

Presentation to CSIS Conference  
On Global Trends - - Future Planning  
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**“Global Trends: Planning for the Future”**

**(Final as Delivered)**

Thank you for your kind introduction and for the opportunity and challenge to talk to you about a vision of the future. The next 20-25 years is a huge challenge.

Fortunately for me, from time to time Boeing commissions a study to look at long-term future trends. We've also had the opportunity to work with organizations such as CSIS who have in place focused efforts to identify key emerging and future trends, and analyze the implications of these trends for government and industry. CSIS has achieved something quite unique with its "7 Revolutions" and "7 Futures" work, and I'd like to commend them, and in particular its leader, Erik Peterson, for the path-breaking and important work they've done. My congratulations as well on the one-year anniversary of the CSIS Global Strategy Institute, which Erik is leading so ably and which has provided such an excellent forum to look at the challenges and opportunities that the future has in store for us.

As a matter of fact, it was the work that CSIS had presented to the Boeing leadership that prompted us, a few months ago, to have a survey done of the significant futurist studies and reports from around the world. As food for thought, I'd like to share with you some of the trends they found in doing this survey, many of which are reflected in CSIS's work on future global trends.

I want to give credit for the findings tonight to my old friend David Rothkopf and to thank him and latterly Ian Bremmer of the Eurasia Group for the work and analysis that went into the findings. Most of the findings are quoted in whole or in part from their report to preserve the context and care with which they were put together.

This basic study reviewed four dozen previous studies from 78 countries.

The key findings are in four main areas of international concern, where uncertainty and change offer both challenges and opportunities:

Multidimensional Security Threats; Globalization; Technology; and Energy and Resource Management.

### Security:

The spread of knowledge, the diffusion of advance technologies and increasing travel and population movement have internationalized and intensified a variety of security threats, from the proliferation of weapons of mass destruction, terrorism and cyber attacks to the spread of infectious diseases. In the context of expanding global economic interactions, many of these threats in turn are fueled by economic inequities and resentments. The impact of globalization on insecurity is underscored by the ability of al Qaeda to exploit communication technologies, global financial networks and ease of travel in order to plan and execute the September 11<sup>th</sup> attacks on the United States. Meanwhile, traditional security challenges persist in the form of power vacuums left by failing states and geopolitical disputes. Multidimensional threats, influenced by political, economic, technological, social and cultural forces, will consequently shape the 21<sup>st</sup> century security environment.

### The 21<sup>st</sup> Century Military-Defense Environment

- New political, economic, technological, social and cultural forces will shape the military-defense environment.
- There will be rapid advances in defense-related technologies, particularly in precision weapons, information systems and communications.
- The military will be required to fight more frequently in densely-populated urban environments.
- Space is likely to become a warfare environment as space-based systems become increasingly important to international commerce as well as military operations.

Over the next few decades, developed states will need to contend with asymmetric threats, in which states and non-state aggressors (such as terrorists) avoid direct engagements with an adversary and instead devise strategies, tactics and weaponry to minimize strengths and expose perceived weaknesses. Developed states will also face strategic Weapons of Mass Destruction (WMD) threats, as the unconventional delivery capabilities of states and non-state aggressors grow. Regional military threats, in which a few countries maintain large military forces with a variety of concepts and technologies, will also persist.

Militaries will be increasingly required to fight in densely-populated urban environments, in complex indoor spaces, in canyons between buildings, and

in subterranean areas and the armed forces will be required to modify their focus in order to deal with these scenarios.

### **Technological Advancements:**

There will be rapid advances in defense-related technologies over the next fifteen years particularly in precision weapons, information systems and communications. Significant effort will continue to be focused on developing the technological tools available to intelligence analysts. A more market-based, or decentralized approach to intelligence analysis may develop, whereby multiple groups, possibly contractors, or even the general public, are allowed to make competing input to databases and analyses for the decision-maker.

Information-based military forces are not likely to take root in many developing countries in the near future, although some developing countries are taking their first steps towards a modern 21<sup>st</sup> century professional defense force by attempting to scale back their military and moving away from expensive, uncontrollable, and unstable mass armies. The development and integrated application of technologies will occur mostly in advanced countries, which will maintain a strong technological advantage in IT-driven “battlefield awareness” and in precision-guided weaponry.

There is some debate as to the role that Space will play in future wars. Some predict that Space become a warfare environment, as Space-based systems become increasingly important to international commerce as well as military operations.

### **Weapons of Mass Destruction:**

- Despite ongoing non-proliferation efforts, the spread of weapons of mass destruction will undoubtedly continue.

To try to prevent the proliferation of weapons of mass destruction, governments will have to focus on developing nonproliferation tools, including: domestic and international security mechanisms for storage and transfers; multilateral export controls, arms control verification; intelligence surveillance and tracking operations and military interdiction. The continuation of the nuclear Non-Proliferation Treaty in one form or another may prove particularly critical, as the treaty’s system of inspection and verification can provide transparency into whether states are working to develop a nuclear weapons program or whether mutual restraint is being maintained. (Iran, tighter inspection!)

### Terrorism:

- It is probable that the next quarter-century will witness more catastrophic terrorist attacks. While state-sponsored terrorism may decrease, terrorists will become better-networked and more able to exploit new technologies to target population centers and critical infrastructure.

Future terrorists will probably be even less hierarchically organized, and yet better networked, than they are today. Although their diffuse nature will make terrorists more anonymous, their ability to coordinate mass effects on a global basis will increase.

### Cyber Wars:

- Modern societies are increasingly vulnerable to weapons of mass disruption. Although cyber-war and cyber-terrorism are still in their infancy, more sophisticated attacks are likely.

Information technologies and systems are central characteristics of globalization and have become increasingly important to the functioning of many critical civilian systems - including energy, communications, transportation, electricity, water and banking. The problem is that information technologies and systems are now vulnerable to cyber attacks and disruption.

### Infectious Diseases:

- U.S. intelligence estimates project only limited successes over the coming 20 years against the overall infectious disease threat, with virulent diseases, led by HIV/AIDS, malaria and tuberculosis, continuing to take a significant toll.

Infectious diseases are increasingly likely to spread globally and quickly, because of more drug resistant microbes, the lag in development of new antibodies, poor patterns of land and water use, shifts in climate and the rise of mega-cities with severe health care deficiencies. Significantly, the speed with which people travel can exceed the incubation period of many infectious diseases, which means that infected persons may move between countries or regions before they manifest any recognizable symptoms.

### Failed States and Internal Conflict:

- Violence within states could reach unprecedented levels, spawning refugee flows and humanitarian emergencies.
- Failed states will continue to pose a threat to wider regional stability and are likely to be exploited as operational bases or safe havens by terrorist organizations.

Regions where popular discontent is high due to economic stagnation, political instability and cultural alienation are likely to foster more violent political, ethnic, ideological and religious extremism. The inability of some countries to meet the basic service needs of their population could encourage non-state actors, including criminal organizations, to attempt to fill the void.

Now let me turn to a regional analysis.

### United States:

- The U.S. will retain its economic and military superiority, but will find it harder to capitalize on its economic prowess to advance its foreign policy agenda and to build coalitions.
- Defense of national and allied borders will continue to be a central task of military power, but the United States will have to adapt to face asymmetric threats.

Persistent regional frictions and high resource stakes - - oil and water - - together with the limited capacity for self-defense of key allies suggest that the defense of borders will continue to be a central task of U.S. air and space power. New asymmetric threats, however, will force the United States to adapt to new national and war-fighting strategies.

Although the U.S. military will face challenges, no peer competitors are likely to emerge for the next several decades.

The United States will therefore be unparalleled in technological, military and diplomatic influence. Allies and adversaries will factor continued U.S. military pre-eminence into their calculations of national security interests and ambitions, but the United States will struggle to leverage its economic power to further its foreign policy agenda. Many actors will seek to challenge and check U.S. power, and the United States will face greater difficulties in building coalitions.

### Europe:

- The EU will be a leader in scientific and technological innovation, capable of deploying sophisticated weaponry, but is unlikely to emerge as a superpower.

- The EU is likely to develop as a multi-speed entity with different groupings of countries leading the way on different issues.
- Russia will face even more challenges in trying to play a leading global role with dramatically reduced resources and simmering domestic tensions.
- Russia's internal development will be a key factor in shaping the geopolitical future of Europe.

Greater Europe, which includes the countries of Western Europe, Eastern and Central Europe and Russia, will have a population of approximately 760 million by 2025. There is a wide range of possible futures for Greater Europe, but even the most positive predicts that Russia will not be robustly democratic and prosperous, and that a unified European Union (EU) will present challenges as well as opportunities, particularly once the EU enlarges to include less-developed countries in Eastern and Central Europe.

The EU will remain an important center of international trade and finance, a leader in scientific and technological innovation, and a significant actor in global politics. Western Europe will become a more cohesive political and economic force.

Since the Soviet Union's collapse, residual threats include nuclear safety, minority issues, water pollution, narcotics trade, international organized crime, corruption and fraud in state administrations and general disparities of living standards. In the coming decades, Russia will face even more challenges as it seeks to play a global role with dramatically reduced human and other resources and simmering domestic tensions. Russia still too dependent on oil income.

### East Asia:

- The Asia-Pacific region will emerge as the world's largest and perhaps most important concentration of economic power in the next century.
- The region will remain turbulent, beset by internal conflicts, political transitions and instability flowing from the introduction of new military technologies and territorial disputes.
- The Asian geopolitical environment is likely to be determined by the increasing economic and political power of China, the economic transformation of Japan, change and growth in India and tensions around Taiwan and on the Korean peninsula.

East Asia, defined as Northeast Asia, Southeast Asia, Australasia, and their oceanic neighbors, comprises more than a third of the world's population. Despite recent financial turmoil, the Asia Pacific region's history of high growth rates continues to suggest it will emerge as the world's largest and perhaps most important concentration of economic power in the next century.

While some see China as posing the greatest threat to world order in the future, many observers also concur that the perception of China's rise as a global power is exaggerated and that China is more interested in a role as a regional leader in East Asia and the Pacific. The main threats to China's security will probably be internal rather than external. To secure borders in the new millennium, China will need to enhance not only its military capabilities, but also to focus on its financial, information and ecological security. China must continue developing both its "hardware" - - per capita GNP, infrastructure, living standards and modernization - - and also its "software" - - democratic institutions, legal reform and the global awareness of the general population.

### Middle East:

- The Arab-Israeli struggle and developments in the Gulf will remain key determinants of the future in the region, but sources of conflict will diversify.
- Lasting peace is unlikely in the absence of an agreement over shared water use.

The Greater Middle East is the site of the world's largest supply of fossil fuels, a region where several ambitious powers actively seek regional hegemony and where weapons of mass destruction are being actively developed. The Greater Middle East is also the region where the United States and Britain are currently engaged in armed conflict (Afghanistan and Iraq).

### Africa:

- Familiar conflicts may persist or intensify over the next 25 years, as soaring population growth and the spread of HIV/AIDS further deteriorate the security situation.

For most of the countries in Sub-Saharan Africa, the last four decades since independence have been characterized by rampant instability, mostly despotic rule and unsurpassed corruption. The region has experienced frequent violent conflicts, including genocide of Africans by Africans. The familiar conflicts in the region may persist or intensify over the next 25 years.

### Latin America:

- Democratization in Latin America remains fragile, but the region continues to pose largely non-traditional security threats.

- Greater economic stability and a socially conscious, political class should help bolster the region's future.

Latin America has undergone profound change over the past 20 years and currently all 35 countries in the region (with the exception of Cuba) have democratically elected governments. However, democratization in Latin America is still fragile (except in Chile, Costa Rica and Uruguay) and violence and crime are pervasive. Latin America mostly poses non-traditional security threats, such as illegal immigration, drug trafficking and money-laundering.

### **Globalization:**

The geopolitical landscape of the world will be constantly changing with the tide of globalization. Globalization and interdependence will create more transnational problems that will require state and non-state actor cooperation. Such problems will include increasing border porosity, transnational crime, energy demand and its impact on global warming, lack of non-state actor transparency, and the concentration of population growth among the global poor.

The forces of globalization will continue to impact geopolitical developments, the economy, population movements, information and technology. While globalization will contribute to stability, its reach and benefits will not be universal.

### **The Global Economy:**

- The driving forces of the global economy will be the information technology revolution and increases in communication and computing capabilities.
- The defining characteristics of the global economy will be knowledge intensity, investment, changing competitiveness and industry composition, convergence of goods and services industries along with new manufacturing, low inflation, variable unemployment and rising inequality within and between nations.
- Economic growth is expected to slow after 2010, with the pace falling even more after 2025.
- The possibility of recurring recessions in Europe and Japan is highly likely, especially after 2025.
- East Asia and the Pacific will experience continued economic growth and improved corporate profitability.

Over the next decades, the economic world will transform itself into a private-dominated field. Most futures studies predict that while trade will continue between nation-states, the role of the state will decline as trade spreads to private investors and other third party actors.

The driving forces of the global economy will be the information technology revolution, including internet usage, new software, chip technology, support technology and digitization, national and international deregulation with the liberalization of trade, capital and internal markets, and increases in communication and computing capabilities. The defining characteristics of this economy will be knowledge intensity, investment, changing competitiveness and industry composition, convergence of goods and services industries along with new manufacturing, low inflation, variable unemployment, and rising inequality within and between nations.

In the coming decades, developing states will continue to lag economically and wealth will remain concentrated in westernized democracies. The developing world will still be cast in a shroud of underachievement. Rising debt levels, meanwhile, potentially as high as 200 percent, also pose a threat to the global economy because of their propensity to induce drastic change.

In terms of the official exchange rate, China stands as the 7<sup>th</sup> largest economy and the second largest in terms of purchasing power parity. As China moves to a market economy while trying to catch up to developed nations, it faces a number of challenges, including intra-party disputes, rural unrest, corruption, uneven regional development, a lagging pace of reform and blockades by other regional players. Despite these challenges, China shows significant signs of productivity and steady growth. China's GDP could double. Per capita income could double but remain under \$10,000. Military spending and capital will rise substantially.

### **The Impact of Demographic Change:**

- Population migration from rural to urban areas will become more drastic in the developing world and may threaten agrarian production and trade.
- In developed countries, aging populations will become a social and economic burden.
- Developed states are likely to experience an exhaustion of their workforce.

Despite a slowing growth rate, the global population will increase to 7.2 billion by 2015, possibly reaching 11.2 billion by 2050. Approximately 95 percent of population growth will be in the urban areas of developing countries, particularly in Asia.

### **Technology:**

Electronics and bioengineering high technology industries will become the primary drivers of the 21<sup>st</sup> century network global economy, along with the

increasingly unrestricted and rapid flow of information, values, goods & services and ideas. While advancements in information technology will have positive applications, criminals and disaffected states will also be able to capitalize on the ability rapidly to transmit information.

- The network global economy will be increasingly driven by the unrestricted and rapid flow of information, values, goods & services and ideas.
- In first-world countries, voice and data communications and bandwidth expansion will be characterized by seamless data, voice and video sharing, universal connectivity, application convergence through the Internet Protocol (IP), widespread wideband wireless and optical, multiwave lines.

## IT:

In the next 20 years, Information Technology (IT) will have a profound effect on health care, education, entertainment and supply-chain management. Telemedicine will influence health care services, linking both patients and health-care professionals with more choices. Educational services will offer lifetime learning and specialized training opportunities. Many improvements in IT over the next 15-20 years will be driven by the entertainment industry. Merging supply-chain management and IT applications will provide efficient production control services, making it easier to understand very complex systems.

## Computing Power:

Computing power is expected to continue to grow exponentially over the next 10-15 years. In first-world countries, voice and data communications and bandwidth expansion will be characterized by the new technology previously noted. Economic opportunities will arise in automatic voice recognition and in machine translation between natural languages, primarily English, Arabic, Japanese, Chinese and Spanish, although these technologies are unlikely to be perfected in the next 20 years.

## Nanotechnology:

Perhaps no scientific field will yield such advances in the future as nanotechnology. In the coming years, nanotechnology will evolve into one of the world's most sophisticated and useful instruments of advancement. Within the next 30 years, man will acquire the ability to manipulate and modify molecules. Machines and supercomputers will be sized to fit atop the head of a pin. This technology will also introduce a new facet of mechanical development: self-replication. Molecular, or nanomachines, will have the ability to replicate more

molecular machines that will have the same infinite capability. The initial research and development costs will likely be high, but could be offset by the incrementally lower costs of manufacturing a system able to replicate itself.

### Energy and Resource Management:

Resource management has been among the least-publicized problems in the world, but is perhaps one of the most critical areas of concern, with implications ranging from climate change to the prospect of armed conflict. The challenge of finding alternative energy sources, however, also presents some of the most promising opportunities of the 21<sup>st</sup> century.

### Energy Demand:

- It is estimated that the world's developing nations will increase their energy demand three-fold in the coming decades. China alone will nearly triple its energy demand within the next decade.

### Environmental Concerns:

- Growth in worldwide energy and manufacturing activity risks significantly elevating pollution rates in industrializing nations that are already heavily polluted.
- Most Asia-Pacific countries are already experiencing increasing air pollution and acid deposition problems.
- Air pollution is causing significant numbers of premature deaths and chronic bronchitis and other respiratory symptoms in many Southeast and South Asia metropolitan areas.
- Unless nations begin to shift to a low-carbon future by cutting emissions 60 percent or more, we will face critical changes in our environment.
- Global warming stands to displace potentially millions of people, particularly in developing countries.
- Technological innovation is required to combat the threat of global warming.

### Renewable Energy:

- Growing concerns for the environment and resource depletion will cause most developed nations to transfer the bulk of their energy to natural gas and to other renewable sources.
- Hydrogen will become a key source of energy as fuel cells become more efficient and capable.

- The U.S. stands to benefit greatly from investment in renewable energy sources. There is an expectation of a new look at nuclear energy.

### Water:

- Between 1990 and 1995, global water consumption rose six-fold, more than double the rate of population growth; consumption continues to increase.
- More than one-third of the world's population lives in countries experiencing moderate to high water stress.
- Competition for water in the Middle East is so intense that lasting peace in the region is unlikely in the absence of an agreement over shared water use.
- Over the next half-century, Sub-Saharan Africa will join the Middle East and North Africa as one of the regions most seriously affected by water scarcity.
- The Indus Water Treaty between India and Pakistan is a key security issue that is not receiving enough attention.

Demand for water is likely to become one of the most pressing resource issues of the 21<sup>st</sup> century. Between 1990 and 1995, global water consumption increased six-fold, more than double the rate of population growth, and it continues to grow rapidly as agricultural, industrial and domestic demand increases. Although water supplies may seem abundant, the problem lies in the unequal distribution of water within and between various actors. In some areas, water withdrawals are so high, relative to supply, that surface water supplies are literally shrinking and ground water reserves are being depleted faster than they can be replenished by precipitation. (Jordan-Israel eight years in the Middle East)

This background sets the stage for some additional conclusions. And here I want to tell you I share many of the thoughts and ideas of the recent National Intelligence Council Report - - "Mapping the Global Future".

### Conclusions:

China and India are likely to emerge as key global players. But don't count out Europe in the form of the EU, or even Russia or Brazil from that result as well. Japan will be under greater stress competing with China as we have seen in recent weeks. And all of this emphasizes certain policy prescriptions we need to look at in the days ahead.

- Maintaining U.S. leadership in world affairs based on our size, economic strength, military/security capability and political and social ideas and

ideals. The style and focus of our diplomacy will be even more critical than in the last two decades.

- ❖ Education in the U.S. is a bedrock factor which must be built upon and improved
- Globalization will stay with us. The U.S. needs to be a rule-setter in this area, but also to consult and work closely with others, in Asia in particular, who could also come to dominate this field.
- Economic growth is inevitable. But divisions between rich and poor will also grow. Programs to overcome, or at least manage this disparity will be critical. If not, democracy in new and fragile areas is at high risk; financial crises could become more pervasive.
- Technology spread and growth will be large. Connectivity will be used to challenge governments and institutions. Fundamental will be policies to assure democratic participation in Government and that economic benefits are equitably distributed.
- Asia will become the next center of gravity in the world. U.S. policies in the region, especially respecting China and India, will determine whether we have a world of contention and competition or of cooperation and consultation.
- Demography and aging are growing factors to be dealt with for stability and to ensure success. Welfare systems, migratory patterns and policies and indeed the future of Europe and eventually the U.S. will depend on getting approaches to these issues correctly. Ignoring the problems is a recipe for failure.
- Energy too is a taxing question. Many assure supplies in the ground are adequate. But access, its use for leverage, inequalities, and the need for more efficiency all point to the need for new policy equations to face the energy future with confidence.
- Non-state actors, from terrorists to NGO's, will play an increasing role in the next quarter century and beyond. Governments will have to consider new ways of organizing and acting to oppose those which are a danger and work with those that are supportive.
- Terrorists and WMD will pose serious challenges. Religion, "Jihadism" and fundamentalism and non-proliferation are seriously pressing inter-related issues. International cooperation, tighter efforts against proliferation and better intelligence capabilities are vital for dealing with these potentially combined threats.
- International instability, failed and failing states and internal, intra-state conflict will also require our, and our allies' and friends', attention in the coming decades. Stronger international institutions, especially in dealing with Africa, and parts of Latin America, Central Asia and the Middle East are serious requirements to develop the policies and the actions to face these difficulties. Local resolve and good governance and support for the

- growth of democracy and sustainable economic growth are seriously needed to protect our own long-term interests in these areas.
- Happily, the crystal ball seems to show consensus that the chances for great power conflict have declined. Managing crises and competition will help to ensure that new-found stability since the end of the Cold War.
  - And in the end, we at home can see our economic, technological and military strength remaining pre-eminent. But increasingly, this will be true only if we:
    1. Understand the changing new environment we face;
    2. Lead others to success for win-win strategies to deal with it;
    3. Combine our hard and soft power into clear policies and actions to make it a reality;
    4. And incorporate and enlist the power and strength of others in a multilateral framework to bring about the changes required.

Thank you.

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