intellectual property rights systems in support of Theme I and its role of granting rights to inventors and enhancing trademark protection in support of Theme III, PTO plays a significant role in the dissemination of patent and trademark information. One way of doing this is to provide information regarding current trademarks in use by the business community. The temporary right to exclude others from practicing the invention protected by a patent ensures that an innovator's investment is protected. In exchange for this limited right, the inventor discloses the invention and enriches the Nation's technology base. In our free enterprise system, this technical disclosure leads to further innovation and progress through competition. Registered marks used in commerce must be protected from interference and unfair competition.

The NTIA promotes the development of an advanced telecommunications and information infrastructure. Their programs in spectrum management and promotion of a national telecommunications and information policy strengthen the capacity of U.S. firms to compete more effectively in both the domestic and international market place.

The BEA and the Bureau of the Census provide a broad and comprehensive range of data and information to both public and private sector decision makers. This information measures the performance of the American economy and the well-being of the American public. It provides the basis for public and private policy decisions and the impact of these decisions is felt in markets and economies world-wide.

The International Trade Administration (ITA), drawing upon its comprehensive industry and country information bases, counsels small and medium-sized U.S. firms on export strategies that will make them more competitive in the global marketplace. Additionally, ITA plans to expand the services of its Trade Information Center (at D.C. Headquarters) for the purpose of providing more extensive and timely trade information to the U.S. business community. ITA also supplies comprehensive, up-to-date technical, country, and industry sector information and analysis to the U.S. Trade Representative for use in trade negotiations.

The Bureau of Export Administration (BXA) is also combating the proliferation of weapons of mass destruction with export control, and licensing and enforcement programs, while further encouraging the growth of U.S. exports.

The Economic Development Administration (EDA) uses an array of program tools to address the challenges facing the nation's distressed communities. By applying technology and information to promote sustainable economic development, many of the nation's distressed communities are developing programs that are critical building blocks for their economic development.

Commerce bureaus have also worked extensively to develop interagency linkages as a part of the Department's science, technology, and information policy framework, and to coordinate effectively with activities throughout the Federal government. For example, the Department has a key role at all levels of the National Science and Technology Council (NSTC), an example of the effective ways in which agencies come together to coordinate and share the results of science and technology programs. Commerce staff serve and provide leadership on NSTC working groups spanning computing, information and

communications; construction and building; manufacturing; environmental technology; toxic substances; and fundamental science. Based on NSTC strategies, Commerce has responded to a number of cross-cutting initiatives including the Partnership for a New Generation of Vehicles, Rapid Commercialization, Next Generation Manufacturing, and Natural Disaster Reduction (proposed for FY 1999). Commerce has also figured prominently in the President's Council on Sustainable Development, which impacts the science and technology agenda across Federal, State, and local agencies, and the private sector.

The collective efforts of bureaus within the Department of Commerce to apply cutting-edge science and technology and maintain "world class" information bases enhance the competitive capabilities of American firms and promotes improved living standards for all Americans.

IV THEME 2 — GOALS, STRATEGIES, AND OBJECTIVES

Through the strategically developed goals, strategies, objectives, and illustrative performance measures listed below, DOC bureaus efficiently and effectively serve the needs of all Americans, create job opportunities for American workers, and enhance the competitiveness of United States industry in the global marketplace.

A. Partner with industry to accelerate the development and application of cutting-edge technologies. The strategy pursued in accomplishing this goal is to use NIST programs (including laboratories, the Manufacturing Extension Partnerships, and the Advanced Technology Program) to perform research in world-class facilities, render technical assistance to the small and medium-sized industry sectors, and leverage resources for technological innovation.

- Develop the measurement tools for advanced science and technology. (TA)

  — GPRA's "Alternative Format" based on peer review (to ensure that the program is appropriate, clear, effectively designed and executed, and revalidated) and economic impact studies (to provide qualitative and quantitative assessments) are used to assess how effectively these goals are achieved and to provide feedback to program planning efforts to ensure that goals and objectives are met.

- Introduce modern technology to U.S. small and medium sized manufacturers. (TA)

  — Increased companies served by extension services.

- Create world-class research facilities for U.S. economic advantage. (TA)

  — Increased laboratories enrolled in the National Voluntary Laboratory Accreditation program.

- Open new opportunities for U.S. business and industry by fostering enabling technologies that lead to new, innovative products, services, and industrial processes. (TA)

— Increased number of technologies commercialized.

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

- Play a leadership role in assisting Federal agencies with dissemination of their scientific, technical, and business information. (TA)

  — Increased number of information users reached.

- Provide services and infrastructure to control scientific, technical, and business related information, and increase the effectiveness of systems for locating and delivering information in the form required by customers. (TA)

  — Decreased number of customer complaints.

C. Monitor and assess international R&D and barriers faced by U.S. industrial sectors, and develop policy options in partnership with industry, academia, and the States. The strategy to be used in this goal is to conduct relevant research and analysis, conduct industry roundtables and partnership events that bring together the Federal government, States, industry, and academia, as well as advocating for issues identified through comprehensive analysis.

- Monitor and assess what competitor nations are doing to support R&D and enhance their industrial competitiveness. (TA)

  — Research and analysis on the use and effectiveness of technology policy tools employed by other nations to foster economic development. Information provided by this and the following performance measure is used to identify and document the competitive position of U.S. industries and the technology policies of other countries, the effective synthesis of analysis into publicly available reports, the dissemination of analysis to the public and private sectors, and the influence that analysis and advocacy have.

- Monitor and assess the technological strengths, weaknesses and barriers faced by U.S. industrial sectors, and translate those assessments into policy options with partners in industry, academia, and the States. (TA)

  — Conduct analysis of “best practices” in government to industry technology partnerships.

D. Implement seasonal to interannual climate forecasts. The strategy for this effort requires a permanent observing capability for those ocean and atmospheric observations needed for predictions and a strong research program in modeling and process research to improve forecasts.

- Deliver useful seasonal to interannual climate forecasts for the U.S. and collaborate in a multinational effort to generate and use similar forecasts. (NOAA)

  — Increased lead time and skill score for U.S. temperature and precipitation. Improving the accuracy and timeliness of predictions of temperature and precipitation will promote the use of climate forecasts, leading to economic benefits.

- Enhance global observing and data systems required to provide data for the initialization and validation of model predictions of seasonal to interannual climate variations. (NOAA)

  — Increased percent of Tropical Oceans/Global Atmosphere (TOGA) observing system operational. Wind observations and surface and subsurface temperature measurements are the essential components of an in-situ tropical Pacific observing system required for skillful El Nino-Southern Oscillation (ENSO) predictions.

- Invest in process and modeling research that leads to improved predictability of temperature and rainfall distributions. (NOAA)

  — Increased percent of key research goals implemented. Continuing research will improve seasonal-to-interannual predictions, and NOAA will expand efforts beyond the initial focus on predictability in the tropical Pacific to examine the impacts of other oceans and surface processes.

- Assess the impacts of climate variability on human activity and economic potential, and improve public education so that climate forecasts are understood and acted upon. (NOAA)

  — Quantify economic and social benefits of climate forecasts. User surveys will be undertaken to assess the extent and satisfaction with NOAA's seasonal-to-interannual forecasts, and scientific studies will be conducted to determine the economic and social benefits of applying these forecasts on a regular basis.

E. Predict and assess decadal to centennial change. Building upon its strengths in climate research, NOAA will address the societal questions that the U.S. and the world face in air quality, ozone depletion, greenhouse warming, and climate change. NOAA seeks to provide both the science needed for policy decisions and the information on emerging scientific issues that have policy relevance.

- Characterize the agents and processes that force decadal to centennial climate change. (NOAA)

  — Improved understanding of trends and forcing of greenhouse gases. Trends in the concentration and characteristics of greenhouse gases must be monitored and assessed to explain global change trends being observed.

- Examine the role of the ocean as a reservoir of both heat and carbon dioxide to address a major source of uncertainty in climate models. (NOAA)

  — Improved representation of the ocean in coupled climate prediction models. The potential for the ocean in redistributing heat on the planet is a major source of uncertainty in modern climate models; reducing this uncertainty will improve predictions of long-term potential change.

- Ensure a long-term climate record by enhancing domestic and international weather networks, observing procedures, and information management systems. (NOAA)

  — Updated and improved data bases for documenting climate variability and change on time scales of decades to centuries. International and national climate assessments will have updated and more reliable information to develop policies for addressing climate change; engineers and planners will have access to long-term climate time series required for infrastructure design and operation.

- Guide the rehabilitation of the ozone layer by providing the scientific basis for policy choices associated with ozone-depleting compounds. (NOAA)

  — Percentage of commercially viable CFC substitutes evaluated for their ozone depleting potential. NOAA research is helping define ozone-friendly replacement compounds and documenting that the recovery of the ozone layer is as expected.

- Provide the scientific basis for better air quality by improving the understanding of high surface ozone episodes in rural areas and by establishing a monitoring network to detect cleaner air quality. (NOAA)

  — Percentage completion of initial state of science assessment for rural ozone chemistry. Air quality decision makers in government and industry will have information for planning improvements to State Implementation Plans.

- Develop models for the prediction of long-term climate change, carry out scientific assessments, and provide human impacts information. (NOAA)

  — Percent completion of the inventory of NOAA research contributing to the Year 2000 IPCC scientific assessment of climate change. NOAA will develop better models for climate prediction based on the understanding of radiation science, leading to improved assessments of greenhouse gas policy options.

F. Promote awareness of, and provide effective access to, patent and trademark information. A strategy of leveraging information technology and effectively managing resources is followed in pursuing this goal.

- Consistently achieve customer satisfaction by understanding and supporting customer needs. (PTO)

  — Increased customer satisfaction. This information will help guide changes in the services and products provided, and the delivery mechanism used.

- Promote the use and accessibility of intellectual property information. (PTO)

  — Increased awareness of patent and trademark information. This measure will be used to assess program effectiveness, since timely availability of, and ease of access to, patent and trademark information is critical to the user community.

- Develop the highest quality information products and services which deliver information when, where, and in the format needed. (PTO)

  — Increased State, local, and business partnerships. This will be used to assess program effectiveness, as serving the most populated metropolitan areas enables greater access to patent and trademark information.

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

- Administer the Information Infrastructure Grants program of grants to assist State and local governments, universities and school systems, hospitals and other health care providers, and other social service entities. (NTIA)

  — Increased number of entities connected to the NII.

- Improve the delivery of communications services and products to the public, through Executive Branch attention to the issues, legislative initiatives, and Federal Communications Commission (FCC) dockets. (NTIA)

  — Increases in access for rural areas.

- Improve the international competitiveness of the U.S. telecommunications industry and the ability of U.S. businesses and consumers to have access to high quality, reasonably-priced international services. (NTIA)

  — Increased adoption of U.S.-supported standards.

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

- Ensure that all government needs for vital telecommunications services can be satisfied nationally and internationally. (NTIA)

  — Increased identification of new technologies for governmental application.

- Ensure that: the educational and cultural benefits of public broadcasting are available to as many people as possible; educational entities are able to use a variety of telecommunications technologies to improve the effectiveness of distance learning; minorities and women have increased access and control of public telecommunications; and blind and hearing-impaired persons are able to participate more fully in society through the use of telecommunications. (NTIA)

  — Development of content policy models adaptable to different cultural beliefs.

I. Provide Gross Domestic Product (GDP) and related national, regional, and international economic statistics in the most accurate, timely, cost-effective, and easily accessible way possible. ESA will re-engineer its computer systems to reduce respondent burden and improve the accuracy, reliability, timeliness, and accessibility of data for its customers.

- Reduce respondent burden and increase accuracy and timeliness through electronic filing of BEA's surveys of direct investment and international services. (ESA)

  — Establishment of electronic interchange system standards. Standardized interchange systems will result in less time required to prepare survey responses, quicker availability of survey results, and fewer data problems.

- Increase accuracy, reliability, and timeliness, across the national, regional, and international programs, through standardized data transfer and on-line interactive editing and processing systems for source data. (ESA)

  — Increased re-engineering of critical processes. The resulting processes will support more efficient data transfers within ESA and between ESA and outside data sources, more timely data availability, and fewer data errors.

- Increase the timeliness and accessibility of data products to a wide range of customers through Internet and other electronic gateways. (ESA)

  — Increases in e-mail system capacities to handle customer inquiries. Increased use of e-mail will result in more timely and efficient communication of information about ESA data and programs to customers.

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

- Develop customer- and market-driven Census products through a strategy of regularly soliciting, surveying, and responding to customer needs. (ESA)

  — Improved public perception and cooperation. Greater cooperation is expected to lead to the availability of more complete data.

- Provide easier access to, and greater customer satisfaction with, Census products and services through a strategy of developing a faster, better, and cheaper electronic data dissemination system for Census products. (ESA)

  — Increased data accessibility. Greater availability of data is expected to lead to increased use and impact of information.

K. Provide information on economic events and the workings of the economy.

- Provide information, analyses and guidance on pending economic policy decisions. (ESA)

  — Monthly assessments of macroeconomic impacts.

- Provide a focal point for data dissemination bringing together business, economic, and trade statistics in formats that are easy to use and located at a "one-stop shop." (ESA)

  — Increased subscription rates.

L. Employ ITA's 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 and up-to-date information to these firms to support business strategies, and related analyses to the USTR for trade negotiations. To do this, ITA will implement a strategy of expanding its information bases, distribution network, and marketing efforts.

- Expand and enrich ITA's general trade, industry sector, technical, and country information, and increase their utility to ITA's industry clients' export decision making. (ITA)

  — Number of custom agency reports. This will show the areas and extent of customer interest, and help ITA fine-tune its activities.

- Broaden and improve ITA's information distribution network (e.g., use of the Internet, increased support of the National Trade Data Bank, etc.) to ensure that information reaches a larger universe of small- and medium-sized companies in a more timely fashion. (ITA)

  — Number of matching services. This will help show the market relevance of some of ITA's products and services.

- Expand and improve marketing activities undertaken to make ITA's clients more aware of ITA's extensive information resources. (ITA)

  — Percentage of satisfied customers. This will provide important feedback and help ITA respond to topics of high customer interest.

- Complete identification of the trade agreements negotiated by the U.S. and construct a searchable database of these agreements. (ITA)

  — Number of new-to-export firms. This will show the extent to which ITA is helping firms export for the first time.

- Continue to update the Commercial Service's client contact and management system, and migrate the client information to a widely-used and robust application platform to maintain our ability to provide trade and economic data worldwide. (ITA)

  — Number of new-to-market firms. This will show the extent to which ITA is helping experienced firms to do more exporting.

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

- Ensure that the automated export control system (EAIS) can assist exporters and provide necessary information to ensure compliance with the U.S. export control regulations. (BXA)

  — Increased applications processed in less than statutory time frames. Technology can contribute greatly to faster processing of export license applications, and timely processing is important for U.S. competitiveness.

- Implement the Nation's encryption export policy. (BXA)

  — Increased number of encryption key recovery agent reviews. The U.S. is promoting the use of key recovery agents in encryption products to ensure the uses of secure and safe encryption technology.

- Oversee domestic implementation of the Chemical Weapons Convention (CWC) by the business community. (BXA)

  — Chemical industrial inspections conducted. By ensuring CWC treaty compliance, these inspections promote national security and economic strength. By safeguarding business confidential information, they keep America competitive with cutting edge technology.

- Promote U.S. economic security, technological competitiveness, and defense diversification. (BXA)

  — Completion of critical defense industry studies. These studies help to identify potential vulnerabilities and dependencies, as well as competitive opportunities.

N. (EDA's strategies under Theme 2 are achieved through grants to alleviate conditions of substantial and persistent unemployment and underemployment in economically-distressed areas of the Nation through technology-based solutions. EDA's performance goals relate directly to job creation, capacity building, information dissemination, and recovery from economic dislocation.)

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

- Help distressed communities plan for technology-led economic development. (EDA)

  — Increased community participation.

- Help distressed communities build infrastructure necessary for technology-based economic development, including business incubators, industrial technology research centers and laboratories, technical skills training centers, and entrepreneurial development centers. (EDA)

  — Jobs created and/or retained.

- Provide technical assistance to communities to develop the networks and linkages necessary for technology-based economic development, including the creation of electronic networks and trade and commerce organizations. (EDA)

  — Improvement to the community through evaluation or feasibility study.

V PARTNERSHIP ACTIVITIES SUPPORTING SCIENCE/ TECHNOLOGY/ INFORMATION INITIATIVES

Many of the Federal, State, and local agencies, and outside groups with which we partner, do not make distinctions about which specific Commerce goals they link to — their focus is on an overall program. Therefore, we believe that to show a partnership link between one specific goal/objective and a partner organization could be misleading. As a result, we will discuss our partnership relationships at the bureau level in this Plan.

TA

NIST partners with industry to accelerate the development of cutting edge technologies, in four main areas:

- Develop and apply measurement and standards tools for advanced science and technology.
- Introduce modern technology to U.S. small and medium sized manufacturers.
- Create world-class research facilities for U.S. economic advantage.
- Open new opportunities for U.S. business and industry by fostering enabling technologies that lead to new, innovative products, services, and industrial processes.

The NTIS has the authority to enter into joint ventures with companies in the private sector, which has broadened its ability to reach larger audiences with the development of new information products. An active joint venture program has produced innovative solutions to increase information access points for businesses by working together with notable leaders such as Kinko's, Inc., The McGRAW-HILL Companies, Inc., and Bernan.

NTIS also partners with other government agencies by assisting them in fulfilling their needs for information collection, processing or dissemination. Service support work for other Federal agencies continues to build in the electronic information processing areas. On-line services provided through the FedWorld system cover a full range of information dissemination provided to several Cabinet level and over 60 other federal agencies. Special facilities to provide 2-way, on-line communication with agency constituents are now offered for on-line rulemaking or other consensus building processes. Transactions in real-time using industry standard methods have been pioneered with NTIS' own automated on-line ordering system. NTIS also develops audio-visual and CD-ROM products for agencies.

NOAA

NOAA co-chairs the National Science and Technology Council Committee on Environment and Natural Resource (CENR), including 20 Federal agencies charged with developing cost-effective strategies to optimize the Nations' Federal investment in our $5 billion R&D investment. This partnering organization promotes complementary and coordinated research efforts across the Federal government. In coordination with OMB, the CENR assures that Federal research efforts are not redundant, and as a result, the best scientific R&D information is both developed and disseminated for the benefit of the Nation in increasingly efficient and cost-effective ways.

NOAA's climate prediction effort is a key component of the U.S. Global Change Research Program (USGCP), a Presidential and CENR priority. Climate variability has emerged as one of the four thrusts recommended for the USGCP by the National Research Council in its recent review of this program. While maintaining a leadership role in the research, NOAA actively coordinates its efforts with its partner Federal agencies, principally the NSF, NASA, and DoE. This program also supports the CENR Water Resources and Coastal and Environmental Subcommittee, the CENR Subcommittee on Natural Disaster Reduction, and the President's Council on Sustainable Development.

Longer-term climate information gathered by NOAA and coordinated with efforts of other Federal agencies contribute science-based information though the USGCP to assist decision-makers in understanding issues concerning the global environment. Key NOAA contributions include improved understanding of climate change and greenhouse warming, ozone layer depletion, and air quality improvement. Due in part to the Global Change Research Act of 1990, Federal agency global climate change research efforts, such as those involving NOAA, USDA, DOD, DoE, EPA, HHS, DOI, NASA, NSF and others are now more effectively coordinated.

PTO

PTO's domestic and international partnerships enhance its customer responsiveness and facilitate better working relationships among the businesses, communities, Federal agencies, and foreign countries and organizations which produce and/or depend on patents and trademarks. PTO has taken an aggressive approach to its public policy role in the dissemination of patent and trademark information. At the international level, PTO has partnered with the European and Japanese Patent Offices (its Trilateral partners) in developing dissemination policies for the respective regions which will enhance effective dissemination of patent and trademark information. Through this partnership, the scope of information available for use by PTO employees and the network of Patent and Trademark Depository Libraries (PTDLs) has expanded significantly; for example, a database of AIDS-related patents and electronic information products offered by CD-ROM.

PTO partners with regional, State, university, and public libraries around the country to make patent and trademark information accessible locally through the PTDLs. Enhanced partnerships were developed between the PTO and the Sunnyvale Center for Innovation, Invention, and Ideas in Sunnyvale, California, and the Great Lakes Patent and Trademark Center of the Detroit Public Library, which in turn has a relationship with the Toledo-Lucas County (Ohio) Public library.

NTIA

NTIA's responsibilities encompass telecommunications issues including domestic and international policy, spectrum management, research, and grant programs. Within the Federal government, the State Department, the U.S. Trade Representative, and other agencies address telecommunications as a peripheral aspect of their primary missions and rely on NTIA for telecommunications expertise. NTIA coordinates Federal use of the radio spectrum by chairing the Interdepartment Radio Advisory Committee (IRAC). The IRAC is made up of all Federal agencies that use spectrum and includes the Federal Communications Commission.

ESA

ESA works with all Commerce bureaus, and, as a representative of Commerce, with White House policy councils and similar economic policy forums on issues affecting the economy. ESA reviews material prepared by other Commerce bureaus to ensure that it contains accurate and timely information, and reflects Departmental policy positions. ESA prepares information, analyses, and guidance for presentation to White House policy councils and other policy-making forums on pending economic policy decisions.

ITA

ITA's partnership initiatives are not limited to co-location of offices, or joint trading and sharing of staff. We are providing for electronic links between Commercial Service offices and our private sector partners and clients to enable information to be shared across the country. We continue to develop concepts such as the "mobile trade specialist", videoconferencing, and home pages on the World Wide Web. Hard copies of documents are giving way to CD-ROM, and the Commercial Service is actively pursuing a program to upgrade its telecommunications and information technology capabilities worldwide.

ITA's industry specialists prepare forecasts for U.S. industries, industry sectors, or subsectors. To disseminate this information, ITA prepares and distributes industry-specific reports or research on foreign market opportunities and U.S. competitiveness in specific markets. This information is also becoming available on an ever-increasing number of Web pages.

BXA

BXA continues to assess the capabilities and competitiveness of various critical domestic supplier industries as the economy moves into the 21st century. A major project which is in its early stages is an assessment of the high performance explosives sector which serves as sources for the Defense Department, and the specialty chemicals supplier base upon which these explosives manufacturers are dependent for key ingredients. BXA is also working on a new study of the industries which comprise optoelectronics; this assessment is a follow-on to a major publication which BXA completed in 1994.

VI ECONOMIC CONTRIBUTIONS AND OTHER BENEFITS OF SCIENCE, TECHNOLOGY, AND INFORMATION ACTIVITIES

Commerce programs support the Nation's science, technology, and information initiatives in numerous ways. The key activities are cited here, in the context of Theme 2 goals.

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

NIST's primary mission is to promote economic growth by working with industry to develop and apply technology, measurements, and standards. NIST laboratories further the technical aims and capabilities of U.S. industry by serving as an impartial source of expertise, developing measurement capabilities and other infrastructural technologies that are beyond the reach of individual companies, needed widely by industry, and likely to have significant economic impact.

In partnership with states and local governments, the MEP provides U.S. small- and medium-sized manufacturers with an array of tools, including implementation assistance in adoption of new, more advanced manufacturing and information technologies. The MEP provides this assistance through some 700 partnerships with Federal agencies, national associations, and other organizations.

The ATP program is a unique partnership between government and private industry to accelerate the development of high-risk technologies that promise significant commercial pay-offs and widespread benefits for the economy, and an enhanced quality of life for American citizens.

Studies of the economic impact of these NIST programs indicate that significant benefits flow back to U.S. society and the economy. For instance, preliminary Census surveys of MEP clients indicate that the program does create and save jobs, and has helped companies increase sales and reduce costs. Studies have documented important near-term results of the ATP which include: the pursuit of challenging

research projects that would have been delayed or scaled down without the ATP; new commercial opportunities based on the new technical capabilities; and, greater use of cooperative research ventures and industrial alliances. In tackling with industry the key tasks that companies cannot accomplish on their own, NIST provides timely, indispensable support that companies themselves fashion into competitive advantages.

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

NTIS provides public access to information in several formats, on an extremely wide range of R&D, engineering, and program subjects, regarding activities of U.S. and foreign governmental agencies and agency-supported research. Information is available in the form of periodicals, stand-alone hard copy, microfiche, and data files and software (on tape, diskette, or CD-ROM). NTIS adds an average of almost 300 titles to its collection every business day. By making its holdings widely accessible, in ways that are most useful, and on topics that are of current market or research importance, NTIS provides key information resources that are essential to the business, research, academic, and governmental communities.

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.

The TA develops technology policies that increase the competitiveness of U.S. industry. Economic research has long indicated the important role that the development and deployment of new technologies play in improving industrial productivity and generating economic growth. Recent estimates suggest that as much as one-half of recent growth in our economy is attributable to such innovation; government policies and programs play an important role in defining the context within which such innovations occur.

As part of its work, the TA attempts to define more clearly the interconnection between government policy and technological innovation. Through studies of the competitiveness of key industrial sectors, it brings to policy-makers current information concerning the technological challenges facing our industries and the role which government policies play in helping meet those challenges. These studies provide a basis for more comprehensive consideration of the ways in which government policy should be shaped to further technological advantages of U.S. industry. A related part of this effort is the periodic review of government technology partnership programs intended to help industry develop and deploy new technologies. It develops recommendations for improvements in those programs and seeks to carry out those recommendations throughout the executive branch.

The link between technology policy and industrial performance is long and complex in a large, market-driven economy like ours. In a basic sense, government policies developed by the TA provide important elements of the climate within which private sector technological competitiveness can be achieved.

D. Implement seasonal to interannual climate forecasts

A broad range of commercial, business, and public users, making up a substantial segment of the U.S. economy, benefit directly from interannual climate forecasts. The $820 billion U.S. food system, for which agricultural productivity is the core, is particularly sensitive to climate fluctuations. Recent studies estimated the value of El Nino Southern Oscillation (ENSO) climate forecasts for U.S. agricultural sector range from $240-$323 million annually. In each case, prior knowledge of the onset and intensity of the next season's or next year's climate fluctuations can lead to far more efficient decision making. Although economic benefits derived from the use of climate information will vary from year to year, conservative estimates place the average value of an ENSO forecast at $1 billion annually in terms of mitigated losses (including jobs saved and social disruption minimized) in the U.S. economy, and exceed several billion dollars globally.

E. Predict and assess decadal to centennial change

Research on climate change enables society to make sound decisions to mitigate and adapt to climate change, to assess the utility of investment to reduce greenhouse gas emissions. The purpose of this research over time is to improve regional air quality. Performing research, presenting results in up-to-date assessments, and describing the implications in policy-relevant terms to government and industrial leaders are cornerstones of environmental stewardship and can have enormous benefits. The value of reducing climate-related uncertainty in the implementation of policies on stabilizing anthropogenic greenhouse gas emissions is estimated to be $100 billion for the U.S. alone between now and the year 2020. Assisting industry to choose the most "ozone-layer friendly" substitutes for chlorofluorocarbons will promote protection of the stratospheric ozone layer while continuing economic development. Scientific findings will assist Clear Air Act decisions to reduce surface ozone, with benefits to human health and agriculture.

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

Intellectual property is a potent force in, and a fundamental component of, the world's competitive and technologically-based free enterprise system. By protecting intellectual endeavors and encouraging technological progress, the PTO preserves the U.S.' technological edge, which is a key to our current and future competitiveness. In market-driven economic systems, innovation provides a catalyst for economic prosperity through the accumulation of scientific knowledge, introduction of new products and services, and improvements in the productivity levels of land, labor, and capital resources.

In addition to the benefits for ensuring adequate protection for innovations through patents and trademarks, the knowledge disclosed through a patent grant contributes to the base of science and technology on which the Nation's economy is built. Disclosure of the information contained in a patent grant provides the public with information about the most recent state of technological development. In addition, a patent offers the necessary information and stimulation for continuing development, and directs those interested in the exploitation of an invention to the relevant source of technology. The trademark system helps promote order and certainty in the Nation's economic infrastructure. The introduction of new products and services is made easier and less risky by the availability of information concerning trademarks in use by others. Using this information, a mark can be selected which will distinguish new products and services from others and thereby avoid confusion on the minds of customers.

In addition to meeting customer needs in traditional ways, the PTO will use the Internet for customer ordering and delivery of patent and trademark information products and services, providing customers with the status of patent and trademark applications, and with access to patent and trademark assignment data. The PTO will also be able to produce and transmit products electronically to major international patent offices (e.g., WIPO, the EPO and the JPO).

At the same time, the PTO will enhance the effectiveness of the PTDL network by controlled expansion into major metropolitan areas which are not currently served by a PTDL.

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

The NII is an effort to use new telecommunications and information technologies to connect Americans to one another, to services, and to information. The private sector is building the NII, but Federal government actions are necessary as a catalyst to facilitate and encourage private development of it. NTIA continues to demonstrate leadership in the development of the NII through its management of the Telecommunications and Information Infrastructure Assistance Program, to promote the expansion and effective use of the NII by public and nonprofit entities at the community level.

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

Over the years, NTIA's Institute for Telecommunication Sciences has pursued numerous technical research and engineering projects, on a reimbursable basis, for other Federal agencies, including the Departments of Defense, Agriculture, and Transportation, the Federal Communications Commission, and others. These efforts, which include telecommunications planning, consultation and evaluation services, provide agencies with a centralized capability to address their mission-related telecommunications problems

effectively. This would not be possible without NTIA assistance because of the lack of agency in-house expertise, or because of changing requirements for sophisticated telecommunications support that only NTIA could fulfill. Other-agency sponsored work undertaken by NTIA has contributed to efficient Federal resource management and reduced unnecessary duplication of effort, and at the same time, has reinforced and supported NTIA's overall telecommunications policy and spectrum management responsibilities in support of the Department and the Administration.

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.

BEA has begun a critical move to an integrated micro-computer network. BEA's Information Technology Strategic Plan, benchmarking BEA's existing system against the computer systems used by statistical offices in other countries and against best-practices technology in the U.S., brings together BEA's customer service, Mid-Decade Strategic Plan, and computer re-engineering efforts. The integrated environment will increase the accuracy, reliability, and timeliness of BEA's data. Re-engineering BEA's data collection, analysis, and dissemination will enhance its ability to provide accurate, timely, and relevant estimates to its customers, while reducing respondent burden.

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

The Bureau of the Census compiles and publishes economic, social, and demographic data on a wide range of topics, such as manufacturing, population, housing, agriculture, and foreign trade. This crucial data provides invaluable insight into the Nation's economic infrastructure. National Statistical Profile data are used by agencies allocating Federal funds to State and local programs, show long-term economic trends, and define Congressional representation. National Performance Indicators are monthly to annual statistics driving today's markets and their analysis of the population.

K. Provide information on economic events and the workings of the economy.

ESA provides information to other Commerce bureaus, and to other Federal agencies, on matters related to economic developments and forecasts, and the development of options and positions relating to both macroeconomic and microeconomic policy. In turn, this information drives Federal, State, and local government investment decisions, program decisions within the Federal, State, and local governments, and decisions of countless private sector entities.

In addition, ESA's STAT-USA is a focal point for data dissemination that brings together business, economic and trade statistics in formats that are easy to use and located at a "one-stop shop". By building on earlier successes with new technologies to deliver information, STAT-USA is now a leader in the delivery of Federal government information to the public.

L. Employ ITA's 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.

ITA's counseling, information, and related services contribute directly to the export sales by thousands of American companies. These efforts resulted in over $1 billion in exports in FY 1995, when over 275,000 small- and medium-sized firms received counseling. ITA's Trade Information Center alone handled nearly 65,000 inquiries, 90% of which were from small businesses.

As the essential link between the economic interests of U.S. industries and the Nation's broader public policy concerns, ITA works closely with the USTR to ensure that trade agreement negotiations give full consideration to the requirements of the private sector. ITA participates annually in thousands of multilateral negotiations and consultations, and produces briefing papers which provide vital international trade information for U.S. business and industry. The success of many trade negotiations hinges on the quality of analysis ITA provides. In addition, through ITA's Industry Consultations Program, U.S. negotiators draw upon the advice of over 500 industry representatives who provide essential information on the impact of foreign trade barriers on U.S. business interests.

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

BXA focuses on restructuring export controls for the 21st century and on facilitating the transition of defense industries as relevant. These objectives contribute to keeping the Nation's economy competitive while remaining within the limitations imposed to keep this Nation secure. BXA works with various countries as well as other agencies in furthering these objectives. BXA also seeks to keep the exporting community informed by disseminating its revised export regulations and technological information in a timely manner.

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

EDA programs support the Nation's science, technology, and information initiatives by working in conjunction with State and local governments and the private sector to promote the use of technology to increase trade and thereby create jobs. For example, EDA funded the establishment of BAYTRADE, a regional public-private partnership that links eight one-stop-shop centers to assist export-ready businesses by developing an electronic communication network, which provides information on international markets. The economic benefits of this initiative are the increased exports by U.S. companies using the system.

EDA public works grants have enabled the construction of science and technology learning centers for the purpose of providing training to disadvantaged youths and long-term unemployed residents of inner cities. For example, EDA funded a multi-tenant technological incubator at the Johns Hopkins Bayview Medical Center in Baltimore, Md., and helped Baltimore construct the Maryland Bioprocessing Center, generating over 1000 jobs and $42 million in new capital investment.

VII INTERNATIONAL ACTIVITIES RELATED TO COMMERCE SUPPORT FOR THE NATION'S SCIENCE, TECHNOLOGY, AND INFORMATION INITIATIVES

Many of the Commerce programs supporting the Nation's science, technology, and information have international aspects. Key examples are cited here, in the context of Theme 2 goals.

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

NIST stimulates the Nation's economic growth through technology, measurements, and standards. As economic growth is intimately connected with global trade, NIST has specific responsibilities and opportunities internationally.

NIST's measurements and standards program cooperates with other countries, through the International Bureau of Weights and Measures and other international standards bodies, on comparisons of the measurement capability in each country. NIST supports state-of-the-art measurement capabilities that keep it at the forefront of these international comparisons. These capabilities give U.S. companies access to processes other countries use to assure that private industry makes accurate measurements and supports U.S. companies who want to compete internationally.

Through its measurement and standards-related services, NIST promotes market efficiencies that provide the means for assessing and demonstrating conformance and for resolving technical disputes, efforts especially important where technical trade barriers have arisen. NIST is helping to develop Mutual Recognition Agreements that specify conditions under which testing for conformance with foreign and international standards can be done within the United States. In 1994, NIST established a National Voluntary Conformity Assessment System Evaluation Program to evaluate and recognize U.S. testing laboratories and organizations with demonstrated competence in determining whether products satisfy foreign regulatory requirements.

NIST activities have been formalized by the passage of the National Technology Transfer and Advancement Act (PL 104-113), which directed NIST to take responsibility to provide public sector leadership in standards and conformity assessment and in working with other Federal agencies and the private sector to support the creation and maintenance of a sound technical infrastructure for the U.S. NIST is in a unique position to provide coordination and policy input for standards and conformity assessment structures and activities in the U.S., and to lead the development of a realistic, workable technical infrastructure to support the goal of an effective global market.

The ATP program works with multinational corporations to assure that those corporations do not merely sell in the U.S. market, but also find it profitable to perform research and development and to manufacture products in this country. The MEP helps forge links between small and medium-sized countries in the U.S. with those abroad to improve domestic manufacturing practice and to provide new markets for domestically manufactured goods. In general, NIST's support of U.S. industry bolsters U.S. competitiveness in the global marketplace.

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

NTIS maintains international relationships with similar information sourcing and dissemination entities throughout the world in more than 20 countries. NTIS is recognized by the foreign information providers as a primary source providing U.S. businesses and industry information about foreign technology. NTIS obtains the foreign information through governmental and in-country business channels.

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

The TA conducts technology and innovation-related international activities that complement its domestic initiatives by creating opportunities for beneficial international partnering, providing information and policy analyses, and directly addressing existing international impediments. Because technological leadership means operating effectively in an international environment, the TA's international activities are expanding.

The TA negotiates international science and technology agreements and other joint arrangements, represents the U.S. in multinational fora such as the OECD and APEC, and advises senior government and industry officials on the potential impact of foreign science and technology policies and programs. The TA provides value-added information through electronic and printed publications, business counseling, conferences and other special activities. Since other countries do not provide the same open access to science and technology, the TA plays a role in making this information more accessible, educating Americans on finding such information and cooperative opportunities.

The TA supports Presidential and other high-level initiatives to increase international technology cooperation, facilitating peace restoration and economic reconstruction in important areas of the world. The TA works closely with other U.S. agencies, U.S. industry, and foreign partners to establish business activities and relationships that provide tangible benefits by creating a business climate supportive of innovation and an opportunity for balanced collaboration.

D. Implement seasonal to interannual climate forecasts.

International cooperative activities are an integral part of climate research, observing systems, and assessments. NOAA's Seasonal to Interannual Forecasts program is a principal U.S. contribution to the World Climate Research program, Global Ocean Observing System (GOOS), and Global Climate Observing System (GCOS). NOAA supports the International Research Institute, which produces climate forecasts a season to a year or two in advance, as well as societally and economically useful forecast guidance. NOAA will maintain and develop international partnerships to build a global ocean observing system to operationalize ENSO climate observations, leveraging the expertise and resources of partner nations.

E. Predict and assess decadal to centennial change

NOAA is a recognized major source of research and information on international environmental issues. NOAA and NOAA-supported research has made discoveries driving international environmental policy decisions. NOAA's predictions and assessments are key input for the United Nations scientific assessments (e.g., the Intergovernmental Panel on Climate Change, IPCC) on greenhouse warming. To understand the role of the oceans in global change, NOAA leads planning and implementation efforts for the U.S.'s contributions to the international GCOS to provide necessary observations as part of the GOOS. Since weather in the U.S. is influenced by weather throughout the world, international contributions of data and observations figure into all of NOAA's key climate research and global and regional observing programs. As part of this effort, NOAA also supports the International Geosphere-Biosphere Program as well as the associated World Data Centers.

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

PTO's formal agreements and informal working relationships with the European and Japanese Patent Offices significantly help to enhance awareness of, and access to, patent and trademark information. The PTO has collaborated with the WIPO in developing dissemination policies for the respective regions which will enhance the effective availability of information. Further, through this partnership, the scope of information available for use by PTO employees and the PTDL network has expanded significantly.

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

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

With burgeoning global growth in demand for advanced telecommunications and information services and facilities, effective U.S. standards development efforts — at the Federal, national, and international levels — are vital to achieving U.S. telecommunications policy objectives. NTIA has been at the forefront of U.S. telecommunications standards development efforts, and continues to play a leading role in domestic (e.g., Standards Committee T1 Telecommunications) and international telecommunications standards conferences (e.g., ITU-T and ITU-R) and negotiations in cooperation with other interested agencies/ administrations/industry groups.

NTIA has spearheaded highly successful efforts to enhance domestic competition and improve foreign trade opportunities for U.S. telecommunication firms by developing user-oriented, technology-independent quality-of-service network performance standards. This work is providing key contributions to the development of the NII and Global Information Infrastructure (GII). In today's competitive multi-vendor environment, the NII and GII will provide the linchpin for the delivery of new and innovative multimedia services in such areas as distance learning, health and safety, law enforcement, entertainment, finance, and others. Telecommunications standards development is a primary mechanism for cooperative planning of these future 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.

BEA's participation in international organizations brings uniformity and higher quality to international statistics and improves the U.S.'s ability to compare economic developments here and abroad. BEA helps set international standards, such as the U.N.'s System of National Accounts and the IMF's Balance of Payments Manual. With the implementation of the new standards, U.S. measures of economic growth, investment, and trade will be more comparable to those in other nations and will better reflect new and rapidly growing sectors of the economy, increased globalization of production and investment, and other features the changing world economy.

The present Standard Industrial Classification (SIC) system — the basis for BEA's GDP and gross State product-by-industry estimates, input-output accounts, and foreign direct investment and services data — presents an outdated picture of economic activity. Work on the North American Industry Classification System (NAICS) was begun in 1992 under OMB and carried forward with our Canadian and Mexican NAFTA partners' statistical agencies. The design of the system is now complete, and it will replace the outdated SIC system in 1997. BEA will work with the Census Bureau and BLS to oversee the introduction of NAICS in the U.S. and the integration into the accounts of the new data collected using NAICS.

Increased integration in world markets for goods, services, and capital, in combination with major advances in computer and communications technology, have resulted in large gaps in BEA's coverage of international transactions. These gaps pose difficulties which BEA is seeking to address through data exchange with other countries' statistical agencies and with foreign central banks. Efforts to reconcile import and export statistics of other countries with our own have improved U.S. trade data.

BEA, Treasury, and the Federal Reserve System — in cooperation with the IMF, the Organization for Economic Cooperation and Development, and the other G-7 nations — are developing common definitions for collecting consistent data on portfolio investments. Participating countries and organizations will then modify their data collection systems to improve consistency and fill existing gaps in coverage by exchanging data with each other.

K. Provide information on economic events and the workings of the economy.

ESA participates in policy deliberations of such international organizations as the Organization for Economic Cooperation and Development, the International Labor Organization, the Asia Pacific Economic Cooperation Forum, and the Conference on Security and Cooperation in Europe.

L. Employ ITA's 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.

The very essence of ITA is its focus on international activities, specifically in its ability to provide strategic support in the development of U.S. international trade and commercial policies. It is the only Federal agency with the proven capacity to provide hands-on assistance to U.S. companies that seek to broaden their markets by exporting or doing business abroad. The majority of ITA's counseling of small- and medium-sized businesses and much of the preparatory work for trade negotiations takes place in the United States. ITA maintains staff, allied with American embassies, in some 70 foreign countries. These staff both directly assist American companies seeking to do business in those countries, and provide information on those countries back to the U.S. Also, ITA experts participate on international negotiating teams and may lead the negotiations. Finally, ITA's desk officers provide the expertise needed by U.S. trade negotiating teams and by the USTR, by producing market barrier analyses and the detailed understanding of technical problems necessary for successfully negotiating trade agreements.

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

BXA's export control agenda for the 21st century is focused on preventing the proliferation of weapons of mass destruction while seeking to promote U.S. competitiveness in the global marketplace. BXA recognizes that U.S. industry cannot successfully compete internationally if the export control system does not reflect a changed security environment. Actions have already begun to remove unnecessary obstacles to exporting and strengthen multilateral regimes.

BXA plays a major role in discussions to build key recovery management infrastructure that will support both electronic commerce and public safety needs.

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 ITA's 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 ITA's 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. ITA's 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 ITA's advocacy efforts, ensuring that American business and American workers get the benefits from successfully negotiated the trade agreements; and develop and expand ITA's 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 up-dated 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.

EDA's 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.