the region)

Ecotale scenarios





Recommendations on: Parking regulation

Reference GPs : Luxembourg, Wien and Helsinki examples.

The **regulation of parking** is a simple and effective tool to manage transport and the use of urban space.

The first step (often implicit) is the decision about **how much space should be destined to the parking of private vehicles** with respect to other urban functions, The effects of those choices might be quite complex and difficult to be assessed: for example, the improvement of the quality of urban space versus a worsening in private transport accessibility might entail phenomena of substitution (in some cases, even expulsion) of retail activities and in some cases also in residential typology.

The dependence of the willingness to pay from the income poses some social equity issues and it's sometimes necessary planning also **alternative measures**.



Recommendations on: Parking regulation

Reference GPs : Luxembourg, Wien and Helsinki examples.

Furthermore, it could be useful planning the use of some **tools to discriminate the users**, as: residents' parking spaces, disc parking spaces, etc.

Sometimes it's a good idea using an innovative parking pricing program, in which parking rates are dynamically set during the day.

In many cases, a 10% increase in park fee determines a 3% reduction in parked cars.



Recommendations on: Access regulation

Reference GPs : Berlin, Milan, London examples.

Alike the “parking regulation”, **limited traffic zones, LTZ**, imply a trade off between the **quality of the urban space and its accessibility via private vehicles**. So they might entail phenomena of substitution or expulsion of retail activities and of residential typology.

Differently from pricing tools, this tool cannot discriminate users on the base of their willingness to pay and thus of the utility of the trip: for this reason it should be considered **less efficient than pricing**, but also **much simpler to be implemented**.

Hybrid forms that foresee the possibility to enter for non authorized vehicles if paying a toll do exist, an example being the city of Bologna (Italy).



Recommendations on: Access regulation

Reference GPs : Berlin, Milan, London examples.

In terms of reduction of the externalities, these zones play an important role on road safety and on perception of safety.

This strategy positively affects the modal shift to walking and cycling.

Better results are possible with a coordinated plan including 30km/h zones or others traffic calming tools,



Recommendations on: Road management - HOV lanes

Reference GP : Madrid example.

The idea of **High-occupancy vehicle (HOV) lanes** is to dedicate one road lane to private vehicles having a certain amount of people onboard, with the **aim of increasing the load factors of private vehicles.**

This can **reduce the impact** of trips in terms of congestion, environment and accident.

Sometimes it's possible to extend the use of **bus lanes** to this kind of vehicle.

The guarantee of lower travel times and reductions of costs should encourage people **to share their vehicles.**

But on the other side requires people to coordinate outward and return trip and it needs **high flexibility**: in the absence of alternatives, they are forced to make the return trip with the same people and vehicle of the outward one.



Recommendations on: Road management - HOV lanes

Reference GP : Madrid example.

The introduction of HOVs can plan in three different types of roads: freeways, arterial and urban routes.

It is also possible to define a set of scenarios where the main variables are the Average Occupancy of Vehicles (AOV) and the presence or not of Electric Vehicles (EV).

On the freeway, usually the majority of vehicles can reduce their travel time with a positive impact in terms of total emission.

In the urban and in the arterial corridor, the emissions reduction could be achieved only if the AOV is considerably higher (around 1.5 or 1.7 passengers per vehicle). The introduction of EV do not show a significant impact on the corridors performance in terms of travel time. However, is a way to promote their market penetration and contribute to improve local air quality.



Recommendations on: Road management: speed limit

Reference GP: Barcelona example.

The **dependence between travelling speed of vehicles and negative externalities** of road transport was subject to many studies.

It is possible to build, **for different urban contexts and road types**, curves relating travelling speed with the relative **perceived cost** and **social cost** .

A re-design of speed limits of the network should thus allow, practically at zero costs, **a reduction in the social cost of road transport and thus a higher relative efficiency**

Since accidents rates are related to speed variance, well-designed minimum speed limits should be considered as a further measure to reduce accident externalities.

Monitoring and policy revision

Foreseen activities

- Annual monitoring of external costs of transport in Emilia-Romagna and comparison with the current value (2012)
- Analysis to be added in the regional annual report on mobility
- Creation of a regional database





Thanks for your attention.

Contacts: Denis Barbieri, Marco Macchiavelli, Analia Patricia Rutili
Head of Transport Planning Office - Emilia-Romagna Region

debarbieri@regione.emilia-romagna.it

mmacchiavelli@regione.emilia-romagna.it

arutili@regione.emilia-romagna.it

