Deliverable

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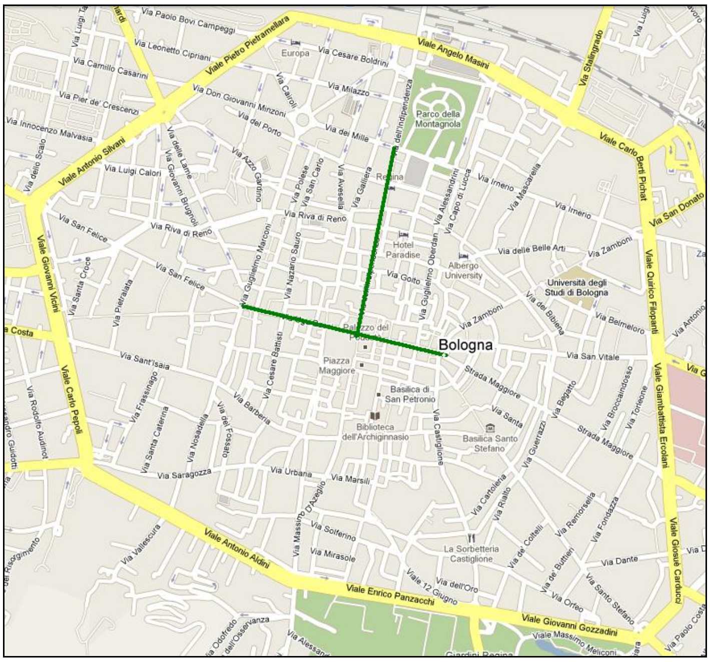
Context and Purpose

Guidelines for access restriction to the “T” area of two-wheeled vehicles are defined in Bologna Urban Traffic Plan of 2006 (PGTU). The “T” area (see the picture below), consists of three streets (Via Ugo Bassi, Via Rizzoli and Via Indipendenza) in the heart of the historical centre.



Data from PGTU 2006:

- more than 20% of motor vehicles entering the Limited Traffic Zone (LTZ) controlled by the video enforcement system have their final destination outside the historical center;
- motorcycles are almost 60% of total motorized vehicles accessing the "T" area;

- motorcycles accessing to the "T" and presumably not complying with Euro standards are estimated at 16%.

Actions planned:

To activate a regulation of motor vehicles access based on the pollution emission level with the following steps

- Step 1: preventing the transit of motorcycles pre-Euro in "T" area controlled by video enforcement gates;
- Step 2: following the evaluation of the first phase results , the extension of circulation prohibition in "T" (excluding the residents) to all motor vehicles with the exception of low and zero environmental impact ones can be considered. The completion of the second phase foresees the prohibition of access to LTZ (the wider central area controlled by SIRIO system) to all motorcycles pre-Euro.

Expected benefits:

- decrease in accidents caused by motor vehicles;
- reducing emissions from motor vehicles.

Summary Contents

Technical/organizational analysis

A depth analysis was conducted to assess the number of two-wheeled vehicles registered in the municipality and the province of Bologna and the number of daily transits in the historical centre of the town.

Number of two-wheeled vehicles (estimated)

Category	**City of Bologna**	**Other municipalities of the Province of Bologna**	**Notes**
Motorcycles (over 50cc)	50.000	50.000	65% meet the Euro standards (ACI estimation 2007)
Mopeds	90.000	90.000 (estimated)	

Daily transits

Daily transits in T of 2 wheeled vehicles (motorcycles + mopeds)	10.500	85% comply with Euro (University estimation in 2006 on vehicles operating in LTZ) 60% motor vehicles - 40% mopeds
Daily transits in LTZ of 2 wheeled vehicles (motorcycles + mopeds)	27.000	

Current situation: the remote control system for motorcycles and mopeds

Currently in Bologna, the control of motor vehicles using the camera is active on 27 gates, which control bus lanes and main access points to the LTZ area; this system over the years has enabled a significant reduction in not allowed transit, sometimes up to 70% .

The realization of control gates has been studied in detail in order to identify the “natural” channel of vehicles flow along a lane. After several years of experience in monitoring vehicles with

cameras, it was found that lanes with a width up to 4 metres, force vehicles along a precise trajectory and the system (camera equipped with Optical Character Recognition - OCR) can read the vehicle license plate with good results, even if in case of the marks of mopeds up to 50cc of old type, which are more difficult to decode for the lack of a default syntax.

The photographs below illustrate two examples of gates.

The first photo below, shows a test image of a moped licence plate. The second one shows the tool for enlarging and zooming the image used by the operators of the Municipal Police ; other tools are available for filtering and improving lighting conditions of photos with the aim to better recognize the plate.

On this lane, the framed area is approximately 3metres and it is sufficient to detect also two-wheel vehicles.

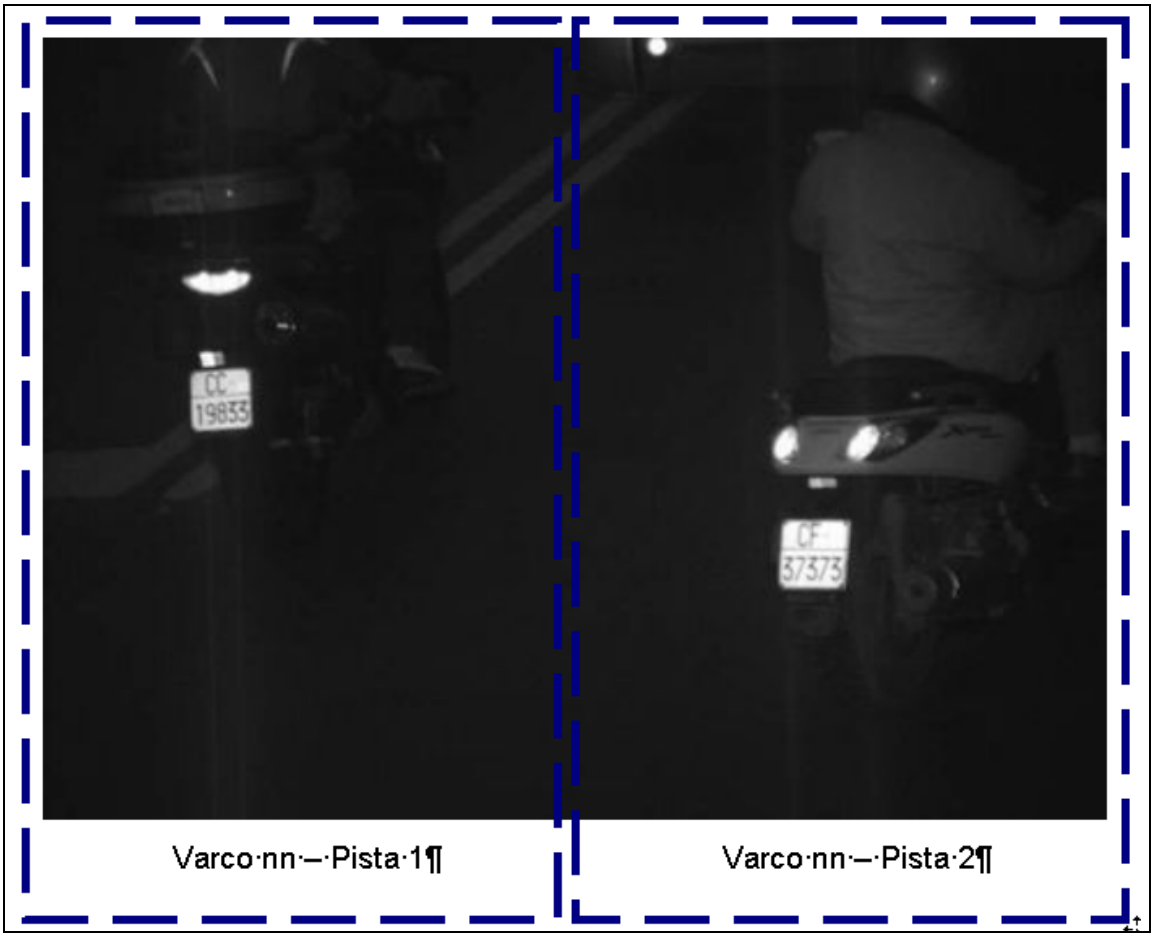
Measure objective: technical improvement of the system
The proposed technical improvement should allow to extend the control of motor vehicles to the gates in the “T” area.

The streets included in the "T" have a width of about 6 metres and the current video enforcement guarantees good results only on cars and vans detection; the control of motor vehicles is instead very difficult with the current technology.

The intervention should consist in updating the technology used (hardware and software).

The technical solution foresees to add a second camera to the gate and to adapt the software to enable the detection of motorcycles and mopeds: in particular, the road is virtually divided in two sections and each camera controls a half part so that it works with optimum trajectory conditions.

The figure below identifies a street of the "T" with the simulation of new system. Each of the two sections is controlled by a camera .



The possibility to access the area for motor vehicles is based on EURO standard compliance so it’s fundamental to know for each registered motor vehicles its EURO standard level.

It’s necessary to implement a data base with motor vehicle licence plate and corresponding Euro standard.
This activity is quite difficult, time consuming and expensive; the situation is represented in the following table:

Data base of environmental sustainability Motorcycles and Mopeds

Vehicle category	Environmental data acquisition mode	Acquisition costs
1. Motorcycle (over 50cc)	Retrieve data from *Automobil Club Italia* and do an automatic acquisition	about 15.000€
2. Mopeds (till 50cc) registered after 1/7/2007	Retrieve data from *Motorizzazione Civile* and do an automatic acquisition	about 30-60.000€
3. Mopeds registered before 1/7/2007	Data should be asked directly to the vehicle owner	not already quantified

Data concerning vehicles of category n. 3 has to be communicate by the owners: the possible procedure should consist in asking citizens to communicate data directly at municipality offices and also through a web application.

Spot checks at the gates should be done by the local police in order to verify correspondence of vehicle characteristics to the declaration of the owner.

It's evident that this manual procedure risks to create lack of information, inconsistencies in the data base and wrong fines.

Communication campaign concerning the measure
It is necessary to give a wide information concerning the new measure and the obligation for citizens to communicate data concerning mopeds.

The procedure could be:

- Sending letters to all holders of two-wheeled vehicles actually circulating: the list can be drawn from the archives of the Region concerning payment of the circulation tax;
- Communication campaign through local/national newspaper, TV, information leaflets to reach also students of the University and non-residents people.

Criticalities
The current situation concerning motor vehicle fleet in Bologna has extremely changed since we proposed the realization of this measure: thanks also to national economical incentives to scrap old vehicles, the fleet of non-euro motor cycles is extremely reduced. The restrictive measure planned could therefore have a limited impact.

The information campaign for non-residents (ex: students) through main communication channels may be insufficient and the risk to fine mopeds that potentially could circulate could be very high.

Furthermore the procedure to collect data concerning mopeds registered before 1/7/2007 is extremely weak and could be contestable from a legal point of view. Legal arguments against fines would be very numerous and also the acceptance of the system by citizens would be compromised.

The process of acquisition of licence plates of mopeds registered before 1/07/07 is very difficult and uncertain and could generate inconsistencies in the database.

For these reasons we decided to stop the measure development and to ask the Commission to use the resources for a different activity.

Functional Use

Deliverable 8.1.3 describes the technical and organizational analysis developed for the realization of the motorbike control in Bologna central area.
The feasibility study results suggested to stop the activity development.

Attachment

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