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SIXTH FRAMEWORK PROGRAMME

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SUSTAINABLE DEVELOPMENT, GLOBAL CHANGE & ECOSYSTEMS

INTEGRATED PROJECT – CONTRACT N. 031315

Towards advanced transport for the urban environment

Yearly reports on Rome demonstration progress

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1 Introduction

The objective of the CityMobil project is to contribute to a more effective organisation of urban transport, resulting in a more rational use of motorised traffic with less congestion and pollution, safer driving, a higher quality of living and an enhanced integration with spatial development. In order to achieve this objectives advanced concepts for advanced road vehicles and passengers are developed. Further more new tools for managing the urban transport are introduced and barriers that are in the way of large-scale introduction of automated systems are removed.

In the first sub-project of CityMobil (SP1) those advanced concepts and tools are validated and demonstrated in a number of different European cities under different circumstances. Therefore three large-scale demonstrators have been chosen, which will present real implementations of innovative new concepts. Theses three innovative concepts will be implemented in the city of Heathrow, Rome and Castellón.

Concerning the Rome Demonstration, CTS will be implemented in the main car-park that will take the costumers from the car-park to the main entrance of Rome Exhibition.

In this deliverable the yearly progress concerning the Rome demonstrations is described. The main achievements of the Rome Demonstration in this year are:

- The definition of the requirements of CTS;
- The preparation of the Call for Tender for implementation of CTS in P1 car park;
- The preparation of the project for civil works needed for insertion of CTS in P1 car park.

Some institutional and political problems have been experienced and ATAC is not already entered in the project. For this reason the Call for Tender for the implementation of CTS has not already been published causing a delay in work plan previously scheduled.

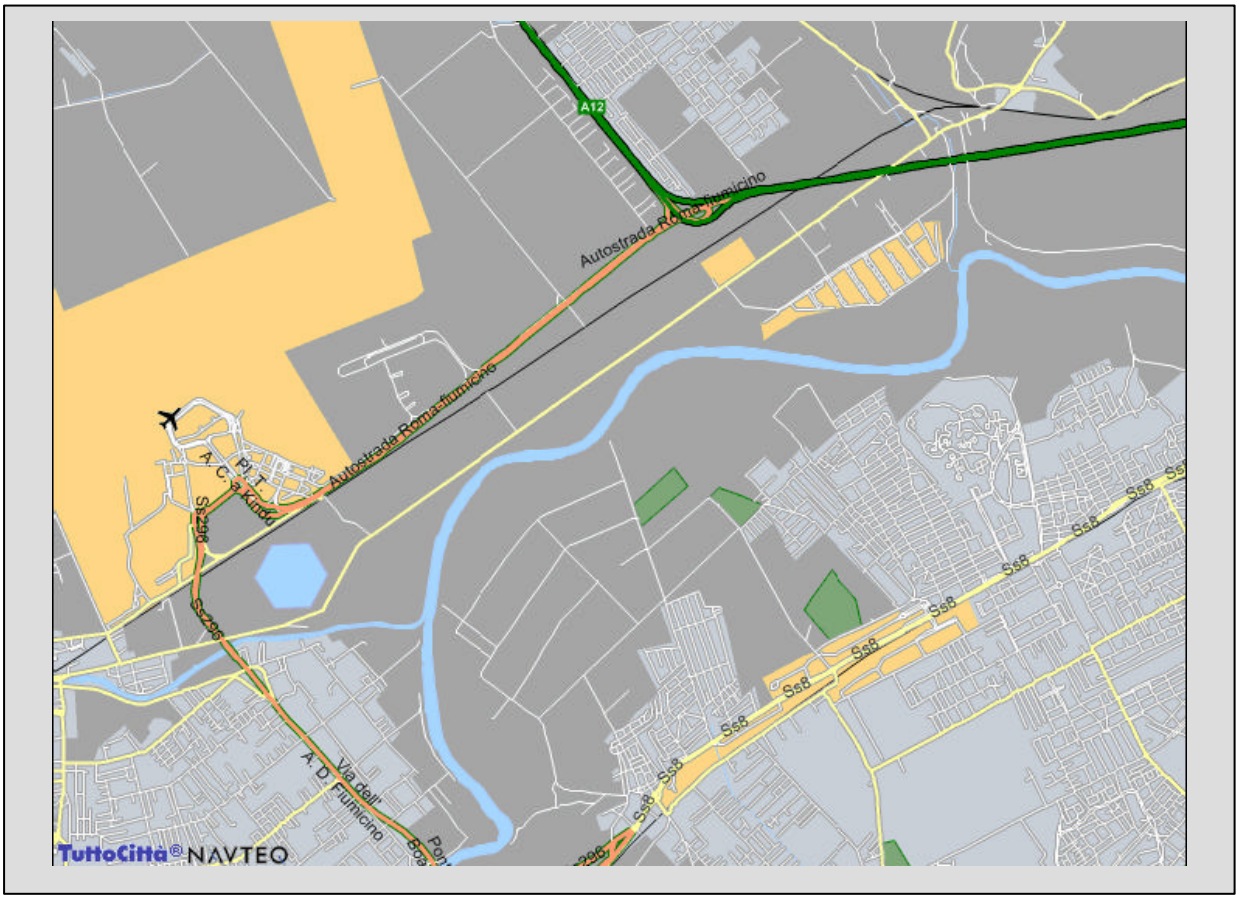
2 Rome Demonstration

Rome is building a new exhibition centre to replace the old one. The old one is currently inside Rome with big problems of parking, public transport and with a limited exhibition area. The new one aims to become one of the important European exhibition areas.

It will be located in the direction of Fiumicino airport (the main international airport of the city) on the west side of the city 3 km outside of the outer ring road and 16 km away from the city centre, along the airport highway and railway link.

The area where the new exhibition is being built is on the lower side of the airport highway and railway link and it is shown in Figure 2.1, whereas the new building for the Rome exhibition centre is shown in Figure 2.2. Around a 1.5 km long central corridor, each block represents an exhibition stand of 72 by 12 metres each.

Figure 2.1: The area where the new exhibition is being built



In front of the building, there is a car-park with about 2500 car-slots. The building can be reached not only with the private car, but also with the train by using the railway from Fiumicino Airport to Rome (FM1). The distance between the railway station and the nearest building entrance is about 500 metres.

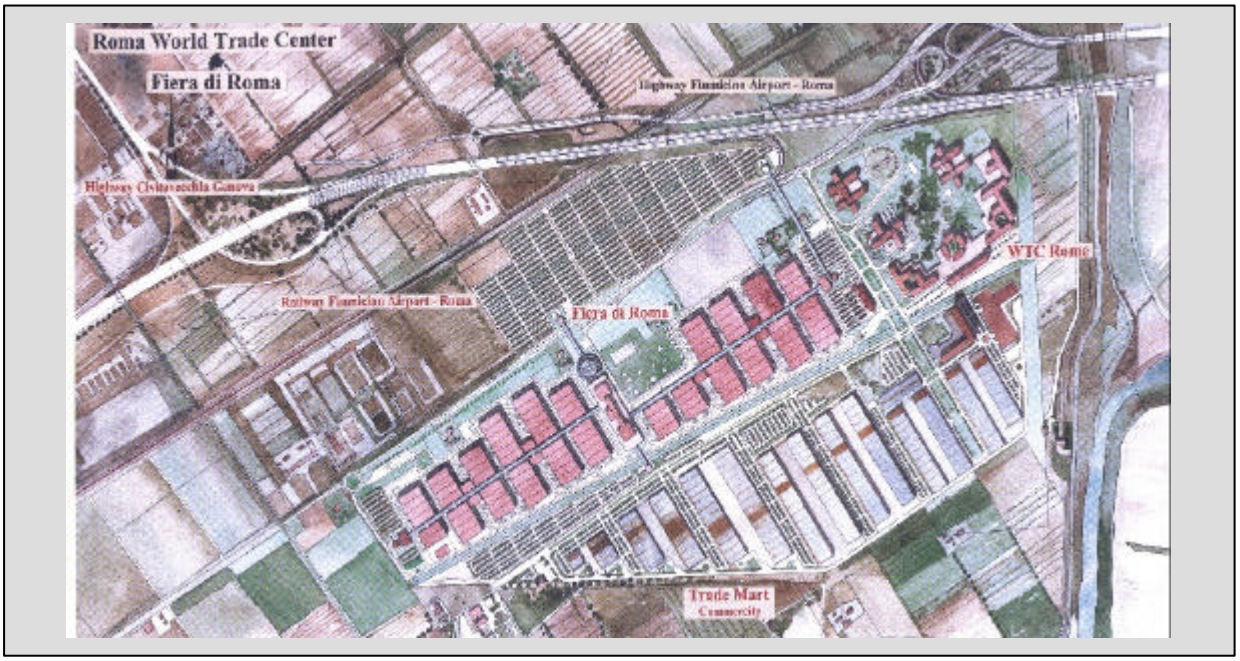
The transport system that will be the core of the Rome demonstration will serve the car-park and probably the railway station with two objectives:

- To improve visitors' accessibility to the buildings, for people coming both by car and by train;
- To eliminate the shuttle, which would be needed to serve the farthest car-slots.

A further objective in the longer term is to demonstrate the economic viability of automated systems for providing an effective feeder transport service; if successful, similar systems are expected to cover the feeder public transport needs for the new housing currently under construction along the railway and toward the airport.

With respect to the initial design, the car-park in front of the building has been re-designed in order that a "Cybercar" network can be built inside it. Its aim is to pick-up the visitors once they have parked their private cars and to bring them to the building entrance. On the return trip a "Cybercar" drives them to their car-slots. The extension of the system to the railway station will be evaluated after the implementation of the CTS in the main car-park.

Figure 2.2: New building for Rome exhibitions



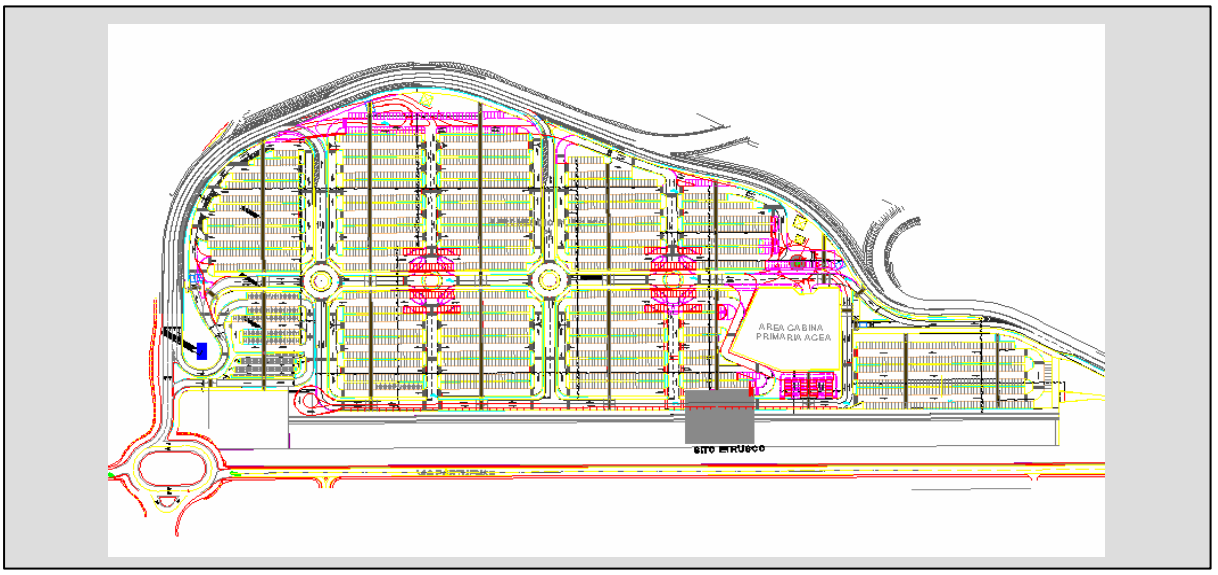
The car-park capacity with the present design is 2500 car-slots. Visitors park their cars in the slots without any order searching for a free place at their arrival. However there are parking zones inside the car-park about 600-700 metres distant from the building entrance, meaning that some people would need to walk for more than 10 minutes to reach the exhibition, and to return to their cars. In such cases, it is common experience in Italy, to park illegally in the proximity of the entrance rather than use parking spaces. In order to avoid this problem, the car-park has been re-designed introducing a "Cybercar" network inside it to pick-up visitors once they have left their cars and to bring them to the building entrance. Once they finish their visit inside the building, the "Cybercar" returns them near to their cars.

The new structure of the car-park is shown in Figure 2.3.

The main features of the new system car-park – "Cybercar" network are:

- A "car corridor" around the car-park to allow car owners to reach the slots, which they have been addressed at the car-park entrance gate;
- A central "Cybercar corridor" from the left to the right with five vertical joined corridors to serve all the car-park as reported in Figure 2.3;
- Car-slots for impaired mobility people cars near the entrance of the building.

Figure 2.3: New car-park structure after the insertion of the CTS



In this configuration the “Cybercar” is segregated and the maximum allowed speed is 30 km/h (according to CyberMove results, see reference list). Furthermore this new configuration avoids congestion problems due to the absence of intersections between “Cybercars” and cars and parking-search traffic, because each car is addressed to a specific slot at the car-park entrance gate.

At the two car-park entrances (one on the west side and one on the east side), there are automated gates: once a car enters, the driver states how many passengers there are in his/her car and receives a ticket which shows in which car-slot he/she has to park. Immediately a “Cybercar” vehicle is sent to the “Cybercar” stop, which is the nearest to the car-slot and is waiting there for the visitor to arrive at their designated parking slot.

The new configuration of the car-park has 3,000 car-slots. The total length of the “Cybercar” network is 2.2 km. 20-place “Cybercar” vehicles have been chosen to serve the visitors.

The system will provide a fully on-demand service, and vehicle reservation will be integrated with the car-park management; each time a car enters the car-park-gate it receives the number of the slot where to park and an automated vehicle is called to wait for the car occupants at the right stop.

These features contribute to the achievement of four different objectives:

- Improvements in transport performance.
- Increased public acceptance of public transport services.
- Proof of financial viability.
- Demonstration of the technical maturity of the technology.

2.1 Actual situation

The first four blocks of the New Rome Exhibition has been opened on 21st of September of 2006 and the works are on going to build the other blocks. Anyway New Rome Exhibitions is working and the main car park has been opened to customers (P1 car-park). The P1 car-park is now managed manually and many problem has been experienced by customers going to the exhibition and by Exhibitors. The P1 car park is always empty, because of high entrance fee that is 5 € and there is a problem due to illegal parking in the surrounding of Rome

Exhibition. For this reason the Commissioner for the Mobility of Rome Municipality is trying to find out a solution.

2.2 CTS requirements definition

The definition of Demonstration requirements has been done at month 3 as planned in DoW. The analysis made in D 1.3.2.1 has found the major requirements to make it operating that are:

- A system for the communication of the network status in terms of status of the vehicles, traffic control and power management;
- A system for the communication between the vehicles;
- A system for the management of the network intersections, in terms of priority of vehicles passing the same intersection;
- Systems for the management of visitors' requests (through human-machine interface (HMI) in the automated gates), in terms of car-slot and vehicle selection and verifying of the right position of the cars inside the car-park;
- Techniques for the management of peak hours, considering at the same time the recharging operations of the vehicles;
- Safety measures, especially linked with the obstacle detection;
- Certifications for the approval of the new "Cybercar" system.

Such requirements could be satisfied by interaction with the other sub-projects, especially SP2 for CTS approval, SP3 for obstacle detection and avoidance, platooning technique, intersection management and communication between the vehicles, and SP4 for advanced CTS network management (including car-slot selection and verification of the right position of the cars, vehicle selection and recharging) and system integration with the car-park. The interactions with other SP will be planned when the CTS detailed design will be done.

2.3 Preparation of call for tender for the implementation of the CTS

After the definition of Demonstration requirements the preparation of the call for tender for the implementation of the CTS in P1 car-park, and the preparation of project for the civil works needed in P1 car-park for the insertion of the CTS started.

The call for tender is ready and all the requirements have been defined taking into account what reported in D 1.3.2.1 and some informal suggestions from Ministry of Transport that is responsible for the approval of the CTS.

The requirements reported in the tender are referred to:

- Cybercar technical requirements;
- Stops technical requirements;
- CTS management requirements;

Concerning the Cybercar some of the requirements reported in the tender are:

- Max dimension of Cybercar a max capacity in terms of passengers. Each Cybercar must have a max dimension of 6 m X 2,1 m and a max capacity of 20 passengers;
- Max speed and max acceleration and deceleration. Each Cybercar must have a max speed of 8,33 m/s (30 kph) and a max acceleration and deceleration of 1,2 m/s^2. In case of danger the deceleration could be higher than 1,2 m/s^2.

More over each Cybercar must have on board:

- An obstacle avoidance system;
- A wireless communication system;
- An internal telephone for passengers to contact the control room;

- An emergency stop system that could be activated by passengers on board or from control room in case of danger.

Concerning the 13 off-track stops of the CTS some of the requirements reported in the tender are:

- Each stop must have a length of 7 m and the platform must have the same height of the Cybercars.
- Each stop must have a door that will be opened when a Cybercar will arrive in the stop;
- Each stop must have an internal telephone for calling the control room in emergency cases.

Concerning the management of CTS some requirements have been inserted in tender and the most important are:

- During the peak hours there will be scheduled service;
- Outside the peak hours there will be an on-demand service:
  - When a car enter will be sent to a sector of the car park;
  - A Cybercar will be sent to the nearest stops waiting for driver and other occupants of the car;
  - The Cybercar will take the passengers to the main entrance of the exhibition.
- Outside the peak hours the maximum waiting time to the stop must be less than 2 minutes in 90%of cases.

Together with the call for tender a layout of P1 car park has been defined. In the final project for the civil works needed for the insertion of the CTS have been defined:

- Position and number of entrance/exit gates (6 entrance gates and 6 exit gates);
- Position of the stops;
- Position of the control room;
- Position of the Cybercar depot;

Some of plates of final project are reported in the Annex A.

2.4 Problems experienced in this first year

The building of New Rome Exhibition has been delayed due to archaeological discoveries done during the works. In particular projects of P1 car-park and of train station car-park have been changed due to archaeological discoveries. This problem has caused a delay on the project schedule.

Another delay to schedule is due to the delay of ATAC entry in the project (ATAC is the Rome Municipality Institutional partners for what concern mobility). ATAC will manage the all car-park areas of the New Rome Exhibition and the delay of its entry in the project is linked to two different reasons, being:

- The economical risk linked to the management of the CTS. Indeed the EU funding covers only 35% of the cost for the management and the implementation of the CTS; the other 65% of the costs should be covered by the fees paid for parking in P1 car park. For this reason ATAC and Rome Municipality are still discussing about the future pricing scheme;
- the New Rome Exhibition Management has asked for management of all the parking areas and is doing quite strong political pressures to obtain it causing some problems and delays.

Anyway ATAC is already working with the CityMobil project and has been informed about the situation.

2.5 Adaptations of work and time plan

Taking into account the problems and the issues above reported the next steps of the Rome Demonstration could be:

1. Formal agreement between Rome Municipality and ATAC for the management of car park areas of the Exhibition (before the end of May 2007);
2. Publication of the call for tender for the implementation of CTS in the P1 car-park and the acquiring of 2 Cybercars (August 2007). In the call for tender there will be an option for buying other 8 Cybercars at the same conditions proposed by the contractor in the bid within 15 months from the sign of the contract. Award to the best bid into three months from the publication (November 2007);
3. Before November 2007 infrastructural works in P1 car-park for the insertion of CTS will be done;
4. The delivery of the first two Cybercars and the installation of the guidance system are expected into 6 months after the awarding of the Tender (May 2008).
5. The approval of the CTS probably will require a quite long time and is expected before May 2009;
6. After the approval, 6 months will be needed for the full implementation of CTS in P1 car-park and probably the CTS will be opened to the costumers before November 2009;
7. After the full implementation of the CTS in P1 car-park the economical and technical sustainable of connection between the train station and the main entrance of the Exhibition will be evaluated.

The respect of this work plan is strictly linked to the entrance of ATAC in the project and to the time required for the approval of the CTS.

3 Sources

3.1 Reference List

CYBERMOVE CONSORTIUM, 2004, a. Ex-ante Evaluation, Deliverable D2.3a&6.2b of CyberMove project

CYBERMOVE CONSORTIUM 2004, e. Final evaluation report, Deliverable D6.3 of CyberMove project