Measure title: **Bus lane control system in Genoa**

City: **Genoa** *Project:* **Civitas Caravel** *Measure number:* **12.05**

Introduction

A1 Objectives

The measure objectives are to design and implement a specific monitoring system to achieve a more efficient bus lane control and enforcement

- ensuring that unauthorised private road users respect the lanes reserved;
- and, consequently, an increased efficiency of the bus lanes in terms of bus speed and regularity

A2 Description

The effort by the Genoa Municipality and AMT has been made in order to ensure that unauthorised private road users respect the lanes reserved for buses.

To do so the Municipality of Genoa and AMT have agreed that AMT is in charge of developing a specific bus lane control system and managing all the monitoring activities and the complex process of fining for the illegal use of reserved bus lanes (in cooperation with Local Police)

More in details.

In collaboration with the Local Police, the activity of monitoring will be managed by the **AMT Traffic Officer's team** named **Ausiliari del Traffico** (they are entitled to fine illegal transit and illegal parking on reserved bus lanes).
Along with the coordination on the ground and in order to reinforce the system's efficiency, AMT is also using electronic monitoring systems: **fixed optical devices (cameras).**

AMT will purchase cameras that will be installed across the network and connected to its Operations Centre.

The cameras, **full financed by AMT**, will be installed in selected key locations, strategic for bus traffic flows.

A simplified scheme of the architecture of the system based on fixed gate is reported in the following paragraph B3. Actual implementation of the measure in the *sub-paragraph* titled **Stage 2**

The simplified outline of the fining procedures is shown in the following paragraph **B3. Actual implementation of the measure** in the *sub-paragraph* titled **Stage 3**.

The Map concerning the locations of the fixed gates is reported in the following **paragraph B3 Actual implementation of the measure** in the *sub-paragraph* titled **Stage 4.**

B Measure implementation

B1 Innovative aspects

The main innovative aspects of the measure are:

- **New conceptual approach** The design and implementation of a bus lanes enforcement system (based on fixed gates and AMT Ausiliari del Traffico) able to cover all the different aspects of the enforcement, taking into account all the legal issues of these systems, as well as the management of all activities of monitoring and fining has been never done before.
  Moreover the bus lane control system is part of a wider, innovative concept and integrated approach to develop and promote the use of public multimodal transport - managed by AMT - as a better ecologically sustainable transport alternative: the transformation of "reserved laneways", specifically dedicated for buses, into a high mobility corridors networks. The success of this quality bus-way network hinge on several activities (such as introduction of new clean large buses, real time information system at the bus stop and on board, new *static* information customer oriented etc.) including the ones expected within this measure. The bus-way network and the relevant monitoring and control increase the appeal of PT services (improving the bus speed and regularity) while contributing the city's sustainable mobility and pollution reduction. In a city like Genoa, with few wide streets and lack of parking areas, the implementation of the above Clean High Mobility Corridor Network the space for private car traffic decreases. Therefore to avoid misuse of the Network (circulation and parking of not authorized vehicles) it is very important to monitor and control the Network otherwise the above advantages disappear. This in the interest not only of the Public Transport passengers but also in the interest of private car drivers (if more people will use Public Transport private traffic will decrease and if Corridor misuse will be fined buses will be able to run in their corridors without using or crossing the private car lines).

- **Use of new technology/IT'S** The use of fixed optical gates as well as electronic devices supporting the activities of fining of Municipality Police and the AMT Ausiliari del Traffico has never been applied before Caravel.

- **Targeting specific user groups** In Italy some categories of drivers/vehicles - such as disabled people, taxis, Police, emergency vehicles, etc - have, by law, the right to transit on the reserved bus lanes. In addition, and also by law, other categories are admitted to transit on the bus lane having a dedicated Mayor's act. Accordingly AMT, in its role of concessionaire, defined (according with the Municipality of Genoa, the Municipal Police and some Municipal Technicians) the user that are also authorised to travel on the bus corridors to collate in the so called *white list* , as well as the rules for the use. Those included in the white list were requested to communicate their plat number; this was informed with a special newspaper campaign. In particular special attention has been dedicated to disabled people. Procedures to avoid fining this user group have been discussed with the relevant organizations, formalised and promoted (using different -- as already wrote - information and data transmission channel different channel such as media, mailing, internet, etc.).·Moreover, more than 7000 letters have been sending to the disabled people.

- **New economic instrument** A new and innovative approach of using financial resources has been developed. In details: according to the agreement between Municipality of Genoa and AMT the revenues from fines made by AMT (using fixed gates and Ausiliari del Traffico) for misuse of the bus lanes (circulation and parking of not authorized vehicles) has been assigned to AMT (normally, in Italy, revenues from these fines, even if imposed by licensed personnel of PT companies, enters in the account of the relevant municipalities) and the 50% of revenues coming from fines has to invested by AMT in measures to improve the public mobility (such as bus stop design that considers improved access for everyone including people with special needs and the elderly).

- **New organisational arrangements or relationships**
  - Agreement with AMT and Municipality of Genoa about the bus lanes and their enforcement and the relevant responsibilities. Municipality of Genoa has been charged to extend the Genoa reserved bus lane network (from 23 km existing in 2005 to about 40 Km in 2008) and AMT has been charged to the role of *concessionaire* of the reserved line network . This role includes all the actions and investments to transform the reserved line network in a real High Mobility Corridor Network and to implement and management the relevant monitoring and enforcement control system based on fixed gates and AMT Ausiliari del Traffico. Please note that AMT is the first PT company in Italy having the role of concessionaire of the reserved bus lines network. Normally in Italy this role is responsibility of the Municipality.
  - Agreement and procedures with AMT, Municipality of Genoa and Municipal Police to regulate the different phases, activities, the relevant rules and process owners per phase/activities of the complex process for fining (such as the activity and procedures of assessment the made violations by fixed gates or AMT Ausiliari del Traffico, the payments and the not payments of the fines, appeal procedures for fining, the management of the revenues from fines and so on).
  - Agreement with the relevant Disabled People Organizations about the procedures to avoid to fine disabled people (in Italy they have the right to use reserved lanes) Please see also the above relevant point **Targeting specific user groups**

B2 Situation before CIVITAS

In Genoa, 23 kilometres of dedicated bus lanes have been developed during the last 20 years.

There was a specific problem in controlling and enforcing the bus lanes scheme.

The control of the bus lanes was only made using human resources on the road (both the Municipal Police and AMT Ausiliari del Traffico that are allowed to fine on public transport dedicated spaces such as the corridors and bus stops).

Due to their economical constrains, the Municipal Police and AMT cannot dedicate more staff than the present one to this activity therefore a new technologically advanced and automatic system is needed.

The realisation of a specific monitoring system will lead to a more efficient control and enforcement ensuring that unauthorised private road users respect the lanes reserved and consequently an increased efficiency of the bus lanes in terms of bus speed and regularity.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1. Design of the monitoring system based on 3 mobile equipment on board; elaboration of the new strategies about monitoring and control of bus lanes with the preliminary design of an integrated control system based on fixed gates and mobile devices (*from February 2005 to January 2006* **)**

From February to November 2005 the activities developed were focused on the monitoring system based on three mobile equipment on board. According to this focus, introductory analysis of legal and regulatory aspects (including a *state of art* of the bus lanes monitoring systems working in other cities) has been done as well as the first draft of the system architecture design·(elaborated after meetings with the Municipal Police)

From November 2005 the elaboration of a new AMT strategy about the corridors dedicated to public transport and the relevant control started up. AMT has negotiated with the Municipality of Genoa the extension of the present network of bus reserved lanes. According to the agreement Municipality of Genoa is in charge of the realization of the new reserved bus lanes and AMT is in charge of all activities (including the relevant investments) to transform the bus lanes into high mobility corridor network and the development of a bus lane control system able to cover aspects of monitoring and fining.

Accordingly AMT has carried out a new first draft of the system architecture design for an integrated bus control system based on fixed gates with cameras and mobile devices to be installed or on AMT buses or on auxiliary cars or to be used the AMT personnel in charge of the control activities (or mix of these options).

Fixed gates should be about (at least at the beginning) 10 (+ 8 as option) and they should be sited in the more critical areas (where private traffic is more heavy or around crossing points and therefore where it is possible that private cars use the reserved lanes instead of their lanes) a preliminary study about the possible positioning of these gates has been done.

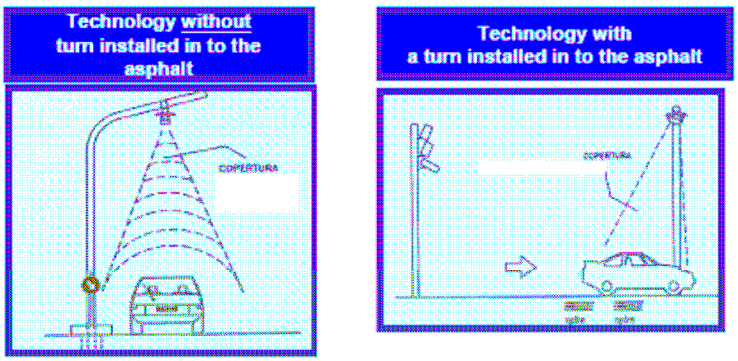
Mobile devices should be about 30 accordingly to the fact that a task of 30 AMT Ausiliari del Traffico has been expected to manage on the road the reserved lane control activity. Devices under studies are small portable PC (“palms”) with cameras to take pictures of cars running or parking in the reserved lanes and with printers to write penalties.

As alternative, optical pens able to write as the traditional ones but also able to memorize the writing of the personnel have been considered (by these pens obviously it will be impossible to take picture but these devices will be used by the municipality policemen, therefore synergies will be possible). Software has been in phase of study to manage data coming from mobile devices and fixed gates; “to clean” these data according to the white list (private cars or other vehicles allowed to run in the reserved lanes), to process the penalties and the relevant relationship with the municipality.

In addition to the above activities 2 suppliers for testing activities have proposed fixed gates.

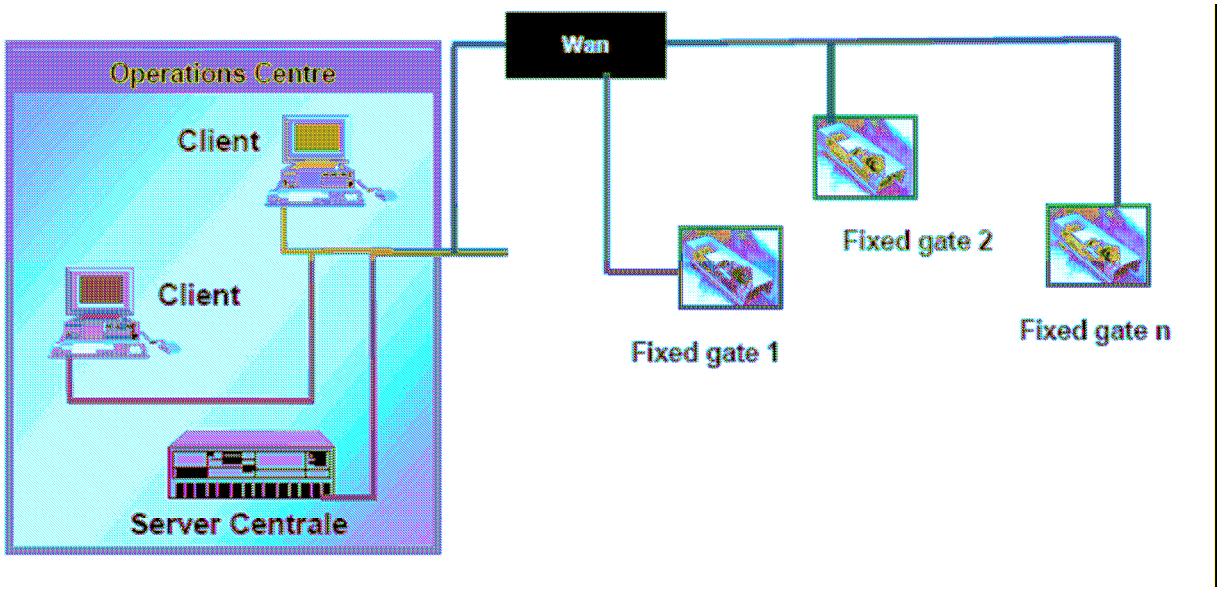
The fixed gates proposed by the suppliers are based on two different technologies; camera is switched on by the vehicle running on a turn installed into the asphalt or by an optical device (in this case no works to install turns into the streets are needed).

Figure 1. The two different technologies of camera



Regardless of the "modalities" of switching the gate, the architecture of the system is structured by two components: the **peripheral devices** (camera, infrared fotodetection, possible “camera of context”) and **Central Control Operations Centre** - among them connected through a wireless connection (UMTP / GPRS) or xDSL

Figure 2. A simplified scheme of the architecture of the system based on fixed gate



Stage 2. Design and implementation of the bus lane control system and the process, agreements and authorizations by the relevant Authorities, development and testing of the prototype system for the bus lanes control based on 4 prototype of fixed gates, studies to implement the system; procurement of the system (*from February 2006 to January 2007)*

After a new analysis of legal and regulatory aspects (including a benchmarking of the IT the bus lanes monitoring systems) it has been decided to implement the project through a bus lane control system based on:

- 10 fixed ITS gates (+ option for further 8) to control some strategic points
- and Ausiliari del Traffico (AMT personnel in charge to prevent and fining illegal transit and parking on reserved bus lanes (mainly in the areas where there will be no gates) supported by electronic devices.

Accordingly, the design of the whole project based on the fixed gates and Ausiliari del Traffico has been finalised and implemented :

- technological aspects,
- software specifications,
- selection of the points where the expected 10 fixed gates (+ 8 as option) will be installed;
- design of the prototype fixed gates system as well as their locations;
- definition of users that are also authorised to travel on the bus corridors to collate in the so called *white list*
- rule for the use and the relevant procedures,
- design of the new bus lane control system department's organizational structure, etc.)
- a first draft of the processes including agreements and procedures with AMT/Municipality of Genoa and Municipal Police to regulate the different phases, activities, the relevant rules and process owners per phase/activities of the complex process of fining (such as the activity and procedures of assessment the made violations by fixed gates or AMT Ausiliari del Traffico, the payments and the not payments of the fines, appeal procedures for fining, the management of the revenues from fines and so on) has been carried out.

All the authorizations and agreements have been done and finalized: authorization from the Ministry of Transport to use the fixed gates on the bus lanes for fining; agreement with the Municipality of Genoa concerning the Italian law to protect people's privacy; agreement with Municipal Policy to manage penalties arising from the gates; agreement with the Municipality of Genoa to share the revenues coming from penalties; etc.·

More in details:

- 4 prototype fixed gates have been installed (3 in Val Bisagno, 1 in Val Polcevera) and tested from the last August 2006 (two gates works with allowing automatic monitoring of the transits on the bus lanes with a turn insert under the asphalt, the other ones without turn); AMT personnel has been trained to use the gate system and the relevant software installed in the central control room.
- An international tender has been issued to buy the other gates needed to complete the projects (10 + option for further 8 gates); the offers are now under evaluation phase. ·
- White list (the data base of the plates of the vehicles authorised to run in the reserved lanes) is on progress (the gates will automatically cancelled photo to the plates stored in the white list).·

- 64 AMT persons have been trained and qualified as Ausiliari del Traffico (personnel authorised to fine not authorized vehicles in bus lanes) ·
- Information campaigns have been designed and carried out. ·
- Definition of functional specification of the electric support device for enforcement (optical pen) has been done according to the choice made by Municipal Police. These devices are on testing phase by Municipal Police. The use of this device by AMT Ausiliari del Traffico has been postponed (their use depends on the results of the testing phase by Municipal Police and of its authorisation).

Stage 3. Operation of 2 prototype fixed gates, improving of the processes and procedures for fining, procurement of the system (gates and software), studies to improve the system, system installation and operation *(from February 2007 to January 2008)*

Since February 2007, 2 fixed gates (allowing automatic monitoring of the transits on the bus lanes with a turn insert under the asphalt) entered in operation (i.e. they started producing fines).

Realized another public information campaign with also flyer distribution in the neighbour of the two gates (Val Bisagno) informing drivers on commissioning of those gates.

Figure 2.
The flyer distributed informing drivers on commissioning of the Archimede and Tolemaide fixed gates

New additional signage displayed to inform persons of the installed fixed gates. Further the Ausiliari del Traffico and Municipal Police attended the areas of the fixed gates for some days.·

Moreover the Municipality of Genoa required to AMT an higher visibility of the installed new fixed gates in operation (nevertheless the information campaigns launched by AMT including flyer distributions, the indicators installed according to the Italian law, the additional signage displayed, the attending of the areas where the fixed gates operated by AMT Ausiliari del Traffico and Municipal Police for some days).

Therefore AMT acquired and installed new large illuminated indicators ecologically friendly with solar panel to give a further information to drivers to the fixed gates.

Figure 3
The illuminated indicator with solar panel

Finalized the Protocol Agreement between AMT and Municipal Police concerning the management of the fines (this Protocol regulates the different phases, activities, and the relevant rules and process owners per phase/activity of the complex process for fining such as the activity and procedures of assessment of the made violations by fixed gates or AMT Ausiliari del Traffico, the activity concerning the white list and the relevant upgrade, the payment of the fines,

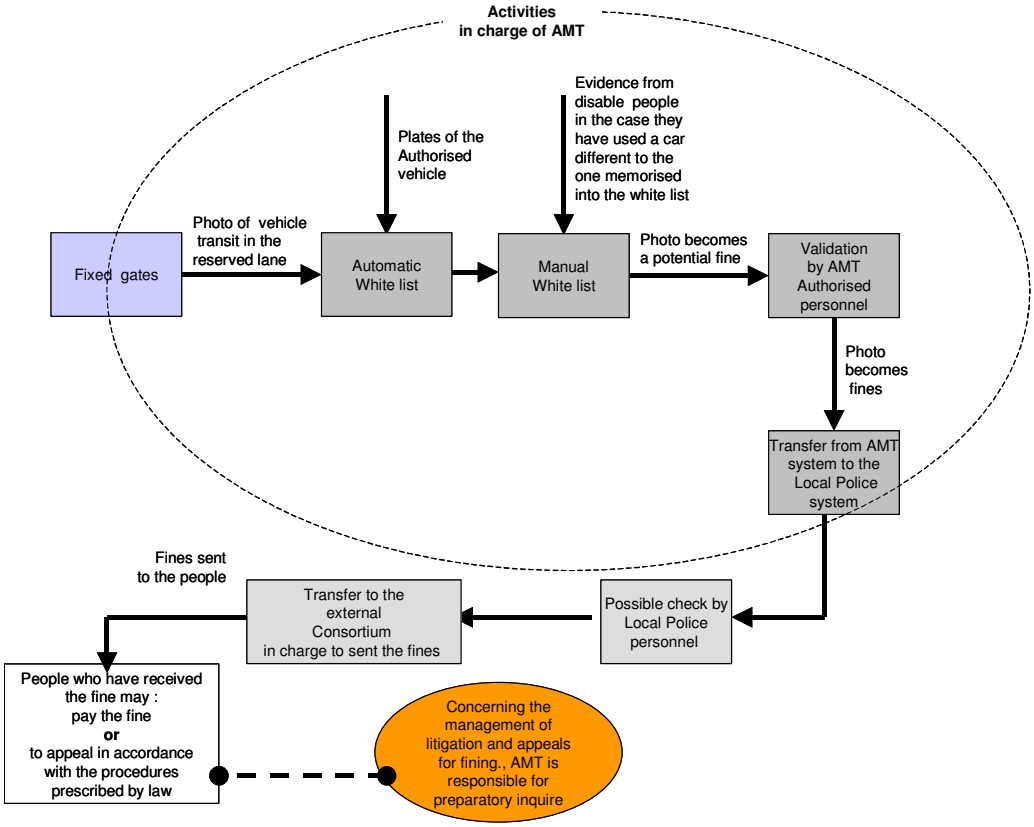
types of fixed gates authorized to fining, appeal procedure for fining, and so on).

According to this Protocol, designed, developed and entered in operation the new IT and procedures concerning the management of the fines.
In particular, the application software in order to guarantee AMT's access to Municipal Police's database - that manages the fines has been customized and the procedure concerning the consignment of the AMT' fines to Municipal Police (after the positive results carried out by experimental consignment of fines) began its operation.

On going the consignment of fines made by the 2 fixed gates in operation from February, as well as the fines made by Amt's Ausiliari del Traffico, to Municipal Police that must be really paid by whom used the bus lanes monitoring by the gates or Amt's personnel without right.

The figure shows a simplified outline of the fining procedures

Figure 4 The simplified outline of the fining procedures



Designed and realized the software enabling to verify that the fines elevated by AMT Ausiliari del Traffico don't include plates stored in the white list (till-up today this was possible only for the fixed gates).

In August, substituted the 2 fixed gates (allowing automatic monitoring of the transits on the bus lanes with a turn insert under the asphalt) in operation in Valbisagno (from February to July) with the other 2 fixed gates (allowing automatic monitoring of the transits on the bus lanes without turn insert) were installed and in testing phase in Val

Bisagno and in Valpocevera. The new 2 fixed gates entered in operation for fining the illegal uses of reserved bus lanes in October.

AMT's activities for the management of litigation and appeals for fining (at the moment AMT is responsible for preparatory enquiry) are on progress.

The purchase of **15 fixed gates** (+ further 3 optional gates) has been assigned to the selected tender winner (please note that AMT decided to "immediately" install 15 fixed gates instead of 10 fixed gates as it was previously planned) and started up the project:

- the executive design and the relevant documents to obtain the authorizations for the laying of the first new 15 fixed gates have been carried out – in cooperation with the bid winner. The project is now under evaluation by the Municipality of Genoa;
- the evaluation of the additional offer received by the bid winner for the supply of electronic devices able to preventing the fining of disabled persons driving a car no listed in the white list (in Italy the disabled persons have the right to use reserved bus lanes with any car) is on progress.

Stage 4. System installation and operation of all new 15 fixed gates*(last year of the Caravel Project)*

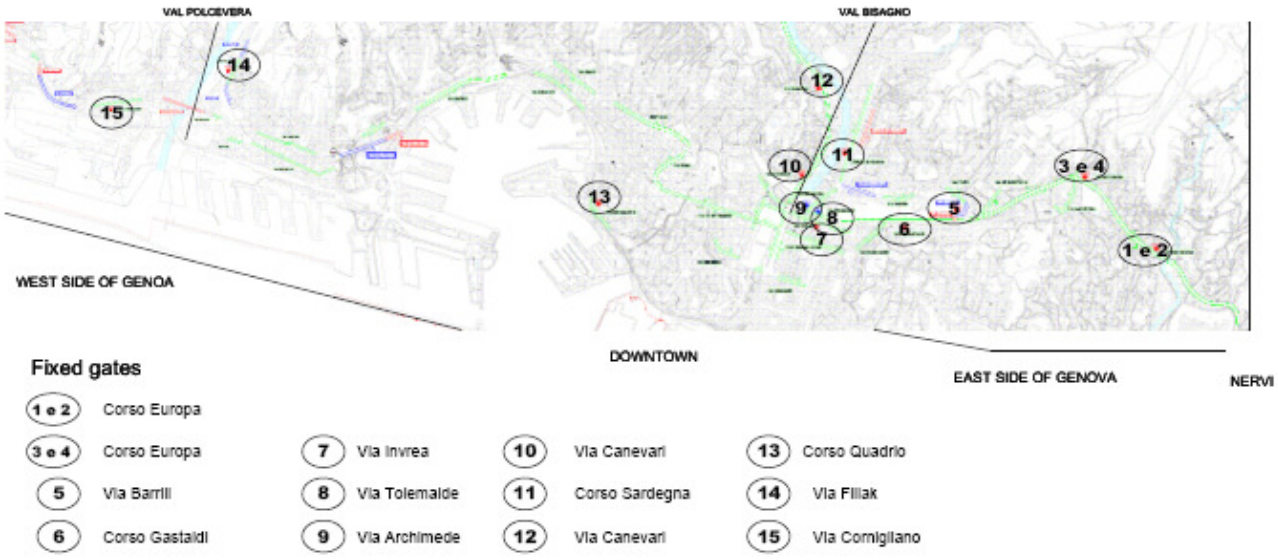
On going the activities concerning the management of the complex process of fines made by fixed gates and AMT Ausiliari del Traffico. These activities also include:

- the management of litigation and appeals for fining
- the upgrade of the white list (the data base of the plates of the vehicles authorised to run in the reserved lanes)·

Approved by Municipality of Genoa and Municipal Police the **new further study concerning the new 15 fixed gates**[1]**.**

The following picture shows the locations of the 15 fixed gates.

Figure 5 *Locations of the 15 fixed gates*



[1] The Municipality of Genoa and the Municipal Police has been required at the end of 2007 to Amt a new further analysis to confirm or change the locations of the new 15 fixed gates stated in the executive design and the

Obtained the authorizations for the laying of each fixed gate.

AMT, Municipality of Genoa and Municipal Police have also agreed the main activities to be done before the enter in operation of each fixed gates:

- meeting with each of the Local Municipalities whose areas are interested by the installations of the fixed gates;
- involvement of the Consumer Associations;
- installation of the indicators to install according to the Italian law;
- installation of the additional signage displayed;
- information campaign (press articles);
- attending of the area where the fixed gate will be operated by Amt's Ausiliari del Traffico and Municipal Police, including flyer distributions, in the seven days preceding the start of fining.

All 15 fixed gates installed and in operation (including the further replacement of the fixed gates located in Archimede and in Tolemaide with the models of the tender winner) and all the activities (described above) were completed prior to the launch of the new fixed gates.

Figure 6. The new flyer distributed informing drivers on commissioning of the Barrili fixed gate and on the relevant additional signage

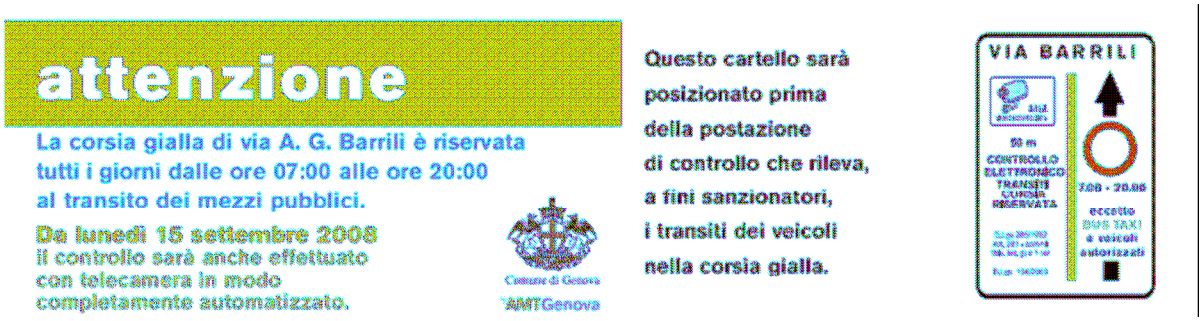


Figure 7. The additional signage elaborated by Local Police and AMT

relevant documents - already submitted to Municipality of Genoa and Municipal Police - for the laying of the fixed gates.

The new model of the 15 fixed gates and the relevant details are shown in Figure 8 and 9

Figure 6. Canevari fixed gate, one of the 15 new fixed gates installed

Figure 7 Detail of the Canevari fixed gate

Operative the software enabling to verify that the fines elevated by AMT Ausiliari del Traffico don't include plates stored in the white list (till-up today this was automatically possible only for the fixed gates).

Scheduled for the end of November the testing phase of Telepass (the electronic device offered by the supplier of the fixed gates able to preventing the fining of disabled persons driving a car no listed in the white list)

B4 Deviations from the original plan

The original scope of the measure (*IR 2005*) was to use ITS for PT quality improvements, implementing bus lane control and enforcement using optical plate recognition on 3 vehicles specific on board devices for bus lane enforcement on some mobile vehicles.

The scope of the measure has been enlarged (*Amendment 2007*):

- **fixed optical plate recognition equipment** (fixed gate) **instead of mobile equipment installed on vehicles** according the technological and regulatory constrains for mobile equipment on board;
- **10 fixed gates** (+ option for further 8) **instead of 3 mobile equipments**.
- **change in the Measure Partner leadership** from AMI to AMT because AMT is in charge to develop a specific monitoring system (full financed by AMT own funds), to achieve a more efficient control and enforcement of the corridors, to manage all activities of monitoring and the complex activities of fining for the illegal use of reserved bus lanes (in cooperation with Municipal Police).

The reasons of **fixed optical gates instead mobile equipment on vehicles** in short:

- **technological constrains**, mobile equipments are not yet reliable (where these equipments are under testing phase no more than 10% of the plates are recognized);
- **law constrains**, in Italy a licence, issued by the Ministry of Transport, is needed to use optical electronic devices to enforce traffic rules without the on filed presence of policemen (or other authorised personnel in fining) and without the need to provide in real time penalty to the person who has not respected the traffic rule; at the moment only fixed gates have this kind of licence, mobile equipments have not;
- **organization constrains**, without licence mobile equipments should be used by and with the presence of policemen or other authorised personnel (this authorization is issued by the Major); only the employees of AMT - called Ausiliari del Traffico - have been authorised (so they can fine not authorised vehicles running on the reserved lane) but the AMT bus drivers majority has not the authorisation; accordingly mobile equipments could be not installed on buses while mobile equipment could be installed on the Ausiliari del Traffico cars, but also in this case the photo taken, from the legal point of view, has no relevance (Ausiliari del Traffico can fine not authorised vehicles without any need to take photos); to use mobile equipment installed on buses all the drivers should have the Major authorization, this should be negotiated with the Unions with labour cost increasing.

The reasons for the **measure leader change (AMT instead Ami**) in short:

- at the end of 2005 the new AMT private partner Transdev entered in AMT[2] . Accordingly with the agreement between the two partners, the responsibility to manage AMT has been given to Transdev. At that time the main change in comparison with the DOW was that the Working Document "Bus lane control system design in Genoa" has been postponed; this in order to give to the new private partner of AMT the time to define its own strategy in coherency with the CARAVEL project.
- during 2006 the 2006-2011 Business Plan (accordingly to the agreement between the two AMT's shareholders Genoa Municipality and Transdev) has been prepared and approved by the Board of AMT and Municipality of Genoa. The Business Plan includes the agreement with the Municipality, the actions and relevant investments to create the High Mobility Corridor Network (Caravel Measure 8.1) and to design and install the Network monitoring system that is the subject relevant to this Measure 12.5. According to the above scenario AMT is in charge of all the activities relevant to the reserved bus lane control, to develop a specific monitoring system to achieve a more efficient control and enforcement of the corridors, to manage all activities of monitoring and the complex activities of fining for the illegal use of reserved bus lanes (in cooperation with Municipal Police). Therefore AMT carried out the project to install the gates and AMI doesn't have any role in the project). When the former AMT has been subdivided into the new AMT and AMI, personnel in charge of the UE projects has been assigned to AMI, therefore mainly at the beginning some activities relevant to this measure, even if in charge of AMT, have been carried out by AMI; therefore AMT and AMI agreed to redistribute workload to recognise the work done by AMI.

B5 Inter-relationships with other measures

The measure is related to the follow measure:

- **Measure 08.01 Clean high mobility corridors in Genoa** The enforcement of the bus lane of the High Mobility Corridors contributes to a better effectiveness of this measure (details in the above point **B1. Innovative aspects – New conceptual approach)** .

[2] Context in short:
On December 2004 AMT (Public Transport operator in Genoa – 100% property of Municipality of Genoa) was subdivided into two companies: the new AMT- Azienda Mobilità e Trasporto S.p.A. (transport operator in charge of all transport services) and AMI – Azienda Mobilità e Infrastrutture S.p.A. (Public Mobility and Infrastructure Agency and company in charge of the maintenance of AMT's buses and other activities such as real estate and parking management). Both the companies were 100% owned by Genoa Municipality.
During 2005 an international tender has been issued by the Municipality of Genoa to sell the 41% of AMT share to a private partner. The winner was the French Group Transdev.
At the end of 2005 the new private partner Transdev entered in AMT; therefore now AMT is 59% property of Municipality of Genoa and 41% property of Transdev.
Accordingly with the agreement between the two partners, the responsibility to manage AMT has been given to Transdev. Relationship between AMT and the Municipality concerning the PT service to be operated is now managed by a contract named Contratto di Servizio.
Relationship between AMI and AMT first of all for bus maintenance is managed by three a contracts named Contratti Intercompany.

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

Table of Indicators

Evaluation Category	N°	Indicator	Units (*)	Source of data	Methodology for indicator construction (survey, modelling, etc)	Baseline date
Society	14	Acceptance level	• n. of fines per each fixed gate in year n/ n. of fines per each fixed gates in year n-1	AMT	Survey	○ From February 2007 for the n. of fines per each fixed gates ○ 2008 for the relevant unit

(*) Clarifications respect to the Evaluation Report:
Respect to the Evaluation Plan, the *unit* "n. of fines per Ausiliari del Traffico Year n/n. of fines per Ausiliari del Traffico year n-1" has been cancelled because it is not correlated to the object of the measure " decrease of illegal transit"

Detailed description of the indicator methodologies:

Indicator	Methodology for indicator construction (*)
Acceptance level	• **Definition of acceptance level:** the acceptance level is defined as the respect by private vehicles of the bus lanes. The measure of this is given by an i*ndirect* data: the number of fines for illegal transit on the bus lanes • **Method of measurement frequency**: - Measurement: Survey of average number of fines that have been done from each fixed gate (the number of fixed gates will change during the period 2007 – 2009) - Baseline: **From February 2007** the number fines that has been done by two fixed gates are available - Data is collected on monthly basis. Data for evaluation are delivered on annual basis. • **Target group** . general public • **Domain**: the corridors where the gates operate (the installation on fixed gate is in progress) for the fine by fixed gates

<u>Other indicators reported in the following paragraph C5. Appraisal of evaluation approach</u>

C1.2 Establishing a baseline

This information for the baseline date is contained in the tables below

C1.3 Building the business-as-usual scenario

Not applicable because before Caravel Project there were not the fixed gates installed on the reserved bus lanes and further the activity concerning the bus lane control made by AMT Ausiliari del Traffico was very limited and not so significant.

C2 Measure results

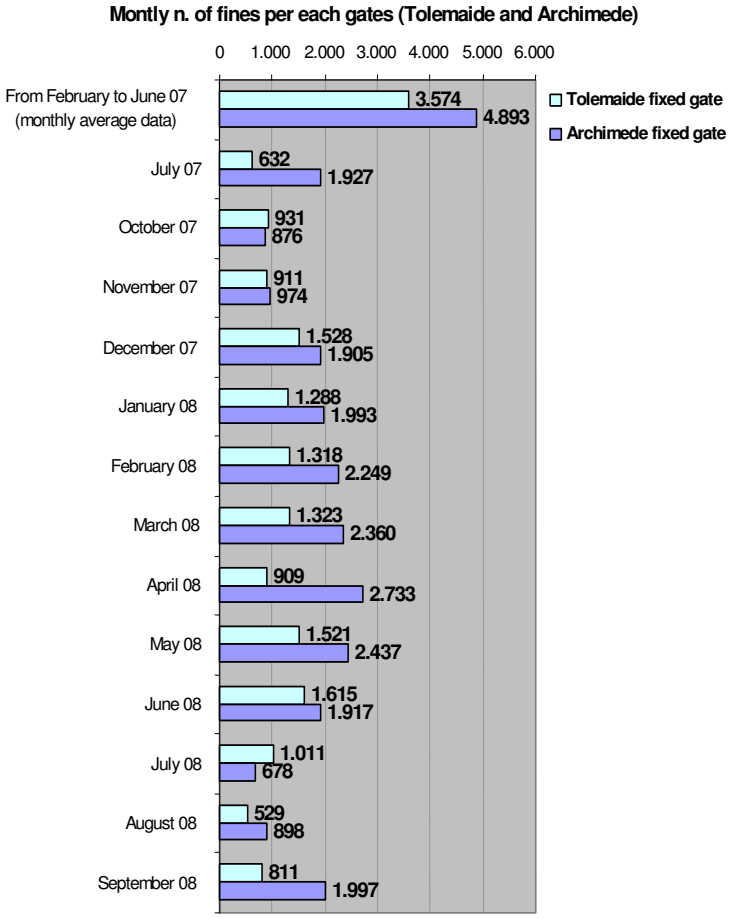
C2.5 Society

Indicator: Acceptance level

The chosen indicator is defined as **the respect by private vehicles and of the bus lanes**. **The measure of this is given by an indirect data: the number of fines for illegal transit on the bus lanes.**

Graph 1 shows the monthly number of fines produced by each of the two fixed gates installed on the reserved bus lanes in Val Bisagno (Archimede Street) and in Centro – Val Bisagno (Tolemaide Street) from February 07 to September 08 (August and September 2007 excluded)[3].

Graph 1. Monthly number of fines produced by each fixed gates (Tolemaide and Archimede)



[3] From August to September 2007 no fines have been done by the two fixed gates for the following reason: in August the 2 fixed gates (allowing automatic monitoring of the transits on the bus lanes with a turn insert under the asphalt) in operation (from February to July 2007) in Valbisagno (Archimede Street) and in Centro–Val Bisagno (Tolemaide Street) have been substituted with the other 2 fixed gates (allowing automatic monitoring of the transits on the bus lanes without turn insert) installed and in testing phase since July 2007 in Fillak Street and in Canepari Street. The *new* 2 fixed gates (in Tolemaide and Archimede Streets) entered in operation for fining the illegal uses of reserved bus lanes in October 2007. Accordingly there is no data concerning these two months for the relevant indicator. At the end of August 2008 these two fixed gates were again substituted with the models of the tender winner

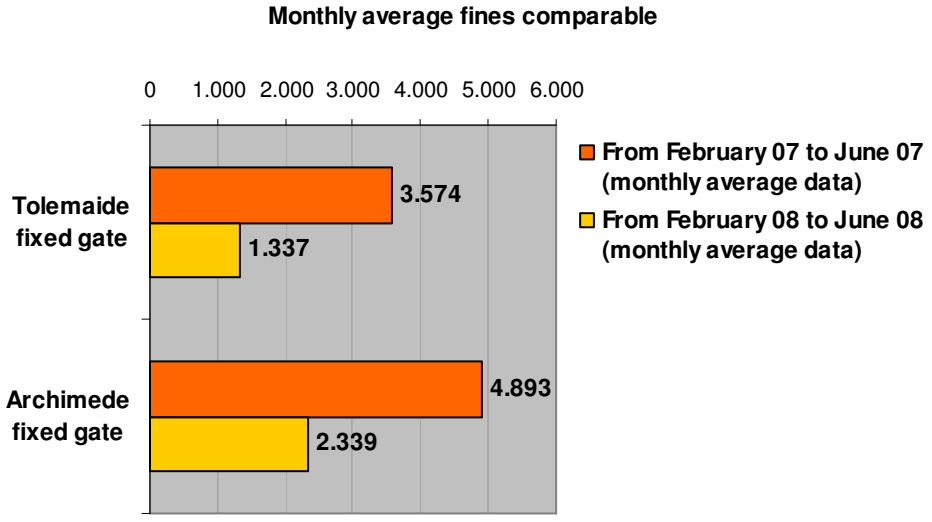
Fines produced by the two fixed gates during the first months (February-June 07) are not significant because people were not yet fully aware of the gates despite the information campaigns carried out. So that in Graph 1 is showed the monthly average data for this period.

After the above beginning period the number of fines seems to be more significant, but during August – September 2007 the two gates have been switch off due to the reasons described in note.

Accordingly up to now there are no monthly data in 2008 to be compared with the same month in 2007. However a first comparison can be done between the period February-June 2007 and the period February-June 2008. This is illustred in Graph 2

The analysis shows a reduction in fines (*alias* the **reduction in the illegal use of the bus lanes monitoring by Archimede and Tolemaide fixed gates) around 60%**

Graph 2. Monthly average fine comparable: period (February-March 2007 vs.2008)



To have more reliable information it will be better to collect data for the whole 2008 and 2009 in order to compare month per month per year.

<u>For other indicators please see the following paragraph C5. Appraisal of evaluation approach</u>

C3 Achievement of quantifiable targets

No.	Target	Rating
1	Decrease of illegal use of bus lanes monitoring by fixed gates (- 20% monitoring by fixed gates at the end of Caravel project)	***

NA = Not Assessed * = Not achieved **= Achieved in full *= Exceeded**

C4 Up-scaling of results

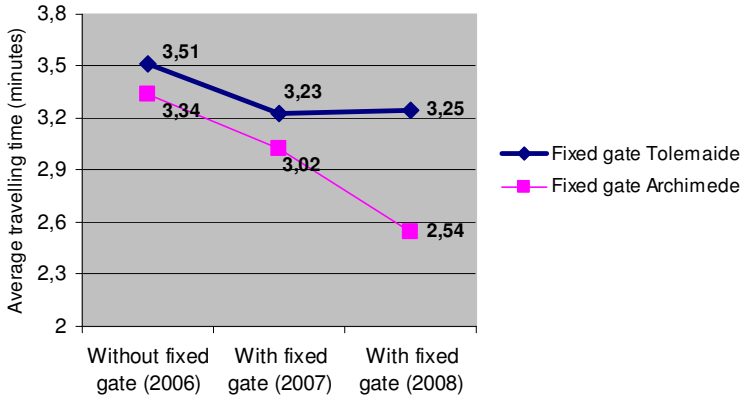
Not applicable. Within this project it is expected the installation of 15 gates (+ 3 as option), this is already the maximum number of gates that it is reasonable to install in a city like Genoa also considering the expected program to extend the reserved lane network (while if the Municipality will not extend the reserved lane the 18 gates will exceed the real needs). For what concerns the Ausiliari del Traffico they already monitor all the network of the existing lanes and will monitor the new ones when (and if) the Municipality realized them, therefore there is no up-scaling at least in terms of object to be monitored.

C5 Appraisal of evaluation approach

The only right way to measure that unauthorized vehicles respect the bus lanes monitoring by the fixed gates is through the chosen indicator: **Acceptance level** (reported in the previous relevant paragraph C2.5 Society)

To check the efficiency of fixed gates, another indicator was chosen: the **reduction of bus average travelling time on the reserved lanes area where there are fixed gates**
More in details, to check the efficiency of fixed gates were calculated the bus average travelling time in the area located between the stop before and the stop after where the fixed gate has been installed and in operation. Graph 3 shows the bus average travelling time in this area before and after the installation of the two fixed gates Tolemaide and Archimede (in operation since February 2007)

Graph 3 Bus average travelling time before and after the installation of the two fixed gates Tolemaide and Archimede



To have more and significant information concerning the efficiency of the all 15 fixed gates installed it will be better to collect data for the remaining period of 2008 and for the whole 2009.

In any case, the additional control on the bus lanes, **have produced small improvements in the overall bus transport network**

Indicator	2006	2007	2008 partial data (not comparable)
Accuracy of PT time keeping	**88,9%**	**89,3%**	**89,8%**
Average bus speed peak	**14,7**	**14,8**	**14,8**
Average bus speed off peek	**16,3**	**16,3**	**16,4**

C6 Summary of evaluation results

To be completed - upgraded

The key result is as follows:

- 15 fixed gates installed and in operation
- Average increasing of 60% of the respect of the reserved bus lane monitoring by the fixed gates
- **Reduction of the bus average travelling time** on the reserved bus lane area where there are fixed gates: **minus 7,5%** (2008 vs. 2006) for the *area* where the fixed gate Tolemaide is installed, **minus 23%** (2008 vs. 2006) for the *area* where the fixed gate Archimede is installed
- Increased of accuracy of PT time keeping in the overall bus transport network
- Increased of average bus speed in the overall bus transport network

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Public opposition**. Strong opposition arose and are still arising from **motorcycle drivers**, from **shop owners** and **local politicians**. Moreover positions of these people have been "enlarged" and promoted by **local media** (newspapers and televisions) this mainly for getting visibility by supporting the share of population more aggressive (while the other share, the bus users, are silent).In particular shop owners are afraid that new bus reserved lanes as well as the fining of bus lane misuse can reduce the number of their clients; car and motorcycle drivers fear the reduction of street width due to the bus lanes (this is particularly significant in a city like Genoa characterized by narrow streets). Moreover motorcycle drivers in the past had been rarely fined for bus lane misuse while now

this tolerance approach (at least for penalties arising from the automatic fixed gates) has been abandoned by AMT. Therefore, even if it could seem that in presence of roles people should respect them, in the reality it is needed a wide changing in the people mentality.

1.2 Drivers

- **AMT, local administration and politicians (Municipality of Genoa and Local Police).** In addition to AMT the other *driver* of this project is mainly the Municipality (and in particular the Local Police as well as politicians and their managers working in the mobility sectors). Even if the project is foreseen in the *Contratto di Servizio* (the contract between AMT and Genoa Municipality to manage PT services) the Municipality has to face the wishes both of bus clients and private vehicle users, therefore the path from the designing phase of the project to the implementation phase is not easy (it has to be noted that after having had the general project approval several specific authorizations should be provided by the Municipality to install each gate and political reasons can stop these authorizations even if, in theory, these are linked only to technical issues).
  Moreover there are other issues that have to be managed together with the Municipality such as the white list (including the relevant roles) and the penalties process (including the relevant share of responsibilities and procedure between AMT and the Municipality).
- **Local media.** Local media, usually prefer to share the position of private vehicle drivers (being the cluster with more visibility) therefore AMT is working with the media in order to make visible also the *voice* of the bus clients (the other more silent cluster).

D2 Participation of stakeholders

- **Associations of disable people**. These have been contacted to discus and agree about the procedure for permitting to disable, to use the bus lanes.
- **Motorcycle drivers and their association**. An association among some motorcycle drivers has been created to fight against the fining and to push the Municipality and AMT to authorize the motorcycle circulation in the bus reserved lanes. This association has arranged some demonstrations even if not a lot motorcycle drivers attended these road events.
- **Media**. Please see above.

D3 Recommendations

- To study in deep the law and the relevant roles concerning private and public traffic in order to understand if solutions such as those implemented in this project (in Genoa/Italy) can be adopted also in other countries.
- A strong endorsement of the Municipality and the Local Police is needed.
- Fines have to be sent to fined people as soon as possible also before the relevant law deadline (according to the Italian law penalties have to be sent within 150 days starting from the date of the penalty). Otherwise people cannot know that they have been fined and without this feed-back they will continue in their behaviour, not only they can collect several penalties with the relevant social and political problems (while it is correct to fine an abuse it could be less correct, even if formally relevant with the law, to fine more times the same abuse without informing the fined person). The best approach could be to start with *virtual* penalties it means that during the first weeks just after the gate installation it could be better to send in real time something like a *warning* instead of a real penalty,

this should permit to people to understand their fault and therefore to change behaviour being this the real target of the project: not to fine but to improve regularity and speed of public transport avoiding misuse of the reserved lanes.
- To install, in the proximity of the gates, big and lighted information panels (in addition to the ones requested by the law) to inform drivers about the gate presence.
- Where and if it is possible ("where" according to the size and shape of the street and "if" according to safety roles) it could be better to install physical devices to separate the reserved lanes from the other lanes than to install the gates (virtual separation).
- If it is possible ("if" according to the law and economic resources) it be better used coloured asphalt in the reserved bus lanes for an immediately identification of them

D4 Future activities relating to the measure

On going all activities concerning the bus lane control according to the project.