PROJECT

**CyberCars**

**Cybernetic technologies for the car in the city**

**Funding:** European (5th RTD Framework Programme)

**Duration:** Aug 2001 - Jul 2004

**Status:** Complete with results

**CORDIS RCN : 61003**

**Background & policy context:**

In many urban environments, private automobile use has led to severe problems with respect to congestion, energy (our dependency on oil resources), pollution, noise, safety and general degradation of the quality of life. Therefore, historical cities centres are facing severe problems, traditional commerce in them declines, moving to the periphery, and they become less attractive to tourists. Although public transport systems have seen many recent improvements (mostly due to information technologies), in many cases the car still offers a much better service at the individual level. This leads to a constant increase in its use, hence to non sustainable development of urban transportation. A new approach for mobility, emerging now as an alternative solution to the private passenger car, offers the same flexibility and much less nuisances: small automated vehicles form part of the public transportation system and complements mass transit and non-motorised transport, providing passenger service for any location at any time. Such systems can also evolve to provide door to door freight delivery or garbage collection. Experiments are under way in several places in Europe and in Japan and the first operational system (the ParkShuttles) has been in use in the Netherlands since the end of 1997 and is now being expanded.

**Objectives:**

The project main goal is to accelerate the development and implementation of novel urban transportation systems, based on automated vehicles for movement of people and goods. These systems aim at improving the mobility, while reducing negative effects of the private car use in cities (congestion, pollution...), by complementing today's mass transit systems and hence offering a real alternative with better convenience and efficiency than the private car in the cities. The main characteristics of these systems are the use of small electric automated vehicles which run on the existing urban infrastructure but with a limitation of private vehicles in speed and access.

These vehicles will be made available on demand for door to door service in complement to public transportation. The deployment of such systems in cities will provide better urban environment and mobility for all users, better safety and security, and reduced dependency on oil resources. This will make European city-centres more accessible and attractive for business, culture and tourism.

**Methodology:**

The work is focused on the testing, analysis and improvement of existing techniques which are starting to appear on the market. In particular, technical improvements are expected for the vehicles on guidance, collision avoidance, platooning and vehicle control systems. For the infrastructure, technical improvements are also expected on the system management, human-machine interfaces, remote operation and energy management.

The improvement of the various technologies are targeted into integration in the cybernetic vehicles and in the infrastructure. The analysis will be performed by looking at the users requirements in terms of operational performances of the transportation system. Several cooperating cities will join us in this analysis. Existing systems will then be tested on private grounds in order to set technical goals for the
improvements expected. The technical improvements will be performed and tested on the same premises and evaluated against the needs.

Part of the work will finally include a real size experiment in the city of Lausanne for detailed evaluations of the performance and users acceptability. Looking at the existing legal constraints which can hamper the diffusion of such systems in cities, a significant part of the work will address the certification guidelines which could be accepted at the European level. Finally, dissemination work will be performed throughout the project in order to accelerate the implementation of these systems in the cities.

The dissemination work will consist of a detailed and very informative Web site, of conferences and seminars directed at the key city technicians and officials who participate in the implementation decisions and at demonstrations in cities and public grounds to prepare the public.

Related Projects:
The Cybercars Project is related with the following European Projects:
- UTOPIA Project
- ADASE Project
- CARSENSE Project
- RADARNET Project
- STARDUST Project

Parent Programmes:
FP5-EESD KA4 - City of Tomorrow and Cultural Heritage

Institute type: Public institution
Institute name: European Commission, Directorate-General for Research (DG Research)
Funding type: Public (EU)

Partners:
- Institut National de Recherche en Informatique et Automatique
- Centro Ricerche Fiat Frog Navigation Systems (FNS)
- Yamaha Motor Europe N.V.
- Autos and Energies RUF
- International Robosoft SA
- CN Serpentine SA
- University of Bristol Transportation Research Group
- University of Southampton Organisation For Applied Scientific Research
- TNO Transportation Research Institute
- Technion, Israel Institute of Technology
- Instituto de Sistemas e Robotica, University of Coimbra
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Key Results:
The CyberCars Project was focused on the development and dissemination of a new form of urban transport based on cybercars, which are road vehicles with fully automated driving capabilities. Such innovative transport system can provide on-demand and door-to-door capabilities for passengers or goods. The project has focussed on the improvement and testing of the technologies, on the certification procedures and on the dissemination.

For the technologies, several new techniques have been developed for better guidance, collision avoidance, energy utilisation and fleet management and the development of simple, standard user
The project was able to improve significantly the performances of these technical systems or to lower their cost. Guidelines have been established concerning the development of cybercars and their installation and should lead to new certification procedures. Finally, the project has performed a thorough dissemination activity during the entire length of its life with a very active web site (www.cybercars.org), numerous scientific papers and conferences, excellent media coverage and several technical demonstrations in cities such as the final one in Antibes, now available on a DVD.

**Policy implications**

If cybercars become very popular, there will be a need to develop a new dedicated (and protected) infrastructure (very light and possibly elevated) that could have a high throughput because of platooning techniques, to link the automated zones together. With the availability of a large network for automated travel, private cars would be interested to use these infrastructure (under control of the overall management of the resource and possibly with a toll) for automated driving, using the capabilities of the driver aids. For the same reason, freight transporters would also be interested to use the network for automated goods delivery, in particular for city environments where large (and perhaps medium size) delivery trucks are or will be prohibited.

We can see that this is the most promising approach since it can serve a large portion of transport needs. If the political will is present to offer an alternative to traditional cars, this approach could lead quickly to a large infrastructure dedicated to driverless cars (with mostly existing roads for low speed driving in limited access areas) and new infrastructures for high speed driving.

**Intelligent Transport Systems**

**Key findings**

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**STRIA Roadmaps:** Cooperative, connected and automated transport, Smart mobility and services

**Transport mode:** Road transport

**Transport sectors:** Passenger transport

**Transport policies:** Digitalisation

**Geo-spatial type:** Urban