Vehicle testing at Heathrow

Rendering of vehicle interior

ULTra interior

On the Right Track

By **Nick Lerner**

Driverless personal transport is to become a reality at London Heathrow Airport. Dassault Systèmes PLM ensures that this futuristic system is designed, produced and delivered on time, to budget, and with a great user appeal.

DELIVERING THE FUTURE

The dream of driverless vehicles that effortlessly deliver passengers in futuristic automatically guided luxury pods has become a reality that will be launched to the public in 2009 at London's Heathrow Airport. This is the first project of its kind and heralds a new transportation era. The company responsible for design engineering and production of the vehicles that run on a dedicated lightweight guideway is ARRK R+D Limited based in Basildon, Essex, UK.

> CATIA is the key to delivering this futuristic transportation system.

ARRK R+D is part of the 120 company ARRK Group, which employs 15,000 people involved with product development, analysis and prototyping in composites, metal, and plastic for a range of industries covering aerospace, automotive, construction, medical equipment and transportation.

The company's work covers the whole of product development from R+D, through body in white, exterior and interior trim, production tooling design and assembly. For this work the company deploys Dassault Systèmes PLM including the use of CATIA, ENOVIA, SIMULIA and 3DVIA software to offer a prototype-to-launch service.

SINGLE PLATFORM

The company has been working extensively on the ULTra Personal Rapid Transportation (PRT) programme. Jason Roberts ARRK Director explained: "This project includes development of 21 initial vehicles that will run on a dedicated track much of which is elevated. This was fitted on site at Heathrow at up to 80 metres per night and will carry passengers to their destination at up to 40kph. Our work was carried out using the Dassault Systèmes PLM suite. This delivered the advantages that we experience in our other work, which includes the benefit of operating on a single software platform for prototyping, tooling, testing and surfacing. Suspension durability testing of was carried out using Abaqus and the software helped to provide the vehicles with their highly accurate tracking characteristics."

Phil Griffiths, General Manager, Engineering Group added: "This first phase of 21 vehicles is for Terminal 5, however, it is planned to eventually have 400 vehicles running at Heathrow serving all Terminals. Dassault Systèmes software provides all of our product development needs and this is an excellent example of how the software can be scaled to suit variable demand over time. Our technological position means that we are the data holder for the ULTra project and since we have more than 300 seats of DS PLM within Europe alone, we will be able to deal with any level of demand. We cut tooling direct from 3D CATIA models and can easily accept third party software input from stylists and others in the supply chain, incorporating it to develop 3D data for our purposes."

The economics of this type of transport system are very promising since they are able to make use of land that would otherwise be too distant from main facilities. The cost of guideways is relatively low compared to roadways and light rail, as is their cost of installation. The Heathrow project cost is around 30 million euros for the entire system including vehicles. Cost of operation is also low since there are no drivers, and the environmental benefits are significant with zero emissions at the point of use and no empty busses needlessly cruising around.

RETURN OF THE NATIVE

ARRK sees a strong future for ULTra with interest coming from around the world including Middle Eastern cities, leisure resort hotels and other mixed usage environments that would replace bus services or conventional transport with this modern alternative system. Jason Roberts said: "By developing the engineering and production of the project with DS PLM we are in a position to provide maximum productivity, design automation and a means of retaining 3D data that will serve this and other ULTra projects in the future. Since CATIA has become the transport industry's standard software, our work can integrate, in native formats, with supply chains and stakeholders."

> The use of DS PLM has greatly aided this project by providing a flexible, technically and economically viable tool to deliver advanced transport solutions.

With its aluminium chassis, vacuum formed and acrylic coated panels, air conditioning, in-vehicle led screens displaying journey information, alarm system and cameras the Heathrow ULTra's are well equipped, sleek and appealing. Smart scheduling reduces waste in use by optimising journey routes while onboard systems compensate for wind, obstacles and other obstructions that might be encountered.

DRIVEN BY ACADEMICS

Jason Roberts concluded: "The total cost of developing, building and operating the Heathrow ULTra project is a fraction of the budget required for a conventional transport system. The use of Dassault Systèmes PLM has greatly aided this project by providing a flexible, technically and economically viable tool to deliver advanced transport solutions."

ULTra re-defines transport and offers planners and developers a range of opportunities that have never before been available. CATIA is the key to delivering ULTra and ARRK, through its deployment, ensures that after decades of academic and commercial discussion a transport system of the future has been delivered today •

For more information:
www.arrk.eu
www.atsltd.co.uk
www.tatatechnologies.com

ULTra on elevated track

More about ARRK

ARRK has been a leader in Product Design and Development services for over 25 years and is among the UK's largest Design and Development enterprises. ARRK Corporation has facilities around the world from Japan, Thailand, Taiwan, Korea, China, USA, Germany, France, Spain, Hungary, Poland. In the UK,ARRK expert professionals use the latest technology to provide outstanding quality, precision and speed of service.