

Editorial

The threat to the environment, from growing industrial pollution and greenhouse gases continues...

Reports such as Stern (www.sternreview.org.uk) show that the cost of dealing with the problem is considerable, but will be greater the longer we leave it, while Eddington (<http://www.dft.gov.uk/about/strategy/transportstrategy/eddingtonstudy>) shows that the contribution from transport is one of the worst and that the full costs should be covered.

Meanwhile, the growing demand for resources fuelled by the growth of the developing world, and particularly the BRIC countries (Brazil, Russia, India and China) has pushed up the price of commodities, particularly petrol and diesel fuels to a record high of \$140 per barrel last summer.

The developed world has responded by producing fuel oils from crops, particularly grain. But stocks of grain which were until recently produced in excess of need have been reduced by the growing demand from the developing world, and now further reduced by using some to produce fuel, with the result that costs of grain have soared.

Now we learn that at least 25% of the world's mammal species are at risk of extinction unless man can somehow learn to reduce his impact on natural habitats, particularly deforestation, which also leads to accelerating climate change. (<http://news.bbc.co.uk/1/hi/sci/tech/7651981.stm>)

And most recent of all, we have the so called 'credit crunch' leading apparently to global melt down in the financial markets, the serious erosion of savings and pension funds, and recession in world economies. Recession is leading to negative growth, growing unemployment and less money in people's pockets. And with that has come a substantial slowing in demand, for retail goods from the high street, for fuel, new cars. Notably, fuel has dropped to \$80 a barrel and car sales have slumped by 20% in the last quarter.

CityMobil cannot solve these problems of course, but it can make a valuable contribution. We are responding to environmental concerns by promoting clean, green transport and supporting initiatives that use alternatives to fossil fuels (though perhaps we should stick to batteries and

hydrogen rather than fuel from grain!). And by supporting the development of Personal Rapid Transit and Cybernetic Transportation Systems type public transport systems, and also Advanced City Vehicles in car-share schemes, we are also promoting 'shared' as opposed to 'individual' vehicle use. Automated vehicles also run on narrow lanes, and so require less land take. Shared green transport must be cheaper overall for both users and operators in the long run, and it will certainly be kinder on the environment.

Professor Mike McDonald
CityMobil Advisory Board Member
TRG, Southampton University



Project update

The CityMobil Business case tool

David Jeffery, TRG, Southampton University

A business case is the basis for the economic justification of any new scheme. It takes into account the various factors that need to be considered, and presents them in a way that is easy to understand. It also facilitates a comparison of alternatives in order to assess value for money. An alternative may be a 'do nothing' or 'business as usual' scenario, or it may be an alternative transportation system. Either way, the results of a business case are needed to show the funding partners if their investment will be worthwhile.

The business case tool developed within CityMobil comprises an Excel spreadsheet and a User Guide. It is based on the results of a literature survey of earlier economic analyses undertaken in association with the development of new automated transport systems, and of previous guidelines developed to assist in the economic and value for money assessments of new transport systems and schemes.

From the literature review a list of criteria and a methodology have been developed for the assessment of both a wider 'transport case' that includes details of the background, policy and context, and the social costs and benefits that are needed to enable a local authority partner to assess a scheme; and also for a more focussed

'business case' that considers only cash flows and is needed separately to satisfy the funding partners.

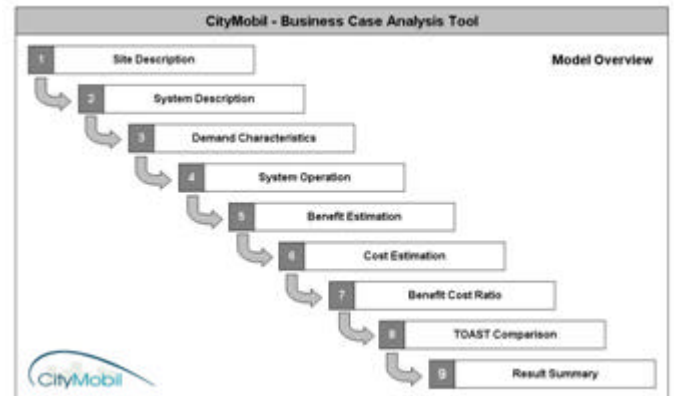
The methodology basically provides for a comparison of a new, ie. CityMobil, system with a conventional alternative, eg. bus scheme, through a structured set of questions that are designed to build up the transport and business cases for each system. The process then provides a formal framework for the appraisal of the two schemes in terms of relative costs and benefits, and the use of a TOAST (Technology Options Appraisal Summary Table) methodology. The TOAST requires the user to exercise his/her professional judgement to rate and weight the various benefits, intangibles, impacts and risks of the alternative schemes, and produces ranking figures that enable the two options to be compared. The use of the TOAST enables a more complete assessment as compared to just relying on a purely economic evaluation using the benefit-cost ratio (BCR) figures, and facilitates an assessment of value for money.

The results are finally summarised in a table which shows the key features of the alternative systems including the types, numbers and carrying capacities of the vehicles needed, the length of the route, if a special guideway is required, the number of stations/stops, the average vehicle speeds and passengers waiting times, business and total BCR values and the TOAST ranking.

Decisions should then be possible for the funding partners from a consideration of the cash flows revealed by the Business BCR analysis, plus any additional funding needed, and of any subsidy required.

Some particular features of the CityMobil Business Case Tool include:

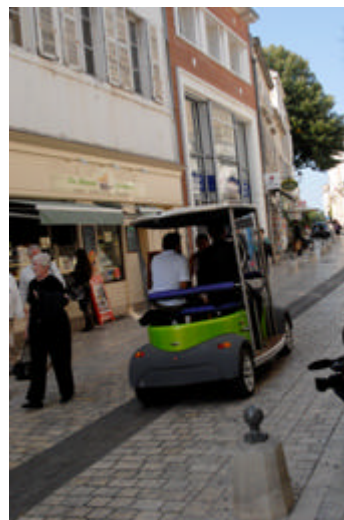
- Business BCR to satisfy the funding partners
- Total BCR to satisfy the government partners, if the necessary data are available
- A TOAST methodology to take the data into account if they are not available
- Quick answers to 'what if' questions, eg, the effects of changes in demand, fares, waiting times etc
- Guidance is provided, eg, on costs of different systems, values of time, pollution etc.



Showing an overview of the process and spreadsheet structure

Reference Group activities: La Rochelle showcase & CityNetMobil

La Rochelle played host to the latest CityMobil showcase of automated vehicles as part of European Mobility Week. Several vehicles (provided by Inria, CRF, IAI and TNO), displaying automated driving and other functions such as platooning, were on show for ten days for members of the public to watch and to actually be driven by them. A seminar on automated transport systems was also held during the La Rochelle showcase, attracting more than 100 delegates and the media. La Rochelle is one of many local authorities that is interested in automated transport systems for their potential to deliver an on-demand, 24/7 transport service. La Rochelle is a city pioneer on mobility matters, having created car-free day in the 90s and being the leading European city on electric vehicles. Indeed, it is for a possible extension of its electric-based car-sharing scheme



Cybercar on La Rochelle street

that La Rochelle is interested in bringing automation into the vehicles, in particular to solve the problem of relocating the empty vehicles. CRF demonstrated three electric vehicles with such a relocation capability based on platooning.

La Rochelle is a member of the CityMobil Reference Group, created to provide a forum for local authorities interested

in automated systems to share ideas and to learn about developments in this area. The activities of this group were only planned to last for the first 12 months of the CityMobil project (now in its third year); however, the interest among local authorities in automated transport has been so great that a new project, CityNetMobil, has been set up to take forward the Reference Group. CityNetmobil will organise a further five showcases in cities around Europe that have shown an interest in automated systems (in addition to those planned within CityMobil). A call for applications to host a showcase will be issued shortly. For further information about the Reference Group, contact: adriano.alessandrini@uniroma1.it The next CityMobil showcases will be held in Trondheim (NO) in August 2009, Genoa (IT) in November 2009 and Vantaa (FIN) in the Spring of 2009 or 2010.

CityMobil workshop at Heathrow

The mid-term workshop of CityMobil is planned to take place at Heathrow in April 2009. Delegates will be able to learn about the main achievements of the CityMobil project as well as gain insight to the Heathrow PRT scheme – one of the CityMobil demonstrators. The workshop is being organised as part of the ATRA congress from 21-23 April. There will also be an opportunity to visit the Heathrow PRT scheme, which should already be in commissioning stage (ie, undergoing testing but not in public operation).

News from the demonstrators

Heathrow airport

Construction of the ULTra system at Heathrow's Terminal 5 is now very visible to passengers arriving at the Terminal, or passing by on the airport's perimeter road. All the guideway is complete, most of it elevated, and work continues on building the stations. The four stations in the long-term business car park are relatively simple, with parallel loading bays accessed through sliding glass doors which open simultaneously with the vehicle doors. At Terminal 5, where the station is on the third floor of the short-term multi-storey car park with direct high-level access to the departure check-in, there are four berths arranged in a chevron pattern to provide high through-put. Vehicles enter the berth forward, with the glass doors of the station arranged alongside, and reverse out onto the main guideway when they depart for the car park. The assembly line of production vehicles is now in full swing, and each vehicle

will be extensively tested at the Cardiff Test Site when it arrives.

The guideway has been mapped onto the vehicle navigation system. In the ULTra system each vehicle navigates autonomously once the central control gives it permission to leave its station. It steers itself by reference to its internal map, updated at intervals by reference to navigation markers on the guideway. Central control ensures that it has a clear travel slot through to its destination, though there is also an Automatic Vehicle Protection system to provide a second layer of safety. The sensors and communications for this are currently being installed on the guideway. Once the vehicle arrives at a station a separate station management system takes over. The photograph shows the first operation of one of the three pre-production vehicles on the new guideway.



First flight of a vehicle on the PRT guideway outside Terminal 5

Various reviews under Heathrow's new ownership have introduced some unavoidable delay, but the new schedule is now fully-contracted. It is aimed at completion of the system in spring 2009, ready for a six-month commissioning period through the summer of 2009, to ensure absolute reliability, and the start of public operation in the autumn of next year. Meanwhile the current bus shuttle services will be surveyed in early spring 2009, for comparison with a survey of the PRT system itself in spring 2010.

Rome exhibition centre

The Rome demonstration involves a fully automated service at the new exhibition centre close to Rome's main airport that will link the visitors' carpark (2500 vehicle capacity) with the exhibition centre. No parking bay in the car park will be more than 100m from the 10 stops in the car park and the vehicles will deliver passengers to the two main exhibition

centre entrances. The total length of the guideway will be 1.6 km. No infrastructure is required for the vehicles as the guidance will be based on a DGPS. The vehicles will run for around 70km before recharging is required. Despite some earlier hitches (due mainly to institutional changes), which caused a delay in implementation, the construction of the cybernetic transportation system is now full steam ahead. Since no system of this kind (ie, mixing with other users on a public road) has received certification in Europe (beyond the Machinery Directive 98/37/EC that applies to designated areas such as theme parks), the certification procedure will occur in three phases: (1) certification of a fixed frequency service; (2) of an on-demand service; (3) of a service



Prototype Cybernetic Vehicle

involving lanes with pedestrian crossings – in the first two phases, pedestrians and private vehicles will be fully segregated from the automated system. The Rome organisers hope to accomplish all three phases within the lifetime of the CityMobil project.

Partner profiles

28 organisations representing industry, research and public authorities, are partners in CityMobil. Each issue of the CityMobil newsletter profiles three partners.



TRG is a multi-disciplinary Group with research links across the University. Major activities relate to all aspects of the development, application and understanding of the impacts of a wide range of Intelligent Transport Systems (ITS), with additional fundamental research in the areas of Traffic Management, Safety, the Environment/Sustainability, Public Transport Operations and Freight and Goods movement. The Group offers particular expertise in assessing user needs, and evaluating user behaviour in response to new technologies, as gained in numerous projects sponsored by the EC, research, government and industry bodies.



Centro Ricerche FIAT (CRF) is an industrial organisation which has the mission of

promoting, developing and transferring innovation through the development of innovative products, the implementation of new processes (manufacturing and organisational), the development of advanced methodologies, consultancy and the training of human resources. Priority areas of R&D at CRF include Energy and the Environment, Safety and Well-Being, and Sustainable Growth.



ROBOSOFT, established in 1985 by INRIA researchers, is recognized as a leading supplier of advanced robotics solutions throughout Europe and beyond. It is a profitable and independent SME of 20 persons with a turnover of 2.5 M€. ROBOSOFT has been building a unique expertise in service activities automation, its experience in robotics, more precisely in subsets integration and automatic control, allows to provide operational robotic solutions in many areas, for example automatic transport of goods and people.

Related events

- *ITS World Congress 2008, New York*
16-20 November 2008, <http://www.itsworldcongress.org/>
- *Move on CityMobil club, Mobilis conference*, 18-20 November 2008, <http://www.mobilisconference.com/en/index.html>
- *Polis conference, Barcelona*
25-26 November 2008, www.polis-online.org
- *ICT 2008, Lyon*, 25-27 November 2008,
http://ec.europa.eu/information_society/events/ict/2008/index_en.htm
- *Transport Research Board, Washington*, 11-15 January 2009, <http://www.trb.org/meeting/2009/default.asp>
- *ATRA/CityMobil conference, Heathrow*
21-23 April 2009, <http://advancedtransit.org/news.aspx>

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, embedded in an advanced spatial setting.