

## DOCUMENT RESUME

ED 306 820

HE 022 482

**AUTHOR** Caldwell, Roger L.  
**TITLE** Some Thoughts about Approaching the Future of Arizona.  
**INSTITUTION** Arizona Board of Regents, Phoenix.  
**PUB DATE** Nov 88  
**NOTE** 6p.; In "The Arizona Board of Regents' Task Force on Excellence, Efficiency and Competitiveness. Final Report and Working Papers." Volume Two. For Volumes One and Two, see HE 022 446-447. For individual working papers, see HE 022 448-460 and HE 022 482-501.  
**PUB TYPE** Reports - Evaluative/Feasibility (142)

**EDRS PRICE** MF01/PC01 Plus Postage.  
**DESCRIPTORS** Change; Change Strategies; Competition; \*Educational Change; \*Educational Planning; Educational Quality; Efficiency; Excellence in Education; \*Higher Education; \*Long Range Planning; Prediction; Public Colleges; Science and Society; Social Change; State Universities; \*Statewide Planning; Technological Advancement

**IDENTIFIERS** \*Arizona; Arizona State University; Arizona Task Force on Excellence Efficiency Compet; Northern Arizona University; University of Arizona

**ABSTRACT**

One of the working papers in the final report of the Arizona Board of Regents' Task Force on Excellence, Efficiency and Competitiveness, this document looks at ways to approach future changes in Arizona, focusing on how they will affect the higher education needs of the state. It is important to consider long term outlooks in order to better understand how they might affect current planning. Three basic assumptions when dealing with this issue are: it is not possible to predict the future over long periods; it is possible to observe and understand forces of change that suggest that certain events have a greater probability than others; and it is possible to influence these trends today to shape the future. Several changes over the past 25 years are noted. The importance of finding several major forces that could shape the future are discussed (e.g., unanticipated acts of God, political and social trends, technological changes, power shifts, and environmental concerns). These major forces of change can develop into the critical issues of the future. Two critical issues to consider in Arizona are: (1) the infrastructure of the state might become more mature as the growth rate slows and the demands for services increase; and (2) the political and social climate will shift to include a range of subjects and an increase in the types and diversity of individuals involved in the issues. Implications of these possible future changes include a great amount of uncertainty over the next decade and a wide variety of viewpoints. A few critical events could have profound effects. (SM)

---

# SOME THOUGHTS ABOUT APPROACHING THE FUTURE OF ARIZONA

---

ROGER L. CALDWELL

"PERMISSION TO REPRODUCE THIS  
MATERIAL HAS BEEN GRANTED BY

~~AZ Board of Regents~~

TO THE EDUCATIONAL RESOURCES  
INFORMATION CENTER (ERIC)"

## INTRODUCTION

It is highly appropriate for Arizona to discuss the long term future of the state as we approach the 21st Century. Several Arizona cities have mounted efforts to assess their directions over the next decade or so. The Board of Regents has established a Task Force on Excellence, Efficiency, and Competitiveness, which as part of its activities is attempting to anticipate possible changes in Arizona as they will affect the higher education needs of the state.

It is important to consider these long term outlooks to better understand how they might affect today's planning activities. I believe the question is especially timely, for there are several aspects of Arizona that are in the process of change, and these changes will affect all of us. I will approach the "thoughts about the future" by giving a few assumptions, looking backward for an equal time frame, looking for the "major" forces that might shape the future, and then identify some critical issues and their implications for Arizona over the next several decades.

## ASSUMPTIONS

One of the major problems in dealing with the future involves clarifying assumptions. People tend to look at the world through their experiences and personal value systems, and this causes all of us to approach an issue from very different perspectives. What are facts to some people are desires or false information to other people. Let me therefore begin with a statement of three assumptions:

- 1) it is not possible to predict the future over long periods, and therefore we should not try to be too specific in our discussions (neither should we be too general);
- 2) it is possible to observe and understand forces of change that suggest certain events have a greater probability than others (or a low probability but a potentially high impact); and
- 3) we can influence these trends today and therefore are in a position to shape the future. This latter point is especially true in Arizona, where the growth rates are relatively rapid (and therefore the results of changes can be seen more clearly), and where the size of or complexity of the issues are manageable. Before we discuss some ideas about the next 25 years, what has happened over the last 25?

---

Roger L. Caldwell has been a member of the University of Arizona for 20 years, where he is a Professor of Soil and Water Science. He has served in several administrative positions relating to general environment, energy conservation, computing and information services, and academic planning. He has taught in the fields of plant diseases and pesticides, environment, alternative futures, and scientific communication methods. He has served on several state and local governmental committees relating to economic development, transportation and environmental concerns.

U.S. DEPARTMENT OF EDUCATION  
Office of Educational Research and Improvement  
EDUCATIONAL RESOURCES INFORMATION  
CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

894

2

BEST COPY AVAILABLE

ED306820

284 022 482



---

## WHAT HAS CHANGED IN THE LAST 25 YEARS?

A number of years ago, say during the 1950s and 1960s, it was relatively easy to understand the important future issues relating to the state as a whole. In this previous 25 or so year period, the state grew rapidly, and felt few constraints on that growth. The economy slowly shifted from agriculture and mining to manufacturing and tourism. Other fundamental changes were beginning to occur, for example, the availability and widespread use of the common air conditioner (refrigeration) that greatly assisted development in the state.

Several leaders were assassinated (John Kennedy, Martin Luther King, Anwar Sadat), and an oil embargo caused increases in energy prices in 1973 and again in 1978. We also saw the first human on the moon, the introduction of the inexpensive and powerful microcomputer, and the beginnings of designing by biotechnology new organisms that produced products for human use.

Further, in the last decade or so, other changes have surfaced: an increase in two income families, single parent families, equal opportunity employment, increased national and international debt and negative trade balances, and decreased savings rates by individuals.

New technologies, working conditions, job opportunities, and health issues now face us. It is sometimes difficult to see changes as we participate in them. It is somewhat like watching how a child grows from the perspective of an occasional visit to that of daily observance. It is important to recognize that significant change, often unexpected, has taken place in the past.

## MAJOR FORCES OF CHANGE

We must first try to find the several major forces that could shape the future, and to categorize them. While different people might do this in various ways, let me select six major categories: population, economy, technology, politics, society, and environment/health.

Further, there are the unanticipated "acts of God" that could occur, including nuclear war, Three Mile Island nuclear generation replicas, AIDS, earthquakes, and climatic change to affect water supplies in arid areas. Within each of these some shifts are occurring. Consider population for example. The initial "baby boomers" recently turned 40, so the age distribution (nationally and in Arizona) will have a "bulge" in middle age rather than in the early job attainment years (and years of greatest migration rate). This phenomenon will have profound effects on Arizona, in job opportunities, population migration patterns, health care, and marketing needs. Within the economic area, the alternative solutions to national (and international) debt will cause changes in the role of the government, the types of jobs that are available, and may cause different purchasing patterns for all sectors of society. The increased integration of the United States into the world economy makes us less immune to international business cycles and decisions of other countries.

There are many technological changes taking place, and there will be more that are difficult to assess at this stage. Some of the more important are the information industry (computing, data access, working via electronic links), the materials industry (ceramic and strong but light synthetic structures), and the biological discoveries (genetic engineering, drug

---

design, replacement of body components). As these new activities emerge, and old ones decline, we will need people trained (or retrained) in subject areas that may exist today.

These new technologies will also raise new questions, such as the role of privacy in an information society, the ethics of organ transplants or health care for the very old, and availability of services (or access to information) based on economic class. In addition, as technological change increases the "complexity" of daily life, we will need a broadly educated public to participate in society (e.g., discussing the ethics of prolonging life).

Political and social views have tended to cycle over long time periods (on the order of generations). With the increased availability of information, including rapid publication of specialized magazines-books, and the relative ease of access by a broad spectrum of individuals, the political "views" will not fall into simple categories (the historic two major parties). It is more difficult to determine how these alliances will be built, how long the process will take, and how the alliances will shift and interact on the various issues. Public and private attitudes also shift, and in the next few years we could see a replay of some of the views of 20-30 years ago (less "me generation" and more social activism).

Along with societal changes, we will likely see "power shifts" in the composition of community leader groups. The change will be toward a greater need for negotiation or consensus building, will involve evaluating a series of alternatives, and will involve a number of people, rather than approaches that might appear to be simple decisions by a relatively small number of people.

Environmental concerns (e.g., quality of life and health factors) will gain in importance for Arizona, as the increase in population causes a loss of amenities (clear air, short drives) and as the population age distribution shifts (more young and old). This shift has as yet unrealized consequences on retirement programs and health care industries in the next 25 year period.

All changes, whether these examples or others, will likely occur at different rates within different societal groups. The changes will appear small (like the child growing up when viewed on a daily basis), but over time, small changes cause large differences. For example, when the oil embargo occurred in 1973, changes were made that nearly doubled the fuel efficiency standards. Since the "typical" car lasts 15 years, the majority of cars on the road today are approaching these new standards.

Change is difficult to pinpoint. For example, in the last 10 years, estimates (from one source) of the Arizona population in the year 2000 have ranged from 3.9 to 5.3 million. It currently ranges from 4.4 to 5.3 million according to two sources. For that reason, I will focus on the critical issues and their implications, rather than attempt to identify specific events.

## **CRITICAL ISSUES**

How do these major forces of change develop into the critical issues facing the state? What are the critical issues facing Arizona in the next 25 years? We could make a listing of specific items (like water availability, types of jobs, or amount of solar energy used), but getting that specific over such a long time period is inappropriate for two reasons:

- 1) we will likely miss the target because there are too many uncertainties about specific items, or
- 2) we will concentrate on too much detail and miss the overall forces and trends, which will really be the important influences on the future.

A listing of these critical issues will differ according to who develops the material and how deeply one delves into detail. I will attempt to combine the major forces of change into two critical issues for discussion.

**First**, the infrastructure (physical and human services, analytical capability) of the state might become more mature as the growth rate of the state slows and the demands for services (which lag behind growth but may eventually) continue to increase.

**Second**, the political and social climate will shift to include a range of subjects and an increase in the types and diversity of individuals involved in the issues.

The effects of these two changes will cause conflicts in the ways we are accustomed to operating, and will generate discussion in areas that are somewhat unfamiliar; therefore the change will not come easily.

### IMPLICATIONS

What are the implications of these possible future changes? Here are some "guidelines" we might identify by reviewing these major forces of change:

- 1) There will be some uncertainty over the next decade or so as Arizona "matures" from a rapid growth state to one resembling many other states. This will be further

influenced by national and international economic events (e.g., debt) and political events (e.g., Middle East or Central America/Mexico).

- 2) Shifts will not be immediately obvious, because some will occur slowly and many will occur at different rates in various parts of society.
- 3) The uncertainty, coupled with current information technologies which allow technical ease of access to information sources, will enable multiple viewpoints to be heard. This will cause, at times, conflicting information about the different perceived "best" directions to take.

### CONCLUSIONS

We should be able to define the major forces of change and the critical issues that may emerge from these forces or their interactions. What are the critical issues of the next 25 years? By focusing on the forces of change rather than the results of these forces, we are forced in part, to identify the actual changes ourselves. The critical issues are few and have substantial consequences. I have identified several categories of issues in the form of the population changes, economic conditions, technological change, and political, social, and quality of life shifts.

Could we have foreseen these events, if we had been looking for them? While there are some events that really are surprises, most give early warnings if you had a little radar system scanning the horizon for signals (including the oil embargo and its after effects). Understanding the future is not trying to

predict it. Rather, it is more in looking for these "early warning signals" and understanding how to interpret them, in finding the few major events that are likely to produce the most significant effects (positive or negative), in reassessing old assumptions, and in remaining flexible as you continually reevaluate conditions.

It is important to look at both the positive and negative aspects of new happenings, as well as further impacts of the initial impacts (e.g., the invention of the car brought highways, then urban traffic, then air pollution, then catalytic converters, and so on). The US Congress has approached this by creating an Office of Technology Assessment (1972) to study impacts of today's technologies (an approach to the new field of technology assessment). It seems to me there are several such signals evident today; what is difficult is interpreting their impacts and evaluating the timing. There are many techniques for developing this foresight, and since it is an uncertain enterprise, one must use multiple approaches and consult a variety of sources and points of view.

What will the future look like? Society is large and complex, so much of what we see today may still be evident in the next 25 years, just as much of what we remember of 25 years ago is still apparent. Looking back 25 years may give some indication of the size of the changes we could expect, but they are likely to be greater, as the rate of change is increasing. It is relatively clear (to me at least) that one of the best approaches to the next 25 years is to retain flexibility and keep alert for new directions; it is surprising how many things seem clear in retrospect, and we can learn to anticipate change (in both the future and the present) to minimize its negative

effects as well as capitalize on the positive aspects.

A few critical events (either anticipated or as surprises) could have profound effects. What is the likelihood of the economy of Mexico collapsing, causing a significant increase in migration rates to Arizona? What is the likelihood of sufficient instability in the Middle East to cause a large scale energy supply disruption? How will changes in the economies of other states affect population migration rates to or from Arizona?