

GLOBAL **ARIZONA** 100

A New Century, A World Stage



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by

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The contributions and insights of the Morrison Institute team are acknowledged gratefully.



Dear Global Arizona 100 participant:

Back in the days when Arizona became a state, it was home to several hundred thousand people—a far cry from its current reality of more than 6.5 million. As we approach our second century of statehood in 2012, we face enormous challenges that may define our state's prospects for many years to come. While Arizona experienced a population boom that drove much of its growth, it's now clear that the state was too narrowly based on real estate, tourism and construction—and that we need to diversify.

Arizona is fortunate to possess gifted citizens who care deeply about their state and value can-do problem solving. Do we have the necessary policies, strategic leadership and shared vision needed to achieve a prosperous 21st century future? At a time of intensified global competition, a positive answer to this question has never been more critical.

Science Foundation Arizona reached out to Morrison Institute to help shape a program and a process that can help set an agenda for the state to become more competitive. This report and the website can assist this effort (visit www.globalarizona100.org). But it also will take the concrete input of smart and committed Arizonans.

In reviewing current trends, we can see that innovation, educational excellence, and dynamic entrepreneurship—backed by strategic leadership—are keys to enhancing the state's progress and prosperity. To achieve this requires high-performing companies, effective government, and a high-quality education system that can provide a prepared workforce and informed, engaged citizens.

We look forward to your active participation in the Global Arizona 100 conference. This is an opportunity for statewide leaders to put aside partisan differences, engage each other and design an action plan that can advance the Arizona we want. We are excited to begin building that future and the ongoing effort that will continue after December 1.

William C. Harris
President and CEO



GLOBAL ARIZONA 100

A New Century, A World Stage

The world is exploding with change. Despite the recent economic downturn, the pace of technological advance, market transformation and commercial innovation seems only to accelerate with each passing year. New economic giants like China and India loom over the international landscape; heavyweights like Brazil, Russia, Mexico and South Korea are building the infrastructure needed for a competitive economy. The time is long past when the United States—let alone its individual states—could find comfort in the advantages of size, wealth and economic dynamism. Instead, it must face a global future in which winners and losers will be determined largely by conscious decisions taken today. The winners will be those who look past the blare of daily headlines and invest carefully in education, innovation, entrepreneurship and excellence, thereby seizing the momentum of events and helping drive the future.

Arizona, on the eve of its 100th birthday, has a choice to make—as does every state and nation in the expanding global marketplace. That choice will determine the role it plays on the international stage.

The choice is not, “*Should Arizona go global?*”

The question now is: “*Will Arizona muddle forward with the crowd, or will it ready itself for a lengthy marathon?*”

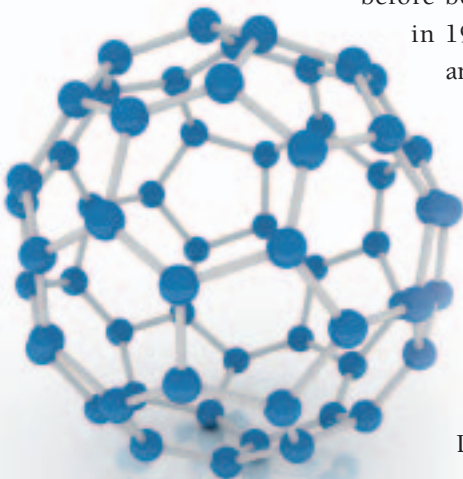
First, as for whether Arizona should go global, Arizona has in fact always had global connections—long before becoming the 48th state in 1912. Native Americans are known to have traveled and traded over huge distances. In the 16th century Arizona became New Spain, a settlement, military outpost and commercial station of a global empire based thousands of miles away. Later, as part of the new

Republic of Mexico, and still later as a U.S. territory, Arizona spent centuries roiled by the international currents of nationalism, religion, warfare and commerce. Today, Arizona shares a 370-mile international border, has a population nearly one-third Latino, welcomes visitors from everywhere and trades with nations around the world. The choice to go global has been made.

As for the second question, Arizona does not lack for capacity. It's the 14th most-populous state in the nation, with an economy ranked 17th among the 50 states and about the size of Thailand's or Finland's. With an enduring entrepreneurial spirit, a technology-related industry base of 162,000 jobs and a university research base of \$783 million, Arizona owns the essential ingredients to fuel a robust global outreach. It also has the motive: It simply must act. Economic development experts are virtually unanimous in urging states and nations to stake their place in the global marketplace or lose it. International capital flows surge daily; supply chains measure in thousands of miles; manufacturers, distributors and retailers confer across continents; goods in various stages of manufacture crisscross the globe; marketing decisions made in Singapore, or Auckland, or Glasgow rattle bottom lines in Phoenix and Tucson.

But if the need for global expansion is clear, Arizona's shortcomings are too. The state is among the hardest hit by the Great Recession and has been slow in recovering. It ranks among the nation's worst in bankruptcies, foreclosures, mortgage meltdowns and state budget deficits. It has long dwelled at or near the bottom among states in K-12 education funding. Its support for higher education falls well short of the need. The latest U.S. Census Bureau data find Arizona poorer than any state save Mississippi. Unfortunately, Arizona is not competing with Mississippi alone. Yet to date, Arizona has never mounted a truly focused, collaborative, supported campaign to take its place in the global market.

These are formidable obstacles for a state aspiring to perform on the world stage. They can only be overcome by concerted action by public and private leaders who are closely monitoring the global markets. These markets are suggesting—pointedly—that Arizonans can no longer sit back and wait for prosper-



ity to drive in from Illinois or California, no longer simply surf the historic boom-bust cycle tethered to housing prices and population flows. Instead, the imperatives of international commerce demand an enthusiastic embrace of globalization through a commitment to education, innovation and entrepreneurship.

Doing so will not guarantee Arizona a worthy place at the richly-laden global table. But not doing so guarantees the opposite.

There is a chance to begin.

Now.

To discuss, yes. To contemplate, certainly. But also to knock out a plan—and a plan to make it happen.

Global Arizona 100, on December 1, 2010—together with its follow-up activities—will offer Arizona’s leading policy and business leaders an opportunity to initiate and later execute a strategic plan for the state’s global future. This report seeks to provide participants with background information and a platform for engaging fully with the issues at the conference.

It offers narrative and data concerning demographics, economics, workforce and related topics. It includes questions to prompt thought and discussion. What it does not offer is a roadmap. That vital piece—a prioritized set of realistic action items—can only come from the participants in December’s conference, the men and women who truly hold Arizona’s global future in their hands.



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1

GLOBAL BRIGHT SPOT FOR ARIZONA

Musical Instrument Museum

A newly-opened portal into global culture, this \$250 million project has assembled 12,000 instruments from around the world to broaden Arizonans’ knowledge of global music and to lure visitors from other states and countries. The Musical Instrument Museum’s 190,000-square-foot building, located in Phoenix, currently displays some 3,000 instruments that one reporter wrote “are haunted by the animal world and its natural setting.” Its five major galleries are devoted to Africa and the Middle East, Asia and Oceania, Europe, Latin America and the Caribbean, and the United States and Canada. The museum also boasts a 299-seat concert hall for performances of traditional, contemporary, instrumental and vocal music from around the world.



THE SETTING: READY TO LAUNCH

A Dynamic Economy

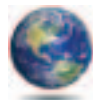
Old images fade slowly. Many people, residents and visitors alike, may still think of Arizona as a serene Southwestern outpost celebrated for its sun-swept plains, slow-paced living and rich selection of healthful pursuits. This view is not wrong. But it overlooks some of the most salient characteristics of a state that, at 100 years of age, is poised to leap fully onto the world stage. In fact, Arizona is a large, dynamic economy already heavily engaged in international transactions, from high-tech exports to global tourism. It possesses the 34th largest economy in the world, according to the International Monetary Fund. Within the United States, Arizona's economy ranks 17th, as measured by state gross domestic product (GDP). Among the nation's western and border states, it trails only the national behemoths California and Texas (Fig. 1).

FIGURE 1: GDP OF WESTERN AND BORDER STATES*

STATE (2008 RANK)	GDP 2008	PERCENT GROWTH (2005-2008)
UNITED STATES	\$11,523,637	5.6%
CALIFORNIA (1)	1,546,125	5.3%
TEXAS (3)	925,505	11.7%
ARIZONA (17)	210,235	7.2%
COLORADO (20)	203,024	7.8%
NEVADA (31)	103,192	6.1%
UTAH (33)	87,700	12.7%
NEW MEXICO (38)	61,385	6.5%

* Values in millions of 2000 dollars.

Source: U.S. Department of Commerce Bureau of Economic Analysis.



Global Takeaway

Arizona is well-positioned for the global contest. It is a sunny and beautiful place, and it also possesses an economy ranked among the top three dozen in the world and a GDP ranked 17th highest in the United States.

Speaking of states' gross domestic product, economists say the preferred industry mix for success in the international marketplace emphasizes knowledge-based pursuits that add value primarily through creativity, innovation, design and management rather than muscle power or simple, repetitive operations. It's also important for global competitors to cultivate "export" industries—manufacturing and financial services are examples—that send goods and services beyond their borders and thus bring in outside revenue.

The Industrial Mix

Figure 2 shows that the distribution among Arizona's industries reflects the mix of the United States as a whole, with a few noteworthy exceptions. At the national level, the information, finance and insurance, and professional and technical services sectors made up a notably greater share of output than they did in Arizona. This is not encouraging for the Grand Canyon State, as these sectors are among the most often prized—and rewarded—by the knowledge economy. Arizona's economy is more focused on construction, real estate and retail trade than the nation as a whole. There is a growing body of opinion that, to prosper in the world economy, Arizona must expand beyond its historic dependence on real estate and construction towards a more diverse economic portfolio.

2

GLOBAL BRIGHT SPOT FOR ARIZONA

Embry Riddle Aeronautical University

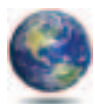
Nestled in the pines of northern Arizona, this campus of a global university teaches the science, practice and business of aviation and aerospace. Its Prescott campus' 1,700 students choose among 12 bachelor degrees and one master degree in such fields as aeronautical science, air traffic management, engineering and global security and intelligence studies. Embry Riddle exerts a worldwide reach.

FIGURE 2: SELECTED INDUSTRIES, ARIZONA AND THE NATION* (2008)

INDUSTRY	SHARE OF TOTAL	
	AZ GDP	U.S. GDP
PRIVATE INDUSTRIES	89.2%	89.5%
AGRICULTURE, FORESTRY, FISHING	0.8%	1.1%
MINING	1.2%	1.0%
UTILITIES	1.5%	1.0%
CONSTRUCTION	3.7%	2.9%
MANUFACTURING	13.2%	13.7%
WHOLESALE TRADE	5.6%	6.0%
RETAIL TRADE	9.7%	8.0%
TRANSPORTATION AND WAREHOUSING	2.9%	3.0%
INFORMATION	3.7%	6.2%
FINANCE AND INSURANCE	6.9%	8.0%
REAL ESTATE	15.4%	12.5%
PROFESSIONAL AND TECHNICAL SERVICES	6.7%	8.5%
MANAGEMENT	1.0%	1.6%
ADMINISTRATIVE AND WASTE SERVICES	4.1%	2.9%
EDUCATIONAL SERVICES	0.7%	0.8%
HEALTH CARE AND SOCIAL ASSISTANCE	7.3%	6.9%
ACCOMMODATION AND FOOD SERVICES	3.1%	2.6%
GOVERNMENT	10.9%	10.7%

* Values in millions of 2000 dollars.

Source: U.S. Department of Commerce Bureau of Economic Analysis.



Global Takeaway

Arizona lags the nation in the percentage of output devoted to the information and financial services industries, and is heavily reliant on retail trade, real estate and construction. These latter industries tend to cater to domestic rather than global markets.

International Exports

Another oft-cited hallmark of successful modern economies is specialization, which includes the deliberate development of niches for international transactions. This is frequently expressed by a “location quotient,” also called the industry specialization index. Looking at the location quotient in terms of employment suggests that Arizona’s industries that serve state residents exceed national averages, while those that reach beyond Arizona’s borders tend to lag the nation. The location quotient also confirms Arizona’s relatively high level of specialization in the construction and real estate industries. Agriculture and utilities also fare well. However, manufacturing, information and management do not.

Yet Arizona does show activity in international exports (Figure 3). In 2009, more than 13% of Arizona’s international exports

were civilian aircraft, engines and parts. Its second-largest export was processors and controllers for integrated circuits, although this declined sharply from 2008 to 2009. Arizona exports also benefit from its manufacturing in the military sector, both in weapons systems and other industrial parts. While this can be affected by the recession, too, it has generally remained more insulated as a result of national defense policy.

Indeed, Figure 3 reflects the volatility of the global market, especially during the past few years of international economic recession. Only five of Arizona’s top exports saw a gain between 2008 and 2009, including natural gas and military ordinance. Meanwhile, the biggest one-year losers were copper ores and molybdenum ores, the latter used in hardening steel.¹

FIGURE 3: ARIZONA’S TOP INTERNATIONAL EXPORTED GOODS*

EXPORTED GOODS & MATERIALS	2006	2009	SHARE OF AZ TOTAL EXPORT, 2009
Civilian Aircraft, Engines, and Parts	\$1,775	\$1,903	13.6%
Processors and Controllers, Electronic Integrated Circuits	0	897	6.4%
Electronic Integrated Circuits	0	508	3.6%
Bombs, Grenades, Torpedoes, Mines, Missiles, Other Ammunition and Projectiles	208	406	2.9%
Parts and Accessories of the Automatic Data Processing Machines	677	276	2.0%
Parts of Particle Accelerators, Audio Mixers, High Frequency Amplifiers	496	243	1.7%
Parts of Switches, Automatic Circuit Breakers, Relays or Connectors	254	213	1.5%
Electric Apparatus for Line Telephony, Telephone Sets, Parts	0	202	1.4%
Molybdenum Ores and Concentrates (Roasted)	519	189	1.3%
Other Apparatus for Making Connections to or in Electrical Circuits	205	169	1.2%
Copper Ores and Concentrates	129	166	1.2%
Natural Gas, Gaseous	0	163	1.2%
Plugs and Sockets, for a Voltage Not Exceeding 1,000v	134	141	1.0%
Other Articles of Plastics	182	138	1.0%
Oil-cake, Solid Residues Resulting from Extraction of Soybean Oil	81	134	1.0%
Other Automatic Regulating or Controlling Instruments and Apparatus	79	125	0.9%
Parts of Airplanes or Helicopters	190	112	0.8%

* In millions of 2009 dollars; not including services.

Source: U.S. Census Foreign Trade Database.

¹ Definition from Merriam-Webster Online Dictionary, <http://www.merriam-webster.com/dictionary/molybdenum>.



Global Takeaway

Arizona exports a wide variety of goods. However, over half of its top 25 exports are mechanical or electrical goods, suggesting a need for greater diversity for the global market.

Arizona's Top Markets

While Arizona sends goods all over the world, Mexico is our largest trading partner, followed by Canada and China. Arizona's exports to Mexico alone comprise nearly one-third of the state's total international exports; adding Canada raises that percentage to 45%. Three-fourths of the state's exports go to its top 10 markets. As the international economic recession worsened, all Arizona export activities declined from 2008 to 2009, except for those to Italy and Switzerland. Figure 4 lists Arizona's top 15 international export markets, not including services. Interestingly, although India's economic power is growing, it is not among Arizona's top 15 trading partners.

FIGURE 4: ARIZONA'S TOP 15 EXPORT MARKETS*

COUNTRY (SHARE OF ARIZONA'S TOTAL EXPORT ACTIVITY, 2009)	2006	2007	2008	2009
MEXICO (32.4%)	5,369	5,235	5,910	4,547
CANADA (12.6%)	1,847	2,193	2,319	1,762
CHINA (5.9%)	1,196	1,317	1,255	822
UNITED KINGDOM (4.3%)	803	959	1,013	597
GERMANY (4.2%)	755	1,011	964	587
JAPAN (3.8%)	686	716	732	526
SINGAPORE (3.7%)	1,243	1,140	1,008	524
FRANCE (3.5%)	496	512	608	494
MALAYSIA (2.4%)	808	539	382	340
THAILAND (2.2%)	444	493	469	307
BRAZIL (2.2%)	155	278	363	304
ITALY (1.7%)	113	153	215	239
NETHERLANDS (1.6%)	798	482	372	226
SWITZERLAND (1.6%)	159	75	106	219
SOUTH KOREA (1.5%)	199	446	262	210

* In millions of 2009 dollars; not including services.

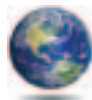
Source: U.S. Census Foreign Trade Database.

Global Stars Are Born

Success in global competition requires states and nations to constantly review international economic actors in order to pursue the best new opportunities. While opinions vary, many economists and businesspeople expect the so-called "BRIC countries"—Brazil, Russia, India and China—to be

the most dynamic emerging markets in the next 10 to 20 years. Several years ago, Goldman Sachs economists predicted that by 2050 the BRIC countries' economies could rival those of the six current largest world economies. Some economists argue that Mexico and South Korea should be added to the list—BRIMCK. Of the BRIMCK countries, Arizona has a strong, high-volume export relationship with Mexico, with China as the state's third most profitable export market. Arizona currently has a negligible export relationship with Russia.

In the wake of the BRIC theory, Goldman developed a second-tier list of emerging economies, called the Next Eleven, whose growth will also be strong, if less so than the BRIC. Its Next Eleven includes Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey and Vietnam. Of these, Arizona has a trading relationship with only three—Mexico, South Korea and the Philippines.



Global Takeaway

Arizona has a trading relationship with only 40% of the emerging world markets and is heavily dependent on trade with Mexico; however, in just one year, our exports to Mexico fell by nearly one-fourth.

3

GLOBAL BRIGHT SPOT FOR ARIZONA

Paragon Expands the Frontier

Tucson-based Paragon Space Development creates sophisticated life-support and thermal systems for the harshest conditions on Earth, in orbit and even faraway Mars. Founded in 1993 after its president Jane Poynter and CEO Taber McCallum emerged from Biosphere 2, Paragon has become an innovative design and engineering firm that works with many of the world's leading aerospace companies, NASA and the U.S. Navy. Its hardware has been employed in more than 70 spaceflight missions. Earlier this year NASA selected Paragon as one of its first "space pioneers," highlighting its emerging role in the commercialization of space. Among Paragon's forward-thinking projects that extend beyond our own globe: creating a system to grow a plant on the moon.

A successful global competitor needs to know how international trade affects jobs and incomes on the home front. Data tying Arizona jobs to international trade are limited—excluding, for example, jobs in the service industries and commodities production. However, these data do include non-manufacturing occupations (such as accountants) that provide support services.

FIGURE 5: ARIZONA JOBS DEPENDENT ON INTERNATIONAL MANUFACTURED EXPORTS (2008)

	TOTAL EMPLOYMENT RELATED TO MANUFACTURED EXPORTS	PERCENT OF ALL MANUFACTURING JOBS DEPENDENT ON EXPORTS	PERCENT OF ALL PRIVATE SECTOR JOBS DEPENDENT ON MANUFACTURING EXPORTS
UNITED STATES	6,814,000	22.1%	5.9%
CALIFORNIA	737,600	23.7%	5.8%
TEXAS	731,800	26.3%	8.2%
COLORADO	95,000	23.8%	4.8%
ARIZONA	85,100	22.6%	3.9%
UTAH	51,200	15.1%	4.9%
NEVADA	17,600	13.9%	1.6%
NEW MEXICO	16,000	13.3%	2.4%

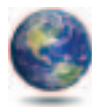
Source: U.S. Department of Commerce International Trade Administration.

At first glance (Figure 5), the nearly 4% of Arizona’s total private-sector employment linked to manufactured international exports is low compared to other western and border states. Only New Mexico and Nevada trail. Looking solely at jobs in the manufacturing sector, however, Arizona’s dependence on exports tracks the national norm at 22.6%. This points to an important role for manufacturing in promoting export success.

Investment from Abroad

Actors on the international stage not only exchange goods and services, they also exchange business start-ups and investment capital. These are not huge factors for the nation or for Arizona—at least not yet—but may be areas of potential growth. MOUSAs (“majority owned United States affiliates”) account for 4.8% of all private-sector jobs in the United States. Texas, California and Colorado reflect that percent, while Arizona comes in near the bottom of the western region with only 3.2% of private employees working for foreign companies. Considering MOUSA employment by industry, manufacturing takes the lead both nationally and regionally. For Arizona retail trade follows, with wholesale trade following that. The comparison states rely less heavily on the retail trade industry.

Another way to examine MOUSAs in the United States is to look at foreign direct investment (FDI), which is the gross value of property, plant and equipment. Comparing FDI to state GDP gives a sense of the importance MOUSAs play in our economy. Colorado’s estimated ratio exceeds that of all of the comparison states and U.S. Arizona is at the bottom of the western region—as is Arizona’s MOUSA employment. These data raise the question why Arizona has not been more successful here—and suggest an area of opportunity for Arizona to attract more foreign businesses and capital.



Global Takeaway

Foreign-owned firms’ investment in Arizona—both in people employed and dollars spent on businesses—is low. Colorado fares better than Arizona, in spite of a smaller total economy and employment.

4

GLOBAL BRIGHT SPOT FOR ARIZONA

Angel Focuses on Earth

World-renowned astronomer Roger P. Angel is a pioneering innovator in the use of optics for telescopes. Based at the University of Arizona in Tucson, Angel has set his sights on earth. His goal: The creation of a solar technology that can significantly cut the globe’s dependence on fossil fuels. Angel’s idea for generating electricity involves concentrating solar rays 1,000 times brighter than natural sunlight with the use of specially designed reflective mirrors. The concentrated energy then passes through a glass sphere onto photovoltaic cells that are twice as efficient as traditional ones. Angel and his newly formed firm, REhnu, is aiming to develop and commercialize a system that can match or better the cost of any other electricity method.

Tourism Remains Strong

A longtime global destination—14% of visitors are foreigners—Arizona is expected to continue to benefit from tourism dollars. Travel and tourism is one of the most important “export” industries in Arizona. Spending by visitors generates jobs and tax revenues for local communities. In recent years the GDP of the Arizona travel industry has exceeded that of other export industries such as mining, microelectronics and aerospace.

But there are challenges, including increased competition from foreign destinations. Indeed, the United States as a whole has dropped to third place, behind France and Spain, as the most popular international destination, according to the Travel Industry Association of America. Excluding visitors from Canada and Mexico, the number of foreign visitors has dropped steadily since 1996.

Mexico remains Arizona’s greatest source of foreign visitors, with more than 25 million visits in 2008, most being day visits

from Sonora. Next is Canada, with more than 500,000 visitors in 2008. Some trends in the tourist industry suggest that Arizona would be wise to keep its focus southward. Mexico should only grow in importance as it grows in size. Indeed, the expected rapid population growth in emerging nations could hasten the decline of European markets and promote the emergence of new ones, such as China and India. Arizona must be ready to adapt its highly important tourism industry to these new global realities.



Global Takeaway

Tourism and travel will continue to play major roles in Arizona’s economy. But international demographic changes will generate new issues. And social and economic dislocations at home may pose challenges to Arizona’s quality of life that visitors travel here to experience.

5

GLOBAL BRIGHT SPOT FOR ARIZONA

Heard Museum

One of the Phoenix area’s first cultural attractions has grown to be one of the world’s finest destinations for learning about American Indian arts and cultures. Founded in 1929 by prominent Phoenix residents Dwight B. and Maie Bartlett Heard, the Heard Museum of Native Cultures and Art collects, preserves and presents Native art, ranging from ancestral artifacts to contemporary paintings and jewelry. The museum is recognized internationally for the quality of its collections, its educational programming and its festivals. Through these activities, the museum seeks to set the national standard for collaborating with Native people to present first-person voices. Partnerships with American Indian artists and tribal communities provide global visitors with a distinctive perspective about the art and cultures of Native people.

6

GLOBAL BRIGHT SPOT FOR ARIZONA

Discovery Channel Telescope

After four years at University of Arizona College of Optical Sciences for finishing work, the Discovery Channel Telescope (DCT) mirror was delivered to its Flagstaff-area site in June. The 4.3-meter-aperture telescope will be the fifth largest in the continental United States when completed in 2011. The flagship instrument for Lowell Observatory – a private, non-profit research institution founded in 1894 by Percival Lowell – the DCT will enhance Arizona’s global role in the science and technology surrounding astronomy. In addition to research, however, the observatory’s partnership with the Discovery Channel will produce programming and online content for an inside look at the DCT and how its science is done. The telescope, which in its initial phase will cost some \$40 million, will take advantage of Flagstaff’s Dark Skies Initiative.



THE PEOPLE: GLOBAL CITIZENS

Big and Getting Bigger

Arizona is the West's third most-populous state, a distinction easily overlooked because of its location between the two giants, California and Texas. In fact, Arizona, once a remote, sparsely populated region, today ranks among the nation's larger states; at 6.5 million residents, its population ranks 14th nationally.

FIGURE 6: POPULATION, ARIZONA & NEIGHBORS

RANK		2009 POPULATION ESTIMATE
	UNITED STATES	307,006,550
1	CALIFORNIA	36,961,664
2	TEXAS	24,782,302
14	ARIZONA	6,595,778
22	COLORADO	5,024,748
34	UTAH	2,784,572
35	NEVADA	2,643,085
36	NEW MEXICO	2,009,671

Source: U.S. Census Bureau, 2009 estimates.

And it's still growing. True, the severity of the current recession renders demographic projections less reliable than usual. But between 2000 and 2030, Arizona is expected to grow by a greater percentage than any other state in the region except Nevada, and add more residents than any except California and Texas. If projections hold, Arizona, along with Nevada, will also host a population older than any neighboring state except New Mexico. This development could bring both benefits and disadvantages. Older residents in general may be wealthier, more stable and civically active; however, they also tend to have higher health care costs and less participation in the economy. In addition, some recent scholarship links younger residents with greater economic innovation and vitality.

Economic Challenges Abound

Arizona and New Mexico are projected to lead the western region in 2030 in the "dependency ratio," which is based on the percentage of a state's population that is either 20 or younger or 65 or older—and are thus considered "dependent"

on the state's working-age population, those aged 21-64. Arizona's high ratio suggests that a sizeable portion of the state's population is not directly engaged in productive activity, lessening Arizona's overall ability to compete. Compounding the dependency issue is the fact that Arizona is a relatively low-income state compared with most of its neighbors and to the nation as a whole. This is reflected in the state's per capita personal income. This dependency issue forcefully underscores why innovation and education are so crucial in strengthening the state's prospects for attracting and growing high-paying jobs.

FIGURE 7: PROJECTED INDICATORS FOR STATES IN 2030

STATE	2030 POPULATION	MEDIAN AGE	DEPENDENCY RATIO*
UNITED STATES	363,584,000	38.7	83.0
ARIZONA	10,712,397	39.3	96.6
CALIFORNIA	46,444,861	37.4	79.5
COLORADO	5,792,357	35.6	80.4
NEVADA	4,282,102	39.4	85.5
NEW MEXICO	2,099,708	44.8	102.1
TEXAS	33,317,744	34.6	83.1
UTAH	3,485,367	30.4	89.4

* Dependency Ratio = (Age under 20 + Age 65 and over) / (Age 20-64) X 100.

Source: U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.

FIGURE 8: STATE PER CAPITA PERSONAL INCOME*

STATE (2009 RANK)**	PCPI
UNITED STATES	\$39,138
CALIFORNIA (10)	\$42,325
COLORADO (15)	\$41,344
NEVADA (20)	\$38,578
TEXAS (29)	\$36,484
NEW MEXICO (42)	\$32,992
ARIZONA (43)	\$32,935
UTAH (49)	\$30,875

* Preliminary figures.

** Includes District of Columbia.

Source: U.S. Department of Commerce Bureau of Economic Analysis.

Residents from Elsewhere

Arizonans are known to remark that, “Everyone in Arizona is from somewhere else.” As a case in point, the state’s foreign-born population increased by 42% between 2000 and 2008. While large, this was substantially less than during the decade of the 1990s, when the state’s number of foreign-born residents soared by 136%. Mexico is the leading nation of origin for most foreign-born Arizonans. Nationally, Arizona ranks ninth among states in the percent of foreign-born residents, with 14.3% of Arizona’s population in that category.

Foreign-born Arizonans play a significant role in the state’s workforce. More than seven in 10 are of working age (18-54), and in 2007 they comprised 19.5% of Arizona’s civilian employed workforce, up from 8.4% in 1990. However, these workers are generally not well-educated. Nearly 60% have not completed high school, and only 12% hold a college degree.

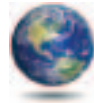
Undocumented immigrants, whose numbers have dropped in recent years, are the subject of intense political controversy in Arizona and throughout the nation. Yet regardless of one’s positions on the issues involved, this population group remains a large and important source of economic activity, both positive and negative. This is especially true given the long-term expectations that the state will experience a shrinking working-age population. With an estimated 500,000 undocumented immigrants, Arizona ranks sixth among states. However, as a percent of total population and percent of the labor force, Arizona ranks second and third, respectively. That means that nearly one of every 10 Arizona workers is undocumented.

FIGURE 9: ESTIMATED UNAUTHORIZED IMMIGRANT POPULATIONS

STATE (RANK)	UNAUTHORIZED IMMIGRANT ESTIMATE, 2008	PERCENT TOTAL POPULATION	PERCENT OF LABOR FORCE
UNITED STATES	11,900,000	4.0%	5.4%
CALIFORNIA (1)	2,700,000	7.3%	9.9%
TEXAS (2)	1,450,000	6.0%	7.9%
ARIZONA (6)	500,000	7.9%	9.8%
COLORADO (12)	240,000	4.8%	5.4%
NEVADA (13)	230,000	8.8%	12.2%
UTAH (22)	110,000	4.1%	5.8%
NEW MEXICO (27)	80,000	4.0%	4.5%

Source: Pew Hispanic Center, *A Portrait of Unauthorized Immigrants in the United States*, April 2009.

2 Institute of International Education, *Open Doors 2009 Fast Facts*, 2009.



Global Takeaway

Arizona’s population is becoming international at a faster rate than the national average, though most foreign-born Arizonans are from a single country, Mexico. The foreign-born population is nearly one-fifth of the state’s workforce, but is poorly educated and low-skilled.

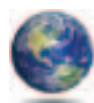
Students from Everywhere

Attracting foreign students is another way for Arizona to acquaint potential residents with its many positives, spread the state’s “brand” further around the globe and expand the existing population’s knowledge of international culture. According to the Institute of International Education (IIE), Arizona ranks 19th among states hosting international students in higher education. For the 2008-09 school year, 10,787 foreign students attended an Arizona post-secondary institution.

IIE estimates that these foreign students spent \$228 million in Arizona during the 2008-09 school year. By contrast, IIE estimates foreign students spent \$2.8 billion in California (the state with the largest foreign student population) during the same time period. Ohio and Pennsylvania have a comparable total post-secondary student population, but both attract a larger share of international students than Arizona. Pennsylvania ranks seventh and Ohio ranks ninth. With more international students comes more economic impact. Expenditures by international students total \$820 million annually in Pennsylvania and \$506 million in Ohio.

The leading home country for international students attending Arizona schools is India, followed by China, South Korea, Mexico and Taiwan.

IIE also reports that 3,825 students attending college or university in Arizona studied abroad during the 2007-08 school year, a decrease of 2.3% from the prior school year. However, Ohio had 11,149 students study abroad in the 2007-08 school year (up by 9.1% from the prior year), and Pennsylvania had 16,326 (up by 7.6%). Nationally, study-abroad students increased by 8.5% over the previous year.



Global Takeaway

Compared to other states with similar-sized student bodies, Arizona could do more to attract international university students. The number of Arizona university students studying abroad is dropping, contrary to the national trend.



THE PATH FORWARD: EDUCATION, INNOVATION, ENTREPRENEURSHIP

Cultivating Human Capital

Human capital is vital for success, domestically or internationally. As it surveys the global arena, Arizona should give top priority to growing its current talent base in science, math, computer and engineering to provide a reliable and consistent labor supply for the state's technology economy. Its current situation is not good. Arizona ranks poorly among the states in terms of science, engineering and computer-related degrees, creating a void in homegrown talent in these key fields. Worse, the negative impact of this limited talent base can feed upon itself, as graduates leave the state for better jobs and high-tech firms bypass Arizona due to lack of local talent.

This is not a new story for Arizona, but the consequences remain severe for its efforts to compete on the world stage. Figure 10 shows that Arizona compares well to several of its neighbors in critical education metrics, but it is substantially behind others in some measures, and is substantially behind the U.S. average in all.

Computers in the Classroom

Arizona has lost ground in terms of providing an educated and skilled workforce proficient in math and science. An essential tool in making that possible, however, is currently a clear deficiency: digital education infrastructure. Arizona is not only lagging benchmark states and the national average in computer access in classrooms, it ranks near the bottom among

states in overall access to technology in schools. A high ratio of students to computers only exacerbates the problem, as less computer-driven learning is available for each student, further limiting the number of students who might otherwise enter the pipeline leading to a high-tech, skilled labor force that is already competing against increasingly well-educated, well-prepared global rivals.

The Promise of Innovation

If one word can be applied across the board to describe what's needed to boost Arizona's global future, it is "innovation"—in designing novel goods and services, in creating robust public-private partnerships, in linking enhanced educational outcomes to workforce quality, in penetrating new international markets, in promoting Arizona's brand around the world, in attracting foreign businesses and capital, even in spurring new industries. But wise global initiatives must be grounded in reality. At present, Arizona's standing in key benchmarks is mixed, at best. Still, with a technology-related industry base of 162,000 jobs and a university research base of \$783 million, Arizona does possess the building blocks to fuel strong and innovative growth in the global arena.³

Most economists agree that a substantial share of global prosperity will accrue to the owners of intellectual property.

³ Battelle Memorial Institute, *The First Annual Report Card of Arizona's Technology & Innovation Registry*, February 2009.

FIGURE 10: EDUCATION AND WORKFORCE MEASURES, 2007

	ARIZONA	CALIFORNIA	COLORADO	NEVADA	NEW MEXICO	TEXAS	UTAH	U.S.
Expenditures Per Pupil for Elementary & Secondary Public Schools	\$7,338	\$8,952	\$8,286	\$7,806	\$8,849	\$7,850	\$5,706	\$9,683
BA or Higher, Ages 25–44	24.5%	30.0%	35.8%	21.0%	22.5%	25.4%	28.3%	29.8%
State Expenditures on Student Aid Per Full-Time Undergraduate Student	\$47	\$1,229	\$488	\$906	\$1,793	\$910	\$87	\$1,029
Science & Engineering Occupations as Share of Workforce*	3.26%	4.30%	5.38%	1.99%	3.60%	3.96%	3.80%	3.75%
Engineers as Share of Workforce*	1.14%	1.31%	1.51%	0.57%	1.20%	1.25%	1.04%	1.06%
Life and Physical Scientists as Share of Workforce*	0.24%	0.50%	0.55%	0.25%	0.72%	0.40%	0.47%	0.40%
Computer Specialists as Share of Workforce*	1.74%	2.09%	2.93%	0.94%	1.20%	2.10%	2.22%	2.08%

*2008 data. ** 2006 data.

Source: National Science Foundation, *Science and Engineering Indicators 2010*, <http://www.nsf.gov/statistics/seind10/c8/c8s8.cfm>.

Patents issued are one key intellectual property metric, and Arizona is not currently a leader among benchmark states. For instance, while Arizona is slightly ahead of the national average in patents issued, it trails most benchmark states. In addition, Arizona's severe and enduring economic recession has taken its toll: 2008 saw nearly zero growth in Arizona patents, far below the national average of 9.7%.

FIGURE 11: PATENTS ISSUED*

	PATENTS ISSUED 2008 (PER \$100 MILLION GDP)	PATENT CHANGE (AVG. 2006-07 VS. 2008)
UNITED STATES	0.76	9.7%
OREGON	1.72	- 8.5%
WASHINGTON	1.54	9.9%
MINNESOTA	1.34	-4.8%
WISCONSIN	1.06	-3.5%
COLORADO	0.98	-11.4%
ARIZONA	0.92	0.6%
NORTH CAROLINA	0.71	6.1%
GEORGIA	0.51	-1.1%
VIRGINIA	0.44	0.8%

* As part of its *Report Card*, Battelle used eight states for comparison purposes related to the structure and size of the state's technology-based industries, levels of university and industry funding, and population.

Source: Battelle Memorial Institute, *The First Annual Report Card of Arizona's Technology & Innovation Registry*, February 2009.

Paying to Learn

Arizona ranks in the middle among the benchmark states in both university and industry research expenditures relative to

the size of its economy. However, the state lags the national average. Arizona's nearly \$800 million in total university research expenditures ranks 20th among all states. The good news is that academic research expenditures in Arizona grew from 2006 to 2007, nearly keeping pace with the national average. The bad news, however, is that, percentage-wise, such growth was well behind seven of the eight comparison states. Dollar amounts alone, of course, do not communicate success; the challenge is to use those resources wisely and strategically.

FIGURE 12: UNIVERSITY RESEARCH EXPENDITURES

	PATENTS ISSUED 2008 (PER \$100 MILLION GDP)	PATENT CHANGE (AVG. 2006-07 VS. 2008)
UNITED STATES	\$35,968	3.5%
NORTH CAROLINA	\$47,203	10.2%
WISCONSIN	\$45,920	2.6%
COLORADO	\$36,923	6.3%
OREGON	\$36,309	3.1%
GEORGIA	\$35,031	6.6%
ARIZONA	\$31,683	2.1%
WASHINGTON	\$31,515	- 0.7%
VIRGINIA	\$25,378	2.6%
MINNESOTA	\$24,980	5.2%

Source: Battelle Memorial Institute, *The First Annual Report Card of Arizona's Technology & Innovation Registry*, February 2009.

Prior to the national recession, at least, Arizona's industrial research base was faring better, growing at more than twice the national average for all states and increasing by more than 20% from 2005 to 2006. The state's industrial research expenditure totals (\$3.6 billion, 18th among all states) are modest compared with some of the benchmark states; but only Georgia had a similarly large percentage increase over the year.

FIGURE 13: INDUSTRIAL RESEARCH EXPENDITURES

	INDUSTRIAL RESEARCH EXPENDITURES, 2006 (PER \$10 MILLION GDP)	CHANGE IN INDUSTRIAL RESEARCH EXPENDITURES, 2005-2006
UNITED STATES	\$180,214	9.5%
WASHINGTON	\$363,671	10.7%
MINNESOTA	\$246,931	- 0.7%
OREGON	\$216,074	5.1%
COLORADO	\$197,060	8.3%
ARIZONA	\$145,328	20.5%
NORTH CAROLINA	\$137,340	6.4%
WISCONSIN	\$130,008	10.7%
VIRGINIA	\$125,756	10.0%
GEORGIA	\$70,264	22.1%

Source: Battelle Memorial Institute, *The First Annual Report Card of Arizona's Technology & Innovation Registry*, February 2009.

7 GLOBAL BRIGHT SPOT FOR ARIZONA Human Origins Genotyping Laboratory

Perhaps nothing reminds us how intrinsically closely we are all related than global DNA analysis, which can trace genetic evolution back to *Homo sapiens* in Africa more than 60,000 years ago. The Human Origins Genotyping Laboratory at the University of Arizona is the only site in the world to analyze DNA samples from the general public. It's all part of the National Geographic Genographic Project, which so far has used cheek swabs of DNA from more than 415,000 individuals around the globe to trace their global roots. Want to trace your ancient ancestry? Go to <http://hogl.arl.arizona.edu/> to find out how. The project, now in its fifth year, recently expanded its laboratory to include the DNA Shoah Project, a humanitarian forensic effort to reconnect victims and families who were separated by the Holocaust.



Global Takeaway

Patents are a key measure of innovation. Arizona's performance, ranking near the middle of benchmark states, could improve through concerted action or decline through neglect. The same applies to Arizona's performance in research and in workforce preparation for high-tech global competition.

The Entrepreneurial Spirit

Even the most inventive scientists and skilled technicians will be of limited value in Arizona's global efforts unless there is venture capital available to fuel and expand enterprises, along with business people ready to drive them. Americans have long had a reputation as risk-takers and Fortune Small Business, drawing on data from the World Bank and Global Entrepreneurship Monitor, found that this continues to set the U.S. apart from other countries. What sets the top countries apart from those at the bottom are fewer steps and barriers for entrepreneurs wanting to set up shop.

FIGURE 14: LEADING ENTREPRENEURIAL NATIONS

1. NEW ZEALAND	6. HONG KONG, CHINA
2. UNITED STATES	7. UNITED KINGDOM
3. CANADA	8. IRELAND
4. AUSTRALIA	9. DENMARK
5. SINGAPORE	10. ICELAND

Source: http://money.cnn.com/magazines/fsb/fsb_archive/2007/06/01/100049637/index.htm.

Among the states, Arizona ranks fairly well, according to both the Milken Institute's 2008 *State Technology and Science Index* and the 2009 *Kauffman Index of Entrepreneurial Activity by State*. The Milken report ranks Arizona 17th among all states, issuing a mixed verdict after reviewing 77 indicators grouped into five major components:

FIGURE 15: COMPONENTS OF ENTREPRENEURSHIP

COMPONENT	ARIZONA RANKING
Human Capital Investment	33
Research and Development Inputs	16
Risk Capital and Entrepreneurial Infrastructure	10
Technology and Science Workforce	22
Technology Concentration and Dynamism	6

Source: Milken Institute, 2008 *State Technology and Science Index*.

These findings suggest that Arizona displays strengths in the formation and growth of high-tech firms, and in its pool of entrepreneurs and the capital to support them. However, the state is experiencing only fair success in attracting research funding and is about average among states in its technology and science workforce. Arizona scores its lowest ranking in human capital investment, which once again highlights the state's weakness in educational achievement.

A more positive finding comes from the Kauffman Foundation's 2009 ranking of entrepreneurial activity. Arizona ranked third in the nation, behind only Montana and Oklahoma and ahead of Idaho and Texas. The foundation defines entrepreneurial activity as the percent of individuals ages 20-64 who do not own a business in the first survey month but who start a business in the following month with 15 or more hours worked per week. The foundation also ranks metropolitan areas, and placed the Phoenix area fourth among the nation's 15 largest MSAs, after Houston, Miami and Atlanta.



Global Takeaway

Arizona ranks above the middle among states in entrepreneurship and even higher on startups and activity, which is good news for global competition. Yet it still shows weaknesses in the critical area of education and workforce preparation.

8

GLOBAL BRIGHT SPOT FOR ARIZONA

SkySong

SkySong is a unique innovation center designed to help companies grow by providing business services and programs offered or facilitated by Arizona State University. These services include access to new technologies, capital networks, business education and a skilled workforce. SkySong serves the needs of businesses, research and technology industry, and academia. It builds vital networks between university innovations, regional progress and the worldwide technology industry. Located in south Scottsdale near the ASU Tempe campus, the mixed-use project today hosts 43 companies and organizations on site and 19 additional ones working "virtually" with SkySong.

THE QUESTIONS AT HAND



Facts, figures, traditions, experts. All can help Arizona in meeting the challenges of globalization, but even together they are not sufficient. The data and opinion in this report will hopefully help set the stage for a productive meeting of the minds on December 1. Only the combined experience, savvy and will of the participants can inaugurate the vital process of guiding Arizona more fully onto the world stage. On that day specific policy recommendations will be raised, debated and voted upon. To prepare for that task, this report ends with a few of the key questions that frame the goals and challenges before us.

- **What are Arizona's major strengths and weaknesses in global competition?**
- **Which economic sectors show the most promise for global competitive success?**
- **How can Arizona improve its level and diversity of international exports?**
- **How can Arizona best address the deficiencies in its talent base?**
- **How much of a role should state government play in Arizona's global efforts?**
- **What new partnerships or collaborations can provide leadership in advancing the state's global position?**
- **Should Arizona concentrate on attracting more foreign firms and investment?**
- **Is there a smarter way to harness Arizonans' entrepreneurial spirit?**
- **What lessons can Arizona learn from the global success of other states and countries?**
- **Can Arizona dedicate the necessary attention and resources to increasing its global competitiveness given its serious challenges on the home front?**
- **How can Arizona better exploit its geographic location, cultural history and changing demographics as competitive advantages?**
- **What is the most effective way to organize a successful global development movement in Arizona?**

9

GLOBAL BRIGHT SPOT FOR ARIZONA

Thunderbird School of Global Management

This Glendale institution is the nation's oldest and largest graduate management school focused solely on preparing international business leaders. Thunderbird draws students from dozens of countries who are striving to become skilled professionals with global knowledge, awareness, sensitivity and experience. They are taught to manage effectively in different social, economic and political environments to better understand global markets and to work with individuals from diverse cultures.

10

GLOBAL BRIGHT SPOT FOR ARIZONA

Biosphere 2

Over the last two decades, Biosphere 2 near Tucson has provided a fascinating focal point for scientific study, with a particular emphasis on the earth sciences and global climate change. Managed now by the University of Arizona and toured by more than 2.3 million visitors, the highly-controlled environments inside this unique glass-and-steel structure continue to serve as a cutting-edge hub for multidisciplinary research and teaching.



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