

Project update

CityMobil conference, 12-13 May 2011

CityMobil is celebrating the end of its five year programme on the development and demonstration of innovative transport technologies for cities with a major international conference in La Rochelle (France), a city well known for pioneering sustainable mobility solutions.

Results from the three large-scale implementations (Heathrow, Castellón and Rome) and from the industrial and academic research will be presented together with general analyses on the advantages and challenges of introducing automated transport technologies in urban mobility. Specialists in urban planning will present their views on the changes which can be expected from the introduction of these new (semi) automated transportation systems to make life in cities better and more sustainable. The conference will be held alongside an exhibition of automated vehicles.

Conference delegates will have a guided tour of La Rochelle's cybercars demonstration, one of the first transportation systems based on fully automated vehicles in a public area. This demonstration follows the advanced mobility "showcases" which were carried out in several European cities during the CityMobil project. It will run within walking distance of the conference venue until June 2011. Further information about the conference is available on the CityMobil website (www.citymobil-project.eu)

CityMobil on Discovery Science Channel

In October 2010 on the Planet Green Channel, the show "Dean of Invention" premiered. Dean of Invention follows Dean Kamen, a renowned inventor, and correspondent Joanne Colan as they explore the emerging technologies being developed to tackle the most daunting global challenges of today. In each episode, Kamen and Colan encounter the world's latest cutting-edge creations by embedding themselves with leading scientists, doctors and inventors.

CityMobil is part of the episode "Forward Motion," which aired on November 19. The episode should also be available as Video On Demand and for download through iTunes. Following the Planet Green channel "Dean of invention will air on the Science Channel in the first quarter of 2011. To download the

video, go to: <http://planetgreen.discovery.com/videos/dean-of-invention-who-is-driving-that-car.html>

News from the demonstrators

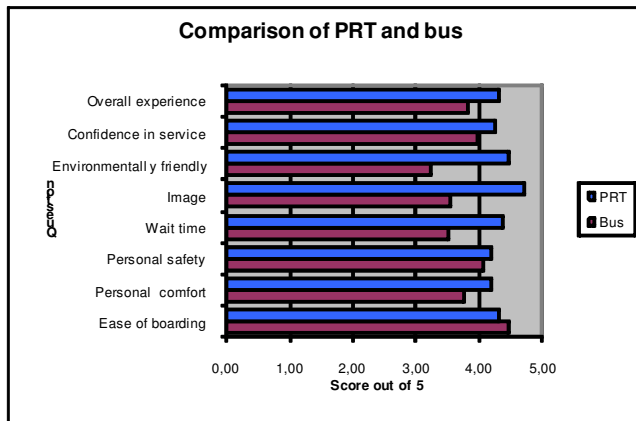
Heathrow PRT under extensive testing

Summer and autumn 2010 have been spent running the Heathrow PRT system with a full complement of vehicles and intensive monitoring by BAA staff, plus a wide range of operational testing by ULTraPRT Ltd. As with any new system and especially with one as innovative as this, there has been an assortment of minor problems. It is very encouraging that those aspects of the system which relate to the control and operation of the Personal Rapid Transit vehicles have worked well and reliably, but there has been a frustrating series of minor faults with the peripheral equipment. Bought-in components such as touch-screen destination selectors and door closing sensors should be straightforward and reliable but, as many transport constructors have found, it takes time to sort them out. It was also necessary to change the frequency of the voice communications band (for communication between passengers and central control) to obtain adequate transmission across the system, and to optimise the location of the in-vehicle audio equipment.

However, these technical adjustments have been made in parallel with gaining extended experience in operation of the system. Having finally gained full reliability and confidence in the system, BAA have begun "Simulated Revenue Operation", whereby airport workers use the system in exactly the same way that regular Business Car Park users will use it, once it opens for regular service. Naturally, BAA need to be confident that, once it opens to the public, it will be absolutely reliable and, unlike so many new advanced technology systems, it will not have to be taken out of service almost as soon as it opens.

This caution has extended the commissioning period, but it has provided valuable operating experience and engendered great confidence. It has postponed the CityMobil survey of passengers, for comparison with the survey of transit bus passengers made in March 2009, and this will not now take place until the New Year. Nevertheless, many different groups of people have ridden the system during commissioning, and this provided a good opportunity to pilot the survey questions. So far, over 50 passengers have been surveyed, and although these results are preliminary, the bar chart shows very clearly

that passengers value highly the reduced waiting time for PRT compared with the buses, that they consider the vehicles comfortable and safe, and of course they have a much more modern image and are more environmentally friendly.



Some of the passengers surveyed in this way were attending the second PRT@LHR Conference, held at Heathrow in September. As with the first Conference, this drew an audience and presentations from many of the world's authorities on PRT, and gave them a chance to see the world's first PRT system in operation. CityMobil will provide a comprehensive assessment of the practicality and value of PRT, for dissemination to many cities and sites that are interested in installing it. A video of passenger trials with the system is available on the ULTraPRT website at <http://www.ultraprt.com/>.

Group rapid transit at Rome exhibition centre

The preparation of the demonstration of the people mover system (based on Cybercar technology) in the main car park of the new Rome exhibition centre is proceeding well. The Cybercar corridor has a round-trip length of about 1 620 metres and includes 11 stops, which are within 100 metres of nearly all parking bays. The track will be fully segregated by means of a fence and the stops are provided with doors that open only when the Cybercars are stationary at the stop. Two of the stops are located close to the eastern and northern entrances of the new Rome Exhibition.

Progress has been made in the last 6 months. The civil works will finally start in November 2010 and should last around 3 months. Civil works in the P1 car park are required to meet the certification requirements of the Italian Ministry of Transport (MoT) and the most important modifications to the P1 car park are:

- The track which should be segregated - for this reason a 1.2m high fence will be erected along the track and each stop will be equipped with doors.
- The construction of a control room, a depot and maintenance area for the Cybercars;

- The installation of a fibre optic LAN needed to allow communication between the Cybercars and the control room.
- The civil works call for tender was issued on 13 January 2010 and now the bids are under evaluation at ATAC.

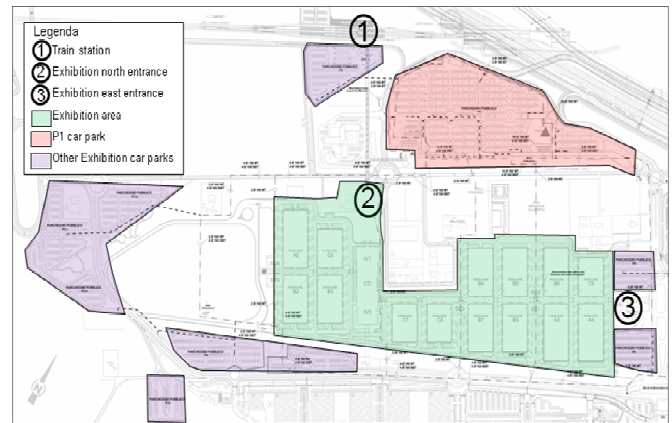


Figure 1 – Overview of the Exhibition Area

Concerning the vehicle construction, two vehicles are ready and have been fully tested at two different sites in France where the vehicles ran for about 1000 km. During the tests no major problems were met by the vehicles. Concerning the track it is interesting to report that after testing some ruts appeared on the surface. To avoid this problem in the call for tender for civil works, specific requirements were inserted.

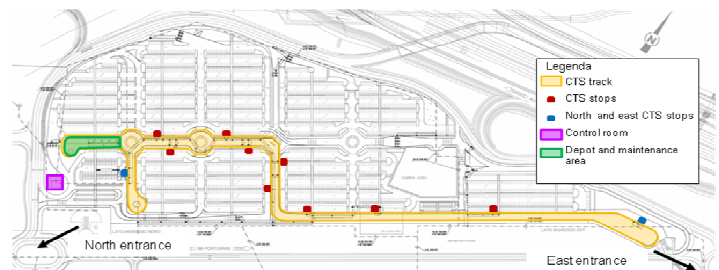


Figure 2 – Civil works underway in P1 carparks

Following a first training course held in the Robosoft premises in April 2010 for ITR staff who will manage the CTS once it is operational in Rome, the first vehicle was shipped in Rome in July 2010 and stored in a depot made available by ATAC. Since late August 2010, the vehicle is under testing and is managed by ITR staff with the remote support of Robosoft personnel. The vehicle runs each day, from Monday to Friday, for about 4-5 hours covering about 20 km each day. Several vehicle features are under testing such as: obstacle detection system, trajectory following system and long-run system reliability. All the data collected during this test are being stored in a structured manner to allow a full analysis and will be made available to the MoT for CTS certification.

The third area of work concerns the certification of the system. Following intensive preliminary work, the CTS final design has been provided to the MoT. After the review of the document



provided, the MoT requested a second round of documents to better understand some aspects related to the vehicle braking and navigation systems and to safety systems redundancy. The second set of documents has been prepared and translated into Italian.

The CityMobil coordinator, TNO, has proposed to support the CTS certification process and to test a new certification process for innovative driverless transport systems. The core of the methodology was the Failure Mode Effects and Criticalities Analysis (FMECA). This analysis was applied to the CTS and required 28 work sessions of 4-5 hours each from April to July 2009. The panel that run the analysis was composed of Gabriele Giustiniani from ITR, Damien Salle from Robosoft and was coordinate by Jan Van Dijke from TNO. ATAC personnel were involved in the analysis in the sessions on civil works only. The results of the FMECA have been translated into Italian and submitted to the MoT. The certification procedure is proceeding well and a meeting between ITR personnel and the Ministry of Transport is planned soon.

There are some new developments with the Rome demonstrator following the recent announcement of Rome as the Italian Candidate for the 2020 Olympic games. The area around the exhibition centre has been selected to host some of the competitions. For this reason the Mobility Commissioner of Rome has approved the extension of the system to the exhibition centre train Station and to the east exhibition entrance. This project is now under development and solutions to deal with the economic, financial and technical challenges will be defined in Deliverable 1.3.5.4 due in early spring 2011.

News from related initiatives



Ixelles showcase

The 3rd CityNetMobil showcase was held in Brussels from 19-22 September in Brussels and was hosted jointly by the district of Ixelles and the EESC (European Economic and Social Committee - a European institution representing civil society and trade unions). The 4 day showcase formed part of a wider event on sustainable transport called Move-IT, which comprised a number of activities including a high-level conference involving Siim Kallas, Vice-President of the European Commission and Commissioner for Transport (pictured in a cybercar), the Brussels Region Mobility Minister, EESC President, and the Mayor of Ixelles, Mr Decourty, as well as Michel Parent of Inria (representing CityMobil and CityNetMobil). In addition to the CyberCar showcase, which proved extremely popular among school groups, there was also an exhibition on sustainable mobility and a demonstration of innovative mobility modes. Taking advantage of this showcase, the CityNetMobil Reference Group held a one-day

meeting comprising a trip to the Group Rapid Transit system operating in Rivium (near Rotterdam) followed by a meeting to take stock of current interest and/or plans with regards to the implementation of automated transport.



Niches+ and Daventry

The host of the first ever CityMobil showcase of automated vehicles, the UK town of Daventry, is to hold a national seminar *Unlocking Transport Innovation* in the framework of the Niches+ project. Daventry has been selected as a Champion City within Niches+ which enables it to receive additional support from experts and financing through NICHES+ to progress its work in the area of space efficient automated transport systems.

The seminar will take place on 8 February 2011 and will offer a high-level panel of speakers including the EU Commissioner for Regional Policy and the Chief Scientific Advisor for the UK Department for Transport as well as PRT consultants and implementers of automated transport systems. For further information and to register, go to:

www.daventrydc.gov.uk/transport-seminar

PRT Heathrow conference

As the site of the potentially first PRT system to be launched in the world, London Heathrow was the ideal setting for a conference on PRT from 22 until 24 September. The two and a half day event, supported by CityMobil, saw a broad range of presentations on PRT and similar systems addressing a wide range of aspects including ongoing and planned implementation of automated systems, modelling and simulation, and public procurement. Delegates also enjoyed the opportunity to take a ride on the ULtra system at London Heathrow's Terminal 5. ULtra, or Heathrow Pod as it has been branded, is currently undergoing passenger trials prior to opening fully to the travelling public.



During the conference, delegates learned about other PRT schemes being implemented or considered in other countries around the world. These include, in addition to the Heathrow Pod, the 2getthere system under construction in Masdar (United Arab Emirates) and Vectus, a rail-based PRT system, which will be piloted in one of five Swedish cities applying for central government funding. Other cities that have expressed an interest in PRT and are the subject of PRT modelling and/or design studies include the historic city of Bath, a science park in The Hague/Rotterdam area, Daventry, Delhi and Shanghai. In addition, two CityMobil demonstrators (Rome and La Rochelle) were presented although these are not PRT systems strictly speaking but rather Cybercar systems which are fully automated and can operate in an open environment on a normal road.

Some interesting points coming out of the discussions included the role of PRT in changing travel behaviour, particularly moving away from the private car but also the potential shift from soft modes (walking and cycling). This discussion clearly pointed to the need for further research on the potential impact of PRT in a multi-modal city. There was a discussion around individual and collective ridership of a PRT system. Clearly on sustainability and efficiency grounds, it makes more sense to encourage passengers to share rides; however, this was perceived as moving away from the philosophy of PRT, ie, an individualised, origin to destination service (like a car), towards a mass transit type system.

Although local authorities are an important client group for PRT, efforts to persuade local authorities, in Europe particularly, to consider PRT have so far produced little. This is primarily due to the risk-averse nature of local authorities who prefer tried and tested solutions. Other important obstacles for local authorities are cost, visual intrusion and privacy. Despite many PRT modelling studies showing that the system can pay itself back over a given period of time, the huge initial capital outlay to design and build the system is dissuasive. The mainly elevated track of a PRT system is cited as a major barrier by transport planners, especially in historic cities. However, the PRT design produced for the historic city of Bath, in the CIVITAS project Renaissance, shows that it is possible to find sympathetic design solutions that can be reasonably well integrated into the urban landscape. The elevated track can also be a source of privacy issues, where it passes in front of a bedroom especially.

The discussion also briefly touched upon land value which could rise for home owners in the vicinity of the PRT network (as happens for land around railway and underground stations). It was proposed that an increase in land value could offset the intrusion and privacy aspects; however, studies have shown that land value increases would not benefit all nearby homes and indeed, those homes immediately adjacent to the

track could see their house price go down. Other ways of dealing with privacy loss and visual intrusion include route selection (ie, avoiding the most sensitive streets), screening, improving the street at ground level (eg, building street lighting into the track, enhancement schemes) and compensation. When appraising a system, it was recommended that the visual and privacy impacts be quantified and weighed up against the wider benefits of a PRT scheme.

The future of PRT was the focus of the final session of the conference. It became clear that awareness of PRT as a transport solution is still relatively low and furthermore, PRT lacks credibility due primarily to the absence of an operating system. A successful launch and operation of the Heathrow Pod and/or Masdar PRT system could help to dispel myths but it was concluded that more needs to be done to raise awareness and importantly to spell out the real benefits and potential impact of PRT over a conventional transport service. The conference demonstrated that there is a wealth of research findings on the benefits and potential impact of PRT and it was proposed that these findings be pulled together and new communication tools be devised, drawing on the research findings. In this regard, the Niches+ guidelines for implementers of PRT were cited as a good example.

Relevant events

- *Unlocking transport innovation*, 8 February 2011, Daventry (UK), www.daventrydc.gov.uk/transport-seminar
- ICT2011, 8-11 May 2011, Ayia Napa, <http://www.ict2011.org/>
- **CityMobil Conference, 12-13 May 2011, La Rochelle**, www.citymobil-project.eu
- *ITS Europe Congress*, 6-9 June 2011, Lyon, <http://2011.itsineurope.com/>
- *HAVEit final event*, 21-22 June 2011, Borås (Sweden), www.haveit-eu.org
- *IEEE Forum on Integrated and Sustainable Transportation System*, 29 June-1 July 2011, <http://www.ourglocal.com/url/?url=ieee-fists.org>
- 19th *World ITS Congress*, 16-20 October 2011, Orlando (USA)

What is CityMobil?

CityMobil is an Integrated Project, co-funded by the Sixth Framework Programme for RTD (FP6), whose main aim is to achieve a more effective organisation of urban transport by developing integrated solutions based on advanced concepts for innovative autonomous and automated road vehicles for passengers and goods.

