

VIII EXTERNAL FACTORS, AND CURRENT TRENDS AND ISSUES AFFECTING COMMERCE SUPPORT FOR THE NATION'S SCIENCE, TECHNOLOGY, AND INFORMATION INITIATIVES

All of the Commerce programs supporting the Nation's science, technology, and information initiatives must operate in the real world, and must be aware of outside events that affect them. The key trends and issues are cited here, in the context of Theme 2 goals.

A. Partner with industry to accelerate the development and application of cutting-edge technologies.

The NIST laboratory program assures that the U.S. has the measurement capability needed by industry to continually improve products and services, by conducting research and providing the infrastructural technologies, such as measurements, standards, reference materials, and test methods.

NIST laboratory research is targeted at identifying and addressing the critical measurement needs of U.S. industry. Laboratory research programs encompass such diverse areas as microchemical analysis; microelectronics processing and materials analysis; acoustics, mass and vibration measurement; chemical kinetics; and photonic materials. NIST experts also support U.S. industry in roadmapping efforts, including The National Technology Roadmap for Semiconductors; Technology Vision 2020; The Next Generation Manufacturing Initiative; and The Action Plan for Achieving High Priority Construction in the Residential Sector. Roadmaps help NIST research programs anticipate and respond to industry measurement needs, consistent with the NIST mission.

However, the current state of NIST facilities hampers our efforts to respond to these needs effectively. NIST facilities in Gaithersburg, Maryland and Boulder, Colorado, valued at \$3 billion, were built 30 - 45 years ago, and house laboratories that conduct advanced research in semiconductor electronics, biotechnology, manufacturing engineering, atomic scale physics, computer science, and advanced materials. The combination of advancing age and increasingly sophisticated technological needs are rapidly making NIST's current facilities inadequate for supporting its mission of providing U.S. industry with essential infrastructural technology, measurements, and standards.

NIST also cannot adequately support the major technologies that were undreamed of when NIST facilities were built — lasers, microprocessors, biotechnology, and nanomaterials — that have become commonplace in U.S. industry. Finally, NIST facilities lack the high quality environmental system controls need to make precision measurements under predictable, stable conditions. It is critical that the deterioration and technical obsolescence of the NIST laboratories are addressed.

B. Collect, preserve, and disseminate government technical, scientific, and business information.

Since 1945, NTIS has served as a central acquisition and clearinghouse and government-wide resource for scientific, technical, engineering and related information, as a means of strengthening the U.S. competitive position in global markets.

As a component of the Technology Administration, NTIS operates three core information dissemination lines of business: clearinghouse; production and brokerage services to other government agencies; and FedWorld, an on-line information services platform. Information seekers continue to drive the trend towards providing easier location, access, and delivery of information electronically. The trend is clear that seekers of government information want the ability to search, locate and retrieve their information electronically.

Throughout its history, NTIS has pro-actively expanded channels of access for users of the government information in its possession. In recent years, the trend of increasing access to government information has been posing both challenges and opportunities for NTIS. NTIS acquires its information material from Federal agencies and their contractors and grantees, as well as from foreign (primarily governmental) sources. Between 85,000 and 100,000 new titles are acquired, cataloged and included into the archive collection each year. Annually, the number of customers served continues to grow.

NTIS continues to respond to the challenges of addressing and meeting customer demands through the development and delivery of new information products and services. The FedWorld platform increased the capacity of NTIS to serve far more customers, at the lowest possible costs, while increasing information locating and access.

C. Monitor and assess international R&D, barriers faced by U.S. industrial sectors; and develop policy options in partnership with industry, academia and the States.

In the past ten years, there has been increasing recognition of the important role technology plays in generating economic growth. Government, academia and industry have all sought to improve their understanding of this interconnection, and government has been particularly concerned with improving the social return on its considerable investments in research and development. More recently, government policy makers have given increased attention to the effects policy has on the climate for innovation within our country. As a consequence of these developments, technology policy has changed from a tool for management of research budgets to an important complement to economic and trade policy.

In this new environment, there is continuing need to develop a common understanding among policy makers of the dynamic relationship between technology and the economy. The TA anticipates continuing opportunities to reiterate these themes in the context of trade, taxation regulation and other policy issues that help to shape the climate for private sector innovation.

Internationally, other nations are implementing science and technology policies to develop cutting-edge domestic industries and attract the engines of economic expansion to their shores. Our trading partners explicitly recognize the connection between technology and economic growth in their science and technology policies. The TA must address the increasingly complicated technology policy issues that arise from the science and technology activities of our trading partners such as Japan and Europe as well as rapidly emerging areas such as China, Southeast Asia, Russia and the Newly Independent States. Effectively monitoring and analyzing the technology efforts of other nations allows the Commerce Department to better focus U.S. technology efforts to ensure that the U.S. business climate remains internationally competitive.

D. Implement seasonal to interannual climate forecasts

Society is accustomed to dealing with climate variations, but growth in human population and infrastructure pressures leaves society increasingly vulnerable to unanticipated departures from the norm. Agriculture, fishing, water management, and fuel distribution take into account the climatological mean annual cycle, and have evolved to function optimally under accustomed seasonal changes. However, in the absence of forecasts, the best society can do is to prepare for "normal" seasonal trends. Long-term climate forecasts allow society to reduce or avoid the losses that occur with changes in the annual climatological cycle. The immediate challenge is to introduce an operational program for the systematic production and application of regionally-tailored climate forecasts. NOAA plans to establish a system, including the multinational infrastructure to generate useful climate information and forecasts.

Optimal utilization of monitoring and forecast efforts depends on a coherent process for translating improved climate predictions and forecasts into products and services that are directly beneficial to users. For example, improved forecasts of precipitation variability in California must be brought down to the river basin scale, combined with regional/local observations and models of water resources, to ensure that the forecasts are of maximum benefit. It will be critical to develop this type of cooperative relationship with pooled resources with players on the regional and local scale. An infrastructure must also be developed to deliver climate services. NOAA will work to use regional and local information dissemination mechanisms of the USDA, USGS and other Federal agencies, the Sea and Land Grant structures, and the various trade associations.

In addition to the tropical Pacific, the tropical and subtropical Atlantic is important to the climate of Africa and South America and for generation of hurricanes impacting the U.S. Deployment of observing systems in this region and development of the capability to assimilate these data into models will lead to major advances in climate prediction capability. NOAA plans to expand ocean-atmosphere research measurements, through international cooperation, into these other ocean regions with the aim of improving skill in the seasonal climate predictions. NOAA is currently discussing joint observing system efforts with potential international partners, to extend the current NOAA TAO Array into the tropical Atlantic.

E. Predict and assess decadal to centennial change

Our planet is naturally a place of change, often with severe impacts on humans. Human activities now are inducing additional changes, including atmospheric pollution and thinning of the ozone layer, with impacts of considerable magnitude. Greenhouse gases being added to the atmosphere will reside there for decades to centuries and are predicted to increase average global surface temperatures. Those changes create critical prediction and assessment needs for the world community. Global models providing predictions must be strengthened through implementing global observing systems. The challenge is to understand and foresee the natural and human-induced variations of the approaching few decades in order to make sound economic and social decisions. NOAA will provide options for decisions regarding decadal to centennial changes in the global environment regarding climate change and air quality improvement.

Although scientific documentation concerning global climate change, stratospheric ozone health, and air quality and human health is being steadily advanced, policy options continue to be debated. NOAA has assembled data documenting an increase of greenhouse gas levels in the atmosphere over decades and centuries. However, this trend, as well as its implications and significance, is the subject of strong debate. NOAA's role remains clear — to predict and assess decadal to centennial changes in the global environment — but NOAA must also describe the implications of its research in policy-relevant terms to ensure that the outcomes have impact and that policy makers understand how proposed research directions must continue to be supported or modified. The framework for these policy choices already exists in the United Nations Montreal Protocol, the Framework Convention on Climate Change, and the U.S. Clean Air Act.

Decadal-and-longer changes place a special credibility requirement on predictions and associated assessments. In contrast to the credibility of "tomorrow's weather forecast" (which is tested quickly), the predictions of changes decades ahead are input to decisions faced long before the predicted change can be observed. The keys to such credibility lie in the completeness and rigor of the research and its results. A prime need facing our Nation and the governments of the world is to predict the possible natural and human-induced environmental changes of the coming decades and to predict how best to repair the problems at hand. The separation of the natural variability from human-induced changes is one of the most significant aspects of this research. Only then can public policy, private-sector economic strategies, and other societal decisions be made effectively over the coming years.

F. Promote awareness of, and provide effective access to, patent and trademark information.

There has been a significant rise in the number of patent and trademark applications being filed at the PTO. In part, this can be attributed to a more competitive global marketplace and the need to secure protection of intellectual property throughout the world. This, in turn, leads to greater demand for access to patent and trademark information. As American businesses expand their operations across national boundaries, there is a greater demand for global patent and trademark protection, which in turn requires

a more global perspective on the dissemination of patent and trademark information. PTO works with national, regional, and international intellectual property offices to enhance the content and quality of information that is disseminated.

American businesses are recognizing the value of their intellectual property by including the ownership of patents and trademarks as part of their financial portfolio, and are listing these as assets on financial income statements.

G. Support the development of a National Information Infrastructure (NII) that will be accessible to all Americans.

On February 8, 1996, the President signed landmark telecommunications reform legislation into law. NTIA was deeply involved with other elements of the Administration in shaping the legislation as it moved through Congress. The overwhelming bipartisan support for this law demonstrates America's commitment to ensuring that all citizens benefit from the information superhighway now and in the next century. Among other things, the new law: opens up competition among local telephone companies, long distance providers, and cable companies; helps connect all classrooms, libraries, and hospitals to the information superhighway by the end of this decade; gives families control of the programming that comes into their homes through television; and prevents undue concentration in television and radio ownership so that a diversity of voices and viewpoints can continue to flourish in this Nation.

The Federal Communications Commission (FCC) is adopting regulations to implement the Act. NTIA participates actively in these proceedings on behalf of the Department of Commerce and the Administration.

H. Engage in technical research to improve telecommunications system planning, design, and evaluation and to support government and industry efforts in these areas.

NTIA is providing key technical support to the Department of Transportation in its development of Intelligent Transportation Systems, to the Federal Railway Administration in improving rail traffic management and safety, to the Federal Highway Administration in planning for the Global Positioning System (GPS) to provide more accurate navigation and positioning information, to the National Communications System in enhancing communications survivability during national emergencies, and to other Department of Defense and security agencies in improving their strategic and tactical communications capabilities.

I. Provide Gross Domestic Product (GDP) and related national, regional, and international economic statistics in the most accurate, timely, cost-effective, and accessible way possible.

Increasing numbers of customers, their increasingly sophisticated needs and capabilities, and increasing reliance on automation, are all clear trends which are impacting BEA. In response to these trends, BEA is committed to maintaining the high level of customer satisfaction with its products' quality, availability, usefulness, and cost-effectiveness.

J. Provide products and services of greater value and satisfaction to Census national and local information base customers.

Two major challenges provide the opportunity to change the way the Census Bureau does business. First, both Congress and OMB have directed that Census 2000 must be simpler, less costly, and more accurate than the 1990 census. Census 2000 must: count every resident, using easy-to-use forms and new ways to respond; follow an open process that diverse groups can support; eliminate the differential count of ethnic groups; and produce a single result that is accurate.

Second, Census 2000 must achieve the highest levels of quality, by ensuring that its products and services meet/exceed customer expectations, and are appropriate for end users.

L. Employ ITAs comprehensive industry sector, technical, and country information bases to counsel U.S. firms (especially small and medium-sized firms) on appropriate export strategies, and provide comprehensive, up-to-date, technical, country, and industry-specific information to these firms to support business strategies, and related analyses to the USTR for trade negotiations.

In response to the growing trend of increased automation, ITA is making greater use of technology to improve the trade information made available to its customers. By dialing 1-800-USA-TRADE or by accessing ITAs Internet homepage, users can be connected to a comprehensive information resource for export assistance programs available government-wide. The 1-800 telephone number also connects customers to a network of Fax-On-Demand from which they can receive detailed trade information. Over one billion documents were supplied in response to business requests in

FY 1996. ITA is installing a database throughout its offices, to improve the development and management of information and allow for better tracking of client needs and export activity. It also will dramatically improve the ability of U.S. exporters to utilize trade agreements and comprehend the market openings created by these agreements.

To complement USTR's trade agreements compliance tasks, ITA is assessing the results of trade agreements and monitoring whether foreign governments are keeping their trade agreement commitments. ITAs industry and country specialists in the Trade Compliance Center: supply information and analysis to assist USTR in its expanding enforcement activities; provide the information to sharpen ITAs advocacy efforts, ensuring that American business and American workers get the benefits from successfully negotiated the trade agreements; and develop and expand ITAs relationship with the private sector, acquiring information about compliance problems, and becoming more proactive in efforts to intercede on behalf of American business.

M. Restructure export controls for the twenty-first century, and facilitate transition of defense industries.

BXA moves forward into the 21st Century by instigating more appropriate and orderly procedures in various programs including streamlining the inter-agency process and fostering further reliance on updated technology. BXA has initiated development of an automated database to provide electronic images of export requests and related documentation to replace an outdated microfiche system. In addition, BXA is undertaking a comprehensive review of its automated support system to determine changing needs and requirements for the 21st Century, including requirements related to implementing the President's encryption policy and compliance with the Chemical Weapons Convention. In addition, BXA will also use EAIS to help detect/deter violations of exports not subject to export licensing.

N. Help both rural and urban communities incorporate technology as a tool for their economic development.

To regain their former position as engines of economic growth, the distressed urban and rural areas of the country need to build capacity to promote and use technology. They need to focus on improved education for their future labor force and its readiness for the information age. While technology offers the opportunity for development of new industries and high wage jobs, it also demands a highly trained and motivated workforce. The challenge to EDA is to support America's rural and urban communities in their need to restructure their economic base to be innovative, flexible, and competitive.

EDAs University Center program, for example, promotes such use of technology through the technical assistance it provides to local communities and businesses. At a time when many such public institutions face cuts in general State support for higher education, reduced funding at the Federal level will stifle the efforts to promote technology literacy among local economies.