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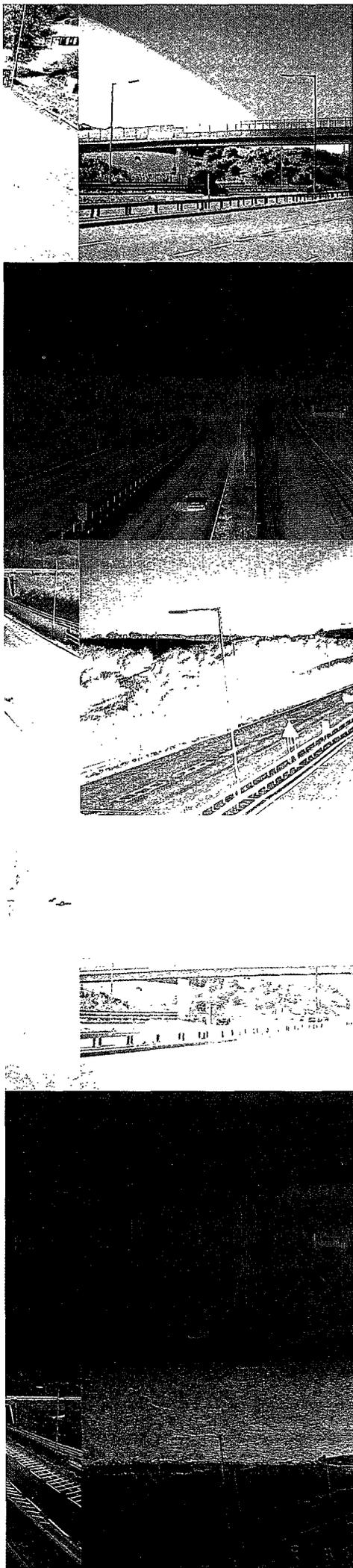
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creative highway



TOLLtrans

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TOLLtrans

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Foreword

Ian Nuttall, Traffic Technology International

While putting together the contents of this first issue of TOLLtrans I pondered the paradox of road pricing through tolls. As Neil Schuster of the International Bridge, Tunnel and Turnpike Association points out in our interview on page 41, "tolls are an emotive issue". I'm aware of the sensitivities - to the motoring public toll is a dirty four-letter word, another form of taxation, and an unwelcome intrusion in their lives. It's ironic, though, that these same motorists are quite willing to part with their money to leave their vehicles idle in car parks, but protest loudly at the thought of paying to put their vehicles in motion. As Schuster goes on to emphasise, we have to re-educate the motoring world that roads are not free and that, like it or not, tolls are coming.

Tolls are not new, they've been around since the Middle Ages, but there is now a renaissance in their application and availability. Two spurs are driving this development. The first, as outlined by Professor John Hibbs of the University of Central England on page 10, is the move to equitable, rational and market-driven roads provision. Discussing the current UK situation, he says that "the way we pay for roads today is a mess... Private ownership in a market economy is generally seen to be the most efficient and most effective way of providing the utilities, free from arbitrary intervention. The private ownership of road offers a similarly rational framework for the transport industry."

Greater private sector participation is being encouraged on all sides. Wim Westerhuis of International Road Federation outlines his organisation's plans to get the private sector behind the completion of the Trans-European Road Network on page 15. California's efforts through the Transportation Corridor Agencies for new roads are examined on page 44. The state has adopted many of the business practices of private enterprise - bond finance, contracting-out, concession management and user-fees - to provide US\$3bn-plus worth of new roads at minimal cost to the local tax-payers.

The second thrust to tolling comes from technical innovation. Electronic toll collection now offers the opportunity to toll vehicles non-stop at highway speeds. Despite the media hype surrounding the danger of Big Brother, motorists have embraced the technology, appreciative of the added convenience and faster journey times. Operator experiences from Maine and Illinois (page 24) highlight this user acceptance and report on the continued expansion of the toll authorities' ETC systems.

Users of ETC transponders can expect much more than simple account handling in the future, if the development of north-east America's TRANSMIT system (page 37) is anything to go by. Trials are now underway to use the same toll transponder to receive real-time traffic and travel information. As more and more services are provided to the motoring public, we are likely to see the now detested 'toll' function merge with a range of vehicle-roadside communications services for the motorist on the move. Then we may have, finally, buried the bad image of tolls.

Canada Toronto's Highway 407 is setting a precedent for future toll systems. Cashless, utilising pre-paid accounts and stored-value transponders, unprepared motorists simply receive a bill in the mail after their registration plates are photographed. Digital images of plates utilise asynchronous transfer mode technology.

California After nine months of operation, the SR-91 Express Lanes are proving their worth, with virtually trouble-free operation. The amount of traffic using the lanes is benefiting paying users, non-paying HOV users, and non-users alike. Tolls vary from 25 cents to US\$2.50 depending on the time-of-day.

California The San Joaquin Hills TCA has opened the first section of the new toll road in July and will open the second in December, ahead of schedule. This allays fears about construction risk, but still leaves open the possibility of less-than-projected traffic volumes. Even if slow employment growth in Orange County means less traffic, investors are still likely to reap some benefits.

Non-stop toll lanes utilise FasTrak tags, compatible with the SR-91 Express Lanes. See article on page 44 for discussion of TCAs.

Colorado A public/private partnership success has been claimed for financing the US\$694 million E-470 in Colorado. The combined efforts of the E-470 Public Highway Authority and Morrison Knudsen enabled the entire sum to be secured through a combination of VRF bonds, senior current coupons, deferred interest, government loans and contractor investment. The segments of the road under this agreement will be opened gradually between mid-1998 and mid-1999. The financing aspect of the E-470 project was the subject of one of the IBTTA Toll Innovation Awards, announced on 24 September.

Texas Dallas metropolitan area will be connected to growing northern communities by the George Bush Turnpike, thanks to a 1990s incentive to change the funding source for the road from traditional fuel tax and public finance to toll collections. A TXDOT loan to the Texas Turnpike Authority, partial conversion of advance construction (to tap Federal-aid funds) and local right-of-way contributions have made the US\$463 million required for the project.

Argentina Spanish systems integrator SICE has installed a 19 plaza toll-collection system in Argentina. With 95 AVI, 110 manual and 70 card payment lanes, the contract is the biggest in Argentina. Some 50,000 tags have been provided by Swedish firm Combitech, expected to increase to 300,000 in the next three years. The read-write system operates at 2.45GHz.

A new 12-lane tollway has been built in Argentina by Argentine/Spanish consortium Autopistas del Sol, who will also operate the road. Sistemas Electronicos Integrados (SEI) are the systems integrators for the project, which utilises Saab Scania Combitech products.

Canada In New Brunswick, the Hanas 1100 system using TIRIS technology has been operating on the St John Harbour Bridge for two years. It introduced ETC to Canada, but retained automatic toll collection too.



Brazil A non-stop ETC system has been installed on the Rio-Niterói Bridge in Brazil, commencing operations in August. Of 14 toll lanes, four are ETC, two exclusively. The system integrator was Compis (see its bulletin board item). Amtech provided hardware and some software for the project.

WWS

New York New York's Tappan Zee Bridge is to be the subject of a study of time-of-day pricing, using E-ZPass. Impacts will be monitored, including physical and social responses. The study is being funded by the federal government.

New Jersey/New York In a recent struggle between Lockheed Martin IMS and MFS for an ETC contract in NJ and NY, the legality of banks being included in toll collection and accounting was brought into question. After being approved by the treasury, **both** teams included banks. Lockheed won the contract, valued at approx. US\$17million, involving installation of 77 ETC lanes on six crossings, which are operated by the NY and NJ Port Authority. The System Will feature E-ZPass, already operative throughout the region. But recent bad publicity about exclusive ETC lanes have dulled the incentive to include these, so potential time savings for users of ETC will be lost as ETC is mixed with other forms of payment, at least for the time being.

New Jersey/New York The proximity of tolling operations in the NY/NJ/Pennsylvania region prompted neighbouring authorities to join together to ensure seamless operation between toll roads. The E-ZPass system was selected, and already two authorities are sharing the technology, as well as proposing to join together back-office operations! Other authorities will join with E-ZPass systems in the near future. The combined effort of these authorities in ensuring interoperability has won an IBTTA Toll Innovation Award.

New York Another winner is the next day data initiative of the New York State Thruway Authority. While other toll authorities are busy updating their toll collection equipment, the Authority is updating data collection and presentation. In order to achieve marketing and planning goals, database query tools were developed to extract information from the toll systems, including O-D data, vehicle mix, and traffic management. Both open and closed systems are included.

Maine System-E (easy, electronic, efficient, etc) will soon be implemented on Maine turnpikes, under the award of a new contract to AT/Comm. Over 100 miles of road from York to Augusta will be equipped with a fully integrated RF ETTM system, and operation is expected by the end of 1996.

Illinois The publicly owned and operated North-South Tollway in Illinois has 190 I-pass lanes and 179 manual lanes. The I-pass lanes, first announced in 1994, are used by holders of 20,000 tags. The tags are not integrated with nearby systems. The tollway is proposed to be extended south, to meet traffic needs, although the additional toll will not cover costs of construction.

Washington DC/Virginia The Dulles Greenway has stirred up prophets of doom throughout the US, as it has failed to meet expected traffic volumes since opening one year ago. But Greenway operators believe they may be able to renegotiate its debt. The road has 29 per cent ETC, which is hoped to increase with added cost incentives, hence reducing administration costs.

Oklahoma The Oklahoma Turnpike Authority manages 10 turnpikes, ranging from 7.5 to 104 miles, each with some ETC. The Amtech system has been operative since 1991, and is claimed to have 99.5 per cent accuracy. Currently there are about 310,000 toll tags in circulation, representing 165,000 accounts with the turnpike authority. On interstate highways there is as little as 25 per cent ETC, whilst local commuting routes ETC accounts for up to 70 per cent.

To encourage users to adopt ETC, a 10 per cent discount applies and during holiday periods ETC users save 10 to 15 minutes per trip. Funds raised from the tolls finance the roads, and any profits are kept as contingency funds.

FLORIDA Throughout Florida, it is anticipated that 455 lanes using SunPass equipment will be installed by September 2000. The system will utilise transponders of types II and III or IV, either 2.45GHz or 915MHz communications, and cater for 1,600vph in dedicated SunPass lanes. There will be 16 express (high-speed) lanes, 92 non-stop lanes in existing plazas, and 347 mixed lanes. Proposals were submitted on 24 September, and intent to award contract will be 12 November 1996. Equipment will be field tested in August next year, after which the system will be installed progressively through Florida, starting from South Florida and through Tampa, Orlando and then other areas. Marketing, integration and operations are other components of the project that are yet to be finalised.

Europe

United Kingdom Throughout the UK, DBFO (Design, Build, Finance, Operate) shadow tolling schemes have begun to be implemented. Where motorways and A-roads require new or significant works, companies are being invited to provide the services in return for a shadow toll. DBFO has been seriously considered since early 1994, and the first contracts were awarded in January this year. Four routes were included in the first set of contracts, and two more have been awarded since. Currently, there are two more being negotiated, due to be announced before Christmas. Repayments to consortia are based on traffic volumes, with capped repayments. During the 30 year concession periods, consortia are required to maintain the roads to an acceptable standard and hand them over in good condition. See article on page 48 for an approach to making vehicle counts more accurate for DBFO.

United Kingdom Trials of ETC in the UK have finally regained momentum. The two consortia remaining in the trials are GEC-Marconi and Bosch Telecom, and each will now take turns to demonstrate enforcement equipment. A test site, established at the Transport Research Laboratory, will be host to the trials, where difficult operating conditions and illegal manoeuvres such as tailgating will put systems to the test. Afterwards, the M3 motorway will be the first real-world site of system appraisal. Current schedules point to May 1997 for the start of motorway tests, a date which is not expected to be adhered to with the imminence of a general election at that time.

France France is to have another open toll road by mid-1997. The northern part of the Lyon Ring Road, to be operated by company SCBPNL (Societe Concessionaire du Boulevard Pkripdrique Nord Lyon), will have a mixture of manual, automatic and electronic tolling.

The 20,000 tags predicted to be taken up in year one will communicate with microwave detectors at 2.45GHz, technology provided by French company Thomson CSF. Vehicles approaching ETC facilities will be able to travel at 40-60km/h, where a successful transaction will result in a barrier further along the road being raised. This means that video enforcement will not be required.

The 10km northern section of the Lyon Ring Road has been largely privately financed, with one quarter of costs met by the Lyon City and Department of Transport

France A programme designed to specify future ETC systems for France, conducted by Telepeage Inter Societes (TIS), is in its second phase. French company CGA has been selected to continue tests involving three sites equipped with CGA equipment and about 300 AVI-fitted cars. The European pre-standard protocol for EIC has been adopted for the tests.

Italy Negotiations are now underway for the eventual privatisation of the Autostrada highway operating companies. Decisions have yet to be made for a single sell-off or the break-up and sale of individual operating units of the organisation. The proposed sale has generated strong private sector interest, not least the attraction of a stable, high cashflow generating operation.

ITALY Italian authorities have agreed on a national standard for road pricing and access control, reported as the first of its kind in the world. A draft standard based around the 5.8GHz Telepass has been defined backed by a joint declaration from the Ministry of Roads and the Ministry of Public Works. The agreement is seen as the basis for a national expansion of ETC deployment.

Sweden A toll ring in Stockholm is expected to be operative by 1999. A zone pricing initiative, ETC will be used around the city, with the possibility of varying tolls by time-of-day. The Swedish National Road Administration was to announce the supplier for the system in August, but due to the need for an environmental assessment of the proposed system, and to the longer-than-expected time taken by consortia in preparing bids, the announcement has been postponed to about November. An article on page 60 explains the toll ring concept for Stockholm.

Germany Trials of ETC on the A555 concluded in late 1995. No further action has been decided from the trials, as the benefits of ETC are not considered to outweigh the costs. However other charges may be incurred by trucks, in a move to pay investors for roads.

Poland Contract awards for the first 350km section of the A2 Poland-Germany motorway to Lodz are expected by the end of the year, the first stage in the country's ambitious plan for 2,500km of toll motorway. Final bids from three consortia are expected by the end of October.

Poland's scheme to build nearly 2,500km of toll motorways is firmly on track, with a tender to build the first major 350km section to be completed this year.

Under the Polish scheme the government finances 15 per cent of the construction costs, mainly for land purchases and technical documentation, and offers a 2530 year concession on the highways. The total cost of the construction programme, scheduled to last 15 years, is estimated at US\$8bn. Two motorways will connect Poland's western and eastern borders and one is to run from the Baltic sea to the Czech Republic. The A2 motorway is to become part of the trans-European route connecting Paris, Berlin, Warsaw, Minsk and Moscow, and is noted as one of the most potentially lucrative routes in the programme.

Poland's first toll motorway, a modernised 65km section of existing road, should open next year between the southern cities of Katowice and Krakow.

Hungary The east-west M1 motorway links Budapest with Vienna, and has a small section of tolls near Gyor, the western end of Hungary. The forecast for traffic growth in 1995 was six per cent, while there was actually an 18 per cent drop in traffic. A number of economic factors, such as Hungary's lower-than-expected GDP out-turn and long traffic delays at the Austrian border are suspected to have contributed to the project. A study is currently underway to further explore the 5,200vpd traffic shortfall.

Italy Multilane ETC has been trialled on the Prato-Firenze Nord section of the All motorway. Remote payment is via 5.8GHz link using smart cards compatible with Florence buses and airport car parks on other routes. Other ETC in Italy is through existing toll booths. Currently about one-fifth of all toll booths take either or both of Viacard or Telepass, however, they are 'single-lane' applications of the technology.

Asia-Pacific

China Henan Province looks set to have the fifteenth World Bank financed toll road for China. The road will follow the course of the Yellow River, with 44 bridges and 220 grade separations along its 136km.

China Zuhai City in Guangdong province will soon toll outsiders electronically at the city's periphery. Locals will be exempt because they already pay an annual usage fee. There will be 17 entry points tolled under the final system which will be based upon the existing manual tolling system. The project is being funded by investors who will share in the annual usage fees and entry tolls.

China The selling of public infrastructure appears to be a country wide trend in China, where each province has been economically left to its own devices. The Guangdong Provincial Expressway Development Co already owns five roads, and is therefore a target for overseas investment. The GPED does not have a guarantee, like other local-government backed firms, and therefore is being carefully watched. Most investment comes through Hong Kong, where shares are sold.

Thailand The Highways Department plans to build a 4,150km motorway traversing the country at a cost of US\$18.2 billion, over 20 years. The high investment cost means that overseas companies have been invited to form joint ventures to build and operate the highways, collecting revenue from tolls.

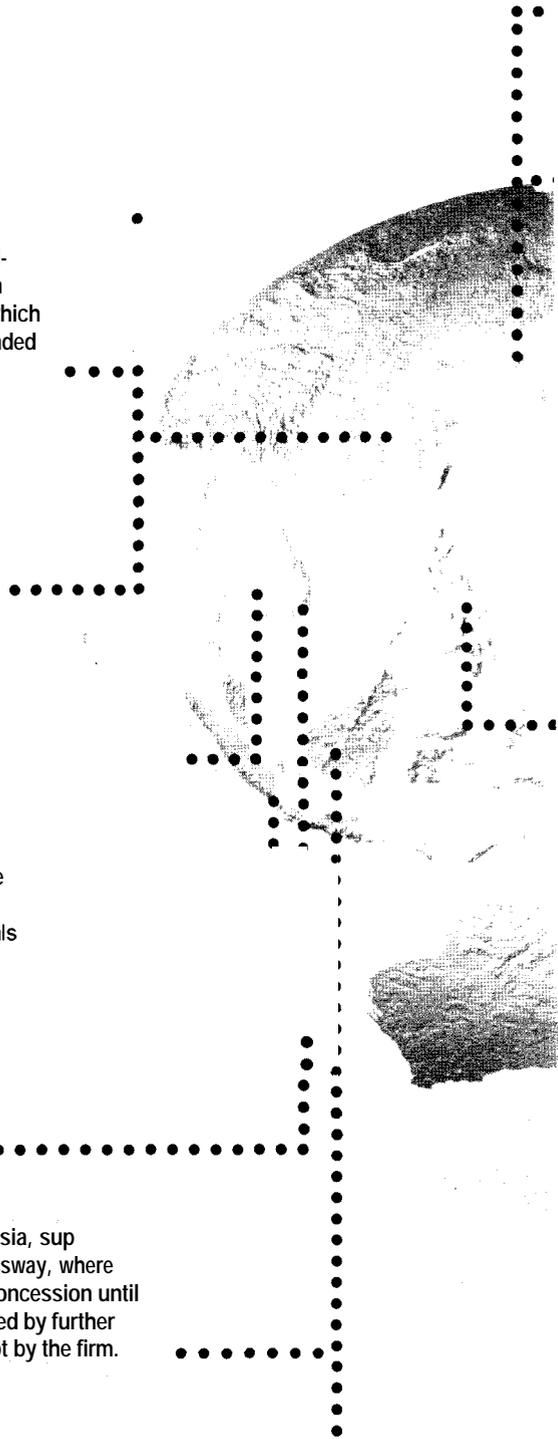
Singapore Since the awarding of the Singapore ERP (Electronic Road Pricing) contract to a Philips/Mitsubishi/Miyoshi/CEI consortium at the end of 1995, trials to prove the technical quality of their product have been underway. These trials will continue for the next six months, after which the system will progressively be installed assuming no hitches in the trial.

Vietnam Hanoi and Hoa Laca in Vietnam will be linked, in the next 12 months, by a new 30km freeway, costing US\$390 million. One third of the Finance will be from overseas sources, although recent attempts to raise overseas finance for Vietnamese infrastructure have obtained mixed results. Tolls will be imposed on the route.

Malaysia Tolls are on the increase in Malaysia, supported by the government. On the North-South Expressway, where company Project Lebuhraya Utara-Selatan holds the concession until 2018, the recent 20 per cent increase is to be followed by further increases in the next two years. Revenue will be kept by the firm.

Malaysia A Malaysian consortium has been granted a 35 year concession to construct a US\$1.8 billion 259km coastal highway from Banting to Taiping. The first 29km will open at the Banting end in 2000, with the whole project complete by 2004. A mixture of open and closed tolling will be used.

Malaysia Another consortium will build, operate and transfer the 68km Ipoh-Lumut Highway over 33 years. The highway, valued at US\$430 million, will have a closed toll system.



Korea An ETC trial in Seoul was completed in September. Seoul City Transport Department conducted the trials, which involved RF of 5.8GHz, with a view to implementing electronic congestion pricing by the end of 1997. In the meantime, manual tolls are being collected.

Korea Korea's highways outside Seoul are managed by the Korean Highway Corporation, a government subsidiary company. From 1 November, month-long trials of 5.8GHz ETC systems will be conducted in existing tollbooths. Participating companies are GEC-Marconi, Bosch, Micro Design and a combination of AT/Comm, Poscon and Hitachi Zosen.

Japan An extensive Japanese R&D programme into ETC systems was conducted from June 1995 to March 1996. Each of the 10 consortia undertaking field trials of equipment proposed a certain ETC system for the standard. The areas studied were the radio communications system, traffic operation and toll collection procedure. In August, the results of these trials were released. The country's four highway authorities and the Japanese Ministry of Construction will now compile standard ETC specifications for the country on the basis of the R&D project. NEC, one of the firms involved in the trials, relates its experience of the trials in the bulletin board.

Philippines The North Luzon Expressway connecting Manila to the rest of Luzon is being upgraded and expanded by the Benpres group, a Philippine conglomerate. Projected to cost about US\$770 million, it is the biggest project entrusted to a private firm in the Philippines. The new tollway, however is at the centre of a major controversy; in November the Philippine Congress opened an inquiry into the Benpres contract, then in February a Manila newspaper alleged that members of the investigating committee had been offered US\$7,700 bribes to influence their findings.

Australia In Melbourne, bids for the electronic toll contract for the City Link project are being assessed by Translink Systems, a Transfield-Transroute International joint venture. Bids were received from six consortia: CGA France, Hughes TMS US, MAC Alenia Italy, MFS US, Mitsubishi Japan and Saab Combitech, Sweden. The specifications for the ETC system include fully free flowing ETC, with no toll booths. Announcement of the successful tender is due in February. The City Link project is expected to open incrementally in 1999 and 2000.

Australia Consortium Airport Motorway was selected in August as the preferred proponent for the financing, design, construction, operation and maintenance of the Eastern Distributor project. The Eastern Distributor will link central Sydney with Sydney Harbour and the Airport, and will be fully operative for the 2000 Olympics. Valued at A\$600,000 (US\$450,000), the project includes twin 1.5km three-lane tunnels under the city's worst pedestrian blackspot and underpasses to improve traffic flow. Buses will use the toll road free and tolls will only be collected northbound.

Australia Trials of ETC have been conducted on Sydney Harbour Bridge and Tunnel for three years. Over 3,000 tags are in circulation, but a decision about the future of ETC for the crossings has been delayed until the specifications for the neighbouring Eastern Distributor are released.

Australia Privately financed roads in Sydney are the motorways M2, M4 and M5. The M2 and M5 are trialling ETC, the M2 using AT/Comm technology and the M5 a system from Hughes TMS. On the M5, where trial of 200 tags started in August, 915MHz communications and type II tags are being used. Preliminary results are positive, with 75 per cent time savings over manual tolling.