

TRANS SCAN

A scan of emerging trends in mobility and the built environment

Volume 2

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Changing social demands create new environmental pressures

“Jobs are more likely to be at risk where environmental standards are low and where innovation in favour of cleaner technologies is lagging.”

Michael Renner, author of the new Worldwatch report: *“Working for the Environment: A Growing Source of Jobs.”* (See page 19)

RENNER might have added that people with the most sought after qualifications also - if they have a choice - gravitate to those places where environmental standards are highest. In fact a number of trends identified in this edition of *TransScan* highlights the pressures this new mobility is causing and is likely to cause.

In Britain, the main thrust of the government's new White Paper on Urban Planning is to encourage those who have already fled the cities, to leave their rural retreats and return to an urban environment. (See page 5) Not only are such people putting pressure on traditional rural communities, but by leaving the cities in such great numbers (1000 a week) they have become a threat to concepts of urban sustainability.

Meanwhile, in the United States, one group of employers is so concerned that a degraded urban environment will encourage staff to look elsewhere for jobs and housing, that they are pressing the local planning authority to make urgent improvements - including the construction of a new road system.

Clearly the days when employees stuck loyally to one company or organisation have all but disappeared but the new levels of personal mobility have major implications for planners.

As a report from the Brookings Institute points out: “We can build jobs and houses together, but many people will not work in the places near their home if they can find better opportunities elsewhere. And the chances are that there will be no public transit available to make such a journey.” (See page 3-4)

At a time when the world is becoming increasingly concerned about climate change - caused to a significant degree by vehicle emissions - it does not help to have another stimulant for the greater use of the car. (See page 19)



Photo by Billie Fairclough

BRUCE CONRAD, an energetic 62 year old from Forrestfield, enjoys a coffee after cycling to Fremantle for the city's "Shed Your Car" Day. He told our photographer he was very supportive of the car free movement and had been involved with cycling groups for more than 15 years. The idea of placing more reliance on bikes as an alternative form of transport is gaining momentum. Today in Europe more than 750 cities take part in Car Free days. (See page 7)

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TransScan reports a variety of views from around the
world. None are necessarily those of the publishers.

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This edition of TransScan is printed on Australian-made paper using 100% recycled fibre which has neither been de-inked nor further bleached. Part of the manufacturing process also involves flocking using fine, deep cotton.

About TransScan

TransScan monitors change world-wide and is based on analysis of information scanned by staff of Transport WA, Main Roads Western Australia, the Ministry for Planning and the research organisation, Strategic Scan.

The aim is to stimulate the informed discussion necessary for the departments to operate more effectively in a period of rapid change. The subject matter will often challenge assumptions. At the same time it seeks to familiarise readers with an ever-changing environment. It is not possible to predict tomorrow, but it is possible to make calculated assessments about the future. Fundamental to this approach is the recognition that the future is here now. When decisions are made on what is thought the future will bring, those decisions help shape that future.

Information which appears in *TransScan* does not represent definitive research. The contents are the result of a scan made in the past few months. On an ongoing basis, such scans will expose ever more new and emerging themes.

A GIANT floating crane lowers the world's first tilting bridge into position across the River Tyne in northern England. When completed in mid-2001, it will provide a new pedestrian way between Gateshead and Newcastle and a link for cyclists using the new National Cycleway. (1) Civil engineers, Gifford and Partners and architects, Chris Walkinson, designed the 800 tonne steel structure. It features a radical design that allows the entire bridge to tilt forward and create an arch high enough to allow ships to pass. (2) The manoeuvre takes four minutes and the bridge's 589 hp electric engines will handle the job using only a few cents-worth of power.

(1) Gateshead Council Millennium Bridge <<http://www.gateshead.gov.uk/welcome2.htm>

(2) BBC Online News has an animated drawing on: <http://news.bbc.co.uk/1/english/uk/newsid_1030000/1030561.stm#top

Photo: © Ian Britton - FreeFoto.com



Planning for sustainability

Must life become more restricted?

ONE reason for the immense popularity of the ABC's *Sea Change*, is the way the TV comedy plays on the fantasies of countless urban dwellers who dream of leaving the city for a new and less stressful life, by the sea.

In Western Australia, the realities can be seen in the population drift to the southwest region but it is a common phenomenon across Australia and in many other parts of the developed world. In England, for example, more than 1000 people a week are leaving towns and cities for a new life in the countryside. (1)

Now two major reports have been published - one in Britain, the other in the United States - warning of the threat such movements pose to a sustainable future.

In Britain, the government has just published its long awaited White Paper on Urban Planning which makes it clear that the only

way to stop the drift and achieve sustainability, is to make towns and cities more attractive. (2)(See page 5 for full report)

In the United States, the problem is not just people drifting from the cities - but offices too. According to a report by the Washington-based Brookings Institution, the last 20 years has seen the cities' share of office space diminish significantly. (3)

According to the report, in 1979, 74% of American office space was found in central cities and only 26% was in the suburbs. By 1999, the central city share of office space had dropped to 58% while the suburban share had reached 42%.

In cities like Philadelphia, Atlanta, Washington DC, Miami and Detroit, the majority of the office space is now in the suburbs. New York and Chicago are now the only American cities where most office space is at the city centre.

The report says office location is now adding to urban sprawl.

"If most new office space is constructed at the regional edge, it may extend commuter sheds for many miles into underdeveloped rural areas and thereby fuel sprawl," said the report.

"If most new office space is built in areas with no public transit access, then reliance on automobiles will continue to grow."

The report says the findings have policy implications for those working on "smart growth" - the concept which prescribes mixed-use development, especially combining employment and housing.

It says one of the reasons for advocating smart growth has been that it is supposed to reduce commuting times.

"Yet commuting patterns across regions have grown so

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Photo: © Ian Britton - FreeFoto.com

IT has not happened to New York yet, but in many other American cities, the majority of offices have moved from the CBD to the suburbs.

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complicated that transportation engineers equipped with supercomputers have a hard time figuring them out,” says the report.

“As the data indicates, a significant percentage of office employment has decamped from the regional core. People increasingly commute from dispersed location to dispersed location. Even the concept of well-defined suburban edge cities seems to be

out of date, as metropolitan areas become post-polycentric or edgeless.”

As the report points out: “We can build jobs and houses together, but many people will not work in the places near their home if they can find better opportunities elsewhere. And the chances are that there will be no public transit available to make such a journey.”

The scan also found:

CONCERNS over an increasingly mobile population are by no means confined to planners. One of America’s key business groups, the Northern Virginia Technology Council, is using the mobility “threat” to argue for special consideration in planning new road infrastructure. (4) The group’s 1552 member companies employ more than 185,000 people in new technologies – like telecommunications, Internet applications, biotechnology and software development. Together they are spread either side of the Potomac River near Washington. But there is no easy access linking the two high-tech corridors despite the fact that the two are in constant contact. “Our Potomac region has the unique

opportunity to become the world’s role model for what a great community looks like as new technologies create a New Economy,” Council representative, Bobbie Kilberg, told Washington’s Transportation Planning Board when putting the case for a new bridge. But she said the “great community” would not occur unless the companies involved were able to retain their employees - and that meant providing a happy working and home environment. “Our fear is that (our employees’) daily commute is eroding their quality of life,” said Ms Kilberg. “Our risk is that, unlike the fixed assets of Old Economy businesses, the human employee assets will move away and we, as a community, will see our tax base erode and our prosperity falter.” Ms Kilberg said the greatest threat to employee productivity and an unstressed home life was spending hours in a traffic jam and confronting “road rage”. The transportation board has agreed to investigate the proposal.

WHILE some communities may need new bridges to promote social sustainability and wellbeing, in England local councils have just been given new powers to prepare and implement a whole range of measures which might “improve quality of life”. (5) According to the Minister for Local Government, Hilary Armstrong, the new powers will “help councils and other local stakeholders work together and respond to the needs and aspirations of their communities”. She said the powers were designed to give local people a chance to develop a long-term vision for their areas and help set out how their aspirations will be delivered. “Community strategies and the power to promote local wellbeing mark a real cultural shift in the way councils work and how they relate to local people,” she said.

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- (2) UK White Paper on Urban Planning <<http://www.regeneration.detr.gov.uk/policies/ourtowns/cm4911/index.htm>>
- (3) “Office Sprawl: The Evolving Geography of Business” by Robert E Lang the Brookings Institution Center on Urban & Metropolitan Policy <<http://www.brook.edu/es/urban/officesprawl/press.htm>>
- (4) “NVTC Endorses Techway Connector Study” PRNewswire 19 Oct 2000
- (5) “New powers for Councils will improve quality of life” Department of the Environment, Transport and the Regions 18 Oct 2000 <<http://213.38.88.195/coi/coipress.nsf/1d4410efd9700935802567350059a4fa/18d25a9b40dbe28a8025697c003d9df4?OpenDocument>>

Encouraging people back to the city

ALTHOUGH there may be many people who would like to escape the pressures of city life, it is going to become increasingly difficult to meet their wishes – at least in England. The country's first White Paper on urban planning in 23 years makes it clear that sustainable communities are intrinsically bound to properly managed cities and that, to save the English countryside, it's now essential that people who have left the cities be encouraged to return. (1)

In fact encouraging people back – and encouraging others not to leave – is the main thrust of the White Paper's policy initiatives including:

- \$2.8 billion in fiscal incentives over the next five



Photo: © Ian Britton - FreeFoto.com

To many, village life is idyllic. Now England's planners hope to encourage the same feelings about cities.

years to encourage people to invest in urban areas

- New planning guidelines to encourage an “urban renaissance”
- A wide-ranging program to improve the quality of parks and open spaces
- Better health, better education, better transport.

According to a BBC news report, the proposals are nothing less than a strategy to clear up urban decay and turn the tide on people leaving towns and cities. (2) Had nothing been done, the country was facing the prospect of a population flood from the cities. All the trends show increasing numbers of people will be living on their own in future and as a result, four million extra homes will need to be built in England over the next 20 years.

The White Paper is more specific. The continued exodus from the cities is:

- Continuing the pressure for towns and cities to expand into greenfield sites
- Continuing the legacy of under used land and buildings within urban areas
- Widening the social impact on rural communities with local people being priced

out of their own housing market by better-off people leaving the towns and cities

- Turning villages into city dormitories
- Creating social polarisation in previously healthy communities with those people who are unable to move out finding themselves living in a poor local environment with high levels of crime.
- Wasting natural resources and increasing pollution as those who move out travel greater distances to get to work, shops and the places where they spend their leisure time.

According to the BBC, under England's current system of Value Added Tax, (VAT) it is cheaper for developers to build new homes on greenfield sites than pay VAT on converting and re-using old buildings.

The new strategy will include a cut in VAT for urban development and incentives to “bring ‘brownfield’ land and empty buildings back into constructive use”. There will also be tax credits for cleaning up contaminated land, and 100% capital allowances for creating flats for rent above shops.

The White Paper also mirrors some of the concerns expressed by the Northern Virginia Technology Council in its demands for new roads infrastructure to ensure employees in Washington's high-tech precinct are not

Continued next page

Urban planning

Designing cities which will encourage people back

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enticed to areas with better living environments. (See page 4)

According to the White Paper, it is essential that the “weak economic performance of some parts of our towns and cities are addressed to enable all areas to compete successfully for jobs and investment in the global marketplace.”

The White Paper takes very much a modern perspective on sustainability and the problems created by oil-fuel vehicles. One part of the paper is particularly scathing of past generations of city planners. For example it says many English cities and towns, to their detriment, were reconfigured during the 1960s and 70s to make way for road schemes and urban renewal built around motor transport.

“This has not only destroyed the physical appearance of some of those city centres but has also caused the severance and dislocation of communities and higher levels of pollution, congestion and noise,” says the White Paper.

“Although subsequent planning decisions have improved this situation, in many cases the scars remain.”

As mentioned earlier, the paper has a pre-occupation with the need to keep urban areas at-

tractive – so that they can compete in the global economy.

According to the White Paper: “If we are to attract and retain jobs and investment we must offer the facilities, the skilled and adaptable workforce, the public services and an urban environment to match the best in the world.”

Urban environments that compete globally need to include components that add to the quality of life and according to the White Paper that means a significant expansion in theatres, concert halls, art galleries and museums.

But the White Paper admits that urban planners still face an uphill struggle when it comes to social change. It points out that in some areas of East London social problems are very longstanding. In fact some were identified as far back as the late 19th Century by the founder of the Salvation Army, William Booth. He identified East London as suffering the city’s worst social deprivation – and it is still true today.

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- (2) “Urban regeneration boost unveiled” BBC News 16 Nov 2000 http://news.bbc.co.uk/1/hi/english/uk_politics/newsid_1025000/1025704.stm

TRANSNet

A regular review of Internet sites related to mobility and the built environment



THE UK’s Building Research Establishment has been keeping tabs on building waste and has discovered a thriving market for architectural and ornamental antiques reclaimed from demolition sites. In fact it estimates about 3.3 million tonnes of such material is being traded in the UK each year. Learn more at the BRE site at <<http://www.bre.co.uk/>>

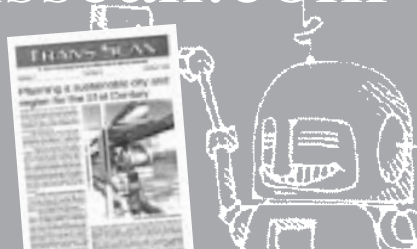
THE American Public Transport Association has developed a link page to just about every transport operation in the country, as well as a news service update of events shaping the country’s transit services. <<http://www.apta.com/sites/transus/>>

RAILWAY enthusiasts in New York have pulled together a remarkably diverse photographic history of rail services around the world ranging from the latest light rail systems in Europe to trams in Hong Kong. There are brief histories and technical information – including descriptions about abandoned and unused tunnels. It can all be found at NYC Subway Resources: <<http://www.nycsubway.org/>>

Disclaimer: The inclusion of these sites does not mean endorsement by the publishers. They have been selected for interest value only.

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'Car free' trend is spreading

THE "Car Free" movement appears to be gaining momentum. A record 757 cities in 25 countries took part in Europe's Car Free Day in September, and the organisers of the first similar event in Western Australia - Fremantle's "Shed Your Car" on November 29 - described it as an "enormous success".

"Even though we only targeted people in Fremantle to take part, we had people cycling in from as far as Kalamunda (about 31 km away) to be involved," said John Pinkard of the Shed Your Car Day Community Advisory Group. (1)

"We are still analysing all the data we collected but we know the 200 vouchers we offered to cyclists for free breakfasts all went and the anecdotal evidence we have suggests most people surveyed were happy and supportive about the event."

They also received 300 "pledges" from the employees of six local companies that supported the event that they would leave their cars behind and cycle to work or find alternative transport - at least for the day.

Among the sponsors were the City of Fremantle, Bikewest, Transport's TravelSmart program, Transperth, and Main Roads WA. According to John Pinkard, the response has been sufficient to persuade the community group to start planning a second event for 2001 - and look to encouraging other cities in Western Australia (and possibly the country) to take part.

"We received formal messages of support from the Town of Cottesloe and as far away as Christchurch, New Zealand," said Mr Pinkard. "So there is certainly a lot of keen interest out there."

A formal decision to hold a second car free day will rest with the City of Fremantle. According to the city's transport planner, David Nicholson, that decision can be expected in January when the council has had the chance to study the results of the traffic and retailer surveys.

The scan also found:

ACCORDING to the EU's Commissioner for Environment, Sweden's former Minister for Social Affairs, Margot Wallstrom, if Europe's car free momentum is maintained the next step may be for local authorities to declare "car free neighbourhoods".(2) In an Internet question and answer session to mark Car Free Day, she said such a concept would depend on citizens putting pressure on local politicians. "But it can become very big," she said. Ms Wallstrom said she had no doubt that a less car dependent society would become a reality in her lifetime. "The current fuel crisis shows us that we cannot continue in current trends and that a change in our mobility behaviour is necessary," she said.

HELSINKI has become the latest city to offer a "free" bike service. (3) The scheme is being promoted by the city's transport department which has provided 25 "Citybike" stands at strategic points. Meanwhile Copenhagen, which has been operating its own free bike system for three years (See *TransScan* July 1998 pp15) is planning to add an additional 1000



Photo: © European Communities

EU Environment Commissioner, Sweden's Margot Wallstrom: "Car free neighbourhoods could be next."

bikes to its current fleet of 2000 by 2002.(4) According to a recent newsletter from Copenhagen Citybike, the system is now becoming highly refined. The City Council is now providing fulltime staff to keep the bikes maintained and new laws have been introduced imposing a \$300 fine on any user who takes a bike beyond the city's bike-free boundaries. The newsletter says there are now more than 20 cities around the world, which have adopted the system - including Munich, Amsterdam, Karlstadt, Trondheim, and Denver.

WHETHER or not people cut back their use of cars, car manufacturers are certainly becoming more interested in bikes. (5) Porsche, BMW, Land Rover

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'Car free' trend spreads

Continued from previous page

and Ford have all started to promote their own bicycle designs and all four included them in recent motor shows in Europe.

The top-of-the-range Porsche FS Evolution (pictured below) sells for more than \$10,000. BMW, Land Rover and Ford are all selling ranges of mountain bikes.

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- (5) "On yer bike!" PRNewswire 29 Oct 2000

Safety issues

Should motorists report near misses?

IN the aviation industry, it is standard practice to collect information on "near misses" and "close calls" and use it to help avoid future accidents – but would a similar system work for road transport?

The idea would require an entirely new structure to collect and process data from all road users and major legal questions on confidentiality and privacy would have to be solved. But the concept is to be investigated by the US Department of Transportation (DOT) as part of its "Safety in Numbers" initiative to markedly improve the quality of safety data. (1)

It wants to determine whether near-miss reporting can provide a data stream that complements accident investigations and provides the type of information which would prevent, in particular, "low probability – high consequence" accidents.

The near-miss research will be one of ten projects the Department will use to help in re-designing the collection and interpretation of accident data. Ultimately it wants to produce a data system similar to that used by public health authorities to identify medi-

cal risk factors. According to the Department, its more standard approaches to safety – such as campaigns against drink driving; promoting seatbelts use; and encouraging the introduction of new technology like airbags - are beginning to reach their limit of effectiveness.

"Diminishing gains indicate that these broad-brush approaches to safety are reaching their performance limits," according to the Department's action plan for "Safety in Numbers".

"Such strategies are analogous to the nationwide inoculation and fluoridation programs used in public health, in that they are essential, but so general that better-focused efforts can reap major additional benefits.

"For DOT to achieve the next level of safety improvement, new tools are needed that focus very specifically on the causes and circumstances of accidents, in the same way that modern public health researchers have gone beyond national vaccination programs by sifting medical data to find risk factors.

"Success requires the analysis of highly-qualified accident data to identify patterns that can be addressed by new local legislation, technology, or other interventions."

Under the plan to improve safety data, DOT will become the lead agency in its collection and the country's National Transportation Library will be expanded to enable much of the new information to be accessed online. The



The new Porsche - selling in Europe for around \$10,000

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Safety issues

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Department is hoping the move will also set new international standards for accident data collection.

The scan also found:

EUROPE too is finding there are limits to standard safety interventions. According to Britain's National Association of Air Ambulance Services, Europe-wide research has shown safety is now at the forefront of new car design – but the people who drive them do not come with upgraded skills and 95% of road accidents can still be traced to motorist error. (2)

DRIVING without a licence is directly linked to a high accident rate, according to a report by the Australian Transport Safety Bureau. (3) It has found that when it comes to fatal crashes, illegal motorcyclists are five times more likely to be responsible than those with licences and illegal motorists are 15 times more likely to be responsible. It says illegal drivers are much more commonly drunk, speeding, riding without a helmet or in a car without a seatbelt.

A RANDOM survey in England has found 12.4% of cars and 17.5% of light goods vehicles failed to comply with minimum standards of roadworthiness. (4) About half the vehicles involved had such serious defects they had to be prohibited from being driven any further. "Although we know that most accidents are caused by driver error, it is inevitable that some accidents are caused by defects and that some are made worse than they would otherwise

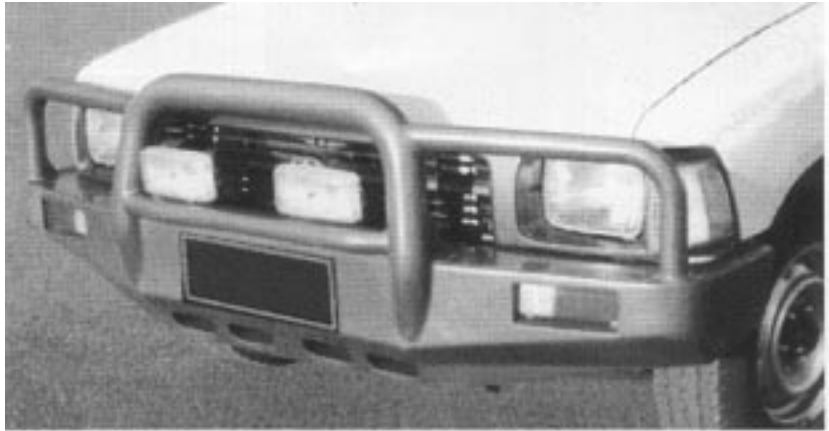


Photo: Transport Research Laboratory

Bull bars like these, made from deformable materials, would not only reduce pedestrian injuries, they could even improve the accident performance of vehicles which currently do not fit them - according to TRL research. (See below)

be, simply because the motorist has failed to maintain the vehicle properly," said Transport Minister, Lord Whitty.

IF US research can be applied generally, it is likely that motorists who keep their cars more regularly serviced are most likely to be women. (5) A survey by America's National Institute for Automotive Service Excellence has found women make up 65% of all US motorists who take vehicles to a mechanic's shop for service or repair.

POOLED results of 16 studies in Australia, Canada, the UK and US show cyclists who do not wear helmets are three times more likely to be killed in an accident than those who do. (6) When it comes to injuries, those without helmets doubled their chances of suffering head or brain damage. Launching the report, Senator Ron Boswell, Parliamentary Secretary to the Minister for Transport and Regional Services, said the results were alarming when taken with other evidence suggesting child cyclists were far less likely to wear helmets.

WHILE cycling appears to be getting safer in Australia – it is not safer for children. (7) Fig-

ures from the Australian Transport Safety Bureau show cyclist fatalities across the country declined 20% during the 12 months ending August 2000. But for children aged 12 to 16 the total number killed during the period rose from 6 to 10 – a 66% increase.

BULL bars often receive bad press for increasing the risk of injuries to pedestrians. But research just completed by England's Transport Research Laboratory (TRL) has shown that with more attention paid to design, bull bars could actually be used to reduce pedestrian injuries. (8) However, there is no reprieve for conventionally designed bull bars made from steel tubing. TRL found that all the steel bars it tested showed a "very high risk of causing life-threatening brain injuries in impacts with the heads of children, or serious injuries to the abdomen and chest of adults and taller children, even in low speed accidents". But the situation improved radically with vehicles fitted with bull bars made from deformable materials – like plastic or hard foam. Tests with these showed they offered "very low risk" of causing serious and life-threatening accidents. As a further check, TRL measured the

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Safety issues

US examines the case for reporting near misses

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likely injuries caused by the same vehicles with the steel bull bars removed. According to TRL, most performed badly – and better results would have been achieved had they been fitted with properly designed deformable bull bars.

BRITAIN'S drug rehabilitation agency, Turning Point, is pressing the government for a high profile public awareness campaign warning of the dangers of

driving when under the influence of either illegal or prescription drugs. (9) "Campaigns aimed at drivers and alcohol have been very successful in reducing the numbers of those who are prepared to drink and drive and a campaign aimed at raising awareness of the consequences of drug use and driving could be just as effective," according to the agency's chief executive, Ted Unsworth.

ONE concern of traffic authorities in planning for the future has been

the likelihood that larger and heavier trucks will be sharing road space with a new generation of lighter and smaller passenger vehicles. Now research being funded by major international steel companies – including BHP – suggests an alternative future of light but far stronger vehicles than are seen today. (10) Instead the research suggests the dynamic properties of some of the newly developed steel products, coupled with some novel approaches to vehicle design, could produce vehicles far better equipped to withstand crashes. The researchers say steel's ability to become harder when crushed means it becomes stronger on impact – and this goes for the ultra lightweight steels now being developed. Using computer-aided design, analysis and simulation, they hope to release their final report on a "safer" future car next year.

BRITAIN'S "Think!" road safety campaign (See *TransScan* Sept 2000 page 11) has been turning its attention to driver fatigue with some new advice to drivers based on as yet unpublished research by Loughborough University's Sleep Research Centre. (11) The research shows that drivers do not fall asleep without experiencing some symptoms of tiredness first. Drivers are therefore being advised to:

- **Plan stops of 15 minutes for every two hours on a long journey**
- **Try to get a good night's sleep before starting a long drive**
- **Share driving if possible**
- **If tired, stop in a safe place, drink one or two cups of strong coffee and take a short nap**

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Europe looks at new ways to ease urban congestion

COULD such vehicles as Post Office vans and trucks carrying wholesale vegetables be pooled together to operate a general freight delivery service around the city?

In Germany the concept is already in operation in Berlin, Bremen, Ulm, Kassel and Freiburg, and now its being promoted for general adoption across the Continent by the European Union.

Such "city logistic" pooling arrangements are one of the key recommendations being put to Europe's transport industry in "Environment and Transport" - a new EU sourcebook designed to give business practical examples of how to increase transport efficiency and reduce environmental impacts. (1)

"City logistics involves setting up new partnerships and styles of cooperation between all those involved in the logistics chain and in delivering/receiving goods in city centres," says the sourcebook.

"These partnerships offer significant reductions in vehicle kilometres and truck numbers."

In Germany, where logistics contractors have already started voluntarily pooling resources, the results have been significant.

One scheme in Freiburg has seen total journey times cut from 566 hours a month to 168 hours, while at the same time, the number of truck operations has been reduced from 440 to 295 (a 33% reduction). The time trucks involved spend in the city has now fallen from 612 hours to 317 hours a month.



Photo: © Ian Britton - FreeFoto.com

Pedestrian congestion in London's popular shopping precinct, Oxford Street

ROAD rage has become a familiar term - and phenomenon - around the world - but what about "pavement rage"? In London's Oxford Street it is apparently becoming such a problem that local traders want the street's pavements divided into two lanes with dawdlers kept in one section and through-traffic pedestrians (minimum walking speed 3mph) confined to the other.* According to the traders' action group, Operation Tugboat, speed cameras and street marshals would be used to enforce compliance and anyone caught window shopping from the fast lane, would face a ten pound fine (\$28).

* Daily Telegraph Online 4 Nov 2000 <<http://www.telegraph.co.uk:80/et?ac=003729510947374&rtmo=QwSeH93R&atmo=tttttttd&pg=/et/00/12/4/nped04.html>>

In Kassel, the scheme has reduced the vehicle kilometres travelled by 70% and reduced the number of vehicles needed for deliveries by 11%. The sourcebook advocates other actions to reduce fuel consumption and im-

prove safety - such as setting higher standards among truck drivers and driver training in fuel management. It says Mercedes-Benz is offering such courses in the Netherlands and those taking

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City environments

New ways to ease urban congestion

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them have been able to reduce the average fuel consumption of their trucks by between 5 and 10%.

It quotes the example in Britain where Blagden Packaging Ltd has reduced fuel consumption in its delivery fleet by 18% through a combination of fuel performance-related bonus payments and by encouraging its drivers to use gears properly, switch off the engine when the vehicle is stationary and avoid heavy acceleration.

“These performance gains are also likely to have knock-on effects in reducing accident rates, reducing vehicle wear and tear and reducing repair and insurance bills,” says the sourcebook.

The scan also showed:

A NEW study by the Washington-based Worldwatch Institute suggests that creating an environmentally sustainable global economy would generate an extra 14 million jobs worldwide with the promise of millions more as the century progresses. (2) “Jobs are more likely to be at risk where environmental standards are low and where innovation in favour of cleaner technologies is lagging,” said the study’s author, Michael Renner. “Investing in renewable energy, using energy and materials more efficiently, and designing products to be more durable and repairable, will generate more jobs than continuing to invest in extractive industries and fossil fuels.”

WHAT is believed to be the world’s largest urban solar instal-

lation is to be built on top of Melbourne’s historic Queen Victoria Market. (3) The City Council is to use a \$1 million grant under the Federal Government’s Renewable Energy Commercialisation Program, to install 2800 square metres of state-of-the-art solar panels.

LONDON-based company, Future Forests, is trying to reduce the environmental impact of car emissions by creating an individual, carbon-absorbing, tree-planting scheme around the sale of every new vehicle. (4) According to company founder, Dan Morrell, it wants car manufacturers to start the process by planting five trees each time they sell a new car. The cost would be added to the purchase price and the new owner would be encouraged to continue the process by planting extra trees every year. Future Forests report Mazda and Fiat are the first to sign up.

THE health impacts caused by traffic generated air pollution have been highlighted in two separate reports published in Europe. In Basel, researcher with the city’s Institute for Social and Preventive Medicine found traffic emissions killing 20,000 people a year in Austria, France and Switzerland while at the same time were annually responsible for 25,000 new cases of chronic bronchitis, 500,000 asthma attacks and more than 16 million person days of restricted activity. (5) The report, “Public Health Impact of Outdoor and Traffic Related Air Pollution: a European Assessment” found the cost of treating pollution suf-

ferers in the three countries amounted to 1.7% of their gross domestic product.

Meanwhile in the UK, traffic air pollution is now killing more Londoners than are killed in the city’s road accidents. According to a National Health Service report, “On the Move” , while 226 people died on London’s roads in 1998, 380 more died as a result of transport pollution.(6)

THE problems of breathing polluted air inside a car may be of even greater concern than what is going on outside the vehicle, according to a report by the US-based, International Center for Technological Assessment. (7) It says air quality is typically much worse with benzene concentrations sometimes four times more than the roadside measurement and carbon monoxide concentrations 10 times higher. “While it receives little attention, in-car air pollution may pose one of the greatest modern threats to human health,” says ICTA’s executive director, Andrew Kimbrell. The institute now wants government to offer greater incentives to solve the problem – including encouragement for people to make more use of public transport. Included in its recommendations are:

- **Tax incentives to individuals and companies using public transport**
- **A phasing out of current tax incentives which encourage car use, and**
- **More US States to adopt California-type laws encouraging the development and use of zero-emission vehicles**

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City environments

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ACROSS the border in Canada, Ontario has been conducting a blitz on car pollution by issuing infringement notices to any motorist caught driving a vehicle emitting excessive contaminants – particularly if they are visiting from other Provinces or the United States. (8) This year Ontario introduced strict emission limits on local industry, placed a freeze on the sale of all coal-fired generating plants and invested \$4 million on a new air monitoring network. Meanwhile its clamp down on dirty vehicles has already reduced car pollution by 6.7%.

ONTARIO'S problem (See above) is that half of its air pollution is not caused domestically – it is blown in as smog and acid rain from the United States. In October the Canadians moved closer to finding a solution when negotiating teams from both countries finalised a draft text for a Canada-US Air Quality Agreement. (9) The draft calls for a 35% reduction in US Nitrogen Oxide emissions by 2007 from power plants and major industrial sources. At the same time Canada will agree to cap the Nitrogen Dioxide emissions from certain of its fossil fuel plants. The draft also commits both countries to look at further options for reducing transport emissions. The document is subject to approval of both governments.

CAR buyers would be more likely to purchase fuel-efficient cars, if information on a vehicle's environmental friendliness was more readily available, according to a report prepared jointly for Britain's Society of Motor Manufacturers and Traders and the Depart-

ment of the Environment, Transport and the Regions. (10) The report recommends against non-comparative information and instead suggests vehicles be rated on a comparative basis.

HONDA has received the US Environment Protection Agency's "2000 Climate Protection Award" for the development of its petrol-electric hybrid, the Honda Insight. (11) The vehicle has the Agency's highest fuel economy rating for a petrol-electric car - almost twice the

economy level of a conventional vehicle.

THE UK's Department for the Environment, Transport and the Regions is to provide administrative support for the country's new Sustainable Development Commission – an advisory body to "harness consumer demand for a better environment and encourage business to see the profit of the new green technologies". (12) At the same time \$100 million a year is to be provided to help develop low carbon technologies. (13)

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Intelligent Transport Systems

How ITS technologies could cut air pollution

ELECTRONIC Payment Systems – including Electronic Road Pricing and Electronic Toll Collection – have been identified as the ITS technologies likely to have the greatest single impact in reducing the air pollution generated by vehicles on Australian roads.

The findings have been published in a report prepared for the Federal Government by consultants, Maunsell McIntyre Pty Ltd who have specifically examined the potential impacts of those technologies suggested for rollout in the National ITS Strategy.

It was last May that the Bureau of Transport Economics stated that urban congestion was producing an extra 13 million tonnes of greenhouse gas emissions annually and that reducing the figure would make a “significant contribution to addressing greenhouse targets”. (See *TransScan* June 2000 page 20)

According to the Maunsell report, from the environmental viewpoint, Electronic Road Pricing (ERP) is perhaps the most promising ITS application because it has the potential to dramatically reduce vehicle kilometres travelled. (VKT)

“ERP is able to influence travel demand by making travellers more aware of the full cost of road transport, incorporating the ‘hidden’ costs such as air pollution and noise,” it said.

“The majority of other technologies and applications are able to influence the timing of trips, the mode of travel, the route of travel, the travel destination and the flow of traffic, but do not have a great impact on the number of vehicle trips.

“Clearly, the greatest emission reductions will be achieved when VKT is reduced (excluding reductions due to improvements in vehicle, engine and emission control technology.)

“In fact, ERP has the potential to be directly targeted at air pollution management. Variable pricing could be linked to pollution monitoring technology and charges increased when pollution levels rise.”

The scan also found:

THE FRENCH Department of Transport is coordinating an ITS research project to determine whether mobile phones carried in vehicles can be “probed” to determine the vehicle’s speed and direction. (2) If the concept proves feasible, the department will look at selling the concept to a traffic report service provider. The concept is to be tested on a 40km stretch of freeway south of Lyon where a more conventional speed measuring system is already in use.

AT the end of 1999, the US National Highway Traffic Safety Administration was complaining that too little attention was being given to the distractions drivers could suffer if confronted by too much in-vehicle, digital technology – including mobile phones. (See *TransScan* February 2000 page 13) Now ITS America which represents all the major players in the US ITS industry has decided to set up a “Driver Focus Task Force” to look at the technology

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Australia: Walking the 21st Century - International Walking Conference
20-22 Feb 2001.
Perth, WA
<<http://www.transport.wa.gov.au/>>

Urban Development Institute of Australia National Congress
5-8 March 2001
Adelaide, SA
<<http://www.camtech.net.au/~plevin/UDIA2001/>>

3rd International Space Syntax Symposium
7-11 May 2001
Atlanta, USA
Email:
sonit.bafna@arch.gatech.edu

4th UITP International Congress (International Association of Public Transport)
20-25 May 2001
London, England,
<http://www.uitp.com/>

Velo-city 2001 (International cycling conference)
17 -21 Sept 2001
Edinburgh, Scotland
Email: velo-city@meetingmakers.co.uk

8th ITS World Congress
30 Oct – 4 Nov 2001
Sydney NSW
<http://www.itsworldcongress.org/index1.htm>

If you have an item for Events up-date, please email the Editors at
<scanasia@highway1.com.au>

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Intelligent Transport Systems

Privacy concerns 'pose a threat'

PRIVACY concerns could hamper the development of ITS unless legislation addressing the issue is introduced - or so believes the United State's ITS industry lobby group, ITS America.*

It has drawn up its own set of privacy principals and warned that people will become reluctant to install ITS devices in their vehicles if they believe the devices are undermining their privacy.

Just how quickly privacy issues can arise is demonstrated by the French research project to monitor vehicle speed and direction by electronically probing the mobile phone the target vehicle may be carrying. (See page 14)

According to ITS America, the overriding principal of ITS must be to recognise and respect the individual's interests in privacy and information use.

ITS should be used to improve travellers' safety and security, reduce travel times, enhance individuals' ability to deal with highway disruptions and improve air quality.

The group says ITS information systems should be built in a manner "visible" to individuals. "ITS may create data on individuals," says the group. "Individuals should have a means of discovering how the data flows operate."

It also means disclosing to the public the type of data collected, how it is collected, what its uses are and how it will be distributed. "ITS has the potential to make it possible for traffic management agencies to know where individuals



Photo: © Ian Britton - FreeFoto.com

If motorists think they are being watched, they may be slow to adopt in-vehicle ITS

travel, what routes they take, and travel duration," says the group. "Therefore, ITS can increase the efficiency of traffic law enforcement by providing aggregate information necessary to target resources. States may legislate conditions under which ITS information will be made available to law enforcement agencies. However, ITS systems should not be used as a surveillance means for enforcing traffic laws, nor used as a tool of criminal investigation.

"Although individuals are concerned about public safety, persons who voluntarily participate in ITS programs or purchase ITS products should not be surprised by how information they are providing is used." The group says any ITS data sold for commercial use should be stripped of information identifying individuals.

* Intelligent Transportation Society of America's Proposed ITS Fair Information and Privacy Principals 27 Oct 2000
<http://www.itsa.org/resources.nsf/24aebd36f046a5a58525658d00644198/bad372b260280b3385256818004fe7e3?OpenDocument>

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and "review and recommend actions on research, education and standards to make transportation safer and more enjoyable to the driver." (3) The new body is to be chaired by Ford's vice president for research, William Powers, and include representatives from such organisations at Motorola and the Massachusetts Institute of Technology. According to Powers, the industry knows ITS must not be developed in such a way that it distracts drivers. "Members are

deeply aware that the intelligent transportation industry worldwide is faced with a patchwork of laws, guidelines and research on driver focus," he said. "By acting now, we are giving ourselves that chance to develop thoughtful standards that will allow the driving public to have the advantages of improved in-vehicle communications and information while the possible negative impacts are minimised or eliminated."

THE US Department of Transport has released a position pa-

per summarising the issues involved in establishing America's National Mayday Readiness Initiative - an ITS system to automatically identify and respond to traffic accidents. (4) Already millions of new vehicles in America are being fitted with airbags that transmit "help" signals the instant they are inflated. The next generation of in-vehicle transmitters are expected to be able to provide details of the severity of the accident. The Department's sum-

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Corrosion breakthrough will save maintenance

IT used to be said that painting the Sydney Harbour Bridge was a never-ending task. No sooner is the job completed than it has to be started again for fear of corrosion. Now the CSIRO has come up with a solution that may lengthen the periods between repaints to more than 30 years. (1)

Researchers at the organisation's Sustainable Materials

Engineering laboratory have developed a new scanning device that can identify previously unobservable interactions that take place just at the "birth" of corrosion.

With this knowledge it becomes possible to calculate how quickly corrosion will proceed – and importantly what coating treatments will best stall the proc-

ess. According to Aaron Neufeld, the scientist behind the breakthrough, this means a new surface coating could be tailor-made for Sydney Harbour Bridge that would reduce the need for repainting from once every 11 years to once every 33 years.

"The potential savings are very large," he said. "For example, in the aircraft industry a new corrosion-resistant coating could save \$3 million on a large commercial aircraft for each 10-year scheduled maintenance strip down."

The scanning device, known as the Scanning Kelvin Probe, will also help solve corrosion problems on cars and trucks, trains, metal light standards, and buildings.

New ITS technologies

Continued from previous page

mary describes the issue involved in operating the service as a public-private partnership.

TECHNOLOGY pioneered by transport authorities in Curitiba, Brazil has just been adopted by the Los Angeles Metropolitan Transportation Authority to reduce travel times for the city's 70,000 bus commuters by as much as

25%. (5) The Brazilian concept is a refinement to an earlier system which allowed buses to hold traffic lights on "green" until they had passed. Experienced showed that the indiscriminate use of green lights often backfired by creating jams for other buses travelling along the cross streets. Under the new system, the bus can only hold a traffic light on green – if the city's central traffic computer decides it will not cause problems.

The scan also showed:

THE next ten years will see electronic innovations shaping the car industry, according to Donald Runkle, executive vice president of Delphi Automotive Systems. (2) He told a forum that major changes would come from "unlimited computing power, unlimited memory and unlimited bandwidth". "By 2010, I expect advancements in electronics to propel the auto industry toward solving many of its remaining problems," he said. Runkle predicted the advent of:

- Electronic Cocoons - sensors and computers that would constantly guard a car against rear-end and frontal collisions, broadside collisions and vehicle stability. "With the right kind of focus and developments, I think we can imagine cars that don't have accidents," he said.

- Vehicle Stability Controls - major improvements to braking, handling, and overall vehicle stability. "I know the concept of acci-

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Off-road and online



Photo: PR Newswire Photo Service

THE Ironman looks different from standard vehicles and it is being promoted in the US as the first in the world to be "built-to-order" and distributed via the Internet. But if the concept takes off, it could be the design and manufacturing techniques that have been used, which have the biggest impact on future vehicle development. One complaint often heard from safety experts is the length of time it can take to have new concepts incorporated in new car designs. As Model E Corporation, the Ironman's manufacturers, point out, it usually takes a traditional manufacture between 12 and 18 months to turn a sketch into a concept vehicle. It takes even longer for the concept vehicle to reach full-scale production. In the case of the Ironman, the makers used Computer Aided Industrial Design (CAID) techniques and eliminated the need for clay modelling. After the original sketch was complete, the first Ironman - with its centrally positioned driver's seat and exoskeletal frame design - was ready to drive in 90 days. Meanwhile in Britain, researchers are predicting that it should soon be possible to deliver "tailored" vehicles within three days of the buyer placing an order.# To support the program, the Glasgow School of Art is developing an advanced 3D projection system which would allow any assortment of new cars to be "virtually" displayed in shopping centres - and thus do away with the need for car lots.*

* <<http://www.modele.com>>

<<http://www.foresight.gov.uk/servlet/Menu?id=44>>

dent-free driving will strike fear in the hearts of many, including airbag producers and some 'legal eagles,' but we can't stop progress," he said.

- Electrical Intense Powertrains – making cars both cleaner and more efficient by replacing me-

chanical and hydraulic devices with electrically driven motors and actuators.

- Total Vehicle Energy Management - "One can see the day when engine control may be a subset of the car's energy management system," he said.

- Mobile Multimedia - in-vehicle information and entertainment features will "relieve the tedium of the long commute."

WHILE the new Ironman would appear to be designed to appeal primarily to young people, (See photo report left) Britain's Institute of Mechanical Engineering believes it is time to develop vehicles specifically for older drivers – who incidentally make up the majority of the new car market.(3) "Most manufacturers appear to design vehicles around the premise that the driver will be fit, young, agile and male," says the institute's director general, Sir Michael Moore. "But as the population gets older, fewer and fewer drivers are fitting this stereotype." The trend has convinced the institute that it is time to research the real needs of older drivers and design vehicles accordingly. It is now funding a research program at the University of Sunderland to investigate car access, seating, controls, visibility and cabin layout from the viewpoint of the older driver.

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Creative cities

How innovation can be used to revitalise urban areas

Charles Landry is director of Britain's cultural planning consultancy, Comedia, and an international authority on "city futures". In projects for the World Bank and OECD, he has developed strategies for revitalising public and social life through cultural activity. Landry was in Perth in September to address Curtin University's Habitus 2000 Conference and talk about his latest book, "The Creative City: A Toolkit for Urban Innovators". (1) Emma Rooksby filed this report for TransScan.

CHARLES LANDRY defines creativity as "constant innovation and the implementation of new ideas" and in his new book, *The Creative City*, he suggests remarkably practical ways of using the concept to revitalise cities.

His definition of "creativity" is certainly not limited to "artistic creativity" - although he does show how links between artistic practitioners and others such as youth groups, industry and local government, can be used to contribute to a city's creativity.

To foster city creativity he believes it is necessary to build a "creativity cycle" and for that he suggests a five-stage strategy in which ideas are worked on and developed and in a virtuous circle that reinforces the city's creative success.

The first stage in the cycle involves establishing a climate in which people and organisations that would not normally meet can exchange ideas. For instance, this might involve a government agency linking unemployed people with private investors and companies ready to fund new ideas.

The second stage involves making sure that ideas can be

come reality, that is, training people in producing the product, managing the company that produces it, and so on.

The third stage is marketing the ideas - and that includes giving people marketing skills.

The fourth stage, delivery, involves providing the places in which to pilot products, and display and sell work. Landry suggests utilising urban fringes and land whose use is changing (such as former ports or industrial zones).

The final stage, of dissemination, reflection and evaluation, involves looking back at what has been achieved with an eye on where to proceed next. Importantly, this includes spreading the news among the wider community, so that innovation is associated with the city as a whole rather than with a smaller group of people more directly involved.

The final stage leads straight back round to the first, by generating new ideas.

Landry's ideal of creativity is actually being attained by at least one city.

The northern English city of Huddersfield is the test ground for the cyclical approach.

Its Creative Town Initiative received a large grant from the EU, as an Urban Pilot Project. The city is now developing from a post-industrial desert with low employment and high youth disaffection and violence, to a thriving metropolis, with its own strong identity and increasing co-operation among citizens. (2)

The transformation is still going on, with projects such as the Millennium Project, aiming to complete 2000 community initiatives by the end of 2000. Projects include increasing the wealth of Huddersfield, and increasing the health and safety of the city, and are undertaken by a diverse range of groups and individuals.

When I talked to him, Landry stressed that seed funding was essential to the success of the Huddersfield project, allowing greater autonomy and faster progress.

He also noted that the Huddersfield project used the EU's monetary contribution to set up an organisational body independent of the local council. This meant that the two bodies could work, and still work, together in creative tension.

Landry believed Perth could benefit from a similar approach, using competition among different urban centres (such as Mandurah, Fremantle, and Stirling) to spur on creativity.

He hypothesised that eventually these centres would compete with each other for residents in terms of quality of life, each improving its own creativity and quality of life in order to attract residents and investment.

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Are there new drivers to reverse global warming?

“Decision-makers should realise that once carbon dioxide, the major anthropogenic greenhouse gas, is emitted into the atmosphere, it stays in the atmosphere for more than a century. This means that if policy formulation waits until all scientific uncertainties are resolved, and carbon dioxide and other greenhouse gases are responsible for changing the Earth’s climate as projected by all climate models, the time to reverse the human-induced changes in climate and the resulting environmental damages, would not be years or decades, but centuries to millennia, even if all emissions of greenhouse gases were terminated, which is clearly not practical.”

Robert T Watson, Chair of the Intergovernmental Panel on Climate Change, addressing the UN Framework Convention on Climate Change 13 November 2000 (1)

IN the debate that has followed the collapse of the world summit on climate change, there have been numerous commentators advocating strategies that would specifically exclude the United States from any international plan to combat global warming.

An editorial in the French daily, *Le Monde*, said bluntly that if America kept turning a blind eye to climate change, it would be appropriate to examine the alternative - of Europe, Japan, and Russia concluding a separate Kyoto agreement. (2)

In a series of letters carried by the *Guardian Weekly* of December 7-13, a number of writers suggested that as the US was responsible for only 20%-25% of emissions, why not leave the country out and seek a serious agreement among those who were responsible for the remaining 75%. (3)

Even the *Washington Post* conceded that there might be serious difficulties ever getting America to agree to anything meaningful. (4) “America’s political reality ... is mired in old thinking – or non-thinking – which

holds that any change in our habits will harm us,” the newspaper said in a commentary by Geneva Overholser. “The question for Americans is: When and how will we figure out that we share in the responsibility to do so?”

There can be no doubt that without serious political will widely supported by the electorate, it will be very difficult for even the 75% to reach agreement.

As commentator, Madeline Bunting said in the *Guardian Weekly* of November 30-December 6: “What has been singularly lacking has been any widespread popular campaign. There have been no Seattle-style protests. Instead there have been fuel tax campaigns and a public stubbornly recalcitrant about changing its own lifestyle, unwilling to turn out for a demo on climate change.” (5)

But if these drivers for change are still absent, the economic pressures may be rising.

For some time, sections of the international financial industry have become increasingly concerned by the potential costs that can be brought about by radical

changes in weather patterns – particularly if investments made now undermine returns 20 years hence.

Britain’s Building Research Establishment is hoping to highlight the subject with a report due in the New Year on the implications of climate change for insurers over the next 20 years. (6) According to the report’s editor, Dr Julian Salt: “The insurers could have a major impact on the outcome of the climate change debate, if they chose to take a leadership role”.

But perhaps the biggest driver for change will be the economy itself. The Washington-based *Worldwatch* organisation has estimated that creating environmentally sustainable industries has already generated 14 million jobs worldwide and that in the 21st Century, the environment will be the “jobs engine”. (7)

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- (4) “Wake-up call unheeded by energy abusers” *Washington Post* section of the *Guardian Weekly* 7-13 Dec 2000 pp35
- (5) “Commentary” *Guardian Weekly* 30 Nov-6 Dec 2000
- (6) UK Building Research Establishment <<http://www.bre.co.uk/>>
- (7) “Saving the Environment: A Jobs Engine for the 21st Century” by Michael Renner *Worldwatch* 21 Sept 2000 <<http://www.worldwatch.org/alerts/000921.html>>

The search for alternatives speeds up

IN the last quarter, the continued high price of petroleum fuels remained a major preoccupation for both consumers and governments. Collectively such concerns have attracted the most headlines both in Australia and around the world, but in the research institutes and among car manufacturers there is a markedly different focus.

Many manufacturers are now demonstrating a new sense of urgency as they seek to develop vehicles with greater fuel economy – including the production of alternative power systems. (See below)

At the same time, the long term alternative fuel - hydrogen – has received a considerable boost from the findings of an independent report funded largely by the US Department of Transportation and US Department of Defence in which 44 experts around the world were consulted on the future of fuel cell technology. (1)

The “vast majority” of the experts believed that:

- The development and production of pure hydrogen fuel cell vehicles are and should be the world’s ultimate goal
- The biggest question now is what “fuel” should be used in the near to mid-term for fuel cell passenger vehicles
- The “fuel of the future” - hydrogen – may come from many feedstocks and that unlike today, there will not be a global “fuel of choice” such as petrol and diesel. Different geographical regions will select the hydrogen feedstocks most appropriate to the area i.e: geothermal electrolysis in Iceland, ethanol in the US wheatbelt.

The report, “Future Wheels” was compiled by America’s Northeast Advanced Vehicle Consortium - a partnership of companies, public agencies, universities and government laboratories. The 44 experts who took part were drawn from such companies and organisations such as BP Amoco, Daimler-Chrysler,



Photo: PR Newswire Photo Service

PERHAPS to prove there is life yet in petrol engines, Saab has just won an international prize for this concept engine that cuts petrol consumption by 30% and keeps emission levels low enough to meet all proposed clean air regulations. Popular Science magazine was so impressed it has given the company its “Best of What’s New” Award for 2000. The so-called Variable Compression Engine is designed to use fuel more efficiently through what Saab describes as a “combination of reduced engine displacement, high supercharging pressure and a unique system for varying the compression ratio.” (4)

ExxonMobile, Ford, Hyundai, the UK’s Imperial College, the US Department of Energy, and the Union of Concerned Scientists.

The scan also showed:

EVEN if a non-carbon based fuel like hydrogen proves to be the solution, it may not be necessary to scrap all the hundreds of millions of internal combustion engines that power vehicles today. A Canadian company, Alternative Fuel Systems Inc., has launched a research program to develop an internal combustion engine that will operate on hydrogen. (2) The company already produces an injection system to convert petrol engines to natural gas and now hopes to do the same using hydrogen. “It is not an issue of ‘can’ hydrogen be used but ‘when’,” says company president, John Anderson.

CHRISTOPHER Flavin, Acting President of the Worldwatch Institute, fully supports any move to hydrogen. (3) “Just as the economies of the 20th century were fuelled by oil, so must this century be powered by a new generation of energy sources,” he says. “Already, the market for (fuel cell) technologies is growing at double digit rates, and automakers that once seemed inextricably wedded to the internal combustion engine are developing a new generation of hydrogen fuel cell cars.”

References:

- (1) “Future Wheels” Northeast Advanced Vehicle Consortium & M. J. Bradley and Associates Nov 2000 http://www.navc.org/Future_wheels.pdf
- (2) “AFS demonstrates zero emission hydrogen fuelled diesel engine” CNW/NEWSdesk 17 Oct 2000
- (3) “The Real Price of Oil” by Christopher Flavin, Worldwatch News Brief 28 September 2000 <<http://www.worldwatch.org>>
- (4) “Best of What’s New” PR Newswire 28 Nov 2000