Opportunities and barriers to the introduction of automated transport

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Highlights from Tony’s presentation

- No policy instrument is sufficient alone
- An integrated strategy with clear objectives (e.g. car-use reduction) must feature a number of measures
- Any ATS has a niche where it performs best but they are no magic wands; they need to be part of a wider strategy
- However where correctly used they can help making urban transport more sustainable even with positive BCR
Barriers to ATS diffusion and how CityMobil addresses them

- Technological
- Diffusion
- Regulatory and standardisation
- Economic
- Implementation
- Mind change
Technology

- ATS technology is ready for the market
- Is there room for further improvement?
  - Of course there is
    - Navigation can gain in precision and speed
    - Obstacle avoidance can learn to see in the dark and in severe weather conditions
- However CityMobil (and not only) demonstrated that current technology is enough for reliable and useful applications
Diffusion

- Most local transport planners and politicians do not know about ATS and their advantages.
- We have a strong belief that politicians and citizens need to know about these systems.
- CityMobil and CityNetMobil organise events like this one these days to show citizens, politicians and local stakeholders that these systems are no longer science fiction but after all we are working for the future.
Regulatory and standardisation (1/2): the legal aspects

• Automated systems are not allowed on normal roads because a specific legal framework is missing
  – In La Rochelle the vehicles circulate with an “arrêté” of the mayor allowing them
  – In Rome there is a long certification process going on

• The EC will need sooner or later to issue a Directive regulating automated driving
Regulatory and standardisation (2/2): responsibility attribution

- Who is responsible if an automated vehicle is involved in an accident?
  - The manufacturer?
  - The system manager?
  - The passenger?
  - The community?
**Economic**

- ATS (though can be designed for higher capacity) are normally in the capacity range of a bus network
- But have a much higher investment costs
- They do have a perspective of lower costs over the time but an higher initial investments nevertheless
Implementation

- Many actors decide upon city mobility and it is very unlikely they all agree upon the installation of ATS
- To the success of these system strong “push” (unpopular) accompanying measures are often necessary
- Nobody wants to be the first to implement a new system
- CityMobil implements three large scale and lasting demonstrators to smooth such barriers
Mind change

Adoption of automated transport would require a fundamental shift in the users’ mentality from asking:

**WHY I SHOULD BUY AN AUTOMATED CAR?**

to asking:

**WHY WE SHOULD USE AN AUTOMATED CAR?**

Increasing awareness of environmental and climate change problems and the need to change mobility habits in the urban environment may provide for this shift to happen.
Enough of barriers
let’s see the opportunities
Some more of Tony’s highlights

- Some appropriate niche markets for ATS are
  - Suburban PRT or Cybercar Feeders to PT in larger cities
  - High Tech Buses on major medium density corridors
  - PRT distribution within centres of smaller cities
  - And probably services for major activity hubs

- It is essential that these are designed to complement, reinforce other strategy elements
Opportunities offered by ATS diffusion

- Use the ATS to reinforce sustainability policies which otherwise cannot become popular
- ATS to reduce energy consumption and environmental impact of transport
- ATS to provide a seamless public transport with private-car-quality even where it seems to be impossible
- ATS to make cost effective public transport in off peak hours
ATS for sustainability policies

- To build a brand new “sustainable” city quarter you need to remove private cars but would people leave there without cars?
- Pricing and rationing strategies to limit access to city centres are often a burden on the poorer and a benefit for the richer. ATS can contribute to change that.
- Unpopular car-use restriction policies can be enforced more easily when a good PT is provided.
- ... reducing car-ownership rate in cities is a key to sustainability.
ATS for energy and the environment

- Fully or partially automated electric cars in sharing can diffuse the electric car in cities much more than trying to sell electric cars to citizens.
- On average 25-30% of fuel consumption (at 20 km/h avg speed) is due to the driver and not to the vehicle ... remove the driver ...
- Having ATS to ride in the cities will help the citizen to use more appropriate conventional cars when they drive outside of the cities.
ATS for a seamless high quality public transport

- The Achilles heel of any public transport is low and dispersed demand (typically peripheral urban areas) and this is where ATS perform best

- With a conventional PT when demand is low there is no other option than lowering the frequency and therefore the quality of PT

- Integration of ATS with high quality high frequency mass transit can be (and should be) done in a very effective way ... look at Heathrow PRT stations in airport Terminal 5
ATS for an effective public transport in off peak hours

- When it makes no sense to keep the metros running smaller automated vehicles can use their tracks
- When driving is not recommended (e.g. when you have been drinking)
- ATS can reduce the capacity without reducing the quality of service supplying a h24 good public transport
Conclusions

- Advanced Transport Systems are a range of complementary solutions to make urban transport more sustainable
- CityMobil is bringing the implementation of these systems one step closer developing knowledge and disseminating them
- ATS can be an effective part in a greater strategy to make urban transport more sustainable
- But each city needs to highlight its problems, define its strategy and then look to ATSs, and not just to ATSs, for solutions
- There are still barriers to overcome but, not without, difficulties they can be
THANK YOU

For information
CITYMOBIL Website:
www.citymobil-project.eu
But what exactly are these advanced transport systems?

- Advanced here stands for:
  - automated (fully or partly)
  - safer
  - cleaner

- But what does it mean in terms of the transport service supplied?
  - an ATS can be private but also public,
  - individual but also collective,
  - small but also very big,
  - on demand but also on schedule,
  - automated but also manual or semi-automated,
  - on segregated routes but also on shared ones,
  - ...

CityMobil Conference, La Rochelle
How much does a cybercar network for peripheral PT-feeding costs?

- **Start-up costs are:**
  - 0.5 ~ 4 M€/km for short distance services on existing infrastructure against 0.5 M€/km for a bus service and 11 M€/km for a tramway

- **Operational costs are:**
  - 0.5 ~ 3.17 €/veh·km (excluding vehicle depreciation) against 2.8 ~ 3.5 €/veh·km for buses