



Martin Lowson with an ULTra pod-car at the London Science Museum in August, where it formed part of the Antenna Live Summer 2009 showcase of futuristic technologies celebrating the Museum's centenary. Event director James Bell ranked ULTra in a line of historic transport 'firsts' that are on permanent show in the Museum including Stephenson's Rocket and a model-T Ford.

ULTra-personal transport on the way?

David Crawford looks at plans to put 'pod-cars' into the transport mix

Personal rapid transit (PRT) systems could replace nearly a third of all car trips, believes Martin Lowson of Advanced Transport Systems (ATS). His company has developed the ULTra (urban light transport) system as a 21st-century contribution to meeting urban public transport needs.

ULTra uses fleets of computer-controlled, driverless, electrical battery-driven 'pod-cars', each carrying between four and six passengers, that run automatically on dedicated concrete or steel 2m-wide guideways at speeds of up to 40km/h. Waiting times can be as short as one minute, and passengers control their journeys using in-car touch screens.

The system uses off-the-shelf technology, largely derived from the automotive industry, with software specially developed by ATS. Its first UK implementation, due to open in early 2010 at London's Heathrow Airport, will connect Terminal 5 with a business passenger car park along a part-

elevated track. It moved into its operational testing phase in July 2009.

ATS expects the go-live for the Heathrow system to unleash a flow of potential demand for urban schemes both in the UK and overseas. Current possible locations include Daventry, in Northamptonshire, and Cambridge.

Cardiff was to have been the location of the first UK urban installation, but fell victim to political wrangling. ATS maintains its 1km test track on a section of the projected route, from the city centre to the seat of the Welsh Assembly Government at Cardiff Bay, which could yet be reactivated as a public transport corridor.

DAVENTRY

Daventry gained early prominence as a prime case for pod-car travel when, in autumn 2007, it staged a demonstration within the EC-supported CityMobil programme, using prototypes developed by French transport research institute INRIA (a

partner within the CityMobil consortium). These ran on a 400m off-road track to give visitors a taste of how automated transportation could work in the town.

Daventry's population, of 23,000, is due to rise to 40,000 under the Government's 2003 Sustainable Communities Plan. Its existing built-up area consists of an historic market town, bolted onto which are residential estates built in the late 1960s to take pressure off Birmingham, 56km to the north-west.

Their layout is typically car-oriented, Radburn-style, making them difficult for conventional bus services to penetrate. Founded in 1929 in New Jersey, US, Radburn was designed from the outset as a 'town for the motor age', separating vehicular from pedestrian traffic and introducing the concept of a the 'superblock' urban neighbourhood, bounded by traffic-distributing roads rather than local streets.

In the existing built-up area, un-



Inside an ULtra pod-car

derused Radburn-type pedestrian links and subways, land set aside for road widening and part of a former rail link to the West Coast Main Line could contribute to guideway routes. New schemes needed to house Daventry's additional population could have pod-car systems built into them from the outset as part of a sustainable transport policy.

The new concept has, in fact, already been cited in reference to planning applications for proposed developments on the edge of Daventry's present built-up area, at a planning inquiry into appeals which ended on 23 July. Churchfields was

the first scheme to reach the West Northamptonshire Development Corporation (WNDC), set up in 2004 to create a framework for the development of Daventry and its neighbouring towns of Towcester and Northampton.

This would include the realignment of the B4036, within which consulting engineers Stuart Michael Associates are proposing to safeguard a corridor for a public transport link that could use pod-cars. The issue that would then arise is that of integrating the new-style services into ones connecting with the town centre and industrial estates. The same would

apply to possible edge-of-town locations in Cambridge, see box.

URBAN PROBLEMS

In the UK's first-ever comprehensive study of the potential role of an urban PRT network, transport planning consultants Colin Buchanan and Partners defined Daventry's transport problems as comprising:

- An under-used and expensive bus network;
- Its massive planned expansion;
- The need to accommodate this growth, and the resulting increases in traffic and parking demand, while supporting the existing town centre plan;
- The need to attract jobs of the right type;
- The importance of putting Daventry 'on the map'; and
- The need for a good public transport system, capable of providing a genuine alternative to the car.

A basic configuration PRT proposed for Daventry consists of up to 55km of dedicated track, carrying up to 500 fully automatic driverless 'Stations' around 10m by 20m in area along the route would allow vehicles to enter side loops to pick up or set down passengers.

The Buchanan study compared the effects of such a network with two alternative methods of upgrading the town's existing bus services, supported by priority systems. It then tested these options on highway authority Northamptonshire County Council's multi-modal VIS-SIM traffic management model to estimate the likely level of mode switching as between car, bus and PRT.

The results showed that, depending on the fares charged and modal penalties assumed for PRT, the new system would reduce car trips within the town by between 22% and 33%. This contrasted with predictions that even an optimal bus network would increase its share of the mechanised trip market from the current 4% to only 10%.

The study then used a second simulation model, Sweden-based Logistic Centrum's PRTsim software suite, first to check first that the network would not overload; and second to estimate the number of cabs needed to ensure average waiting times of less than one minute. It went on to estimate capital and operating costs, taking advice from consulting engineers Arup as designers of the Heathrow route system.

THE CITYMOBIL INTEGRATED PROJECT

The EU-supported @11 million CityMobil programme (2006-11), led by Netherlands applied scientific research organisation TNO, is an EU-co-funded integrated project set up to develop knowledge of the issues relevant to the integration of automated road transport systems in the urban environment. Its emphasis is on tackling the twin problems of urban congestion and pollution by developing innovative automated public transport systems that can take people where they want to go, when they want to go.

The CityMobil consortium consists of 26 partners, from 10 European countries, including ATS. ATS began developing the ULtra system in 1995 in association with the University of Bristol.

Another consortium partner, the Institute for Transport Studies at the University of Leeds, has carried out modelling and simulation work on PRT and other innovative passenger transport systems in Europe. Using the MARS dynamic land use and transport interaction model to assess demand, it looked at four case-study cities including Gateshead as a typical UK example.

Here, a hypothetical 20.7 km network with 56 stops gave a 'business case' benefit/cost ratio of 3.4. Among the Institute's overall conclusions are that:

- An inner-city PRT network can be viable in most types of city (but less so in the largest ones);
- A PRT network can attract trips that would otherwise be made by car;
- PRT can also attract walking trips, and those made by other public transport modes; and
- PRT could serve as a suburban feeder for existing public transport systems.

An ULTra pod car on operational test on an elevated guideway section at Heathrow Airport



Including track, safety fencing costs, and assuming a fleet of between 300 and 500 pod-cars, the capital sum came out at between £80 – £85 million (@90-96m). Annual operating costs ranged from £4 – £6 million (@4.5-6.8m), at 2006 prices, depending on the fleet size.

Summed and discounted over the government's required 60-year timescale, the results showed that a PRT system could earn substantial operating profits provided fares were substantially above the then average bus fare of 80p (@0.90). At £1.60 (@1.80), demand would still be substantial, with operating surpluses estimated to be almost sufficient to fund the full capital costs – 'a remarkable prediction', says the report, 'when compared with the finances of trams and guided buses.'

It continued: 'The reasons for the apparent financial success of the PRT network when compared with even

the best bus alternative relate to its much greater competitiveness with the car. It is possible to get almost anywhere in the town by car in a drive of 10 minutes or less.'

Daventry District Council, in conjunction with Northamptonshire County Council, is currently considering proposals for a pilot, possibly in 2014, in the context of the Department for Transport (DfT)'s November 2008 Delivering a Sustainable Transport System (DaSTS) report. It expects to reach a decision by the end of 2009.

CAMBRIDGE

The potential of Cambridge as a location has been highlighted by the recently published final report of Cambridgeshire County Council's independent Transport Commission. This was set up to advise the authority on its next steps in the process of finalising and submitting a bid for Government money under the DfT's Transport Innovation Fund (TIF) programme.

The report's review of potential solutions to congestion in the city cites evidence from the locally-based Marshall Group of vehicle engineering and aerospace companies, which drew the Commission's attention to 'innovative solutions' such as pod-cars. The Group has recommended the county council to use its traffic model for a computer simulation, to see if such a system could be a viable option for Cambridge.

Marshall's interests are twofold. First, the group is a major local employer, with a staff of 4,000. Of these, 27% live within four miles of their work, and the company is concerned for their travel needs.

It has already commissioned its

own report on the subject from Colin Buchanan and Partners. Group property executive Stephen Sillery sees problems with long-term public transport solutions for Cambridge that are based on the bus, and is interested in innovative alternatives such as the pod-car although he doesn't see a role for it in the historic city centre.

Second, the company has an interest, as landowner, in proposals to develop a new 'urban quarter', with between 10,000 and 12,000 new homes, a district centre and employment space, on the eastern side of the city. Pod-cars, says Sillery, could well provide a solution, particularly at peak hours – although he stresses the importance of good integration with other public transport links.

There is also interest within the county council in the potential for PRT as a link between the Cambridge Science Park, to the north of the city centre, and a new station being planned nearby at Chesterton. Guideways could run alongside the new Cambridgeshire bus rapid transit (BRT) route to Huntingdon, which is due to open in November 2009.

The county council will decide its response to the report at a full meeting in October 2009.

www.citymobil-project.eu
www.atstld.co.uk
www.its.leeds.ac.uk

CAMBRIDGESHIRE AND TIF

The Cambridgeshire independent Transport Commission's final report recommended the county council to submit a full TIF bid to secure Government resources to improve cycling, walking and public transport and to inform the Government that it has not ruled out the introduction of a congestion charging regime. But it should stress 'clear evidence' that such a regime would be unacceptable without a programme of investment, including the TIF proposals.

The report further recommended that the county council state that, in any case, no such scheme should be introduced without further public information and consultation, and not before 2017 at the earliest. The reference to ULTra appears in a section on high-tech alternatives to the TIF proposals

The Daventry showcase used INRIA vehicles. An operational system would run on segregated guideways.

