New Technologies
Sustainable Urban Transport in Europe

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www.cybercars.org
Problems of Road Transport

- Use of fossil energy (GHG+Dependency)
- Pollutions
- Accidents
- Health
- Quality of life
- Equity
Modal Split

Surface Transport Modal Split

EU vs. US

- Car
- Bus/Coach
- Railway
- Tram & Metro
Transport Objectives

While improving mobility for people and goods:

- Eliminate accidents
- Reduce energy needs and GHG
- Reduce local nuisances
- Reduce the need for public space dedicated to transport
- Offer a transportation accessible to all
How to meet the objectives?

- Better urban planning
- Offering better high capacity modes
- Improving the multimodality
- Developing door to door alternatives
- Offering the car as a service and not as a product
- Taking the driver out of the control loop
- Controlling the system as a whole
European Research Approach

- **Urban Planning and Land Use** (www.lutr.net)
  - *Travel Demand Management*,
  - *Parking controls*,
  - *Road user charging for passenger and freight vehicles*,
  - *Urban distribution centres*,
  - *Land use planning that favours urban regeneration and polycentric development*

- **New Urban Transport Technologies** (www.netmobil.org)
  - *Advanced Drivers Aids*
  - *Advanced Mass Transit (including PRT)*
  - *Car-sharing and CyberCars*
Driver Aids

- ABS/ESP/EBA/…
- Adaptive Cruise Control (ACC)
- Intelligent Speed Adaptation (ISA)
- Lane Departure Warning (LDW)
- Lane Keeping Assist (LKA)
- Parking Assistant/Automated Parking
- Stop&Go
- Anti-collision…..
Better Mass Transport
IMTS (Toyota)
IMTS - Aichi
Philleas BRT
Phileas
Car-Sharing

- Advanced instantaneous rental system
- Fleet of vehicles available in particular stations
- Reservation through telephone or Internet
- Access through coded lockers or keyless access
- Exists since the 60’s
- Station-car variant (from station to station)
- Complement to mass transport (time/space)
Cybercars

- Road vehicles (Micro-car to mini-bus)
- Low speed driving automation. Dual mode?
- Existing and new road infrastructure
- Segregated automatic mode (from drivers)
- Central management system (CTS)
- Public door to door on demand transport
- Private vehicles allowed in the future
Cybercars History

- First concepts in early 1990’s (Serpentine, RUF, Dedale,…)
- First prototypes in mid 1990’s
- First operational system late 1997
- CyberCars project in 2001
- Large scale experiment in 2002
- Antibes demonstrations in 2004
- Rivium II (2005)
- CyberCars2 (2006)
- CityMobil (2006)
Floriades - Amsterdam
ULTra
Antibes Problems
Antibes Project

- A 1500 meters 2 ways track
- 24 hours a day
- 3 minutes waiting time
- 5 minutes trip
- flexibility was the key criteria
Antibes CTS integration

Before

After
Antibes Demonstration

- June 2004
- Very simple to install technically
- Two weeks in the city
- 4,000 passengers
- Very strong positive response
- Political support
- Operational in 2007?
Antibes Evaluation (1)
Antibes Evaluation (2)
Key Industrial Present Players

- Frog Navigation Systems (2GetThere)
- Robosoft SA
- Advanced Transit Systems Ltd
- Serpentine SA (Lohr)
- EcoTaxi (Koné)
- Taxi 2000 Corp.
- Mitchel Transit Systems Inc.
- Vectus Ltd (Posco Corp., Korea)
CTS Projects

- Rotterdam-Capelle (Frog), NL
- Heathrow airport (ATS Ltd), UK
- Shanghai Jiao Tong University, China
- Rome Expo, Italy
- Mont St Michel, France
- Antibes, France
- Vantaa, Finland
- DestiNY, USA
Dual Mode Cybercars

- City car adapted to car-sharing
- Assisted driving on regular roads
- Objectives of automation:
  - Relocation (platooning or automated tracks)
  - Automated parking
  - Automated driving on a network
  - Advanced fleet management
The AMIC A System

(Auto Mobilità Individuale Basata sulla Condivisione di Autoveicoli)

The AMIC A System is based on:

- A fleet of small cars, specific for the city environment, which provide individual on-demand transport
- A set of micro-parking lots densely diffused in the operation area
- A centre for management and control
- Technologies for the re-distribution of vehicles (on specific lanes) in automatic or semi-automatic mode to react very quickly to requests
DARPA-Hard Challenges

- Avoid a child running across the path of a cybercar moving at 30 km/h
- Merge two flows of vehicles running at 150 km/h with total throughput of 8,000 veh./h
- Handle an emergency stop as per above
- Handle a street crossing of 2 flows of automated vehicles at 1,000 veh./h
Transport Research Agenda

- Improve the technologies for mass transport
- Improve the technologies for cybercars
- Develop the transport service concept
- Develop a new automated road network
- Get cities to support new transport services
- Develop the business model for the services
Paris-Plage
Nostalgia…. 
Thank you

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