

MEGAP * LITAN

ARIZONA'S SUN CORRIDOR



MORRISON INSTITUTE
FOR PUBLIC POLICY
ARIZONA STATE UNIVERSITY

MAY 2008

SUN CORRIDOR



THE PLANE FROM CHENGDU WAS LATE.

In fact, the 9 a.m. direct flight to Phoenix was nearly always late. After major international flights started arriving at Sky Harbor in 2009, the airport seemed overwhelmed. Even with four big airports in the Sun Corridor, international traffic still centered on good ol' Terminal 7.

As the 10-hour flight wound down, Sylvia Wong sat around the table with her two business partners. This trip was a big deal, and she was cautiously optimistic about their critical deal-closing meetings at three tech powerhouses from north to south: Northwest Innovation Center, Mid-Mega Science Park, and Gateway Ventures. The first meeting was the most important. They would head to Prescott Valley to see Hector Padilla, the richest man in Arizona and the chairman of CoolMed. If they could land him, other Arizona venture capitalists would fall into place as potential investors in CURED, the global “med-match” network Sylvia and her partners were pitching. After months of web conferencing, these are the first in-person meetings with the pioneers of Arizona’s leadership in affordable, individualized nutraceuticals. Their visionary bets had created an \$800 billion industry.

Sylvia is a native Arizonan with three degrees from universities in as many countries. She’s proud, but nervous about showing off her home state. She knows the Sun Corridor’s economy has the financial strength and entrepreneurial spirit to support their new venture, and is anxious to show the value of her connections. But she also dreads the hassles of trying to get around in the sprawling Sun Corridor. *Everything here is so far apart*, she thought to herself. *I know Neru and Ari don’t understand why I like Arizona. It still seems like a backwater compared to Shanghai and Dubai.*

“I’m glad we flew over Solavolt,” she said aloud. “You have to be impressed by 10,000 acres of sun power. The world’s largest concentrator solar facility was almost not built. At one point, the state land it’s on was scheduled to be basic subdivisions.”

DOR 2035



“So Arizona has the world’s biggest solar plant. That seems like a no brainer,” replied Ari. “What I don’t get is why Phoenix wound up being the center of the nutraceutical world.”

She was used to this question. Few people could recall exactly how the Sun Corridor rose from a regional distribution hub with a few chip manufacturing plants to become a global economic leader. Padilla had started CoolMed in Mexico in the late 1980s as a vitamin manufacturer. But his AZ medical training had led him back to the state and connections with the genetics expertise that took hold in downtown Phoenix in the early 21st century. He and CoolMed were the first to seize the commercial potential of personalized pills. The company’s growth was explosive, and it became the “Microsoft” of its era.

“2010 was a turning point for Arizona,” she explained. “First, the housing bust forced the state to change the way it viewed its economy,” she went on. “Before that, Arizona, and especially Phoenix, put all its eggs in the basket of delivering as many houses as quickly and cheaply as possible. That led to continuous boom and bust cycles. When new home construction fell by 75% and prices dropped by 30% in many places, everyone started paying attention. Then Padilla announced that he was considering an offer to relocate CoolMed to Seattle. They were offering him tons of incentives, and he could more easily recruit a workforce with the right technical skills. It looked like Arizona was losing its best shot at a different, more diversified, high-wage economy.”

She continued to describe how the state’s conservative legislature was shell-shocked by the economic downturn, and persuaded, at last, by a few business leaders to create, and stick with, a Sun Corridor collaborative knowledge economy strategy for presenting a united front to foreign businesses and global investors. “Keep CoolMed” became a rallying cry for a bundle of public policy reforms.



NORTHWEST AIRPORT

Northwest Innovation Center

Prescott

Arcosanti

Solarium

PHOENIX

Buckeye Festival

SKY HARBOR AIRPORT

Superstition Vistas

PHOENIX-MESA GATEWAY AIRPORT

Casa Grande

MID-MEGA SCIENCE PARK

Gateway Ventures

TUCSON

TUCSON INTERNATIONAL AIRPORT

Sierra Ortiz

Sierra Vista

NOGALES

First, the Arizona Legislature funded an aggressive international economic development program that quickly led to an upward trajectory. A relatively small budget allocation at the time, it was an important symbol of the state's determination to become a global player. The program helped connect isolated economic assets and build on a strategy of investment in science, engineering, technology, and higher education as economic drivers.

Second, Sylvia explained to her partners that K-12 education choices played a critically important part in the shift from a real estate economy to global leadership in sci-tech-driven business. Once the state and the Sun Corridor's realms decided to work together to play on the world stage, educators quickly recognized their obligation to prepare the state's youth for international opportunities. This spawned a profound change in the state's expectations and its K-12 curriculum. To graduate and be admitted to an Arizona public university, students had to demonstrate proficiency in math, science, English, Spanish, and another language of their choice. Many guidance counselors pushed Mandarin, but it was a tough sell. Sylvia herself was a member of the first high school cohort to meet the new language requirement in 2016, albeit with a lot of help from her grandmother. This hard-won education policy garnered the state positive national and international attention.

An additional benefit was the federal government's enactment of comprehensive immigration reform in 2015. This freed Arizona from trying to enforce immigration laws through employer sanctions. The image of the state as unfriendly to immigrants turned around quickly with the focus on global education, and the Sun Corridor emerged as a leader in Latino-owned businesses. Cities and towns fell in line behind the state strategy and began to focus their economic development energies on presenting regional and sub-regional assets. Economic development organizations became well known for collaborations that boosted domestic and international investment and exports. A great bonus was that many of Arizona's rural communities gained significantly from the Sun Corridor's spin-offs and spillovers.

"Another big piece of the puzzle was the formation of the Megapolitan Transportation Authority and the changes it brought, but you'll see the evidence of that in a few minutes. It was the convergence of policy choices in economic development, education, and transportation that made Arizona competitive." Sylvia concluded. "It really is a remarkable story."

Why do I sound like such a booster, she thought. I left here because Arizona was boring and hot. But if this deal goes, maybe I'll buy a condo in Clarkdale. It would be fun to come home more often.

The plane was landing and Sylvia had to start thinking through the logistics of their appointments. Their first meeting was in the Northwest Innovation Center, the major employment node that had developed in Prescott Valley. It was there that Padilla headquartered his empire. Padilla lived on a sprawling cattle ranch where he recreated a kind of cowboy lifestyle while commuting (by either horse or helicopter) to his 12-story headquarters at the center of the N.I.C. But the main way to get there remained to head up I-17. As they merged into the controlled smart lanes, their vehicle latched onto its guidance system and switched to full electric mode, receiving power from the induction cable buried under the pavement. Vehicles were separated from one another by only eight feet. As long as there wasn't a software problem, the capacity of the freeway was nearly quadruple what it had been before. But when there was a problem, the consequences were catastrophic.

Sylvia switched to auto pilot and swiveled the driver's chair around to again engage her partners. "We're coming up on Anthem, where I grew up," she said.

“How come there are all these separate homes,” asked Neru. “I mean, even in L.A. the majority of people live at higher densities than this. No wonder this place is so spread out. Why does everyone think they have to have separate walls from their neighbors?”

“When I was a kid, I didn’t even know anyone who lived in an apartment,” answered Sylvia. “But it’s changing. Even up north you’ll see blocks of townhouses, condos, and flats. The fact that you can have a separate house remains part of Arizona’s appeal. Middle class people can’t do that in very many places anymore. When we head south toward Tucson you’ll really see the sprawl. Pinal County is still building beige stucco and red tile boxes as far as you can see.”



“What’s with all those big empty buildings?” asked Ari.

“Abandoned retail,” she answered. “They’ve tried to retrofit other uses, but there just isn’t much demand for huge windowless boxes. I assume they’ll get knocked down soon.”

“Some attempted reforms didn’t work,” said Sylvia, returning to her travelogue. “The business and civic coalition pushed for regional government as the Sun Corridor started blending together. There was a feeling that Arizona’s cities and towns were too parochial, and still fought all the time over how to divide the economic pie. So they proposed ‘CorrGov.’”

CorrGov had been put on the ballot in 2012 as a way to deal more effectively with transportation and air quality for the entire region. But voters in the Sun Corridor’s mosaic of communities turned it down. Apparently, the old political fault lines still existed despite using a collaborative, big-picture strategy to achieve its economic development goals. In frustration, municipal, county, tribal, and state leaders formed a non-authoritative coalition among the Sun Corridor’s COGs or councils of government. Although the coalition lacked statutory power, Arizona’s “governance without government” approach became a practical, effective way to deal with key challenges. An early achievement was to put before the voters a plan to set aside miles of open space—primarily in Mid-Mega—but also throughout the Sun Corridor, which was approved by a solid 63%. As confidence in the coalition grew, the collaborators tackled ever-tougher problems, including the massive public infrastructure demanded by continuous growth.

“Then in 2017 the other shoe dropped. After transportation and air quality weren’t shifted to a regional model and the air got worse, the U.S. Department of Transportation finally made good on its threat to cut off Arizona’s highway funds. Everyone freaked and finally formed the Megapolitan Transportation Authority.”

The Megapolitan Transportation Authority’s “Bank It” financing plan paved the way for the distinct airports throughout the Sun Corridor and for the high-speed train connections into Sky Harbor Airport. The Mega Smart Route, or “MSR,” system

built starting in 2017 was one of the country's earliest intelligent ground-based transportation systems. The MSR made it possible for Arizonans to keep up their love affair with their cars.

Neru said she had heard criticism of the Sun Corridor's social well-being due to divides between the young and the elderly and long-time residents and new arrivals. She had read, for example, that Arizona's working-age population was small in comparison to the Sun Corridor's youth and elders. Long-lived seniors demanded social, health, and transportation services that took a heavy bite out of the public revenue necessary to serve other political constituent groups. She said the state was developing a reputation as having distinct "haves" and "have-nots."



"This may sound hypocritical coming from someone who grew up in India, but my country has made great strides in spreading affluence about. Here, I read, things seem to be going the other way."

"It is true that Arizona is looking more like California – a population with a diminishing middle class and fewer homeowners," Sylvia acknowledged. *But capitalism breeds winners and losers*, she thought. *We're never going to change that.*

As they exited the interstate and Sylvia had to resume control of the car, Ari asked about the brown cloud hanging in the distance.

"It's a dry place," she said. "You can control lots of kinds of pollution, but it's hard to do much about the dust that's kicked up by this many people and vehicles. I think Arizona is in something like year 17 of the latest big drought." And so their discussion turned to water. Sylvia said that back in the 2020s, the Sun Corridor's water managers said the population of 8 million still had plenty of water supplies despite decreasing rainfall. New technologies and voluntary and mandated conservation measures had ratcheted down per capita use throughout the Sun Corridor. Stretching water supplies insured that growth could continue. Desalinization plants on the Pacific coast freed up more Colorado River supplies for Arizona.

"People used to think water would be the limiting factor," said Sylvia. "Someday there just wouldn't be any more water coming out of the tap. But that was less of an issue. The Sun Corridor's economic success story papered over unexpected problems. People were surprised that the smart growth principle of quality to manage quantity didn't really work well. Decades of growth simply overwhelmed communities and created major environmental challenges, both rural and urban. Basically, what we didn't realize was that less landscaping, lots of people, and continuing drought make the place dustier and dustier."

As a result, air quality was a major factor behind a decline in population, an outcome few long-time Arizonans thought they'd ever witness. In places including Prescott Valley, Casa Grande, and Sierra Vista, a blanket moratorium was imposed on building permits. In 2022, the cover of *Newsweek* had proclaimed the Sun Corridor "the new dustbowl," offsetting its reputation as a leader in international commerce.

Shortly thereafter Governor Lopez proclaimed, “Our past is haunting our future. We must face the challenge of restoring our land by changing our ways or suffer dire social, economic, and environmental consequences. It’s time for extraordinary deeds, not merely words, regarding the sustainability of the most populous part of our state.”

Lopez had been an exceptionally popular governor. His election platform was simple – “It’s about sustainability.” – and it resonated very well with Arizona voters, long-timers and newcomers alike. Coming from a leading political family and Rhodes Scholar experience didn’t hurt either. Lopez was elected governor by the widest margin in state history.



Sylvia noted that the governor’s now-famous speech motivated everybody to get on board with dramatic policy changes that helped to head off – to an extent – the worst of the region’s problems. Municipal water prices were increased to reflect actual delivery costs and the reuse of nearly all effluent. Renewable energy became the only power available. The list of changes was long. Sustainability went from talk to action seemingly overnight. But since Arizona had grown so much and taken so much for granted, the results were better, but not great. So while the economy was robust well into the 2030s, the megapolitan area’s quality of life was, according to many residents, going sideways at best. Many of the region’s best and brightest wondered if it had come time to move on. The Sun Corridor had clearly earned the title of “world city,” but it might not be able to maintain it.

The group reached their destination at N.I.C. three hours after leaving Sky Harbor. “Not bad,” she thought, “I’ve done worse.” As the CURED team rode the elevator to the key meeting they had come from China for, Sylvia realized that the maturation of the Sun Corridor profoundly had remade Arizona’s sense of itself and its place in the world. After years as an “also ran” among the world’s truly competitive citistates, the Sun Corridor had become too populous, too wealthy, and too pushy for the world to ignore.

The elevator doors opened directly into Padilla’s penthouse office suite. He stood with his back to a wall of glass framing the Bradshaw Mountains.

This is our shot, Sylvia thought.

LESSONS

FROM THIS SCENARIO

THE SCENARIO POINTS OUT CONSIDERATIONS FOR THE SUN CORRIDOR'S FUTURE.

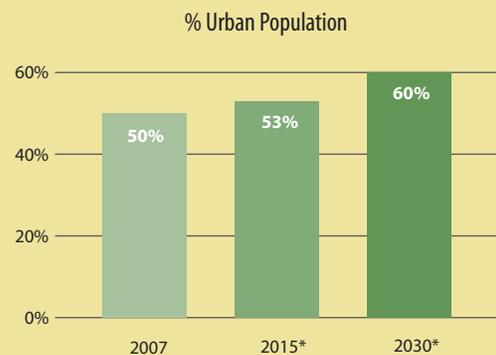
A scenario about life in the Sun Corridor in 2035 is sure to leave out one thing or another. But it highlights important aspects that are described more in the following pages. The scenario's contents are meant to point out lessons, concepts, and innovations that should be considered now so that good public policy decisions will be made for the future of the Sun Corridor.

Some "take aways" from the scenario include:

- **All politics will be "glocal."** That is, a global economic strategy has to be matched with local commitments to livability and competitiveness.
- **Sustainability is vital.** As the Sun Corridor grows, finding balance between resource depletion and replenishment, energy use and conservation, and economic growth and social needs will be tough, but necessary.
- **Mega will become another scale for community, economy, and environment.** Size creates opportunities; size creates threats.
- **Public policies are inextricably linked.** Each choice affects many others. In a region as large, complex, and dynamic as the Sun Corridor may become, good public policy making will depend on collaboration more than ever before.

- **Among the 20 megapolitan areas projected for the U.S., there will be winners and losers.** These citistates will compete aggressively. Not all will have the success the scenario suggests for the Sun Corridor.
- **Innovation-based growth will be the key to success.** But this does not mean technological innovation alone. New technologies to improve air quality, transportation, water, and other areas will have to be matched by innovation in social, education, and government systems and institutions.

GLOBAL POPULATION IS INCREASINGLY URBAN



* Projected.

Source: United Nations Population Fund, State of World Population, 2007.

FULFILLING THE SUN CORRIDOR'S PROMISE

CREATING AN ECONOMIC, TECHNOLOGICAL, AND CULTURAL CENTER

Michael M. Crow, President, Arizona State University

At the founding of our Republic in 1789, those who called themselves Americans numbered approximately 3 million. At that time and with the structure of our democracy, no one could have predicted or planned for the scale of the nation that would emerge or the size and complexity of the world in which it is still evolving. Arizona is already twice the size of that early American nation and well on its way to a citizenry of more than 10 million. When that milestone is reached in about 2030, America's population will exceed 375 million and our democracy will have grown more than 120-fold in only 250 years.

Twenty "megapolitan" areas with economic and cultural potential equivalent to the largest and richest foreign countries are emerging in our nation. The design, political structure, and competitiveness of these vast regions will be the drivers of massive new economic and social opportunities. Arizona, with its unparalleled natural assets, spirit of free enterprise, and open, egalitarian culture is home to one of these megapolitan areas, one of these new American citistates – the Sun Corridor. These megapolitan regions will power our innovation, creativity, and socioeconomic gains in races with formidable competitors throughout Asia and Europe.

With a megapolitan area that stretches from the Prescott region to the border with Mexico, Arizona, once a rural state dominated by ranching and mining, is faced with tremendous challenges. The emergence of cities in the Sun Corridor was simultaneously encouraged and constrained by the physical barriers of mountains, deserts, and distance. The result has been a disconnected planning paradigm and lack of a coherent, cohesive vision to guide rapid development. This habit of planning in isolation and island-like separations mutes the fantastic opportunities that exist to build the greatest of America's megaregions in our state. One example is the failure, thus far, to plan for adequate, modern connectivity between metro

Phoenix and Tucson and, indeed, among all of the Sun Corridor cities. The expectation that a single four-lane interstate will serve the megaregion's two major hubs is unrealistic at best.

As one of the newest of the 20 megapolitans and as one of the two or three with the greatest natural capital, Arizona has a unique opportunity to plan and build what could be the world's first sustainable region. In this case, "sustainable" means economic growth and wealth generation matched with continuously enhanced natural and social capital. The achievement of sustainability through innovation and careful market-driven designs would position the Sun Corridor as America's leading center for creativity at all levels and in all sectors in a changing world energy arena. It also would provide Arizona residents with unparalleled quality of life.

To move in this direction, Arizona must develop a new social psychology based on a different set of perspectives. With the unlimited scale of our opportunities and challenges, Arizona will have to think more like a country and less like either a disparate set of isolated areas or a standard issue American state. The great economic states in our Republic, such as Texas, California, and New York, and increasingly Florida, Georgia, and North Carolina, possess the magnitude and ambition of any region on the planet. Likewise, Arizona with its Sun Corridor, culturally diverse population, and physically beautiful landscape has the makings of a great republic within the macro-scale American Republic.

For Arizona, thinking like a nation means planning to compete against the best in Singapore, Shanghai, Frankfurt, and Bangalore. Beyond that, it requires that the Sun Corridor at the center of the republic of Arizona – small "r" – must be the American megapolitan that finds the way to lead in education, sustainability, and the free enterprise driving creativity and

innovation. To do this will require a vision wherein our focus is not on beating other American states but, in fact, on cooperating with them to compete with other nations. Arizona in this mode, as a mini-republic with the Sun Corridor at its heart, should strive to be known for policies and investments that enable us to compete readily with:

- Greece or Spain for tourist experiences
- France or Singapore for technology development
- Korea or Finland in high-tech manufacturing
- Germany or Japan for renewable energy
- Costa Rica or Sweden for sustainability-based design and business development

We must change our perspective from that of a small American state to one that recognizes Arizona – with its Sun Corridor – as a republic capable of economic advance, sustainable

development, and global engagement. Anything less than this transformation likely will result in 8 million Sun Corridor residents and 10 million Arizonans living in an unsustainable, uncompetitive place where the standard of living stagnates or declines and the position of Arizona tumbles from its historic attractiveness to undesirable.

The bottom line of this study of Arizona’s Sun Corridor is that demographic shifts in America and global trends in competitiveness offer our state matchless prospects for evolving one of the most significant economic, technological, and cultural centers in the world. The opportunity is now since these changes are already fully in motion. This Sun Corridor study outlines the challenges that lie ahead in shaping an outcome that will enhance the wealth and quality of life for all Arizonans for decades to come.



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MEGAPOLITAN

ARIZONA'S SUN CORRIDOR

MAY 2008

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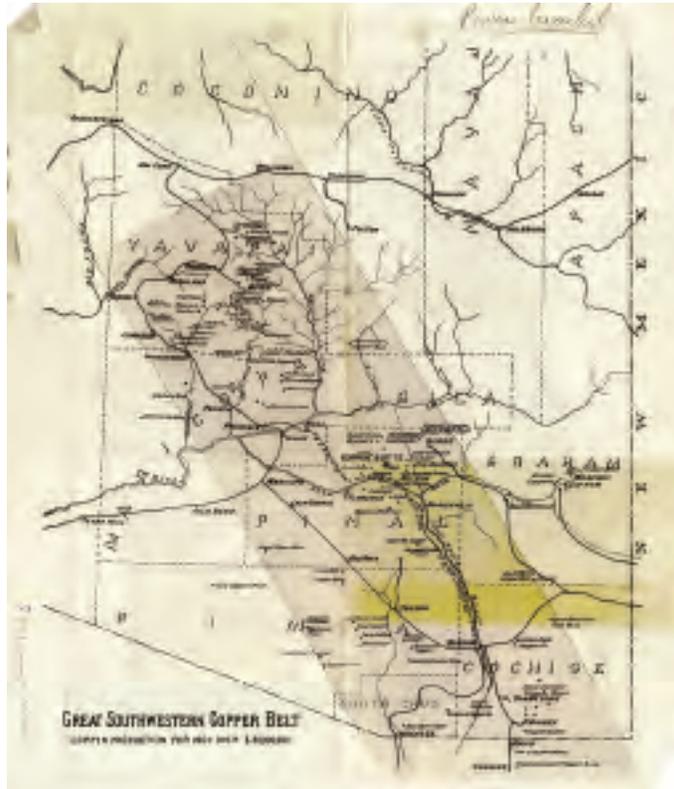


THE MAKING OF THE SUN CORRIDOR

The terms “megapolitan” and Sun Corridor are increasingly common terms and accepted concepts in Arizona. The Sun Corridor is now home to approximately 5 million people from the middle of Yavapai County to western Cochise County to the border with Mexico. By approximately 2040, the Sun Corridor could be nearly 10 million strong or roughly the size of metro Chicago today. Urban Arizona is clearly moving from “metro” to “mega.” But there is a back story to today’s buzzword that is critical to understanding this new geography.

LOCATION, CLIMATE, AND BEAUTY

Early Arizona maps show that the Sun Corridor has long been a focal point for settlement. World War II, however, divided “old” Arizona from the path to a megapolitan. When author Kevin Phillips coined the term “Sun Belt” in the late 1960s, he was referring to politics,



Source: Sharlot Hall Museum Map Collection. Used by permission.

but his catchphrase perfectly described where more and more Americans wanted to live. Arizona’s southwestern location attracted many who just wanted to follow the sun, while the state’s unique environment drew others.

In turn, the locations of Phoenix and Tucson helped lay the foundation for the Sun Corridor. Just 150 miles apart and connected since 1963 by U.S. Interstate 10, Phoenix and Tucson developed mostly as urban “islands” with different histories and cultures. However, despite go-it-alone mindsets, connections developed between the two. Now, the state’s first- and second-largest urban regions are less remote outposts and more interdependent centers for

business, arts and culture, universities, sports, and institutions. Competition is not gone, but the two regions are no longer separate or isolated.

WHAT IS A MEGAPOLITAN?

Special Characteristics Distinguish These Places

COMPACT

2 or more metropolitan areas with principal anchor cities 50-200 miles apart. Population of at least 5 million by 2040.

CONNECTED

Census-defined employment interchange measure (EIM) of 15% by 2040. EIM refers to commuting patterns and is often a measure of “interconnectedness.”

COMPLEX

Megapolitans and metros make megaregions. Virginia Tech’s Metropolitan Institute identified 20 U.S. megapolitans and 10 megaregions.

CORRIDORS

Urban form is often linear with multiple centers.

SOLDIERS, TOURISTS, AND RETIREES

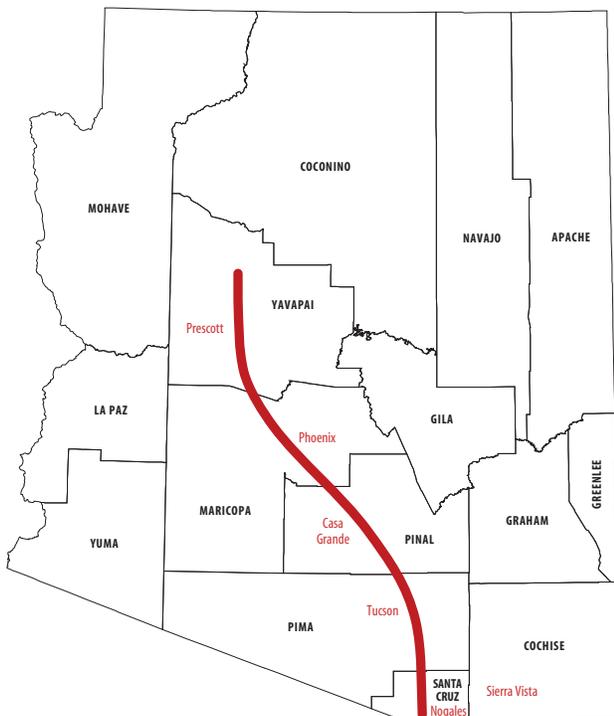
Military personnel and defense workers who had gotten to know Arizona during war time service later returned in substantial numbers. In addition, tourism became an even more vital economic force with the advent of widespread air travel. Many moved to the state after being introduced to it as visitors. Sun City's early-1960s debut began the era of "active adult" retirement, creating another source of new residents.

A (MOSTLY) PRO-GROWTH CULTURE

Creating cities in arid places is difficult. The challenges have been the wellspring for a special Western brand of boosterism,

which has continued to shape Arizona's culture even as its influence has waned. Supported by federal revenues, the national Sun Belt shift, and local investments, leaders in Phoenix and many other places throughout the Sun Corridor, including Tucson, assumed early on that growth would come, and most growth was good. Not surprisingly, predictions of a super-sized urban Arizona are common. In 1967, Jerome Pickard, the Urban Land Institute's research director, told an Arizona State University audience that "metropolitan Arizona" by 1980 would be the "nation's fifth-largest 'megalopolis.'" He based his conclusion on the period's fast growth, presence of Interstate 10 between Phoenix and Tucson, and the fact that "substantial development continues between the two cities." Pickard noted that by 2000 "the state's urban region should have almost 4 million people out of a projected national population of 312 million."¹ General Electric computer executive Thomas Vanderslice presented a similar vision to a Phoenix Chamber of Commerce audience in 1969: "Phoenix and Tucson will merge into a super metropolitan area called the Golden Corridor...looking at future problems such as mass transit between cities, air transportation, electrical power supply, and air pollution control (we must) apply the advanced resources available to us to assure that together we preserve the amenities so easily lost by nearsighted or blind planning."² In 1973, State Real Estate Commissioner J. Fred Talley spoke of a continuous city spreading from Wickenburg to Nogales by 2020, predicting 6 million people would live in metro Phoenix.

THE SUN CORRIDOR
Takes in MORE
THAN 80% OF ARIZONA'S
POPULATION NOW



The Sun Corridor icon provides a sense of the new geography. It should be understood to extend into Cochise County and include the Sierra Vista region.

Source: Morrison Institute for Public Policy, ASU.

GROWTH HAS BEEN A CONSTANT IN ARIZONA FOR DECADES

Metro and State Population in 1960 and 2006

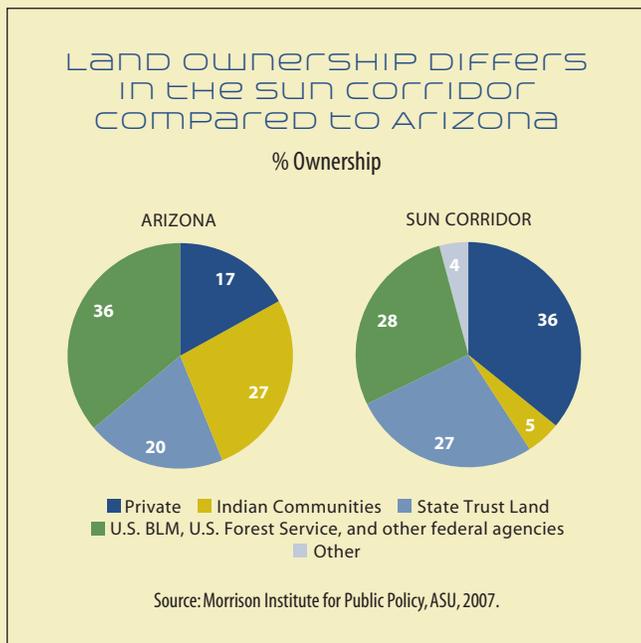
	1960 Population	2006 Population
Metro Phoenix	663,510	4,039,182
Metro Tucson	265,660	946,362
Arizona	1,302,161	6,166,318

1960 reflects Maricopa and Pima counties. 2006 population is the U.S. Census MSA definition.

Source: U.S. Census Bureau and Arizona Statistical Abstract, Morrison Institute for Public Policy, ASU.

SUN CORRIDOR OWNERSHIP

Arizona is almost square in shape, but the sixth-largest state in land area is most certainly not flat. In fact, Arizona is best understood as a series of peaks and river valleys. Arizona's land ownership pattern reflects the historic development of most Western states. The majority of the state's 72.7 million acres is in state, federal, or tribal hands. The Sun Corridor includes approximately 1/5th of Arizona's land mass but 80% of the population. Of the approximately 11.2 million acres* within the Sun Corridor, private ownership accounts for more than a third of the land, roughly twice the percentage of the entire state.



* Acreage based on the area of the Sun Corridor realms rather than the total area of the counties.

METRO PHOENIX AND TUCSON ALREADY ACCOUNT FOR 88% OF ARIZONA'S ECONOMY

Gross Metropolitan Product, 2005

	2005 Size of Economy* (millions \$)	%
Metro Phoenix	160,028	75
Metro Tucson	27,077	13
Arizona	212,312	100

* Gross domestic product by metropolitan area in millions of current dollars.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, September 2007, Morrison Institute for Public Policy, ASU.

He also expected that “communities will be built 15 to 50 miles from the hubs of existing cities.”³

While the “growth machine” courted people and economic development, many also expressed fears about losing the qualities that brought people to Arizona. In 1974, opinions voiced at a public hearing reflected the difference in outlooks: “A predicted megalopolis of 7 million people stretching from Phoenix south to Nogales was among concerns expressed Friday at a public hearing held by the Arizona Environmental Planning Commission....Among opinions expressed by the nearly 100 persons who attended were strong urgings for containment of urban sprawl, better transportation planning, and preservation of farmland.”⁴ Like boosterism, conversation about preserving Arizona from the downsides of growth has been a fixture of Sun Corridor civic life. In some places, concerns prompted conservation and controls; in others they went unnoticed. Over time, proponents of the two ends of the opinion continuum have perfected the art of focusing only on the best or worst case scenarios for Arizona and its cities. As a result, public dialogue and opinion generally have been limited to “pro” and “anti” camps, while the realistic middle has tried to advocate for balance and growing smarter as well as larger.

AFFORDABLE HOMES

Sunshine and jobs made Arizona attractive, but it was the addition of affordable housing that sparked much of the 50-year upward trend. In addition, the innovations of master-planned communities and their ready-made lifestyles helped to make Arizona an easy destination that was very different from the East.

FROM VAST AREA TO SINGLE ENTITY

“The megapolitan concept is more than just two cities’ suburbs spilling across each other’s borders. It’s a combination of land use, commerce, and transportation planning that looks at vast areas as single entities.”⁵ Is a move toward this new geography a move away from caring about quality of life on a local scale? No. The megapolitan moniker simply gives Arizonans a vocabulary as expansive as the Sun Corridor and a sense of urgency to deal with significant challenges.

The megapolitan concept is powerful in part because it reinforces the power of fundamental forces shaping Arizona and the world. Far more than the idea of the moment, megapolitan should be one of Arizona’s watchwords for the foreseeable future.*

SUN CORRIDOR GEOGRAPHY AND LAND OWNERSHIP

THE NEXT CHICAGO?

When people wanted to study how 20th century industrial cities worked, they went to Chicago. The Sun Corridor, because of its characteristics and size, could be a 21st century exemplar – the next Chicago. The Sun Corridor could do worse. With a population of over 9.4 million, the Chicago metropolitan area is in the top tier of worldly cities. An international financial center with tremendous amenities, Chicago’s airports, train stations, and bus depots are some of the busiest in the world, yet it also has an increasingly “green” reputation and successes in revitalization.



* The Sun Corridor utilizes a variety of data from many sources. Thus, time periods are often different. Projections from various sources are used. These may differ in method. In addition, projections are always considering what may happen based on certain assumptions. The best use of the sources is to gain a general picture of the present and future, rather than to depend on the figures for a detailed description.

This report has its roots in a School of Public Affairs (SPA) graduate studio class taught in spring 2006 by visiting professor Dr. Robert Lang, director of the Virginia Tech Metropolitan Institute, and Dr. John Stuart Hall, SPA research professor. Graduate students researched various topics and prepared some of the data and analysis presented here. The staff of Morrison Institute for Public Policy complemented the work of the students and their professors. In addition, the following materials provided a foundation. *Lincoln Institute of Land Policy, Regional Plan Association and the University of Pennsylvania. 2004. Toward an American Spatial Development Perspective. Briefing Paper for a Policy Roundtable on the Federal Role in Metropolitan Development. Tarrytown, NY: Regional Plan Association.*

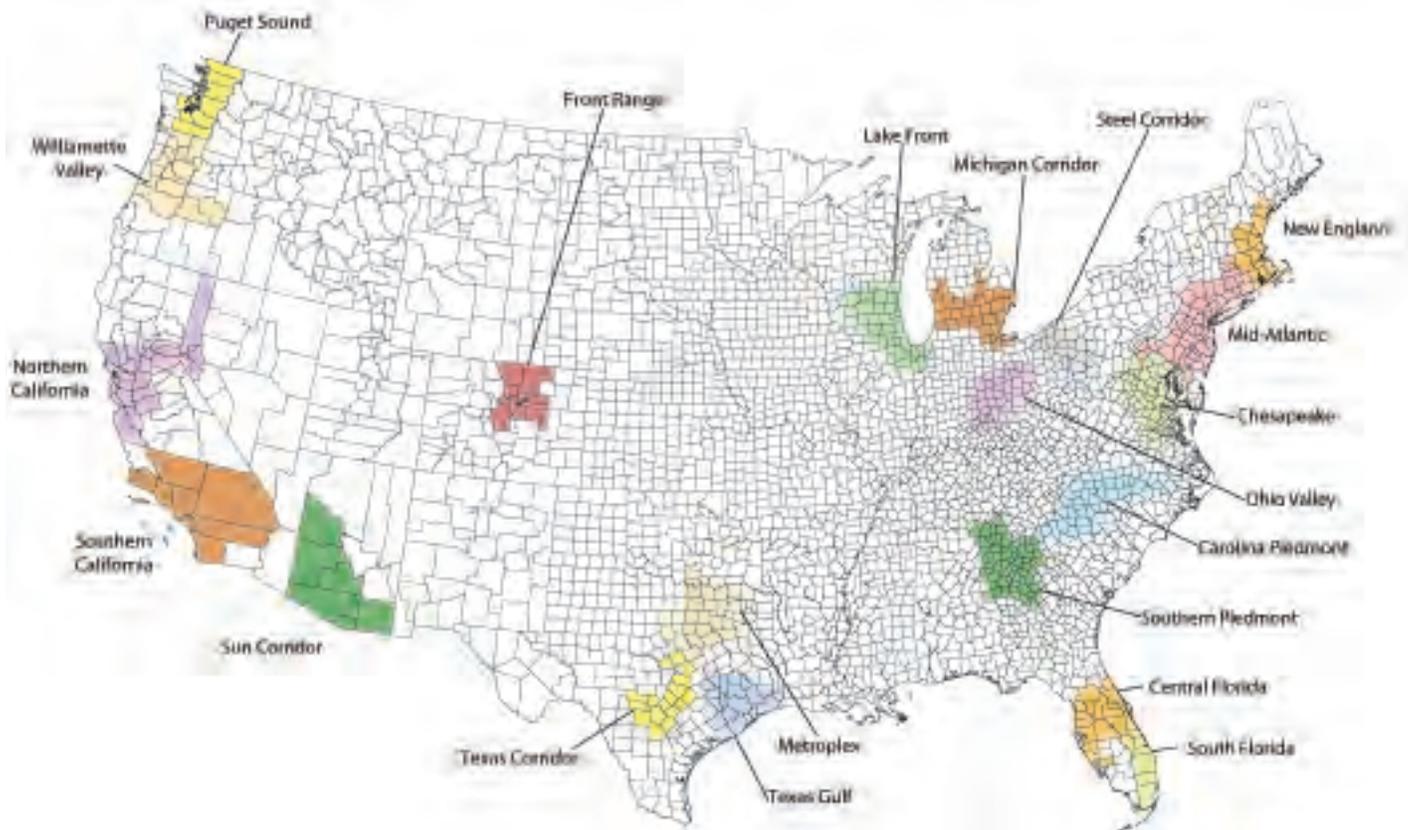
A MEGAPOLITAN NATION

Predictions of growth are not new, and neither is the idea of a corridor or network of cities. However because growth and development now are altering the U.S. at a vast scale and unprecedented pace, the “mega” concept is making its way out of academia and into the mainstream of urban development and public policy. Scholars at the Metropolitan Institute at Virginia Tech took up the more-than-metro banner in 2005 while seeking to depict where the next 100 million U.S. residents might live. Their conclusion was that most growth would be in 20 megapolitan areas, which would combine to form 10 megaregions. These regions would account for roughly 10% of the nation’s area, but more than 60% of the population.

Approximately half of America’s population lived in urban areas by the 1920s. That proportion is more than 80% today. By 2040, two in three Americans likely will live in megapolitan regions, which will include long-time metro centers and new places. This convergence of cities, a result of population increases, economic forces, and public policies, is a familiar process. In the 1960s, Dallas and Fort Worth began growing together, as Washington and Baltimore did in the 1980s. Now more distant cities, such as Tampa and Orlando, Austin and San Antonio, and Phoenix and Tucson, are exhibiting the same pattern.

Building on years of demographic research, Virginia Tech’s megas essentially reflect the areas that by 2040 are expected to

a MEGAPOLITAN NATION IS TAKING SHAPE



Source: Metropolitan Institute at Virginia Tech Alexandria.

have the U.S. Census Bureau’s “combined statistical area” (CSA) designation. The main criterion for this category is economic interdependence among two or more metropolitan areas, as shown by overlapping commuting patterns. All of the megapolitans are expected to be CSAs with at least 5 million people by 2040 and exhibit the hallmark patterns of cross-region commuting and economic interdependence. Virginia Tech scholars expect the 2020 decennial census to show Phoenix-Tucson as a CSA.

Counties have been the building blocks for megapolitans because they are the most consistent units of local governance and decades of detailed statistics are available for them.⁶ The generally large size of counties in western states, however, presents a challenge. Western counties can easily be as large as eastern states. As a result, the concept of urban “realms” is added to counties for two reasons: 1) to divide Arizona’s large counties into smaller study areas; and 2) to provide a new way of looking at areas that include many municipalities and public entities. This is vital because resources will have to be allocated to complex, interrelated issues over larger areas. The Sun Corridor’s realms are described in greater detail later in this publication.

LOOKING ACROSS THE MEGAPOLITANS

Across the U.S., the megapolitans vary from one another just as states do. At the same time, some trends affect them all, and some common characteristics are evident. In the coming years, some of the 20 will expand significantly, while others will experience more modest growth. The southeastern and southwestern regions will gain most dramatically, and, if projections are accurate, the biggest increase may be in the Sun Corridor. The Front Range, both Florida megapolitans, and the Texas Corridor and Metroplex will not be far behind. Southern Piedmont and Carolina Piedmont will follow closely as well. In contrast, Southern California is projected to add residents just on pace with the national growth rate, although that is still significant considering its current size.



Above: Looking south from Thunderbird Road in the early 1960s, Phoenix was not yet a “mega” place. Used by permission AZ DLAPR.

Below: Forty years later, the view south to downtown Phoenix is quite different.



Regardless where a megapolitan falls on the growth continuum, expansion is shaped by these realities:

PEOPLE GO WHERE PEOPLE ARE, CONCENTRATING ECONOMIC POWER AND OPPORTUNITY

As regions grow, opportunities become most plentiful where there are already people, infrastructure, and jobs. More than 180 million Americans now live in megapolitan areas. Another 60 million – roughly the same number as two Californias – are projected by 2030. Thus, not surprisingly, megapolitan areas represent a tremendous concentration of the nation’s wealth and productive capacity. Megapolitan economies now account for nearly 70% of the U.S. gross domestic product.⁷ In addition, the megapolitans are the key zones by which the U.S. has integrated into the global economy. The nation’s leading office markets and high tech clusters are in megapolitans, including Boston’s Route 128, the Bay Area’s Silicon Valley, Northern Virginia’s Dulles Toll Road, and Austin’s Silicon Prairie. The 10 most affluent urban areas lie in megapolitans, as do most of the nation’s busiest air and sea ports.

DENSITY IS THE BEST OPTION FOR MORE PEOPLE

Some megapolitans, particularly South Florida and Southern California, are facing a land shortage. At the same time, the focus increasingly is on adoption of smart growth principles for sustainability and quality of life. To accommodate expected growth and a better built environment, policies and programs are encouraging or mandating building up rather than out. In Florida, the desire to protect and restore the Everglades has drawn a boundary around the mega. Leaders of Broward County, the region’s largest county, expect its last new single-family-detached subdivision to be built in the next several years. The vast California coastal shelf is now bursting at the seams as cities meet the mountains. In Orange County, Santa Ana has lofts, high rises are close to Disneyland, and transit-oriented development has opened in downtown Fullerton. Los Angeles by some measures has the highest density of any urbanized area⁸ in the country. San Diego, which is now merging with Los Angeles, is not far behind. This development pattern will continue as the Southern California megapolitan area squeezes millions of new residents into a limited geography.

URBAN SPACES GO BY MANY NAMES DEPENDING ON SIZE AND CHARACTERISTICS

Type	Description	Examples
Metropolitan Statistical Area	According to the U.S. Census Bureau, an “urbanized area” or “principal city” with at least 50,000 people plus surrounding counties with a 25% Employment Interchange Measure* (EIM) in 2000.	Pittsburgh, Denver
Combined Statistical Area	Two or more adjacent micro and metropolitan areas that have an EIM of at least 15% in 2000, according to the U.S. Census Bureau.	Washington/ Baltimore, Cleveland/Akron
Megapolitan**	Two or more metropolitan areas with anchor principal cities between 50 and 200 miles apart that will have an EIM of 15% by 2040 based on projection.	Sun Corridor, Northern California
Megaregion***	Large, connected networks of metropolitan areas that maintain environmental, cultural, and functional linkages.	Piedmont, Texas Triangle

* EIM means the number of people who travel from one designated place to another for work, such as county to county.

** Defined by Virginia Tech Metropolitan Institute.

*** Defined by Regional Plan Association and Lincoln Land Institute.

Source: Robert E. Lang.

HOW DO YOU SAY VERY LARGE CITY?⁹

On the other end of the land spectrum are Texas' Metroplex and the Carolina Piedmont. In both areas, observers say growth could take place on greenfields to mid-century. Yet even there, smart growth, transportation needs, and quality of life are pushing more compact development. Shifting demographics, sustainability concerns, and other trends may substantially reduce the amount of exurban development in coming years. The Sun Corridor includes a mix of land and development pressures and patterns. Arizona's urban mosaic has more land than California, but aridity, tribal lands, public lands, infrastructure patterns, water policies, and public opinion have already made the region denser than many realize. The argument will be more over the style rather than the substance of putting more people in smaller land areas to deal with the Sun Corridor's mosaic of ownership, enhance quality of life, and preserve open spaces.

NEW DESIGNATIONS AFFECT DOLLARS AND ATTENTION

Mega regions will be closely watched because of the importance of more people to federal funding formulas, marketing targets, and venture capital options. The megapolitan description provides an instant image of the places that will demand attention and investments from the public and private sectors for years to come.

La Placita is a colorful multistory office complex in Tucson. Situated on the site of the former Barrio Historico neighborhood of the 1880's. Bistro cafes, shops, and shady courtyards with picnic seating exist now.



The term “megapolis” came into vogue as early as the 1820s. Since then, observers have described urban areas and forms in various ways. Some of today’s megapolitan concepts are rooted in ideas that originated decades ago.

1930S “Regionalists” and “metropolitanists” debated the nature of the modern city. Metropolitanists believed that 20th century cities would maintain their 19th century centralized form, even as they grew to 10-20 million residents and extended miles from the core hub. Regionalists saw a shift away from a one-center metropolis to a network of cities and villages arrayed across a vast yet integrated region. The megapolitan concept takes off from the regional notion. Author R.D. McKenzie described metropolitan regions as “multi-nucleated in a complex of centers that are economically integrated into a larger unity.”

1949 U.S. Census Bureau designates metropolitan areas to show economic relationships among urban places.

1961 Jean Gottmann’s influential *Megalopolis* foretold the size and commercial impact of urban regions.

1967 In *The Region’s Growth*, New York’s Regional Plan Association applied the regional ideas to the north-east U.S. “The emerging larger form has a multitude of major nodes whose areas are likely to be largely autonomous. Nevertheless, the individual urban centers benefit from mutual proximity, and there is bound to be increased integration.”

1991 The U.S. Congress requires regions to have metropolitan planning organizations to receive federal transportation funding.

2002 The European Union designates the first “global integration zone,” which is comparable to a megapolitan. The U.S. Census Bureau creates the “combined statistical area” (CSA) designation, the first trans-metropolitan category. In 2005, the U.S. had 120 CSAs.

2005 Megapolitan adds a larger unit of analysis by combining metropolitan and micropolitan areas into a larger defined space.

Source: Beyond Megalopolis: Exploring America’s New “Megapolitan” Geography, July 2005.



A MEGAPOLITAN NATION

MEGA PLACES ARE FOUND ACROSS THE U.S. FROM EAST TO WEST AND NORTH TO SOUTH

Population and Land Area in 2005

Regions and Areas	Anchor Metros	2005 Population	Square Miles
Northeast		51,601,118	62,612
New England	Boston/Providence	8,276,116	12,320
Mid-Atlantic	New York/Philadelphia	33,527,905	31,027
Chesapeake	Washington/Baltimore/Richmond	9,797,097	19,265
Great Lakes		34,267,189	68,992
Steel Corridor	Cleveland/Pittsburgh	7,067,896	16,320
Ohio Valley	Cincinnati/Columbus	5,344,052	15,256
Michigan Corridor	Detroit	8,969,861	19,313
Lakefront	Chicago/Milwaukee	12,885,380	18,103
Piedmont		13,953,787	47,226
Carolina Piedmont	Charlotte/Raleigh	7,012,769	26,175
Southern Piedmont	Atlanta	6,941,018	21,051
Florida		13,823,188	26,189
Central Florida	Tampa/Orlando	7,851,525	18,126
South Florida	Miami	5,971,663	8,063
Texas Triangle		18,187,772	70,842
Texas Gulf	Houston	6,247,170	20,801
Texas Corridor	San Antonio/Austin	3,965,018	16,690
Metroplex	Dallas-Fort Worth/Oklahoma City	7,975,584	33,351
Front Range	Denver	3,880,126	20,880
Sun Corridor	Phoenix/Tucson	4,988,564	31,906
Cascadia		7,350,438	35,746
Puget Sound	Seattle	4,106,956	14,628
Willamette Valley	Portland	3,243,482	21,118
Northern California	Bay Area/Sacramento	11,288,313	24,644
Southern California	Los Angeles/San Diego	21,720,656	49,301
Megapolitan Total		181,061,151	438,338
U.S. Total (lower 48 states)		296,410,404	3,007,400

Megaregions are shown in bold. Anchor Metros rank in the top 50 U.S. Metropolitan Areas.

Source: Metropolitan Institute at Virginia Tech, U.S. Bureau of the Census and ESRI, October 2006. Morrison Institute for Public Policy, ASU.

EACH MEGA WILL ADD
MILLIONS OF NEW RESIDENTS

JOBS WILL INCREASE
ALONG WITH POPULATION

Population Growth 2000 - 2030				Employment Growth 2000 - 2030			
2000 Population	2030* Population	Increase*	% Change	2000 Jobs	2030* Jobs	Increase*	% Change
49,948,064	62,427,070	12,479,006	25.0	29,810,773	39,907,658	10,096,885	33.9
8,133,219	9,873,668	1,740,449	21.4	5,202,823	7,036,228	1,833,405	35.2
32,656,309	39,072,196	6,415,887	19.6	18,582,712	23,815,709	5,232,997	28.2
9,158,536	13,481,206	4,322,670	47.2	6,025,238	9,055,721	3,030,483	50.3
33,641,220	39,536,775	5,895,555	17.5	20,240,029	27,253,115	7,013,086	34.6
7,140,287	7,434,689	294,402	4.1	4,125,653	5,401,332	1,275,679	30.9
5,198,100	6,374,776	1,176,676	22.6	3,283,356	4,666,120	1,382,764	42.1
8,835,742	10,070,142	1,234,400	14.0	5,145,202	6,624,297	1,479,095	28.7
12,467,091	15,657,168	3,190,077	25.6	7,685,818	10,561,366	2,875,548	37.4
12,633,926	19,096,474	6,462,548	51.2	7,959,205	11,892,775	3,933,570	49.4
6,460,338	9,431,809	2,971,471	46.0	4,088,784	5,983,031	1,894,247	46.3
6,173,588	9,664,665	3,491,077	56.5	3,870,421	5,909,744	2,039,323	52.7
12,474,423	20,312,554	7,838,131	62.8	6,942,288	11,653,237	4,710,949	67.9
6,975,772	11,352,506	4,376,734	62.7	3,954,535	6,834,409	2,879,874	72.8
5,498,651	8,960,048	3,461,397	62.9	2,987,753	4,818,828	1,831,075	61.3
16,525,203	25,598,697	9,073,494	54.9	10,166,894	16,091,038	5,924,144	58.3
5,699,704	8,535,961	2,836,257	49.8	3,354,405	5,268,726	1,914,321	57.1
3,573,621	5,870,470	2,296,849	64.3	2,178,404	3,780,176	1,601,772	73.5
7,251,878	11,192,266	3,940,388	54.3	4,634,085	7,042,136	2,408,051	52.0
3,582,688	5,594,523	2,011,835	56.2	2,464,171	3,968,775	1,504,604	61.1
4,295,516	7,839,873	3,544,357	82.5	2,456,731	4,527,408	2,070,677	84.3
6,901,160	9,927,217	3,026,057	43.8	4,349,993	6,370,273	2,020,280	46.4
3,892,016	5,556,154	1,664,138	42.8	2,496,805	3,687,791	1,190,986	47.7
3,009,144	4,371,063	1,361,919	45.3	1,853,188	2,682,482	829,294	44.7
10,788,599	15,057,719	4,269,120	39.6	6,752,872	9,938,199	3,185,327	47.2
20,326,831	27,796,900	7,470,069	36.7	11,451,406	16,821,342	5,369,936	46.9
171,117,630	233,187,802	62,070,172	36.3	102,594,362	148,423,820	45,829,458	44.7
282,193,477	378,302,736	96,109,259	34.1	166,758,782	240,248,993	73,490,211	44.1

* Projected.

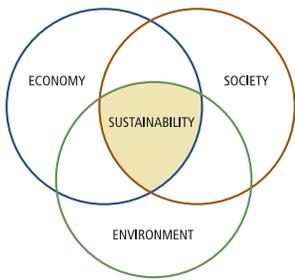
Source: Metropolitan Institute at Virginia Tech, October 2006 tabulation from U.S. Census Bureau 2000 data and Woods & Poole Economics, Inc. for 2030. Morrison Institute for Public Policy, ASU.



WHAT'S SHAPING THE SUN CORRIDOR NOW

After a half century of dramatic growth, new circumstances and the effects of past decisions are shaping the Sun Corridor now.

THE RISE OF SUSTAINABILITY



Sustainability – meeting the needs of the current generation while allowing future generations to meet theirs and balance among the economy, environment, and community – is becoming central to governments, organizations, businesses, and individuals.

The downsides of environmental damage, climate change, and global growth have been just some of the catalysts for the rise in interest in sustainability. The “triple bottom line,” a conservation ethic, and livable communities are increasingly in the public eye and in the public mind.

THE STATE TRUST LAND WILD CARD

The Arizona State Land Department manages approximately 9 million acres of state trust land – many of which are now

in or close to urban areas. How these lands are dealt with will dominate discussions of the form, speed, and design of growth and development in the coming years. Much of the Sun Corridor’s land is controlled by the State Land Department. Various comprehensive reform initiatives have failed in recent years, but efforts to create ways to provide for more conservation, better planning, and intergovernmental cooperation while fulfilling the trust’s mission are continuing.

One encouraging sign is the continuing attention to the huge parcel known as *Superstition Vistas*. Following the attention focused on this 275-square-mile area by a Morrison Institute report in 2005, a broad group of stakeholders has embarked on a visionary, interactive planning process. Funded by a variety of contributors and supported by the State Land Department, this effort could become a model for mega-scale thinking about state trust land and its role in the future of Arizona.

“ENTITLED” DEVELOPMENT AND PROP 207

In development parlance, “entitled” is the principal step of government land use approval. The public thinks of the process as “zoning” but that may be only one piece of complex “entitlements.” Arizona’s jurisdictions have already entitled thousands of units. While more are usually entitled than are built, patterns of growth and development have already been set for far into the future. For example, more than 650,000 units are entitled in Pinal County. While cities may change what has been put into place, the 2006 passage of Proposition 207 made alterations more difficult, risky, and potentially costly. Proposition 207 has been called the “most sweeping change in Arizona land-use law in the state’s history.”¹⁰ The voter-approved measure included “a requirement that government must compensate for the negative financial impacts of land-use regulations on the value of private property.”¹¹ Despite the current existence of miles of empty land, Sun Corridor entities actually have limited room to maneuver.

Superstition Vistas, 275 square miles of state trust land, is in the middle of the Sun Corridor.



COMPETITION FOR A DIVERSE, HIGH-WAGE ECONOMY

Every region is competing for leadership in a knowledge economy that functions across boundaries of all types. Experts and experience show that talent, innovation, science and technology research, and investments in livability and sustainability are vital to success. Because of the worldwide nature of commerce and the increasing movement of people around the world, multi-lingual and multi-cultural economies and communities are a reality.

Arizona's K-12 performance, expansion of higher education to meet demands, and retraining and upgrading of the work-

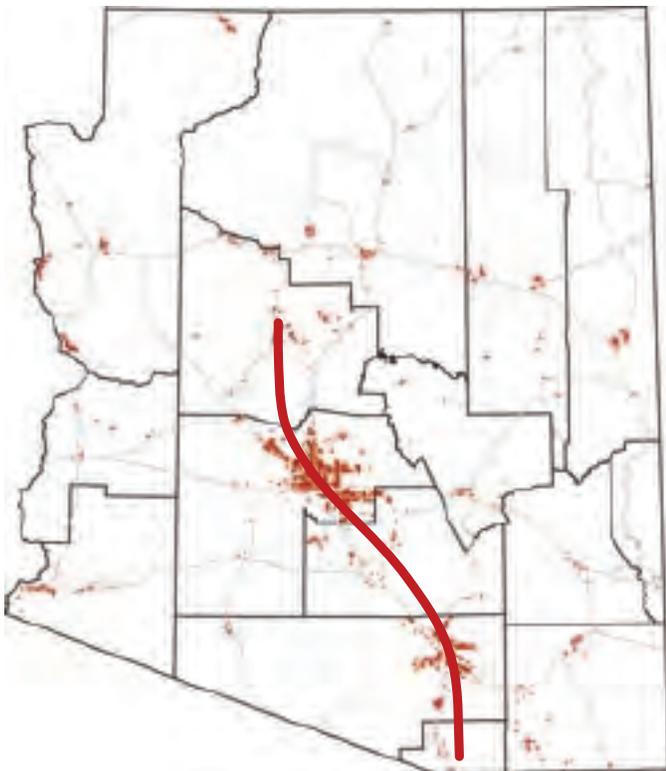
force are just some of the learning issues tied to developing a vibrant knowledge economy. Governor Napolitano's P-20 Council is at the forefront of determining how to align learning and the economy at all ages and to ensure that Arizona's students are prepared for work in a global economy. The effort is clearly critical, considering that the state's students overall continue to lag in achievement in various ways.

DOMINANT AND DRAMATIC TECHNOLOGIES

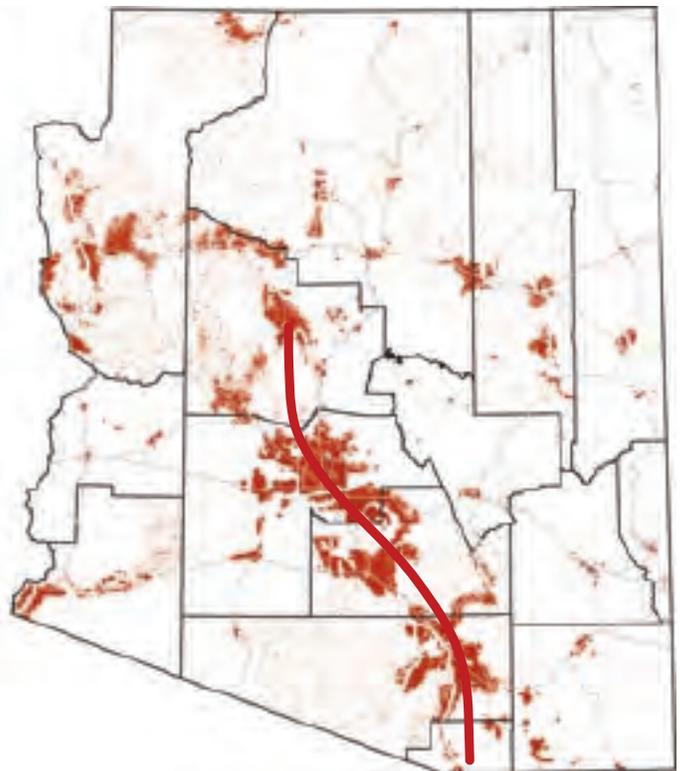
The dramatic extent to which technology is shaping everyday life, health, and commerce is hidden to most people. Each person understands only a small fraction of how the goods, services, and options are changing because of advances in

ARIZONA'S POPULATION WILL NEED MORE LAND

2000



2050



Note: Populated areas shown in red.

Source: Morrison Institute for Public Policy, ASU; map adapted from Maricopa Association of Governments.

science and technology. In the next 20-30 years, many observers are looking to future breakthroughs for progress in such areas as sustainability, education, energy, and transportation. From the mundane to the global, technology is the factor to watch. Today's public investments

in university science and technology research and private sector developments are expected to lead to useful products, new businesses, and new ways of working, communicating, and traveling, as well as solutions to problems that have yet to surface.

The Sun Corridor's cities have been as affected by the advances of science and technology, such as water delivery systems and air conditioning, as much as or more than other places. Continuing innovations and tech developments are a significant factor for the Sun Corridor – whether in goods and services or in how people and places relate to others. However, many observers are cautioning that advances in traditional sci-tech alone will not be enough to solve social, economic, and environmental problems.

HIGHWAYS AND WATER PLANNING AREAS HELP DEFINE THE SUN CORRIDOR

AGE, DIVERSITY, AND EQUITY
As Arizona's majority white population ages, substantial immigration and high birth rates among Latinos and other communities will be increasingly sources of youth and workers. The state's older and younger segments are growing faster than the working-age population. The changing mix of ages and the diversity of the population will make the future Sun Corridor different than the present. Immigrants will play a big part here.

LATINO WORKERS, CONSUMERS, AND LEADERS
Hispanic Arizonans soon will comprise much of the state's homegrown workforce. In addition, immigrants will continue to fill gaps in the workforce. Arizona Latinos spend \$15 billion in the state's economy currently. In addition to their consumer clout, investments in education and the rise of the second and third generations will move Latinos to center stage economically and politically.

WATER ASSUMPTIONS AND QUESTIONS
Arizona has a history of innovation in water planning and development. The creation of Salt River Project, the 1980 *Groundwater Management Act (GMA)*, the Central Arizona Project, and the Arizona Water Institute stand out as



Source: Arizona Water Atlas, Arizona Department of Water Resources, 2006.

examples. Indian water rights settlements early in the 21st century are another important example of Arizonans dealing with water issues in advance of problems becoming insurmountable. Such settlements will have a dramatic impact in determining the future shape of the Sun Corridor and in structuring how critical decisions will be made about growth and the future of farming.

Yet, outside of active management areas related to the GMA, portions of the Sun Corridor are subject to fewer regulations and are likely on the path to a negative water future. Groundwater pumping continues at levels that outstrip recharging. While many experts predict sufficient water for Arizona’s projected population, others are far less sure, particularly with climate change and evolving public opinion about the intrinsic value of natural resources and environmental restoration. Public opinion often contrasts with expert opinion. For example, a 2006 survey by Valley Forward noted that those in metro Phoenix considered their region to be in a water “crisis.”

CHANGING PEOPLE AND DIFFERENT LIFESTYLES

Baby boomers’ preferences for retirement will less often include golf and age-restricted communities. Downtown locations are gaining favor with empty nesters in addition to young professionals. Latino consumers have different preferences still. Housing choices are in the spotlight as lifestyles change and the marketplace must adapt.

GROWING INFLUENCE OF TRIBAL COMMUNITIES

Seven of Arizona’s 22 federally recognized tribes have reservation communities in the Sun Corridor. The choices made by tribal leaders and institutions will

make a difference in the patterns of growth, presence of agriculture, water uses, and the future of intergovernmental collaboration. Often ignored in the past, tribal communities are increasingly important players.

NEW STEPS TOWARD “BUILDING A QUALITY ARIZONA”

Arizona’s Department of Transportation and the state’s councils of governments and metropolitan planning organizations are just some of the entities that share responsibility for mobility planning. Deciding how and where to design transportation systems, however, is affected by land use and economic development. Traditionally, all of these systems have operated separately. With dramatic growth continuing throughout the Sun Corridor and other parts of Arizona, the state’s transportation planners have joined with the Governor’s Office to collaborate on “development of a Statewide Transportation Planning Framework that includes transportation alternatives and integrates them with land use and economic planning and development.”¹² This unprecedented effort is looking at circumstances and needs to 2050.

STRUGGLING OVER THE SIZE AND SCOPE OF GOVERNMENT

Arizona was a “progressive” state in 1912 at statehood. Over nearly 100 years of history, Arizona has become known as a “conservative” state. Since the mid-1980s, there has been significant tension between those who think Arizona’s overweening governments should be curtailed and those who think the public sector must make more investments to meet the demands of the 21st century. This tug of war will most likely continue to shape choices in all public policy areas related to the Sun Corridor.

MANY ARIZONANS CAME FROM SOMEPLACE ELSE

	% Born in Arizona
Arizona	35
Sun Corridor	33
Northwest	27
West Valley	28
Central Valley	37
Upper East Valley	25
East Valley	32
Mid-Mega	50
Foothills	28
Rincon	40
Gateway	33
SouthCo	26

Source: Census 2000, Morrison Institute for Public Policy, ASU.

THE RECENT TOP STATES FOR NEW ARIZONA RESIDENTS ARE SIMILAR TO THOSE 40 YEARS AGO

Sources of Arizona’s Migrants, 1960 and 1996-2005

1960*	1996-2005**
California	California
Illinois	Illinois
New York	New York
Indiana	Washington
Minnesota	Texas
Ohio	Colorado

* Origin of families moving in the last 5 years.

** Compiled from drivers licenses surrendered from other states.

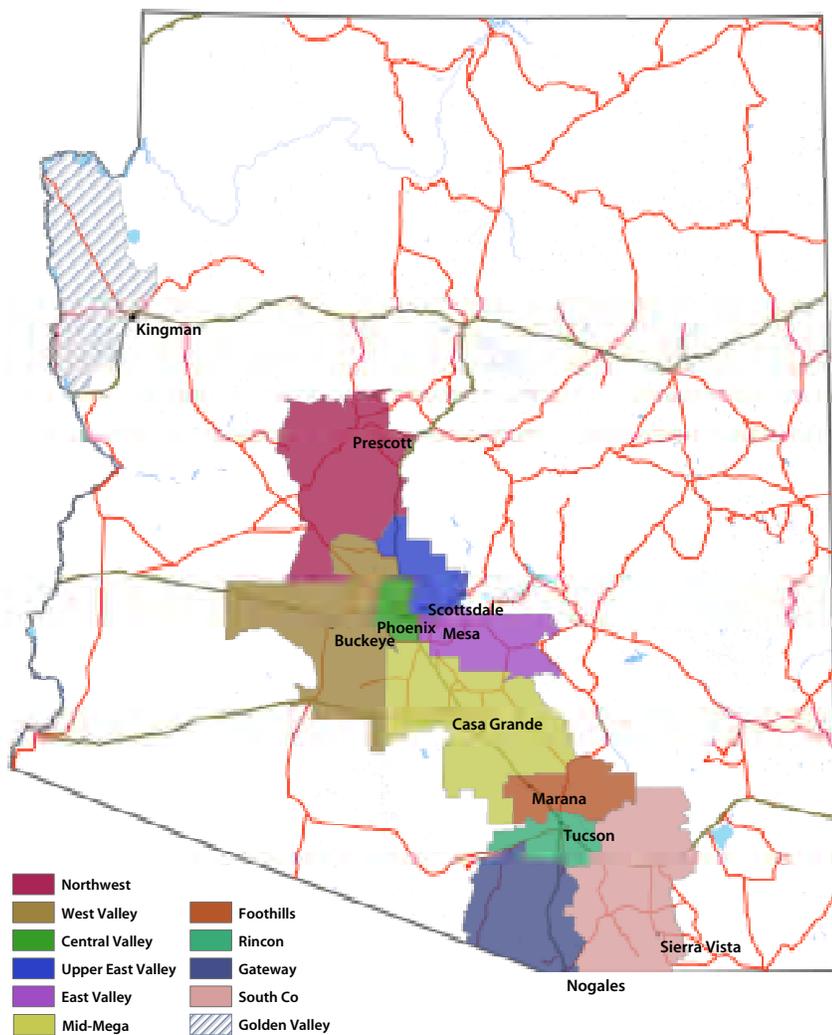
Sources: Phoenix Newspapers, Inc. and Arizona Motor Vehicle Division, Morrison Institute for Public Policy, ASU.

THE SUN CORRIDOR'S URBAN MOSAIC

The city of realms came into existence when...
the metropolitan area increased to the point that the majority
of persons living in an outlying section of the city
no longer had constant direct ties to the central city.

James Vance, *The City of Realms*

THE REALMS OF THE SUN CORRIDOR



Note: The realms are based on census tract data. This accounts for the detail of the realm boundaries. However, these areas are still meant to give only a general sense of size and location. Golden Valley in northwest Arizona could be viewed as another realm. However, it would be related to the Southern California megapolitan.

Source: Morrison Institute for Public Policy, ASU, 2007.

Geographer James Vance popularized the “urban realms” concept in the 1960s. To him, the dispersal of people and jobs had made U.S. metropolitan areas so decentralized that they were not “cities” but a series of sometimes independent, sometimes dependent realms. Vance saw realms as the natural outcomes of growth. A region became less “core” and “fringe” and more equal, cooperative, and shared as areas grew and matured. Eventually, realms comprise the basic units of an extended metropolis.

SUN CORRIDOR AND ITS REALMS

The many connections among realms stitch a megapolitan together and make it one functionally integrated space, despite its size. Realms are a helpful concept for the Sun Corridor because:

- A mega sense of place demands new ways of distinguishing urban areas.
- Current competition makes it hard for public entities to think at the mega level.
- Tribal and public lands, mountains, and highways divide the Sun Corridor into areas that share characteristics but include many boundaries.
- Such areas could be more neutral politically than cities and towns.
- Existing geo-political units are in part communities of memory with complex pasts. Realms can be defined and evaluated more objectively than existing entities.

Ten Sun Corridor realms were identified by looking at history, geography, free-ways, economies, and other factors. Four realm types became evident.

VANCE'S URBAN REALMS ARE DEFINED BY CHARACTERISTICS, NOT BOUNDARIES

Population, Commuting Patterns, and Geography Help Define the Sun Corridor

General Characteristics	Sun Corridor
Overall size of the region – the bigger the metropolis, the more plentiful and differentiated the realms	<ul style="list-style-type: none"> • 2000 4.3 million or 8 out of 10 Arizonans with a projected 10 million in 2040. • 10 realms ranging in population from approximately 100,000 to nearly 2,000,000 and including 6 counties and 57 municipalities.
Terrain and topography – Physical features such as mountains, bays, and rivers often serve to delimit realms by directing the spread of urbanization into distinct and geographically defined areas	<ul style="list-style-type: none"> • Mountains and valleys define the Sun Corridor from the Bradshaws in the north to the Chiricahuas in the south with numerous ranges in between. • Salt, Gila, Aqua Fria, San Pedro, and Santa Cruz rivers define the spaces • 36% private land ownership in the Sun Corridor • I-10, I-8, I-17, I-19 Loops 101, 202, and 303, U.S. 60 • Union Pacific and BNSF Railroads
Amount and type of economic activity – Places share generally either an overarching type of economy (such as Silicon Valley) or employment centers identified by commute sheds	<ul style="list-style-type: none"> • In 2000, the six counties of the Sun Corridor each sent workers out of the county: Maricopa 2%, Pima 3%, Cochise 7%, Yavapai 12%, Santa Cruz 13%, and Pinal 40%. Destinations were primarily Maricopa and Pima counties. • The six counties in the Sun Corridor account for more than 80% of Arizona's employment.

Source: Census 2000, Morrison Institute for Public Policy, ASU.

- **URBAN CORES** Centers of early-to-mid 20th century development, including the region's major central cities and downtowns
- **MATURING SUBURBS** Areas of mid-to-late 20th century and early 21st century development that are rapidly filling in and ultimately will approach the core in scale
- **FAVORED QUARTERS** The most affluent portions of the region with upscale communities, luxury shopping, and high-end development
- **EMERGING EXURBS** Rapidly growing, lower-density spaces that will not soon be full extensions of the main metropolitan development

REALM TO REALM HIGHLIGHTS

Profiles¹³ of the Sun Corridor realms were compiled from Census 2000 for insights into the megapolitan region.¹⁴ Because the Sun Corridor accounts for so much of the state's population, economy, and wealth, the region's statistics tell a

REALMS IN THE SUN CORRIDOR ILLUSTRATE VANCE'S IDEAS

Sun Corridor Has Four Types of Realms

Urban Cores	Favored Quarters	Maturing Suburbs	Emerging Exurbs
2	2	2	4
Central Valley Rincon	Upper East Valley Foothills	East Valley West Valley	Northwest Mid-Mega, Gateway, SouthCo

Source: Morrison Institute for Public Policy, ASU.

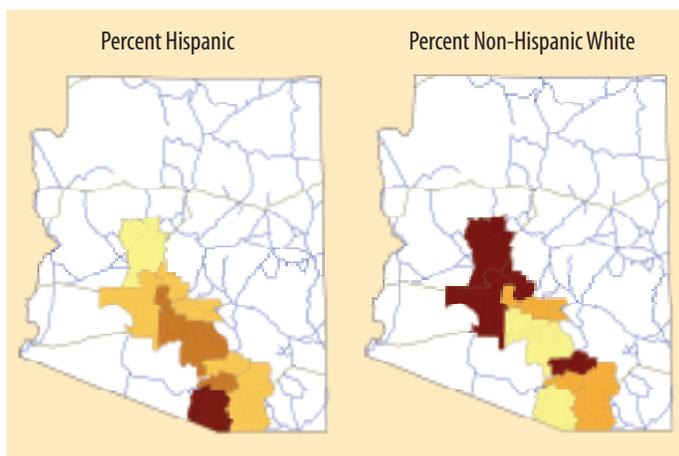
story similar to that for Arizona as a whole. The differences appear when the Sun Corridor is compared to the remainder of Arizona. Even though some areas outside of the Sun Corridor are growing also, the challenges faced by the state's mostly rural areas for attention and resources are evident. A key to rural development will be the spin-offs from the Sun Corridor and building connections with its entities.

- Population is greatest in the most established mid-sections of the Central Valley, East Valley, Upper East Valley, and Rincon.
- Incomes are highest in the Upper East Valley, Foothills, and East Valley. Educational attainment is greatest there also, as is the proportion employed in management and professional jobs. Production and transportation occupations stand out in the Mid-Mega, Gateway, and Central Valley.
- Latino population is greatest in the southern portion of the Sun Corridor, and non-Hispanic white population is greatest in the northern area.
- Homeownership ranges from a high of 75% to a low 53%. Values range from a high in the Upper East Valley to a low in the Mid-Mega.
- The Sun Corridor's residents are somewhat better off than Arizonans as a whole. The region counts somewhat fewer households below the poverty line.

MORE PEOPLE, OLDER RESIDENTS, AND MORE LATINO ARIZONANS

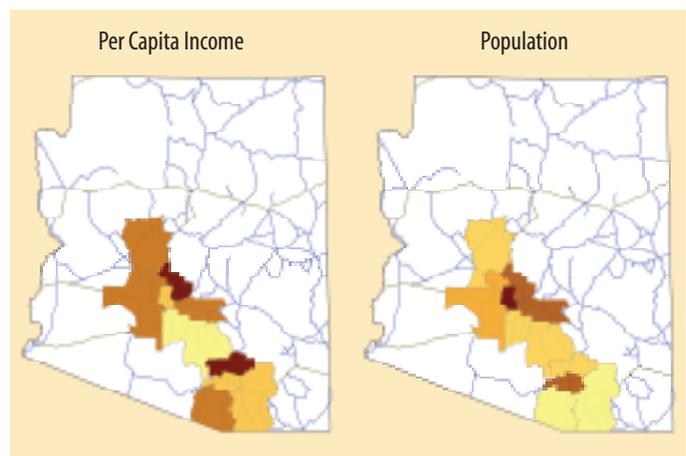
- Although the current economic downturn is likely to affect near-term projections, the Sun Corridor is predicted to continue to grow more rapidly than the nation over the next five years. More than two-thirds of the expansion is anticipated in the mid-sections of the Central, East and West Valley realms.
- The Sun Corridor's average age is projected to increase slightly over the next five years, from 35.1 to 35.9, thanks mainly to an increase in the retirement-age population.
- Average income growth is projected to slightly outpace the national average over the next five years. The Foothills may see the highest income growth over this period, but the Northeast Valley will remain the wealthiest realm.
- Latinos will make up more than 1/3 of the region's population by 2011. The Gateway realm will continue to have the highest concentration of Hispanic residents.

LATINOS, WHITES, AND THE SUN CORRIDOR



Source: Morrison Institute for Public Policy, ASU, 2007.

INCOMES, POPULATION, AND THE SUN CORRIDOR



Source: Morrison Institute for Public Policy, ASU, 2007.

REALMS IN BRIEF: NORTH TO SOUTH

Realm	Highlights/Assets	Strengths	Challenges	
Northwest Urbanizing Outposts	<ul style="list-style-type: none"> • Small town images • Prescott Airport • Embry-Riddle Aeronautical University • Lake Pleasant 	<ul style="list-style-type: none"> • Pre-emptive efforts for quality growth • Strong identities • Open spaces 	<ul style="list-style-type: none"> • Higher education assets • Recreation areas • Public lands 	<ul style="list-style-type: none"> • Continuum of housing • High median age • Small-town and “Old West” feel at risk • Learning quality lessons • I-17 limitations • Water supply
West Valley The Cinderella Realm	<ul style="list-style-type: none"> • Coming into its own • Land available • ASU West Campus • Garvin School of International Management • Sports facilities 	<ul style="list-style-type: none"> • Continuum of housing with rising affluence • Loop 303 • Specialized military base • Higher education assets 	<ul style="list-style-type: none"> • New amenities (Heard Museum West) • Committed benefactor • Agua Fria Recreation Corridor • I-10 to California 	<ul style="list-style-type: none"> • Quality economy after real estate slows • Jobs-housing balance • Negative image • Skill/job matches • Education and quality jobs • Parity with other realms • Air quality
Central Valley First Among Equals	<ul style="list-style-type: none"> • Influence throughout the Sun Corridor • Downtown Phoenix • Sky Harbor Airport • Arts and culture hub 	<ul style="list-style-type: none"> • Job core • Government core • Arts and culture core • ASU Downtown Campus • Bio-sciences core • Light-rail center 	<ul style="list-style-type: none"> • Historic neighborhoods • 202 and 101 Loops • Redevelopment momentum • Desert preserves • Sky Harbor Airport 	<ul style="list-style-type: none"> • Competing globally • Skill/job matches • Commuting • Low-income core • Heat island effect • Patience to see projects through • Equity in renovation • Reluctant to embrace bilingual-bicultural communities • Aging infrastructure • Air quality • Competition with Rincon
Upper East Valley The Crown Jewel	<ul style="list-style-type: none"> • Employment powerhouse • Camelback Corridor • Cultured image • Scottsdale brand 	<ul style="list-style-type: none"> • Quality job center • ASU SkySong • Desert preserves 	<ul style="list-style-type: none"> • Affluence • Enduring upscale image • Arts and culture 	<ul style="list-style-type: none"> • Continuum of housing • Heat island effect • Traffic congestion • Competition from new areas • Embracing redevelopment • Air quality
East Valley The Third Power	<ul style="list-style-type: none"> • Strong identity • ASU Tempe and Polytechnic • Gateway area 	<ul style="list-style-type: none"> • Family-friendly, suburb image • ASU Tempe and Polytechnic campuses • 3rd-largest job base and increasing quality • Light-rail links 	<ul style="list-style-type: none"> • Vibrant and redeveloping downtowns • Phoenix-Mesa Gateway Airport • Larger U.S. 60 • San Tan Freeway 	<ul style="list-style-type: none"> • Slow to regional action • Largest municipality weakened by finances • Heat island effect • Adapting to changing demographics • Reluctant to embrace bilingual-bicultural communities • Available land • Air quality
Mid-Mega The One to Watch	<ul style="list-style-type: none"> • In growth spotlight • Golden Corridor • State parks • Historic towns and buildings 	<ul style="list-style-type: none"> • Continuum of housing • Public lands • Rich history in communities 	<ul style="list-style-type: none"> • Rail connections • County comprehensive planning process • Economic development focus 	<ul style="list-style-type: none"> • Negative jobs-housing balance • Development before planning • Transportation • Rural to urban transitions • Skill/job matches • Education and quality jobs • Heat island effect • Air quality
Foothills AZ Lifestyle Leader	<ul style="list-style-type: none"> • Upscale image • Natural beauty 	<ul style="list-style-type: none"> • Resorts • Scenery • Upscale neighborhoods 	<ul style="list-style-type: none"> • Sense of place • Mountain location • Traditional favored quarter 	<ul style="list-style-type: none"> • Matching quality jobs to housing • Continuum of housing • Transportation • Conservation • Air quality
Rincon The Southern Anchor	<ul style="list-style-type: none"> • Focus of southern government, economy, education, and culture • Regional Transportation Authority 	<ul style="list-style-type: none"> • University of Arizona • Aerospace and optics • Desert identity 	<ul style="list-style-type: none"> • Bilingual and bicultural • Specialized military base • Open space plan • Job core • Unified economic development focus 	<ul style="list-style-type: none"> • Relatively slow to create quality jobs • Rapid groundwater use • Competition with Central Valley • Heat island effect • Air travel resources • In-realm transportation
Gateway International Thoroughfare	<ul style="list-style-type: none"> • Connection between Arizona, Mexico, and Latin America 	<ul style="list-style-type: none"> • Bilingual and bicultural • CANAMEX Corridor 	<ul style="list-style-type: none"> • Cross-border economy • I-10 east 	<ul style="list-style-type: none"> • Immigration stresses • Low incomes • Skill/jobs match • Quality education and workforce development • Water quality • Air quality • Cross-border environmental declines
SouthCo Tech Hotspot	<ul style="list-style-type: none"> • Military influence and coming growth center 	<ul style="list-style-type: none"> • Skilled workforce • Military foundation for economy and entrepreneurs 	<ul style="list-style-type: none"> • Tech spin-offs from Rincon and military • I-19 	<ul style="list-style-type: none"> • Pressure on San Pedro River • Wildlife and open space pressures • Vulnerable to military changes • Immigration stresses

SO WHAT? FIVE MEGATON TOPICS

FIVE AREAS OF CONCERN

THE TREND IS GLOCAL

Big Fish in Relatively Small Ponds, Phoenix, Tucson, and the Sun Corridor Lack a Global Profile

GOVERNANCE

The Sun Corridor Has Hundreds of Players and No One's in Charge

TWO TRILLION DOLLAR QUESTIONS

Can Quality Ever Hope to Compete with Easy Money and 50 Years of Tradition? Who Will Pay for Public Systems and Spaces?

WHAT ABOUT WATER?

The Oil of the 21st Century, Water is a Critical, Limited Resource

THE TRAGEDY OF THE SUNSHINE

Each Person Adds to and Subtracts from the Sun Corridor's Resources

For more than 50 years, observers have been suggesting that Phoenix and Tucson would grow together into one giant desert conglomerate. Now it has a name: the Sun Corridor. And for all of that time, the possibility has been seen as exciting, intriguing, and distressing.

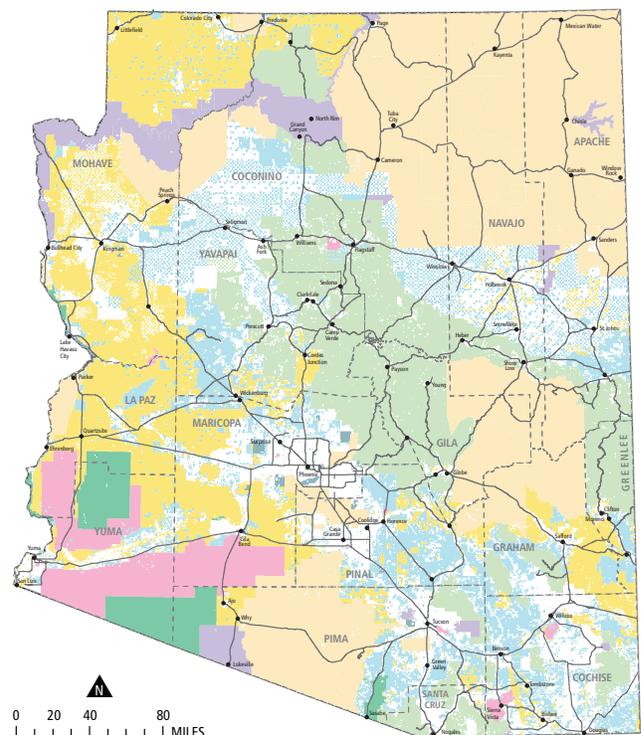
For a long time, Arizonans thought the point was that the cities would physically blend together, so that there would be no sense of leaving one place and entering another. Interstate 10 would be lined with houses and shopping centers the whole way. That has not happened, and given the location and current plans of the Gila River Indian Community, probably will not come to pass. This study recognizes a more sophisticated technique for analyzing urban growth – that the economic merger brought on by overlapping commuting patterns and shared interests is more important than a physical one. The Sun Corridor is already becoming a single economy, and its borders extend even farther than the commentators of the past expected.

The possibility of 8 million people living a high-consumption lifestyle in a region with an arid climate, fragile environment, and history of laissez-faire attitudes causes nearly everyone to do a double take – no matter how long they have been Arizonans or how they feel about growth. The concerned, often even flabbergasted, reaction highlights the opportunity to look at the Sun Corridor differently, not in judgmental terms, but in analytical ones.

The following pages present overviews of areas that are topics of concern for the Sun Corridor, issues in which futurists forecast dramatic changes in coming years, and subjects of intense development or debate now. People, places, and values all play a substantial part in a variety of positives and

negatives. The Sun Corridor in 2020, 2030, and 2040 will be recognizable, but different. How different will depend in large part on choices in five big areas.

ARIZONA HAS MANY PUBLIC LAND OWNERS



Source: Arizona Department of Transportation.

1

THE TREND IS GLOCAL

Big Fish in Relatively Small Ponds, Phoenix, Tucson, and the Sun Corridor Lack a Global Profile

“Paris is romance, Milan is style, New York is energy, Washington is power, Tokyo is modernity, Lagos is corruption, Barcelona is culture...”¹⁵ Phoenix is...well, not included in this recent ranking of global cities and their brands.

This report’s opening scenario paints a fairly rosy picture of the Sun Corridor as a powerhouse of global commerce plugged into the knowledge economy, connected to Asia and the world. But what if that does not happen? It seems at least equally plausible that the trajectory of growth in the Sun Corridor may produce primarily warehouses along the CANAMEX Corridor and distribution centers for Southern California.

Electronics manufacturing plants were once the source of large numbers of well-paying jobs in the Phoenix metropolitan area, but Intel’s new Fab 32 may be the last of its breed in the U.S., as most new electronic manufacturing goes offshore. Call centers were a boon to metro Phoenix job growth in the 1980s and 1990s. The jobs were not as good as those making chips, and many of those call centers have now also moved abroad.

Metro Phoenix has always been good at producing jobs in a variety of industries. Pima and Pinal counties have often lagged Maricopa County in this regard, but adaptability to new job opportunities and industries has been a hallmark of Arizona’s growth. The state’s economy has been relatively diversified and quite derivative. The bets have not been placed on a single industry such as aerospace, but rather on population growth, construction, and housing, which attract people who bring jobs and industry with them.

A consequence, however, is that the Sun Corridor’s economy is challenged by lower cost producers around the world. The Sun Corridor could easily be lost as an independent global player, operating only in a supporting role and known only for the *number* of jobs it creates, not the *quality* of those jobs. The

CANAMEX CORRIDOR AND THE SUN CORRIDOR



Source: Arizona Department of Transportation, June 2005.

debate between the quantity and quality of jobs has been going on for years throughout Arizona and it is at the heart of considerations for the Sun Corridor’s prosperity.

GLOBALISTS AND LOCALISTS

The rewards of international leadership were crystal clear to many the first time they heard the phrase “global economy.” For these “globalists,” all the world’s an economic stage. They champion innovation for a first-rate economy. They thrill to the worldwide race, even as equally concerned “localists” defend the Sun Corridor as doing just fine the way it is. The “globalists” and the “localists” are both right about some things. As futurist Richard Watson described in one of his trend outlooks: “There

ARIZONA'S POPULATION WILL BE MARKED BY THE YOUNG AND THE OLD

Age and Dependency 2000 and 2030

Indicator	2000	2030	Change
Median Age	34.2	39.3	5.1
Male	32.9	38.2	5.2
Female	35.5	40.6	5.1
Dependency Ratio*	74.2	96.6	22.4
Youth**	51.6	53.1	1.5
Old Age***	22.7	43.5	20.8

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

** Youth dependency ratio = under 20/20-64 X 100.

*** Old age dependency ratio = 65 and over/20-64 X 100.

Indicator	2000	2030	Change
Child-Women Ratio****	35.3	41.4	6.1
Sex Ratio *****	99.7	101.9	2.3
Under 18	105.4	106.4	1.0
18-64	102.0	104.1	2.1
65-84	83.8	95.5	11.7
85+	50.6	71.1	20.4

**** Child-Women ratio = under 5 / Female 15-44 X 100.

*****Sex Ratio = Male/Female X 100.

Source: *Land Use Choices and Challenges for the 21st Century*, 91st Arizona Town Hall Report, College of Public Programs, ASU, October 2007.

is already evidence emerging that power is shifting towards the local at the one end and the global at the other.”¹⁶ The question is how the two perspectives will work together to make the Sun Corridor a successful brand that stands simultaneously for global reach and local strength.

Arizona is the 18th-highest exporter among the 50 states, and Mexico is Arizona’s largest trading partner. However in global awareness, cross-border relationships, and business capacity, the Sun Corridor is just getting started. For example, in 2005, The Brookings Institution ranked 300 metro areas in the U.S. and around the world on the strength of their connections to the global producer service economy.¹⁷ Of the 40 (including

Phoenix¹⁸) in the U.S., Phoenix’s score (25th) placed it well below Atlanta (6th), Dallas (9th), Houston (10th), Seattle (11th), and Denver (12th).

Some observers say that the Sun Corridor’s location and history mean that it will always strive – for better and worse – in the shadow of Southern California. The business relationship between SoCal and the Sun Corridor has promoted some industries, such as homebuilding and distribution, while robbing the region of other opportunities, such as nurturing international service firms. To these thinkers, the Sun Corridor unfortunately functions as a distant Southern California suburb – a warehouse hub instead of a global partner.

Where is the common ground for the Sun Corridor’s globalists and localists? Many would say it is in the education that prepares Arizonans to thrive as entrepreneurs and workers in global concerns and local industries. Without that foundation, the Sun Corridor will fail to compete on the world stage, leaving local economies to suffer also.

THE NEXT LEARNING REVOLUTION

When officials began celebrating the Golden Corridor between Phoenix and Tucson, a secondary education was enough for a good job. In the decades since, educational attainment has risen as have the skills jobs demand. Expectations continue to escalate as more people appreciate that education is not just the key to individual earnings, but also to broad participation in civic life and innovation potential for the Sun Corridor.

Unfortunately, Arizona’s education system is stuck behind the times. As futurist Thomas Frey has noted: “The pace of change is mandating that we produce a faster, smarter, better grade of human being. Current systems are preventing that from happening.” Even so, education remains the “highest leverage point for improving society.”¹⁹ Over the next 10-30 years, Frey and his colleagues see the next learning revolution in individual choices coupled with extreme computing power. To their minds, the concept of school choice was just the tip of the individualization iceberg. If the Sun Corridor is to be a global player, its educational systems must recognize the growing need for mastery beyond the basics of the 20th century – especially languages and creativity – and for embracing new ways in which learning can be delivered.

INTEREST IN LANGUAGES AND ARTS NOT UNKNOWN IN ARIZONA

An interest in elementary-level foreign language teaching surfaced in Arizona in the early 1960s. In the 1980s, interest was renewed and expanded as concerns for global competitiveness began to be felt throughout the state. Study of the issue led to a requirement in 1989 for “foreign language study in grades 1-8.” Foreign languages (modern, classical, and American Indian) joined social studies, language arts, arithmetic, literature, health, science, music, and visual arts as a “core subject area.” Funds for the additional programs began in 1992, and academic standards were adopted for elementary grades in 1997. But Arizona lost its language edge as a lack of resources, too few qualified teachers, and changing priorities put Arizona’s requirement on the back burner. At the same time, the influx of speakers of other languages has been viewed as a barrier instead of an opportunity for a multi-lingual population. While English remains the critical foundation of U.S. life, Arizona students have lost the opportunity that burned bright 20 years ago.

Today, advances in learning techniques and technologies should make mastery of English and other languages cheaper, easier, and faster. Second and third languages and comfort

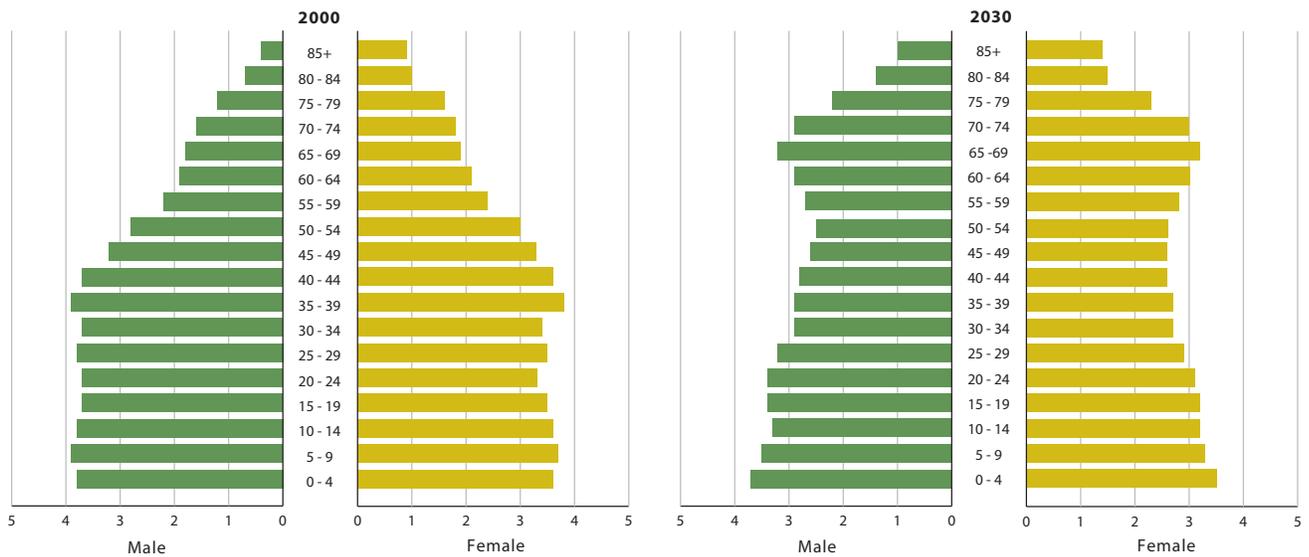
with other cultures would make Sun Corridor K-12 students and first-, second-, and third-career adults into desirable workers at home and abroad.

As with foreign language teaching, Arizona adopted voluntary K-12 academic standards for drama, music, visual art, and dance in 1996 and updated them in 2006. In addition, Arizona students need a fine arts or career/technical education credit to graduate high school and gain admission to the state’s universities. Unfortunately, the potential of arts education as a component of a global education has also not been realized. Disparities among Arizona’s school districts and their arts capacities have made quality arts education hit or miss across the state. For every top-flight effort such as the Tucson Unified School District’s Opening Minds Through the Arts, many urban and rural districts fail to provide even barebones programs, often for a lack of resources. The Arizona Department of Education, Arizona Commission on the Arts, arts institutions, and “teaching artists” work to fill the void, but more is needed.

The Sun Corridor has traditionally looked to other states for a quality workforce. The globalists and localists could change that and make the Sun Corridor a leader with strengths abroad and at home.

POPULATION PYRAMIDS OF ARIZONA

Percent of Total Population



Source: *Land Use Choices and Challenges for the 21st Century*, 91st Arizona Town Hall Report, College of Public Programs, ASU, October 2007.

REASONS TO WORRY ABOUT WORKERS

Northeastern University's Andrew Sum and other authors of *America's Perfect Storm: Three Forces Changing Our Nation's Future* forecast a decline in workers' basic skills in the next 20-30 years. Looking to 2030, the authors described the convergence of:

- substantial disparities in skill levels (reading and math)
- seismic economic changes (widening wage gaps)
- sweeping demographic shifts (aging, less education, and immigration)²⁰

Their conclusions are meant to motivate better learning options and outcomes for everyone from early childhood through multiple careers. Highlighting the link between civil society and economic growth, the authors also argue that human capital development is as vital for strong communities as it is for good jobs.

Because the Sun Corridor is Arizona's immigrant, economic, and population center, the convergence of human resource and demographic trends will matter significantly.

MORE ELDERS AND YOUNGSTERS WILL DICTATE A HIGH-WAGE ECONOMY

- By about 2030, for every 100 working-age adults, there will be 96.6 youth and elders instead of the 74.2 in 2000.²¹ Anything less than a first-class economy will put dramatic pressure on public coffers and social supports.

A HIGH BIRTH RATE CAN BE A BLESSING OR A CURSE

- Arizona's birth rate is now one of the highest in the nation. That will be good news if skills match economic needs and bad news if some students continue to be marginalized. More than 50% of Arizona's K-12 students now belong to minority groups that traditionally have been under-utilized. The Sun Corridor can hardly afford to leave these potential workers behind.

FOREIGN-BORN WORKERS AND THEIR CHILDREN WILL MAKE A DIFFERENCE

- Foreign-born residents account for approximately 14% of the state's labor force. Most assume that immigrants bring few skills. In fact, immigrant workers run the skill gamut. The up-and-coming workers in the U.S. are the native-born children of immigrants. Skills, education, civic participation, and English mastery increase from generation to generation.

Given Arizona's traditional limited intervention with its workforce and dependence on skills from elsewhere, the cautions and policy choices from these researchers are especially noteworthy for the Sun Corridor. The next generation can be the Sun Corridor's human capital engine if as Professor Sum suggests, "We can invest in policies that will help us to grow together, policies that will result in better opportunities for all Americans."



EDUCATIONAL Attainment varies THROUGHOUT THE SUN CORRIDOR

Educational Attainment Among 25 and Older, 2000

Realm	% H.S. Grads 2000	% BA + 2000
Northwest	86	22
West Valley	85	22
Central Valley	75	19
Upper East Valley	90	39
East Valley	87	27
Mid-Mega	66	9
Foothills	93	40
Rincon	79	21
Gateway	74	22
SouthCo	88	23

Source: Census 2000 and Morrison Institute for Public Policy, ASU, 2007.



When it comes to governance, one could argue that the Sun Corridor is better off than some other megas. It is in one state with comparatively few counties and cities. Still, no entity is in charge across more than 30,000 square miles where five councils of governments, six counties, 57 municipalities, and 300+ other governmental units have overlapping responsibilities and conflicting, as well as common, concerns. Add in the state legislature, state agencies, federal landowners, private sector organizations, and nonprofit service providers, and the result is a tangle of boundaries and interests.

It's no wonder then that many analyses (including a number from Morrison Institute for Public Policy) call for organizing and governing regionally. But despite a few hopeful signs, many observers likely would agree with public administration scholar Donald Kettl's assessment: "The current conduct of American government is a poor match for the problems it must solve."²² Arizona government expert David Berman brings the concern closer to home: "Localism remains common throughout the Sun Corridor."

STRUCTURAL OR COOPERATIVE?

Those calling for regional perspectives on governance tend to fall into two camps: structural reformers or cooperative champions. In the structural view, fragmentation of authority among local governments results in duplication of effort, inequity in taxes and services, competition among places, and inability to address big cross-boundary issues. From this point of view, laws are needed to:

- Minimize further fragmentation by making annexation easy and incorporation difficult
- Reduce divisions by consolidating governments
- Create a regional mechanism to divide responsibilities among levels of governments

Thus, matches are made between governments' and issues' geographic scope. The state addresses statewide concerns, regional governments address regional concerns, and local governments take care of local issues.

A drawback of existing Sun Corridor arrangements from the structural perspective is that local governments are relied upon to solve regional problems. Structural reformers argue that putting locally elected officials in charge of regional matters ensures that larger interests will either be ignored or sacrificed to local ones. To move ahead, the power to address regional problems should be shifted to a body that can work at the appropriate scale. One current example is arguably Central Arizona Project since it operates at nearly a megapolitan scale.

The cooperative advocates see many local governments as desirable because residents have numerous choices, making governments more accountable. Competition may also keep taxes down and encourage efficiency. They contend, moreover, that local entities can solve common problems on a cooperative basis through a makeshift system in which inter-local agreements and voluntary regional bodies play large roles. From this perspective, local officials are capable of functioning with a regional perspective. The cooperative approach has been popular with local officials because it maintains local home rule, while often contributing to efficiency and lower costs.

In Arizona, cooperative regional models include the councils of governments (COGs) and a host of intergovernmental agreements on emergency assistance, joint policing, and many other topics. Structural regionalism is limited to a handful of special purpose agencies like the Tourism and Sports Authority. In either case, cooperation and structural change are borne of self interest and necessity. Here, the emerging recognition that the Sun Corridor exists could be of great impact.

GOVERNMENT GOODIES

The most concrete consequence of officially redefining urban statistical boundaries may be the way various governments analyze and subsequently supply funding. For example, the U.S. Department of Transportation for years has funded interstate highways based on a formula that treats intra- and inter-urban freeways differently. I-10 between Phoenix and Tucson has been classified as an inter-urban freeway since it was first built. As such, federal funding is available for two lanes in each direction. With a redefined statistical area encompassing

the entire Sun Corridor, I-10 would become an intra-urban freeway, and the federal government would consider participating in more lanes. This is a potential difference of hundreds of millions of dollars and could result in significantly accelerating transportation improvements that nearly everyone says are critical to the economy and quality of life. The same type of definitional updating could impact funding for law enforcement, health care, homeland security, and other vital issues.

The first step is the U.S. Census designation of a “combined statistical area.” Virginia Tech predicts this change will take place after the 2020 decennial census.

Because of megapolitan regions’ importance to the U.S. economy, significant voices are urging a new, more effective alignment among the megapolitans and the federal government. As reported by urban columnist Neal Peirce, the *America 2050* platform of the Regional Plan Association and its many allies presents strategies and formulas for rebuilding megapolitans’ infrastructures, developing new energy sources, reducing carbon emissions, and building rapid-rail systems up to world standards.²³ Similarly, a recent Brookings Institution report urges a “21st Century Compact” between the federal government and large urban regions that reflects “realities of our moment – fast-moving, super-competitive, unpredictable, tumultuous, and metropolitan-led.”²⁴

Because of the way politics and intergovernmental relations have worked traditionally, proposals such as these likely will not be adopted in total. However, an effort to move from the usual silos of public policy to realign and develop national-local-regional collaborations to meet 21st century megapolitan, and therefore national, economic needs is underway. Megapolitan status certainly will be required to qualify for new resources that result from the movement.

MEASURING PERFORMANCE

Collecting statistics at a Sun Corridor scale can lead to measuring performance regionally as well. Many leaders have taken to heart scholar Steven Kelman’s message that “at the end of the day, what the world cares about is outcomes (health, crime reduction, educational attainment), not inputs or outputs.” However, performance management still is more novelty than norm. Harvard University’s Robert Behn says that the first step to the “best practice” is the “better practice.” He recommends starting with three questions that are applicable to the Sun Corridor’s many governmental units:

- What would it mean to do a better job?
- How can we mobilize our people?
- How must we change to do even better?²⁵

An important aspect of performance management is “keeping score” via tools that measure whether an agreed-upon indicator is on the right or wrong track. Used to some extent in many places, including Arizona, scorecards have not yet become sufficiently strong or institutionalized to provide constant guidance for collaborative decision-making. Many Sun Corridor institutions and public and private entities separately have begun tracking indicators in areas from education and competitiveness to quality of life. University experts are developing new scorecards for sustainability. The Governor’s Growth Cabinet is testing a municipal scorecard. Cochise County recently completed the baseline study for a quality of life index, while ASU, *Arizona Republic*, Arizona Community Foundation, United Way, and Arizona Department of Commerce have teamed up to create the Arizona Indicators Project. Nothing specific, however, is in place now to track metrics for the Sun Corridor as a unified region. Doing so could be the first step toward creating a Sun Corridor identity.

FROM MEASURING TO ACTING

After keeping score, the next logical step is to create mechanisms for getting results on the same scale. This is, of course, more about governance than government.

Governance involves “processes and institutions, both formal and informal that guide and restrain the collective activities of a group, while government is the subset that acts with authority and creates formal obligations. The interest in ‘governance’ beyond ‘government’ relates to collaborations between government and the private/nonprofit sectors.”²⁶ The increasing interest in governance responds to today’s tough issues and the scarcity of resources to deal with many of them. “The reality is that the challenges of today’s complex society are such that individual agencies and programs cannot succeed in delivering results on their own any longer. The fundamental performance improvement challenge facing government today is for leaders to achieve results by creating collaborative efforts that reach across agencies, across levels of government, and across the public, nonprofit, and private sectors.”²⁷

Beyond redefining how government distributes dollars, moving to megapolitan scale would shift the view of urban analysts, academics, journalists, and the population at large. Self-image matters, and definitions of what fits together have long-term implications for our construct of “place.” Public and private institutions will adapt in response to the emerging identity of a larger unit. Imagine, for example, the Sun Corridor Economic Council, the Sun Corridor United Way, or the Sun Corridor *Times*.

What’s clear is that the Sun Corridor is rapidly becoming a different entity, a new urban form for the 21st century. Merging is further along in economic and social reality than it is in regional governance. Regional decisions need to be made, yet the tradition of ultra-local governance throughout the Sun Corridor calls for new approaches. Without them, fundamental decisions are most likely to be reached in a piecemeal, haphazard manner, or worse, never made at all.

PROFESSIONAL ARTS AND SPORTS CONNECT THE SUN CORRIDOR

Arizona Opera and Arizona Theatre Company are two arts and culture institutions that long ago decided to serve the state, rather than just one urban area. Arizona Opera and Arizona Theatre Company were both founded in Tucson. By the mid-1970s, each was performing regularly in Phoenix as well, knitting together the ambitions of the Tucson performing arts community with the possibilities of the larger Phoenix market. These examples indicate that arts and culture have been operating at the megapolitan level for years. Professional sports from the Arizona Cardinals to Arizona Rattlers and Arizona Diamondbacks tell much the same story and have benefited from similar dynamics as the statewide arts institutions. The economic necessity that prompted these groups to reach out to larger audiences and take advantage of the proximity of the state’s urban centers highlights the foundation in place for the Sun Corridor.





TWO TRILLION DOLLAR QUESTIONS

Can Quality Ever Hope to Compete with Easy Money and 50 Years of Tradition? Who Will Pay for Public Systems and Spaces?

Realizing the Sun Corridor will be expensive. There is private cost (and opportunity) in the houses, businesses, shopping centers, and offices that are the building blocks of cities. Then, there is the infrastructure – utilities, roads, and schools – necessary to keep things functioning. Each side of this massive investment balance poses major questions.

TRILLION DOLLAR OPPORTUNITY: CAN QUALITY EVER HOPE TO COMPETE WITH EASY MONEY AND 50 YEARS OF TRADITION?

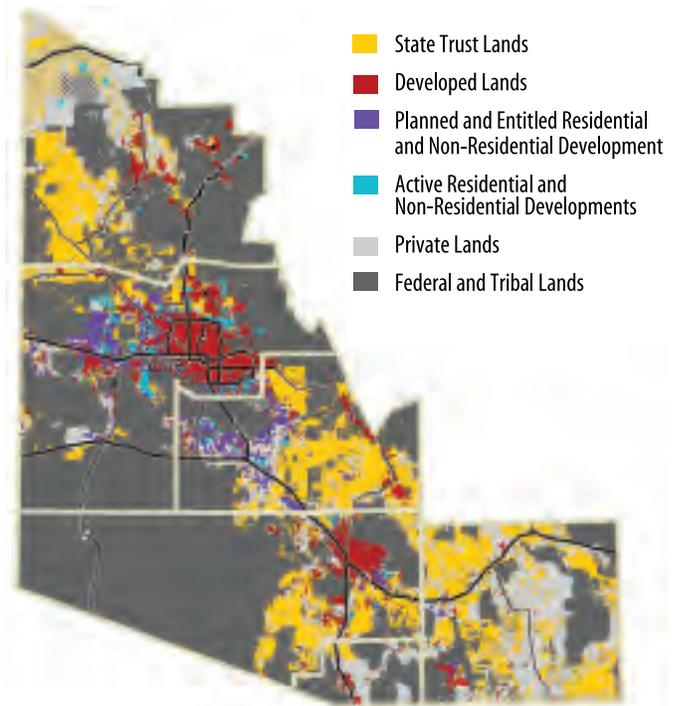
Many will think “real estate bonanza” when they read “trillion dollar opportunity.” Without question, the huge development demand forecast for the next 30 years will produce fortunes for some and jobs for many more Arizonans. A focus on just the profit potential, however, misses the priceless opportunity – the chance to put the Sun Corridor on the track of prosperity and sustainability. As author Stephan Goetz has said, a region’s choices now will determine the “future quality of life of its residents, its economic growth prospects, and its attractiveness to domestic migrants and foreign immigrants.”²⁸

In a recent paper, Virginia Tech’s Metropolitan Institute co-director Arthur C. Nelson wrote: “By 2025, the U.S. population will approach 350 million, adding 67 million people since 2000.²⁹ No quarter century of the nation’s history will have seen such population growth. The nation will need 35 million

new housing units to accommodate this expansion. Another 17 million homes must be rebuilt, replaced, or substantially renovated, bringing the total number of units constructed to about 52 million, or about 45% of the 116 million units that existed in 2000.³⁰ The U.S. will also add about 26 million jobs requiring 15 billion more square feet of nonresidential space than the 81 billion existing in 2000. Yet, because nonresidential space is less durable than residential space, another 63 billion square feet of nonresidential space must be replaced, rebuilt, or substantially renovated, bringing the total space constructed to 78 billion square feet or nearly what existed in 2000. The bottom line is that the U.S. will see about \$30 trillion in development between 2000 and 2025.”³¹

Nelson made a similar set of calculations for the Sun Corridor.³² To accommodate millions of residents, the Sun Corridor will need an estimated 3.7 million housing units and 2.4 billion

MUCH IS IN PROCESS: DEVELOPED AND ENTITLED LAND



Source: *Land Use Choices and Challenges for the 21st Century*, 91st Arizona Town Hall Report, College of Public Programs, ASU, October 2007.

ESTIMATES SHOW THE POTENTIAL INVESTMENTS IN THE SUN CORRIDOR TO BE SUBSTANTIAL

Projection	~2040	Change
Population	10.3 million	110%
Employment	4.9 million	93%
Housing Units	3.7 million	146%
Commercial/Public (sq feet)	2.4 billion	226%
Housing	NA	\$541.1 billion
Commercial/Public	NA	\$482.3 billion

Source: Arthur C. Nelson, Metropolitan Institute, Virginia Tech.

square feet of commercial and public use space, which taken together total approximately \$1 trillion worth of investment.

That's a lot of new buildings. But many people may be surprised to learn how many residential units have already been "entitled" in Maricopa and Pinal counties alone. Far from being a blank slate for the best in 21st-century development, much of the Sun Corridor's form is already set in car-dependent, high-consumption patterns.

"Entitlement" refers to the governmental process which approves new projects. When a project is entitled through municipal or county plans, zoning, and development agreements, the maximum number and density of residential units are fixed, commercial and industrial parcels identified, and general road layouts approved. Arizona's extensive use of entitlement far in advance of development sets it apart from other states. In 2006, state voters made this little-understood practice into one of vital concern to anyone interested in quality communities. A ballot initiative, Proposition 207, emphasized a change to eminent domain, but it also required governments to compensate landowners for any negative impacts of land use regulations on the value of private property. Cities and towns understandably will be loath to change plans lest they open themselves up to potentially huge liabilities. This may well mean that the different development patterns many leaders and residents have called for may now be left largely to the marketplace.

The Sun Corridor has been remarkably successful at attracting private sector investment for building in the classic postwar, auto-dependent suburban development pattern. Shopping centers, subdivisions, and office parks are build-

ing blocks of the megapolitan area. But as things change, the question will be whether these past growth patterns are able to adapt to new challenges. In addition to coping with the current economic downturn and housing crisis, the marketplace will have to adjust to more households without children, more single-person households, and more minority households. In addition, demand is rising for environmentally and community sensitive building, as public health concerns call for revamping community design. One place to focus is with building methods and integrated planning choices, and this is an area in which the Sun Corridor could have a head start on other places – if it is put to use over the long term.

Much has been made about the "anywhere" nature of the most desirable jobs. Being a great place is now viewed as a prerequisite and an insurance policy for a vibrant knowledge economy. While "great place" is often defined in terms of livability, experts say great should also mean healthy. The Centers for Disease Control and Prevention's 10 most important public health challenges included four related to land use, urban design, and community well being:

- Integrating physical activity into our daily lives
- Cleaning up and protecting the environment
- Recognizing the contributions of mental health to overall health and well-being
- Reducing the toll of violence in society³³

Making better houses, cooler environments, and healthier places is being addressed now in many ways, such as new "cool" materials. In turn, state actions are expected to strengthen the planning

PEOPLE REQUIRE BUILDINGS AND SERVICES TO LIVE

Given today's patterns of use, 2.5 million people could require:

- **926,000 more housing units**
- **1,575,00 more cars**
- **50.4 million square feet of office space**
- **65 million square feet of retail space**
- **Nearly 900 more schools**
- **26-50 more hospitals**

Source: Phoenix Community Alliance.

requirements for land use and transportation. Future analysts may look back and say that these and other decisions put the Sun Corridor on a path to sustainability.

The Sun Corridor's trillion dollar opportunity is a chance, perhaps one of the last, for real changes in how Arizona's built environment impacts people, the economy, and the environment.

THE TRILLION DOLLAR INFRASTRUCTURE GAP OR WHO WILL PAY FOR PUBLIC SYSTEMS AND SPACES?

One of the first questions most people ask about the Sun Corridor's future is who will build the roads, power lines, sewer systems, schools, and parks that 5 million more people will need. A myriad of plans are in place or in the works among utilities, transportation departments, developers, and planners of all types. There is another trillion dollars in all of these things.

SKY HARBOR
AIRPORT SERVES
MILLIONS
OF TRAVELERS
ANNUALLY

Passengers 1951-2001

Year	Total Passenger Traffic*
1951	240,786
1961	920,096
1971	3,000,707
1981	6,641,750
1991	22,140,437
2001	35,438,181

* Arriving, departing, domestic, and international passengers.

Source: City of Phoenix Aviation; Morrison Institute for Public Policy, ASU, 2007.

This is an immense number, but infrastructure usually is built as development occurs. Arizona is relatively good at financing some components of infrastructure. For example, impact fees are used to “make development pay for itself.” The state’s roads, bridges, and sewers are among the nation’s newest and therefore among the nation’s best.

One of the great dilemmas of a fast-growing area, however, is that infrastructure investment lags behind the development it serves. Thus, a “gap” exists between new people moving in and the roads and utilities required to serve them. This is especially a problem when the principal mechanisms of public finance are sources such as impact fees and sales taxes. Impact fees are only paid one building at a time. Until enough are paid to accumulate the funds to install the infrastructure, it cannot be built. Bonds and public borrowing can be a solution to this but only if public entities realize what is coming, and citizens are willing to authorize their use. Sales taxes react quickly to changes in economic circumstance and are paid in small, relatively painless increments. But until sales tax generators are built in a new area, its

revenue lags behind. Houses get built first and the people living in those houses drive back into existing municipalities to go shopping.

Lagging infrastructure has obvious and subtle consequences. The clearest example is the traffic jam. When people “drive till they qualify” the roads back to their jobs are not improved at the same pace as houses are built, and congestion is the result. A 2005 study of metro traffic in the U.S. concluded that traffic problems cost the Phoenix area alone \$1.68 billion in “congestion cost.” The traffic jam serves as the perfect metaphor for the overall “hard” infrastructure gap in roads, plumbing, and other utilities.

WHERE ARE THE TRANSPORTATION IMPROVEMENTS?

Economist Tyler Cowen, in a recent column, harked back to the 1960s visions of 200 mph monorails, noiseless family cars riding on air, and personal rocket belts and wondered “Why have we made progress so slowly in transportation – when expectations were so high?”³⁴

The same question could be asked of the Sun Corridor. With decades of rapid growth and dramatic projections, one would have thought that Arizona would be on the cutting edge of transportation choices.

Few would question that – without something soon – the Sun Corridor is on a collision course with traffic congestion. Former transportation secretary Norman Mineta described traffic as “one of the single greatest threats to our prosperity.”³⁵ Governor Janet Napolitano called it a “time tax.” Transportation has become *the* growth topic, but talking about roads is easier than planning, financing, and building for easy multi-modal mobility.

In the late 1950s and 1960s – the ribbon-cutting era for most of Arizona’s major highways – the I-10 lanes built between Phoenix and Tucson seemed fine, especially for two urban islands. Today,

however, 225,000 vehicles are on the I-10 daily and 400,000 are projected for 2030; more freight is moved on I-10 between metro Phoenix and metro Tucson than anywhere else on the highway from east to west. This may be in part because Union Pacific no longer has an inter-modal hub in Tucson.³⁶ Planners conceived I-17 as a rural highway connecting a small urban area to tiny communities in northern Arizona and then to coast-to-coast I-40. I-19, like I-17 completely within Arizona, was built through even sparser areas. Local leaders viewed the highways as vital, but national planners did not foresee the Phoenix and Tucson areas as the growth centers they have become or the interstate highways as more than small-time connectors.

Perhaps technology will save the day for the Sun Corridor. Journalist Alex Marshall has written that the U.S. is overdue for another transportation revolution. “The car and the highway, and the airplane and the airport, have been dominant for almost a century. By comparison, canals lasted about 50 years, streetcars about the same, and railroads about a century as dominant modes of travel.”³⁷ Even so, the experts he cites say cars will get better rather than go away. So, traffic will be a problem of the future, not just the present.

But few are advocating for only cars and highways. Years of expert study and public opinion surveys underscore the desire for many ways to get from Point A to Point B cheaply and cleanly. New technologies will provide some of the options, while others will come from changes in consumer behavior. As a result, research and development and transportation investments are focused on such areas as:

- Smart infrastructure
- New ways to pay
- Rerooled cars and trains and clean, renewable fuels
- Creative choices for transit

Most federal transportation funding has come from gas taxes. But as fuel economy rises and gas prices soar, raising gas taxes is unpopular and their proportionate contribution stagnates or falls. Arizona has used sales taxes for transportation, but now sales tax also pays for many other public needs. More creative transportation policy-based funding mechanisms must be employed – but so far Arizonans do not even seem ready to accept a toll road.

Now, technology may provide more readily acceptable solutions. Thanks to GPS (global positioning system) technology, it would be possible to charge drivers for mileage rather than fuel. Some experts predict that mileage fees could replace gas taxes. Jon Kuhl, chairman of the University of Iowa Department of Electrical and Computer Engineering and leader of a six-state test of the concept says, “It’s not a question of if this is viable, it’s a question of when it becomes politically and socially viable to make such a large-scale shift.”³⁸

Congestion pricing allows consumers to pay to avoid traffic. With an in-vehicle sensor, drivers are charged for using special lanes or separate roads. A driver’s account is assessed on a sliding scale based on time of day, state of congestion, and distance. This scheme has been used in Southern California for more than a decade, and it has been credited with reducing traffic in central London.

Creative highway funding is not the only transportation innovation needed for the Corridor to keep pace. Passenger rail could become a real means of reducing congestion along the Phoenix-Tucson I-10 corridor. Another major factor is decentralizing air travel into the region by building up Phoenix-Mesa Gateway Airport. The best analog for Gateway may be Orange County’s John Wayne Airport.

Beyond the infrastructure gap represented by the traffic jam lies a more subtle lag when an area as large as the Sun Corridor begins to come into its own. Educational, cultural, and social institutions can similarly fall far behind demand, and have a much more difficult time catching up. Sometimes that lag becomes permanent. Consider, for example, the dilemma of open space. As the center of the Sun Corridor begins to urbanize, it will become harder and harder to reach close-by large areas of open space. The desert may be Arizona’s equivalent of the ocean, but there is a huge difference – the desert is easily developable. Unless mechanisms are created to preserve and protect areas of open space within the Sun Corridor, this infrastructure lag may be incurable: by the time a serious problem is recognized, there may be no affordable land left to acquire. If this turns out to be the case, Arizona will have lost what many people consider its greatest asset.

Two trillion dollars in private and public investment does not represent an insurmountable hurdle. But investing it in timely and wise ways may be the more daunting challenge.

MAJOR BUILDERS ARE ALREADY AT HOME IN THE SUN CORRIDOR

Five major national homebuilding firms³⁹ – Centex Homes, D.R. Horton, KB Home, Lennar, and Pulte Homes – are active in the Sun Corridor as are hundreds of smaller firms. Arizona State University real estate expert Jay Butler says: “Growth comes not only from people moving to the area, but from new households being formed, rental households seeking homeownership, and people seeking investment opportunities.⁴⁰ As the housing industry faces the consequences of the 2007-2008 downturn and prices remain relatively high, some are questioning whether many Sun Corridor locations will continue to be attractive. Yet as this selection shows, builders remain active in many Sun Corridor locations.

	Centex	D.R. Horton	KB Home	Lennar	Pulte
Sun Corridor Locations*	Maricopa, Queen Creek, Goodyear, Laveen, Surprise, Peoria	Buckeye, Casa Grande, Goodyear, Queen Creek, Gilbert, Maricopa	Maricopa, Buckeye, Gilbert, Mesa, Phoenix, Laveen, Queen Creek, Surprise, Tucson, Sahaurita	Tucson, Sahaurita, Phoenix, Buckeye, Goodyear, Laveen, Gilbert, Maricopa, Tolleson, Casa Grande, Surprise, Queen Creek, Peoria, Waddell, Litchfield Park	Buckeye, Peoria, Coolidge, Florence, Goodyear, Glendale, Oro Valley, Mesa, Phoenix, Queen Creek, Maricopa, Red Rock, Sahaurita, Tempe, Tucson, Vail, Waddell

* This provides a general overview and is not intended as an inventory. Many other builders are active also.

Sources: Compiled by Morrison Institute for Public Policy, ASU; 2007 from DRHorton.com, KBHome.com, lennar.com, centexhomes.com, pulte.com.



WHAT ABOUT WATER?

The Oil of the 21st Century, Water is a Critical, Limited Resource

In any conversation about growth in Arizona, the question is always: what about water? Indeed in most discussions of the Sun Corridor, someone will say: “It cannot happen. There’s not enough water.”

According to many observers, water will be to the 21st century what oil was to the 20th.⁴¹ Thanks to 20th century planning, policies, and infrastructure, however, the Sun Corridor’s water supply is more sustainable and secure than most people think. That is in part because water has been moved from place to place and mined in one area for the benefit of another. Still, drought, increasing population, climate change, and declining habitat health are sounding alarms in the Sun Corridor.

Ironically, no accepted study of central Arizona’s regional water issues exists. Not only has the Sun Corridor never been thought of as a discrete unit for analyzing water supply and demand, but very few of the subsets of the Sun Corridor have aggregated and researched water supply. Data, instead, have been developed for various cities or Salt River Project (SRP) or Central Arizona Project (CAP). In 2005, when Morrison Institute for Public Policy studied the 275-square-mile piece of State Trust Land known as Superstition Vistas, which lies in Pinal County, it was clear that growth, water supply, and demand had to be considered on a broader regional basis. A paper commissioned as part of that study looked at the combined water supply and demand of the Phoenix, Pinal, and Tucson “active management areas.”⁴²

If the Sun Corridor is to exist as a meaningful planning unit, one of the first tasks is to analyze the overall water supply and demand balance. This would be a highly unusual exercise because, typically, active management areas (AMA) in Arizona have not been studied jointly, and large areas of the Sun Corridor lie outside of the AMAs.

Holway, Newell, and Rossi in their Superstition Vistas paper used population projections compiled by the L. William Seidman Institute at Arizona State University for the three-county CAP service area of 11 million by 2055 and just under 13 million by 2075. Based on those populations, they estimated that annual municipal water demand in the study area would increase to about 2.5 million acre feet in 2055 and exceed 3 million acre feet in 2075. Against that future demand, they projected current and future potential water supplies for central Arizona in categories ranging from “currently allocated” through “virtually certain,” “likely,” “possibly

available,” and “uncertain.” Through a combination of existing surface water, likely importation of additional water from the Colorado River to central Arizona, groundwater transportation from water farms outside of the AMAs, and increasing reuse of effluent, they projected a sufficient water supply to sustain the area’s growth until 2030. At that point, a deficit of about 30,000 acre feet per year began to grow.

WaterSim, another study done at Arizona State University by the Decision Center for a Desert City, similarly concluded that 2030 marks the rough beginning of a new era of water challenges for central Arizona. These and other studies seem to confirm the conventional view of Arizona water managers that the projected population in the Sun Corridor can be sustained for the next few decades as a result of conservation measures, good management practices, and the slow-but-steady elimination of irrigated agriculture.

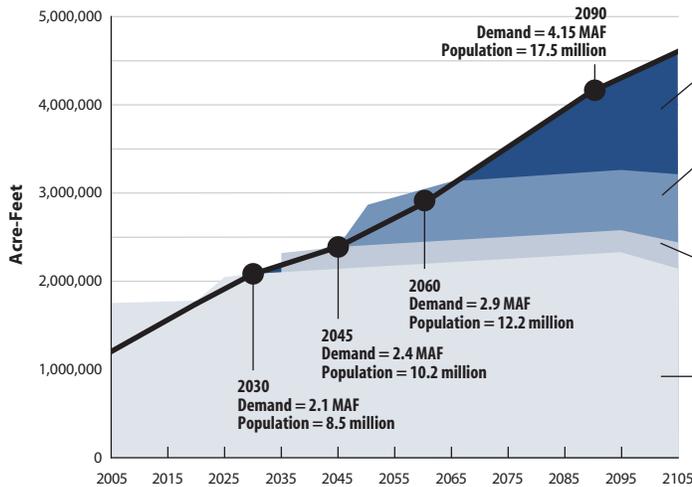
A CHANGING WATER PICTURE

Generally, the conventional wisdom has been that Arizona’s greatest water challenges lie beyond 2045. The studies cited above conclude that the challenges begin earlier. But even those studies have been largely based on historic water availability. The rising likelihood of dramatic climate change has not been factored in and could force significant reassessment of Arizona’s water supplies. And increasingly, water experts and residents alike are concerned about the relationship between water and growth. This concern is manifest in several particular respects.

RENEWING RIPARIAN AREAS

Because the Sun Corridor’s water resources have been devoted mostly to agriculture and people, nearly all of the state’s riparian areas are either gone or substantially degraded. This has left a legacy of damage, and it reduces recreational and educational opportunities and decreases options for dealing with drought and climate change. Changing outlooks on sustainability and the benefits of healthy ecosystems have encouraged restoration of waterways and riparian areas in Arizona. Fossil Creek has been restored, as has a portion of the Colorado River Delta. Funding these efforts has proven challenging, as has finding the water – often effluent or storm runoff – to devote to them. In many areas, the needs of the environment are increasingly being quantified in the same way that people’s needs are calculated. The Sun Corridor could be Arizona’s leader in that effort and in augmenting mechanisms such as the Arizona Water Quality Fund and Heritage Fund.

Water matters: COMPARISON OF REGIONAL SUPPLY AND DEMAND



“Possibly Available Supply” includes additional possibly available supplies secured from the Colorado River or elsewhere. New infrastructure not currently envisioned would have to be built to import these supplies.

“Likely Available Supply” includes additional supplies that may be able to be secured for importation through CAP as a result of changing current operating conditions and making some infrastructure improvements. These supplies would be comprised of additional purchase or lease of approximately 200,000 acre-feet of Colorado River rights and other potential sources such as Planet Ranch surface water. Up to another approximately 300,000 acre-feet of reclaimed water is assumed available by raising the percentage of available effluent going to municipal use from 30 to 70 percent.

“Highly Likely Available Supply” includes additional supplies which could be secured for importation through excess canal capacity in the CAP without changing current operating conditions or making infrastructure improvements. These supplies would include Colorado River rights.

“Currently Secured Supply” is comprised of both a) “currently used and absolutely available” municipal supplies (i.e. SRP rights and CAP allocations that may not be full utilized today) and b) “virtually certain” additional supplies that are already secured through ownership, contract or law for central Arizona water users. In addition sufficient infrastructure exists to import all of these supplies. These supplies include groundwater farms in western and central Arizona.

Studies continue on water supply and demand. See <http://sustainability.asu.edu/giosmain/engagement/waterworkshop.htm>.

Source: *Superstition Vistas: Water Matters*, Morrison Institute for Public Policy, ASU, July 2005.

THE FUTURE OF AGRICULTURE

For now, it appears that the Gila River Indian Community will be the keeper of agriculture in the Sun Corridor. Urban Arizonans have tended to view agriculture as a holding zone: what you do with property until it is ready for subdividing.⁴³ Because an area of housing often requires less water than crops, the elimination of farming typically has not been a major issue in Arizona. But agricultural water use is a buffer. In times of shortage, it is possible to bargain with farmers to not plant crops and the water can migrate to less-interruptible urban uses. If agriculture is lost, part of the price will be more limitations on urban water use.

WATER AND GROWTH

Currently, water decisions and land use decisions are made by different actors in different places at different times. These processes have been separated consciously. But the public is increasingly uncomfortable with that relationship and is seeking to insert water use questions into zoning and land use decisions at city councils and the ballot box. Water managers cannot hang onto the classic notion that they are only plumbers building delivery systems. Water decisions will need to be more transparent, more responsive, and more clearly linked to future growth projections. Public education about water conservation must become much more sophisticated. Recent changes in assured water supply rules and legislation allowing local governments outside of AMAs to consider long-term water supplies in land use decisions are harbingers of this important attitudinal shift.

URBAN VS. RURAL EXPANSION

One of the basic assumptions of Arizona’s water management system is that the water supply of the central Arizona mountains is available to be relocated to metropolitan Phoenix. But the Sun Corridor vision suggests that areas in Yavapai County around the headwaters of the Verde River will become part of the Sun Corridor urban mosaic. For that to happen, the same water supplies that have been assumed to be available for metropolitan Phoenix must also support the northern end of the Sun Corridor. Political friction is bound to be the result.

INCREASING SEVERITY OF THE DROUGHT

Now in its 13th year, the drought on the watersheds of central Arizona and the Colorado River appears to likely exceed previous assumptions. Models may need complete reconstruction because of it.

The story of urban growth in the Southwest is written in the portability of water. But this works only if the areas from which water is moved do not themselves experience dramatic population growth. Now with that happening, growth is competing with itself for this limited resource. The result of that competition will shape the Sun Corridor’s future. Starting to deal with this competition requires analyzing the Sun Corridor’s overall water situation – a task currently on no one’s radar screen.

Water supplies are not the fatal flaw that will prevent the Sun Corridor from happening. But the role of water in shaping life in this region will continue as a dominant force. Increasingly, development patterns, trends, and growth rates will be modified significantly by water issues and attitudes.



THE TRAGEDY OF THE SUNSHINE

Each Person Adds to and Subtracts from the Sun Corridor's Resources

2007 was the hottest summer in Phoenix history. As a result, “Sun Corrideans” were reminded that the comfort zone for human life in central and southern Arizona is precarious. Global climate change likely is a more immediate challenge here than in most places, but a local phenomenon is making it worse: the heat island effect created by constant urbanization. Metropolitan Phoenix does not cool off at night the way the undeveloped desert once did, or the way agricultural fields still do. The mass of built environment heats up during the day and radiates warmth all night long in the summer.

The Sun Corridor would extend this uncomfortable, expensive heat island over a massive area. Research at Arizona State University suggests that the island is shaped like a plateau. Increasing urbanization does not make things hotter and hotter. Rather, development creates a heat sink that warms the area at night in the summer. Once that plateau is reached, more urbanization spreads the island over an ever-larger area, making cooling steadily more difficult.

INDIVIDUAL CHOICES AND COLLECTIVE EFFECTS

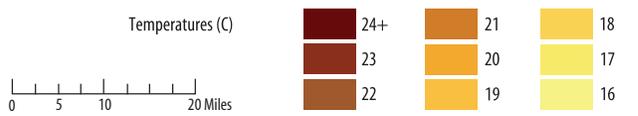
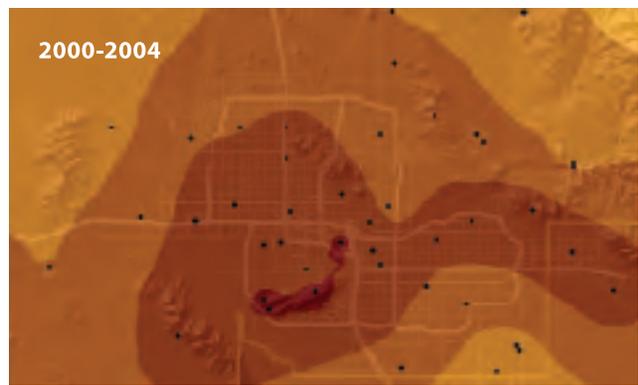
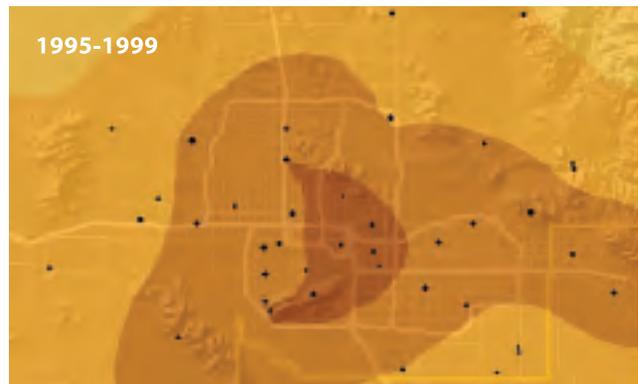
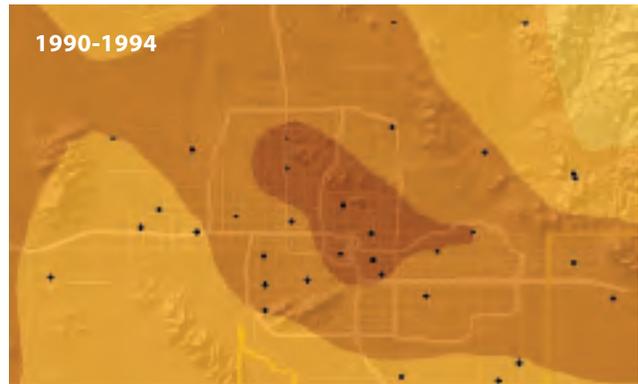
Environmental damage often results from the “tragedy of the commons.”⁴⁴ Each resident adds an incremental measure of negative environmental effect, by, for example, driving a car. But the decision of any individual to stop driving does not have any noticeable impact in decreasing air pollution. So the “commons” – in that case clean air – is spoiled by the aggregation of individually rational actions.

Thus, the “tragedy of the sunshine”: each person who moves to Arizona creates a need for more pavement, roofing, and concrete that make it hotter. As areas heat up, they become less attractive to everyone living here. But no individual choice to mitigate that impact is possible. So we grow, hotter as we do, and do so at considerable risk to quality of life and reputation.

Yet, this tragedy may present the Sun Corridor with its greatest opportunity. As the world gets warmer and more urban, the heat island phenomenon will spread. The Sun Corridor should be the global leader in addressing this issue.

One aspect of the problem is developing new building materials and paving technologies to absorb less heat. Buildings can be sited to allow the urban mass to breathe more at night. The City of Phoenix Downtown Urban Form Project has developed standards for building design. ASU's Center for

URBAN HEAT ISLAND SPREADS OVER TIME



Monthly mean minimum air temperature patterns (using ordinary kriging methods) from 1990 to 2004 in 5 year increments. June minimum temperatures in degrees Celsius. Created by Brent Hedquist.

Source: *Determinants of Changes in the Regional Urban Heat Island in Metropolitan Phoenix Between 1990 and 2004*. Anthony Brazel, Patricia Gober, Seung-Jae Lee, Susanne Grossman-Clarke, Joseph Zehnder, Brent Hedquist, Erin Comparri. National Science Foundation under Grant No. SES-0345945 Decision Center for a Desert City, ASU.

SMART Materials is experimenting with different roofing and building materials with great promise. Landscaping can also be planned to shade and reduce heat.

All of these need to be moved quickly into mainstream practice. Suppose the entire Sun Corridor cooperated in the adoption of building and development codes designed to mitigate the heat island effect – the imprint could be huge and the precedent earthshaking.

SUN-POWERED SUN CORRIDOR?

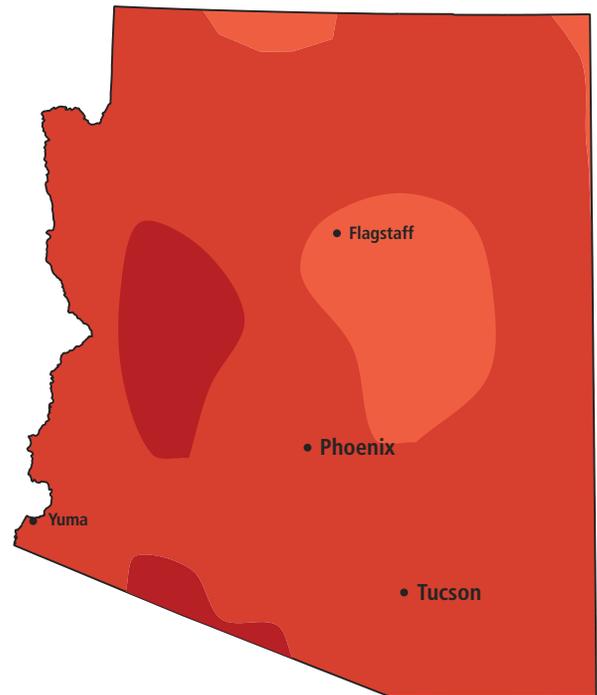
The sunshine that warms the corridor provides the opportunity to be a world leader in solar energy. Arizona’s service economy makes the state one of the lowest in total energy consumption. Still, electricity demand is forecast to escalate dramatically by 2020.

“I believe we will one day look back on this action as the vote that created the TGen of the energy industry – fueling economic development, technical innovation, and a new wave of entrepreneurship in Arizona.”⁴⁵ Arizona Corporation Commission (ACC) member Barry Wong was referring to the ACC’s 2006 decision to require utilities to generate 15% of the “total megawatts sold from renewable sources by 2025.”⁴⁶ Another commission directive increased the amount of “distributed” power for residential or non-utility facilities. The distributed requirement begins at 5% of the state’s renewable portfolio in 2007 and increases after 2011 to 30% of the total renewable mix.⁴⁷ The new rule put Arizona in the top tier of states on renewable energy.

After years of neglect, the solar opportunity is once again at the forefront of economic development and environmental actions. The APS Solara concentrator solar plant planned to be online in 2012 is a very visible example. In addition, the Arizona Department of Commerce commissioned a “roadmap” for the solar industry. Cities are actively recruiting firms, while ASU Polytechnic researchers, among others, are commercializing new technologies. The state’s solar profile could change rapidly, but competition is stiff from other states. Unfortunately, experts forecast that solar power will not be plentiful or reliable enough to meet all of the demands for power.

Since the days of the Golden Corridor, Arizonans have worried about the disappearance of the beauty that brought so many here. Those concerns have been translated into many positive policies and programs, but much more remains to be done. The scope and scale of the Sun Corridor and its environmental needs show that the reservoir of interest in sustainability will need to be tapped – and soon – to maintain and restore the health of our environment.

THE SUN CORRIDOR HAS GREAT SOLAR POTENTIAL



Solar Insolation Annual Average in kWh/m²/day for Flat Plate Collector



Source: U.S. Department of Energy, 2002.

INNOVATIONS IN PLACE AND ON THE WAY FOR BETTER BUILDINGS AND COMMUNITIES

Available Now	Next 10 Years	Next 20 Years
Rubberized asphalt for quieter roads that shed heat more quickly than other roads	Absorbent paving materials to allow plants alongside to grow better	Sensors to regulate energy use
Energy-efficient appliances, building materials, and electronics	Cheaper versions of recycled materials	Solar roof and paving materials
Recycled building materials		Recycled trash to replace concrete

Source: *Arizona Republic*⁴⁸, October 1, 2006, Morrison Institute for Public Policy, ASU, 2007.

DO YOU WANT TO LIVE IN THE SUN CORRIDOR?

Since 1997, Morrison Institute for Public Policy periodically has surveyed greater Phoenix residents about quality of life. The results have been fairly encouraging. Among residents of greater Phoenix from 1997 through 2004, two-thirds or more typically rated their quality of life as either “good” or “excellent.” Throughout that period, most felt that the quality of life was staying about the same or improving. Yet, the population continues to churn.

As Arizona boosters like to point out, people “vote with their feet.” In that election, more have been moving here than have been leaving. But a lot do leave for whatever reason. For many people, the state is a kind of desert encampment: a place to move to make money so you can afford to move somewhere else. For others, it is a sunny place to move toward the end of life when you can afford to escape during the hot part of the year. In any event, roots and long-term commitment are not generally embedded in the Arizona lexicon. Fast-forward to 2035 or 2040. Imagine you are living in the Sun Corridor. Will

you like it? Will you want to stay? Is the vision of this megapolitan region attractive and appealing?

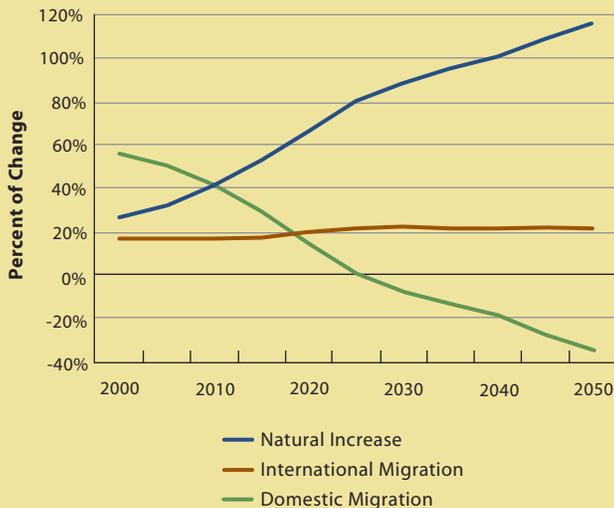
The invisible hand of Adam Smith may be at work here. He would tell us that cities, however complex, are largely self-regulating mechanisms. As the attractiveness of living in a place declines because of an increase in traffic, pollution, or temperature, its growth rate should slow, stop, and maybe reverse. People will begin leaving, the population will drop, and as it does the place may become more attractive again. But this self-regulation does not always work very well. For one thing, natural increase takes over and population continues to rise even when migration starts falling. Southern California became a net exporter of people to domestic markets in the 1970s. The same phenomenon may happen in Arizona. One scenario shows that could happen to Arizona in a relatively short period, although many observers see it as taking place more slowly. By 2020, however, the population base is so large that significant total increases will continue to occur. That Arizona would cease to attract residents from the rest of the U.S. is hard for most current Arizonans to envision.

As a place becomes unattractive to one kind of migrant, it may retain or increase its attractiveness to another. Migration from U.S. locations may go negative, while international migration may continue to climb. Certainly, it is possible to point to cities around the world that have continued to grow even as their quality of life deteriorated. As the Sun Corridor begins to be a more crowded place, it will shift from being a “City by Choice” to being a “City by Momentum,” fueled like an inevitable snowball accumulating mass as it rolls.

Future growth does pose trade offs, as was recognized in the 1960s and 1970s studies quoted at the beginning of this report. Some choices are conscious, like the decision to build freeways through Phoenix after years of dispute. Other choices are subtle market adjustments that occur with little, or only diffused, public debate: since the 1960s, for example, residential lots have steadily decreased in size even as houses have grown larger.

As the Sun Corridor grows bigger, some compromise in existing lifestyles will be required. Traffic jams will force more residents onto transit, or require that jobs and houses be located closer

ONE SCENARIO SHOWS U.S. MIGRATION COULD SLOW SOON



Source: Joint Legislative Budget Committee, 2005, based on data and assumptions from Regional Economic Models, Inc., forecasting. The State of Arizona uses REMI primarily for analysis of tax policies, proposed legislation, and other issues.

together, or that a major portion of the workforce telecommutes. Residential densities throughout the Sun Corridor have already been rising in response to increased land and construction costs, but a much more dramatic uptick in density will be necessary to accommodate the projected influx. Much of that higher density will need to be accommodated in the existing urban fabric. Yet, few development proposals spark as much controversy as taller buildings and more people being inserted into older neighborhoods. If the Sun Corridor is to be something other than an endlessly sprawling suburb, changes must occur.

WHERE AND HOW DO WE SORT OUT THESE TRADE OFFS?

- In particular zoning cases making incremental decisions in dozens of different city councils dealing with specific development proposals?

- In some other set of regulatory decisions by local government?

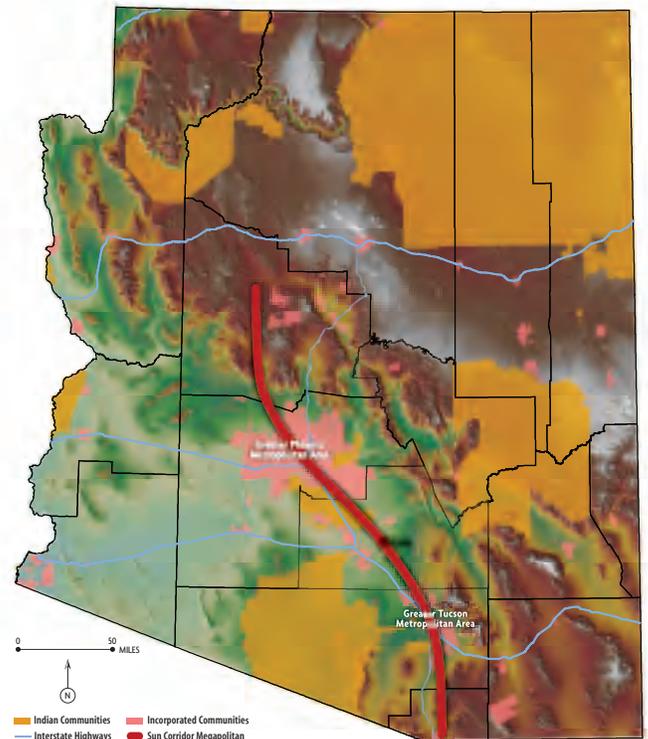
- In a series of regional discussions lead by civic groups?

- Is a Sun Corridor-wide debate about the future in order?

- Are the choices sorted simply by price competition for dwindling resources?

Return to “What about Water?.” This question provides a convenient way to think about the trade offs between the lifestyle enjoyed by current residents and the compromises necessary to accommodate more new faces. In most parts of the Phoenix metropolitan area, two-thirds of domestic water use goes for landscaping. Xeriscaping and drip irrigation have become accepted and popular means of conserving water. But even the newer xeriscapes still account for a very high percentage of domestic water use. Ultimately, severe limitations on landscaping – and a potential ban on outdoor swimming pools – may be necessary to continue stretching water supplies. If you can have nothing beyond crushed granite, some landscaping boulders and a couple of barrel cactus in your yard, would you still want to live in the Sun Corridor? If you have been living here for a long time and love your swimming pool and

ARIZONA'S DIVERSE LAND WILL MAKE FOR AN URBAN MOSAIC



Source: Morrison Institute for Public Policy, ASU; data from the Central Arizona Association of Governments, 2002.

landscaping, are you willing to give both up to sustain the next 100,000 people who want to move here? Will you fall out of love with sustainability if it truly affects your lifestyle?

If the preliminary research is correct, the heat island will grow larger, not hotter, as the Sun Corridor spreads. If climate change is layered on top of that effect, would just a few extra degrees start producing a “Hohokam effect?” As people move on, however, they do not take buildings and pavement with them, so for those who want to stay, the fact that some “vote with their feet” may not solve the tragedy of the sunshine for those they leave behind.

THOSE WHO WANT TO STAY

There's the issue. Do you want to live in the future Sun Corridor? For most people, the answer is a resounding "maybe." For whatever reasons, the Hohokam left. But our society is different. In our world, individuals have huge personal investments tied up in houses, businesses, and buildings. They will not be willing to abandon those investments, and our technological capacity can alleviate slowly developing resource crises. So, many of us will decide to stay and protect our investments, even as others may think its time to move on.

The choice in times of perceived decline of any organization or community is always the same, according to Albert Hirschman in his classic book *Exit, Voice, and Loyalty*. People may *exit* – withdraw from or leave the community, or they may give *voice* – attempt to improve the community, develop proposals for change, protest, and so forth. The path chosen is largely a function of *loyalty*. The greater the loyalty, the less the chance of exit and the better the potential for voice. It is in the long-term best interest of the Sun Corridor to understand this relationship, the importance of developing loyalty to the region and crafting means and methods to promote voice (genuine public involvement) in building a resilient, sustainable place.

The future of the Sun Corridor isn't inevitably either rosy or bleak. It is what we make it.

Arizona State University Professor Charles Redman says: "Sustainability means treating the earth as if we intend to stay."

Think the same way about Arizona's Sun Corridor. What can we do collectively to make the Sun Corridor continue to be somewhere we want to stay? This report suggests three overarching themes:

- **First, we should focus our educational systems on creating citizens to deal with an increasingly global future.** Embracing diversity, using arts and culture, and emphasizing the importance of languages are all aspects of such a focus. We often highlight Arizona's bleak position at the bottom of national lists about education spending or school drop outs. Such comparisons are important measures, but for the future of the Sun Corridor, those statistics are behind the curve. Global competition will increasingly become the real question. Maybe, just maybe, Arizona can take the challenge of its diverse population and turn it into an asset. If we could do that, instead of playing catch up, the Sun Corridor could go to the front of American cities in the global future.
- **Second, we must think of the Sun Corridor as a place.** Collecting and tracking data on a corridor-wide basis is a start. It may lead to regional institutions or only to a different discussion when decisions are made by existing

jurisdictions. Either way, acknowledging the reality of the Sun Corridor is a critical step in managing its future. Phoenix and Tucson have never gotten along well, even though they've learned to do it. Each of the other cities in the Sun Corridor has struggled to find its own identity. Fighting over where car dealerships and shopping malls locate is just the most graphic example of non-regional thinking. Separate cities are not about to surrender their governance. But we could come together regionally on particular issues like air quality, water management, and transportation. In so doing, new institutions will need to be created. Here, Arizona's thin institutional base – a few large counties, no townships, and relatively few large and growing cities – is an asset. The limited purpose governmental unit of the Central Arizona Project is a current example of a nearly Sun Corridor-wide regional institution. Maybe it can be a model for other efforts.

- **Third, the Sun Corridor can become a world leader in understanding the challenges of sustainability facing humankind.** Creating this place took a bold willingness to face climatic challenges. Building on that history can make the Sun Corridor an experiment of continuing vitality.

Sun is in the name for a reason. Its inescapable presence shapes and defines all existence in this corridor. It's why people are here, why they leave or stay. The sun shapes our cities, creates our landscape, and nurtures our lives. But it also challenges the survival of our society. Much of the world's population lives in places that are hot and dry, and it is likely to become an ever-larger portion of mankind, due to migration patterns, urbanization, and climate change. The Sun Corridor should be the exemplar of how to live in those hot and dry places: of how to use the sun, survive the heat, celebrate the desert, and build appropriately for this climate. We owe the world, and ourselves, nothing less than figuring this out.

In his book *The Wisdom of Crowds*, James Surowiecki argues that groups of people often display surprising collective wisdom, making better choices than individual experts. A democratic society doesn't just vote with its feet, it votes with every policy made by government, every action taken by a neighborhood group, and every movement of the marketplace. The combination of those decisions creates laws, establishes institutions, and builds cities.

Crowds don't wind up making good decisions by happenstance. Individuals exercise their best judgment, and the total of that judgment turns out to be greater than the sum of the parts.

If we act like we are staying and we use our best judgment, the future of the Sun Corridor will be shaped by the wisdom of all those who live there.

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