

defining economic

DEVELOPMENT LEADERSHIP FOR THE 21ST CENTURY GLOBAL ECONOMY

Edited by Ioanna T. Morfessis, Ph.D.

Perhaps more than any other factor, globalization will be the single most seminal dynamic of the 21st century economy. While only time will prove or disprove this assertion, we do know that globalization and the rapid advancement of technologies are irrevocably changing how individuals, enterprises, communities, and nations do business. New opportunities and challenges have been created by the growth of capitalism, opening of new markets, and powerful new technologies that now enable governments and firms to transact business across national boundaries on a scale that is unprecedented. As trade and foreign direct investment between companies, countries, and continents continue to grow, transglobal corporations and small businesses alike are changing how they assess and develop opportunities; grow market share and allocate resources; and where they locate, create, and grow jobs.

The mandate for economic development in today's world is clear: new forms of leadership and new models and programs are essential to succeed in this competitive environment. Local, regional, state, and national economic development agencies will compete even more vigorously worldwide to offer the infrastructure, resources, and quality-of-life that employers need to support their employees and the markets they serve.

Communities once considered the best business locations for people and business now are methodically and consistently evaluated against markets in

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continents around the world. No longer can any community consider itself insular in the globalized world of commerce and trade. Consequently, the economic development executive has been compelled to abandon many practices of the 20th century and instead adopt new approaches to create, strengthen, and sustain global competitive advantage for the economy he or she represents.

With knowledge now the fundamental basis of competitive advantage, economic development organizations are looking for ways to grow and attract concentrations of innovative, knowledge-based business activity. The economic and quality of life attributes and amenities that drive where talented and high-skilled young knowledge workers choose to live have become paramount in the evaluation and determination of the best places for business, entrepreneurs, innovation, R&D, and virtually every type of capitalistic enterprise. Human capital development strategies, including the quality of education from early childhood through post-graduate studies, are essential to ensuring the social and economic health and competitiveness of communities. In addition to high quality earnings and employment opportunities, the quality and expan-

Ioanna T. Morfessis, Ph.D., is president of IO. INC, Phoenix, AZ, which works with companies, communities, and non-profits in the areas of strategic planning and growth. Formerly, she was the founding president and CEO of the Greater Baltimore Alliance and the Greater Phoenix Economic Council.

AN ANTHOLOGY OF NEW LEADERSHIP PERSPECTIVES IN ARIZONA

Historically, communities looked to the chief elected official and top economic development executive for policy and strategic direction to create competitive advantage and economic success. Today, however, the once exclusive stage of the economic development executive is shared with new players in lead economic development roles. They influence policies and opinions that profoundly impact the economic development of our world. They constitute the new generation of economic development leadership – a hybrid of private and public interests, operating principally in the philanthropic realm, all for the greater good. Who are these leaders? How can economic developers optimize and capitalize on their talents and resources?

siveness of a community's amenity economy – including the arts, cultural, recreational, and natural environments – hold equal importance in the economic development landscape. The fusion of economic development interests with those of education, philanthropy, business, arts and culture, and other major institutions of capitalistic societies has become mission critical to economic vitality and competitiveness.

Finding that to succeed in this dynamic and ever-more complex environment, today's economic development executive is sharing the stage with new actors. Throughout the world, and at all levels of the economy, the economic development executive is but one of many prominent players engaged in the economic development process. Among these new leaders are the CEOs of foundations, colleges and universities, business and professional organizations, and other institutions. These leaders have staked their legitimate and high profile claims in the economic development arena, fusing their interests with those traditionally the exclusive domain of economic development.

As a result, new strategic alliances, collaborations, and partnerships have proliferated throughout the world – all focused on creating competitive advantage and increasing wealth generating employment.

The State of Arizona provides many promising examples of these new forms of leadership and alliances. Having the distinct advantage of a historically growth-driven economy, Arizona traditionally has been a state of economic development innovation. According to the U.S. Bureau of Census, Arizona ranked first among all states in population growth in 2005. The state added more than 213,000 new people, bringing its total resident base to approximately 5.8 million individuals. Job growth rates were equally robust; the U.S. Bureau of Labor Statistics reports that in 2006, Arizona's job growth rate was 4.5 percent, adding 116,000 new jobs to its at-place employment of 2.75 million. Even with this growth, new leaders have come to the forefront of policy making and change, sharing a widely held recognition that growth in itself is insufficient to drive Arizona to a status of global economic competitiveness.

Who are these new leaders? What role do they play on the economic development stage? What forms of alliances and partnerships have they created to create competitive advantage in the 21st century economy? In this anthology of leadership perspectives, four highly dis-

tinguished leaders provide their unique and instructive viewpoints and case studies of the roles that their respective organizations have assumed in advancing Arizona's economic standing and competitiveness in the globalized world. In each case, these individuals recognize that economic development is far more expansive than the models of the past. Based on this understanding, they have graciously agreed to share their thoughts with the economic development profession. Following are essays from four of Arizona's most influential leaders: Donald Brandt, president of Arizona Public Service Company; Dr. Judy Mohraz, president and CEO of The Virginia G. Piper Charitable Trust; Donald V. Budinger, chair of Science Foundation of Arizona and chairman and founding director of Rodel Foundations; and Dr. Jeffrey M. Trent, president and scientific director of the TGen, Translational Genomics Research Institute.

Arizona – Ensuring Bigger Means Better

By Donald Brandt
President, Arizona Public Service

Donald Brandt is president and chief financial officer, Arizona Public Service Company and executive vice president and chief financial officer, Pinnacle West Capital Corporation. He is responsible for finance, treasury, accounting, tax, investor relations, risk management and insurance, supply chain management, financial planning, as well as power marketing and trading.

Some people might consider the loud, repetitive pounding of giant steel girders into the ground a few hundred feet outside their office an unwelcome distraction – especially as they attempt to write an insightful think-piece about Arizona's future.

Fortunately, I find the insistent pounding of steel, the whirr of giant cranes, and the chatter of construction workers somewhat melodic. We listen to this tune often here in Arizona, and the lyrics to this song tell a tale about development, opportunity, and growth.



Arizona continues to grow at a pace three times the national average.



Bio-tech institute T-Gen, located in downtown Phoenix, could lure other bio-tech firms to Arizona.

Growth fuels the economic engines here. For our state, growth represents both a significant reality and a tremendous asset. Arizona claims the title of the fastest growing state in the country and adds new residents at a rate three times the national average. Each day, nearly 600 new residents call Arizona home.

While population expansion has been brisk throughout the state, the nucleus of this growth centers on the greater Phoenix area, where my company, Arizona Public Service (APS), has its corporate headquarters. In the last 20 years, the Phoenix area has seen its population double, from 1.8 million to 3.6 million. Phoenix claims the position of the fifth largest city in the United States.

However, while growth represents a tremendous economic asset for Arizona, it also poses our greatest challenge. We must fashion not merely a bigger, but a better future. Building a strong and sustainable future will require our collective attention to the following factors:

Economic Diversity – Arizona's economy must become more diverse. As much as 20 percent of new job creation in Arizona over the last five years has occurred in the construction industry. And, this does not include growth-related businesses such as lumber supply, concrete, landscaping, home furnishings, mortgage companies, etc. Without a

doubt, this growth has paid dividends for the state. However, in light of the cyclical-ity of the construction industry, we must develop more long-term, high-paying jobs as we find in the aerospace, bio-tech, and high-tech industries. These sectors have begun to blossom as a result of the state's focus and support for science and technology at our local universities; T-Gen (the Translational Genomics Research Institute), a large biomedical research institute; and the Arizona Science Foundation. These efforts deserve and command our continued support to ensure their success.

Education – Simply stated, Arizona's educational system needs significant improvement. The current numbers paint an underwhelming picture. At the beginning of this year, the annual "Quality Counts" report from *Education Week* ranked Arizona 43rd in academic achievement and 49th for "students' chance for success." Even

if some of these national surveys overstate Arizona's educational shortcomings, they point to areas requiring improvement. Moreover, we will have to work hard to change the negative perceptions such studies have created in the public mind.

Fortunately, I have reasons for optimism.

In her recent inaugural address, Arizona's Governor Napolitano acknowledged the need for improvements in the state's education system and made it a top priority of her administration. The institution of all-day kindergarten throughout the state, new initiatives to reduce the drop-out rate, and increased funding for university research and development have contributed to a new wave of progress. Ideally, improvement must happen quickly given the nature of the competitive global economy. Only if Arizona achieves its

goal of ranking among the best educational systems in the country will we attract the high-paying businesses and high achieving employees we require for sustainable economic growth. These improvements remain essential to retaining and attracting more of those businesses by providing a key success factor: a well-educated, future workforce. Making this happen will require the attention of many stakeholders, including state and city governments, teachers and parents...and the business community.



APS will invest nearly \$15 billion over the next decade to build the electric infrastructure to power Arizona's future.

Infrastructure and Planning – APS ranks as Arizona's largest and longest serving electric utility. We understand growth. We understand the need to plan and put infrastructure in place to manage this growth. And we understand the high price tag that accompanies this infrastructure. Over the next ten years, APS will invest nearly \$15 billion in power plants, substations, and other vital equipment necessary to ensure we continue to meet our customer growth with safe, reliable power.

This exemplifies one company's challenge in one industry. However, the necessity for planning for growth confronts Arizona and all its industries, not just APS. We must apply a long range outlook in areas such as transportation, telecommunications, and fuel pipelines. And, while I do not focus on it in this article, it is imperative that these efforts, as a central part of any decision making, carefully address environmental issues such as land preservation, water and air quality.

Growing Better – As Arizona grows in quantity, it must also grow in quality. Phoenix's downtown brims with tremendous potential, and we have gained some momentum in its development. The pounding steel I mentioned earlier emanates from the construction of a new 1,000-room downtown hotel and new buildings for a greatly expanded Arizona State University downtown campus. Other recent Phoenix victories include a \$600 million expansion/renovation of the Phoenix Convention Center, a new light-rail system to relieve some of our traffic congestion, and luring T-Gen.

Other Arizona cities such as Glendale, Scottsdale, Tempe, Chandler, and Mesa have displayed equal promise in their development. Each offers an array of new unique shopping, dining, and entertainment attractions – as well as new schools and parks – for their rapidly expanding populations. These steps represent the beginning of an effort to bring more people, more attractions, more appeal and, ultimately, more businesses to the Valley of the Sun.

While further developing the Phoenix area strengthens our state as a whole, we must also work to enhance the attraction of the cities and towns outside the metro areas of Phoenix and Tucson. For smaller Arizona locales like Cottonwood, Gila Bend, and Winslow, one new medium-sized com-

pany can spur further development that may make the difference between a bustling economy and one that struggles. The task of luring businesses falls not only to the local chambers of commerce, but also on the surrounding cities and towns, as well as the state's medium and large businesses, whose interests ultimately lie in building a strong and sustainable state economy.

Teamwork and Leadership – A healthy Arizona clearly benefits all businesses in the state. Yet, too often, amid the battle for customer loyalty and the most competitive prices, companies can lose sight of big picture issues. Community involvement, economic development, support for the arts and cultural venues, and environmental stewardship comprise just a few examples of the areas in which all Arizona businesses should seek involvement.

An example of this big picture thinking took place shortly after the national tragedy of September 11, 2001. With Arizona's economy reeling, a summit of business community and political leaders gathered to address issues and concerns facing the state. Dubbed the Arizona Business Coalition, the group set forth the initial priorities which ultimately helped jump-start our economy and build for the future. Since then, the Coalition's outlook has broadened, but its holistic

focus on creating a better Arizona remains firmly in place.

I take pride in the fact that my company, under the leadership of Chairman Bill Post, initiated the Business Coalition and continues to support its efforts, as well as those of other economic councils and chambers of commerce. More examples of such teamwork can and should happen if we hope to take full advantage of the opportunities inherent in Arizona's unique growth. Ensuring the success of an entire state demands the concerted efforts of many and requires a lot of heavy lifting. We must address the issues facing Arizona with the perspectives and ideas of a host of different parties. Established leaders must welcome and encourage the new. Acting together, all those people and entities with a stake in Arizona's future must work the long hours and withstand the inevitable criticisms that accompany change.

We can build and sustain a bigger and better Arizona: the kind of place we can proudly call home.

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Foundations: Catalysts for Change in a Flat World

By Judy Jolley Mohraz, Ph.D.
President and CEO
The Virginia G. Piper Trust

Judy Jolley Mohraz is the president and CEO of The Virginia G. Piper Charitable Trust, a private independent foundation located in Scottsdale, Arizona. Focused on the fields of health, education, children, arts and culture, older adults, and religious organizations, the Trust invested over \$26 million in the Greater Phoenix community in 2006. Prior to joining the Trust as its first president in 2000, she served as president of Goucher College in Baltimore.

Tom Friedman's provocative analysis of new global technological and economic forces in "The World Is Flat" reminds us of the warp speed of change in international economic development. While the philanthropic sector shifts at a more deliberate pace, foundations understand that heightened economic competitiveness, global rather than national marketplaces, and new models of business are relevant to their work as well. Recognition that foundations have a key role to play as catalysts for change in a "flat world" is one of the hallmarks of 21st century philanthropy.

Organizations such as the Bill & Melinda Gates Foundation reach out globally with venture capital and audacious plans to transform health in Third World countries. Other foundations push the boundaries of genomic research that will translate into new drugs and health care delivery systems that are international, not national, in economic impact. Smaller foundations working in the local sphere seek to reinvigorate communities, lure new industries, and retool workforces for 21st century skills.

A fable circulates in philanthropic circles that explains why foundations now sit at the table for economic development discussions, whether local, national, or international. The fable is as follows: Villagers witnessed a horrible sight one day: babies were bobbing in the river, surging past in the pulsating current of the river. Villagers rushed to retrieve and save as many babies as possible. But a few in the community decided to go upstream to determine why the babies were being thrown in the water in the first place. Their task was to stop the destruction at its source. While some foundations embrace the role of retrieving the babies – a laudable effort that follows the long standing and

revered tradition of compassionate charity, more foundations are moving upstream to address issues at their root causes and work toward systemic change.

It is this belief that the issues that foundations seek to address – health, education, the welfare of the most vulnerable – demand upstream work in the realm of economic development that has prompted foundations to move into areas previously the sole domain of economic development councils.

Today, foundations commission bioscience roadmaps to chart a state's strategies in a highly competitive field, forge public-private partnerships to build research institutes, create funds to foster scientific incubators, and attract precious coveted venture capitalists. The international contest to lure knowledge workers and research stars drives founda-

tions to fund initiatives as diverse as support for edgy mixed use urban revitalization or stratospheric sums to recruit star scientists in fields such as personalized medicine and technology.

In most cases, these efforts are collaborative, often involving several foundations, state and local governments, higher education, and economic development agencies. The foundations are not simply



Translational medicine "from bench to bedside" has forged strategic public-private partnerships in Arizona.



Vibrant regional arts and culture organizations contribute to a thriving economy in Greater Phoenix.

the funders. Often they are the catalysts, the conveners, and the knowledge brokers. For many foundations, these are new roles involving risk, new partners, and new ways of approaching age-old problems of poverty, ignorance, and suffering.

At The Virginia G. Piper Charitable Trust, a foundation focusing exclusively on Maricopa County, the theme of economic development runs through



New research about early brain development shapes programs to help children get ready to learn even in Neonatal Intensive Care Units.

As foundations forge relationships with economic developers, venture capitalists, and high tech whiz kids, they find themselves echoing the lessons businesses are learning in this period of tectonic economic shift: Collaboration, agility, and working across fields rather than in silos are essential tools for progress in the flat world of the 21st century.

major funding initiatives. Here are a few examples: Last year the Trust committed \$50 million over the next five years to recruit ten of the most distinguished scientists and clinicians to the Greater Phoenix region in the field of personalized medicine. This investment in human capital focuses recruitment efforts in cancer therapeutics and neuroscience, two bioscience strengths identified in Arizona's bioscience roadmap, a strategic plan funded by the Flinn Foundation. The Trust, along with other foundations, recognizes that if Arizona's economy is to thrive in future decades, it must become competitive in fields such as bioscience.

Another Piper Trust investment in cutting edge medical research that has the potential to translate research from the bench to the bedside is a \$4.5 million grant to a local hospital research unit to increase clinical trials for new cancer drugs and build alliances in the bioscience industry. This grant has clear economic development implications that are coupled with goals to cure patients and extend life.

A third example is a \$6 million collaboration between Piper and the Flinn Foundation to fund a regional arts organization to foster locally a vibrant creative culture that will attract knowledge workers eager to live in a community recognized for its cultural vitality. It is not surprising that the new organization, Maricopa Partnership for Arts and Culture (MPAC), has partnered with the Greater Phoenix Economic Council on joint reports and initiatives.

These are only a few funding initiatives that have brought Piper staff shoulder to shoulder with economic development experts and public sector leaders in shaping the future of the region.

In adapting to these new roles, foundations are challenging themselves to act in ways more akin to the for-profit sector: They want to measure effectiveness and impact. They speak of leveraging investments and ROIs. And such metrics are appropriate for a sector that now represents amassed wealth unimagined even a few decades ago. While the Bill & Melinda Gates Foundation, with \$32 billion in assets and an additional \$30 billion coming from Warren Buffett, is the most visible symbol of the new philanthropic power, foundations with hundreds of millions and even billions of dollars in assets are springing up across the country in record numbers. As one headline recently proclaimed, "Giving back is a 'megatrend' in the world today."

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The New Public/Private Partnership: How the Economic Model in the 21st Century Has Changed the Paradigm of the Public/Private Partnership

**By Donald V. Budinger
Chair, Science Foundation Arizona, and
Chairman and Founding Director, Rodel
Foundations**

Donald V. Budinger is a founder and the former president of Rodel, Inc. – the world's largest manufacturer of high precision surface finishing chemicals used in the manufacture of computer chips, silicon wafers, rigid memory discs, and specialty optics. When Rodel was sold in 1999, a significant portion of the proceeds was contributed to create The Rodel Foundations. The purpose of the Rodel Foundations is to improve the pre-kindergarten through 12th grade public education systems in Delaware and Arizona so they will be widely recognized as two of the best in the nation.

In the last half of the 20th century, America was perceived as the world's technological leader. We landed on the moon, helped map the human genome, and perfected the electronic brain that

drives everything from computers and satellites to cars and refrigerators. Public/private partnerships were created to leverage the resources of local economic development efforts. Back then, the emphasis was on generating immediate returns, such as attracting new factories or call centers.

Today, the qualities that form knowledge-based industries and drive the world's economy are much more ethereal. Knowledge has no physical boundaries. There is no easy way to generate returns – in terms of job creation – on a quarterly basis. There is not even an accurate way to predict the next great technology capable of creating an entirely new economic segment. Yet for the most part, we still cling to the foundations and partnership structures that built America's 20th century economy. In the meantime, other nations have embraced change and successfully made the "Great Leap Forward":

- Six of the world's 25 most competitive information technologies are based in the U.S., while 14 are based in Asia.
- The U.S. ranks 8th in the availability of scientists and engineers. India ranks 3rd.
- The U.S. ranks 37th in quality of math and science education, behind nations such as Israel, Scotland, and Korea.

Over the past two decades, developing countries such as China, India, South Korea, and others have instituted integrated programs to "catch up" with U.S. technology. In terms of education, some have invested in science and math education, modern laboratories, and an aggressive faculty-recruiting campaign. Their commitment to excellence has paid off. The U.S. trade balance in high-tech manufactured goods shifted from positive \$54 billion in 1990 to negative \$50 billion in 2001.

With these changes in global market forces and the growing number of competitors, a wide technology gap between the U.S. and leading high-technology nations exists. The public/private partnerships that leveraged resources and made a significant difference in our economy in the last century cannot meet the demands of the new knowledge-based economy. These partnerships are slow and cumbersome; they fail to reach broad audiences; they lack the framework needed to build new partnerships in areas of great economic promise.

In Arizona, leaders in politics, business, philanthropy, and education are asking this question: "Can our state thrive and prosper in the 21st century economy using a 20th century model of economic development dependent on inherited assets, such as climate, inexpensive land, and precious and limited natural desert resources?" The answer is no. The



Photo credit: Courtesy of iGen

The Phoenix-based Translational Genomics Research Institute is among the Arizona-based research-performing institutions that received funding from Science Foundation Arizona's 2007 strategic investments.

Image courtesy of ASU's Biodesign Institute



Neal Woodbury, right, a researcher with Arizona State University's Biodesign Institute, received a 2007 Competitive Advantage Award from Science Foundation Arizona to perform research that focuses on nanoscale techniques and imaging to understand gene regulatory networks relevant to health and disease.

future will belong to regions of the world that learn how to leverage created assets that come from human intelligence, creativity, innovation, and speed.

To help grow these assets and close the technology gap, Science Foundation Arizona (SFAz) was created. SFAz, a 501(c)(3) nonprofit, was designed to be a catalyst to strengthen science, engineering and medical research and technology infrastructure. SFAz focuses on areas of greatest strategic value with the goal of increasing Arizona's global competitiveness.

While Arizona claims much success in the areas of aerospace and semiconductor industries, and continues to invest in the fields of bio-industries, pharmaceuticals, nanotechnologies, telecommunications and optics, there are gaps in federal research funding, start-up seed funding, research grants, and technology transfer to grow science and technology sectors.

SFAz was formed in 2006 by three statewide CEO groups: Flagstaff 40, Greater Phoenix Leadership, and the Southern Arizona Leadership Council. Its operating budget of \$2.5 million for

the first five years is funded by these three private-sector groups. In addition, the Arizona governor and state legislature appropriated \$35 million for SFAz investments.

Heading up the organization as president and CEO is William C. Harris, Ph.D., whose experience includes serving as founding director general of Science Foundation Ireland (SFI). Harris is credited with SFI's success as a global bio/information and communications technology research model.

With a commitment to raise both public and private funds, SFAz intends to partner not only with business, government, and educational entities, but with philanthropic organizations and individuals in order to meet its objectives. For example, the mission of The Rodel Charitable Foundation of Arizona, one of SFAz's partners, is to improve Arizona's education system so it is widely recognized as one of the best in the country by 2020. One of Rodel's initiatives is the Math Achievement Club, an innovative program designed to change the perception of learning math and improve the mastery of math skills among school children. While such complementary goals can be found among many public and private organizations, most are working independently and have not capitalized on the benefits of leveraging their combined resources, talents, and leadership. This need for a diverse range of partners is represented by members of SFAz's board, which includes leaders in the fields of business, education, science, and philanthropy.

The goal of SFAz is to build a research infrastructure grounded in science and engineering that will enable Arizona to compete for the world's top talent and build the state's future economy. The cornerstone programs of SFAz include:

- **Graduate Research Fellowships**, grants designed to transform competent graduate programs into world-competitive programs by retaining the brightest Arizona students in math and science and also attracting new grad students to our state by providing them with an incentive to stay.
- **Small Business Catalytic Funding**, a program that provides seed funding to university-based spin-off companies in order to allow researchers the opportunity to secure much larger amounts of funding for technology commercialization. The end result is the formation of a high-tech company that creates jobs in Arizona.
- **Competitive Advantage Awards**, designed to provide funding to collaborative research teams that have a high potential of attracting large federal grants based on an extensive peer review process.
- **Strategic Research Groups**, partnerships between research institutions and private organizations that will enhance technology transfer.

- **K-12 Teacher Discovery**, a program of research internships for high school science and mathematics teachers that will update their knowledge of modern science and allow them to bring that knowledge back to the classroom.
- **K-12 Student Discovery**, designed to broaden the participation of K-12 students – particularly those from rural and under-served neighborhoods – in scientific discovery activities.
- **Strategic Initiatives**, recognizing that today's research work could generate a solution or cure for tomorrow, these grants allow SFAz to respond quickly to ideas that may not fall into one of the above programs but hold great promise for Arizonans.

In order for SFAz to reach its ambitious goal, we need to communicate the benefits of this endeavor and make virtually everyone in our society a partner. We will need to earn the confidence of everyone from CEOs and educators to legislators, parents, and children. This can only be accomplished by an interconnecting network of public/private partners who are willing to accept change and make the strategic investments that will deliver a promising future for Arizona.

Scientific Collaboration, Education, and Research as a Model for Economic Development in Arizona

By Jeffrey M. Trent, Ph.D.
President and Chief Scientific Director, TGen
(Translational Genomics Research Institute)

Jeffrey M. Trent, Ph.D. is president and scientific director of the Translational Genomics Research Institute or TGen. TGen's mission is to make and translate genomic discoveries into advances in human health. Prior to forming TGen, he served for ten years at the world's largest biomedical research institute – the National Institutes of Health in Bethesda, Maryland. There, he founded and directed the laboratory division of the federal agency in charge of coordinating and finalizing the Human Genome Project.

The role of the U.S. in the global scientific market has changed. In today's reality, the U.S. as a leader in science and technology is no longer a given. In the new economy, new paradigms for accelerating and translating discoveries are necessary in order to maintain our edge and improve the lives of American citizens. Arizona decided to tap into the country's existing strengths in life sciences and marry these with new opportunities resulting from the mapping of the human genome and genomic technologies.

One such paradigm-changing organization is the Translational Genomics Research Institute, or TGen (www.tgen.org). TGen was born with the simple mission of quickly translating its discoveries into new tests and treatments with the added hope of



The open and flexible laboratory environment meets the needs of TGen's diverse research programs while fostering an atmosphere of scientific collaboration and innovation. TGen is focused on personalized medicine and plans to accomplish its goals through robust and disease-focused research programs and its state-of-the-art bioinformatics and computational biology facilities.

creating new businesses to fill the gaps in the translation continuum.

Biomedical science nationally has been an essential component of knowledge-driven economic development. However, the existing successful models of technology-based new company formation are localized to a few regional centers such as Boston, San Francisco, and San Diego. Arizona, by investment in TGen, is one of a new model of public-private partnerships being developed and executed – in this case engaging universities and institutions across the region, state, and country. This new model reflects the relevance of related activities and their need to be integrated, enhanced, and expanded upon. Organizations are rethinking current best practices and working to develop plans to leverage existing expertise, resources, and facilities to accelerate, translate, and drive economic development. In essence, Arizona is seeding collaborative interactions (like TGen) to possibly leapfrog forward as a “delivery state” focused not solely on technology development, but rather upon the introduction of new technologies into clinical practice.

Arizona is one of the few states with a “Bioscience Roadmap” (www.flinn.org) and an organized state-wide Bioscience Steering Committee comprised of leadership from a cross-section of industry, academia, and government singularly focused on implementation and outcomes. The state has also formed the Arizona Commission on Medical Education and Research (www.governor.state.az.us/ACMER/) to expand the capacity of the biomedical education and research programs of the Arizona university system. Arizona is investing in its biomedical sector; the state government, the cities, the counties, the universities, the business community, the philanthropic community and even the public through support of taxes and bond drives in this area.



TGen scientists use microarray technologies to compare genetic patterns between individuals with a disease and those without. TGen investigators hope that the results of such studies will help identify the gene or genes that when altered give rise to a particular disease.

Continued investment, collaborations that leverage existing expertise and resources, and strong leadership are helping Arizona to compete globally and are critical to our future sustainability nationally. One such initiative is the Science Foundation Arizona (www.sfaz.org). SFAz was initiated in the spring of 2006 by the three statewide CEO groups: Flagstaff 40, Greater Phoenix Leadership,

and Southern Arizona Leadership Council. This effort builds on the pioneering work done by the Flinn Foundation and its consultants, the Battelle Memorial Institute, in creating the Arizona Bioscience Roadmap. SFAz was created as a 501(c)(3) non profit and is a unique public-private partnership. CEO groups will fund the first five years of operating costs. Public and philanthropic funds will be used for investments that are intended to deepen Arizona's scientific, engineering, and medical infrastructure that will result in transforming

Arizona's economy into one that is even more innovative and enterprising.

The economic engine that can drive the bioscience industry in Arizona will likely be founded upon three pillars of success: collaboration, education, and research. In today's world, research is no longer conducted in a vacuum. The days of a single scientist working alone in the lab have long passed. Today's research enterprise is more aligned with the idea of a “laboratory without walls”. By leveraging existing resources with collaborators on a local, state, national, and international level, today's scientists includ-

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ing those at TGen, Arizona's universities, and Arizona's research institutes, are able to accomplish far more, far faster in this cooperative fashion.

One of the specific ways TGen is leveraging resources is through collaborating with our excellent state universities. Without a trained, well-educated workforce in these areas, there will be a direct, immediate, and detrimental impact on future research, employment opportunities, and economic growth in these highly competitive areas.

The "translational" focus of a collaborative model enhanced by the state of Arizona as a whole offers the potential to enhance Arizona's economic development by improving health care through the development of earlier diagnostics and smarter treatments. If a disease could be caught earlier, or if a treatment could be made more effective, then the quality of health care increases, as the cost decreases.

Finally, TGen, Arizona's universities, and other research programs, are key players in leveraging existing resources to build upon and advance research discoveries made in Arizona. In addition to simply making discoveries, collaboration between research institutions and clinical provider organizations allows for the unique opportunity for independent research institutions to transition laboratory-based research into clinical care.

Through collaborations; leveraging resources; and focusing on education, health, and research, TGen and Arizona are at the forefront of a new model for economic development and advancing science is emerging.

LESSONS IN LEADERSHIP

What lessons can be learned from these four leaders? Do the alliances they have created bear relevance for other regions, states, and nations? Can an economic development executive in the United Kingdom, Singapore, Mexico or South Africa benefit from these Arizona initiatives? How does the economic developer, regardless of continent, find value in the four models presented in this anthology?

Clearly, each nation, province or state, region and city has its own unique attributes, opportunities, and challenges. What works in one place is not necessarily a formula for success in another locale. However, there are some fundamental aspects of these Arizona models that can, in fact, transcend boundaries and place. Some thoughts for consideration:



The Translational Genomics Research Institute (TGen) is housed in a six-story, \$46 million dollar building that forms the cornerstone of the bioscience and medical research campus located in downtown Phoenix.

1. **Clear Sense of Purpose and Mission** – In each of these essays, it is apparent that a strong sense of purpose and mission has driven these leaders to fuse their interests with those of the economic development imperative. All of these leaders are concerned about the future of this nation, and their state, and understand that innovative approaches are needed to strengthen the U.S.'s ability to compete in the global economy. Recognizing that their respective organizations have a legitimate and important role to play, each has stepped up to provide leadership, backed up by their unwavering commitment and financial resources.


It is reasonable to surmise that business, government, and community leaders around the world are equally concerned for the well-being of their citizens, and the ability of their governments and businesses to compete effectively in the global economy. Having leaders who understand the relationship between these dynamics, and the fortitude to do something about it, is paramount to the economic development competitiveness of any community.

2. **Social Responsibility** – Arizona is fortunate to have many business and philanthropic leaders who have a strong sense of duty and responsibility to others. In each case, these Arizona leaders are using their unique talents, strengths, and positions of influence to advance the greater good of the state. Linking social responsibility to the economic development agenda has provided a platform for the advancement of these new and bold initiatives. In the case of Arizona Public Service Company, community stewardship and corporate social responsibility are integral dimensions of their business operating philosophy, and have been so for decades. The TGen model of social responsibility transcends place and focuses on the well-being of humanity. For the Virginia G. Piper Trust and Science Foundation of Arizona, the underlying premise of their organizations is to foster the health and vitality of Arizona's society and economic future. Economic development executives can and should continuously inform and educate the leadership of their communities, and link doing good with the health of the community and economy.
3. **Teamwork** – Collaboration and cooperation are by-words in contemporary economic development parlance. Yet nothing is more difficult than unifying a group of disparate individuals and organizations to constructively work

together toward the achievement of a common goal. What makes these models so instructive? In each instance, there was recognition of the unequivocal importance of teamwork to advance the economic development agenda. While economic development executives have long recognized that teamwork is essential to their success, all these models underscore the fundamental need for collaboration in advancing the competitiveness of a community.

4. **Foundations as Catalysts for Change** – In the last two decades, philanthropy in the United States, and increasingly in the rest of the world, has emerged as a dominant change agent in the areas of economic development, work force development, education, technology, entrepreneurship, and other sectors vital to the health and welfare of people and nations. In Arizona, philanthropy is deployed with a distinct edge – a penchant for trying the untried in addressing a broad range of opportunities and challenges. Dr. Mohraz of The Virginia G. Piper Trust uses her benevolence in a very deliberate manner to forge change and progress in many areas of the community – again, with the recognition of the important role she and her institution play in advancing the economic development competitiveness of the State of Arizona. As a “retired,” successful CEO, Mr. Budinger of the Science

Foundation of Arizona demonstrates the imperative for change, and leverages his resources to this end. In most communities around the world, there is at least one major benefactor who has the same passion and commitment to making his/her world a better place, and can uniquely set into motion the forces of change for the good.

5. **Economic Development Competitiveness as Fusion Agent** – Finally, and certainly not the least important is the crucial role that economic development competitiveness plays in spurring alliances between and among business, government, education, philanthropy, and society in general. While some may assume that it is relatively easy in Arizona to get people together for economic development and growth, the fact is that it is probably more difficult to do this in Arizona than most other states. Why? Because the inexorable growth of the state frequently obviates a sense of urgency to address Arizona's competitive position in the global economy. Without a true sense of crisis, it often is challenging to convince leaders, especially elected officials, that action is essential to the future of the state. Clearly, the race to remain competitive in the 21st century global economy is the primary unifying factor for all of these bold endeavors. 

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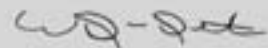
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