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# The networked car

## ICT and motor industries focus on greener and safer driving


International Telecommunication Union


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Special Edition — The networked car

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*Note — Our regular "Pioneers' Page" has been postponed until the next issue of the magazine.*

# Networked cars and climate change

Dr Hamadoun I. Touré
ITU Secretary-General


I am especially pleased that climate change was the theme of *The Fully Networked Car* workshop that took place on 5–7 March 2008 at the Geneva International Motor Show, one of the world's leading automotive events. The workshop was organized jointly by ITU, the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

Climate change is high on the political agenda. At the global level, United Nations Secretary-General Ban Ki-moon has called it the "moral challenge of our generation". As part of a major initiative to examine the relationship between information and communication technologies (ICT) and climate change, ITU is organizing two global symposia this year, in Kyoto, Japan, on 15–16 April; and in London, United Kingdom, on 17–18 June. Also, at the High-Level Segment of the ITU Council session in November 2008, ministers and delegates will discuss this important issue.

Often, technologies that start in Formula One motor racing eventually migrate to ordinary cars, so it makes sense to pay attention to the work of F1 research and development experts. The Honda Racing F1 Team has been one of the main proponents of a "green" technologies policy. We were honoured that the Honda Motor Company was kind enough to put on display, at our workshop, the new 2008 "Earthdreams" racing car, emphasizing green technologies of the future (see pages 4–22).

The major challenge facing the motor industry is to build vehicles that are cleaner and greener. ICT have a major role to play in this effort. Computerized emission controls, for example, have already helped to reduce pollution. With the promise of the "fully networked car", we can achieve even greater benefits. By connecting vehicles to networks, we can provide traffic management and save fuel, all of which will help meet the climate change challenge.

ICT in vehicles also leads to important benefits in terms of safety. An estimated 1.25 million people die on the world's roads each year, and over 30 million are injured. Many governments have now embarked on programmes to halve road deaths and injuries within a decade. Intelligent transport systems (ITS) will provide a major means to achieve this. But low-cost technologies and more global standards are needed for ITS to be used more widely.

ITU continues to address the technical and operational characteristics of ITS. Current studies are focusing on broadband applications for voice and data communications, both among cars and between cars and infrastructure. Our work on standards has been expanded to the development of testing methodologies for wideband communications in cars. I encourage the automotive industry to participate in ITU work, so that ICT can help to create efficient, environmentally friendly transport systems. This will be good for society, and good for the motor industry.

*Executive insight*

# The Fully Networked Car

## ICT and motor industries focus on greener and safer driving



*Tomorrow's vehicles will be online constantly, with networked navigation and entertainment systems operated by voice commands*

*The Fully Networked Car* workshop took place on 5–7 March 2008, at the prestigious Geneva International Motor Show. Now in its fourth year, it was held for the third time jointly by ITU, the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), under the banner of *World Standards Cooperation*.

The workshop brought together some 250 experts and top names among industry decision-makers, engineers and designers, as well as industry analysts, government officials and regulators. Panellists were from leading companies such as BMW, Connexis, Fiat, Ford, Freescale Semiconductor, Honda, Intel, Motorola, Oracle, Telefónica, Telcordia, Toyota-InfoTechnology Center, T-Systems, Volvo and Wavecom.

An exclusive feature of the event was the Honda Racing F1 Team's new Formula One "Earthdreams" car — emphasizing green technologies of the future. As well as addressing the theme of climate change, the workshop focused on the standards that will facilitate the convergence of information and communication technologies (ICT) in motor vehicles.

At the start of the event, ITU Secretary-General Hamadoun I. Touré said "today, ICT are an integral part of keeping vehicles on our roads safe and secure… This merging of technology requires that the *World Standards Cooperation* partners, ITU, ISO and IEC, take into account each other's work and cooperate at points of technological interface, so that manufacturers can use our standards to deliver a final product to customers that functions as expected."

ITU will help to push standards work with initiatives such as its FITCAR (From/In/To Cars Communication) Focus Group, and the hosting of the Advisory Panel for Standards Cooperation on Telecommunications related to Motor Vehicles (ASPC TELEMOV). Malcolm Johnson, Director of the ITU Telecommunication Standardization Bureau (TSB), announced that *The Fully Networked Car* event will become a regular fixture bringing together the ICT and automotive industries and assisting their convergence. He said that priorities identified for future work include standards for the full range of nomadic devices; standards for software-defined radio; standards to cope with the gap between the short lifecycle of mobile


ITU/R. Scholl

*On show alongside the workshop was the Honda Racing F1 Team's new "Earthdreams" car. ITU Secretary-General Hamadoun I. Touré (right) and Malcolm Johnson, Director of the ITU Telecommunication Standardization Bureau*

phones compared to the longer lifecycle of cars; and privacy concerns, where a common understanding is required on what data are reasonable to collect and retain.

Alan Bryden, the Secretary-General of ISO, outlined recent events of global significance that were relevant to discussions at the workshop. The first, he said, was the United Nations Framework Conference on Climate Change, in Bali, Indonesia in December 2007, which gave an opportunity to highlight the contribution of the ISO 14000 series of standards on environmental management — in particular ISO 14064 and ISO 14065 on accounting and verification of greenhouse gas emissions. "The carbon footprint of equipment in general, and the car in particular, is becoming a key parameter both for marketing and for public policy," Mr Bryden explained.

ITU/R. Scholl

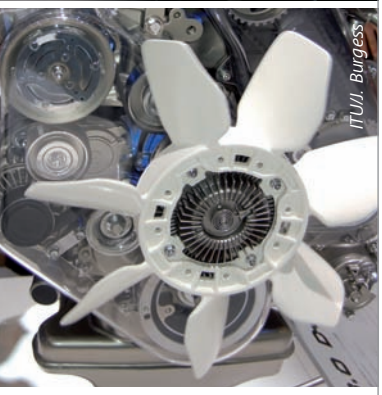
> *"The carbon footprint of equipment in general, and the car in particular, is becoming a key parameter both for marketing and for public policy."*
> *Alan Bryden, Secretary-General of ISO*

Referring to the UN Stakeholders Forum on Global Road Safety, held in April 2007, Mr Bryden said that ISO has begun developing a standard for road safety management systems. It will provide public services and private operators of rental or freight vehicles with a specific and globally recognized framework for improving road safety.

Speaking on behalf of IEC General Secretary Aharon Amit, IEC Standardization Strategy Manager Jack Sheldon said that although the Commission is mainly concerned with electrical and electronic technologies, it is also involved in the automotive industry — notably in producing environmentally friendly vehicles. He said that, as well as looking at multimedia systems for in-car use, IEC is active in the development of hybrid electronic vehicles, and in the application of standards for life-cycle management of electrical and electronic components.

*Executive insight*


Honda


ITU/I. Burgess

## Racing cars lead technological development

Max Mosley, President of the *Fédération Internationale de l'Automobile* (FIA), Formula One's governing body, called for accelerated standards development to support ICT in vehicles, so as to improve safety and the mitigation of climate change. He said that the leading-edge expertise within Formula One to develop "green" technologies could have applications beyond the sport, particularly in the area of fuel efficiency and monitoring of environmental impact.

Mr Mosley recounted how the Formula One motor-racing industry had begun looking at the issue of ICT in racing cars in 1992, when there was concern that the rapid development of in-car technology would soon eliminate the need for human drivers. This led to a decision to separate the future development of road cars, where driver aids can be used to the maximum, and racing cars where limits should be applied. But it is the racing car industry which is setting the pace. Most racing teams have as many as 300 channels of information flowing between cars and pit crew, and their interconnection will become critical as the complexity of systems grows, Mr Mosley explained.

Energy-efficient technologies are said to be the future of greener motoring, and it is hoped that the platform offered by Formula One can help to accelerate their introduction on our roads. The FIA has launched a "Make Cars Green" global campaign, aimed at helping to reduce the impact of motoring on the environment. The FIA Formula One World Championship will take a lead in this when, in 2009, hybrid devices called kinetic energy recovery systems (KERS) will be introduced. These can store energy during braking and reuse it for acceleration. In 2011, the aim will be to recover additional energy from cooling systems and as a next step — in around 2013 — further fuel savings should be feasible from the recycling of exhaust fumes.

Mr Mosley said he is convinced that these innovations in Formula One will also lead to significant developments in ordinary cars. However, he added, there is a dilemma when it comes to introducing energy efficiency and road safety measures in every-

### *10 points for greener motoring*

*The FIA's Make Cars Green campaign aims to help reduce the impact of cars on the environment. The campaign's 10 points for greener motoring encourage motorists to think green before they drive:*

- *Buy Green*
- *Use air conditioning only when necessary*
- *Plan your journey*
- *Offset your $CO_2$ emissions*
- *Check tyre pressures frequently*
- *Accelerate gently and keep your speed constant*
- *Reduce loads and avoid the need for roof racks*
- *Don't idle your engine*
- *Don't warm up your engine before starting off*
- *Use engine braking*

day vehicles: manufacturers will not make the technology available as standard until customers demand it, but customers may not be willing to pay for it. Therefore, Mr Mosley argued, governments need to intervene to create fiscal incentives to use the latest advances in ICT for cars.

## The "Earthdreams" vision

David Butler, Marketing Director of Honda Racing F1 Team (UK), described the sport as "the ultimate combination of man and machine where technological perfection and bravery go hand in glove". It is "the sport where winners are forged lap after lap, and where every metre raced is the product not just of the pilot's courage, but of hundreds of personnel who rigorously test every aspect of racing technology, as well as tens of millions of dollars of investment."

But despite its technological innovations, Formula One must also reflect wider environmental concerns. In 2007, Honda Racing launched its "MyEarthDream" programme, which Mr Butler described as a pioneering initiative not just in sport, but also in the whole area of corporate social responsibility. "Imagine a Formula One team using its most precious marketing platform as a discussion point on the environment," he said. The programme "won many friends and allies — over 70 000 pledged online to raise almost USD 200 000 for environmental causes," he added, and the initiative won the prestigious Green Award at the end of 2007 for its marketing campaign.

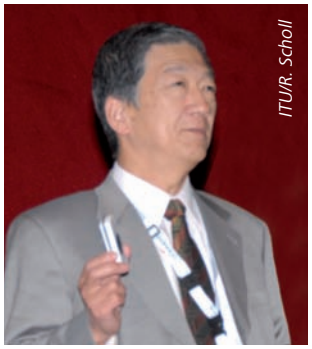
He explained that the programme is far-reaching. It includes staff training, energy monitors for the home and the creation of an environmentally conscious culture. For example, the Honda team is targeting making detailed energy audits and is employing the sport's first environmental manager, along with developing a testing regime that reduces energy use. For Mr Butler, "technology, development, challenge and exploration are all integral to the world of Formula One racing teams — and not just in terms of what happens on the track but also what is happening off it."

This year, Mr Butler said, the "MyEarthDream" campaign has evolved into the "Earthdreams" programme, which

> *"Technology, development, challenge and exploration are all integral to the world of Formula One racing teams — and not just in terms of what happens on the track but also what is happening off it."*
>
> *David Butler, Marketing Director of Honda Racing F1 Team (UK)*

ITU/R. Scholl

*Executive insight*


ITU/R. Scholl

*Kenji Ikeura, President of Connexis*


ITU/J. Burgess

will be funded by the racing team and its partners to deliver support to inspirational projects and initiatives that make the world a better place.

## Expanding connectivity

One of the companies working closely with the racing industry is Freescale Semiconductor, of the United States, which was also a sponsor of the workshop. Its Chief Executive Officer (CEO) Michael Mayer described how Freescale is helping to develop up to 100 sensors in a car, with a bandwidth requirement of up to 500 Mbit/s. As vehicles become more intelligent, with more safety features, this requirement will increase. Mr Mayer said that three major issues must be addressed in tandem:

- environmental concerns associated with climate change, which are becoming business-critical;
- improved road safety, which requires ever-faster processing times for on-board processors;
- the imperative of constant connectivity between increasingly complex subsystems.

By 2010, Mr Mayer added, it is estimated ICT will account for up to 35 per cent of the total costs of a car, and 80 per cent of the innovation. He said that the automotive sector has not yet reached maturity in integrating ICT, and expressed concern at the proliferation of proprietary standards. Calling for global standards bodies such as ITU to take a lead, Mr Mayer said "it is critical that further development be standards-driven".


ITU/R. Scholl

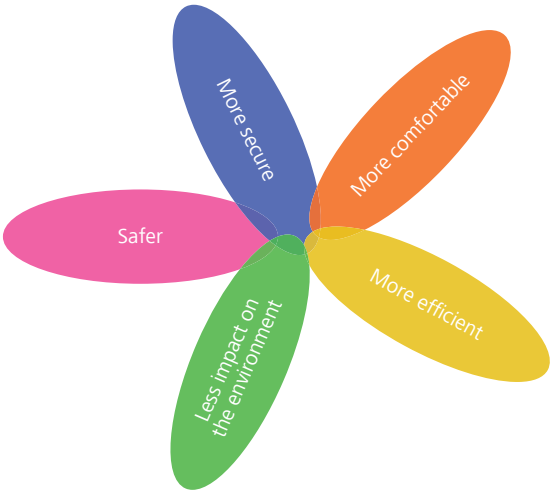
*"It is critical that further development be standards-driven."*
*Michael Mayer, CEO of Freescale Semiconductor*

President of Connexis Kenji Ikeura described how "the always-connected car changes life on board". Connexis, a telematics provider, is part of the Ygomi Group based in the United States, and was the workshop's main sponsor. Because ubiquitous and affordable communications are already available in most developed countries, people now expect them to also be available in cars, Mr Ikeura said. However, the average lifespan of a car (10–15 years) is much longer than that of a mobile phone, for instance (typically less than two years), and this poses a headache for car manufacturers. "Greater flexibility will be required on the technical side," explained Mr Ikeura. He presented forecasts from the Telematics Research Group showing that the potential sales of GPS-assisted navigation devices will rise from 50 million per year in 2007 to over 500 million in 2015. He stressed that "for a safer driving experience, hands-free operation and a user-friendly interface are essential".

## Combating climate change

The fiscal incentives mentioned by Mr Mosley should be linked with future European legislation on $CO_2$ emissions, said Hermann Meyer, CEO of the public-private partnership ERTICO (Intelligent Transport Systems and Services, Europe). He outlined the benefits of a fully networked car as being more secure, more comfortable, more efficient, safer and with a lower impact on the environment (see Figure 1). Mr Meyer described various standards development initiatives in which ERTICO is involved, including eSafety, which "accelerates the development, deployment and use of Intelligent Integrated Safety Systems to increase road safety and reduce accidents on Europe's roads."

*Figure 1 — Benefits of the fully networked car*




*Source: Hermann Meyer, ERTICO.*

Also from ERTICO, Head of Development Paul Kompfner expanded on the workshop's theme with a presentation on "Green ITS (intelligent transport systems) — towards the environmentally-friendly networked car". He said this involves three elements: car, infrastructure and driver. Although the fuel efficiency of cars has been greatly improved, relatively little progress has been made in infrastructure, and there has not been much change in driver behaviour. For this reason, a holistic approach should be adopted that links such elements as traffic management and training for drivers.

Pierre Malaterre is a senior consultant for 4iCom, a service provider in various fields of ICT, including telematics. He agreed that intelligent transport systems offer the best solution for improved fuel efficiency, while ICT can also supplement other measures to improve driving standards that save fuel. But, he said, although there is scope for saving 20–50 per cent of the energy currently being used, this will require much higher investment in infrastructure, greater education of drivers and increased standardization efforts in the area of ITS.

Mr Malaterre asked the fundamental question: "Is the connected car a solution for the environment?" Presenting statistics on the worldwide production of $CO_2$ (see Figure 2 on page 10), he said that if nothing changes, usage of petroleum will double between 2007 and 2030 — and it might treble if people everywhere enjoy the mobility now experienced in the developed world.


ITU/R. Scholl

*Hermann Meyer, CEO of the public-private partnership ERTICO*


ITU/J. Burgess

*Climate change*

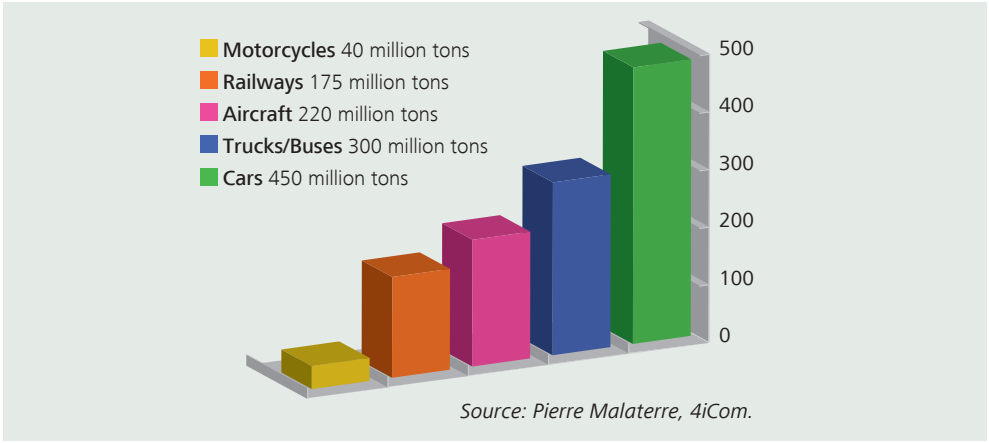

Eva Bonner


Chris Potter

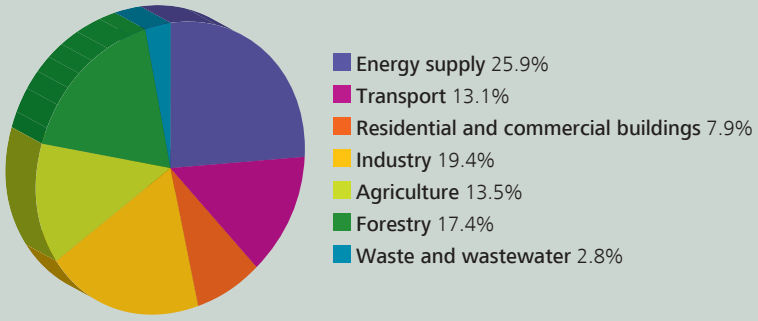
This warning note was echoed by Andreas Schäfer, a lecturer at the Martin Centre for Architectural and Urban Studies, at the University of Cambridge in the United Kingdom, who presented a long-term analysis of how people travel. Detailed studies show that there is exponential growth in the demand for mobility, but at the same time, there is less provision of energy-saving public transport. "Large opportunities exist for reducing greenhouse gas emissions, but they are more than offset by strong demand growth," Mr Schäfer said.

Senior Engineer at the Nissan Technical Centre, Europe, Takashi Sugano told the workshop that, according to a report from the Intergovernmental Panel on Climate Change (IPCC), "to stabilize atmospheric $CO_2$ concentration below 550 parts per million (ppm), $CO_2$ emissions from all new vehicles must be reduced by 70 per cent". He said that Nissan takes a triple-layered approach to this challenge, seeking to improve infrastructure, fuel economy in vehicles, and driving styles. Mr Sugano presented research from Japan on Nissan's "Carwings"

*Figure 2 — Annual, worldwide $CO_2$ emissions*




*Source: Pierre Malaterre, 4iCom.*




*Source: Intergovernmental Panel on Climate Change (IPCC).*

telematics system that offers guidance to drivers on "eco-routes" through town that will save fuel. He said the system results in a typical improvement in fuel consumption of 16–19 per cent.

A similar proposal was described by Carlos Busnadiego, Project Manager at GMV. He talked about advanced telemetry in mass-market cars, focusing on the potential of the Global Navigation Satellite System (GNSS). "The target is an automatic control system for $CO_2$ emissions," said Mr Busnadiego. Combining GNSS with measurement of emissions can "determine the most efficient route and affect the driver's behaviour".

He explained that average $CO_2$ emissions for city-centre journeys can be twice those for longer journeys in suburban areas (see Figure 3). Choosing a more environmentally friendly route might also save money — particularly if taxes are applied to emissions. GNSS technology provides a possible basis for "pay as you pollute" road pricing schemes, and they mean that "government authorities can know which zones are exposed to more emissions and whether their measures reduce them or not". Mr Busnadiego said that a reasonable target for 2012 would be for all cars to emit less than 130 g of $CO_2$ per kilometre.

On a wider theme, the topic of "Connected Life — Networked Car" was addressed by Oliver Bahns, Head of Global Business Development and Consulting (Automotive), T-Systems (Germany), which is both a partner in developing networked cars, and a network operator. Mr Bahns said that today, people often act within "virtual communities". This creates a demand for location-based services which can link a virtual community to geographical space — particularly for services to vehicles. The three necessary components of this are connectivity, the human-machine interface and cost-effective solutions, Mr Bahns concluded. And standardized service platforms are an important component in delivering this vision.


Adam Kuzok


Alexander Abolinsh

*Figure 3 — The effects of using advanced in-car telemetry*

| | City centre route | Suburban route |
|---|---|---|
| Duration | 15 min 29 sec. | 6 min 50 sec. |
| Length | 4.725 km | 5.319 km |
| Total fuel consumption | 0.410 litres | 0.233 litres |
| Average fuel consumption | 8.68 l/100 km | 4.37 l/100 km |
| Total $CO_2$ emissions | 1086.92 g | 616.73 g |
| Average $CO_2$ emissions | 230.02 g/km | 115.95 g/km |
| Note — The test used a VW Golf 1.9 TDI 105 CV. | | |

*Source: Carlos Busnadiego, GMV.*

# Making cars more environmentally friendly

At the Geneva Motor Show 2008, many manufacturers displayed vehicles that reduce greenhouse gas emissions through using hybrid engines or alternative fuels. Here are photographs of some of them.

"HSR", by e-mobile

Dassault "Cleanova II"

Lumeneo "Smera" 2-seater


Rinspeed "SQuba" underwater car


ACREA "Zest" electric car


Inside Toyota's "Hybrid synergy drive"


Honda "Civic" hybrid car


GM "HydroGen 4" fuel cell car


Honda "Insight" with "ultrabattery"


*All photographs on this page are by J. Burgess/ITU.*

# Standards on the move

## Standards for connected cars

For the benefits of intelligent transport systems (ITS) to be achieved, automotive technologies and information and communication technologies (ICT) must link together effectively. This requires standardization — a major focus of the workshop on "The Fully Networked Car".

Mobile phones from any manufacturer can communicate with each other. In contrast, a lack of standards in the automotive sector is hampering the development of safety applications that can be used in cars from different makers, said Martin Arndt, of the European Telecommunication Standardization Institute (ETSI). Describing the work of ETSI, he said its Technical Committee on ITS is a "place to turn research results into standards".

Shuji Hirakawa, of Toshiba Corporation, is also Secretary of the IEC's Technical Committee 100 that deals with audio, video and multimedia systems and equipment. He gave a presentation on the standards needed in these fields in order to create the fully networked car. Mr Hirakawa said that as media in the home become digital, so too will in-car entertainment. In future, an SD Card might act like a "golden key" to share content among multiple devices and (combined with Bluetooth technology) to control content on various devices in the home and in the car.

## ITU standardization work — FITCAR and the future

Hans W. Gierlich, of Head Acoustics, Germany, described the work of the FITCAR Focus Group of ITU's Telecommunication Standardization Sector (ITU–T). FITCAR (From/in/to car communication) reports to ITU–T Study Group 12 and includes representatives from the telecommunication and car industries, suppliers, universities and software companies. The main outcome has been Recommendation P.340 on "Transmission characteristics and speech quality parameters of hands-free terminals". Although mobile phones generally follow international standards, such as Bluetooth, in reality there is a high degree of variation in performance, which is why quality assessment and test interfaces are so important, Mr Gierlich said.

The FITCAR Focus Group has formally completed its work, but will form again as a new Focus Group, CARCOM, with an expanded mandate to cover wideband speech


*Hans W. Gierlich, Head Acoustics*



*Jean-Yves Monfort of France Telecom and Chairman of ITU–T Study Group 12*

and other voice services, said Jean-Yves Monfort, of France Telecom and Chairman of ITU–T Study Group 12. CARCOM's first meeting will take place in June 2008. Mr Monfort explained that study groups in ITU's Radiocommunication Sector (ITU–R) have been restructured and ITS now falls under Working Party 5A of Study Group 5, which has a new study question:" To what extent can evolving mobile communications be used to deliver ITS services?" It is possible that an inter-sectoral collaboration group on the fully networked car may be created in future.

## Talking about telematics

Standards are especially important in the area of telematics, a term for the integration of ICT with telecommunications, and especially its application in motor vehicles. Speakers at the workshop covered how telematics can be delivered, and what services it could include.

Describing trends in the sector was Frank Daems, of Next-Experience Semiconductors (NXP), based in the Netherlands. He drew on a report from the European Union, "Towards Europe-wide safer, cleaner and more efficient mobility," issued in 2007.

*Increasing range of in-car devices*

|  |  |  |  |
|---|---|---|---|
| **1979** S-Class | **1991** S-Class | **1998** S-Class | **2005** S-Class |
| 1. Radio<br>2. Amplifier | 1. Radio<br>2. Amplifier<br>3. CD<br>4. Telephone | 1. Radio<br>2. Amplifier<br>3. CD<br>4. Telephone<br>5. Microphone<br>6. E-call<br>7. Navigation | 1. Radio<br>2. Amplifier<br>3. CD<br>4. Telephone<br>5. Microphone<br>6. E-call<br>7. Navigation<br>8. PDA<br>9. TV-tuner<br>10. DVD<br>11. Displays<br>12. Headphones |

*Note — Based on generations of Daimler S-Class.*
*Source: Harald Kohler.*


The report outlines aims up to 2018 with an initial focus on mobility, then improvements in safety and, finally, better efficiency.

Looking to the future, Axel Moering, Senior Engineering Project Manager at BMW, Germany, spoke about the next-generation telematics protocol (NGTP), which the company launched in January 2008 in collaboration with telematics service providers Connexis and WirelessCar. It is technology neutral, in order to bring greater flexibility and scalability to the industry. "A paradigm shift is needed," Mr Moering said. "There is a need to move from proprietary systems to a flexible platform".

Currently, BMW's telematics service "ConnectedDrive" offers such products as a navigation service based on Google Maps. "All services are available in the driver's native language, independent of where the customer is located," explained Mr Moering. He said this borderless approach should also be taken in enabling adoption of new technologies, developing leading-edge products, supporting legacy systems and offering global solutions tailored to local needs.

Later in the workshop, Bruno Simon, of Connexis, gave a joint presentation with Amreesh Modi, of Navteq, on how the NGTP platform is part of "an industry-wide effort to realize full potential of the networked car". The two firms have developed an updating system for maps and other information, so as to "shorten the time between when a change is observed in the real world and when it is available to customers".

So-Yeon Lee noted that the interface for access to electronic control units (ECU) in cars is becoming a vital element of such applications as telematics and traffic control. She said an overall standards framework is required for data to be collected efficiently. Ms Lee is a project manager in the Telematics Research Group at the Electronics and Telecommunications Research Institute (ETRI), a non-profit, government-funded research organization in the Republic of Korea.

## Delivering services

### The impact of IPv6

A consequence of transport systems becoming more intelligent is increasing demand for Internet access. Thierry Ernst, of INRIA (*Institut National de Recherche en Informatique et en Automatique,* or National Institute for Research in Computer Science and Control), France, told the workshop how developments in the Internet will affect the ITS sector, at a time when each car is beginning to need its own web address.

The unifying layer of the Internet protocol (IP) ensures interoperability, portability and wider deployment of ICT equipment. However, space for addresses is fast running out under the existing IPv4. This problem can be overcome by IPv6, said Mr Ernst, because it offers millions more addresses. It is already used in the CALM series of standards developed by ISO, he added, but there is a need to raise awareness of IPv6 in the ITS community.


*The new "Nano" car made by Tata, of India, represents a "bubble up" rather than a "trickle down" model for the dissemination of technology. It serves the mass market, rather than richer consumers. This principle could also be applied to automotive electronics, said G. Venkatesh, Executive Director of Sasken Communication Technologies Ltd, India. An effective way to spread services would be to set usage fees below USD 2 per month, with an initial cost below USD 80. The intention is to focus on affordable services for "the common man," Mr Venkatesh said.*



Mr Ernst noted that a study of the impact of IPv6 on various sectors, including transport, was recently presented to the European Commission. As part of the study, an analysis of the strengths, weaknesses, opportunities and threats (SWOT) of IPv6 was carried out (see Figure 1).

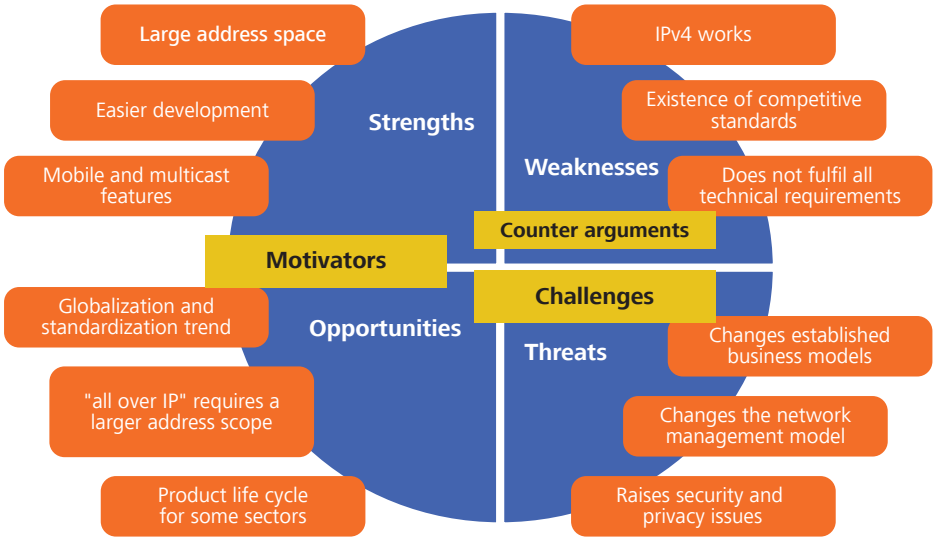
## Satellite communications

Satellite communications can be a useful part of implementing ITS, said Monica Schettino, Project and Development Manager at ERTICO–ITS Europe. She spoke about a project called "SISTER" (satellite communications in support of transport on European roads), launched in 2006 and funded by the European Union. It is closely related to the development of the European global positioning system, *Galileo*. Ms Schettino said that field trials are being carried out for such services as digital map updating, emergency calls, and electronic fee collection — just three of many possible applications.

## Software-defined radio

John Chapin, of Vanu Inc, and Chairman of the Software Defined Radio (SDR) Forum, described how SDR could be a useful means of sending telematics to vehicles. It would help overcome the mismatch between long product cycles in the motor industry and the

*Figure 1 — SWOT analysis of IPv6*




*Source: Thierry Ernst.*

fast turnover of products in the ICT sector. This is because SDR can be modified quickly through software, in contrast with the fixed functionality of conventional wireless. Thus, instead of separate devices for different telematics functions, one piece of SDR equipment in a car could deal with them all, Mr Chapin said. SDR is also better able to accommodate variations in standards between countries.

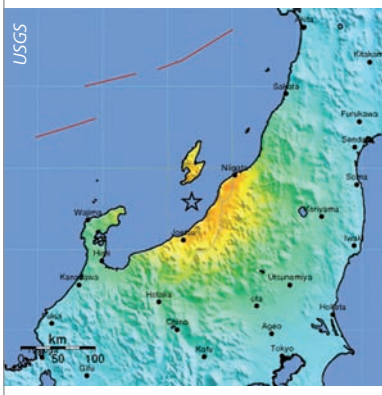
## Car-to-car, and beyond

The delivery of telematics services can also be coordinated through a virtual platform, such as "MYCAREVENT", described by Alberto Los Santos, of Telefónica I+D *(Investigación y Desarrollo, or research and development)*, Spain. The platform is designed "to allow independent workshops, road assistance companies and drivers to have access to specific technical information from the main European original equipment manufacturers (OEM) for vehicles," Mr Los Santos said, including the Volkswagen Group, BMW, Daimler-Chrysler, and Fiat. Services will be created for the platform, such as remote diagnostics and details of the nearest garage.

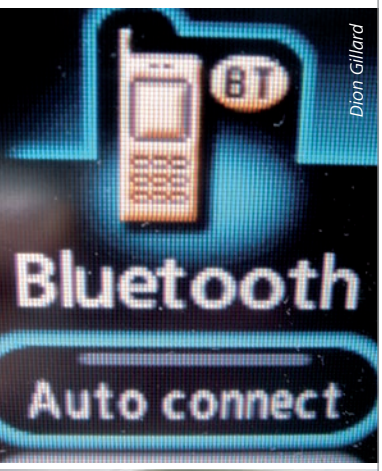
The perspective of a global OEM was presented by Martin Wiecker, of the Ford Research Centre, Germany. He said that the goal of car-to-car communication is to establish "safe and intelligent mobility". This can be achieved "by directly connecting vehicles, driver assistance systems, and the road infrastructure". As a good example of car-to-car communication he cited electronic emergency brake lights, which warn drivers about vehicles ahead that are suddenly braking. However, Mr Wieker said, lack of compatibility among standards is still an obstacle in developing this system.

Chaban Gabay, from Motorola, United States, talked about the "Virtual sub-centre: a safety concept for European road transport". He focused on "COM2REACT," a European research project that offers communication via a "virtual control sub-centre (VSC)". The project builds on the earlier "REACT" system, which used a regional control centre (RCC) through which cars communicated. In the new system, an ad-hoc network (VANET) is created within a cluster of vehicles, with one of the cars temporarily assigned as "master" and communicating with the RCC.

The creation of temporary groups among cars travelling together was also mentioned by Junghoon Lee, Senior Research Scientist at Telcordia Technologies, United States. "Uncoordinated transmissions among all vehicles on the road lead to interference and delays," he said, whereas the "vehicle peer group is a manageable unit for ad hoc communications." Messages are passed from group to group only when necessary, and within a group, emergency alerts, for example, are transmitted more quickly and reliably.




*Takeshi Imai, of Honda Motor Company, Japan, presented Honda's "InterNAVI Premium Club", a location-based system for vehicle navigation launched in 2004. Services include real-time map updates; sharing of traffic information, and details of disasters such as storms and earthquakes. An example of this use occurred following an earthquake in Niigata Prefecture, Japan, in July 2007 (see illustration), when maps of passable roads were posted to the Honda website based on driver observations.*



Dion Gillard


Alan Bruce

Dion Gillard

## The ubiquitous mobile phone

Felipe Gil Castiñeira, of the telematics research group at the University of Vigo, Spain, described a dilemma in the delivery of services to cars: there is growing demand for in-car devices such as navigation systems and multimedia entertainment, but equipment soon becomes outdated. And when devices are securely fitted to the dashboard, they are "unlikely to be removed to install new software or to add information," said Mr Gil.

His research group's proposed solution is to transfer data to vehicles via a nomadic device: the ubiquitous mobile phone. This would have the advantage of allowing the user to download updates at home, rather than trying to do so in the car, and so being distracted from driving. "The mobile phone acts as a mere intermediary," Mr Gil explained. "New features appear continuously, and in the near future, the mobile phone will be able to export its display to the car."

Pat Kennedy, Chairman of Cellport Systems, United States, agreed that the focus should be on the mobile phone as the universal connectivity device. Cellport launched the "Omniport" platform for mobile phones in 2008. It aims to provide Wi-Fi, Bluetooth and USB connectivity to link the disconnected "islands" of incompatible mobile phone platforms, proprietary car interfaces, and multiple carriers and web services. This should help to overcome the "walled garden" approach that has been taken by manufacturers, Mr Kennedy said.

## Portable infotainment

The term "infotainment" refers to the merging of information services, such as maps, with entertainment offerings, such as music. Mobile phones are likely to become dominant in this area too, said Jim Bridgwater, of Freescale Semiconductor. Portable entertainment devices are falling in price while increasing in functionality, he said, just as we are seeing the emergence of converged, high-featured portable navigation devices.

Current models of mobile phone typically have cameras of up to 3 Megapixels, a processor above 600 MHz, a memory of at least 4 GB and data rates of up to 3.6 Mbit/s, Mr Bridgwater said. He foresaw that "by 2011, their memories will typically be 160 GB plus, with a 1–3 GHz processor and data rates of up to 100 Mbit/s; effectively, a high-performance mobile computer that will be able to handle navigation functions". The focus should be on delivering infotainment through portable devices, rather than requiring specialized equipment that is fixed to the car.

Because the number of infotainment devices in a car is rising, and spreading to the mass market as well as luxury vehicles, "a flexible and powerful communication backbone is needed," said Harald Kohler, of SMSC Automotive Infotainment Systems, Germany. He described the "MOST 150" (Media Oriented Systems Transport) backbone, a networking technology optimized for efficient, reliable and cost-effective applications. It is installed in more than 50 mod-

els of car from a range of manufacturers, Mr Kohler said.

Paul Goosens, of Intel Corporation, said that products such as the iPod and iPhone from Apple Inc have revolutionized portable infotainment, and "the digital lifestyle that we enjoy at home is being taken into the car". The broadband connected vehicle would have full access to Internet and media content, with "consumption and creation on the go," he said. To deliver this, "an open platform will provide the optimal solution," using an open operating system, choice of network inside and outside the car, and a scalable, common hardware platform. "And by using the same architecture for the car as in the home or office, this will push the market forward," Mr Goosens said.


ITU/J. Burgess

*"By using the same architecture for the car as in the home or office, this will push the market forward."*
*Paul Goosens, Intel Corporation*

Jean-Pierre Jallet, of NXP Semiconductors, described how acoustic echo cancellation (AEC) is essential for hands-free communication, used in vehicles with noise reduction. He noted that ITU's Telecommunication Standardization Sector (ITU–T) has issued Recommendation P.340 in relation to this field (see page 13). In future, said Mr Jallet, the aim is to provide multi-channel, full duplex, high quality, wideband speech, and to support multi-microphone AEC. In addition, by making use of the car radio, AEC will be able to help people in a vehicle's front seats talk more easily with those at the back.

Gerhard Schmidt, of Harman/Becker Automotive Systems, Germany, played audio examples of the ways in which speech transmitted in a car could be enhanced. He said that techniques to achieve this include artificial bandwidth extension, use of wideband rather than narrowband, noise suppression, voice reconstruction and adaptive equalization.

Using wideband speech technologies was also advocated by Tim Fingscheidt, of Braunschweig Technical University, Germany, who pointed out that ITU–T Recommendation G.722.2 defines the adaptive multi-rate wideband (AMR) speech

## Safety and the networked car

### ITU–T standards for voice services

One of the main purposes of ITS and telematics is to improve road safety. But drivers must not be distracted by having to manipulate devices in the car. Hands-free voice communication is one area that can help to meet this challenge, and ITU–T standards for voice services are playing their part.


ITU/J. Burgess

*The importance of speech technology for the fully networked car was emphasized by Volker Jantzen, the CEO of SVOX, Switzerland, who described state-of-the-art developments in the technology. The objectives are to increase safety, create more efficient human-to-machine communication, and permit new dimensions of interaction, such as listening to e-mails being read while on the move. The main problem is that people are not used to using audio interfaces and "changing habits takes energy and time".*


*Warning of potential wrong-way driving*

codec. Mr Fingscheidt declared that "the better the speech quality, the less processing power of the driver's brain will be required for working out what is said, leaving more available for safe driving!"

## Information overload?

With more and more data being fed to the fully networked car, is there a danger that drivers will not be able to process it effectively? Simon Coutel of INRETS, or *L'Institut National de Recherche sur les Transports et leur Sécurité* (National Institute for Transport and Safety Research), France, said "it is a good question; I don't have a good answer, because it's very difficult to assess the quantity of information that can be understood by the driver… It depends on the traffic situation."


*"The best in-car safety device is a rear-view mirror with a cop in it!"*
*Rainer Makowitz, Freescale Semiconductor*

Volker Jantzen, of SVOX, agreed that "there is obviously some degree of distraction when you listen to content on the move. What is needed is a system of traffic awareness in the car, that can decide whether content should be transmitted in a certain situation or not."

"Increasing the competence of the driver is a major challenge," commented Rainer Makowitz, of Freescale Semiconductor. "If you want to make driving safer, and the car safer for the environment, you need to invest in more intellectual capabilities of the car itself, so it can be more aware of its environment." He said bigger, faster microchips would contribute to a solution.

Another solution could be the driverless car. Thierry Ernst, of INRIA, described its "LARA" project on such cars, which are designed to complement public transport by, for example, carrying people from their homes to the nearest railway station. The LARA technology has been tested and works, Mr Ernst said; "the problem to address is the social aspect, including insurance and licences to use that kind of vehicle on the road."

## A European perspective

An example of improving road safety through ITS can be seen in the European Commission's project, "eCall," which offers emergency communications. Pierre Piver, Group Vice President (Automotive) of Wavecom, France, described eCall as "an opportunity to bring standard connectivity to all cars by implementing a smart integration of the in-vehicle system". It is envisaged that eCall will be standard in all type-approved vehicles in Europe by 2011.

"The eCall initiative drives the introduction of GSM equipment in all cars, enabling new services," Mr Piver said. He added that car makers have the chance to bring

to market many different options, from the basic eCall (autonomous, inexpensive and reliable) to sophisticated infotainment gateways. The key features of eCall are outlined in Figure 2.

Fulvio Sansone, from Oracle EMEA, Italy, said that eCall can be provided over service-oriented architecture (SOA), which is "a collection of self-contained services, or system functions, that can communicate with each other". SOA is a standards-based platform that lets application developers combine services into flexible business processes, he said, and the Oracle Telematics Foundation offers a solution for providing eCall in this way.

Speaking about the electronic components in safety devices, Mr Makowitz, of Freescale Semiconductor, said that new work is focusing on preventing accidents, such as by monitoring drivers for drowsiness, or for wandering outside the traffic lane. At a later stage, safety systems such as automatic braking come into play. It is likely that camera-based systems will ultimately prevail rather than radar-based systems, as prices fall and processing power rises. Meanwhile, Mr Makowitz said, "the best in-car safety device is a rear-view mirror with a cop in it!"

Simon Coutel, of INRETS, talked about the Cooperative Vehicle Infrastructure Systems (CVIS) project, a consortium of some 70 public and private organizations in Europe. One of its possible applications is Enhanced Driver Awareness (EDA), now being tested. This is intended to keep the driver informed about irregular situations, such as an oncoming car heading in the wrong direction, or changes in traffic flow due to

*Figure 2 — Key criteria for the eCall system*

| |
|---|
| Low cost, to be present in every car |
| Safety application must be reliable (embedded solution is key) |
| High reception sensitivity, to provide reliable GPS position and good GSM communication, even with embedded antenna |
| Good time response (interrupt <100 milliseconds) |
| Lower power consumption, especially in standby mode |
| Support technology for modem sharing device in voice (data in-band modem) |
| Software integration and upgrade capabilities |
| Interfacing with the accident sensor, through controller area network (CAN) or direct airbag |
| Fulfils automotive requirements (temperature, vibration/shock, lifetime, etc.) |
| Innovation and creativity from the technology providers are needed to define the proper system architecture and optimized integration |
| Examples are in SIM and intelligent device services (IDS) |
| *Source: Pierre Piver.* |

*Intelligent traffic control in Europe's cities*


*Navigation system designed for trucks*


***The fifth*** **Fully Networked Car** ***workshop is planned for 4–5 March 2009, at the venue of the Geneva International Motor Show***

hazards. It could also provide an online service to update mandatory speed limits, and an onboard service to assess whether the driver complies.

Another European initiative was described by Robert Brignolo, of Fiat, Italy. The SAFESPOT project involves 51 partners and is due to complete its work in January 2010. The aim is to design cooperative systems for road safety based on vehicle-to-vehicle and vehicle-to-road communications, drawing upon existing standards. It will use the Galileo satellite positioning system, communications-based positioning (ultrawideband, wireless LAN) and image-based positioning, such as recognition of landmarks. The enabling technology uses local dynamic maps. Mr Brignolo said that tests were planned at five sites in 2009.

Managing the transport of dangerous goods is a topic of particular concern in the European Union, with its areas of dense traffic and housing. Gregorio Martin of Telefónica I+D, outlined the GoodRoute research project, due for completion in 2008, which aims to develop a cooperative system for guiding dangerous goods vehicles. Problems arise, he said, when several of these trucks need to use the same route, or when the safest roads are temporarily closed. The project includes a "conflict resolution module" to deal with this.

Finally, Pierre Papadimitriados, of *École Polytechnique Fédérale de Lausanne* (Swiss Federal Institute of Technology Lausanne), Switzerland, examined the security of telematics information itself. This is important because false traffic information might be spread for malicious purposes — to avoid paying speeding fines, for instance. Also, personal privacy might be compromised if a driver's location can be discovered by unauthorized people. Such problems are being addressed by SeVeCom (Secure Vehicular Communication), a project funded by the European Union. "Trustworthy data are critical," concluded Mr Papadimitriados, not only for preventing crime but also for protecting road safety.

## Bringing it all together

*The Fully Networked Car* workshop concluded that increasingly, drivers expect to be able to communicate with the world around them, and have access in their cars to the multimedia sources of information and entertainment that they can experience at home.

Most importantly, the effect of cars upon climate change, and ways in which they can help to mitigate it, was the overall theme of the event. The workshop indicated that vehicles on the road today need to provide not only a safe and comfortable means of transport; they should also produce as little impact on the environment as possible.

*Details of The Fully Networked Car workshop, including a full report on the event, can be found on the ITU website at www.itu.int/ITU-T/worksem/ict-auto/200803/index.html*

# Highlights from the Telecommunication Development Advisory Group

The thirteenth meeting of the Telecommunication Development Advisory Group (TDAG) took place in Geneva on 7–8 February 2008. During his opening remarks, the Director of the Telecommunication Development Bureau (BDT) Sami Al Basheer Al Morshid highlighted the main achievements since he took office in January 2007.

## Review of 2007

A major change has been the restructuring of BDT. In particular, a new department responsible for Projects and Initiatives has been created to strengthen the Bureau's project implementation capacity. The field offices with their new strengthened role have been busy preparing ICT projects to help implement the regional initiatives agreed at the World Telecommunication Development Conference in Doha, Qatar, in March 2006.

At last year's meeting, TDAG had recommended a focus on large scale projects "in order to spread overhead and increase impact". Since then, many projects have been identified and formulated. "Some of them have already been funded, while others are at the fund-raising stage," Mr Al Basheer said, giving as an example, the agreement signed with the European Commission at the end of 2007 for over USD 12 million. "This partnership agreement aims at helping sub-Saharan Africa, the Caribbean as well as Pacific islands States on policy, regulatory and capacity building related issues," he said.

*TDAG meets every year. Its mandate is to advise the Director of the Telecommunication Development Bureau (BDT) on setting priorities, formulating strategies, and preparing and implementing the budget and the operational plan of the ITU Development Sector (ITU–D). TDAG's current chairman is Professor Vladimir Minkin (Russian Federation).*

The Policies and Strategies Department continues to support members with assistance in the areas of regulatory and market environment, human capacity building, ICT applications and cybersecurity, and market information and statistics. For example, the 7th Global Symposium for Regulators, held in Dubai, in the United Arab Emirates, adopted best practice guidelines to promote regulatory frameworks that foster innovation, investment and affordable access to next-generation networks. In December 2007, the sixth World Telecommunication/ICT Indicators (WTI) Meeting agreed a set of indicators to measure community/public access. It also discussed possible indicators for the single ITU index (see *ITU News* of January–February 2008).

These, and other activities were broadened by new events such as the *Connect Africa Summit* in Kigali in October, the *Global Youth Forum* and the *Global Forum on Effective Use of Telecommunications/ICT for Disaster Management*.

The Partnership, Promotion and Membership Division was reinforced with the addition of the *Connect the World Initiative,* and is promoting the work of BDT, attracting new members and partners. One of the activities related to implementing the outcomes of the World Summit on the Information

***Regional presence***

*ITU has field offices covering Africa, the Americas, the Arab States, the Asia-Pacific region, and the Commonwealth of Independent States. A number of measures were taken during 2007 to strengthen ITU's presence in the regions, especially regarding staffing levels and reinforcing the regions' role in disseminating information and promoting activities. TDAG expressed its appreciation and encouraged the Director of BDT to continue these efforts.*

Society (WSIS) is the series of *Connect the World* events. Building on the success of the *Connect Africa Summit,* BDT plans to replicate this approach in other world regions.

TDAG noted all these activities with appreciation, while encouraging further efforts to ensure cost-effective use of resources when conducting events. It also underscored the importance of ITU–D's role in raising awareness, as well as capacity building, under the *Special Global Initiatives,* which seek to help increase ICT access to women, young people and children, indigenous communities, people with disabilities, and to underserved rural areas.

ITU–D has two study groups. Under the new BDT structure, a counsellor has been assigned to each group to facilitate coordination. TDAG learned of the progress being made in all study Questions in line with the time schedules determined by the Doha Conference. It approved an additional Question for Study Group 2: "The unique telecommunication needs of small island developing States".

Work to promote cybersecurity is one of ITU's highest priorities. A number of regional cybersecurity forums are planned during 2008 to assist countries in developing national frameworks for cybersecurity and critical information infrastructure protection. One such forum already took place in Doha, Qatar, in February 2008 (see page 32). TDAG encouraged BDT to continue this work, while also calling for coordination of all cybersecurity activities throughout ITU. For its next meeting, TDAG asked for a detailed report to be provided of all the Union's activities in cybersecurity, showing clearly the expected results and priorities.

TDAG also heard reports from its Working Group on Human Resource Development and its Working Group on Private-Sector Issues (WGPS). At the meeting of WGPS on 4–5 February 2008, a number of proposals were made on ways to further increase participation of the private sector in BDT programmes, activities, initiatives and study group Questions.

## Assistance with rebuilding communications

### Lebanon

Resolution 159 of the Antalya Plenipotentiary Conference called for assistance and support to Lebanon to rebuild its telecommunication networks (fixed and mobile). TDAG heard about an assessment mission carried out with the Lebanese administration, which estimated the cost of restoring the country's telecommunication infrastructure at USD 547.3 million. ITU has circulated a request to all Member States encouraging them to contribute and participate in the reconstruction effort. However, responses so far have been very low. TDAG called upon governments and Sector Members to provide support in implementing Resolution 159.

### Serbia

In coordination with Radio Television of Serbia (RTS), BDT has prepared a project proposal that estimates the cost of restoring Serbia's broadcasting system at EUR 56.7 million. The Serbian delegation at TDAG said that the government and RTS have been able to find more than 40 per cent of necessary funding. TDAG called for more contributions from countries and Sector Members in line with Antalya Resolution 126 to assist and support Serbia to rebuild its destroyed public broadcasting system.

## ICT development Index

TDAG received contributions on this subject from Spain and from the Republic of Korea. Spain stressed the importance of up-to-date statistics in measuring the information society and in making policy choices. Its document proposes to update the official country data that BDT publishes on its website on a more regular basis by changing the way in which Member States submit their data.

## Companies marking their 10 years of membership in ITU–D

The following companies were awarded anniversary certificates, marking their 10 years of membership.

| | |
|---|---|
| AzEuroTel JV | Azerbaijan |
| European Telecommunications Network Operators' association | Belgium |
| BH Telecom | Bosnia and Herzegovina |
| Radiográfica Costarricense S.A. (RACSA) | Costa Rica |
| Regional African Satellite Communications Organization | Côte d'Ivoire |
| Pacific Islands Forum Secretariat | Fiji |
| Office des Postes et Télécommunications (OPT) | France |
| Cellular Operators Association of India (COAI) | India |
| Jordan Telecom Group | Jordan |
| Middle East Communications (MEC) | Jordan |
| Satélites Mexicanos, S.A. de C.V. (SATMEX) | Mexico |
| Southern Africa Transport and Communications Commission | Mozambique |
| Saudi Telecom | Saudi Arabia |
| Société Nationale des Télécommunications du Sénégal (SONATEL) | Senegal |
| Agence Tunisienne d'Internet (ATI) | Tunisia |
| Centre d'Etudes et de Recherches des Télécommunications (CERT) | Tunisia |
| Tunisie Télécom | Tunisia |
| Globalstar, Inc. | United States |
| TELCEL C.A. | Venezuela |



The Republic of Korea stated that it "greatly appreciated" BDT's efforts to create a single ICT development index. It stressed that the purpose of the index is not simply to report a nation's ranking; rather, it must identify the obstacles to ICT development and show policy implications. It also said that, because the volume of international telecommunication traffic is affected by a nation's location and language, indicators measuring traffic within a country (rather than across its borders) would better reflect ICT development. It added that "serious recognition must be given" to the rapid move towards communications based on the Internet protocol (IP).

TDAG noted these two contributions and, in view of the complexity of the work related to the single index, suggested that they be considered by the experts' group established by the sixth World Telecommunication/ICT Indicators Meeting.

## A busy 2008

The year 2008 will be equally busy, with a number of important events such as the Global Industry Leaders' Forum (GILF), the 8th Global Symposium for Regulators (see pages 26–31), the Global Symposium on Human Capacity Building, scheduled to take place in the United Kingdom in July, as well as the next Connect the World Series Summit. A follow-up meeting on Connect Africa will take place in Cairo in May, alongside the ITU TELECOM AFRICA 2008 event. This will be an opportunity to report on how the commitments made at the Kigali Summit are being implemented.

"It is no secret that our membership expects us to produce strong results with very limited resources. This means making difficult choices and focusing on priority areas. It also means seeking external resources for important activities," Mr Al Basheer commented.

# Industry leaders look at current issues in ICT

*GILF 2008 was hosted by Thailand's Ministry of Information and Communication Technology and the National Telecommunication Commission of Thailand. It was sponsored by the GSM Association, Nokia/ Nokia Siemens Networks, Microsoft, Rohde & Schwarz, Shin Satellite and WiMAX Forum*

Ahead of the eighth Global Symposium for Regulators (see pages 28–31), ITU organized its first-ever Global Industry Leaders' Forum (GILF) on 10 March 2008, in Pattaya, Thailand. Over 350 participants attended, including chief executive officers (CEO) from the information and communication technology (ICT) sector, as well as policy-makers and regulators representing more than 64 countries. The meeting was chaired by Sanjiv Ahuja, Chairman of Orange UK and CEO of Augere.

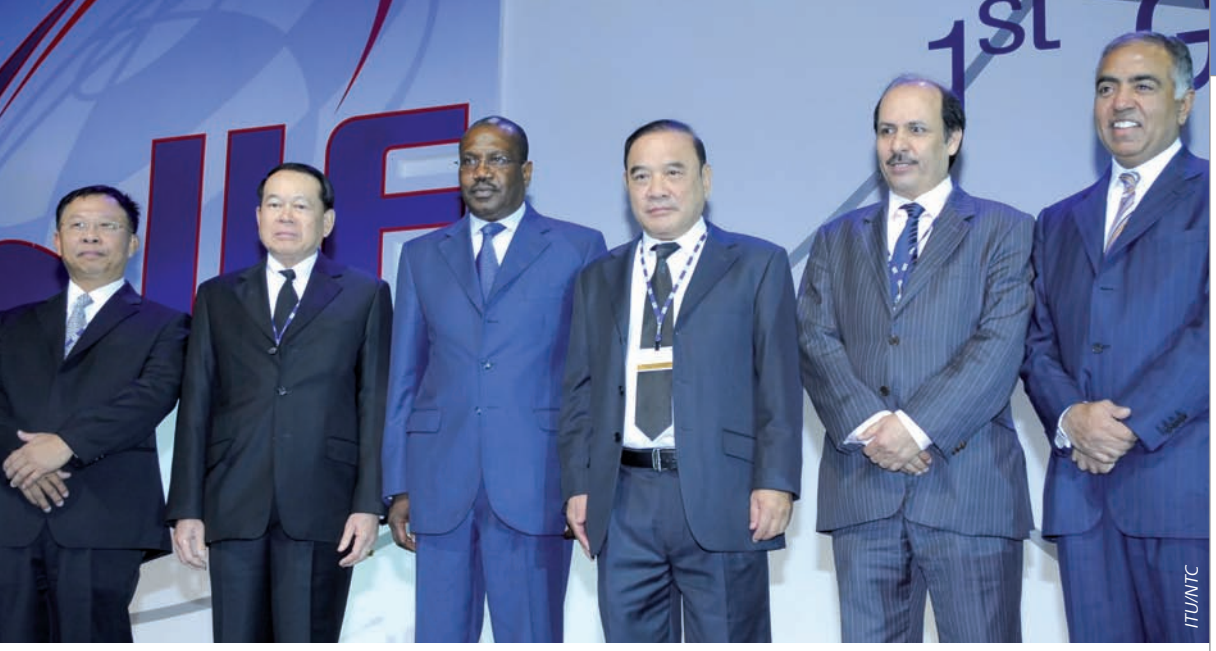
"GILF is an opportunity for business leaders to express their views on how national regulatory frameworks impact their ability to invest and roll out networks," said ITU Secretary-General Hamadoun I. Touré. "Our goal is to ensure that all the world's citizens will have access to ICT services by 2015."

"The presence of CEOs, industry leaders and major suppliers will enhance the investment environment and stimulate business connectivity at the regional and global levels," commented Secretary-General of Thailand's National Telecommunication Commission Suranan Wongvithayakamjorn.

## Industry views

GILF examined important issues in three sessions of discussion, during each of which several industry leaders gave their views. In the session on universal access, Ilkka Lakaniemi, Director of Global Policy Initiatives, Nokia Siemens Networks, Finland, said that "even the world's seemingly most connected countries do not fully exploit the current telecommunication revolution. None can afford to be complacent". At the same time, he added, "lack of basic access to education and infrastructure hampers connectivity in some emerging economies". Governments should provide an enabling regulatory environment, Mr Lakaniemi said. The private sector should focus on what it costs in total for a person to own and use devices such as mobile phones. Businesses must also provide cost-effective end-to-end solutions, and offer affordable and innovative services.

Olga Madruga-Forti, Vice President Regulatory and Legal, Iridium, United States, spoke in the session on emergency telecommunications. "It is our hope that, with the dedicated effort and shared knowledge and experience of regulators from around the world, we will soon no longer question the availability and deployment of emergency communications in times of disaster. Instead, we will have global action plans that are deployed well in advance of times of need, and that ensure to every country on the planet communications of last resort




*At the opening session of GILF (left to right): Secretary-General of NTC Suranan Wongvithayakamjorn; Chairman of NTC Choochart Promphrasid; ITU Secretary-General Hamadoun I. Touré; Minister for ICT Mun Patanotai; Director of BDT Sami Al Basheer Al Morshid, and GILF Chairman Sanjiv Ahuja, who is also Chairman of Orange UK and CEO of Augere*

during and after national emergencies," she said.

Talking about how to stimulate investment in ICT, Narinder Sharma, Director of International Business, Reliance Communications, India, said that "policy and regulations deeply impact investments and costs of services". Regulatory systems can be developed, he said, to foster competition and reduce costs, making it possible to serve low-income markets.

## GILF proposals

The Forum made recommendations to the Global Symposium for Regulators. These cover key issues affecting their businesses in particular, and the ICT industry more broadly:

- Surplus funds raised through levies, such as Universal Service Funds, should be used to extend ICT access to underserved regions.
- Support infrastructure sharing that meets the needs of regulators, operators and investors.
- Strengthen emergency communications by harmonizing regulations to facilitate trans-border relief efforts, as outlined in the Tampere Convention; explore the feasibility of a single, global emergency call number.
- Stimulate investment by reducing taxes, tariffs and duties on handsets and telecommunication equipment.
- Release unused radio-frequency spectrum for productive and innovative commercial applications and services.

Presenting the proposals to the Symposium, Mr Ahuja said that the ICT industry recognizes its responsibility to serve the needs of the public, customers and employees, as well as shareholders. The industry can, and should, do more in this respect, he added. If the right balance is achieved, only limited regulatory action is required.

On wrapping up the first GILF meeting, Mr Ahuja had made a commitment on behalf of the ICT industry to do what is right. "We will serve our customers fairly, properly and with respect, and satisfy the needs of the local economy and the community that we function in," he said. "We will compete fairly, openly, fiercely and vigorously in every market in which we participate; in return we ask the regulators to give us as much leeway as possible within the laws of the country."


ITU/NTC

# Telecommunication regulators agree guidelines for sharing infrastructure

## Six degrees of sharing

The ITU Global Symposium for Regulators (GSR-08) that took place in Pattaya, Thailand, on 11–13 March 2008 had as its theme "Six Degrees of Sharing: Innovative infrastructure sharing and open access strategies to promote affordable access for all". It agreed best practice guidelines to achieve these aims (see pages 30–31). Some 530 participants attended from 96 countries, indicating the high level of interest around the world in creating an enabling environment to spur growth in the information and communication technology (ICT) sector.

A broad range of issues were discussed, including liberalization of international gateways, open access to submarine cables, and sharing of facilities and rights of way for fibre-optic backbones to reach rural users. Other topics were reducing costs through sharing active and passive networks in a competitive environment, the goals and role of functional separation of fixed-line operators' businesses, and regulating international mobile roaming rates. In addition, the Symposium looked at improving the use of the radio-frequency spectrum through spectrum sharing, as well as new regulatory issues raised by Internet protocol television (IPTV) and mobile broadcasting. It also addressed the sharing of end-user devices and innovative applications in developing countries.

## The value of sharing ideas

The Symposium was chaired by Choochart Promphrasid, Chairman of Thailand's National Telecommunication Commission (NTC), who said "this gathering of heads of national regulatory authorities from both developing and developed countries will foster the substantive sharing of views and experiences through an open dialogue between regulators."

Speaking on behalf of Prime Minister Samak Sundaravej, Thailand's Minister for Information and Communication Technology Mun Patanotai said the Thai Government "emphasizes the development of basic infrastructure for information technology, such as extensive and adequate high-speed communication networks at appropriate, fair and competitive prices". This, the minister added, "would serve as the main network supporting Thailand's development into a knowledge-based society, reducing the urban-rural divide and enhancing national competitiveness".

ITU Secretary-General Hamadoun I. Touré told participants that sharing of views, experience and best practice among regulators is the only way to address the challenges posed by today's technological and market developments. Dr Touré stressed that it "is only by working together that smart policies and practices can be put into place to ensure that the target of connecting the world to ICT within the next seven years can be met".

*At the opening of GSR-08 (left to right): Chairman of NTC Choochart Promphrasid; ITU Secretary-General Hamadoun I. Touré; Minister for ICT Mun Patanotai; Director of BDT Sami Al Basheer Al Morshid, and Director of ITU's Radiocommunication Bureau Valery Timofeev*

## Practical examples

Among practical examples highlighted during GSR-08, the success of the renowned Grameen Phone "Village Phone Ladies" programme was described by Chairman of the Bangladesh Telecommunications Regulatory Commission, Manzurul Alam. He explained the impact of such sharing by the end-users of equipment and services. "Women who resell mobile air time to poor rural users earn above-average incomes in Bangladesh. When married women begin their careers as Village Phone Ladies, they offer their monthly take to senior family members, with whom they often have difficult relationships. Over time, the Village Phone women earn the respect of their family members, and one result is a reduction in domestic violence," Mr Alam said.

From India, Chairman of the Telecommunication Regulatory Authority (TRAI) Nirpendra Misra said "sharing is key to promoting ICT access at affordable prices in rural areas". He recommended that sharing be encouraged of both passive and active mobile and backhaul infrastructure. According to Mr Misra, rural India will experience a boom in telecommunications as every village with a population over 2000 will be hooked up with individual fixed or mobile phones.

Ernest Ndukwe, Chief Executive Officer, Nigerian Communications Commission, said "the liberalization of the international gateway creates a win-win situation for the national ICT market. The Nigerian experience has shown that, after the full liberalization of the international gateway in 2006, fixed-line rates dropped by 90 per cent, traffic increased considerably and revenues for international call operators have grown."

> *"Within ITU and within our agencies we have been grappling with the best ways to achieve affordable access to communications. This Symposium provides us with an opportunity to share experiences as regulators facing common challenges."*
>
> *Kevin Martin, Chairman of the Federal Communications Commission (FCC), United States*

## ICT means sharing

At the close of GSR-08, Sami Al Basheer Al Morshid, the Director of ITU's Telecommunication Development Bureau (BDT), awarded certificates to the most active users of G-REX, an online platform maintained by ITU for regulators to exchange information and best practice. Receiving the certificates were the regulatory authorities of Costa Rica, Hong Kong (China), Lithuania, Pakistan, Peru, Saint Vincent and the Grenadines, Sudan, and Venezuela.

Earlier, referring to the goal of the World Summit on the Information Society (WSIS) of providing universal access to ICT for all, Mr Al Basheer pointed out that end-user devices, such as mobile phones and personal computers, are the ultimate sharing tools. "When people communicate over the phone, by e-mail, or through video clips and social networking sites, they do so to share information, views, business information and personal feelings," he said. Accessing ICT inevitably means sharing.

*Participants in the Global Symposium for Regulators 2008*

# Best practice guidelines

The Symposium agreed a set of best practice guidelines aimed at promoting affordable broadband access through open access strategies and innovative ways to share infrastructure.

## Regulatory frameworks and incentives for competition

The guidelines say that an appropriate regulatory framework is needed to foster broadband access, including to the Internet, and to enable competition based on infrastructure and on services. But the risks and benefits of particular sharing options "need to be carefully balanced in the light of specific national circumstances when designing the most appropriate regulatory strategy". Such strategies should uphold competition principles and investment incentives. It is important to hold public consultations with all stakeholders on the various strategies and regulations that deal with infrastructure sharing.

The guidelines recognize the benefits of sharing infrastructure. "Where capital and operating expenditures are likely to be reduced by the joint deployment, management and maintenance of certain facilities (for example, by tower sharing), such sharing can bring about long-term efficiencies, which may in turn enable more investment in innovative products and services and ultimately benefit consumers."

## International gateways

Regulatory policy should promote open access to international capacity and international gateways. "The establishment of Internet exchange points could also encourage shared and more affordable access to national and international broadband capacity for Internet service providers willing to enter the market," the guidelines say.

## Strategies to promote infrastructure sharing

Successful infrastructure sharing can be helped by the introduction of regulatory policies that include:

- **Reasonable terms and conditions:** Infrastructure sharing must take into account the need to protect the value of existing investment in infrastructure and services. However, this should not act as an artificial barrier to sharing.
- **Pricing:** The prices charged for sharing facilities should help players make reasonable and commercial decisions about whether to build their own facilities or lease existing ones. At the same time, pricing should provide incentives for investment in infrastructure, without acting as a barrier to new market entrants.
- **Efficient use of resources:** Non-replicable resources (such as towers, ducts and rights of way) can be shared for installations that serve a similar purpose. In the radio-frequency spectrum, shared-use bands could be promoted, as long as interference is controlled.


ITU/NTC

Spectrum sharing can be implemented on the basis of geography, time or frequency separation.

- **Interconnection frameworks:** Infrastructure sharing can only take place on a neutral, transparent, fair and non-discriminatory basis. Interconnection frameworks ensure that all licensed operators have the right to interconnect; they also encourage the sharing of essential facilities and guarantee that network security and quality of service do not deteriorate. Regulators could consider licensing market players that only provide passive network elements and do not compete for end-users.
- **Coordinating construction:** When local authorities establish centralized and simplified administrative proceedings in this field, it facilitates the coordination of trenching and ducting works by telecommunication service providers and those of other utilities.
- **Improving transparency:** Market players need to know what infrastructure is available for sharing, under clearly established and transparent terms and conditions. Regulators could require publication of the details of existing and planned installations that are available for sharing.
- **Enforcing rules and resolving disputes:** Regulators should introduce enforcement tools to ensure adoption of, and compliance with, regulations on sharing infrastructure. Also, simple and speedy dispute resolution mechanisms must be in place, so as to encourage negotiated outcomes while maintaining the certainty of an adjudicated decision where necessary.
- **Universal access:** In support of universal access goals, regulators can offer incentives for service providers to share infrastructure, as part of efforts to deploy to rural and underserved areas. However, such incentives must not lead to "re-monopolization" of the market.
- **Sharing with other industries:** Sharing should be encouraged with other industrial sectors, such as electricity, gas, and water. In addition, joint construction of infrastructure may be encouraged, to distribute the cost, reduce inconvenience for local residents and cut the number of unsightly masts and towers.
- **Sharing of regulatory practice:** An appropriate level of international and regional harmonization is required in order to ensure that best practice in regulatory policy becomes widespread, and regional organizations have an important role to play in this regard. This is even more important when a regulatory issue has a significant cross-border effect.

*Full details of the Best Practice Guidelines can be found at: www.itu.int/ITU-D/treg/Events/seminars/GSR/GSR08/consultation.html*


ITU

# Arab States call for heightened cybersecurity

> *"Global interconnectivity creates new interdependencies and risks that need to be managed at national, regional and international levels. The formulation and implementation by all nations of a national framework for cybersecurity and CIIP represents a significant first step in addressing the challenges arising from globally interconnected ICT infrastructure."*
>
> *Director of ITU's Telecommunication Development Bureau Sami Al Basheer Al Morshid*


Rodolfo Clix

Maintaining the security of information and communication technology (ICT) networks needs close collaboration between governments and industry. And because attacks do not respect national borders, efforts are required on an international scale. In the Arab States, the issue was examined at an *ITU Regional Workshop on Frameworks for Cybersecurity and Critical Information Infrastructure Protection (CIIP)* that took place in Doha, Qatar, on 18–21 February 2008.

The event was held in collaboration with the Qatar Supreme Council of Information and Communication Technology (ictQATAR) and the Qatar Centre for Information Security (Q-CERT). Over 80 representatives from 18 countries in the region took part, as well as key regional organizations such as the League of Arab States, the Gulf Cooperation Council, and the United Nations Economic and Social Commission for Western Asia.

Participants in the forum recommended that the *ITU National Cybersecurity Self-Assessment Toolkit* should be made available as soon as possible in the Union's six working languages.

The role of the private sector and that of governments in leading national cybersecurity efforts was discussed, with participants stressing the need to review national laws to ensure that they address threats in cyberspace. In this regard, the Convention on Cybercrime (Budapest, 2001) offers an internationally developed basis for examining existing legislation and for determining what new provisions are required.

Participants called for each country to create a national focal point for monitoring and responding to breaches in cybersecurity. Typically, this would take the form of a national computer security incident response team (CSIRT). Also discussed was the need to promote a culture of cybersecurity, to ensure that all users, owners and operators of ICT networks understand their responsibilities and have methods to combat attacks.

ITU is writing a report on best practices for a national approach to cybersecurity. The report will look at five key elements of a national effort. These include developing a national cybersecurity strategy, establishing national government-industry collaboration, creating a national incident-management capability, deterring cybercrime, and promoting a national culture of cybersecurity.

*More details on the Doha workshop are available on the ITU website at www.itu.int/ITU-D/cyb/events/2008/doha/index.html*

# ICT success stories

## Smart card for Handan, China

The *EU-China Information Society Project* is a joint initiative between the Chinese Government and the European Union. The project started in July 2005 and runs to June 2009. One of its activities was the launch in 2007 of a smart card in the city of Handan, to the south of Beijing in southern Hebei Province. The card, containing a microchip, will give people easier access to such social services as retirement pensions, unemployment insurance, workers' compensation, and medical insurance. More than 1.3 million people can use the smart cards, with personal computers or at public facilities.

Implemented by the municipal authorities, the Handan Smart Card initiative aims to create an integrated platform and database. Having "one card for all services" is intended to make life easier for the city's residents, improving local administration and contributing to the provision of efficient and effective government services.

The support platform comprises a population database, a general information exchange and a unified certification system. When such information as age, schooling, employment history and insurance is integrated into a single database, a citizen can easily connect to his or her personal profile and use it for various purposes. In addition, small purchases in grocery stores and supermarkets can be made with the card. The social service element includes a card management system, a one-stop service, and a citizens' call centre. Individual authorities in the area can use systems for providing social aid, health and medical services, and human resource management.

The *EU-China Information Society Project* aims to promote economic and social development through the use of information and communication technologies. It works closely with China's State Council Informatization Office, which became (in March 2008) part of the newly established super ministry — the Ministry of Industry and Informatization. The focus is on regulatory dialogue, e-government, and training and capacity building. It is intended that each demonstration project should be able to be replicated in other localities in China.

To date, over 170 activities have been carried out. Upcoming initiatives include research into telecommunication law, focusing on capacity building for future market regulation, and analysis of consumer protection, backed up by new research on multimedia and Internet governance. There will also be a second round of e-government applications launched in six cities across China, and surveys on benchmarking e-government and e-commerce at a national level.

Stephanie Berghaeuser

*Cotton exporters in Egypt are now online*

Upyernoz

## e-Marketplace for Bolivia

One of the major obstacles for small and medium-sized enterprises (SME) in developing countries is the lack of information on opportunities for cooperation with business partners, or on access to large companies that could help them grow. In Bolivia, in a move to boost the competitiveness of small and very small businesses, the Swiss State Secretariat for Economic Affairs (SECO) has helped to establish an electronic marketplace. It enables SME to create new business opportunities domestically and internationally.

In the new online marketplace, potential buyers of goods and services can be linked to sellers. Small businesses might lack skills to effectively manage sub-contracting and supply chains, but the portal helps them to raise their capabilities.

The key goal of the project is to create a platform providing SME with the chance to interact online with large-scale market players, in addition to face-to-face training and networking opportunities. This combined model can be replicated in other spheres of trade and services, and provide multiple benefits for local business in developing countries.

## Egypt's cotton producers go online

SME are being helped in a similar way in Egypt. Launched at the beginning of 2006 by the Alexandria Cotton Exporters' Association (ALCOTEXA), the *Cotton Exporters Contract Registration Management System* provides a one-stop-shop for SME in the industry. The automated system is able to streamline specific requests for cotton and match them with producers' offers. The project was funded within the framework of the *USAID ICT Programme for Egypt*.

The online system logs all industry-related transactions, and is intended to facilitate the contract registration procedures that cotton producers must complete before being able to export. It should also stimulate the transfer of administration from paper to electronic methods, as well as enable access to information on Egypt's cotton exports for local exporters and foreign importers. During the second phase of the project, ALCOTEXA plans to enable contracts to be sealed online in a digital format, providing an all-in-one system for the cotton export industry.

# ITU and the space industry

## Looking ahead to the next fifty years

On 26 February 2008, representatives of the space industry attended a meeting of the Washington Space Business Round Table, an organization that aims to advance the commercialization of space. The event took place at the Satellite 2008 Conference and Exhibition in Washington DC, United States, and the keynote speaker was ITU Secretary-General Hamadoun I. Touré.

"Last October, the space industry marked a milestone with the fiftieth anniversary of the launch of the first artificial satellite, *Sputnik*," said Dr Touré. Now, there are some 900 satellites orbiting Earth, operated by more than 40 countries. "The United Nations has played a leading role in establishing clear principles to ensure that outer space and space activities continue to enhance the well-being of all countries and humankind," he said.

As the leading UN agency for information and communication technologies, ITU plays a key role in managing radio-frequency spectrum and satellite orbits. The World Radiocommunication Conference (WRC-07), held in Geneva in October-November 2007, examined the growing worldwide demand for radio-frequency spectrum, and how best it can be used and shared. Dr Touré outlined the outcomes of WRC-07 that are relevant to the space industry. For example, the conference expanded frequency allocations for the Earth-exploration satellite service (EESS), which is key in monitoring environmental change, weather patterns and natural disasters.

Satellite communications are also vital in helping to bridge the digital divide by connecting remote communities, the Secretary-General added. "With seven years to go to meet the 2015 Millennium Development Goals and the targets set by the World Summit on the Information Society, the connectivity process needs to be accelerated," Dr Touré stressed, adding that the role of the space industry is very important in meeting these goals.

He went on to highlight the space-related studies which ITU is carrying out in preparation for WRC-11, including new frequency allocations for space research and exploration, meteorological applications and oceanographic monitoring. "As the space industry celebrates its coming of age with its first fifty successful years, allow me to look forward to the next fifty years of success — success that can only be built on continuing collaboration between industry and government, with ITU as the forum where true partnership can be achieved."


*"Satellite communication systems have a huge potential to offer promising high-capacity transmission capabilities over wide areas. I would invite you to join ITU in connecting the unconnected by 2012 and to work together with us to ensure that the role and promise of satellite communications are not neglected in telecommunication investment plans for Africa and elsewhere around the globe." Dr Touré said at the Washington Space Business Round Table.*

# Sir Arthur C. Clarke — space age visionary

*Arthur C. Clarke, 1917–2008*

*In 1977, Clarke wrote of communication satellites: "For thousands of years, men have sought their future in the starry sky. Now, this old superstition has at last come true, for our destinies do indeed depend on celestial bodies, those that we have created ourselves."*

A man whose visionary ideas anticipated the space age, Sir Arthur C. Clarke died on 19 March 2008 in Colombo, Sri Lanka, at the age of 90. ITU pays tribute to his work.

Arthur Charles Clarke was born on 16 December 1917 in Minehead, Somerset, United Kingdom. During the Second World War he was involved in developing the new technology of radar. Later, he achieved a first class degree in physics and mathematics from King's College, London. However, it was in 1945 that he wrote the article which foresaw the dawn of satellite communications.

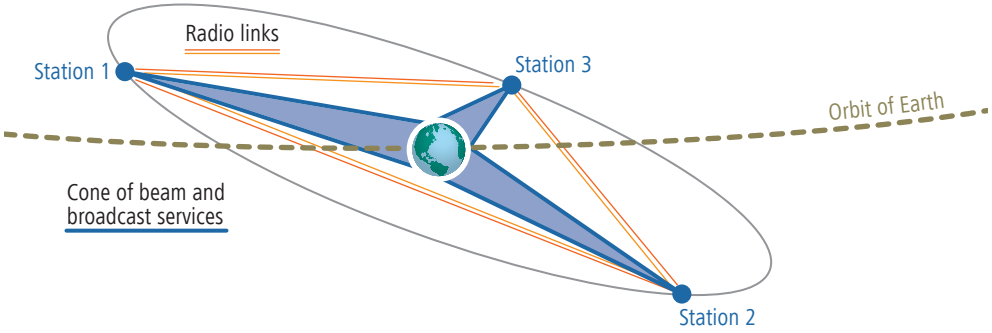
## Global satellite communications

In October 1945, Clarke published in the British magazine *Wireless World* a technical paper entitled "Extra-terrestrial Relays — Can Rocket Stations Give World-wide Radio Coverage?" It established the feasibility of satellites as relay stations for Earth-based communications. Clarke predicted that one day, worldwide communications would be possible via a network of three geostationary satellites spaced at equal intervals around the equator.

His paper began by stating that "although it is possible, by a suitable choice of frequencies and routes, to provide telephony circuits between any two points or regions of the Earth for a large part of the time, long-distance communication is greatly hampered by the peculiarities of the ionosphere, and there are even occasions when it may be impossible. A true broadcast service, giving constant field strength at all times over the whole globe would be invaluable, not to say indispensable, in a world society."

He added, "it will be observed that one orbit with a radius of 42 000 km has a period of exactly 24 hours. A body in such an orbit, if its plane coincided with that of the Earth's equator, would revolve with the Earth and would thus be stationary above the same spot on the planet. It would remain fixed in the sky of a whole hemisphere and unlike all other heavenly bodies, would neither rise nor set." If, Clarke said, material were to be ferried up to such an orbit by rockets, a "space station" could be built there. It "could be provided with receiving and transmitting equipment and could act as a repeater to relay transmissions between any two points on the hemisphere beneath," Clarke went on. "Moreover, a transmission received from any point on the hemisphere could be broadcast to the whole of the visible face of the globe," he explained. "A single station could only provide coverage for half the globe, and for a world service three

*Figure 1 — In his paper of 1945, Clarke illustrated how the entire globe could be covered by three satellites in geostationary orbit.*




would be required, though more could be readily utilized" (see Figure 1).

Two decades later, in 1964, NASA's *Syncom 3* became the first geostationary satellite. It relayed pictures of the 1964 Olympic Games in Tokyo to the United States — the first television transmission over the Pacific Ocean. This development had been preceded by *Syncom 1*, which went silent very soon after being launched in February 1963, and by *Syncom 2*, launched in July 1963 for telephone and facsimile transmissions between Africa, Europe and the United States. Although *Syncom 2* was the first geosynchronous communications satellite, its orbit was inclined rather than geostationary.

In 1954, Clarke had also proposed using satellites in meteorology. Today, we cannot imagine predicting the weather without using dedicated satellites. Nowadays, there are hundreds of satellites in the geostationary orbit, providing communications and broadcasting to millions of people around the globe. And the area of space they use is sometimes referred to as the Clarke Belt.

Looking back on these developments in his book *How the World Was One — Beyond the Global Village*, published in 1992, Clarke explains how the idea of placing a satellite in geostationary orbit had gradually originated in the minds of a series of thinkers, including Russian scientist Konstantin Tsiolkovsky, Herman Potočnik (also known as Hermann Noordung) a Slovenian born in what is now Croatia, and Hermann Oberth, of Germany.

Nevertheless, Clarke can be viewed as launching the idea of a global communication network using satellites, after the groundwork of others. In the book he wrote: "Sometimes I'm afraid that you people down on Earth take the space stations for granted, forgetting the skill and science and courage that went to make them. How often do you stop to think that all your long-distance phone calls, and most of your TV programmes are routed through one or the other of the satellites?"

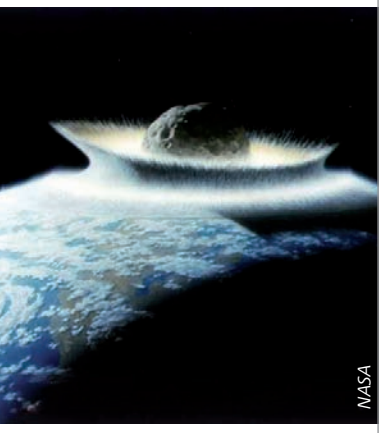
## Paying tribute

Clarke moved to Sri Lanka in 1956 and held dual Sri Lankan and British nationality. President of Sri Lanka Mahinda Rajapaksa said he was "deeply saddened" by Clarke's death. He added that "Sir Arthur made important intellectual, cultural and scientific contributions to Sri Lankan development, while engaged in his scientific research and creative writing that earned him well-deserved praise the world over."

Mr Rajapaksa mentioned how, "always ahead of his time," Clarke had focused international attention on the need for a


*Clarke predicted that a network of geostationary satellites would be used to provide global communications*


*The "space elevator," now being considered by NASA, was another idea popularized by Clarke*




*Clarke predicted the development of technology to intercept asteroids that threaten Earth*

tsunami warning system, after the devastating Indian Ocean tsunami of December 2004. And the people of Sri Lanka were touched by "the courage with which he acted for the protection of nature and the environment, long before climate change assumed the importance it has today".

"We owe Sir Arthur our gratitude for helping to usher in the space age and, in particular, the use of geostationary satellites for worldwide radio coverage," said ITU Secretary-General Hamadoun I. Touré.

Valery Timofeev, Director of the ITU Radiocommunication Bureau, met Clarke in 1979 at an INTELSAT Exhibition, organized during an ITU World Administrative Radio Conference. Mr Timofeev said he remembers Clarke "as an extraordinary man of great warmth and scientific vision, who devoted all his writings and predictions to the positive development of humankind".

## Influential author

To the world at large, Clarke was best known as an author of science fiction. He wrote more than 80 books and 500 articles and short stories, including the famous novel "2001: A Space Odyssey" (1968). It was written concurrently with Stanley Kubrick's film of the same name and was based on earlier works of Clarke, especially "The Sentinel" (1948).

Clarke's writings often contained descriptions of scientific advances that could be put into practice in the real world. He predicted, for example, the development of technology to intercept or deflect asteroids that threaten Earth. And in his novel "The Fountains of Paradise" (1979) he popularized the idea of the "space elevator." This would be a line strung between Earth and a geostationary spacecraft, which could transport materials into orbit. In 1981, Clarke expanded the technical details in a paper entitled "The Space Elevator: Thought Experiment, or Key to the Universe?" The United States space agency NASA is exploring how to make the elevator a reality.

## The last word

Concerning the art of prediction, Clarke formulated the following three laws:

1. When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.
2. The only way of discovering the limits of the possible is to venture a little way past them into the impossible.
3. Any sufficiently advanced technology is indistinguishable from magic.

It may be said that the legacy of Sir Arthur C. Clarke is to point the way for scientists and engineers towards that "magic" future.

# From official sources

## Final Acts of the Regional Radiocommunication Conference for planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174–230 MHz and 470–862 MHz (RRC-06) (Geneva, 2006)

The Government of the Kingdom of the **Netherlands** has approved the Final Acts of the above-mentioned conference. The instrument of approval was deposited with the Secretary-General on 15 February 2008.

## Protocol revising certain parts of the Regional Agreement for the European Broadcasting Area (Stockholm, 1961) (RRC-06-*Rev. ST61*) (Geneva, 2006)

The Government of the Kingdom of the **Netherlands** has approved the above-mentioned Protocol. The instrument of approval was deposited with the Secretary-General on 15 February 2008.

## Protocol revising certain parts of the Regional Agreement relating to the planning of VHF/UHF television Broadcasting in the African Broadcasting Area and neighbouring countries (Geneva, 1989) (RRC-06-*Rev.GE89*) (Geneva, 2006)

The Government of **Spain** has accepted the above-mentioned Protocol. The instrument of acceptance was deposited with the Secretary-General on 27 February 2008.

## New Sector Members

### Radiocommunication Sector

*Free TV Australia Ltd (Mosman, Australia)* and *Next Wave Wireless, Inc. (Washington DC, United States)* have been admitted to take part in the work of this Sector.

### Telecommunication Standardization Sector

*Ygomi LLC (Boyds, Maryland, United States)* has been admitted to take part in the work of this Sector.

### Telecommunication Development Sector

*Electronia Ltd (Al Khubar, Kingdom of Saudi Arabia), Information Communication Network Company (Ulaanbaatar, Mongolia), JSC "National Telemedicine Agency" (Moscow, Russian Federation), Mobile Telecommunications Company (Zain) (Riyadh, Kingdom of Saudi Arabia)* and *Telcordia Technologies (Piscataway, New Jersey, United States)* have been admitted to take part in the work of this Sector.

## New Associates

### Telecommunication Standardization Sector

*Atheros Communications, Inc. (Santa Clara, California, United States), Avalon Microelectronics (St. John's, Canada), DS2 (Paterna, Spain), Lightwaves Systems, Inc. (Austin, Texas, United States)* and *Metanoia Technologies, Inc. (Portland, Oregon, United States)* have been admitted to take part in the work of Study Group 15.

*Digital Fountain (Fremont, California, United States)* has been admitted to take part in the work of Study Group 16.

*University of Zimbabwe (Harare, Republic of Zimbabwe)* has been admitted to take part in the work of Study Group 19.

## Change of name

Arraycom, a Sector Member of ITU–R, has changed its name to *Ygomi LLC (Boyds, Maryland, United States)*.

Mobile Telecommunications Co., a Sector Member of ITU–R and ITU–T, has changed its name to *Zain (Safat, State of Kuwait)*.

INICTEL-UNI, a Sector Member of ITU–D, has changed its name to *Unidad Ejecutora 002 INICTEL-UNI (Lima, Peru)*.

## Diary of ITU events

Up-to-date details of forthcoming ITU meetings and conferences can be viewed on the ITU website at

***www.itu.int/events/index.asp***

# Official Visits

*During March 2008, courtesy visits were made to ITU Secretary-General Hamadoun I. Touré by the following ministers, and ambassadors to the United Nations Office and other international organizations in Geneva.*

Montenegro's Minister of Foreign Affairs Milan Roćen


Cuba's Minister of Foreign Affairs Felipe Pérez Roque


Ambassador Bryon Fernando Larios López of El Salvador


Ambassador Mykola Maimeskul of Ukraine


Ambassador Javier Garrigues Flórez of Spain


Deputy Director-General of the United Nations Office in Geneva, Jan Beagle


The Central African Republic's Minister of Posts and Telecommunications Fidèle Gouandjika

International Telecommunication Union

# The First ITU-T Kaleidoscope Conference

# Innovations in NGN

Geneva, 12-13 May 2008

www.itu.int/itu-t/uni/kaleidoscope

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