ADVANCING GLOBAL COMMUNICATIONS

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**Before the**
**Senate Commerce Committee**
**Subcommittee on Technology, Innovation and Competitiveness**

**Investing in Communications for Tomorrow's Innovations:**
**The Case for Increased Basic Research Funding**

**Hearing on March 29, 2006**

Thank you, Mr. Chairman, Ranking Member Kerry and Members of the Committee. I am appearing today as the Chief Technology Officer of Telcordia Technologies Incorporated and as the Chairman of the Telecommunications Industry Association's Communications Research Division. Telcordia is grateful for the opportunity to appear before you today among such a distinguished panel of witnesses to discuss the importance of basic research to the United States' competitiveness.

Telecommunications, as an industry, represents about 3.5% of our Gross Domestic Product and plays a fundamental role that touches all other industries, impacts the productivity of our industries and our economy, and pivotally effects Emergency Response, Law Enforcement and National Defense. Prior investments in basic and transitional research, and aggressive development of new communication technologies and services, have benefited the United States through significant gains in productivity and contributed to raising standards of living around the world. Today, communications represent a critical element of our infrastructure and form the backbone on which all industries and government depend. No industry could function effectively today without communications. The flow of new ideas from basic research to transitional activity to development is the key to continuing the creation of the next generation of communication technologies and services.

The advances we can expect are as profound and far-reaching as what we have experienced over the last quarter century – the explosive growth of the Internet, computers connected by high speed networks driving commerce around the world, the convenience of wireless mobility, and information services which are changing everything from how we spend our time to how we interact with our fellow citizens. The same is true of our National Defense posture, where the four elements of Vision 2020, situational awareness, precision strike, dominant maneuver, and focused logistics, rely on advanced communications and networks. It is vital for the United States to maintain the leadership and future competitiveness in this critical industry – for the health, general welfare and defense of our population.

Please let me turn to the situation today. The Federal spending on communications-focused basic research, as a percentage of total federal information technology research and

development in the United States, is declining – down 5 percentage points in the last six years. This is in the face of significant growing public investments in other geographies. Examples are: the Framework Programs in the European Union; national programs in Korea, Taiwan, Hong Kong, Singapore and Japan conducted through national laboratories and economic development authorities; and growing investments in China targeted at all aspects of communications. These programs are further accompanied by coordinated transitional activities which forge academic, national laboratory, and local industry partnerships aimed at native deployment and eventual domination in international markets. An example would be the deployment of "Wibro" in Korea – this is high speed Internet connectivity at speeds greater than 10 megabits per second for ubiquitous fixed and mobile wireless services based on the WIMAX standards. A by-product of the early stage investment in innovation that these geographies have made is the deployment of next generation systems significantly ahead of the United States. These systems enable Third Generation (3G) and Internet Protocol Multi-Media Sub-system (IMS) services.

While the United States is still the single largest market for communications and has the most robust economy, we now rank 16th in the penetration of high speed broadband, and we have not commercially brought 3G or IMS services to the consumer. As a consequence, it is more than likely that the next wave of services and technologies will be developed where test beds and deployment of infrastructure will support experimentation of new concepts and ideas and where the human capital is concentrated – locations where business executives, scientists and engineers are familiar with the technology. The experience from my own corporation confirms this. Telcordia, which traces its heritage to "Bell Labs" and which participated in the invention of much of modern communications, is the largest seller of Operations Support Systems to the telecommunications industry. To maintain our edge, we are finding it a necessity to rely on growth in foreign markets and are facing increasing foreign competition, which is advantaged by public spending in the local markets and long range government funding.

Speaking as the Chairman of the Telecommunications Industry Association's Communication Research Division, our division – made up of Chief Technology Officers and heads of research from 40 companies – is advocating that federal funding for communications-specific, pre-competitive, basic research be increased beyond the *0.07 percent*[1] of total federal R&D that we have identified as targeted at communications in the current budget. The members of our Division believe that research is the foundation of the communications industry and the building block for future products and services. As an industry, we are not looking for a hand out. To the contrary, we are asking that the Federal Government invest more of its research dollars in this critical area. This will benefit companies, universities and national laboratories in the long run, and it will make our nation stronger – economically and technologically. We are encouraged by the President's American Competitiveness Initiative and support the doubling of budgets in the National Science Foundation (NSF), National Institute of Standards and Technology (NIST), and the Department of Energy's (DoE) Office of Science. We would like to convey to you that developing leading-edge communications applications is complex, requiring, time, money, and long term vision. Fierce competition and financial realities have made it difficult for U.S. industry to self-fund long-term, basic research, and because the U.S. Government is not

[1] $100 million out of a $137.2 bn federal research and development budget for FY2007.

devoting sufficient resources on long term communications research, the U.S. position in this vital area is waning.

We include a copy of a white paper from the TIA Communications Research Division as part of the testimony. In it, we recommend that increased funding focused on communications basic research in NSF, NIST, and the Department of Defense (DoD) 6.1 will greatly benefit the nation. We further recommend investing additional money in: *Universal Broadband*; *Network Security*; *Interoperable Mobility*; *Telecommunications Research for Homeland Security*; *Networking Architectures*; and *Communications-Specific Nanotechnologies* as priority areas.

I would like share some examples where the investments that we propose could impact the citizens of our great country:

- In everyday life - devices with much simpler interfaces, but at the same time, much more functionality with greater adoption in our society – Imagine a single device the size of your cell phone today, which is your PC, your camera, a projector, shows HDTV, plays music, is a portal to the internet – without a button in sight?
- Reduction in traffic accidents and deaths – sensors on a car that could alert you to hazardous conditions, such as black ice, another vehicle in your blind spot when you are about to change lanes, a deer in the roadway, a washout in the highway, and the communications system that can convey warnings about such hazards to traffic behind you.
- Health care for the elderly – a handheld device that your grandmother has, which could diagnose and warn about medical problems, call for a nurse or a doctor's intervention, or improve quality of life by fostering the ties with a grandchild three time zones away through effortless, high-quality communications.
- New commercial systems – a slim and light portable device to securely purchase, receive, redeem, and store concert tickets, airline boarding passes, subway tickets, and conduct financial transactions from anywhere - without printing a thing?

I would like to close by saying that U.S. industry is unable to fully self-fund the research necessary to discover and exploit long-term, ground-breaking advances so critical to the health and competitiveness of the nation. The history of the telecommunications industry has left us with weak public mechanisms for funding pre-competitive research in communications, paradoxically, because so much of the research was initially done in a dominant institution – "Bell Labs". While that institution left an incredible legacy of successful inventions which has paid off well for our nation – the mechanisms of funding on which it depended no longer exists. New partnerships between industry, government and universities are needed to meet tomorrow's challenges and to maintain the competitive position of the United States in the communications industry.

Thank you once again for the opportunity to appear before you today.