Arizona Board of Regents
Response to Senate Bill 1517
(Laws 2005, Chapter 330)

The University of Arizona
College of Medicine-Phoenix

Submitted to Joint Legislative Budget Committee

September 1, 2005

This document, along with the companion document containing Appendices A-L, may be accessed at www.abor.asu.edu

Table of Contents

President's Letter **1**

Introduction **3**

Vision 6
Mission 6
LCME Accreditation 7

ABOR Responses to SB 1517 Requests 8

1. Detail on expenditures to date by the Arizona Board of Regents, its institutions, and its partners **9**

2. Detailed five-year operational and capital budgets, including information on the expected sources of all funds **10**

The University of Arizona 10
FY 2006-FY 2010 Operational Budget 11
Sources of Funds 18
State funds 19
Tuition 19
Sponsored research grants and contracts 20
Clinical revenues 22
Hospital support 23
Philanthropic goals 23
FY 2006-FY 2010 Capital Budget 24
COM 1, COM 2, and COM 3 25
Arizona Biomedical Collaborative 1 (ABC 1) 26
Educational Facility for The University of Arizona College of Medicine-Phoenix 26

Arizona State University 27
FY 2006-FY 2010 Operational Budget 27
Capital Budget (ABC 1) 29
Sources of Funds 31
First-year funding 31
External funding from federal agencies 31
External funding from private sources 32
National foundations 33

3. A five-year description of enrollment, growth capacity, and graduation expectations by practice area 34

The University of Arizona 34
Admissions 34
Career choice of graduates 35
Demographics of student class 36
Graduate medical education 37
Graduate students 37
MD/PhD students 38

Arizona State University 38
Projected enrollment and growth capacity 38
Projected graduation numbers 39

4. A 20-year financing plan detailing each funding source, including options to maximize resources and partnerships with the Maricopa County Special Health Care District and other health care entities. Funding sources may include federal grant monies, private donations, and contributions from other public entities 42

The University of Arizona 42
20-Year Operational Budget 42
Sources of Funds 46
State funds 46
Tuition 46
Sponsored research grants and contracts 46
Philanthropic goals 47
Maximizing resources 47
20-Year Capital Budget 48

Arizona State University 51
20-Year Operational Budget 51
Sources of Funds 51

5. The programs and areas of practice offered 54

The University of Arizona 54
Practice Disciplines 54
Statewide Retention of Practicing Graduates 56
Rural Outreach 56
Rural Health Professions Program 56
Arizona Area Health Education Centers Program 57
The Arizona Telemedicine Program 59
THealth 59
The Arizona Health Sciences Library 59

Minority Outreach 60
The Office of Minority Affairs 60
Med-Start—Office of Minority Affairs 60
Native American Research and Training Center 61
Commitment to Underserved People Program 61

Arizona State University 61
Degree-Granting Programs 61
Non-Degree Programs 62

6. All partners involved in the Phoenix medical campus project, their roles, and an organizational chart 63

Partners 63
Arizona Commission on Medical Education and Research 63
City of Phoenix Mayor and Council 64
Translational Genomics Research Institute 65
Hospital partners 65
Education 65
Graduate medical education 66
Research 66
Other partners 67

7. The contributions and financing arrangements of all partners contributing to the capital plant, as well as the legal and financial relationships of the Arizona Board of Regents and its institutions to these partners 68

COM 1, COM 2, COM 3 (former PUHS buildings) 68
Arizona Biomedical Collaborative 1 (ABC 1) 68
Additional Facilities to Expand Class Size and to Reach Build-out 69

List of Figures

Figure 1. A Timeline for the Supply of Physicians 6

Figure 2. Sources of Revenue to Support Operations in Research-Intensive Medical Schools 19

Figure 3. Arizona State University Department of Biomedical Informatics Projected Revenue Sources FY 2025 52

Figure 4. Arizona Area Health Education Centers Program Map 58

Figure 5. The University of Arizona College of Medicine-Phoenix Partnership Organizational Chart 63

Figure 6. Master Development Site Plan for Phoenix Biomedical Campus 70

Figure 7. Land Use Scenarios for Phoenix Biomedical Campus..... 71

List of Tables

Table 1. The University of Arizona College of Medicine-Phoenix Planning Expenditures: Arizona Board of Regents, The University of Arizona, and Arizona State University FY 2003-FY 2005 9

Table 2. The University of Arizona College of Medicine-Phoenix Level I and Level II Enrollment and Budget Projections Summary FY 2006-FY 2025 10

Table 3. The University of Arizona College of Medicine-Phoenix FY 2006-FY 2010 Summary Budget..... 14

Table 4. The University of Arizona College of Medicine-Phoenix Projected Students, Faculty, and Staff FY 2008-FY 2025 (selected years) 15

Table 5. The University of Arizona College of Medicine-Phoenix Tuition Estimates FY 2006-FY 2025 20

Table 6. NIH Biomedical Research Funding Ranking for The University of Arizona College of Medicine Departments 21

Table 7. Arizona State University Department of Biomedical Informatics FY 2006-FY 2010 Operational Budget 27

Table 8. Arizona State University Department of Biomedical Informatics Capital Budget..... 29

Table 9. Numbers of Academically Qualified Applicants Rejected for Admission by The University of Arizona College of Medicine, 2001-2005 35

Table 10. Practice Settings Chosen by The University of Arizona College of Medicine Graduates, 1995-2004 35

Table 11. Comparison of The University of Arizona College of Medicine and National Distributions of Racial and Ethnic Composition of Medical Students, 1996-2005 36

Table 12. Projected Numbers of Arizona State University BMI Majors and Students Receiving BMI Instruction 39

Table 13. Projected Graduation Numbers for Arizona State University BMI Degrees and Majors 39

Table 14. The University of Arizona College of Medicine–Phoenix FY 2011-FY 2015 Summary Budget..... 44

Table 15. The University of Arizona College of Medicine-Phoenix FY 2025 Summary Budget 45

Table 16. Breakdown of The University of Arizona College of Medicine-Tucson Space, 2005 48

Table 17. The University of Arizona College of Medicine-Phoenix Capital Expenditure Cost Model FY 2010..... 49

Table 18. Projected Facilities on the Phoenix Biomedical Campus 51

Table 19. Examples of Arizona State University's Expanded Collaborations with Maricopa County Special Health Care District Partners 53

Table 20. Residency Selections by The University of Arizona College of Medicine Graduates, 2001-2005 55

List of Appendices

Appendix A. The Arizona Physician Workforce Study Part I: The Numbers of Practicing Physicians 1992-2004, 2005

Appendix B. Memorandum of Understanding Regarding the Expansion of Medical Education and Research in Phoenix signed by Regent Gary L. Stuart, President Peter W. Likins, and President Michael M. Crow, August 4, 2005

Appendix C. Governor's Executive Order 2004-25 Establishing the Arizona Commission on Medical Education and Research, October 19, 2004

Appendix D. Implementation of the Phoenix Program of The University of Arizona College of Medicine: Directions and Imperatives, Interim Executive Report, Kurt Salmon Associates (KSA), June 15, 2005

Appendix E. The University of Arizona College of Medicine-Phoenix FY 2006-FY 2010 Budget Detail

Appendix F. Economic Quantification Study, Phoenix Biomedical Campus, Executive Report, Tripp Umbach, July 15, 2005

Appendix G. Legislative Briefing Book on the Phoenix Program of The University of Arizona College of Medicine Level I Five-Year Projection, April 27, 2005

Appendix H. Arizona Commission on Medical Education and Research (ACMER) and ACMER Task Forces membership lists

Appendix I. Arizona State University Department of Biomedical Informatics Draft Business and Implementation Plan, July 17, 2005

Appendix J. The University of Arizona College of Medicine-Phoenix FY 2011-FY 2015 Budget Detail

Appendix K. The University of Arizona College of Medicine-Phoenix FY 2025 Budget Detail

Appendix L. Intergovernmental Agreement between City of Phoenix and Arizona Board of Regents relating to Lease of Buildings and Building Pads at Phoenix Biomedical Campus, February 5, 2004

List of Abbreviations and Acronyms

AAMC	Association of American Medical Colleges
ABC	Arizona Biomedical Collaborative
ABOR	Arizona Board of Regents
ACGME	Accreditation Council for Graduate Medical Education
ACMER	Arizona Commission on Medical Education and Research
AHEC	Arizona Area Health Education Centers Program
AHS Library	Arizona Health Sciences Library
AHSC	The University of Arizona Health Sciences Center
AMA	American Medical Association
ASU	Arizona State University
ATP	Arizona Telemedicine Program
AZHIN	Arizona Health Information Network
BMI	Department of Biomedical Informatics
BNI	Barrow Neurological Institute
COM	College of Medicine
CTHVAHCS	Carl T. Hayden Veterans Affairs Health Care System
CUP	Commitment to Underserved People Program
DO	Doctor of Osteopathy
DOD	Department of Defense
ERE	Employee-related expenses
F&A	Facilities and administrative costs
F.A.C.E.S.	Fostering and Achieving Cultural Equity and Sensitivity

FTE	Full-time equivalency
FY	Fiscal year
GME	Graduate medical education
HB	House Bill
GPA	Grade point average
IGA	Intergovernmental agreement
IGC	International Genomics Consortium
IT	Information technology
JCCR	Joint Committee on Capital Review
JLBC	Joint Legislative Budget Committee
KSA	Kurt Salmon Associates
LCME	Liaison Committee on Medical Education
MCAT	Medical College Admissions Test
MD	Medical Doctor
MOU	Memorandum of Understanding
MRI	Magnetic resonance imaging
NARTC	Native American Research and Training Center
NAU	Northern Arizona University
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIH	National Institutes of Health
NRC	Neuroscience Research Center
NSF	National Science Foundation
PBC	Phoenix Biomedical Campus
PhD	Doctor of Philosophy
PUHS	Phoenix Union High School
RHPP	Rural Health Professions Program
RRC	Residence Review Committee
SB	Senate Bill
TGen	Translational Genomics Research Institute
UA	The University of Arizona
UMC	University Medical Center
UPH	University Physicians Healthcare

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September 1, 2005

Representative Russell K. Pearce, Chair
Senator Robert L. Burns, Co-Chair
Joint Legislative Budget Committee
1716 West Adams
Phoenix, AZ 85007

Re: Arizona Board of Regents Response to SB 1517 Requests

Dear Representative Pearce and Senator Burns:

Pursuant to SB 1517 (Laws 2005, Chapter 330), the Arizona Board of Regents is pleased to submit for your review our responses to the seven specific requests relating to the operational and capital plans for The University of Arizona College of Medicine-Phoenix Program. These responses were authorized for submission by the Board of Regents at its August 16, 2005, meeting.

Our submission is limited to be responsive to the specific requests contained in SB 1517, and reflects the best thinking, to date, on the development of The University of Arizona College of Medicine-Phoenix Program. This is not intended to be a final plan for the Phoenix Program. A number of planning processes, both within the universities and in the larger community, are actively engaged in addressing the many complex issues which must be resolved to successfully implement both Level I and Level II of the Phoenix Program. This response, along with the other foundational work accomplished by The University of Arizona and Arizona State University this summer, will be used as tools for the Arizona Commission on Medical Education and Research (ACMER) to work towards finalizing a complete plan for the Phoenix Program.

We thank the Legislature and Governor for providing state funding to support this historic and critically important effort. We appreciate your Committee's oversight role, and trust that this submission is responsive to the statutory mandate.

Questions raised at the July 21, 2005, JLBC meeting and committed to writing in Director Stavneak's August 2, 2005, letter, will be addressed in a separate submission.

Sincerely,

Christina A. Palacios
President

cc: Governor Janet Napolitano
Members, Joint Legislative Budget Committee
Members, Joint Committee on Capital Review
Members, Arizona Board of Regents
President Peter Likins, The University of Arizona
President Michael Crow, Arizona State University
Executive Director Joel Sideman
Richard Stavneak, JLBC Director

Introduction

The need for Arizona to educate more MDs is dramatic, immediate, and well documented. Arizona is among the nation's fastest-growing states and suffers a physician shortage, especially in rural communities. *The Arizona Physician Workforce Study 1992-2004*, conducted by Arizona State University and The University of Arizona Health Sciences Center, and sponsored by the Flinn Foundation, St. Luke's Health Initiatives, and BHHS Legacy Foundation (*please see Appendix A*) indicates that the physician-to-population ratio in Arizona is 207 physicians for every 100,000 people, far below the national average of 283 physicians for every 100,000 people.

In an effort to respond to this critical need, in August 2004 the Arizona Board of Regents approved a Memorandum of Understanding *(please see Appendix B)* establishing an unprecedented collaboration to expand the operations of The University of Arizona College of Medicine in Phoenix, an effort involving the leadership, faculties, and strengths of both The University of Arizona and Arizona State University. The Memorandum of Understanding also provided for the establishment of a Department of Biomedical Informatics at Arizona State University that will be closely linked with the College of Medicine.

This expansion is a complex undertaking because of the resources and partnerships required. Academic leaders, health care leaders, and politicians around the nation are tracking this Arizona initiative, for they recognize, as do we, that this is an opportunity to learn from the past and to build intelligently for the future.

The University of Arizona College of Medicine-Phoenix Program will be part of the Phoenix Biomedical Campus, located on 15.8 acres in downtown Phoenix. The Campus will serve a key role in addressing Arizona's shortage of physicians, pharmacists, and other health care professionals. Regent Gary L. Stuart, immediate past-President of the Arizona Board of Regents, has worked closely and tirelessly since August 2004 with The University of Arizona, Arizona State University, Northern Arizona University, the City of Phoenix, TGen, Phoenix-area teaching hospitals, and other partners to establish the Phoenix Biomedical Campus.

The overall concept is straightforward: to establish in downtown Phoenix a University of Arizona College of Medicine-Phoenix Program that in a very short time period will graduate as many as 150 new MDs per year, with the expectation that a majority will remain in Arizona or return to Arizona following residency training. Phoenix is the largest city in the nation without an academic health center, and this fact creates a strategic liability for the long-term health and prosperity of its population.

The Arizona State Legislature and Governor Janet Napolitano seized this unique opportunity by appropriating $7 million of General Fund support to expand The University of Arizona College of Medicine into rapidly revitalizing downtown

Phoenix. This expanded College of Medicine will lead to improved health care throughout Arizona and will allow more Arizonans to attend medical school in their own state, increasing the likelihood that they will choose to practice here.

The City of Phoenix has provided the land to establish the Phoenix Biomedical Campus, which, in addition to The University of Arizona College of Medicine expansion, is the site of the internationally noted Translational Genomics Research Institute and International Genomics Consortium, and the future site of the Arizona Biomedical Collaborative with facilities to house medical school researchers from The University of Arizona and Arizona State University. Future plans call for expansion of the nationally preeminent University of Arizona College of Pharmacy to the Phoenix Biomedical Campus, possibly at the Mercado, and the relocation of the Arizona State University College of Nursing to nearby Arizona State University at the downtown Phoenix campus. (The Arizona State University College of Nutrition will be located at the Arizona State University Polytechnic campus.)

Another key element of the plan for the expanded College of Medicine is the strong foundation that exists in Phoenix because The University of Arizona College of Medicine has been active in the Phoenix area for more than 30 years. Since 1992, the College has maintained a "regional campus" in Phoenix, allowing about 40 percent of third- and fourth-year University of Arizona medical students (approximately 80 students each year) to complete their final two years of medical school in Maricopa County, training at nine Phoenix-area teaching hospitals. The College now has more than 400 volunteer faculty members in Greater Phoenix.

In order to coordinate the activities of the various stakeholders for this project, on October 19, 2004, Governor Napolitano issued Executive Order 2004-25, "Establishing the Arizona Commission on Medical Education and Research" *(please see Appendix C)*, appointing a statewide Commission to help guide establishment of the Phoenix Biomedical Campus. The Commission was charged to develop a plan to implement the principles enumerated in the Memorandum of Understanding signed August 4, 2004, by then-Regents President Stuart, The University of Arizona President Peter Likins, and Arizona State University President Michael Crow.

Members of the Commission include Governor Napolitano; Phoenix Mayor Phil Gordon; Gary L. Stuart, Arizona Board of Regents; Peter Likins, President, The University of Arizona; Michael Crow, President, Arizona State University; John Murphy, President and Chief Executive Officer, Flinn Foundation; Jeffrey Trent, President and Scientific Director, Translational Genomics Research Institute (TGen); Peter Fine, President and Chief Executive Officer, Banner Health; Linda Hunt, President, St. Joseph's Hospital and Medical Center; and James Kennedy, Chief Executive Officer, Maricopa Integrated Health System. Senator Carolyn Allen and Representative Laura Knaperek are ad hoc members of the Commission.

The Commission engaged, with financial support from the Flinn Foundation, Kurt Salmon Associates as consultants, to help develop an inclusive process for the planning of The University of Arizona College of Medicine-Phoenix, including the creation of various task forces (*please see the Kurt Salmon Associates report at Appendix D).*

With a tremendous need and active participation by many key players, the ingredients are in place for a success story:

- The primary leadership of The University of Arizona, a major research public university with 40 years experience in the training of medical students and physician-residents

- The partner participation of Arizona State University, especially in areas of biomedical informatics and basic sciences education for medical students

- The partner participation of outstanding community hospitals that for many years have supported the clinical training of third- and fourth-year University of Arizona College of Medicine students

- The partner participation of the Translational Genomics Research Institute helping to connect the research endeavors of The University of Arizona and Arizona State University and to provide opportunities for students to engage in translational research

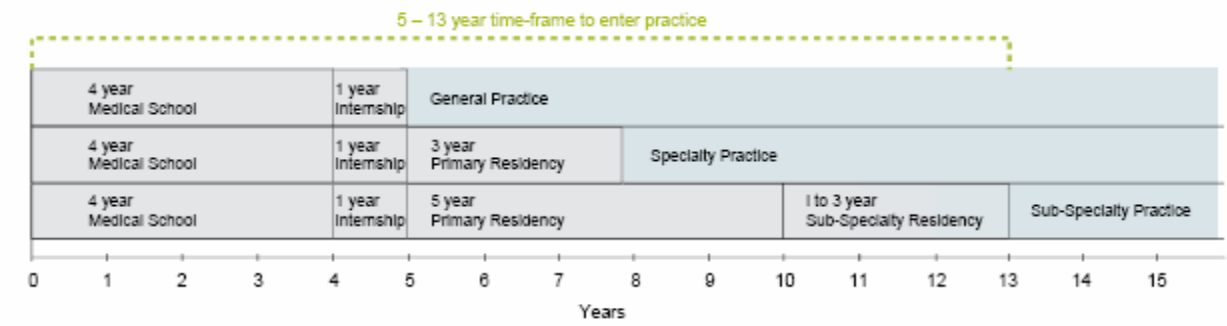
- Continued leadership by the Arizona Commission on Medical Education and Research and the Arizona Board of Regents

The ethos of the academic health center will be what is already foundational to The University of Arizona, Arizona State University, and TGen: the seamless linkages of teaching, research, clinical activity, and outreach. This assures that The University of Arizona College of Medicine-Phoenix students will engage in a set of research-supported learning environments, recognizing that knowledge and protocols in academic medicine are changing at lightning speed, and that graduates in the present and future must be capable of tracking, and leading, change.

The net result will be yet another economic driver for the state of Arizona, but more importantly, the net result will underscore to people and businesses considering Arizona as a home that health and welfare is a strategic priority, and that Arizona intends to increase its capacity to serve these needs.

The urgency to act is best understood with one look at Figure 1. It takes from 5 to 13 years beyond the bachelor's degree to train an MD, depending on selected practice area. We must begin now.

Figure 1. A Timeline for the Supply of Physicians



The Governor's Office and the Arizona Board of Regents are committed to ensuring that the momentum and enthusiasm that have driven this project to date are sustained in order to respond to the urgency of this need.

As emphasized by Kurt Salmon Associates:

"The continued leadership of the Arizona Commission for Medical Education and Research and the Arizona Board of Regents will be necessary to ensure progress across the broad range of participants and constituencies involved in the Phoenix Program. This is likely to be the case for at least the initial years of implementation."

Vision

The vision of The University of Arizona College of Medicine-Phoenix is to create the physician of the 21st century, who will be equipped with the knowledge, continuous learning skills, and technological tools to understand and apply the increasingly complex array of scientific data to the prevention and detection of, and treatment of patients with, a broad spectrum of diseases. This vision will be created through a unique and creative set of collaborations that will draw on the strengths of partnering universities, hospitals, and research institutes in a city and state that support the growth of this enterprise.

Mission

The University of Arizona College of Medicine-Phoenix will provide the outstanding faculty and curriculum to educate and shape physician leaders through the three integrated elements of education, research, and patient care. Faculty, students, and researchers will continually improve the diagnosis, treatment, and prevention of disease for the people of Arizona, with the common goals of improving people's health and alleviating suffering from disease. This

will be accomplished by becoming a national leader in innovative medical education, clinical care, and biomedical research—and by being nationally recognized for innovations in personalized medicine, biomedical informatics, and translational research.

LCME Accreditation

Programs for granting the MD degree are accredited and monitored by the Liaison Committee for Medical Education (LCME), an independent organization affiliated with both the American Medical Association (AMA) and the Association of American Medical Colleges (AAMC). Accreditation requires presentation of a high-quality curriculum, facilities, faculty, student support services, financing, and a supportive setting (clinics, hospitals, etc.). The University of Arizona College of Medicine is accredited by the LCME; the plan is to extend this accreditation to The University of Arizona College of Medicine-Phoenix Program. This extension must be approved by the LCME approximately six months prior to matriculation of students. The College has been in close consultation with the LCME on these issues, including a consultation site visit in January 2005. The College will continue to take all necessary steps to meet LCME accreditation requirements.

ABOR Responses to SB 1517 Requests

SB 1517 (Laws 2005, Chapter 330) states:

> "The University of Arizona shall establish a medical campus in Phoenix, utilizing the campus of the Phoenix Union High School. The Phoenix medical campus shall address medical education needs throughout the state."

In addition, SB 1517 makes seven specific requests for information relating to the expansion of The University of Arizona College of Medicine in Phoenix from the Arizona Board of Regents:

> "By September 1, 2005, the Arizona Board of Regents shall submit for review to the Joint Legislative Budget Committee its operational and capital plans for the Phoenix medical campus. These plans shall include at least the following:
>
> 1. Detail on expenditures to date by the Arizona Board of Regents, its institutions, and its partners.
> 2. Detailed five-year operational and capital budgets, including information on the expected sources of all funds.
> 3. A five-year description of enrollment, growth capacity, and graduation expectations by practice area.
> 4. A 20-year financing plan detailing each funding source, including options to maximize resources and partnerships with the Maricopa County Special Health Care District and other health care entities. Funding sources may include federal grant monies, private donations, and contributions from other public entities.
> 5. The programs and areas of practice offered.
> 6. All partners involved in the Phoenix medical campus project, their roles, and an organizational chart.
> 7. The contributions and financing arrangements of all partners contributing to the capital plant, as well as the legal and financial relationships of the Arizona Board of Regents and its institutions to these partners."

The responses of the Arizona Board of Regents follow. Please note that throughout this report all revenues and expenses are expressed in 2005 dollars, except where noted otherwise.

1. **Detail on expenditures to date by the Arizona Board of Regents, its institutions, and its partners**

Expenditures to date by the Arizona Board of Regents, The University of Arizona, and Arizona State University are fairly limited *(please see Table 1).* Although much time has been devoted to this effort by ABOR staff and UA and ASU faculty and staff, no new salary lines have been created.

Table 1. The University of Arizona College of Medicine-Phoenix Planning Expenditures: Arizona Board of Regents, The University of Arizona, and Arizona State University, FY 2003-FY 2005

	FY 2003	FY 2004	FY 2005	3-Year Total
Arizona Board of Regents				
Salaries	$ 10,892	$ 5,630	$ 0	
Project Operations	59,595	79,130	68,965	
TOTAL	$ 70,487	$ 84,760	$ 68,965	$ 224,212
The University of Arizona				
Salaries			$ 140,000	
Travel			41,200	
Operations			129,100	
TOTAL			$ 310,300	$ 310,300
Arizona State University				
Salaries			$ 3,750	
Travel			2,750	
TOTAL			$ 6,500	$ 6,500
GRAND TOTAL				**$ 541,012**

The expenditures by the Arizona Board of Regents supported general site assessment studies, environmental assessments, site plans, schematic drawings, and programming of facilities for the renovation of the historic Phoenix Union High School buildings. The University of Arizona expenditures supported the salary of the Phoenix Biomedical Campus project manager, consulting services, and completion of an economic impact study. Arizona State University expenditures supported a graduate assistant and travel, both relating to researching Biomedical Informatics departments at other universities.

2. **Detailed five-year operational and capital budgets, including information on the expected sources of all funds**

The University of Arizona

Table 2 presents a summary of projections for numbers of students and budget requirements for both state support and non-state support for The University of Arizona College of Medicine-Phoenix during Level I and Level II. Level I is the initial stage of the UA College of Medicine-Phoenix and is limited to a class size of 24 medical students. During this Level, the curriculum will be refined and research efforts will begin. Level II is the growth period of the UA College of Medicine-Phoenix that will see the medical school expand from 24 students per class to a full build-out of 150 students per class in FY 2015.

Table 2. The University of Arizona College of Medicine-Phoenix Level I and Level II Enrollment and Budget Projections Summary FY 2006-FY 2025 ($ in millions and in 2005 $)

Fiscal Years	Legislative Briefing Book State Budget Projections (4/27/05) (All Level I)	Current Projections (7/05)						
		First-Year Medical Students	Total Medical Students	Science Graduate Students	Post-Doc Fellows	Total Students	State Budget	Total Budget
Level I								
2005-06	$ 6.0	0	0	0	0	0	$ 6.0	$ 8.8
2006-07	$ 6.0	0	80*	0	0	80	$ 6.0	$ 14.5
2007-08	$ 8.5	24	104	48	24	176	$ 8.5	$ 21.1
2008-09	$ 12.0	24	128	136	68	332	$ 12.0	$ 30.0
Level II								
2009-10	$ 16.0	64	192	216	130	538	$ 23.5	$ 78.2
2010-11	$ 20.0	80	272	310	184	766	$ 21.1	$ 90.2
2011-12		104	352	404	238	994	$ 24.1	$ 110.8
2012-13		128	456	498	292	1,246	$ 25.9	$ 120.4
2013-14		144	536	592	346	1,474	$ 26.0	$ 147.6
2014-15		150	606	691	403	1,700	$ 33.6	$ 168.9
2024-25		150	680	1,060	600	2,340	$ 45.0	$ 218.6

*Although the first class of 24 Phoenix Program students will begin in July 2007 (FY 2008), tuition revenue for 80 third- and fourth-year Tucson Program students is included in the Phoenix Program FY 2007 revenue projections, and will be foregone by the Tucson Program, to ensure the success of the Phoenix Program financial model and to limit the request for state support. Therefore, these Tucson Program student counts are included in Table 2.

FY 2006-FY 2010 Operational Budget

The proposed budget summary for FY 2006-FY 2010 represents a comprehensive analysis of the 5-year needs for the UA College of Medicine-Phoenix *(please see Table 3)*. All amounts in the budget summary are derived from the detailed breakdown of expenses, provided in the tables presented in Appendix E. Also provided in the detailed budgets in Appendix E is a partial list of revenue streams required to cover the operating costs associated with the UA College of Medicine-Phoenix.

These budgets assume a phased move from Level I to Level II beginning in FY 2010. Level I is the initial stage of the UA College of Medicine-Phoenix and is limited to a class size of 24 medical students. During this Level, the curriculum will be refined and research efforts will begin. Level II is the growth period of the College and will see the medical school expand from 24 students per class to a full build-out of 150 students per class in FY 2015. The timeframe between FY 2007 and FY 2010 is also characterized by the need for larger facilities for the education and research endeavors. The logic for doing so, and the financial implications of that strategy, are discussed below.

The single most important message from all the budget information provided is that academic health centers are financial engines, and will generate revenues and economic impacts far in excess of expenses. This is the message delivered in detail in the Tripp Umbach economic impact analysis of the Tucson and Phoenix Programs referenced above *(Appendix F)*.

> "Tripp Umbach estimates that the Phoenix Biomedical Campus will rank among the state of Arizona's leading economic engines by 2025 when the campus has the potential to generate $2.1 billion in annual economic impact and generate employment for 24,000 Arizona residents. Further, the campus has the opportunity to generate more than $80 million annually in government revenue providing the state of Arizona with $2 in government revenue for every $1 invested."

A reading of the 12-page executive summary of this analysis is vital to truly appreciate the full economic ramifications of the Phoenix Biomedical Campus, and to recognize the tremendous return on investment that will occur.

The budgetary needs reflect the attempt of the UA College of Medicine-Phoenix to capture the total costs of an academic medical school, while limiting the resources required of the state in the early years to those presented in the *Legislative Briefing Book* shared with legislators on April 27, 2005 *(please see Appendix G)*. This has been accomplished in several important ways.

The total amount of *state* resources requested for the UA College of Medicine-Phoenix over the first four years, FY 2006-FY 2009, is consistent with the *Legislative Briefing Book*, reaching $12 million annually in FY 2009. The total FY

2009 budget for the PBC of $30 million will support the 128 students that will be in the program at this time. These projections reflect the College's strategy to generate non-state funds to subsidize the medical school program, even in the early stages.

The $16 million requested for *operating costs* for FY 2010, the first year of Level II, is consistent with the *Legislative Briefing Book*, which anticipated continuation of *only* Level I in FY 2010. However, with the one-year advancement of Level II implementation, $5 million in *one-time capital funds* and $2.5 million for *technology* are included in the revised FY 2010 total state request of $23.5 million. The FY 2011 state request drops to $21.1 million. This is compared with the $16 million presented in the *Legislative Briefing Book* for *only* Level I in FY 2010, and the $20 million for *only* Level I in FY 2011.

Thus, the College of Medicine has significantly reduced the April 2005 state funding request developed for only Level I. This strategy involves achieving economies of scale and scope between the Tucson and Phoenix Programs. In addition, while discussions are in the early stages, and will be continued through the Arizona Commission on Medical Education and Research (ACMER) process, the College is projecting extensive involvement of all our partners—Arizona State University, BNI/St. Joseph's, TGen, affiliated hospitals, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), and others—in implementing the teaching, clinical, and research efforts. We believe that we should and can develop an excellent medical school program in Phoenix, while still remaining cost conscious.

UA College of Medicine-Phoenix budgets were developed using the process and assumptions described below.

The numbers of faculty, staff, and students required for the education, research, and clinical needs were determined for each fiscal year beginning in FY 2006. The personnel needs shown in Table 4 were used to derive the budget projections shown in Table 3.

Faculty will be recruited and hired during Level I to occupy space in COM 1, COM 2, and COM 3 (the renovated Phoenix Union High School buildings) and in Arizona Biomedical Collaborative 1 (ABC 1). These faculty will have UA College of Medicine faculty appointments, will be intimately involved in the educational mission of the College, and will have varying degrees of involvement in the clinical and research missions. The number of faculty recruited corresponds in Level I to the available space and to the opportunities provided by economies of scale.

The College projected expenses for faculty recruitment (both salaries and recruitment packages) based both on faculty rank—assistant, associate, full professor—and on job description, rather than assuming a fixed amount per faculty member. For faculty predominantly engaged in teaching, the start-up costs are modest and extend over a limited number of years. For faculty with a

strong research orientation, the start-up costs are more substantial and extend over a longer period. A linear model was constructed to project all recruitment costs at all ranks over the time periods shown. Although the details of that model are not shown, they are available and justify the funds requested.

Table 3. The University of Arizona College of Medicine-Phoenix FY 2006-2010 Summary Budget

Revised 8-10-05

	Proposed FY 2006-FY 2010 Budget - Level I moving to Level II in FY 2010																			New State Requests FY 2006-FY 2010					
	FY 2006			FY 2007				FY 2008				FY 2009				FY 2010				Level I	Level I	Level I	Level I	LEVEL II	
	FTE	Budget	Initial State Request	FTE	Budget	Annual State Budget	New State Request	FTE	Budget	Annual State Budget	New State Request	FTE	Budget	Annual State Budget	New State Request	FTE	Budget	Annual State Budget	New State Request	New State FY 2006	New State FY 2007	New State FY 2008	New State FY 2009	New State FY 2010	New State TOTAL
EDUCATION																									
Administration		$1,529,321	$437,783		$1,837,707	$94,112	($343,671)		$1,920,747	$89,253	($4,859)		$1,921,547	$168,515	$79,262		$2,017,627	$0	($168,515)	$437,783	($343,671)	($4,859)	$79,262	($168,515)	$0
Dean of Academic Affairs	1.0			1.0				1.0				1.0				1.0									
Associate and Assistant Deans	2.0			4.0				4.0				4.0				6.0									
Admission/Academic/Financial Support	3.0			3.0				3.0				3.0				3.0									
Admin Assistant and Associates/Reception	7.0			6.0				6.0				6.0				10.0									
Business Affairs/Development/Facilities	3.0			5.0				5.0				5.0				7.0									
Special Assistant to the Dean	2.0			2.0				2.0				2.0				3.0									
Minority Affairs		256,518	0		263,502	0	0		263,502	0	0		263,502	0	0		412,132	0	0	0	0	0	0	0	0
Director	1.0			1.0				1.0				1.0				2.0									
Student Recruiters	3.0			3.0				3.0				3.0				4.0									
Administrative Assistant	1.0			1.0				1.0				1.0				1.0									
Basic Science Faculty Yr 1 & Yr 2 Students		1,947,852	1,947,852		1,947,852	1,947,852	0		3,502,100	3,502,100	1,554,248		4,395,360	4,395,360	893,260		4,533,480	4,533,480	138,120	1,947,852	0	1,554,248	893,260	138,120	4,533,480
PhD Faculty	7.0			7.0				16.0				20.0				23.0									
MD Faculty	3.0			3.0				4.0				6.0				7.0									
Educational Consultants MD, part time																									
Administrative Assistant	3.0			3.0				6.0				10.0				11.0									
Research Faculty		0	0		3,567,284	1,366,773	1,366,773		7,140,680	2,150,356	783,583		10,232,548	2,880,644	730,288		13,719,100	4,295,710	1,415,066	0	1,366,773	783,583	730,288	1,415,066	4,295,710
PhD Faculty				8.0				16.0				22.0				28.0									
MD Faculty				4.0				8.0				12.0				15.0									
Research Staff				18.0				36.0				51.0				65.0									
Admin Staff				12.0				16.0				22.0				43.0									
Faculty 3rd & 4th Year Clinical Education			0				0				0						33,667,014	2,632,728	2,632,728	0	0	0	0	2,632,728	2,632,728
MD Faculty-Teaching																44.0									
MD Faculty Teaching & Research																44.0									
Research Staff																264.0									
Admin Staff																13.0									
Information/Media Technology		141,175	60,120		143,335	62,280	2,160		289,272	206,917	144,637		289,272	206,917	0		737,600	655,245	448,328	60,120	2,160	144,637	0	448,328	655,245
Media Support	1.0			1.0				1.0				1.0				4.0									
Medical Computing	1.0			1.0				1.0				1.0				4.0									
Gross Anatomy Lab		0		1.0	48,440	48,440	48,440	2.0	96,880	96,880	48,440	1.0	96,880	96,880	0	2.0	145,320	145,320	48,440	0	48,440	48,440	0	48,440	145,320
Staff																									
Pre-Clinical Training		0					0		216,672	216,672	216,672		216,672	216,672	0		466,560	466,560	249,888	0	0	216,672	0	249,888	466,560
MD Faculty-Director								2.0				2.0				2.0									
Asst Dir																2.0									
Admin. Assistant																									
Medical Library		91,965	91,965		93,275	93,275	1,310		116,865	116,865	23,590		161,349	161,349	44,484		396,560	396,560	235,211	91,965	1,310	23,590	44,484	235,211	396,560
Librarian	1.0			1.0				1.0				1.0				3.0									
Library Support Staff	0.5			0.5				1.0				1.0				2.0									
Computer Staff												1.0				1.0									
Medical Bookstore		0				0	0		44,484	0	0		44,484	0	0		94,360	0	0		0	0	0	0	
Office Staff								1.0				1.0				2.0									
Shared Support Facilities																									
Office staff																									
Total Personnel (including ERE)	**39.0**	3,966,831	2,537,720	85.5	7,901,395	3,612,732	1,075,012	137.0	13,591,202	6,379,043	2,766,311	178.0	17,621,614	8,126,337	1,747,294	616.0	56,189,753	13,125,603	4,999,266	2,537,720	1,075,012	2,766,311	1,747,294	4,999,266	13,125,603
OPERATIONS	0.0	1,753,000	574,600	0.0	5,737,500	1,548,400	973,800	0.0	7,311,700	1,975,000	426,600	0.0	7,768,955	2,813,068	838,068	0.0	16,503,300	4,856,197	2,043,129	574,600	973,800	1,001,200	838,068	2,043,129	5,430,797
Operations																									
Lease Costs																									
Building Operations and Maintenance																									
Hospital Arrangements																									
Faculty Start Up																									
Travel		30,800	20,800		45,071	35,071	14,271		57,200	57,200	22,129		75,400	75,400	18,200		111,800	111,800	36,400	20,800	14,271	42,929	18,200	36,400	132,600
Capital		2,866,880	2,866,880		803,797	803,797	(2,063,083)		88,757	88,757	(715,040)		473,540	985,195	896,438		5,406,400	5,406,400	4,421,205	2,866,880	(2,063,083)	(1,974,326)	896,438	4,421,205	4,147,114
Computer Systems (inc software)																									
IT Infrastructure																									
Furnishings																									
Office Machines																									
TOTAL	**39.0**	$8,617,511	**$6,000,000**	**85.5**	$14,487,763	**$6,000,000**	**$0**	**137.0**	**$21,048,859**	**$8,500,000**	**$2,500,000**	**178.0**	**$25,939,509**	**$12,000,000**	**$3,500,000**	**616.0**	**$78,211,253**	**$23,500,000**	**$11,500,000**	**$6,000,000**	**$0**	**$2,500,000**	**$3,500,000**	**$11,500,000**	**$23,500,000**

Table 4. The University of Arizona College of Medicine-Phoenix Projected Students, Faculty, and Staff FY 2008-FY 2025 (selected years)

STUDENTS/FACULTY	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2025
Total Students (including graduate)	**176**	**332**	**538**	**766**	**994**	**1246**	**1474**	**1700**	**2340**
Total Students COM (4 yr)	104	128	192	272	352	456	536	606	680
UA Grad Students-Basic Science (4 per PI)	48	136	172	252	332	412	492	576	920
UA Grad Students-Clinical Science (1 per PI)	-	-	44	58	72	86	100	115	140
UA Post-Doctoral Fellows- Basic Science (2 per PI)	24	68	86	126	166	206	246	288	460
UA Post-Doctoral Fellows-Clinical Science (1 per PI)	-	-	44	58	72	86	100	115	140
Educational (students per class)[1]	24	24	64	80	104	128	144	150 (capacity)	150 (capacity)
Total Faculty[2]	**27**	**64**	**161**	**212**	**262**	**312**	**362**	**416**	**552**
Basic Science PIs	12	34	43	63	83	103	123	144	230
ED	15	30	30	33	35	37	39	42	42
Clinical Science PIs[3]	-	-	88	116	144	172	200	230	280
Total PI Support[3]	**18**	**51**	**329**	**443**	**557**	**671**	**785**	**906**	**1220**
Basic Science Staff[4]	18	51	65	95	125	155	185	216	345
Clinical Science Staff[5]	-	-	264	348	432	516	600	690	875
Total Support Staff	**39**	**66**	**127**	**157**	**187**	**210**	**235**	**274**	**360**
PIs Staff	12	22	43	63	83	103	123	144	230
Administrative Staff	27	44	84	94	104	107	112	130	130

[1] Numbers reflect students per class, not total COM students.
[2] FTEs.
[3] Assumes that 50% of these physicians (Clinical Science Principal Investigators) will be doing research.
[4] Basic Science Staff includes technician and laboratory manager (1.5 per PI).
[5] Clinical Science Staff includes data manager, research nurse, laboratory manager, research coordinator, technician, and biostatistician (6 per PI).

The administrative staffing levels were determined based on projections from the current UA College of Medicine staff in Tucson and Phoenix, adjusted to appropriate levels based on class size, as well as on the certain unavoidable fixed costs associated with any start-up operation. Therefore, while the administrative costs per student are high at the outset, they progressively drop, as the size of the student body increases, to levels substantially below current costs in Tucson. The total administrative staff level increases by 7 FTEs between FY 2006 and FY 2010, to support a student enrollment of 80 third- and fourth-year students in FY 2006, and increases to support a student population in FY 2010 of 192 students in all four years, and increases an additional 8 FTEs to support a projected student enrollment of 606 by FY 2015. The estimated

administrative staff to total faculty and research and clinical staff ratio is 43 percent in FY 2006, projected to be 4 percent in FY 2010 and 2 percent in FY 2015. In the early years, administrative staff positions must be funded by state resources. As tuition and other non-state funding resources increase, it should be noted that the state resources will be applied to salaries and operations supporting the faculty and student needs, and not to support of administrative salaries.

While we are still weighing various options for funding the UA College of Medicine-Phoenix, some aggressive cost-saving assumptions have been used in our projections. However, it should be emphasized that these assumptions may change over time. One aggressive cost-saving assumption relates to the percentages of faculty salary allocated to state funds, especially for faculty with a strong research orientation. Those faculty, in particular, are expected to recover one-half of their salary and benefits from sponsored research funding from the outset of their appointment and in perpetuity. This will not be feasible for many new faculty, particularly those at the assistant professor level, when initially recruited, and alternative sources of funds will be required to support their salaries until research funding is obtained. At this time, The University of Arizona College of Medicine-Phoenix has explicitly chosen not to request those alternative sources from the State Legislature, but rather to work toward developing partner participation arrangements to provide this alternative funding source. As discussed in the economic impact analysis by Tripp Umbach, the multiplier effect for research activities in academic health centers is 3.3. While the vast majority of the economic benefits are not manifested as available cash to cover faculty salaries, this figure nonetheless indicates the tremendous return on investment provided for this enterprise.

A parallel aggressive assumption is that no state funds will be used for research support or for research staff salary and benefits, and that the resources to cover those costs will be provided from other sources. Again, this is not the standard model, but reflects the UA's intention to substantially share the responsibility for launching this program.

All clinical faculty will receive 15 percent salary support from state funds for teaching activities. The majority of such clinical faculty will spend substantially more than 15 percent of their time in teaching activities, for which there is no other source of compensation. Again, the request from the state for covering these costs is significantly less than might have been anticipated. For example, a recent systematic analysis of teaching activities at the UA College of Medicine, University Medical Center (UMC), and University Physicians Healthcare Hospital at Kino in Tucson determined that the 340 clinical faculty spend 216,080 hours per year in teaching. On average, this amounts to 15.8 hours per week, or 26.5 percent of a 60-hour work week.

For now, rather than make a request that the state provide the funds to raise this hourly rate to a more appropriate level, we have chosen to seek other alternative funding sources for these costs. For one-half of clinical faculty, we assume that

85 percent of their salary and benefits will be derived from clinical activities. For the other half of clinical faculty, we assume that 35 percent of salary and benefits will be derived from sponsored research activity and 50 percent from clinical faculty activities. Thus, we will cross-subsidize teaching activities with revenues from clinical and research activities. This arrangement is challenging for academic leadership in the national competitive market that academic medicine represents. The challenge is to effectively motivate faculty to be excellent teachers, devoted to students, yet the revenue to cover their salary must be generated from other activities. This is the obligation medical school faculty assume when they choose to work in the academic health center environment for the UA College of Medicine-Phoenix.

On the other hand, 100 percent of the costs of the faculty's administrative staff at the outset, and 80 percent of the costs thereafter, were allocated to the state. This assumption is based on practical and realistic considerations, including, but not limited to:

- Administrative staff support the faculty and research staff as they conduct the activities necessary in the educational, clinical, and research arenas to generate the funds needed to cover their salary and fringe benefits under the considerations above. Administrative costs are part of the fixed overhead required to make the organization function, and can be neither allocated as variable costs nor covered from operating revenues.

- Administrative costs cannot be covered from federal research grants from the National Institutes of Health (NIH), by far the largest provider of funds for biomedical research.

Notable features of the UA College of Medicine-Phoenix budget include the following:

- The expenses grow quickly when the research faculty and support staff are added, but there is a corresponding revenue stream associated with grant activity.

- Expenses increase markedly in FY 2010, when new facilities are projected to accommodate the new students, faculty, and staff numbers. Additionally, the operations segment for building and maintenance, and new media equipment and IT infrastructure will be needed in FY 2010.

- Support is projected from the teaching hospitals in proportion to the number of students on clinical rotations. The $305,000 we now are paying for 80 students will increase to $1.2 million with 150 students. While we have not indicated as such in the budget, an option is that this support would come from the hospitals. Future discussions through the ACMER process will determine whether local hospitals will be able to fill the gap in this area.

Sources of Funds

The Association of American Medical Colleges (AAMC), in its 2004 *The Handbook of Academic Medicine: How Medical Schools and Teaching Hospitals Work (available for purchase at www.aamc.org/publications)*, discusses the traditional financial model for an academic health center *(please see Figure 2)*:

The largest single source of revenue, 35 percent, to research-intensive medical schools (those among the top 20 in research funding from the NIH, including The University of Arizona College of Medicine) is federal research grants and contracts. These grants and contracts are for teaching, research, and service programs, including recovery of facilities and administrative (F&A) costs, i.e., indirect costs, associated with these programs. Federal research funds—totaling $13.7 billion in fiscal year 2003—represent the major component of federal support to medical schools.

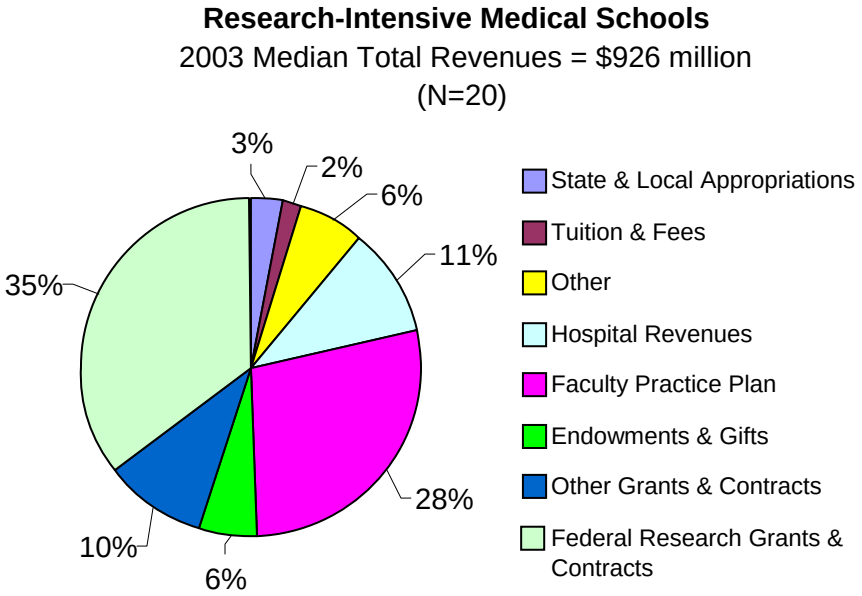
The second largest single source is patient care reimbursements for physician services. In 2003, these activities generated 28 percent of all revenues. In the 1960s, medical schools developed faculty practice plans—formal practice organizations for billing and collection. Payment for patient care services formerly made directly to the individual faculty physician began to flow into the faculty practice plan and to be recognized as revenue to the school. Most of these funds go toward practice expenses, including salaries of an expanding clinical faculty. However, some are invested in medical school teaching and research programs.

Another important source of revenue for medical school programs is hospital support. This source comprised 11 percent of total revenues, the third largest source of funds after federal grants and contracts, and patient care services reimbursement.

Other sources of funding for research-intensive medical schools are:

- Other grants and contracts – 10 percent
- Endowments and gifts – 6 percent
- Other – 6 percent
- State and local appropriations – 3 percent
- Tuition and fees – 2 percent

Figure 2. Sources of Revenue to Support Operations in Research-Intensive Medical Schools



While recognizing the usual financial model for medical school revenues, as discussed above, the following projections have been made for funding sources for the UA College of Medicine-Phoenix.

State funds

The requested funding from the State Legislature for the UA College of Medicine-Phoenix in FY 2006-FY 2010 is justified in Table 3, and in Appendix E, and discussed earlier in this section.

Tuition

The projected tuition revenues from the UA College of Medicine-Phoenix during the first 5 years are illustrated in Table 5. The projections assume student numbers of 24 students accepted per year until FY 2010, at which point the entering class will be expanded to 64. Tuition revenues include an estimated 40 percent of the third- and fourth-year Tucson classes that continue their program in Phoenix. Inclusion of these tuition revenues, but not inclusion of the associated expenses, for third- and fourth-year Tucson Track students is part of the financial strategy to minimize the level of state support required, especially in the early years, and yet to provide the funding necessary for the financial viability of the Phoenix Program.

Tuition levels are estimated to increase by 5 percent per year during FY 2006-FY 2010, based on recent historical averages, coupled with the policy of the UA College of Medicine to benchmark tuition near the top of the bottom third of public medical schools.

Table 5. The University of Arizona College of Medicine-Phoenix Tuition Estimates FY 2006-FY 2025 (based on 5% annual increases)

FY	Tuition & Fees	Students Year 1	Students Year 2	Students Year 3	Students Year 3-Tucson	Students Year 4	Students Year 4-Tucson	Total Students	TOTAL TUITION	Marginal Increase
2006	$ 14,462	0	0	0	0	0	0	0	$ 0	$ 0
2007	$ 15,185	0	0	0	40*	0	40*	80*	$ 1,214,808	$ 1,214,808
2008	$ 15,944	24	0	0	40	0	40	104	$ 1,658,213	$ 443,405
2009	$ 16,742	24	24	0	40	0	40	128	$ 2,142,921	$ 484,708
2010	$ 17,579	64	24	24	40	0	40	192	$ 3,375,101	$ 1,232,180
2011	$ 18,458	80	64	24	40	24	40	272	$ 5,020,463	$ 1,645,362
2012	$ 19,380	104	80	64	40	24	40	352	$ 6,821,923	$ 1,801,460
2013	$ 20,349	128	104	80	40	64	40	456	$ 9,279,366	$ 2,457,443
2014	$ 21,367	144	128	104	40	80	40	536	$ 11,452,691	$ 2,173,325
2015	$ 22,435	150	144	128	40	104	40	606	$ 13,595,797	$ 2,143,106
2016	$ 23,557	150	150	144	40	128	40	652	$ 15,359,212	$ 1,763,415
2017	$ 24,735	150	150	150	40	144	40	674	$ 16,671,341	$ 1,312,129
2018	$ 25,972	150	150	150	40	150	40	680	$ 17,660,738	$ 989,397
2019	$ 27,270	150	150	150	40	150	40	680	$ 18,543,775	$ 883,037
2020	$ 28,634	150	150	150	40	150	40	680	$ 19,470,964	$ 927,189
2021	$ 30,065	150	150	150	40	150	40	680	$ 20,444,512	$ 973,548
2022	$ 31,569	150	150	150	40	150	40	680	$ 21,466,738	$ 1,022,226
2023	$ 33,147	150	150	150	40	150	40	680	$ 22,540,075	$ 1,073,337
2024	$ 34,805	150	150	150	40	150	40	680	$ 23,667,079	$ 1,127,004
2025	$ 36,545	150	150	150	40	150	40	680	$ 24,850,433	$ 1,183,354

*Although the first class of 24 Phoenix Program students will begin in July 2007 (FY 2008), tuition revenue for 80 third- and fourth-year Tucson Program students is included in the Phoenix Program FY 2007 revenue projections, and will be foregone by the Tucson Program, to ensure the success of the Phoenix Program financial model and to limit the request for state support.

Sponsored research grants and contracts

The National Institutes of Health (NIH) is the world's premier medical research institution, supporting more than 212,000 research personnel at over 2,800 research universities, medical schools, teaching hospitals, independent research institutes, and industrial organizations throughout the United States and the world. The NIH has been the primary source of federal funding for biomedical research in the United States for nearly 40 years.

The largest portion of the NIH budget is devoted to research in the life sciences, mainly biomedical research. In FY 2002, the NIH devoted $19.7 billion, or 89.2 percent of its total budget, to life sciences. This comprised 77.4 percent of the total federal investment in life sciences research.

NIH funding for academic health centers has paralleled the growth in the NIH budget. The 125 academic health centers receive nearly 52 percent of the NIH grant funding. Of this distribution, the top 25 centers receive approximately 55 percent of the funds, and the top 50 centers receive nearly 81 percent. The common expectation is that an increasing tendency will be to direct expenditures

on a progressively smaller number of institutions, to focus the funding required for team-based research. Hence, there is a compelling argument for being identified as such a center.

While the NIH is the largest source of funding for biomedical research, the Department of Defense (DOD), the Department of Veterans Affairs, the Centers for Disease Control and Prevention, and the National Science Foundation (NSF) provide nearly $15.2 billion per year in sponsored research funding in the life sciences.

The UA College of Medicine is currently ranked 55th out of 125 Colleges of Medicine in biomedical research funding from the National Institutes of Health. Because these rankings are directly dependent upon organization size, other metrics can and should be used to evaluate performance in comparison to peers.

- For colleges of medicine with fewer than 600 full-time faculty, the UA College of Medicine ranks 3rd nationally in NIH funding.

- The Departments of Cell Biology and Anatomy, Family and Community Medicine, and Pediatrics rank 12th, 3rd, and 26th in the country, respectively. Several other UA College of Medicine departments rank within the top 50 in their respective fields. *(Please see Table 6)*.

Table 6. NIH Biomedical Research Funding Ranking for The University of Arizona College of Medicine Departments

Department	FY 2004 Rank
Anesthesiology	40
Biochemistry	59
Cell Biology & Anatomy	12
Emergency Medicine	-
Family & Community Medicine	3
Medicine	76
Microbiology & Immunology	81
Neurology	-
Obstetrics & Gynecology	66
Ophthalmology & Vision Science	27
Orthopedic Surgery	27
Pathology	68
Pediatrics	26
Pharmacology	33
Physiology	37
Psychiatry	56
Radiology / Radiation Oncology	25
Surgery	59

Revenues to cover salary and employee-related expenses (ERE) from sponsored research are projected to increase from $2.2 million in FY 2007 to $27.5 million in FY 2010, and to $65.2 million in FY 2015. These increases are predicated on faculty growth, with the assumptions as to revenue streams for salary as described above.

As an alternative and confirmatory approach, we took advantage of our interest and expertise in mathematical modeling for predicting revenues from sponsored research funding. We used probabilities for funding that parallel historical averages beginning in FY 2009. The additional revenues associated with the grant funding, over and above those required to cover salary and ERE, are substantial. Most importantly, the facilities and administrative (F&A) costs associated with the grant revenues in FY 2010 and FY 2015 are $8 million and $19 million, respectively.

Clinical revenues

Clinical revenues contribute half of the $60 billion dollars of funding for academic health centers nationally. At this time, we are looking at a “dispersed model” for Level I, an arrangement under which hospitals in multiple locations will be used for teaching. Given such a model for the Phoenix campus, the clinical revenues will be minimal at the outset, and would come almost exclusively from an ambulatory facility, which is an option for the campus. Such an ambulatory facility would be a primary care clinic, with a small volume, a focus on teaching, and likely an unfavorable payer mix. Hence, the revenues generated would be sufficient only to cover the overhead and ancillary personnel.

As pointed out in the Kurt Salmon Associates report, in the traditional model of the academic health center, there is one core teaching hospital for clinical rotations for the medical students. Seventy-two Association of American Medical Colleges are associated with *public* colleges of medicine. In this construct, a median of $39 million and a mean of $43 million are provided from the hospitals annually to their associated colleges of medicine. These revenues are provided by the hospital to the college of medicine in explicit recognition that the faculty, residents, and staff of the academic health center enhance the reputation, and the revenues, of the hospital while engaging in educational activities for which no other source of funds exist. These teaching activities are the essence of an academic health center.

KSA acknowledges that providing clinical operations is a critical element of moving an academic health center forward. As mentioned, one approach to be considered for Level I is to establish an ambulatory facility on the PBC to provide on-site teaching and learning opportunities, albeit in a more limited fashion than permitted by an adjacent primary teaching hospital.

The pro’s and con’s of establishing a primary teaching hospital for the UA College of Medicine-Phoenix are weighed in the KSA report and the Tripp

Umbach report. Issues relating to an on-site ambulatory facility and a teaching hospital will be addressed through the ACMER process.

Hospital support

Support from AAMC hospitals to their affiliated medical schools is substantial, as documented elsewhere in this report. As indicated in the report from KSA to ACMER, "A substantial change in the financial arrangements between the affiliated hospitals and the UA College of Medicine would be required if the overall program is to achieve the status of the best academic centers." Since the discussions with our clinical partners are in the early stages, it is not yet possible to determine either the scale or the structure of support from the affiliated hospitals to the UA College of Medicine-Phoenix. These issues will be addressed through the work of the ACMER.

Philanthropic goals

Endowed Chairs:	
Cancer	$2 million
Diabetes	$2 million
Human Neurosciences	$2 million
	$6 million
Endowed Master Teacher Fellowships:	
8 at $250,000 each	$2 million
College of Medicine Educational Facility:	
50% of $90 million project	$45 million*
Total	$53 million

*Assumes lead donor at $20–$25 million. Also assumes permission from City of Phoenix/ABOR for name of donor to go on UA College of Medicine-Phoenix facility when built. Assuming a $25 million lead gift for the Level II facility, the remainder of the five-year, $53 million gift could project out as follows:

FY 2006	$2 million
FY 2007	$4 million
FY 2008	$6 million
FY 2009	$8 million
FY 2010	$8 million
Total	$28 million

FY 2006-FY 2010 Capital Budget

In early 2004, the City of Phoenix presented to the Mayor and City Council site development guidelines for a master plan of 15.8 acres in downtown Phoenix. Located at the northwest corner of the intersection of 7th and Van Buren Streets, the Phoenix Biomedical Campus site is graced with three historic buildings constructed in 1911 that were once the core of the Phoenix Union High School. The International Genomics Consortium (IGC) and the Translational Genomics Research Institute (TGen) were the initial catalysts for redevelopment of this urban component of downtown Phoenix. A master development plan for a Phoenix Bioscience Center was approved by the Phoenix City Council in April 2003. The goal was to construct an appropriate campus that energized the city and encouraged public/private partnerships benefiting the citizens of Arizona.

The vision for the future build-out of the campus is to accommodate 1 million square feet of new construction, in addition to the rehabilitation of the approximately 60,000 square feet of existing historic structures and 28,000 square feet of new circulation core. The IGC/TGen facility was completed in December 2004 and occupied in early 2005. The three historic Phoenix Union High School buildings, preliminarily designated as COM 1, COM 2, and COM 3, are currently undergoing an extensive adaptive reuse to house the initial class of 24 students for the UA College of Medicine-Phoenix. ABC 1, a collaborative research facility between the UA and ASU, is in design development, and construction is scheduled to begin in November 2005. The City of Phoenix will release an RFP in late summer 2005 seeking a developer to finance, construct, maintain, and manage a parking structure on the site.

ACMER appointed the PBC Master Planning Task Force to provide the Commission with recommendations relative to the mission, plans, and facility development on the PBC (*please see Appendix H for membership*). This task force consists of members representing the City of Phoenix, the universities, ABOR, TGen, and non-profit health care organizations. The Task Force refined the City's original 2003 master plan development and developed the PBC vision and land use concepts. In addition, they identified issues relating to parking demand for all campus users and developed rules of engagement for future development on the PBC. A planning session with KSA identified options for land use that the Master Planning Task Force reviewed.

To achieve the highest and best use of the land, the Master Planning Task Force has identified the allocation of the PBC to be 500,000 square feet for research, 300,000 square feet for academic purposes, and 200,000 square feet for clinical research. Revisions to the original master plan include expanding the planning area from the original 15.8-acre PBC to include City-owned land north of Fillmore Street and the current site of the ASU Downtown Center along Van Buren Street known as the Mercado. The revised plan also identifies and locates the land use for specific activities. These master plan refinements provide direction to prospective tenants and the community regarding the City's expectations for land

use, facility location, vehicular and pedestrian circulation, and the location of campus development.

FY 2006-FY 2010 (Level I moving to Level II) projects for the Phoenix Biomedical Campus include:

COM 1, COM 2, and COM 3 (Phoenix Union High School Historic Buildings)

Buildings and cores: 89,215 gross square feet

Project Description: Owned by the City of Phoenix and leased to the Arizona Board of Regents, this adaptive reuse of the historic Phoenix Union High School buildings, temporarily designated as COM 1, COM 2, and COM 3 (from west to east). COM 1 will house examination rooms equipped with Telemedicine equipment, student services, and administration. COM 2 will house an auditorium to be shared with other Campus occupants, THealth (please see program description below), and mediated classrooms for the Arizona Telemedicine Program (ATP). COM 3 will house pre-clinical training examination rooms, bookstore, and student pods.

Project Cost:	$19.2 million
Construction Start:	April 2005
Proposed Construction Completion:	June 2006

Funding Source: The City of Phoenix is leasing COM 1, COM 2, and COM 3 to the UA for 30 years for $1.00 per year. The buildings will be subleased to DESCO Southwest, who will have the buildings renovated and will add a core structure that provides elevators, stairwells, and restrooms. DESCO Southwest will lease the facilities back to the UA for an estimated annual lease of $1.46 million ($16.25 per square foot), funded with the $308,000 rent the UA currently pays for its facilities at Third Street and Indian School Road in Phoenix. The remainder will come in part, if necessary, from the $6 million FY 2007 General Fund appropriation. The City is also providing New Market Federal Tax Credits through the City's allocation from this awarded federal program.

THealth will serve as the site of origin of unique, modular health care team educational programming, drawing upon the existing resources of the Arizona Telemedicine Program. These modules are expected to address a number of goals of the Institute of Medicine's report on health education team training. Initially, this will be regarded as a supplemental curriculum, designed to complement and broaden the medical school curriculum. The THealth curricular elements will be heavily dependent on the use of remote "video conferencing" telemedicine clinical experiences. The ATP already links more than 130 clinics throughout the state and a wide variety of rural, urban, correctional, community health, and home-health environments and has affiliation agreements with these sites. THealth will link to these clinical settings to expand medical students' patient experiences throughout their education. Congressionally appropriated

federal earmark funds in the amount of $1.2 million for THealth million will equip and staff space on the third floor of COM 2.

Arizona Biomedical Collaborative 1 (ABC 1)

85,600 gross square feet

Project Description: This new four-story research facility will consist of wet-laboratory research space for The University of Arizona and dry-laboratory research space for Arizona State University. The laboratory space, both wet and dry, is designed for maximum flexibility. Both the facility program and building have been developed to accommodate a future second structure, ABC 2.

The importance of the ABC 1 facility to the Phoenix Program of the UA College of Medicine cannot be overemphasized. The UA College of Medicine-Phoenix Program requires research space for faculty recruited to lead the basic science efforts. Through the support of HB 2529 (Laws 2003, Chapter 267), the University Research Infrastructure Bill, we are in the position of having already commenced the planning of such a building, with groundbreaking scheduled for November 2005. Were it not for HB 2529, a necessary component of the initial request for UA College of Medicine-Phoenix funding would have been support for construction of a research facility. While not mentioned explicitly during most of the discussion regarding funding for the College, the availability of ABC 1 provides a quintessential example of the economies of scale and scope, as a facility shared between UA and ASU, with direct ties to research programs in TGen (including NIDDK, IGC, and BNI/St. Joseph's) which will dominate PBC, and lower overall expense.

Total Project Cost:	$27.2 million
Proposed Construction Start:	November 2005
Proposed Construction Completion:	March 2007

Funding Source: Arizona State Legislature House Bill 2529 University Research Infrastructure (Laws 2003, Chapter 267). ABC 1 is scheduled for review by the Joint Committee on Capital Review (JCCR) in October 2005.

Educational Facility for The University of Arizona College of Medicine-Phoenix

310,000 gross square feet

Project Description: The new Educational Facility building, housing classrooms, teaching laboratories, student services, administration, and business services, must be built and ready for occupancy by July 2009 in order to expand the Phoenix Program to a class size of 64 new students from a class size of 24 new students. Budgetary details for the Educational Facility are presented in our response to request number 4.

Total Project Cost: $89.8 million
Proposed Construction Start: 2008
Proposed Construction Completion: July 2009

Funding Source: It is projected that approximately $45 million of the total $89.8 million cost will be supported by philanthropic efforts. Funding of the approximate $45 million balance is under discussion at this writing. Options for this funding include the possibility of state funding of the annual debt service associated with the $45 million balance (approximately $3.6 million), and/or the possibility of assistance from the City of Phoenix, such as bonds or other non-general revenue funds.

Arizona State University

FY 2006-FY 2010 Operational Budget

Arizona State University is establishing the Department of Biomedical Informatics and aspires to develop a world-class partnership between academic researchers, clinical practitioners, and regional health care providers to advance research and education in the science and practice of biomedical informatics. The programs and degrees administered through the department will prepare individuals who are capable of making major contributions to the creation and evaluation of computational and informatics tools and their application to biomedical or clinical research, health care practice and administration, public health, and the education of health professionals and patients.

A detailed FY 2006-FY 2010 operational budget for the Department of Biomedical Informatics at Arizona State University is provided in Table 7.

Table 7. Arizona State University Department of Biomedical Informatics FY 2006-FY 2010 Operational Budget

BMI Legislature Budget					
Personnel	**FY 06**	**FY 07**	**FY 08**	**FY 09**	**FY 10**
Faculty					
Chair		$ 200,000	$ 200,000	$ 200,000	$ 200,000
Associate Chair		$ 175,000	$ 175,000	$ 175,000	$ 175,000
Professor			$ 450,000	$ 900,000	$ 900,000
Associate Professor		$ 187,500	$ 187,500	$ 500,000	$ 625,000
Assistant Professor		$ 200,000	$ 200,000	$ 300,000	$ 500,000
Faculty Buyouts (see budget details)	$300,000				
Faculty Total:	**$300,000**	**$ 762,500**	**$ 1,212,500**	**$2,075,000**	**$ 2,400,000**
Subtotal Faculty w/ERE:	**$300,000**	**$ 953,125**	**$ 1,515,625**	**$2,593,750**	**$ 3,000,000**
-	-				
Administrative					
Associate Director @ 50%	$45,000	$90,000	$90,000	$90,000	$90,000
Accountant, Sr.					$55,000
Office Specialist	$32,000	$ 32,000	$ 32,000	$ 32,000	$ 32,000
Academic Advisor		$ 40,000	$ 40,000	$ 40,000	$ 40,000

Systems Admin/Tech Support		$ 70,000	$ 70,000	$ 70,000	$ 70,000
Total:	**$77,000**	$ 232,000	$ 232,000	$ 232,000	$ 287,000
Administrative w/ERE:	**$100,100**	**$ 301,600**	**$ 301,600**	**$ 301,600**	**$ 373,100**
-	-	-			
Student Assistants, Workers, and Stipends					
Student Worker (includes 8 percent additional)	$15,000				
Blake Atkinson		$ 30,000	$ 30,000	$ 60,000	$ 60,000
Teaching Assistants (includes ERE)		$ 68,000	$ 68,000	$ 170,000	$ 170,000
Research Assistants (includes ERE)	$35,000	$ 35,000			
Post-Docs	$135,000	$ 100,000			
Summer fellowships and stipends.			$ 30,000	$ 50,000	$ 90,000
Other Personnel :	**$185,000**	**$ 233,000**	**$ 128,000**	**$ 280,000**	**$ 320,000**
Total Personnel:	**$585,100**	**$ 1,487,725**	**$ 1,945,225**	**$3,175,350**	**$ 3,693,100**
Operations					
Services	$20,000	$ 25,000	$ 30,000	$ 35,000	$ 40,000
Materials and Supplies	$20,000	$ 25,000	$ 52,525	$ 94,400	$ 83,650
Voice and Data Communication	$10,000	$ 15,000	$ 20,000	$ 25,000	$ 30,000
Software Licenses	$50,000	$ 125,000	$ 125,000	$ 50,000	$ 25,000
Travel In-State (see budget details)	$1,000	$ 2,000	$ 3,000	$ 4,000	$ 5,000
Travel Out-of-State	$6,000	$ 7,000	$ 5,000	$ 6,000	$ 7,000
Travel Foreign	$3,000	$ 4,000	$ 8,000	$ 9,000	$ 10,000
Non-capital Equipment & software (See budget details)	$34,900	$ 6,250	$ 11,250	$ 26,250	$ 31,250
Other capital (general construction & space reconfigure - see budget details)	$50,000		$ 100,000	$ 25,000	$ 25,000
Equipment		$ 153,025	$ 500,000	$ 25,000	$ 25,000
Other (see budget details)	$220,000	$ 150,000	$ 200,000	$ 25,000	$ 25,000
Total Operations:	**$414,900**	**$ 512,275**	**$ 1,054,775**	**$ 324,650**	**$ 306,900**
Total Budget:	**$1,000,000**	**$ 2,000,000**	**$ 3,000,000**	**$3,500,000**	**$ 4,000,000**
BMI President Budget					
Faculty					
Professor	$150,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000
Associate Professor	$125,000				
Assistant Professor	$100,000				
Total:	**$375,000**	**$225,000**	**$225,000**	**$225,000**	**$225,000**
Subtotal w/ERE:	**$468,750**	**$ 281,250**	**$ 281,250**	**$ 281,250**	**$ 281,250**
Operations					
Materials & Supplies	$31,250				
Non-capital equipment		$ 218,750	$ 218,750	$ 218,750	$ 218,750
Total Operations:	$31,250	$ 218,750	$ 218,750	$ 218,750	$ 218,750
Total Budget:	**$1,500,000**	**$ 2,500,000**	**$ 3,500,000**	**$4,000,000**	**$ 4,500,000**

Capital Budget (ABC 1)

A detailed capital budget for the Department of Biomedical Informatics at Arizona State University is provided in Table 8.

Table 8. Arizona State University Department of Biomedical Informatics Capital Budget

Projected expenses for ***ASU's portion*** of Arizona Biomedical Collaborative 1 (ABC 1) are:

PROJECT BUDGET REPORT

PROJECT NAME: AZ Biomedical Collaborative (ABC Building) DATA DATE: 06/30/05
PROJECT NUMBER: 2004-13011 RUN DATE: 06/30/05
AREA/ORG: PB6 2404 FILE NAME: Excel: F:\BUDGET\2004-13011pbr.xls
PM: Vance Linden AREA/ORG MGR: Dave Brixen
PROJECT / FILING TYPE: MAJOR

Object Code	Cost Item	A Appropriated Budget	B Budget Adjustments	C A+B Adjusted Budget	D Encumbered & Expensed To Date	E (Potential) Costs To Date	F C-D-E Uncommitted Budget
7880.01-10	LAND ACQUISITION (1)						
7880.16-20	New Construction (2A)	0	0	0	0.00	0.00	0.00
7880.11-20	Remodeling Renovation	6,359,480	1,000,000	7,359,480	0.00	0.00	7,359,480.00
7880.95-20	Specialized Equip (2C)	110,280	1,050,000	1,160,280	0.00	0.00	1,160,280.00
7880.06-20	Site Development (2D)	257,320	0	257,320	0.00	0.00	257,320.00
7880.06-20	Parking/Landscaping (2E)	220,560	0	220,560	0.00	0.00	220,560.00
7880.06-20	Utilities Ext. (2F)	183,800	0	183,800	0.00	0.00	183,800.00
XXXX.XX-XX	State Sales Tax Research Exemption	0	0	0	0.00	0.00	0.00
XXXX.XX-20	Directives - Potential	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**7,131,440**					
7880.21-30	Constr. Manager (3A)	73,520	0	73,520	0.00	0.00	73,520.00
7880.21-30	Architect/Engineer (3B)	883,343	222,350	1,105,693	0.00	0.00	1,105,693.00
7880.21-30	IDC (3C)	0	0	0	0.00	0.00	0.00
7880.21-30	Preprogramming (3C)	0	0	0	0.00	0.00	0.00
XXXX.XX-30	Other (Move Mgmt)(3C)	35,657	0	35,657	0.00	0.00	35,657.00
	SUBTOTAL	**992,520**					
7325.XX-40	Furniture, Fixtures & Equipment (4)	294,080	0	294,080	0.00	0.00	294,080.00
	SUBTOTAL	**294,080**					
7330.16-50	Telephone Off-Site	0	0	0	0.00	0.00	0.00
7330.16-50	Telephone Inside	0	0	0	0.00	0.00	0.00
7330.16-50	Equip, Cable, Move-In (Telecom Equip) (8)	0	0	0	0.00	0.00	0.00
7330.16-50	Special Phones/Connections	294,080	0	294,080	0.00	0.00	294,080.00
7330.16-50	Special System Interface	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**294,080**					
7310.52-60	Physical Plant SWOs (10E)	0	0	0	0.00	0.00	0.00
7890.21-70	Surveys & Tests (10A)	7,352	0	7,352	0.00	0.00	7,352.00
7390.99-70	Move-In Costs (10B)	33,084	0	33,084	0.00	0.00	33,084.00
7810.65-70	Public Art (10C)	0	0	0	0.00	0.00	0.00
7310.19-70	Adver/Printing (10D)	3,676	0	3,676	0.00	0.00	3,676.00
7310.99-70	Signage (10E)	14,704	0	14,704	0.00	0.00	14,704.00
7310.52-70	Keying (10E)	14,704	0	14,704	0.00	0.00	14,704.00
7310.52-70	Grounds (10E)	0	0	0	0.00	0.00	0.00
7890.11-70	Asbestos (10E)	0	0	0	0.00	0.00	0.00

7810.99-70 Trash Compactor (10E)	2,843	0	2,843	0.00	0.00	2,843.00
7390.99 - Parking Replacement Reserve	0	0	0	0.00	0.00	0.00
XXXX.XX-70 Other (10E)	0	0	0	0.00	0.00	0.00
XXXX.XX-XX Project Mgt Fees (.015)	149,981	0	149,981	0.00	0.00	149,981.00
7390.69xxx State Risk Management Ins. (.0034)	28,489	0	28,489	0.00	0.00	28,489.00
XXXX.XX-Sci-Quest	2,487	0	2,487	0.00	0.00	2,487.00
7390.00-XX Financial Services Assessment (.0005)	4,993		4,993	0.00	0.00	4,993.00
SUBTOTAL	**262,313**					
Design Phase Contingency (5)	220,560	127,650	348,210	0.00	0.00	348,210.00
Inflation Adjustment (7)	441,120	0	441,120	0.00	0.00	441,120.00
Constr. Phase Contingency (6)	363,887	0	363,887	0.00	0.00	363,887.00
SUBTOTAL	**1,025,567**					
TOTALS	10,000,000	2,400,000	12,400,000	0.00	0.00	12,400,000.00
Advantage (APPR Table) Uncommitted Amount as of	06/30/05					$12,400,000.00
Advantage VS PROJECT BUDGET REPORT RECONCILIATION (Advantage less Totals E and F)						$0.00

Projected ***total*** expenses for Arizona Biomedical Collaborative 1 (ABC 1), in partnership with The University of Arizona, are:

PROJECT BUDGET REPORT

PROJECT NAME: AZ Biomedical Collaborative (ABC Building)		DATA DATE:	06/30/05
PROJECT NUMBER: 2004-13011		RUN DATE:	07/01/05
AREA/ORG: PB6 2404		FILE NAME:	Excel: F:\BUDGET\2004-13011pbr.xls
PM: Vance Linden		AREA/ORG MGR:	Dave Brixen

PROJECT / FILING TYPE: MAJOR

Object Code	Cost Item	A Appropriated Budget	B Budget Adjustments	C A+B Adjusted Budget	D Encumbered & Expensed To Date	E (Potential) Costs To Date	F C-D-E Uncommitted Budget
7880.01-10	LAND ACQUISITION (1)						
7880.16-20	New Construction (2A)	0	0	0	0.00	0.00	0.00
7880.11-20	Remodeling Renovation	17,300,000	1,000,000	18,300,000	0.00	0.00	18,300,000.00
7880.95-20	Specialized Equip (2C)	0	1,350,000	1,350,000	0.00	0.00	1,350,000.00
7880.06-20	Site Development (2D)	700,000	0	700,000	0.00	0.00	700,000.00
7880.06-20	Parking/Landscaping (2E)	600,000	0	600,000	0.00	0.00	600,000.00
7880.06-20	Utilities Ext. (2F)	500,000	0	500,000	0.00	0.00	500,000.00
XXXX.XX-XX	State Sales Tax Research Exemption	0	0	0	0.00	0.00	0.00
XXXX.XX-20	Directives - Potential	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**19,100,000**					
7880.21-30	Constr. Manager (3A)	200,000	0	200,000	181,280.00	0.00	18,720.00
7880.21-30	Architect/Engineer (3B)	2,103,000	522,350	2,625,350	2,741,391.94	0.00	(116,041.94)
7880.21-30	IDC (3C)	0	0	0	0.00	0.00	0.00
7880.21-30	Preprogramming (3C)	0	0	0	0.00	0.00	0.00
XXXX.XX-30	Other (Move Mgmt)(3C)	197,000	(100,000)	97,000	7.18	0.00	96,992.82
	SUBTOTAL	**2,500,000**					
7325.XX-40	Furniture, Fixtures & Equipment (4)	1,100,000	(300,000)	800,000	2,651.50	0.00	797,348.50
	SUBTOTAL	**1,100,000**					
7330.16-50	Telephone Off-Site	0	0	0	0.00	0.00	0.00
7330.16-50	Telephone Inside	0	0	0	0.00	0.00	0.00
7330.16-50	Equip, Cable, Move-In (Telecom Equip) (8)	0	0	0	0.00	0.00	0.00
7330.16-50	Special Phones/Connections	800,000	0	800,000	121.14	0.00	799,878.86
7330.16-50	Special System Interface	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**800,000**					

7310.52-60 Physical Plant SWOs (10E)	0	0	0	0.00	0.00	0.00
7890.21-70 Surveys & Tests (10A)	20,000	0	20,000	0.00	0.00	20,000.00
7390.99-70 Move-In Costs (10B)	90,000	0	90,000	0.00	0.00	90,000.00
7810.65-70 Public Art (10C)	0	0	0	0.00	0.00	0.00
7310.19-70 Adver/Printing (10D)	10,000	0	10,000	583.58	0.00	9,416.42
7310.99-70 Signage (10E)	40,000	0	40,000	0.00	0.00	40,000.00
7310.52-70 Keying (10E)	40,000	0	40,000	0.00	0.00	40,000.00
7310.52-70 Grounds (10E)	0	0	0	0.00	0.00	0.00
7890.11-70 Asbestos (10E)	0	0	0	0.00	0.00	0.00
7810.99-70 Trash Compactor (10E)	7,734	0	7,734	0.00	0.00	7,734.00
7390.99 - Parking Replacement Reserve	0	0	0	0.00	0.00	0.00
XXXX.XX-70 Other (10E)	0	0	0	0.00	0.00	0.00
XXXX.XX-XX Project Mgt Fees (.015)	408,000	36,000	444,000	151,616.58	292,383.42	0.00
7390.69xxx State Risk Management Ins. (.0034)	77,500	0	77,500	3,606.55	5,714.18	68,179.27
XXXX.XX-Sci-Quest	6,766	0	6,766	0.00	0.00	6,766.00
7390.00-XX Financial Services Assessment (.0005)	0	14,781	14,781	213.10	14,568.39	0.00
SUBTOTAL	**700,000**					
Design Phase Contingency (5)	800,000	(109,549)	690,451	0.00	0.00	690,450.51
Inflation Adjustment (7)	1,200,000	0	1,200,000	0.00	0.00	1,200,000.00
Constr. Phase Contingency (6)	1,000,000	(13,582)	986,418	0.00	0.00	986,418.00
SUBTOTAL	**3,000,000**					
TOTALS	27,200,000	2,400,000	29,600,000	3,081,471.57	312,665.99	26,205,862.44
Advantage (APPR Table) Uncommitted Amount as of	06/30/05					$26,518,528.43
Advantage VS PROJECT BUDGET REPORT RECONCILIATION (Advantage less Totals E and F)						$0.00

Sources of Funds

First-year funding

For fiscal year 2006, the Legislature has committed to providing as much as $1 million for the Department of Biomedical Informatics as part of SB 1510 (Laws 2005, Chapter 330). ASU has committed an additional $500,000 toward operating expenses.

The Arizona Biomedical Collaborative 1 building will be used for research by the UA College of Medicine-Phoenix. Funding for ABC 1 is being provided through HB 2529, the University Research Infrastructure Bill (Laws 2003, Chapter 267). The total amount committed from the research infrastructure funds for this project is anticipated to be $27.2 million. ASU is committing $10 million to cover the shell space, information technology infrastructure, audiovisual equipment, and outfitting of the ABC 1. BMI will occupy approximately 34,000 gross square feet (20,000 net square feet) of space, including some shared space between ASU and UA for utilities, on the first and second floors of ABC 1.

External funding from federal agencies

Faculty within the Department of Biomedical Informatics will seek individual investigator and multi-disciplinary grants from national funding agencies. Bioinformatics is currently a key focus of the National Institutes of Health's

strategic plan, the NIH Roadmap: *Accelerating Medical Discoveries to Improve Health*. As a result, a number of Institutes at NIH, including the National Library of Medicine, the National Cancer Institute, the National Institute of General Medical Sciences, the National Institute of Biomedical Imaging and Bioengineering, and the National Human Genome Research Institute, are funding research in specific facets of biomedical informatics. Other likely funding sources include the National Science Foundation, Health Resources and Services Administration, Agency for Healthcare Research and Quality, National Aeronautics and Space Administration, Department of Energy, and Department of Defense.

In accordance with ASU's aggressive research goals, the Department of Biomedical Informatics expects its researchers to generate in its start-up phase at least $375,000 in FY 2007, $1 million in FY 2008, $2.8 million in FY 2009, and $4.8 million in FY 2010 in research grants and contracts. These numbers are anticipated to grow as the Department of Biomedical Informatics hires new faculty and post-doctoral research scientists, and is able to compete for large-scale proposals from major funding agencies. During the first two years of the program, emphasis will be placed on developing the curriculum and recruiting students. Starting in FY 2008, the co-location of the Department with researchers on the Phoenix Biomedical Campus will increase the range of federally sponsored grants for which the BMI faculty are eligible.

External funding from private sources

The Department of Biomedical Informatics will seek funding from industry partners from established corporations that have a business and strategic interest in biologically- and medically-based informatics systems. These include International Business Machines Corporation, Sun Microsystems, General Electric, Novell, Siemens, Cerner, and Intel. The Department will also explore the possibility of partnerships with local companies such as MediServe. Funding from these sources will be sought for establishing research infrastructure and graduate fellowships.

Where appropriate, the Department of Biomedical Informatics will work with its clinical and research partners to leverage existing partnerships and to develop new corporate sponsorships. The Department's clinical partners have a number of existing partnerships that have potential benefit to the program. The Department of Biomedical Informatics and School of Computing and Informatics have a high potential for private support.

The Department of Biomedical Informatics expects to secure $2-3 million for in-kind gifts, seed funding, joint positions, and clinical space over a period of five years.

National foundations

The Department of Biomedical Informatics will also explore funding from major foundations such as the W. M. Keck Foundation, Alfred P. Sloan Foundation, and the Robert Wood Johnson Foundation. Our initial analysis demonstrated that each of these organizations is currently funding training programs and projects in the area of biomedical informatics.

3. **A five-year description of enrollment, growth capacity, and graduation expectations by practice area**

The University of Arizona

The expansion of the UA College of Medicine on the Phoenix Biomedical Campus is expected to begin in July 2007 with a class of 24 students. Because of stringent requirements to meet accreditation standards, the need to develop facilities and infrastructure, the time needed to develop a curriculum, the need to recruit excellent faculty and staff, and much other work, this project is on an extremely fast track. The student number was selected to match the space available with the latest small-group educational teaching models. The second year of the program will see 48 students, two classes, in residence. The renovated historic Phoenix Union High School (PUHS) buildings (COM 1, COM 2, and COM 3) are designed to be ideal for close interaction among students and faculty in groups of eight. However, the renovated historic facilities will not accommodate even a small expansion of this class size. In fact, the teaching of Gross Anatomy will have to be done offsite in Level I of the UA College of Medicine-Phoenix.

Admissions

The process of selecting applicants to the University of Arizona College of Medicine-Tucson is a holistic one in that many factors are taken into account. Each application includes a personal statement, academic history, Medical College Admissions Test (MCAT) results, relevant experiences, interviews, and letters of recommendations. The Admissions Committee is comprised of eight faculty, four students, and a faculty chairperson. Each application is thoroughly reviewed by a team of three committee members (two faculty, one student) who then rank-order the applicants based on who they believe will make the best physicians for Arizona. Two-thirds of the full committee must support placing an applicant on the accept list. There are no formulas, point systems, or quotas used in the process. Therefore, the final determination of who is qualified is a subjective judgment of the committee.

For the purpose of compiling this data, strictly academic criteria (GPA and MCAT scores) were used as the best estimate for who might be considered qualified by the committee. When non-cognitive information is included, up to 50 percent of these applicants would likely be rejected.

It is the consensus of the Admissions Committee that we have enough qualified applicants in our current applicant pool of Arizona residents to select an additional 24 students for Level I of the Phoenix Program *(please see Table 9)*. Moving to Level II (up to 150 students per class) will require efforts to increase the size of the qualified applicant pool; however, Arizona's population growth alone should produce additional qualified applicants.

Table 9. Numbers of Academically Qualified Applicants Rejected for Admission by The University of Arizona College of Medicine, 2001-2005

Matriculation Year	Applications Considered	Offers of Acceptance	Class Size	Applications Rejected	Rejected Applicants Who Were Academically Qualified
2001	445	132	100	313	78
2002	454	139	110	315	74
2003	429	157	110	272	68
2004	449	154	110	295	69
2005	539	149	110	390	96

The Phoenix Program likely will establish a separate admissions process from that used for the Tucson Program. The Liaison Committee on Medical Education (LCME) allows this as long as the regional admissions committee functions as a subcommittee of the College Admissions Committee. Because 30 to 40 percent of current UA medical students spend their third and fourth years in Phoenix, the College has already established a process for students to declare a preference for Tucson or Phoenix, or both, at the time of their application.

Career choice of graduates

The UA College of Medicine is focused on training practicing physicians who are well prepared to meet the health care needs of the state. As is the current situation, the large majority of students enrolled in the UA College of Medicine-Phoenix will practice clinical medicine.

The percentages of students practicing clinical medicine graduating from the UA College of Medicine over the last 10 years are shown in Table 10. On average, 92 percent of graduating students enter the practice of clinical medicine. The selection criteria for the students, and the organization of the training experience, reinforce and encourage this situation. This reflects both the mandate from the state and the desire of the applicant pool.

Table 10. Practice Settings Chosen by The University of Arizona College of Medicine Graduates, 1995-2004 (percentage of graduates)

Practice Settings	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	%	%	%	%	%	%	%	%	%	%
Clinical Practice	94.6	94.5	95.5	93.6	84.7	92.5	92.7	91.5	87.2	93.2
Government	2.7	3.2	3.4	5.3	12.7	5.3	2.1	6.4	10.5	2.7
Academics	2.7	1.2	0.0	1.1	0.0	0.0	2.1	2.1	0.0	0.0
Industry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	1.1	1.1	0.0	2.6	2.2	3.1	0.0	2.3	4.1

Demographics of student class

The breakdown of the racial and ethnic composition of the UA College of Medicine graduates over the last 10 years is shown in Table 11. Also shown are the national averages for these categories. Significantly, the UA College of Medicine enrolls more than double the national average of Hispanic students.

Table 11. Comparison of The University of Arizona College of Medicine and National Distributions of Racial and Ethnic Composition of Medical Students, 1996-2005 (in percent)

The University of Arizona College of Medicine Averages										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Non-Hispanic White	77.4	83.9	73.5	69.3	67.3	71.9	71.5	64.1	79.1	65.5
Hispanic	13.7	7.5	13.7	14.8	18.4	8.7	14.7	16.3	10.3	11.5
African American	1.0	2.2	1.0	4.5	1.0	2.9	5.9	2.2	0	2.3
Asian	5.9	5.3	7.9	10.2	10.2	16.5	5.9	14.2	10.6	19.5
Native American	2.0	.1	3.9	1.1	3.1	0	2.0	3.3	0	1.2
National Averages from AAMC Data Book										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Non-Hispanic White	68.9	69.0	66.1	65.7	66.5	65.5	64.7	64.1	64.0	n/a
Hispanic	6.2	6.0	6.5	6.7	6.7	6.0	6.2	6.1	4.5	n/a
African American	6.4	7.0	7.5	7.3	7.1	6.9	7.1	6.6	6.5	n/a
Asian	16.0	16.0	17.7	18.7	18.1	19.8	20.0	20.7	20.0	n/a
Unknown	.5	.3	.2	.1	.1	.1	.1	.3	1.4	n/a
Native American	.6	.7	.8	.8	.9	.7	.9	.7	.6	n/a

Based on the demographics and the health care needs of the population, the mandate for more providers from currently underrepresented minorities, particularly Hispanic/Latino, will become even more pressing. The UA College of Medicine is introducing new mechanisms to increase the percentage of admitted applicants from underrepresented minorities, and, in particular, those from Hispanic/Latino populations. These strategies are applicable to both the Phoenix and Tucson Programs.

SB 1517 also appropriated $1.5 million from the General Fund in FY 2006 for loans to medical students in public or private schools of medicine in Arizona “who intend to enter and complete a residency program approved by the Accreditation Council for Graduate Medical Education (ACGME) or by the American

Osteopathic Association to become board certified in family practice, general pediatrics, obstetrics and gynecology, general internal medicine, or combined medicine and pediatrics, and who are deemed qualified by the Board of Medical Student Loans to receive such loans. Loans shall be granted upon such terms and conditions as may be imposed by the Board. One of the qualifications shall be Arizona residency….The Board shall give preference to qualified applicants who are unable to pay the expenses of obtaining a medical education and to qualified applicants who demonstrate a commitment to serve in an area listed. . .

- A rural and medically underserved area of this state.
- A medically underserved area of this state.
- A medically underserved population of this state.
- Any Indian reservation that is located in this state.

Each applicant who is approved for a loan by the Board may be granted a loan for a period of up to five years."

Graduate medical education

Graduate medical education (GME) is initiated when students complete medical school and enter residency training. Unlike medical school, in which all students take a similar set of courses and clinical rotations, residencies are specialized and designed to train physicians in their chosen area of specialization.

Graduating students from the UA College of Medicine may choose to enter residency training in Arizona, or to go out of state for residency training. Similarly, they may prefer to train in a residency program associated with the UA, or to train in a non-affiliated program.

The Residency Review Committee (RRC) for the individual specialty accredits graduate medical education programs individually. The Accreditation Council for Graduate Medical Education (ACGME), the residency equivalent of the LCME, also must accredit the sponsoring institution.

Current GME programs in Phoenix are sponsored by the nine area teaching hospitals. These residencies have no direct affiliation with the UA College of Medicine except through joint membership in the statewide Arizona Medical Education Consortium. With the growth of the UA College of Medicine-Phoenix, these associations may become even closer.

Graduate students

The first five years will see an increase in medical students as outlined by the ACMER Academic Task Force. This period of growth in the number of students will occur in parallel with the increase in basic and clinical sciences graduate students from approximately 50 to more than 400 during a five-year period FY 2008-FY 2012 to support the research at PBC.

These students enroll through existing UA graduate programs, including Biochemistry, Cancer Biology, Cell Biology and Anatomy, Immunobiology, and Physiology. The top-tiered medical schools are including Genetics as a requirement, and this will be emphasized as part of the curriculum as it impacts every discipline within medicine. Students will graduate with PhD degrees in their selected areas, with a specialty in medicine. Specialty tracks in medicine within the graduate degree-granting program are a new initiative by the UA Department of Biochemistry, in line with the national initiative to produce high-quality, state-of-the-art, translational researchers in Molecular Medicine.

The ASU Department of Biomedical Informatics (BMI) further strengthens this effort, with faculty, and their students, recruited in partnership with the Computer Science and Engineering Department, Bioengineering Department, and the School of Life Sciences at ASU *(please see BMI business plan at Appendix I)*.

The expansion of the graduate-level education in basic science areas by ASU and UA provides an essential link to medicine and is a key element for the success of the PBC.

MD/PhD students

In addition to graduate students, some MD/PhD students will train at PBC. Although a small percentage of the medical school class, these students will be among the "leaders of tomorrow" in biomedical research and serve as a tangible bridge between the PhD and MD scientists. The existing UA program will provide oversight of the program and will ensure its success.

The Clinical Research Scholar Program also will operate at the PBC, as it does at the Tucson campus. This program provides training for MDs to develop their own research programs. The program is a non-degree certificate program that tailors training to MDs currently in practice who wish to expand their careers to accomplish peer-reviewed and nationally competitive translational research. The program is guided by existing faculty at the UA, as well as scientists at TGen and BNI/St. Joseph's.

Arizona State University

Projected enrollment and growth capacity

Table 12 provides an overview of ASU's projections for enrollment and growth capacity for its Department of Biomedical Informatics (BMI). (*Please see pages 8-10 of the BMI business plan in Appendix I for a detailed discussion of ASU's enrollment strategies and plans*.)

Table 12. Projected Numbers of Arizona State University BMI Majors and Students Receiving BMI Instruction

Projected majors and students with focus on BMI	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	Long Term
Graduate concentrations in BMI (through existing departments at ASU)	Faculty hired and new courses developed	10	10	10	20	20	20	25	25
Masters students		-	10	15	20	30	40	50	50
Doctoral students		-	-	5	10	15	20	25	25
Medical students receiving BMI instruction*		-	24	48	72	96	96	96	150*
Undergraduate concentrations		-	-	-	20	30	35	40	40
Totals		**34**	**68**	**102**	**166**	**191**	**211**	**236**	**290**

*The University of Arizona College of Medicine is planning to apply for Level II status which will allow it to expand the number of students in the Phoenix Program. Level II medical schools typically enroll 110-150 students.

Projected graduation numbers

Table 13 provides an overview of ASU's projections for graduation numbers for the Department of Biomedical Informatics.

Table 13. Projected Graduation Numbers for Arizona State University BMI Degrees and Majors

Students	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	Long Term
Graduate concentrations in BMI (through existing departments at ASU)			10	10	10	20	20	20	25
Masters students	-	-	-	10	15	20	30	40	50
Doctoral students	-	-	-	-	-	5	10	15	25
Undergraduate concentrations (through existing departments at ASU)	-	-	-	-	-	20	30	35	40
Totals	**-**	**-**	**10**	**20**	**25**	**65**	**80**	**110**	**140**

In the fall of 2006, it is estimated that 10 graduate students will enroll in BMI concentrations through existing units, such as the Department of Computer Science and Engineering and the School of Life Sciences. Over time, it is anticipated that the interest in BMI concentrations at the graduate level may grow

to as many as 25 students per year. It is anticipated that other units on campus, such as the Harrington Department of Bioengineering, may also wish to offer graduate concentrations in biomedical informatics in conjunction with the Department of Biomedical Informatics.

When the Master of Science degree in Biomedical Informatics is launched in the fall of 2007, an enrollment of at least 10 master's students is projected. When the Doctor of Philosophy program is launched in the fall of 2008, an enrollment of at least 5 doctoral students is projected. It is expected that enrollment in the masters and doctoral programs will grow steadily as the Department hires new faculty and gains prominence.

The Department of Biomedical Informatics will also offer biomedical informatics instruction to medical students at the UA College of Medicine starting in the fall of 2007. The Department expects to offer one informatics literacy course per year for each of the four years of medical school. The University of Arizona predicts the medical college will enroll 24 students per class.

In the fall of 2009, the Department expects to add undergraduate concentrations in biomedical informatics. It anticipates that approximately 20 undergraduates from across the university will participate in the concentration the first year. This number is expected to grow to about 40 undergraduate students over the long-term.

After the master's and doctoral degrees are launched, the Department will consider offering other programs such as combined degrees with the medical and nursing colleges, executive and continuing education, and perhaps an undergraduate degree-granting program. Based on early discussions with community clinicians and local health care providers, there is great interest in executive and continuing education courses in biomedical informatics.

Ultimately, the Department of Biomedical Informatics expects graduate enrollment of between 75 students in the master's and doctoral programs, 25 graduate students in the BMI concentrations, 40 undergraduate students in the BMI concentrations, and 150 medical students receiving informatics instruction. The numbers are comparable with other BMI programs around the country.

The Department of Biomedical Informatics will recruit exceptional students with strong backgrounds in the computing and information sciences (mathematics, electrical engineering, computer engineering, bioengineering) or the relevant application domains (clinical, basic biological sciences, public health, etc). The American College of Medical Informatics recently conducted a broad-based study of informatics programs in which it found that trainees with strong informational and computer science backgrounds offer perspectives that are complementary to those of trainees with strong biological and medical domain backgrounds.

It is expected that in the year the BMI graduate program is launched, some of the students in BMI concentrations will transfer directly into master's and doctoral

degree-programs. It is also expected that some students graduating from the professional master's program in Computational Biology at ASU may also wish to enroll in the BMI doctoral program.

In order to attract the best and the brightest students in this competitive environment, it will be necessary for the Department of Biomedical Informatics to devote a great deal of time and energy into recruitment, especially during the early years of the program. The Department plans to host at least one open house at ASU, and invite and host a number of prospective candidates to visit ASU and meet with faculty. As an enticement to attend the BMI program, especially during the first several years of operation, the Department will need to offer as many graduate research assistant positions as possible, as well as summer fellowships.

The first class of master's students is expected to graduate in the spring of 2010, and the first class of doctoral students is expected to graduate in the spring of 2012 at the earliest. Students enrolling in graduate and undergraduate concentrations will graduate in accordance with their departments' schedules.

4. **A 20-year financing plan detailing each funding source, including options to maximize resources and partnerships with the Maricopa County Special Health Care District and other health care entities. Funding sources may include federal grant monies, private donations, and contributions from other public entities**

The University of Arizona

20-Year Operational Budget

Our response to this request required us to prepare the budget projections presented in Table 14 (FY 2011-FY 2015) and Table 15 (FY 2025). A discussion of these projections is warranted prior to a discussion of funding source options.

A class size of 150 students ultimately could matriculate in the UA College of Medicine-Phoenix, resulting in a total class size of 260 for the combined UA College of Medicine Tucson and Phoenix Programs. This would make class size at The University of Arizona College of Medicine among the nation's largest medical school classes.

To expand the size of the PBC class to 150 students, however, a substantial increase will be needed in faculty size over the next 10-20 years. Faculty will be needed in both the basic sciences and in the clinical sciences. Extrapolating from the faculty size of the Tucson program, and from peer institutions around the country, a full faculty of 120-150 basic scientists and 350-400 clinician scientists is a reasonable estimate of faculty size at full build-out in FY 2015.

Several countervailing factors drive these numbers. Medical education is becoming increasingly faculty intensive, given the mandate for smaller cohorts of learning and simultaneous participation of basic scientists and clinicians in those groups. This requires more faculty and more faculty time. On the other hand, a mandate exists for more self-learning, use of digital curricula, web-based modules, teleconferencing, and other modalities to decrease faculty time demands.

Nevertheless, faculty sizes at academic health centers have expanded dramatically in the last decade, largely based on the demands of the research mission. This, in turn, is being driven by the importance of team-based research.

Therefore, the most reasonable plan is to suggest that the size of the faculty at full build-out should be similar to the Tucson program, but that these faculty will be located at a variety of institutions and organizations in Maricopa County. In other words, the model for growth will be more collaborative than currently is the case for expansion efforts at most academic health centers nationally.

Just as is the case for students, a mandate exists for recruiting, supporting, and retaining faculty from underrepresented minorities. Currently, 18 percent of UA

College of Medicine faculty are non-white, including 9 percent Asian/Pacific Islander, 6 percent Hispanic/Latino, 2 percent African American, and 1 percent Native American and Alaskan. Expanding representation from the latter groups is a challenging task and requires aggressive and bold approaches.

Table 2 and Table 4 illustrate the projected growth of the UA College of Medicine-Phoenix over the next 20 years. The students and faculty listed are from all constituencies, including, but not limited to, UA, ASU, TGen, Carl T. Hayden Veterans Affairs Health Care System (CTHVAHCS), NIDDK, and affiliated hospitals. The economies of scale and scope provided by the synergies between these organizations are reflected in the limited amount of state support requested for an enterprise of such magnitude.

A summary of expenses for the UA College of Medicine-Phoenix for the period FY 2011-FY 2015 is shown in Table 14. A detailed breakdown of projected expenditures for years FY 2011-FY 2015 is shown in Appendix J. These tables illustrate the financial organization of the expanding College for the second five-year period.

The College projects continued growth in student, faculty, and staff size over the second decade, as illustrated. Accordingly, Table 15 illustrates a summary of projected expenses after the second decade of operation, beginning in FY 2025. Appendix K provides a detailed breakdown of projected expenses in FY 2025.

Table 14. The University of Arizona College of Medicine-Phoenix FY 2011-FY 2015 Summary Budget

Revised 7-12-05

	Proposed Budget FY 2011-FY 2015 - All Level II																				New State Requests FY 2011-FY 2015					
	FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				LEVEL II New State FY 2011	LEVEL II New State FY 2012	LEVEL II New State FY 2013	LEVEL II New State FY 2014	LEVEL II New State FY 2015	New State TOTAL
	FTE	Total Budget	Annual State Budget	New State Request	FTE	Total Budget	Annual State Budget	New State Request	FTE	Total Budget	Annual State Budget	New State Request	FTE	Total Budget	Annual State Budget	New State Request	FTE	Total Budget	Annual State Budget	New State Request						
EDUCATION																										
Administration		$2,017,627	$298,363	$298,363		$2,888,429		($298,363)		$2,791,548		$0		$2,791,447	$237,971	$237,971		$2,846,908		($237,971)	$298,363	($298,363)	$0	$237,971	($237,971)	$0
Dean of Academic Affairs	1.0				1.0				1.0				1.0				1.0									
Associate and Assistant Deans	6.0				9.0				9.0				9.0				9.0									
Admission/Academic/Financial Support	3.0				3.0				3.0				3.0				3.0									
Admin Assistant and Associates/Reception	10.0				12.0				12.0				12.0				12.0									
Business Affairs/Development/Facilities	7.0				9.0				9.0				9.0				9.0									
Special Assistant to the Dean	3.0				3.0				3.0				3.0				3.0									
Minority Affairs		412,132	0	0		412,132	0	0		412,132	0	0		412,132	0	0		412,132	0	0	0	0	0	0	0	0
Director	2.0				2.0				2.0				2.0				2.0									
Student Recruiters	4.0				4.0				4.0				4.0				4.0									
Administrative Assistant	1.0				1.0				1.0				1.0				1.0									
Basic Science Faculty Yr 1 & Yr 2 Students		4,913,580	4,913,580	380,100		5,166,980	5,166,980	253,400		5,446,940	5,446,940	279,960		5,733,140	5,733,140	286,200		6,673,811	6,673,811	940,671	380,100	253,400	279,960	286,200	940,671	2,140,331
PhD Faculty	26.0				28.0				30.0				30.0				34.0									
MD Faculty	7.0				7.0				7.0				8.0				7.0									
Educational Consultants MD, part time																										
Administrative Assistant	11.0				11.0				12.0				14.0				24.0									
Research Faculty		18,973,560	5,739,600	1,443,890		26,635,940	8,387,470	2,647,870		32,561,400	9,153,100	765,630		39,312,260	11,258,710	2,105,610		45,070,248	12,890,720	1,632,010	1,443,890	2,647,870	765,630	2,105,610	1,632,010	8,595,010
PhD Faculty	42.0				56.0				69.0				83.0				96.0									
MD Faculty	21.0				28.0				33.0				40.0				48.0									
Research Staff	95.0				125.0				155.0				185.0				216.0									
Admin Staff	63.0				84.0				102.0				120.0				130.0									
Faculty 3rd & 4th Year Clinical Education		44,796,260	3,202,050	569,322		55,367,874	4,397,380	1,195,330		58,334,154	4,787,532	390,152		77,068,734	3,162,034	(1,625,498)		89,070,306	8,172,489	5,010,455	569,322	1,195,330	390,152	(1,625,498)	5,010,455	5,539,761
MD Faculty-Teching	58.0				72.0				86.0				100.0				115.0									
MD Faculty Teaching & Research	58.0				72.0				86.0				100.0				115.0									
Research Staff	348.0				432.0				516.0				600.0				690.0									
Admin Staff	21.0				24.0				30.0				35.0				53.0									
Information/Media Technology		737,600	655,245	0		737,600	655,245	0		737,600	655,245	0		737,600	655,245	0		737,600	655,245	0	0	0	0	0	0	0
Media Support	4.0				4.0				4.0				4.0				4.0									
Medical Computing	4.0				4.0				4.0				4.0				4.0									
Gross Anatamy Lab	2.0	145,320	145,320	0	2.0	145,320	145,320	0	2.0	145,320	145,320	0	2.0	145,320	145,320	0	2.0	145,320	145,320	0	0	0	0	0	0	0
Staff																										
Pre-Clinical Training		466,560	466,560	0		466,560	466,560	0		466,560	466,560	0		466,560	466,560	0		466,560	466,560	0	0	0	0	0	0	0
MD Faculty-Director	2.0				2.0				2.0				2.0				2.0									
Asst Dir	2.0				2.0				2.0				2.0				2.0									
Admin. Assistant																										
Medical Library		396,560	396,560	0		396,560	396,560	0		396,560	396,560	0		396,560	396,560	0		396,560	396,560	0	0	0	0	0	0	0
Librarian	3.0				3.0				3.0				3.0				3.0									
Library Support Staff	2.0				2.0				2.0				2.0				2.0									
Computer Staff	1.0				1.0				1.0				1.0				1.0									
Medical Bookstore		94,360	0	0		94,360	0	0		94,360	0	0		94,360	0	0		94,360	0	0	0	0	0	0	0	0
Office Staff	2.0				2.0				2.0				2.0				2.0									
Shared Support Facilities																										
Office staff																										
Total Personnel (including ERE)	809.0	72,953,559	15,817,278	2,691,675	1,005.0	92,311,755	19,615,515	3,798,237	1,192.0	101,386,574	21,051,257	1,435,742	1,381.0	127,158,113	22,055,540	1,004,283	1,594.0	145,913,805	29,400,705	7,345,165	2,691,675	3,798,237	1,435,742	1,004,283	7,345,165	16,275,102
OPERATIONS	0.0	16,333,200	4,438,140	(418,057)	0.0	18,163,671	4,107,878	(330,262)	0.0	18,442,300	4,233,368	125,490	0.0	20,035,300	3,563,037	(670,331)	0.0	21,406,900	2,634,508	(928,529)	(418,057)	(330,262)	125,490	(670,331)	(928,529)	(2,221,689)
Operations																										
Lease Costs																										
Building Operations and Maintenance																										
Hospital Arrangements																										
Faculty Start Up																										
Travel		149,500	149,500	37,700		183,300	183,300	33,800		149,500	149,500	(33,800)		248,300	248,300	98,800		248,300	248,300	0	37,700	33,800	(33,800)	98,800	0	136,500
Capital		745,082	745,082	(4,661,318)		187,536	193,307	(551,775)		440,875	440,875	247,568		158,123	158,123	(282,752)		1,316,487	1,316,487	1,158,364	(4,661,318)	(551,775)	247,568	(282,752)	1,158,364	(4,089,913)
Computer Systems(inc software)																										
IT Infrastructure																										
Furnishings																										
Office Machines																										
TOTAL	**809.0**	**$90,181,341**	**$21,150,000**	**($2,350,000)**	**1,005.0**	**$110,846,262**	**$24,100,000**	**$2,950,000**	**1,192.0**	**$120,419,249**	**$25,875,000**	**$1,775,000**	**1,381.0**	**$147,599,836**	**$26,025,000**	**$150,000**	**1,594.0**	**$168,885,492**	**$33,600,000**	**$7,575,000**	**($2,350,000)**	**$2,950,000**	**$1,775,000**	**$150,000**	**$7,575,000**	**$10,100,000**

Table 15. The University of Arizona College of Medicine-Phoenix FY 2025 Summary Budget

7/15/05	Proposed Budget FY 2025 Level II				
	FTE	Proposed Budget	Annual State Budget	State Budget FY 2015	New State Request
EDUCATION					
Administration		$2,846,908	$0	$0	$0
Dean of Academic Affairs	1.0				
Associate and Assistant Deans	6.0				
Admission/Academic/Financial Support	3.0				
Admin Assistant and Associates/Reception	11.0				
Business Affairs/Development/Facilities	7.0				
Special Assistant to the Dean	3.0				
Minority Affairs		412,132	0	0	0
Director	2.0				
Student Recruiters	4.0				
Administrative Assistant	1.0				
Basic Science Faculty Yr 1 & Yr 2 Students		6,673,811	4,913,580	6,673,811	(1,760,231)
PhD Faculty	34.0				
MD Faculty	8.0				
Educational Consultants MD, part time					
Administrative Assistant	24.0				
Research Faculty		67,969,342	21,500,991	12,880,720	8,620,271
PhD Faculty	153.0				
MD Faculty	77.0				
Research Staff	345.0				
Admin Staff	705.0				
Faculty 3rd & 4th Year Clinical Education		110,194,176	9,487,371	8,172,489	1,314,882
MD Faculty-Teaching	140.0				
MD Faculty Teaching & Research	140.0				
Research Staff	875.0				
Admin Staff	53.0				
Information/Media Technology		737,600	655,245	655,245	0
Media Support	4.0				
Medical Computing	4.0				
Gross Anatomy Lab	2.0	145,320	145,320	145,320	0
Staff					
Pre-Clinical Training		466,560	466,560	466,560	0
MD Faculty-Director	2.0				
Asst Dir	2.0				
Admin. Assistant					
Medical Library		396,560	396,560	396,560	0
Librarian	3.0				
Library Support Staff	2.0				
Computer Staff	1.0				
Medical Bookstore		94,360	0	0	0
Office Staff	2.0				
Shared Support Facilities					
Office staff					
Total Personnel (inc ere)	2,614.0	189,936,769	39,325,858	29,400,705	9,925,153
OPERATIONS	0.0	25,496,300	2,568,000	2,634,506	(66,506)
Operations					
Lease Costs					
Building Operations and Maintenance					
Hospital Arrangements					
Faculty Start Up					
Travel		248,300	248,300	248,300	0
Capital		2,857,842	2,857,842	1,316,487	1,541,355
Computer Systems (inc software)					
IT Infrastructure					
Furnishings					
Office Machines					
TOTAL	**2,614.0**	**$218,539,211**	**$45,000,000**	**$33,600,000**	**$11,400,000**

Sources of Funds

The Association of American Medical Colleges (AAMC) financial model for medical schools discussed earlier will provide a context for the following discussion of possible funding sources for the UA College of Medicine-Phoenix.

State funds

Based on the same assumptions used to determine state funding requirements through FY 2015, total state funding at full build-out in FY 2025 would approach $45 million in FY 2005 dollars, an estimated 20 percent of the estimated $220 million total budget required in FY 2025. While this funding requirement is similar to that for the current Tucson Program, there is a critically important distinction. The Phoenix Program will train 39 percent more medical students, and employ, at a minimum, 44 percent more basic science faculty engaged in medical student teaching, than are currently engaged for the Tucson Program. The number of clinical faculty employed in medical student teaching in Phoenix is expected to increase by an even greater percentage in comparison to the Tucson Program. These are direct reflections of the economies of scale and scope which are operative from the outset, and will continue through full build-out and beyond.

Tuition

Tuition costs nationally are increasing at an average of nearly 7 percent per year for colleges of medicine, far in excess of the cost of living. Such increases are unlikely to be sustainable over a 20-year period. Therefore, UA College of Medicine officials have projected increases at a more conservative 5 percent per year (*please see Table 5)*.

Sponsored research grants and contracts

Both the UA and ASU are Research-Extensive (Carnegie classification) universities and are recognized as national leaders in the advancement of science. The UA College of Medicine currently ranks 3rd among research-intensive medical schools (the terminology used to refer to the top 20 recipients of NIH funding) with faculty of fewer than 600, and is ranked 55th overall in research funding. ASU is expanding its research in many ways, a prime example of which is the creation of The Biodesign Institute at Arizona State University, the new hub for ASU's biomedical and biotechnology portfolio that cuts across disciplines to directly improve the human condition. The Biodesign Institute combines expertise in life sciences, materials research, computer science, and manufacturing. Rather than being an isolated "ivory tower," The Biodesign Institute is intended to catalyze research across the institution and across metropolitan Phoenix.

The UA College of Medicine-Phoenix is particularly well positioned to receive support from the Department of Defense (DOD) for its THealth program.

Further, large pharmaceutical companies increasingly are challenged to develop new agents and to bring these compounds to market. The opportunities and mandates for drug discovery programs in academic health centers will continue. The likelihood is that partnerships between academia and large pharmaceutical companies will increase.

Philanthropic goals

The potential for philanthropy as a source of long-term funding for the UA College of Medicine-Phoenix is enormous. The natural tendency is to be conservative in such projections. Nonetheless, for a variety of reasons, it is likely that this source of funds will be beyond even the most constrained predictions. Economic growth in Arizona is exploding:

- The majority of the state's population lives in Maricopa County
- Arizona is a destination location for wealthy retirees
- The UA College of Medicine will be, for the foreseeable future, the only allopathic medical school in the state
- The UA College of Medicine-Phoenix will better be able to target donors in Maricopa County

Based on these considerations, the UA College of Medicine-Phoenix projects dramatic and rapid increases in philanthropic giving. Philanthropic revenues in FY 2011 and forward are projected at $6 million annually, the equivalent of adding three endowed chairs per year.

Maximizing resources

A substantial number of mechanisms are available to maximize resources at the Phoenix Biomedical Campus.

First, the synergies and complementary goals among UA, ASU, TGen, BNI/St. Joseph's, Banner HealthCare, Sun Health Research Institute, and other constituencies will optimize the impact of limited state resources. This is most dramatic for scientific collaborations, but also impacts facilities use, as described below.

Second, as noted, the UA College of Medicine has 400 volunteer faculty members in Maricopa County. As the College begins recruiting new faculty, many of the existing faculty will become full- or part-time paid faculty of the UA.

Finally, the UA has faculty in rural areas throughout the state. These faculty help train medical students and encourage students to practice in rural areas. They will complement the training done by faculty at the PBC site. Tucson and Phoenix will be major hubs linking outward to rural Arizona communities and their health needs.

20-Year Capital Budget

Currently, the UA College of Medicine has a class size of 110 students and occupies 1,166,165 gross square feet and 726,675 net square feet of educational, research, and outpatient care space in Tucson. This includes all College of Medicine space at 1501 North Campbell, leases in Tucson and Phoenix for educational programs and clinical trials, and outpatient clinics on The University of Arizona campus. Not included are the offsite out-patient clinics (49,251 net square feet) in the Medical Research Building (135,280 gross square feet, 80,759 net square feet) that will be completed in June 2006. The breakdown of Tucson campus space is presented in Table 16.

Table 16. Breakdown of The University of Arizona College of Medicine-Tucson Space, 2005

Space Category	NSF	GSF	Percent
Administration	152,668	245,001	21.01
Classroom Instruction	113,652	186,388	15.64
Faculty Office	62,003	99,502	8.53
Patient Care	62,785*	100,757	8.64
Research			
Clinical Trial	57,035	91,529	7.85
Dry Lab	40,045	64,264	5.51
Lab Support	26,978	43,294	3.71
Service Core	8,694	13,952	1.20
Wet Lab	162,122	260,172	22.31
Animal Care	40,694	65,305	5.60
UA College of Medicine Total Square Feet	**726,676**	**1,166,165**	**100.00**

*Patient care on the Tucson Campus. There are 112,036 square feet of patient care offsite.

With the expansion of the UA College of Medicine-Phoenix to a class size of 150 students in FY 2015, new educational, research, and patient care facilities will be required. The following space and cost analysis in Table 17 details the types of facilities needed for Level II. The costs are provided in both 2005 and 2010 dollars.

Table 17. The University of Arizona College of Medicine-Phoenix Capital Expenditure Cost Model FY 2010

MEDICAL EDUCATION AND ADMINISTRATION*

Year 2010

	area		unit cost	estimated cost
Core & Shell	310,000	gsf	$100	$ 31,000,000
Administration & Business	54,000	gsf	$75	$ 4,050,000
Student Services	138,500	gsf	$100	$ 13,850,000
Classrooms & Teaching Labs	117,500	gsf	$150	$ 17,625,000
Building Subtotal				**$ 66,525,000**
Site Infrastructure allowance @ 1.5%				$ 997,875
Total Building Cost				**$ 67,522,875**

*Permits, Professional Services Fees, Survey and Testing Fees, Site Assessment and Municipal Development Fees, Moving Expenses, Insurance, Utility Extensions, Design and Construction Contingency, Inflation Adjustment, Keying, Signage, Fixed Equipment, Contractor Pre-Con Fees (25% of total project costs) $ 22,282,549

TOTAL ESTIMATED PROJECT COST (in current 2005 dollars) $ 89,805,424

Approximate 20% increase to reflect estimated escalated costs for 2010 $112,256,780

***This Educational Facility building is required for expansion of the Phoenix Program class size to 64 students in FY 2010. The three facilities detailed below will be required for full build-out to a class size of 150 students in FY 2015.**

BASIC SCIENCES

Year 2010

	area		unit cost	estimated cost
Core & Shell	365,000	gsf	$140	$ 51,100,000
Lab & Lab Support	176,700	gsf	$160	$ 28,272,000
Office & Interaction	88,100	gsf	$100	$ 8,810,000
Vivarium & Core Labs	75,400	gsf	$340	$ 25,636,000
Building Support	25,700	gsf	$65	$ 1,670,500
Building Subtotal				**$ 113,818,000**
Site Infrastructure allowance @ 1.5%				$ 1,707,270
Total Building Cost				**$ 115,525,270**

*Permits, Professional Services Fees, Survey and Testing Fees, Site Assessment and Municipal Development Fees, Moving Expenses, Insurance, Utility Extensions, Design and Construction Contingency, Inflation Adjustment, Keying, Signage, Fixed Equipment, Contractor Pre-Con Fees (25% of total project costs) $ 38,123,339

TOTAL ESTIMATED PROJECT COST (in current 2005 dollars) $ 153,648,609

Approximate 20% increase to reflect estimated escalated costs for 2010 $192,060,761

CLINICAL SCIENCES

Year 2010

	area		unit cost	estimated cost
Core & shell	145,000	gsf	$125	$ 18,125,000
Clinical Office/Lab Suites	127,000	gsf	$125	$ 15,875,000
Conference & Interaction Space	15,000	gsf	$100	$ 1,500,000
Building Support	3,000	gsf	$65	$ 195,000
Building Subtotal				**$ 35,695,000**
Site Infrastructure allowance @ 1.5%				$ 535,425
Total Building Cost				**$ 36,230,425**
*Permits, Professional Services Fees, Survey and Testing Fees, Site Assessment and Municipal Development Fees, Moving Expenses, Insurance, Utility Extensions, Design and Construction Contingency, Inflation Adjustment, Keying, Signage, Fixed Equipment, Contractor Pre-Con Fees (25% of total project costs)				$ 11,956,040
TOTAL ESTIMATED PROJECT COST (in current 2005 dollars)				**$ 48,186,465**
Approximate 20% increase to reflect estimated escalated costs for 2010				**$60,233,082**

CLINICAL OUTPATIENT

Year 2010

	area		unit cost	estimated cost
Core & Shell	115,000	gsf	$125	$ 14,375,000
Administration & Public	21,700	gsf	$100	$ 2,170,000
Diagnostics	21,200	gsf	$200	$ 4,240,000
Clinical Care	57,500	gsf	$125	$ 7,187,500
Building Support	14,600	gsf	$65	$ 949,000
Building Subtotal				**$ 28,921,500**
Site Infrastructure allowance @ 1.5%				$ 433,822
Total Building Cost				**$ 29,355,323**
*Permits, Professional Services Fees, Survey and Testing Fees, Site Assessment and Municipal Development Fees, Moving Expenses, Insurance, Utility Extensions, Design and Construction Contingency, Inflation Adjustment, Keying, Signage, Fixed Equipment, Contractor Pre-Con Fees (25% of total project costs)				$ 9,687,256
TOTAL ESTIMATED PROJECT COST (in current 2005 dollars)				**$ 39,042,579**
Approximate 20% increase to reflect estimated escalated costs for 2010				**$48,803,224**

The proposed size of new educational facilities on the Phoenix Biomedical Campus needed for accommodating 150 students per class is in the process of being evaluated using the above information as a guideline, as well as by establishing benchmarks from other peer universities (University of California at San Francisco, Northwestern University, and the University of Colorado). A new facility will need to be designed and built to accommodate the full class size, as was the case for the UA College of Medicine in Tucson. As the class size

increases, so will faculty, staff, and associated research. The vision for the future build-out of the 15.8-acre PBC site is to accommodate 1 million square feet of new construction in addition to the adaptive reuse of approximately 90,000 square feet of COM 1, COM 2, and COM 3 and new circulation cores, and ABC 1. Preliminary work has identified facilities that will need to be included *(please see Table 18).*

Table 18. Projected Facilities on the Phoenix Biomedical Campus

Building	GSF	Total Estimated Project Cost
ABC 2	160,000	$ 73,000,000
Imaging	15,000	15,000,000
Vivarium	20,000	14,500,000
Loading dock		7,800,000
Underground bridge and tunnels		7,4000,000
Underground tunnels		2,500,000
Totals	**195,000**	**$ 117,700,000**

These facilities will be built incrementally as funds permit, so construction schedules, and scheduled class size increases, are quite preliminary.

Discussions with all potential partners in the Phoenix Biomedical Campus, including the Maricopa County Special Health Care District, are in the early stages and will proceed through the work of the ACMER.

Arizona State University

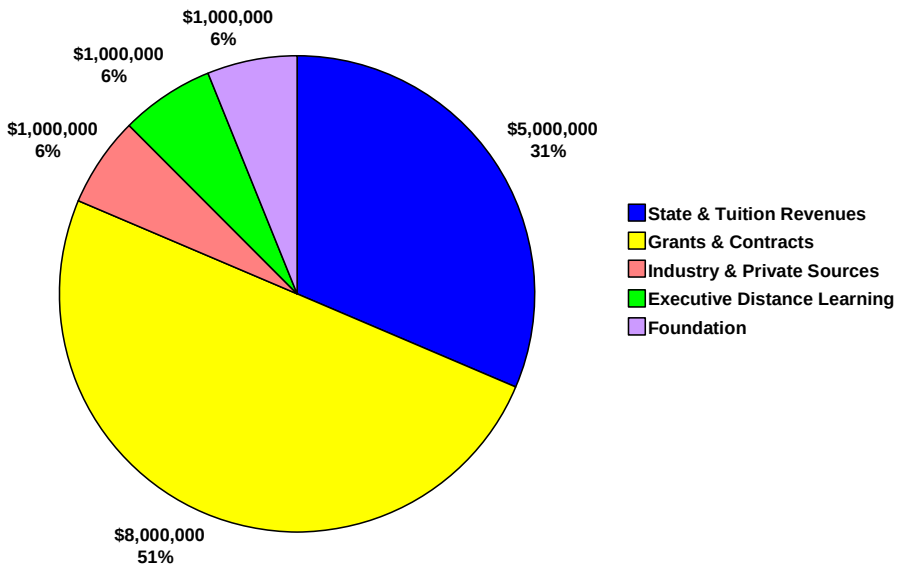
20-Year Operational Budget

The projected total budget of for ASU's Department of Biomedical Informatics (BMI) in 20 years (FY 2025) is $16 million.

Sources of Funds

Financing for BMI is expected to come from several sources: federal grants and contracts, private donations, state funds, and program fees. When BMI is fully staffed with 16 FTEs, it anticipates securing an average of $8 million in research grants per annum. BMI expects to obtain $10 million over 20 years from industry and private sources. They also anticipate receiving continued state funds and a portion of tuition revenues to defray the operating costs associated with providing student education. In addition, other revenues will include laboratory/program fees, distance education, and executive education fees. The breakdown of funding sources is shown in Figure 3.

Figure 3. Arizona State University Department of Biomedical Informatics Projected Revenue Sources FY 2025



Partnerships with the local and regional biomedical community will be critical to the success of the ASU's Department of Biomedical Informatics and the PBC. It is these strong community collaborations that will give the program its distinctive mark and its relevance to the region. Partnerships shown in Table 19 are expected to enhance the Department's and the region's ability to become a leader in both applied and theoretical biomedical informatics.

The Department of Biomedical Informatics will explore the following types of collaborations with its partners:

- Joint hires with community partners
- Adjunct teaching positions
- Joint research grants and contracts
- Internships in clinical facilities, public health agencies, and research organizations
- Sponsored fellowships
- Co-sponsorship of seminars, visiting speakers, conferences
- Co-sponsored educational outreach to the high schools
- Continuing education courses for health care professionals

The Department will begin by exploring the expansion of partnerships with established ASU partners. These include partnerships with the Barrow Neurological Institute, the Translational Genomics Research Institute, the Mayo Clinic and Medical School, The University of Arizona College of Medicine, and Banner Health. Listed below are some examples of new, potential collaborative opportunities:

The Department of Biomedical Informatics will explore additional partnership possibilities with the Veterans Administration, Sun Health, Maricopa Medical Center, Phoenix Children's Hospital, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), Chaparral Biomedical Campus, Arizona Cancer Institute, Arizona Heart Institute, Arizona Department of Health Services, Maricopa County Department of Health Services, Intel and GE/Siemens, Blue Cross/Blue Shield of Arizona, and the Arizona Peer Review Organization, among other potential partners *(please see Table 19)*.

Table 19. Examples of Arizona State University's Expanded Collaborations with Maricopa County Special Health Care District Partners

Partner	Opportunities
Catholic Health Care West/Barrow Neurological Institute	Joint faculty members; joint focus on hospital-based informatics; potential for clinical research space at the Barrow Neurological Institute.
Translational Genomics Research Institute (TGen)	Joint focus on genomics and proteomics-based informatics; potential research space at TGen; potential joint hires in the area of proteomics; collaborative work involving the TGen/ASU IBM supercomputer for genomic research in areas such as cancer genome informatics.
Mayo Clinic and Medical School	Potential for collaboration in clinical informatics/cancer imaging; potential for affiliates; current discussion with the Mayo Clinic and Medical School's Information Technology regarding funding a joint hire and fellowships; joint applications for ASU/Mayo grant seed funding.
The University of Arizona College of Medicine	Use of medical school conference facilities; joint research opportunities; integration of medical student learning with other health professionals through team exercises; potential for joint hires in medical informatics.
Banner Health	Potential collaboration on health informatics, imaging informatics, and Alzheimer research; potential for shared clinical research space in the new Banner facility; potential joint hires.

5. The programs and areas of practice offered

The University of Arizona

Practice Disciplines

Medical students do not decide on their practice areas at the time of enrollment, but rather during their four years of medical school training. No U.S. medical school curriculum is organized by areas of clinical practice. All students must complete an extensive study of basic sciences (anatomy, physiology, pathology, etc.) and clinical sciences (pediatrics, surgery, family medicine, etc.) in order to graduate.

In contrast with undergraduate study, the vast majority, greater than 95 percent, of a medical curriculum is required, and is essentially the same for all students for at least the first three of the four years. The study of human function in health (anatomy, physiology, biochemistry) and disease (pathology, microbiology, pharmacology) occupies the first two years. The third year is an immersion in the direct practice of the major disciplines of medicine in either a hospital or clinic setting. This includes internal medicine, surgery, pediatrics, family medicine, psychiatry, obstetrics and gynecology, and neurology. The fourth year provides more opportunity for selection of subspecialties and individual preferences.

Although electives are offered, the UA College of Medicine does not direct or offer certification beyond that of the MD degree. As discussed earlier, that occurs in graduate medical education. This is not to say that students do not enter with, and develop, preferences for practice areas as they progress through the curriculum. The students' immediate goal after receiving their MD is to obtain a residency position in one of the many specialties of medicine. They participate in a national match to determine the residency position. They may choose to apply for residencies in Arizona and/or to apply out of state, just as they may or may not apply to UA-associated residencies if they wish to stay in Arizona.

The residency selections of the graduating classes from the UA College of Medicine over the past five years are shown in Table 20 below.

Table 20. Residency Selections by The University of Arizona College of Medicine Graduates, 2001-2005

	2005		2004		2003		2002		2001	
	N	%	N	%	N	%	N	%	N	%
Total Students	**90**		**104**		**91**		**101**		**102**	
Anesthesiology	3	3.3%	8	7.7%	9	9.9%	5	5.0%	4	3.9%
Dermatology	4	4.4%	1	1.0%	2	2.2%	0	0.0%	3	2.9%
Emergency Med	4	4.4%	12	11.5%	11	12.1%	7	6.9%	6	5.9%
Family Practice	9	10.0%	12	11.5%	6	6.6%	18	17.8%	12	11.8%
Internal Med-Prelim	2	2.2%	1	1.0%	0	0.0%	0	0.0%	0	0.0%
Internal Medicine	15	16.7%	15	14.4%	12	13.2%	11	10.9%	22	21.6%
Medicine-Pediatrics	1	1.1%	2	1.9%	0	0.0%	0	0.0%	4	3.9%
Neurology	1	1.1%	1	1.0%	2	2.2%	2	2.0%	1	1.0%
Neurosurgery	1	1.1%	1	1.0%	0	0.0%	2	2.0%	3	2.9%
OB/GYN	4	4.4%	4	3.8%	6	6.6%	6	5.9%	6	5.9%
Ophthalmology	3	3.3%	2	1.9%	2	2.2%	0	0.0%	2	2.0%
Orthopedic Surgery	1	1.1%	2	1.9%	3	3.3%	3	3.0%	4	3.9%
Otolaryngology	1	1.1%	1	1.0%	0	0.0%	1	1.0%	3	2.9%
Pathology	2	2.2%	2	1.9%	4	4.4%	5	5.0%	4	3.9%
Pediatrics	18	20.0%	17	16.3%	9	9.9%	13	12.9%	8	7.8%
Physical Med	1	1.1%	1	1.0%	0	0.0%	0	0.0%	0	0.0%
Plastic Surgery	3	3.3%	3	2.9%	2	2.2%	0	0.0%	2	2.0%
Psychiatry	4	4.4%	3	2.9%	4	4.4%	4	4.0%	7	6.9%
Radiation Oncology	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Radiology	5	5.6%	3	2.9%	5	5.5%	6	5.9%	6	5.9%
Surgery-Prelim	2	2.2%	1	1.0%	4	4.4%	3	3.0%	0	0.0%
Surgery	3	3.3%	6	5.8%	9	9.9%	11	10.9%	3	2.9%
Transitional	0	0.0%	0	0.0%	0	0.0%	1	1.0%	0	0.0%
Urology	1	1.1%	2	1.9%	1	1.1%	2	2.0%	0	0.0%
No Residency	2	2.2%	4	3.8%	0	0.0%	1	1.0%	2	2.0%
Primary Care	43	48%	46	44%	27	30%	42	42%	46	45%
Primary Care + OB	47	52%	50	48%	33	36%	48	48%	52	51%
Stay in Arizona	47	52%	47	45%	34	37%	44	44%	52	51%

As can be seen, roughly half of UA College of Medicine graduates enter primary care specialties and select residencies in Arizona. The latter number might be higher if there were more graduate medical education positions available in Arizona. Our state currently ranks in the lower 20th percentile in residency positions per 100,000 population.

Trends in Arizona mirror those at the national level over the last decade. An enormous shift has taken place in the attitudes about primary care disciplines vs. specialty medicine. From the expectation in the early to mid-1990s that specialists would progressively diminish as a percentage of the health care workforce, now a nationally recognized shortage exists in most specialty areas. As a result, as of 2005, based on national statistics, there have been eight

consecutive years nationally of declining enrollment in primary care residencies and an increase in the proportion of residents in other specialties. The reasons for this shift are several, but most notable are the pace of advancement in medicine and public reaction to the managed care experiment of the 1990s.

According to the recently completed *Arizona Physician Workforce Study*, the current physician-to-population ratio in Arizona is 207 per 100,000 people, far below the national average of 283 per 100,000 people *(please see Appendix A)*. In addition, shortages in rural areas remain. In 2004, approximately 86 percent of Arizona physicians practiced in either Maricopa or Pima Counties, and the physician-to-population ratios range from a high of 276 per 100,000 in Pima County, to a low of 48 per 100,000 in Apache County. Arizona has a higher percentage of primary care physicians than other states, and thus a shortage of physicians in specialty areas, especially allergy, cardiovascular disease, endocrinology, gastroenterology, hematology, and infectious disease.

When these two factors are combined with the current crisis in financing of health care, it is obviously not feasible to predict the organization of health care delivery in the next 10-20 years. For example, it is impossible to predict which disciplines will be most in demand, which will be most overpopulated, and, most importantly, which will be most relevant to Arizona.

However, it is certain that the UA College of Medicine programs in Tucson and Phoenix will continuously emphasize training in those areas that are most important for the citizens and health care needs of the state. The College will adapt as needed to the local, regional, and national mandates for training, whether in primary care or specialty areas.

Statewide Retention of Practicing Graduates

Looking toward the next two decades, it is a near certainty that the need for health care providers in underserved and underpopulated areas in Arizona will persist. Accordingly, and as described further below, the UA College of Medicine will focus a substantial portion of its educational efforts on new approaches to delivery of health care in rural and underserved areas. Efforts will include a combination of training individuals who will live and practice in those areas, and spearheading accelerating advances in telemedicine, THealth, and other advanced technologies that can provide services at a distance.

Rural Outreach

Rural Health Professions Program

For four to six weeks in May, June, and July, a select group of physicians in rural communities throughout the state volunteer as preceptors to UA medical students between the first and second years of medical school. The students work at the physicians' practice sites and reside in their communities. Fifteen

medical students per class (for a total of 60) participate in the program at any one time.

The physicians are rural faculty members in UA College of Medicine's Rural Health Professions Program (RHPP), established in 1997 by the Arizona Legislature to encourage medical school graduates to practice medicine in rural communities.

The students are matched with rural physician preceptors based on medical specialty interest and community preference. Physician specialties include family practice, pediatrics, internal medicine, obstetrics and gynecology, and surgery. Thirty-four rural communities are participating in the RHPP, and additional sites will be selected throughout the state. The students will continue to work with their preceptors over the course of their three remaining years of medical training, returning to the rural communities in their third and fourth years.

RHPP students develop long-term relationships with their rural physician preceptors, who act as medical and career counselors, helping the students make informed choices when they decide where they will practice medicine.

Arizona Area Health Education Centers Program

The UA College of Medicine coordinates its efforts to recruit students from underserved communities and from underrepresented racial and ethnic groups with the Arizona Area Health Education Centers (Arizona AHEC). Administered by the UA Mel and Enid Zuckerman College of Public Health, the Arizona AHEC program has been an integral contributor to improving the recruitment and training of Arizona's health workforce.

Founded in 1984, Arizona AHEC's mission has been to recruit students from underrepresented racial and ethnic groups into the health professions, and to support health care professionals in underserved communities statewide. Additionally, the organization focuses its attention on supporting the state's health professionals with continuing training and career enhancements. Arizona AHEC has been recognized nationally as a designated AHEC model for the outstanding work that has been done through the program.

Five regional Area Health Education Centers (AHECs)—located in Yuma, Globe, Nogales, Flagstaff, and Phoenix—work across all 15 Arizona counties *(please see Figure 4)* with local and regional partners such as health care agencies and providers, schools, colleges and universities, public health departments, private employers, and community members. Working with these partners, Arizona AHEC targets the barriers to building and sustaining an adequate supply of health professionals who will meet the needs of medically underserved populations.

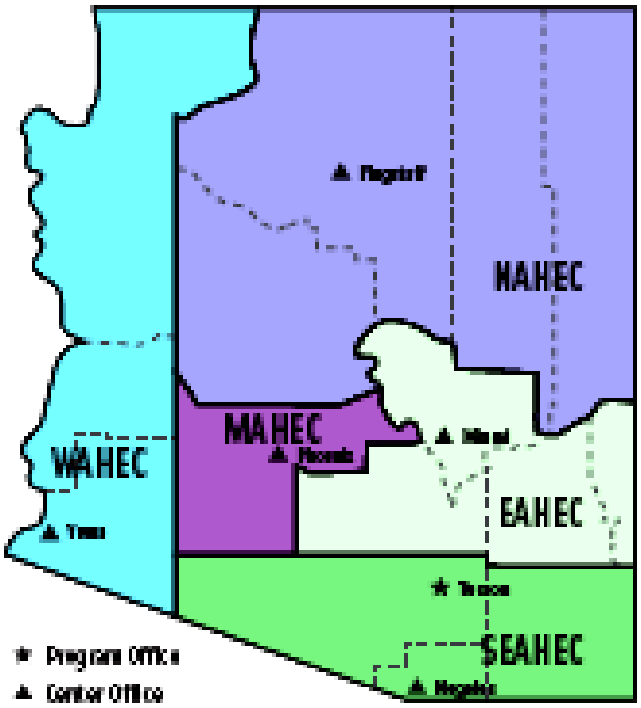
These are the programs Arizona AHECs have delivered annually:

High School and Middle School Programs: An average of 50 career information events reach some 5,000 students and parents each year; currently 14 school-based health career clubs and summer leadership programs reach over 250 high school students a year; more than 300 middle school students are reached through school presentations each year. The AHECs use students enrolled in health professions programs as Career Education Ambassadors; they present health career program information at school programs throughout the state.

Clinical Community Rotations for Health Professions Students: Community-based experiences are provided for an average of 275 students each year statewide in Medicine, Nursing, Nurse Practitioner, Physician Assistant, Pharmacy, Emergency Medical Services, Public Health, Community Health, and Allied Health Programs, including Medical Residents.

Health Professions Continuing Education and Medical Continuing Education Programs: These programs, provided by the AHECs, serve about 3,600 participants each year through an average of 120 courses or conferences.

Figure 4. Arizona Area Health Education Centers Program Map



The Arizona Telemedicine Program

Recognized as the premier telemedicine program in the nation, the Arizona Telemedicine Program (ATP) is bringing subspecialty medical care to rural communities and other locations throughout Arizona, with 75 current sites.

A large, multidisciplinary, university-based program that provides telemedicine services, distance learning, informatics training, and telemedicine technology assessment capabilities to communities throughout Arizona, the program has succeeded in creating partnerships among a wide variety of not-for-profit and for-profit health care organizations, and has created new interagency relationships within the state government.

In 1996 the Legislature funded the Arizona Telemedicine Program and mandated that it provide telemedicine services to a broad range of health care service users including geographically isolated communities, American Indian tribes, and the Arizona Department of Corrections rural prisons. Leveraging the state start-up funds, the Arizona Telemedicine Program succeeded in obtaining additional funding and support from many health care systems, state agencies, federal grant programs, and third-party payers.

THealth

Congressionally appropriated federal earmark funds in the amount of $1.2 million for THealth will equip and staff space on the third floor of COM 2. THealth will serve as the site of origin of unique, modular health care team educational programming, drawing upon the existing resources of the Arizona Telemedicine Program (ATP). These modules are expected to address a number of goals of the National Academy of Sciences Institute of Medicine report on health education team training. Initially, this will be regarded as a supplemental curriculum, designed to complement and broaden the medical school curriculum. The THealth curricular elements will be heavily dependent on the use of remote "video conferencing" telemedicine clinical experiences. The ATP already links more than 130 clinics throughout the state and a wide variety of rural, urban, correctional, community health, and home-health environments and has affiliation agreements with these sites. THealth will link to these clinical settings to expand medical students' patient experiences throughout their education.

The Arizona Health Sciences Library

As Arizona's most extensive source of health sciences information, the Arizona Health Sciences (AHS) Library has supported widespread use of electronic tools to improve health sciences education, practice, and research. Open 363 days a year, 24 hours a day, the AHS Library provides support to Arizona's health care professionals and the public through information services, collections, electronic networks, computing, and outreach services.

Arizona's rapidly growing biotechnology industry also relies heavily on AHS Library collections to facilitate development of new products for hospitals, clinics, and pharmaceutical companies. The Library is working toward a goal of delivering information directly to points of need—in hospitals, laboratories, and offices for immediate use in research and patient care. In 1993 the AHS Library served as a catalyst in bringing together the Arizona Health Information Network (AZHIN), a not-for-profit consortium of Arizona hospitals and educational institutions. Established with a $306,300 grant from the Phoenix-based Flinn Foundation, AZHIN supports easy, inexpensive, uniform communication for information sharing, collaboration, research, administration, and education in the health sciences in Arizona.

As rapidly expanding electronic networks such as MEDLINE, the world's most comprehensive source of life sciences and biomedical bibliographic information, with nearly eleven million records, grow, so will the need for the Library's outreach services and training programs, which teach users how to access computer databases and information sources.

Minority Outreach *(a few examples)*

The Office of Minority Affairs

The Office of Minority Affairs at The University of Arizona Health Sciences Center has the dual mission of diversifying the health professions workforce through recruiting more individuals of ethnic minority background and raising awareness of all health care professionals about the importance of culture in health care. To carry out this mission, the Office provides information, encouragement, and various kinds of assistance for individuals of minority backgrounds or who are economically disadvantaged and who are preparing for a career in the health professions. Some of the services offered include early outreach and recruitment activities such as career day presentations, shadowing experiences, and interviewing skills workshops. Office staff members work closely with the state's pre-health professions student organization, F.A.C.E.S. (Fostering and Achieving Cultural Equity and Sensitivity) in the Health Professions. Chapters are active at each of the three state universities and various community colleges. F.A.C.E.S. seeks to increase the awareness of all pre-health professions students and interested others about the importance of considering cultural issues in providing health care and prevention programs. An annual statewide F.A.C.E.S. conference is held to focus on diversity issues in the health professions and health care system.

Med-Start—Office of Minority Affairs

Med-Start is a program for high school students who have completed their junior year. Med-Start introduces high school students to career opportunities in the health professions and college life through an intensive five-week summer academic enrichment experience on the UA campus.

Native American Research and Training Center

The Native American Research and Training Center (NARTC), part of the UA Department of Family and Community Medicine, serves as a national resource for health-related research and training for American Indian communities and for persons providing services or other resources to those communities. NARTC assists American Indian communities with community-based research projects, especially in the area of chronic diseases and disabilities. The Center utilizes information from research and training projects to contribute to the improvement of the quality of life for Native Americans with chronic health problems and/or disabilities.

Commitment to Underserved People Program

The Commitment to Underserved People (CUP) Program is an elective experience in which over 90 percent of UA College of Medicine medical students participate. Through this service learning program, which is student directed, students provide educational and health care services to a variety of underserved populations. CUP students are exposed to and must operate in consideration of the specific issues related to homelessness, youth homelessness, lack of resources for science/math education, care for refugees including torture victims, processes to achieve asylum status and citizenship, unemployment/low employment, lack of insurance, inability to get diagnostic tests/radiology services/surgery/medications/specialty care/immuniza-tions/dental care, women and children's needs when in domestic violence shelters, care of disabled children from Mexico, low income women's access to reproductive health care, lack of access to sports physicals, need for bone marrow registries for ethnic minorities, importance of translators, and assessing health literacy in patient communication.

Arizona State University

Degree-Granting Programs

ASU's Department of Biomedical Informatics will offer the following degree-granting programs:

- Master of Science in Biomedical Informatics. The anticipated start date for this program is the fall of 2007.

- Doctor of Philosophy in Biomedical Informatics. The anticipated start date for this program is the fall of 2008.

- Joint Master of Science and joint Doctor of Philosophy degrees with the UA College of Medicine and the ASU College of Nursing. These joint programs will begin once the master's and doctoral programs are fully established.

- Undergraduate concentrations in biomedical informatics in conjunction with the Department of Computer Science and Engineering and the School of Computing and Informatics. The concentrations will begin in the fall of 2009 once the master's and doctoral programs are firmly established.

Non-Degree Programs

ASU's Department of Biomedical Informatics will offer the following non-degree programs:

- Instruction in biomedical informatics to medical students in the Phoenix Track of The University of Arizona College of Medicine. Instruction is scheduled to begin in the fall of 2007.

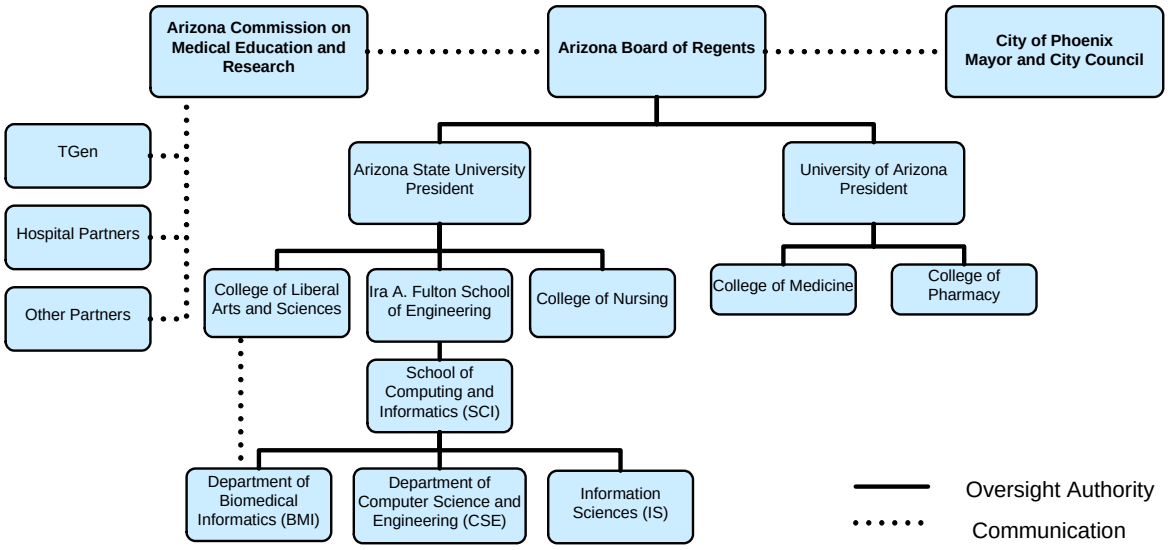
- Continuing medical and nursing education courses. The Department also anticipates offering a certificate program for local practitioners, and possibly some distance education courses. The certificate program will start once the master's and doctoral programs have been established.

6. **All partners involved in the Phoenix medical campus project, their roles, and an organizational chart**

Partners

The partners of the Arizona Board of Regents, The University of Arizona, and Arizona State University in the development of The University of Arizona College of Medicine-Phoenix are shown in Figure 5.

Figure 5. The University of Arizona College of Medicine-Phoenix Partnership Organizational Chart



Arizona Commission on Medical Education and Research

On October 19, 2004, Governor Napolitano issued Executive Order 2004-25, "Establishing the Arizona Commission on Medical Education and Research (ACMER)" *(please see Appendix C)*, appointing a statewide Commission to help guide establishment of the Phoenix Biomedical Campus. The Commission was charged to develop a plan to implement the principles enumerated in the MOU signed August 4, 2004, by then-Regents President Gary L. Stuart, UA President Peter Likins, and ASU President Michael Crow.

Members of the Commission include Governor Napolitano; Phoenix Mayor Phil Gordon; Gary L. Stuart, Arizona Board of Regents; Peter Likins, President, The University of Arizona; Michael Crow, President, Arizona State University; John Murphy, President and Chief Executive Officer, Flinn Foundation; Jeffrey Trent, President and Scientific Director, Translational Genomics Research Institute (TGen); Peter Fine, President and Chief Executive Officer, Banner Health; Linda Hunt, President, St. Joseph's Hospital and Medical Center; and James Kennedy,

Chief Executive Officer, Maricopa Integrated Health System. Senator Carolyn Allen and Representative Laura Knaperek are ad hoc members of the Commission.

ACMER engaged, with the financial support of the Flinn Foundation, Kurt Salmon Associates (KSA) as consultants, who helped create an inclusive process to plan The University of Arizona College of Medicine-Phoenix, including the creation of various task forces. *(The KSA report is provided as Appendix D.)*

The Task Force Steering Committee comprises the task force chairs and is itself chaired by UA Executive Vice-President and Provost George Davis. The ACMER task forces are:

- Academic
- Business/Community and Government Relations
- Clinical Care
- Finance, Administration, and Information Technology (IT)
- Phoenix Biomedical Campus Master Planning
- Resource Development
- Science and Technology

With few exceptions, each task force has at least one representative from each of the following constituencies: UA, ASU, TGen, City of Phoenix, the Governor's Office, St. Joseph's Hospital and Medical Center/Barrow Neurological Institute, Maricopa Medical Center, and the Arizona Board of Regents. These task forces were charged with oversight of the planning in their designated areas *(please see Appendix H*).

According to KSA, "The continued leadership of the Arizona Commission for Medical Education and Research (ACMER) and the Arizona Board of Regents (ABOR) will be necessary to ensure progress across the broad range of participants and constituencies involved in the Phoenix Program. This is likely to be the case for at least the initial years of implementation."

City of Phoenix Mayor and Council

In August 2004, the Arizona Board of Regents approved an agreement to expand the operations of the UA College of Medicine in Phoenix, in close collaboration with ASU. The City of Phoenix provided the land to establish the Phoenix Biomedical Campus, which in addition to the UA College of Medicine expansion, is the site of the internationally noted International Genomics Consortium (IGC) and Translational Genomics Research Institute (TGen), and the future site of the Arizona Biomedical Collaborative (ABC), with facilities to house researchers from the UA, ASU, and NAU. Future plans call for expansion of the nationally preeminent UA College of Pharmacy to the Phoenix Biomedical Campus and the relocation of the ASU College of Nursing to the nearby ASU at the downtown Phoenix campus. Further details of a City of Phoenix Intergovernmental

Agreement (IGA) with the Arizona Board of Regents are detailed in the response to request number 7.

Translational Genomics Research Institute

The major focus of TGen's mission in the next five years is to make and translate genomic discoveries into advances in human health. The ability to better diagnose, treat, and ultimately cure disease in the 21st century will depend on an improved understanding of the underlying genetics of disease and the ability and infrastructure to quickly translate this knowledge into diagnostics and therapeutics for patient benefit. Increased understanding resulting from the human genome project has profoundly shaped the way scientists now study and understand, and eventually will treat, disease. This increased understanding will shift clinical practice from treatment based on symptoms to treatment based on the underlying causes of diseases in individuals. Discovering differences and changes within the genome that translate into disease is a priority for TGen. To accomplish its mission, TGen has recruited cross-functional teams, including world-renowned engineers, geneticists, clinicians, biologists, and computational experts. TGen's scientists have an intense desire to move their research into the clinical setting, and TGen has given them the opportunity to impact disease in a manner that had not been available to them before. As a result, TGen's combined excellence in genomic analysis, bioinformatics, and cancer drug development will be an outstanding element of the PBC.

TGen has already engaged a clinical study to capture the molecular signatures and outcome information on cancer patients who have exhausted all standard therapeutic options. Tumor cells from these patients are being analyzed for cell markers (targets) and for gene expression profiles. The data will be used to determine if other treatment options are available, using existing drugs and technologies. This is an example of how data from molecular profiling can potentially benefit a patient. The growing partnerships between TGen and the UA in translational biomedical research will include the areas of molecular cancer imaging, molecular cancer therapeutics, and the genomics of cancer prevention. These research programs will be focused on improving the diagnosis and treatment for cancer.

Hospital Partners

Education

The presence for the last 13 years of a regional campus in Phoenix, with 30-40 percent of Tucson students conducting their clinical rotations in Phoenix, has established a firm base on which to build. The nine major teaching hospitals in Maricopa County, St. Joseph's Hospital & Medical Center, including Barrow Neurological Institute; Banner Good Samaritan Medical Center; Maricopa Integrated Health System; Phoenix Children's Hospital; Carl T. Hayden Veterans Affairs Hospital; Scottsdale Healthcare; Phoenix Baptist Hospital; and Mayo

Clinic, have been long-standing major teaching affiliates of The University of Arizona College of Medicine.

In addition, over 400 volunteer clinical faculty members currently teach the third- and fourth-year students and participate in curriculum development and evaluation, and student assessment and advising.

Graduate medical education

Current graduate medical education programs in Phoenix are sponsored by the nine area teaching hospitals. These residencies have no direct affiliation with the UA College of Medicine except through joint membership in the statewide Arizona Medical Education Consortium. With the growth of the UA College of Medicine-Phoenix, these associations may become even closer.

Research

Barrow Neurological Institute (BNI) is an internationally renowned medical center that offers care for people with brain and spine diseases, disorders, and injuries. Dr. Robert Spetzler, one of the world's leading neurosurgeons, is the director of the institute. BNI's mission is to improve patient care and advance neuroscience knowledge. To fulfill this mission, BNI focuses on excellence in patient care, medical education, and research.

BNI actively participates in ongoing clinical and basic neuroscience research to further the prevention and treatment of brain, nerve, and spinal cord diseases and injuries. Patients at BNI have the opportunity to participate in clinical research studies to receive the latest therapeutic treatment for a broad range of neurological disorders. The Neuroscience Research Center (NRC) is a world-class facility that features state-of-the-art technology and a highly specialized research staff who specialize in basic research in the areas of neuro-oncology, neurology, and neurosurgery. Outstanding neuroscientists from around the world are an essential part of BNI's research and teaching programs. Neuroscience laboratories include neuro-oncology, neurochemistry, neurogenetics, pain research, and epilepsy research.

UA and BNI have a history of interactions. Researchers with laboratories at BNI have joint appointments as UA faculty members. It is expected that this interaction will increase at the PBC. For example, Dr. Michael Berens is investigating the molecular mechanisms of glioblastoma multiforme invasion and metastasis in a lab at BNI, and has a joint appointment in the Department of Cell Biology and Anatomy at the UA and is a member of the Arizona Cancer Center. His post-doctoral fellows have been trained through the Cancer Biology Interdisciplinary Graduate Program at the UA in Tucson. Another example is Dr. Joe Heisermann, a neuroradiologist at BNI. Dr. Heisermann is a clinical Professor of Medicine at The University of Arizona and conducts his research regarding seizures and functional MRI at the BNI.

The participation of physician-scientists from BNI will be a significant resource for potential scholars and medical faculty conducting clinical research. Perhaps more importantly, BNI/St. Joseph's has developed a three-dimensional teaching system that allows students to define structures and their relationship to each other in ways that could never be accomplished with lectures or texts. The elegant dissection of the human head as a research project was photographed with special three-dimensional microscopes to develop this teaching tool. This will be available to our PBC students.

Banner HealthCare also has strong research connections. Banner is creating an Alzheimer's Disease Institute, Comprehensive Cancer Center, and Cross-Cutting Molecular Imaging Center as Centers of Excellence. They also have a strong interest in having these programs reach out to and support other institutions with shared interests. Banner has strengths in medical toxicology, the management of high-risk pregnancies, and, in collaboration with ASU, neurorehabilitation programs.

Banner plans to create a memory disorders center that will address both the medical and non-medical needs of patients and their families. This would leverage the Banner strengths in brain imaging and, through TGen, genomics to help find effective disease-slowing and disease-prevention therapies, and continue to foster the Arizona Alzheimer's Disease Consortium model.

The UA plan initially will concentrate on cancer, a world-recognized research strength and one where partnerships already exist among the UA, TGen, Scottsdale Healthcare, BNI/St. Joseph's, and Phoenix Children's Hospital.

Other Partners

Other current partners include the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and Northern Arizona University (NAU). As the PBC develops, along with the development of the biomedical industry in Phoenix, additional partners will undoubtedly emerge.

7. **The contributions and financing arrangements of all partners contributing to the capital plant, as well as the legal and financial relationships of the Arizona Board of Regents and its institutions to these partners**

COM 1, COM 2, COM 3 (former Phoenix Union High School buildings)

On February 5, 2004, meeting, the Arizona Board of Regents and the City of Phoenix executed an Intergovernmental Agreement (IGA) with the City of Phoenix under which ABOR would lease from the City and renovate the three historic Phoenix Union High School buildings, preliminarily designated as COM 1, COM 2, and COM 3, at the Phoenix Biomedical Campus *(please see Appendix L).* Under the IGA, The University of Arizona will lease the buildings, approximately 90,000 square feet, and related land, approximately 4.5 acres, from the City of Phoenix for 40 years for $1.00 per year per building.

The City offered The University of Arizona an opportunity to participate in its New Market Tax Credit Program, which could reduce construction costs by 25 percent by offering federal income tax credits to the developer. The universities themselves cannot use these tax credits because they are exempt from federal income tax. The UA solicited proposals from private developers to lease the three buildings from the University of Arizona, renovate them, and lease them back to the UA for 30 years for use for expansion of the UA College of Medicine in Phoenix. The University of Arizona selected DESCO Southwest from five bids, based on DESCO's experience with a similar project in St. Louis, Missouri, and their experience with New Market Tax Credits.

The University of Arizona is subleasing the property to DESCO Southwest for an identical $1.00 per year per building for 30 years. DESCO Southwest is renovating the three buildings to the university's specifications, at an estimated renovation cost of $19.2 million, less City of Phoenix New Market Tax Credits.

Upon completion of renovations, DESCO Southwest will lease the buildings back to the UA. The initial lease rate will not exceed $16.25 per square foot per year, with an inflation increase of 1.5 percent per year. The estimated annual lease payment of $1.46 million will be funded through transfer of annual lease payments of approximately $308,000 currently paid by the UA for its facility at Third Street and Indian School Road in Phoenix, and through General Fund appropriations. At the termination of the leases, the City of Phoenix will retain ownership of the buildings.

Arizona Biomedical Collaborative 1 (ABC 1)

As discussed earlier, The University of Arizona and Arizona State University are partnering in the construction of the Arizona Biomedical Collaborative 1 (ABC 1) building on the Phoenix Biomedical Campus. The building pad lease for ABC 1 is covered under the February 5, 2004, IGA with the City of Phoenix *(please see*

Appendix L). This lease will include an option to purchase the building pad at the end of the lease term. Lease payments, which will commence upon issuance of a certificate of occupancy for the building, will consist of installments of the purchase price as set forth in a rent schedule to be calculated based on an agreed-upon percentage of the fair market value of the building pad at the time of execution of the lease. At the end of the lease term, and upon payment of all obligations thereunder, the purchase price for the building pad will have been paid, and title will be conveyed to the Arizona Board of Regents or to an approved tenant as provided in the lease.

The four-story, $27.2 million ABC 1, scheduled for groundbreaking in November 2005 and completion in March 2007, will consist of flexibly designed wet- and dry-laboratory research space for medical school faculty recruited to lead the basic science effort. Debt service will be funded through General Fund support provided by HB 2529 University Research Infrastructure Bill (Laws 2003, Chapter 267). ABC 1 is scheduled for review by the Legislature's Joint Committee on Capital Review (JCCR) in October 2005.

Additional Facilities to Expand Class Size and to Reach Build-Out

As discussed earlier, additional facilities will be required to expand the Phoenix Program to a Level II class size of 64 in FY 2010, and to full build-out of 150 students per class in FY 2015. Partnerships for these facilities, along with all legal and financial arrangements, will be determined at future dates.

A master development site plan for the Phoenix Biomedical Campus is provided in Figure 6. Land use scenarios for the Campus are shown in Figure 7.

Figure 6. Master Development Site Plan for Phoenix Biomedical Campus

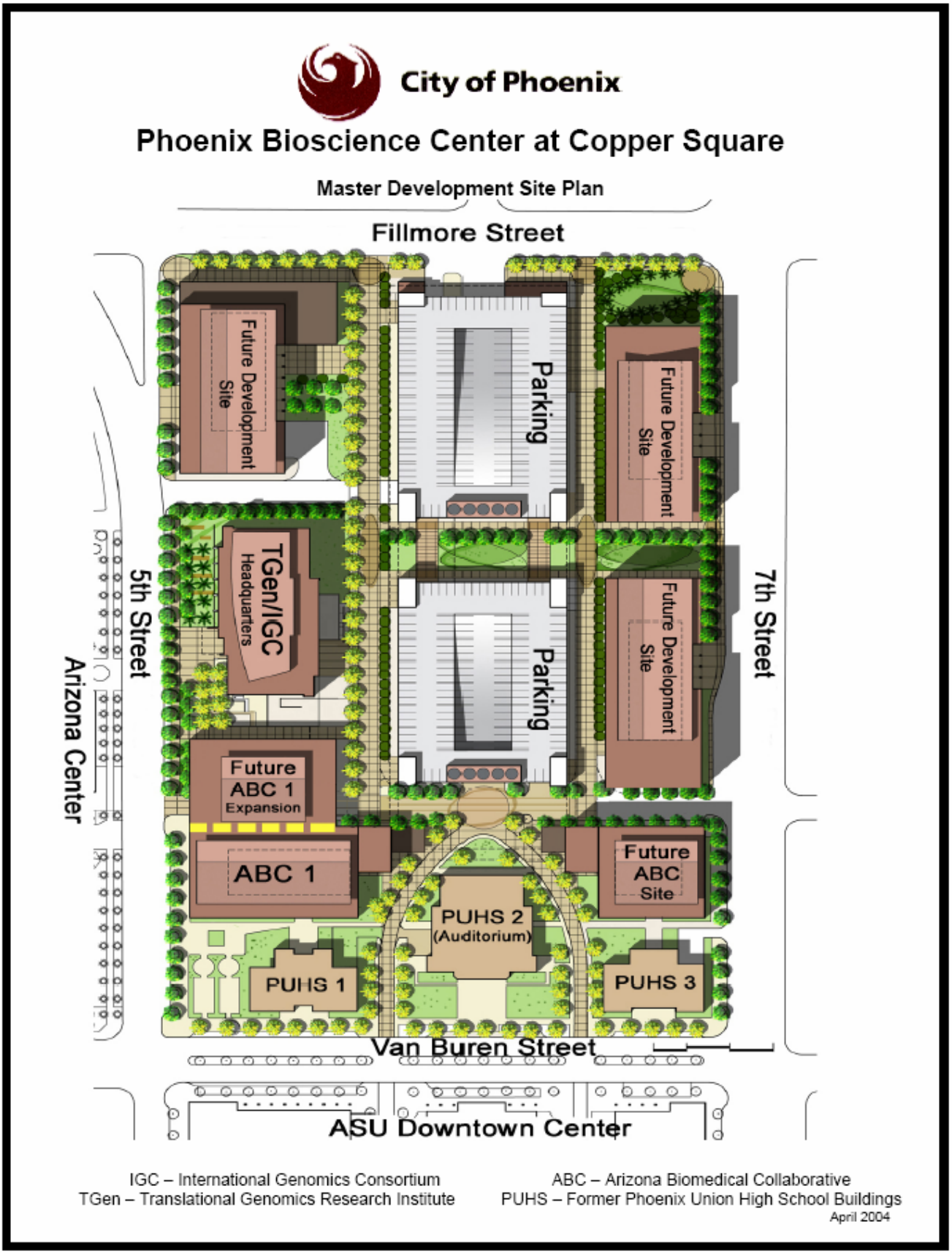
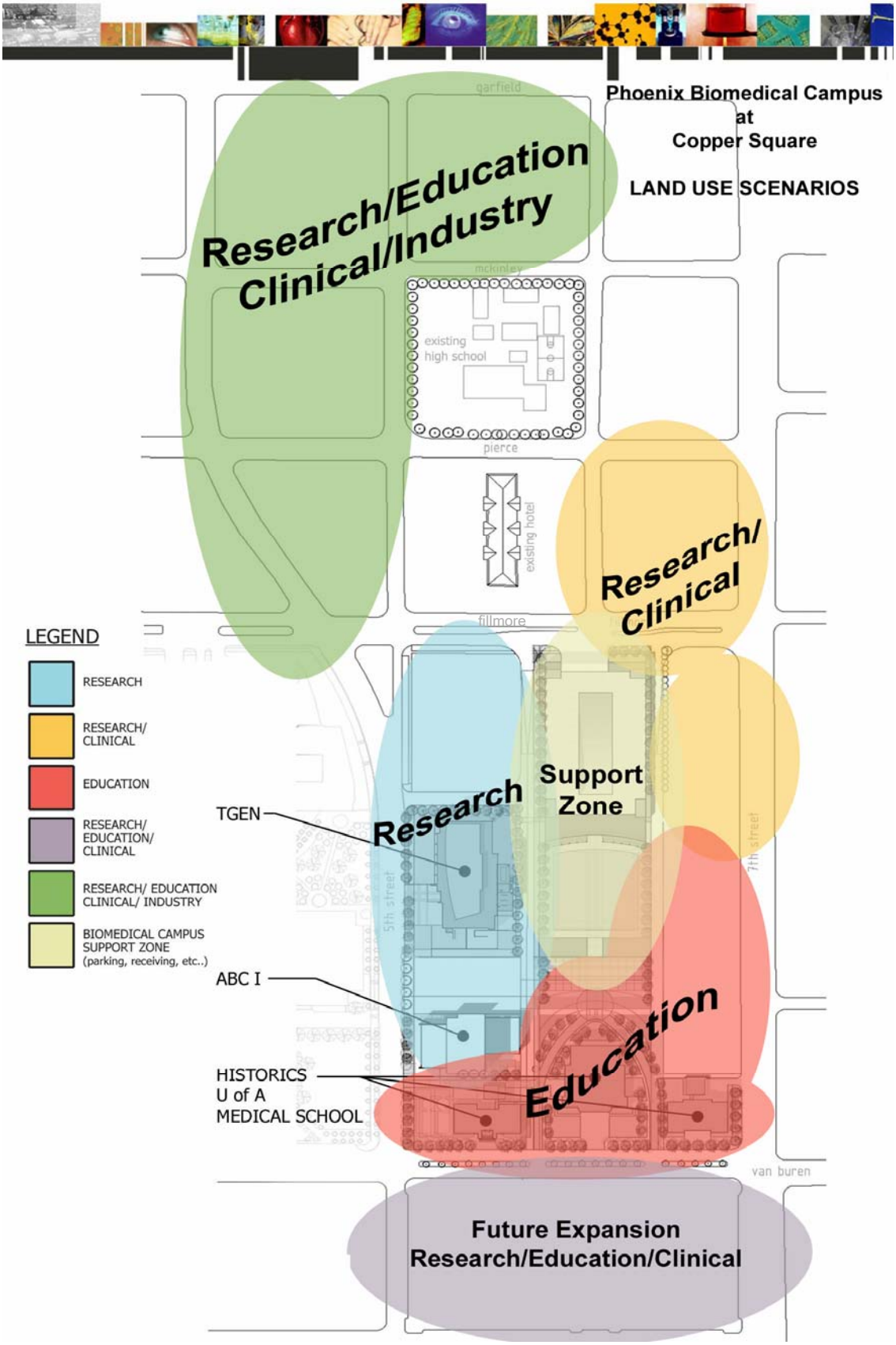


Figure 7. Land Use Scenarios for Phoenix Biomedical Campus



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The Arizona Physician Workforce Study

Part I: The Numbers of Practicing Physicians 1992-2004

2005

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Executive Summary

The health of Arizona's citizens depends on an adequate supply of physician services to meet their health care needs. The supply of physician services is determined by the number of practicing physicians, the mix of physician specialties, and by the productivity of physicians. This is the first of two reports on the supply of physician services in Arizona. This report describes the results of a comprehensive review of the current physician workforce in Arizona and of the trends in the number, specialty composition, and geographic distribution of the physicians. A subsequent report (Part II) combines the numbers of physicians with measures of productivity to estimate the supply of physician services.

The Arizona physician workforce increased by 50% from 8,026 physicians in active practice in 1994 to 12,024 in December 2004 (Table 1). The increase in the physician workforce outpaced the increase in the Arizona population during the same decade resulting in an increase in the physician to population ratio from 190/100,000 to 207/100,000. However, the physician to population ratio in Arizona is still far below the national average of 283/100,000 (Figure 6).

From 1992 to 2004, the physician workforce increased in every Arizona county. The rise in population exceeded population increases in 13 of the 15 counties. The rate of growth in physician to population ratios in some rural counties exceeded growth in urban counties but large geographic disparities in the distribution of physicians remain (Figure 7, 8). In 2004, approximately 86% of Arizona physicians practice in either Maricopa or Pima County, and the physician to population ratios range from a high of 276/100,000 in Pima County to a low of 48/100,000 in Apache County (Figure 7, 8).

Approximately 75% of Arizona physicians are in private practice and 41% are in primary care specialties (Table 3, 4). This percentage is higher than the national average of 38%. Since 1992 the number of primary care physicians, hospital-based physicians, and surgeons has increased. However, the number of physicians practicing in allergy, cardiovascular diseases, endocrinology, gastroenterology, hematology, and infectious disease has decreased.

Approximately 90% of Arizona's allopathic physicians graduated from medical schools outside the state (Figure 12). The addition of the Midwestern University Arizona College of Osteopathic Medicine (AZCOM) in 1995 and the planned expansion of the University of Arizona (UA)

College of Medicine will increase the numbers of physicians who are trained in-state.[1] If historical patterns continue, approximately 50% of these students can be expected to enter practice in Arizona. Even if retention rates increased, in-state graduates will remain a relatively small part of the workforce.

The effect of enrollment increases in medical schools on the supply of practicing physicians is also subject to a considerable time lag. In 2006 enrollment growth, for example, will not increase the supply of practicing physicians until these students complete their residency training five to 13 years later in 2011-2019 (Figure 12). The lag between medical school matriculation and completion of medical training is an especially important consideration for Arizona because of the state's rapid rate of population growth. Unless population growth slows, increases in medical school graduates from Arizona will always lag population increases.

The site of residency training is also a major influence on physicians' choice of a location for their practice. The duration of residency training ranges from three to eight years. During this time, residents have the opportunity to establish ties to the community and develop professional relationships, both of which are factors cited by newly licensed physicians as reasons why they chose to practice in Arizona.

Approximately 39% of the physicians who entered practice in Arizona in 2004 completed residency training in the state and approximately 30% of all physicians currently practicing in Arizona completed residency training in Arizona. The number of physicians in residency training in Arizona has only modestly increased from 1,010 in 1992 to 1,076 in 2004 (Table 6). Some of the programs that have closed include osteopathic and allopathic family medicine training programs, the Maricopa Anesthesia Program, and other small fellowship programs. However, these closures have been offset by the development of new programs, especially at Mayo Clinic Scottsdale, which has increased its residency training from two programs with eight residents in 1996 to 30 residency programs with 110 residents in 2004.

Residency training programs are expensive to maintain and some hospitals have been forced to close their residency training programs because of financial costs and/or failure to maintain

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[1] It was recently reported (June 3) that the A.T. Still University, a private osteopathic school based in Missouri, will open a four-year medical school in Mesa, AZ beginning fall 2007 (Snyder, 2005).

accreditation. Closure of these programs can have an adverse effect on the supply of physicians in the state.

The relatively small enrollments in the two medical schools in Arizona combined with the lack of growth in the number of residency slots in Arizona limits the number of practicing physicians that can be obtained from these two sources. In consequence, Arizona will continue its historical dependency on attracting practicing physicians and recent graduates of residency programs from other states and other countries. The current projections of nationwide shortages in physicians will, presumably, increase competition among the states for the pool of physicians. Arizona faces a more difficult problem than other states because its population is increasing more rapidly than nearly any other state in the U.S.

This report puts the question of the Arizona physician workforce in perspective by describing historical trends and discussing the influences that either attract or discourage physicians from practicing in Arizona.

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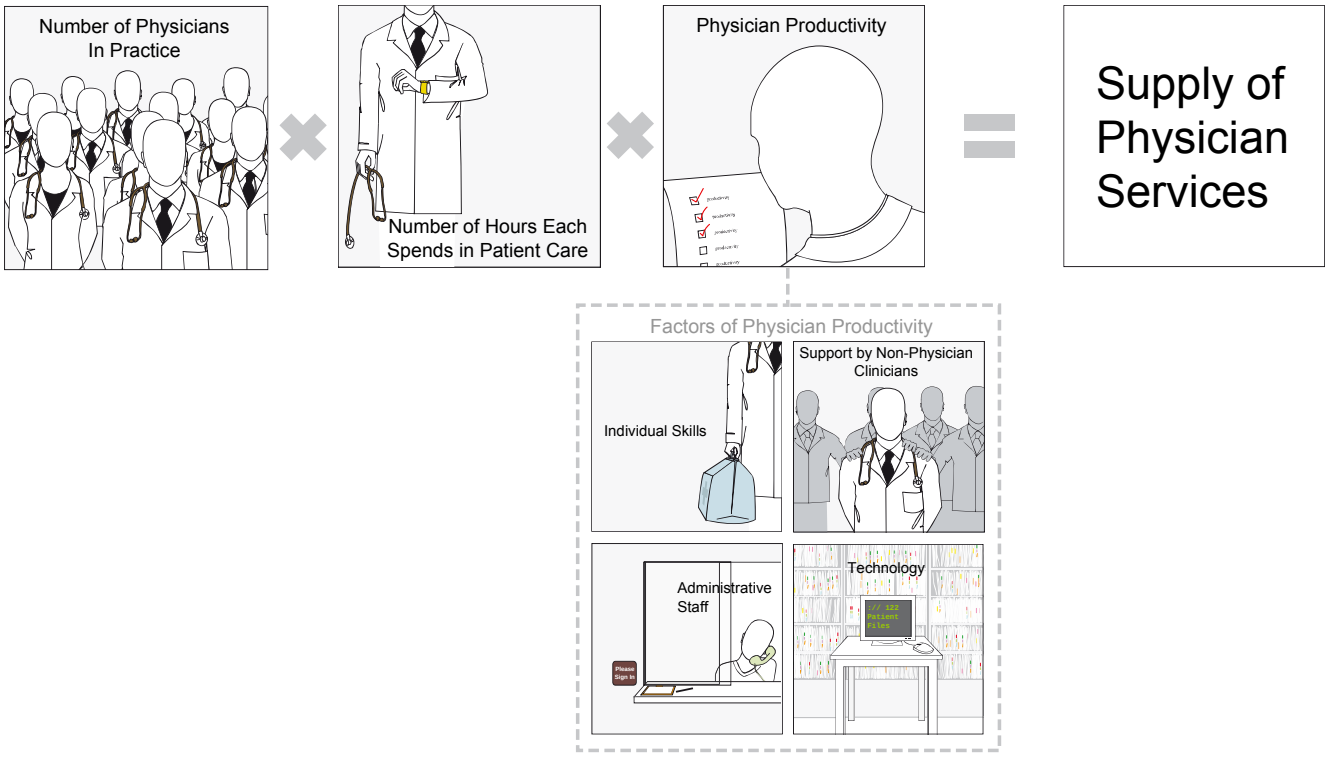
Introduction

Arizona citizens depend on an adequate supply of physician services to meet their health care needs. This report describes the current physician workforce and the trends in the number, specialty composition, and geographic distribution of physicians in Arizona. A subsequent report (Part II) combines the numbers of physicians with measures of productivity to estimate the supply of physician services.

The supply of physician services is the product of the number of physicians in practice, the number of hours each spends in patient care, and their productivity. The productivity of a physician is determined by individual skills, technology, and the level of support from non-physician clinicians, such as nurse practitioners and physician assistants, as well as administrative staff. The number of physicians in practice is only the first of several influences on the supply of physician services (Figure 1).

Figure 1. Influences on Supply of Physician Services



Ideally, the adequacy of the physician workforce should be measured by the quantity and type of physician services that are available to meet the health care needs of a population and by the effect of physician care on the health of the community. The difficulty of assessing the health

care needs, outcomes of physician care, and health status of communities have lead studies of the physician workforce to measure adequacy by comparing the ratio of number of physicians per 100,000 people in a locale to national averages (Feillet *et al.*, 1993; Schwartz *et al*., 1980; Seifer *et al.*, 1995; A. M. Singer, 1989; Whitcomb, 1995).

National mean physician to population ratios do not account for differences among states in the mix of physician specialties, the quality and productivity of their physicians, or population characteristics, such as age and ethnicity that affect the population's health care needs. In Arizona, for example, racial/ethnic minorities represent a higher percentage of the population than the total U.S. population (e.g., 37.3% of the Arizona population versus only 30.9% of the U.S. population in 2002). In addition, a higher proportion of the minority populations in Arizona are Hispanic or Native American and a lower proportion are African-American than in the U.S.

Physician to population ratios are, however, useful as measures of changes in the supply of physicians relative to changes in the size of a population. The relationship between changes in supply and changes in population is especially important in Arizona because of its unusually high rate of population growth. Physician to population ratios are also useful to compare previous reports on physician supply in Arizona. This report, recognizing the limitations of physician to population ratios, describes the number of physicians practicing medicine and the physician to population ratios in Arizona in 2004. These ratios are compared with previous studies on physician workforce conducted from 1992-1997. The descriptive results on physician supply are supplemented by data on the (1) mix of primary care and specialty practices; (2) information on the process by which physicians enter practice in Arizona; (3) changes over time in practice patterns; (4) some data on compensation and medical liability premiums; and (5) results of a survey of physicians entering practice in Arizona.

Our results on physician workforce are based on current and past licensing data from the Arizona Medical Board (AMB) and the Arizona Osteopathic Board (AOB) and survey questions that we include as part of the licensing applications submitted by physicians. Historical trends are obtained from past studies which also were based on the AMB and the AOB licensing data and surveys conducted under the auspices of the Flinn Foundation by the predecessor of the Health and Disability Research Group (HDRG) from 1992-1997 (W. G. Johnson, 1997; W. G. Johnson et al., 1992). Data on physician compensation are obtained from the Medical Group Management Association (MGMA), a nationally known organization whose members comprise

of large medical group practices as well as most medium and small practices; and, the Mutual Insurance Company of Arizona (MICA), a medical malpractice carrier for Arizona, Colorado, and Utah, provided data on medical liability (malpractice) insurance premiums in Arizona. Information on medical liability insurance premiums in other states was obtained from a variety of sources.

The current surveys, described in detail later in this report, are the Practicing Physicians Survey (PPS), which monitors the number of physicians renewing their licenses; the New Physicians Survey (NPS) which tracks the number of physicians applying for an Arizona license for the first time; and the Graduating Residency Survey (GRS) which surveys the resident physicians who complete their residency training in 2005.

The survey questions for renewal licenses (PPS) collect information that is needed to measure physician productivity (e.g., clinical work hours, patient panel) and practice patterns (e.g., time spent in non-clinical care). The NPS provides information on motivations for practicing in Arizona; and, the GRS provides information on factors influencing graduating residents' choice of practice location.

The Physician Workforce in the United States: Surplus or Shortage?

In 1980, the Graduate Medical Education National Advisory Committee (GMENAC) estimated that the U.S. would have a surplus of 145,000 physicians by the year 2000. The GMENAC report recommended limiting U.S. medical school enrollments and the immigration of international medical school graduates (Graduate Medical Education National Advisory Committee, 1980). The U.S. Congress responded to the GMENAC report by discontinuing federal subsidies for students in U.S medical schools. The 1983 Medicare hospital-reimbursement reform inadvertently provided a strong incentive for teaching hospitals to increase the numbers of foreign medical school graduates in the U.S. by increasing funding for teaching hospitals. Because the number of U.S. medical school graduates was limited due to decreased funding, teaching hospitals that wished to take advantage of this increased Medicare funding recruited graduates of foreign medical schools to fill their expanded number of residency positions.

While the U.S. population increased by 24%, the number of graduates from U.S. medical schools increased by only 11% from 1980 to 2000. There were 16,172 graduates in 1980

compared to 17,953 in 2000. Thus, the number of U.S. medical school graduates per 100,000 people decreased from 7.1 in 1980 to 6.4 in 2000. An increasing proportion of the physician workforce in the U.S. is composed of foreign medical school graduates. The number of foreign medical school graduates practicing in the U.S. increased from 94,995 in 1980 to 178,048 in 2000. Most of the foreign medical graduates trained in U.S. teaching hospitals (Blumenthal, 2004).

In 1986, the U.S. Congress created the Council on Graduate Medical Education (COGME) to advise the federal government on workforce issues. The COGME is mandated with the responsibility of assessing trends, medical training, and financing policies as well as advising and making policy recommendations to federal agencies and the private sector about physician workforce developments and needs. The COGME predicted a surplus of 80,000 physicians by the year 2000. The COGME also predicted that this surplus would be in specialty physicians whereas the number of primary care physicians would be adequate to meet the needs of the U.S. population (Blumenthal, 2004).

In 1994, Weiner predicted a surplus of 165,000 physicians by 2000 based on a belief that increased use of managed care would decrease the need for physicians (Weiner, 1994). These projections were, however, based on the assumption that physician staffing patterns used by managed care groups at the time of Weiner's study would become the norm for all U.S. health care. The assumption proved to be incorrect.

From 1991 to 2001, the physician workforce in the U.S. grew by 26% (from 541,000 to about 681,000 physicians) or approximately twice the rate of total population growth. The physician to population ratio in the U.S. increased to 283/100,000 by 2004 with physician to population ratios higher in metropolitan areas (Health Resources and Services Administration, 2005). In 1991, there were 242 physicians per 100,000 people in metropolitan areas compared to 99/100,000 in non-metropolitan areas. By 2001, the physician to population ratio in the U.S. had increased to 267 in metropolitan areas and 122 in non-metropolitan areas (US General Accounting Office, 2003).

Despite the growth in the physician workforce, the projected surpluses have not materialized, and the majority of experts predict that there will be a shortage of physicians over the next 15 years. Cooper, for example, predicts a 200,000 shortfall in the number of physicians by 2020

because of economic expansion. He argues that economic expansion (e.g., increase in per capita income and gross domestic product) leads to increases in health care spending which then lead to increases in the health care labor force, including the supply of physicians. Cooper's estimate has been criticized because it does not provide a criterion for the number of doctors needed to optimize the health and well-being of the U.S. population.

Cooper suggests that increases in health care expenditures are an outcome of income increases that are associated with economic expansion. The model adopts the principle of economic models of consumption in which increases in income, all else equal, increase the demand for most goods and services. His predictions assume that the U.S. economy will grow at an average annual real (inflation adjusted) rate of two percent, which is the historical average rate of growth in the U.S. (Cooper, 2004).

The 16th Health Resources and Services Administration (HRSA)/COGME report on the state of the nation's physician workforce was released in January 2005. The COGME now predicts that the nation will face a shortage if the population uses medical services in the future as it has in the past, and if physicians practice in the future as they have in the past (Health Resources and Services Administration, 2005). In their 2005 report, COGME predicts that the physician per 100,000 people ratio will increase from 283 in 2000 to 301 in 2015, but this increase will not be sufficient to meet the demand for services. They predict that the demand for physician services will increase due to population growth, aging of the population, and changes in the "age-specific" per capita physician utilization rates with those over 45 years using more services and the population under 45 years using fewer services. The report predicts a shortage of physicians in the U.S. by the year 2020. Two estimates were given concerning the size of the 2020 physician shortfall: (1) a demand based estimate suggested a physician shortage of about 85,000 full-time equivalent (FTE) physicians, and (2) a medical needs based estimate predicted that supply will be short by about 96,000 FTE physicians.

In summary, there has been continued debate about the physician workforce over the past 25 years. Predictions of a surplus of physicians by the year 2000 were incorrect and experts now predict that there is a shortage of physicians in the U.S. Our analysis focuses on Arizona, but the analysis requires the same types of models and methods that one would use to make national projections. The next section describes the conceptual model that serves as the foundation for our empirical analysis.

A Model of the Supply of Physicians

In addition to the absolute numbers of physicians, assessing the supply of physician services also requires an assessment of physician productivity. Physician productivity, all else equal, is increased by the number of other professionals with whom a physician works, such as non-practicing clinicians. Physician productivity in terms of services to patients is also reduced by the amount of time a physician spends performing administrative work.

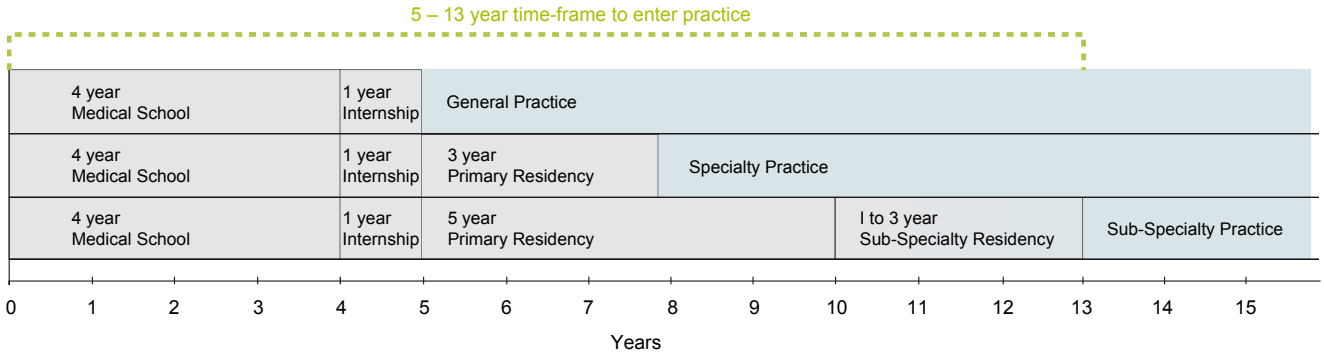
The analysis of the characteristics that affect physician productivity is reserved for a subsequent report. The analysis that is presented here begins with a simple model of the dynamics of the numbers of physicians practicing in a state in a year. The analysis is extended to consider the characteristics that influence physicians' decisions to practice in Arizona or alternatively to practice in other states.

In summary, the number of physicians practicing in a state is determined by the number of new entrants (residency program graduates) and those established physicians who chose to relocate from other states. Changes in medical school enrollment, number of medical schools, number of residency positions, and national immigration policy affect the national supply of physicians. These same factors will affect the supply of physicians in Arizona, but the Arizona supply will also be influenced by the number of Arizona residents who enter medical school, medical school enrollment in the state, residency positions in the state, and attractiveness of the state to established physicians who are considering relocation.

Entrants

The number of physicians in practice at any point in time is the outcome of a process that begins with medical school matriculation. However, because of the long duration of medical training, there is a five to 13 year lag time between the start of medical school training and entering practice (Figure 2). Someone who begins medical school in 2005 and chooses to become an obstetrician will, for example, begin clinical practice in 2013.

Figure 2. A Timeline of the Supply of Physicians



Approximately 93% of medical students will receive a medical degree four years after matriculation. However, there are only 123 allopathic and osteopathic medical schools in the U.S. These do not provide enough medical school positions for U.S. citizens who wish to become doctors. Approximately 1,400 U.S. citizens graduated from medical school outside of the U.S. and entered residency training in the U.S. in 2003.

After completion of medical school, graduates begin residency training in a medical specialty at a teaching hospital. The size of most residency training programs is limited by the Accreditation Council on Graduate Medical Education (ACGME) residency review committee for each specialty. Other factors that influence the number and types of residency programs include the state and federal funding available to support the programs, access to faculty, and the availability of patients which are the necessary “teaching material” for residents.

There are many factors influencing medical school graduates choice of specialty including the number, length, and rigor of the training programs work load (e.g., nights on call), as well as the educational quality of the available programs. Choice of specialty is also influenced by the future income potential and life style of practicing physicians (e.g., irregular work hours, night call) in each specialty. For example, the annual net income of practicing physicians in pediatrics, family medicine, and psychiatry is far less than the income of physicians practicing orthopedics, cardiology, or emergency medicine. Physicians who choose to practice pediatrics, obstetrics, surgery, and internal medicine also can expect to have irregular work schedules and night call responsibilities whereas physicians who choose to practice dermatology, emergency medicine, and pathology are more likely to work less hours per week and have limited night call. These factors will influence the graduating medical students’ choice of residency and thus the availability of specialists in different medical fields.

Currently, some residency programs in specialties with low potential income and heavy workloads, such as family medicine, have difficulty filling all available residency positions. In contrast, some specialties have many more applicants than they can accommodate because of the popularity of the specialty and/or the limited numbers of residency positions. For example, in 2005, there were only 39 neurosurgery and 28 dermatology positions available in the U.S.[2]

The ability to fill residency positions with U.S. medical graduates is a good indicator of the popularity of the specialty. For example, only 40% of the family practice positions were filled with U.S. graduates in 2005. This is the eighth consecutive year in which the number of U.S. seniors from allopathic medical schools entering family practice residencies has declined. In contrast, 74% of pediatric positions and 67% of obstetric positions were filled with U.S. graduates. The specialties in which over 80% of positions were filled with U.S. allopathic medical school graduates included emergency medicine, general surgery, and orthopedic surgery.

In addition to U.S. citizens who receive their medical training outside the U.S., other graduates of foreign medical schools who are not U.S. citizens also may come to the U.S. for residency training if they are able to obtain a visa. However, the number of foreign-born medical school graduates who can train in the U.S. is limited by U.S. immigration policy. They often are required to return to their home country after completing their training.

After completion of a residency, additional training is required if a physician wishes to practice in a medical or pediatric subspecialty such as cardiology, gastroenterology, pulmonary medicine, or in most surgical specialties (e.g., pediatric surgery) (Figure 3).

In summary, the number of entrants into practice in any year is determined by the capacity of U.S. medical schools from five to 13 years in the past, the number of positions available in residencies and fellowships, U.S. immigration policies towards foreign medical school graduates, and, for any given specialty, the ability to fill the residency slots in previous years. All these influences interact to make it extremely difficult to adjust the supply of new physicians to meet the expected challenges of physician shortages. The failure to adequately predict the

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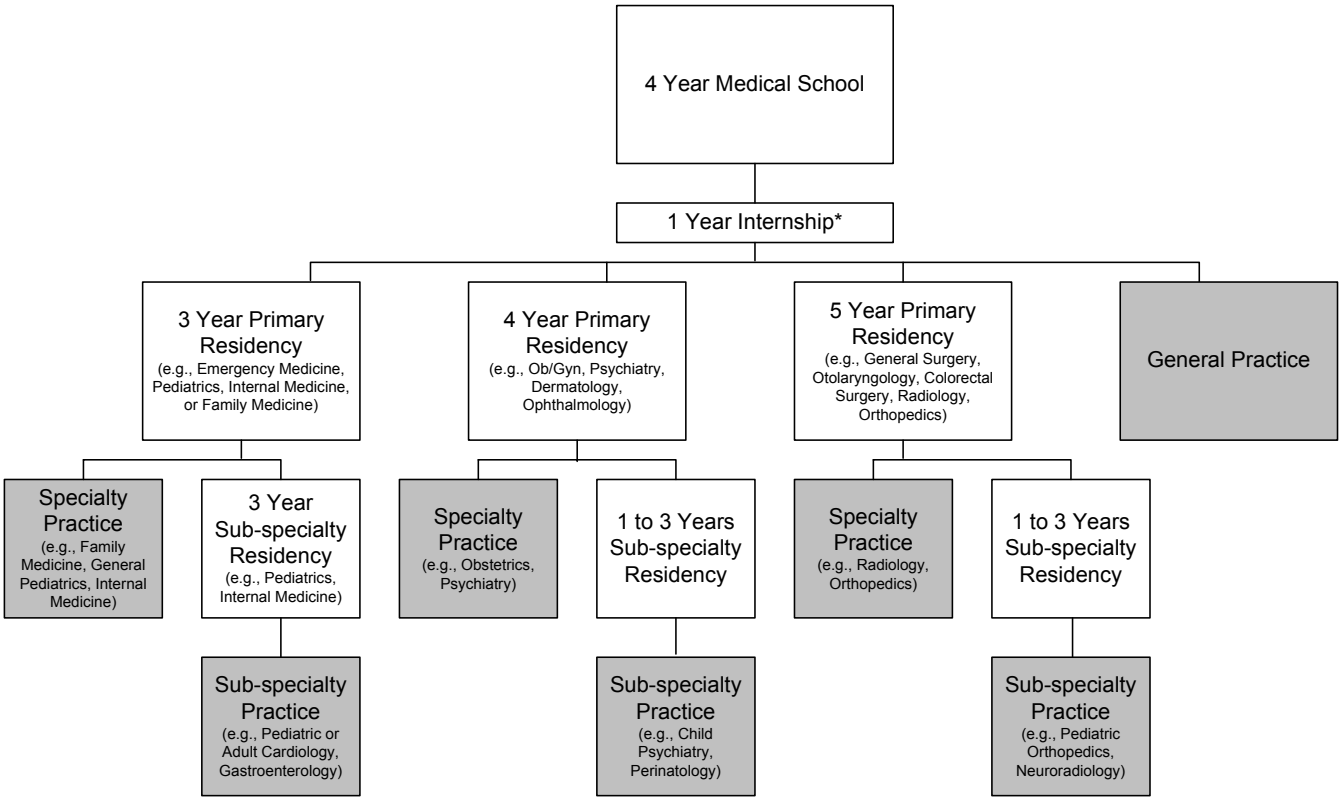
[2] To obtain detailed information regarding the current numbers of residents in training and specialty residency training programs please consult the National Residency Matching Program (NRMP) website at www.nrmp.org. The NRMP is a private not-for-profit organization that tries to match residents with appropriate training programs.

shortages has made the problem more difficult by delaying the attempts to expand the supply of physicians.

Figure 3. A Model of the Supply of New Physicians



*Internship may be done as part of primary residency

Departures

The number of physicians in the workforce is decreased by physician separation from practice due to death, retirement, or career change. Some studies report that retirement rates for physicians are similar across all specialties but others show that surgeons, internists, and family physicians are likely to retire sooner than other physicians (Reschovsky et al., 2005). Although data from the American Medical Association (AMA) Masterfile suggests that physicians are retiring earlier than their predecessors and other studies find that the retirement age of physicians has not changed (Konrad & Sheps, 2005).

A study of over 16,000 physicians conducted by the Center for Studying Health System Change, compared career satisfaction, professional autonomy, practice environment, and personal characteristics of physicians who retired during the study period (1996-1999) to those who did not retire. Factors associated with earlier retirement included age, working in large organizations

(e.g., health center), and having low career satisfaction. Physicians who owned their own practice had a lower income and had good relationships with office staff and were less likely to leave medicine than others (Reschovsky et al., 2005). Practice autonomy (e.g., ability to make your own clinical decisions, obtain services for your patients) and managed care penetration did not seem to influence retirement age. Higher income was associated with earlier retirement. In fact, physicians in the highest income quartile retired 4.4 years earlier than those in the lowest quartile (Reschovsky et al., 2005).

The Demand for Physician Services

The demand for health care is influenced by many factors, including public demand for the use of new technology, a public desire to have life-sustaining and life-enhancing care, and consumer responses to direct advertising of drugs and other remedies. The demand for health care is also affected by the economic status and insurance rates since patients must have sufficient income to pay for services. Thus, the demand for physician services will, all else equal, increase if more Americans have health insurance. Experts estimate that we would need to increase the physician workforce by 95% if the 45 million uninsured Americans had health insurance due to changes in national health policy (Health Resources and Services Administration, 2005). This assumes that the currently uninsured utilize health care in a similar manner as the currently insured U.S. population. Recent trends in health insurance coverage suggest that insurance coverage is decreasing rather than expanding, making it difficult to predict the future.

The rapid aging of the population is one of the most important influences on the demand for health care. Although subject to dispute, the effect of population growth on the demand of health care may be compounded by the increase of diseases related to life style, such as obesity.

A new approach to health and rehabilitation will be needed to deal with the effects of the aging population during the next 20 years. At each point in their life cycle, the baby boomers revolutionized the institutions that were part of their common experience: first in primary and secondary schools and then in colleges and universities. Although the impact was predictable, preparations were incomplete. Baby boomers will substantially increase the demand for health care and increase the number of persons with disabilities but efforts to deal with these situations are equally incomplete.

The incidence of illnesses increases in each subsequent year after people reach the age of 50. The baby boomers' journey through the life cycle will create one of the oldest work forces in contemporary history and a subsequent expansion of the retired population. The number of persons with disabilities will also increase to a historic high. The aging of the baby boomers will add approximately 535,000 persons per year to the population of disabled persons for the next 15 years. Nearly 27 million Americans age 50 through 69 will be disabled in 2020 or slightly less than twice the number in 1997 (W.G. Johnson *et al.*, 2004).

Much attention has been devoted to the effects of aging on the baby boomer generation as they enter the 65 years old or older age group. A recent report to the Social Security Administration finds that health care utilization will also increase substantially among members of the baby boomer generation under the age 65 (W. G. Johnson & Johnson, 2005). The report projects that the number of people with disabilities under age 65 will increase by 1.0% annually, for an overall increase of nearly 30% over 25 years (2000-2025). Total health care expenditures and Medicare expenditures for the under 65 age group will increase by 1.3% annually, for an overall increase of 37%. Seventy percent of persons with disabilities in 2025 will not qualify for Social Security Disability Insurance (SSDI) or Medicare benefits, and over 75% of the health care expenditures will be consumed by these persons.

The persons most at-risk for the lack of planning regarding the needs of the older baby boomers are persons with disabilities who are not eligible for SSDI or Medicare. The at-risk group is primarily composed of women with work histories either too short or too far in the past to allow them to qualify for SSDI but with assets that make them ineligible for Medicaid (W. G. Johnson & Johnson, 2005).

Predicting the effects of the aging on baby boomers on the demand for physician services in Arizona is complicated because a substantial number of older persons live in Arizona only during the winter. These numbers will presumably grow with the increase in the older population. Many winter residents are citizens of Canada who are not likely to be counted by U.S. population surveys. It is likely, therefore, that the seasonal residents are not reflected by the physician to population ratios that we report.

Our subsequent analysis (Part II) may include some estimates of the effects of baby boom generation residents and winter residents on the utilization of health care from the Arizona

HealthQuery (AZHQ) community health data system. The AZHQ is a patient level data base that records health care encounters for a large part of the state (described in detail in a subsequent section of this report).

In summary, the demand for physician services is affected by the economy, availability of affordable health insurance, new technology, and health status of a population. As Arizona's economy grows and increasing numbers of Arizonans can afford more health care, it is likely that the demand for physicians will increase. Even if economic growth were to slow the increased numbers of elderly residents as well as the annual in-migration of seasonal residents (snowbirds) will increase the demand for physicians. New technologies in health care can decrease health care utilization for the treatment of current conditions by increasing physician productivity, but the reductions may be offset by increasing demand for care as new technologies make it possible to diagnose and treat more diseases than in the past.

Some potential changes that could decrease the demand for physicians, all else equal, include increasing numbers of non-practicing clinicians, decreased utilization of ineffective health care services, and improved health status due to changes in personal lifestyles (e.g., diet, exercise).

An understanding of the probable future of the physician workforce and its relationship to health and health care requires an understanding of the current situation and the nature of the process by which it evolved. The next section describes the Arizona physician workforce in the year 2004 and the dynamic changes that lead to the current situation.

Studies of the Physician Workforce in Arizona

The reports of expected shortages of physicians in the U.S. are echoed for Arizona by a series of similar reports that have been published over the last 14 years. Next, we consider the problem in terms of the state of Arizona.

"Arizona Physicians Today and Tomorrow" (1989)

The first report on the supply of physicians in Arizona was published in 1989. The report, "Arizona Physicians Today and Tomorrow," estimated the number of physicians needed in Arizona by 2000 (Flinn Foundation, 1989). The estimates combined population projections from

the Arizona Department of Economic Security (DES)[3] with targeted physician to population ratios. Two alternative criteria were used to make the projections. The first criterion was the Bureau of Health Professions' (BHP) ratio of 231 physicians per 100,000 people. The second criterion was the recommendation of the GMENAC that 195 physicians are required for each 100,000 people.

The two ratios, applied to the DES estimate (1989) of an Arizona population of 4.7 million in 2000, projected needs for 10,800 (BHP) and 9,100 (GMENAC) physicians, respectively. The application of the BHP ratio (231) produced an estimate that 8,300 urban physicians would be needed in 2000. Using the GMENAC criterion (195) and an estimated urban population of 3.6 million, the report predicted that 7,000 physicians would be needed in the urban areas in 2000. If the trends between 1987-1992 had continued, approximately 9,700 physicians in Arizona would have been in practice in urban areas in 2000 and that number would have increased to 15,500 by 2010.

The report also applied the BHP and GMENAC ratios to the DES rural population projection, producing a projected need between 2,500 and 2,100 physicians in rural areas by the year 2000. However, if the 1987-1992 trends had continued an estimated 1,000 physicians would have practiced in rural Arizona in the year 2000 (Figure 4). Thus, although the projected number of physicians in practice in Arizona met or exceeded the projected total needs, the report predicted a shortage of between 1,200 and 1,600 physicians practicing in rural areas and a surplus of physicians practicing in urban areas.

Arizona State University/Arizona Council for Graduate Medical Education Reports (1992-1997)

A series of seven reports on physician supply and graduate medical education in Arizona was published between 1992 and 1997 (Lewis *et al.*, 1992). These reports were based on survey data and licensing data collected as part of the process of licensing physicians. The data were collected by the Arizona State University (ASU) School of Health Management and Policy (SHMP) under the auspices of the Arizona Council for Graduate Medical Education (AzCGME)

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[3] DES estimate from: *Arizona Business,* February 1992.

and sponsored by the Flinn Foundation. The studies showed that the growth in the number of Arizona physicians kept pace with population growth, but there were disparities in the distribution of physicians between rural and urban areas such that there would be a shortage of 1,400 physicians outside of Maricopa and Pima counties by 2000 relative to the levels suggested by GMENAC or BHP (W. G. Johnson et al., 1992). The 1996 report also predicted that the number of specialty physicians would decrease in future years (W. G. Johnson, 1997).

Goldwater Institute Report (2001)

In 2001, the Goldwater Institute published a report on the Arizona physician workforce. The report used 2000 data from the Arizona Board of Medical Examiners which licenses allopathic physicians. The authors made several adjustments to the data to distinguish physicians who provide direct care from physicians who were licensed but retired or employed in administrative positions. The adjusted physician to population ratios were then compared to the ratios that had been published in the 1990s by Johnson et al. (1992). The report concluded that the ratio of physicians to 100,000 people had declined from 198 in 1990 to 185 in 2000. Furthermore, they calculated that the actual number of practicing physicians in 2000 was even lower because 6% (513) of the physicians listed were retired and 1% (120) of the physicians were in administrative practice. They reported that the "adjusted" number of practicing physicians per 100,000 people ratio in 2000 was only 172. However, the Goldwater Institute report data do not include osteopathic physicians, and thus cannot be directly compared with the AzCGME reports which included both osteopathic and allopathic physicians.

The report concluded that "Arizona has a shortage of physicians, a situation that will worsen unless government policies and regulation that caused the shortage are revised or rescinded" (J. A. Singer & Cantoni, 2001). The relatively high penetration of managed care into the health care market in Arizona was cited as another reason for the shortage of physicians. However, no data were offered to show that the physician supply in states with relative low market penetration by managed care was higher than Arizona; nor was any financial data supplied to support the contention that the compensation of Arizona physicians is less than that of physicians in other states. The assertion that government regulation was one cause of the "shortage" was supported by claiming that the effect of EMTALA regulation lead physicians to abandon practice in Arizona.

Information on the compensation of Arizona physicians and premiums for medical liability is presented later in this report.

U.S. General Accounting Office Report (2001)

The U.S. General Accounting Office (GAO) reported that the number of physicians in the U.S. increased by 26% from 1991-2001, twice that of the national population during the same period. The physician to population ratio for Arizona metropolitan areas in 1991-2001 decreased from 214/100,000 in 1991 to 207/100,000 in 2001. Although the ratio in non-metropolitan areas of Arizona increased from 90 to 111, the 2001 ratio is higher than the expected ratio based on the Goldwater Institute report. The two reports agree, however, that the ratios in the early 2000s were lower than in the early 1990s in metropolitan areas of the state.

A decrease in the physician to population ratio in an area of population growth may be due to either a decrease in the physician workforce or an increase in the physician workforce that is less than the growth rate of the population. The GAO reported that 17 U.S. metropolitan areas experienced declines in the physician to population ratio from 1991-2001. Three of the communities were in Arizona (Phoenix-Mesa, Tucson, and Yuma). There were large population increases in all three communities from 1991-2001. The physician workforce increased in all these communities, but the rate of increase was less than the rate of population growth.

The GAO report was based on the AMA Physician Masterfile and the American Osteopathic Association (AOA) Physician Masterfile and included non-federal physicians, with known Arizona addresses, who stated they provided patient care services. These masterfiles are widely used in studies of physician supply (GAO). The AMA Physician Masterfile record is established when individuals enter medical schools accredited by the Liaison Committee on Medical Education (LCME) or, in the case of international medical graduates, upon entry into ACGME-accredited programs; and, the AMA data are likely to be less accurate than the ASU/AzCGME data because some of the AMA Physician Masterfile data are obtained from surveys rather than licensing data. Therefore, because these studies were suspended in 1997, there are no data available that can be directly compared with the 2001 GAO report.

Summary

In 1987, the first of a series of reports on the Arizona physician workforce was completed. At the time of the first report, 3.5 million people lived in Arizona and 6,400 physicians were in active practice for a physician to 100,000 people ratio of 187 (Table 1). Three years later, the population had grown to 3.7 million and the physician population had increased to 7,315, increasing the physician to population ratio to 197 (Table 1). From 1990 to 1996 the Arizona population increased dramatically and the number of physicians increased as well.

Unfortunately, the Arizona physician workforce studies were discontinued in 1997, and it is difficult to establish comparability between the workforce studies and studies of the physician workforce by HRSA and the Goldwater Institute. The HRSA reported in 1998 that the number of active physicians in Arizona was 8,301 and the physician to 100,000 people ratio was 176 (Table 1). In 2000, the Goldwater Institute reported that the physician to population ratio had further decreased to 172/100,000 (Table 1). In reviewing their methodology, however, their report failed to include osteopathic physicians which would lead to an underestimate in the number of practicing physicians in the state. If, as seems likely, there were approximately 1,000 DOs in active practice in 2000 and they had been included in the Goldwater Institute report, the physician to population ratio would have been 200/100,000.

Table 1 summarizes the available historical data on the Arizona physician workforce from 1987 to 2004. Unfortunately, data are not available for many of the years because this information was not retained by the licensing agencies (AMBs). From 1990 to 1997, data are available from the Survey of Arizona Physicians sponsored by the Flinn Foundation and from the licensing data acquired and retained by ASU as part of that study.

Table 1. Comparison between the Numbers of Arizona Physicians to Population 1987-2004

Year	*Active MD's*	*Active DO's*	*Active Physicians (000's)**	*Population (000,000's)*	*Physicians Per 100,000 People**
1987	--	--	6.4	3.4	187
1990	6,617	698	7.3	3.7	197
1992	6,923	758	7.7	3.9	197
1993	--	--	7.9	4.0	--
1994	7,193	833	8.0	4.2	190
1995	7,814	--	--	4.4	--
1996	8,047	--	--	4.6	--
1997	8,421	--	--	4.7	--
1998	8,301 (HRSA)	--	8.2 (HRSA)	4.9	176 (HRSA)
1999	8,428	--	--	5.0	--
2000	--	--	8.8 (GW)	5.1	172 (GW)
2001	--	--	--	5.3	--
2002	8,976	--	--	5.4	--
2003	9,228	--	--	5.6	--
2004	10,787	1,237	12.0	5.8	207

Sources: Population estimates acquired from the Arizona Department of Economic Security, US Census. Active Physicians estimates acquired from the 1990 Arizona's Physician Supply, 1992, 1995, 1996, 1997; MBD, 2004; Survey of Arizona Physicians (SAP); Health Resources Administration (HRSA), 2004; and the Goldwater Institute Report (GW), 2001.

Note: *For some of the years between 1997 to 2003, data have been obtained from other sources (HRSA, GW). The information presented in Table 1 is, therefore, subject to considerable uncertainty during that time period.

Data Sources

The results in this report are based on six different data sets. The data sets include the 2003 MGMA Survey; the statewide Medical Board Database (MBD); several statewide HDRG survey databases including the PPS, the NPS, the GRS, and the AZHQ database (Table 2).

The MGMA Survey provides information on the average compensation and productivity by medical specialty for states and regions in the U.S. The MGMA data are from a national survey that includes information on specialty income by state and region as well as workloads by region. The average salary data are particularly useful because they permit comparisons of physician compensation in Arizona relative to compensation for physician compensation in other states.

The MBD data include demographic data on all licensed Arizona physicians as well as their self-reported specialty and office location. The MBD was compiled from past and present files that the ASU HDRG obtained from the AMB and the AOB. The database contains demographic information on every physician licensed in Arizona as well as their medical specialty, board certification, office location, practice changes, retirement status, and hours of work. The practicing physician's medical school, date of graduation from medical school, and graduate training experiences are also collected.

The PPS is a survey sent to all Arizona physicians by the AMB and AOB at the time of relicensure. The survey instrument is nearly identical for both groups of physicians in a survey cycle except the osteopathic survey did not ask practicing physicians to provide a breakdown of their work distribution. Osteopathic physicians renew their licenses annually whereas allopathic physicians renew their license every two years on their birthday. All osteopathic physicians have completed the 2003-2004 survey, but because MDs renew their license every two years only approximately 50% of the MDs have completed the survey as of January 2005.

The NPS is a survey sent to all physicians at the time of their initial application for an Arizona medical license. The physicians are asked to identify the most important reasons for their decision to practice medicine in Arizona. This survey is ongoing and to date 453 surveys have been analyzed. The current PPS and NPS survey instruments are included in Appendices 1-4.

The GRS was distributed to graduating residents from 1993 to 1995 and is being distributed currently to the physicians completing residency training this academic year. The GRS identifies the reasons that residents decide to remain in Arizona or, alternatively, to practice in other states. The results of the 2005 GRS will be compared to the surveys of graduating residents that we conducted in 1993, 1994, and 1995.

Table 2. Data Sources

Data Source and Coverage	*Measures of Interest*	*Status*
MGMA Survey—National, 2003	1. Average specialty income by region. 2. Average specialty income by state. 3. Work loads by region.	Received.
MBD—Statewide, 1990-91; 1992-97, 2002-05	1. Office locations. 2. Medical specialties. 3. Demographic data.	Received.
PPS—Statewide, 1992-97, 2003-04	1. Productivity measures. 2. Characteristics of practice. 3. Effects of managed care. 4. Other changes over time.	DO: Completed. MD: Approximately ½ complete.
NPS—Statewide, 2004	1. Reasons for application for licensure in AZ. 2. Reasons for choosing to practice in AZ. 3. Region they left to come to AZ.	In the field.
GRS—Statewide, 1993-95, 2005	1. Intent to practice in AZ. 2. Reasons for leaving. 3. Reasons for staying.	1993-1995: Complete. 2005: In the field.
AZHQ Database—Yuma County, 1999-04; Maricopa County, 2001-04; AHCCCS – Statewide, 2000-04; Statewide Immunizations, 1999-04	1. Health encounter data. 2. Diagnoses. 3. Procedures. 4. Patient demographics. 5. Patient profiles over time.	Ongoing.

AZHQ is the Arizona HealthQuery, a community health data system that houses essential and comprehensive health information on Arizona residents. This data system is located at ASU and managed by the HDRG. It serves as a community resource for assessing the health status and health care needs of the state. The AZHQ data system is unique for its ability to provide vast amounts of continuously updated health care information and link patients across systems and over time. The data is voluntarily donated to AZHQ by health systems, physician groups, hospitals, and governmental agencies such as AHCCCS. Currently AZHQ contains information on over 5.2 million people who have obtained health care in Arizona. AZHQ helps the

community by putting actionable information from millions of health records at the fingertips of health care researchers and policy makers. We will utilize AZHQ for the second phase of this study to help us determine the health care needs and demands of Arizona residents.

Arizona Physician Workforce, 2004

There were 10,787 allopathic physicians and 1,237 osteopathic physicians practicing in Arizona in 2004 (Table 1, Appendix 5). In 2004, 72% of Arizona physicians were board certified; approximately 78% graduated from a U.S. medical school; 24% are women; and 44% are over 50 years old.[4]

The Nature of Physician Practices

One of the important links between the number of physicians in practice and the quantity of physician services to patients is the proportion of physicians who are either retired or engaged in activities that do not involve services to patients. The physician license renewal surveys asked physicians to describe the nature of their current practice. The distribution of physicians by the nature of their practice in 2004 is described in Table 3.

Allopathic physicians renew their licenses every two years on their birthdays. The data presented in Table 3 for the allopathic physicians represents approximately one-half of the allopathic physicians in the state, so surveys continue to be collected. Osteopathic physicians renew their licenses every two years *en bloc* so the data presented in Table 3 for the osteopathic physicians are complete.

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[4] Estimates acquired from the MBD, 1994-2004.

Table 3. Practicing Physicians, 2004

Practice	*MD Sample*		*DO Census*		*Total*	
	Number of Respondents	*Percent (%)*	*Number of Respondents*	*Percent (%)*	*Number of Respondents*	*Percent (%)*
Academic/Teaching/Research	252	5%	24	2%	276	4%
Administrative Medicine	63	1%	14	1%	77	1%
Government	239	4%	44	3%	283	4%
Group Practice	2,776	50%	696	52%	3,472	51%
Hospitalist	420	8%	44	3%	464	7%
In training*	77	1%	43	3%	120	2%
Non-profit Community Health Center	89	2%	27	2%	116	2%
Retired/On leave	86	2%	105	8%	191	3%
Semi-retired/On leave	189	3%	1	0%	190	3%
Solo Practice	1,337	24%	341	25%	1,678	24%
Total	5,528	100%	1,339	100%	6,867	100%

Source: MBD Practicing Physician Surveys completed by osteopathic and allopathic physicians.

Note: Because osteopathic physicians are re-licensed annually and allopathic physicians are only re-licensed every two years, the Practicing Physician Surveys have been completed by all osteopathic physicians but are not yet completed by all allopathic physicians. Missing osteopathic respondents = 3.

The results in Table 3 show that approximately 75% of Arizona physicians work in a private practice organized as either group or solo practice. Only 4% work in an academic setting which might include medical research and/or teaching. The number of physicians in training is underestimated because most physicians in training have a training license which limits their medical practice to the hospitals in which they are training. Data from other sources (e.g., ACGME) indicate that there are approximately 1,076 physicians in training in Arizona. Physicians employed as hospitalists represent a small but increasing type of medical practice as an employee of the hospital.

Physician Specialty 2004

Table 4 describes the distribution of practicing physicians by primary specialty in 2004. The listed physician specialty is the specialty reported by physicians on their license renewal applications. The self report of specialty is not required to represent the specialty in which a physician received residency training and obtained board certification or the field of medicine in which they provide care. Appendix 6 provides a more detailed description of the specialties.

Approximately 41% of Arizona physicians were primary care specialists in 2004 (Table 4). (Primary care includes family/general practice, geriatrics, internal medicine, and pediatrics.) Approximately 18% of Arizona physicians work in hospital-based specialties, 20% are surgical specialists, 7% are medical specialists, and 1% are pediatric specialists (Table 4). Other specialties includes psychiatry, occupational medicine, physical medicine, and others (Appendix 6).

Table 4. Distribution of Practicing Physicians by Primary Specialty, 2004

Primary Specialty	*Total Physicians, 2004*	
	N	*%*
All Specialties	12,013*	100%
Primary Care†	4,962	41%
Surgical Specialties	2,457	20%
Hospital-Based Specialties	2,204	18%
Other Specialties‡	1,451	12%
Medical Specialties	829	7%
Pediatric Specialties	110	1%

Source: January 5, 2005 MBD.

Note: Primary specialty reported by physician at the time of licensure. Primary specialties were grouped into general categories as shown in Appendix 6.

*Missing = 11 cases. †Primary care includes family/general practice, geriatrics, internal medicine, and pediatrics. ‡Specialties with < 20 physicians.

The profile of Arizona practicing physicians in 2004 is the outcome of events that have occurred over the past quarter century. An understanding of the historical trends is the first step in beginning to understand and predict the future of the Arizona physician workforce.

Trends in the Numbers of Practicing Physicians

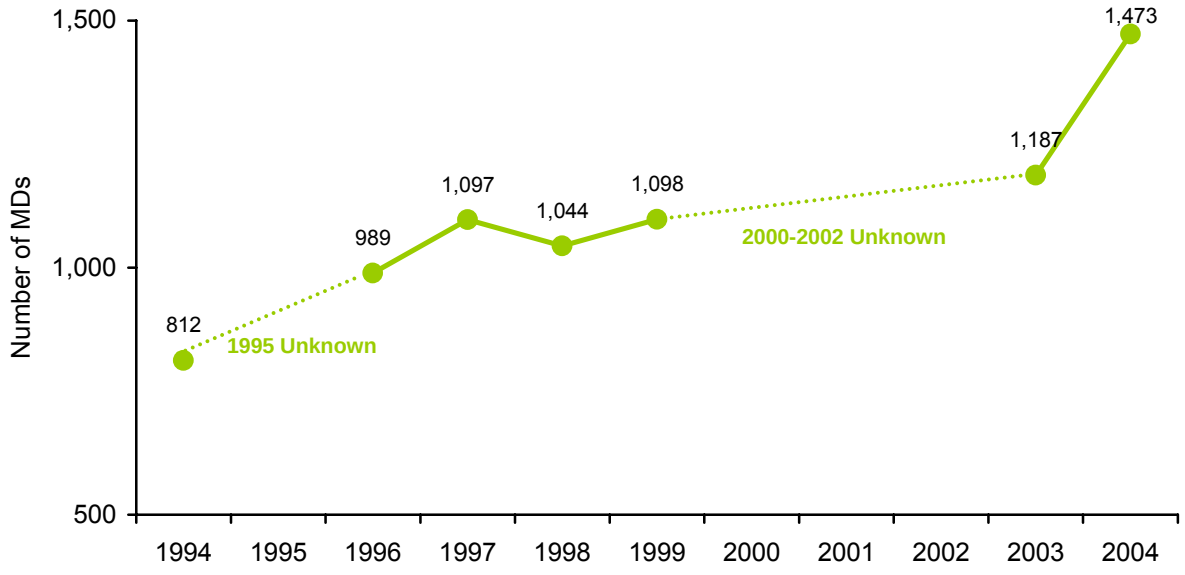
The 10,787 practicing Arizona allopathic physicians in 2004 reflect an increase of approximately 17% between 2003 and 2004 (Table 1). The increase in the number of practicing osteopathic physicians between the two years is not known, but osteopathic physicians are a slightly higher percentage of the physician workforce than in the 1990's. The Goldwater Institute report and the GAO report concluded that the increase in the supply of physicians had not kept pace with Arizona's rapid population growth. Our comparisons of the licensing data from the late 1990s to

the licensing and survey data for 2003-2004 show, instead, that increases in physician supply modestly exceeded population growth. The long term increase, however, is influenced by above average increases in supply between 2003 and 2004. This one year change in the number of practicing physicians is substantially more than the average annual increase from 1992 to 2003.

The uncertainty concerning trends in the data is in part due to the absence of annual data from the licensing agencies for many years. Although the practice is, we understand, being changed, it has been traditional for the licensing agencies to simply overwrite existing records when a renewal is received. Thus, no annual data were maintained for many years by the licensing boards. The historical information presented here on trends mainly is obtained from the previous ASU study in which annual licensing records were saved.

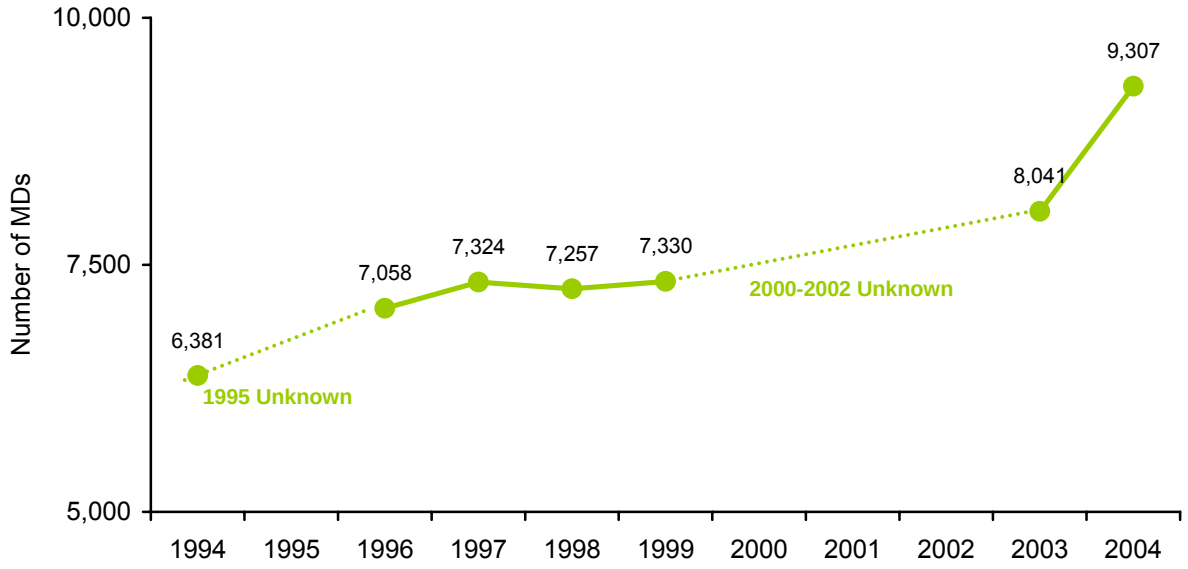
In 1990 an estimated 9% (698/7,315) of the physicians in active practice in Arizona were osteopaths. However, in 2004 the number of osteopathic physicians increased to 1,237 and now represents approximately 10% (1,237/12,024) of the physician workforce (W. G. Johnson et al., 1992) (Table 1). In 1992, we predicted that the supply of physicians in Arizona would keep pace with the growth in the population, but disparities would continue in the physician to population ratio in rural Arizona (Lewis et al., 1992). The 2004 data show that there are still large geographic disparities in the physician to population ratio between urban and rural counties (Figure 7, 8). In 2004, 86% of Arizona physicians practice medicine in Pima or Maricopa County, and the physician to population ratio ranges from a high of 276 in Pima County to a low of 48 in Apache County (Figure 7, 8).

Figure 4. MDs in Practice in Rural Areas of Arizona (1994-2004)



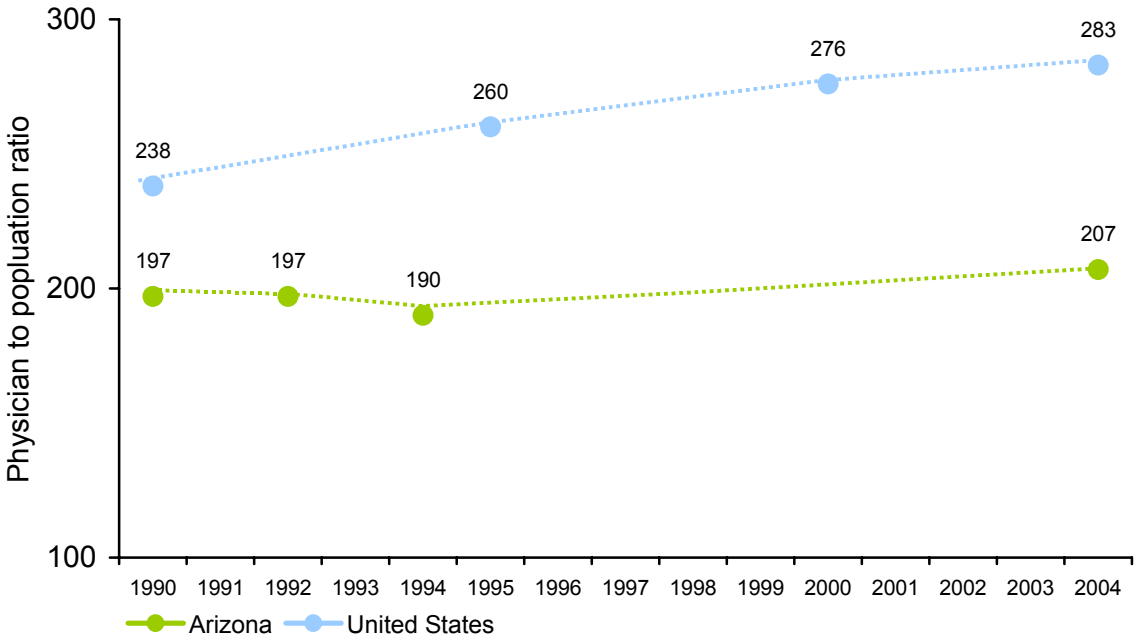
Source: MBD, 1994-2005

Figure 5. MDs in Practice in Urban Areas of Arizona (1994-2004)



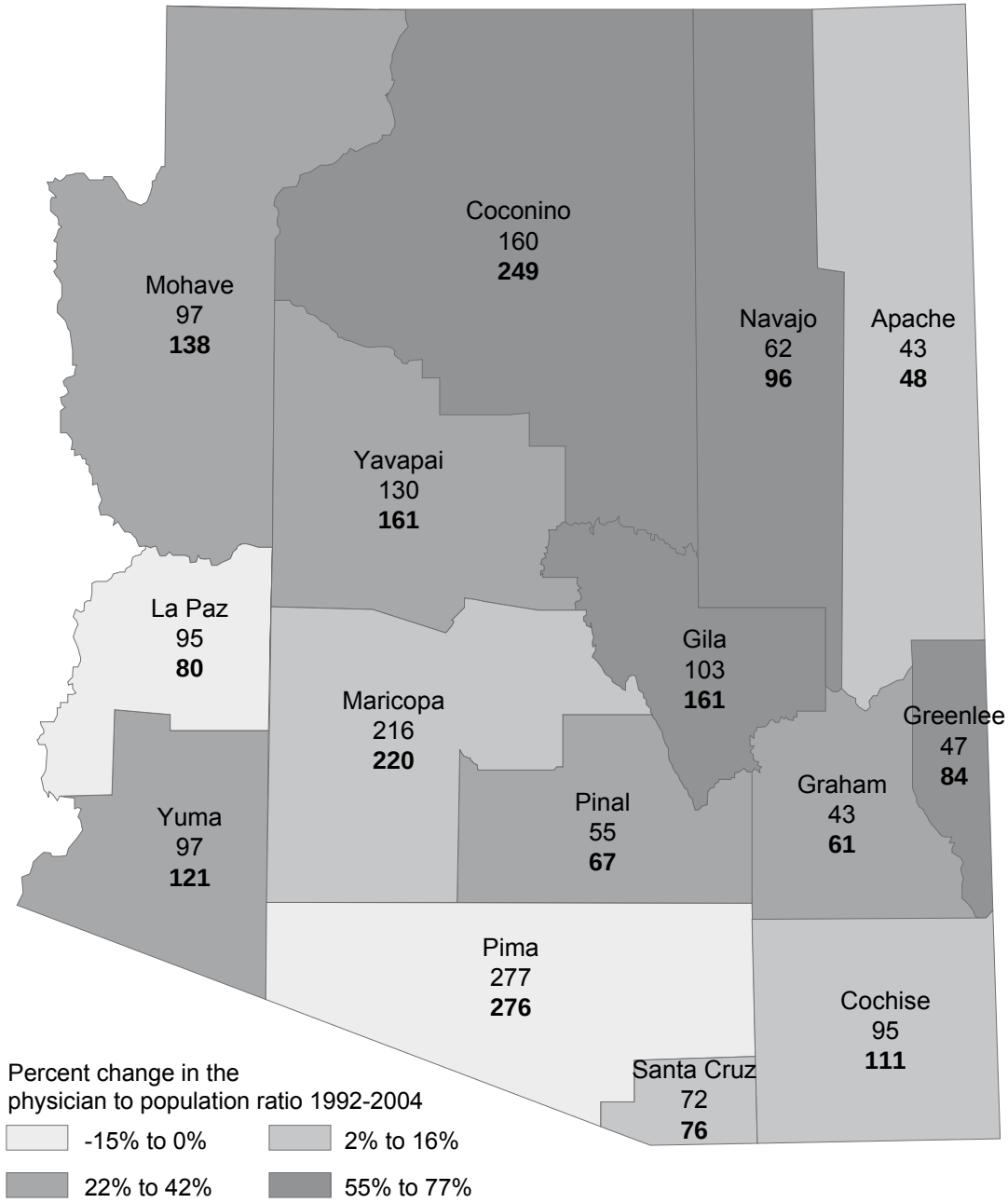
Source: MBD, 1994-2005

Figure 6. Physician to Population Ratio for Arizona and the U.S. (1990-2004)



Source: MBD, 2004; Census Data, 1990-2004

Figure 7. Physicians per 100,000 People, 1992 and 2004*

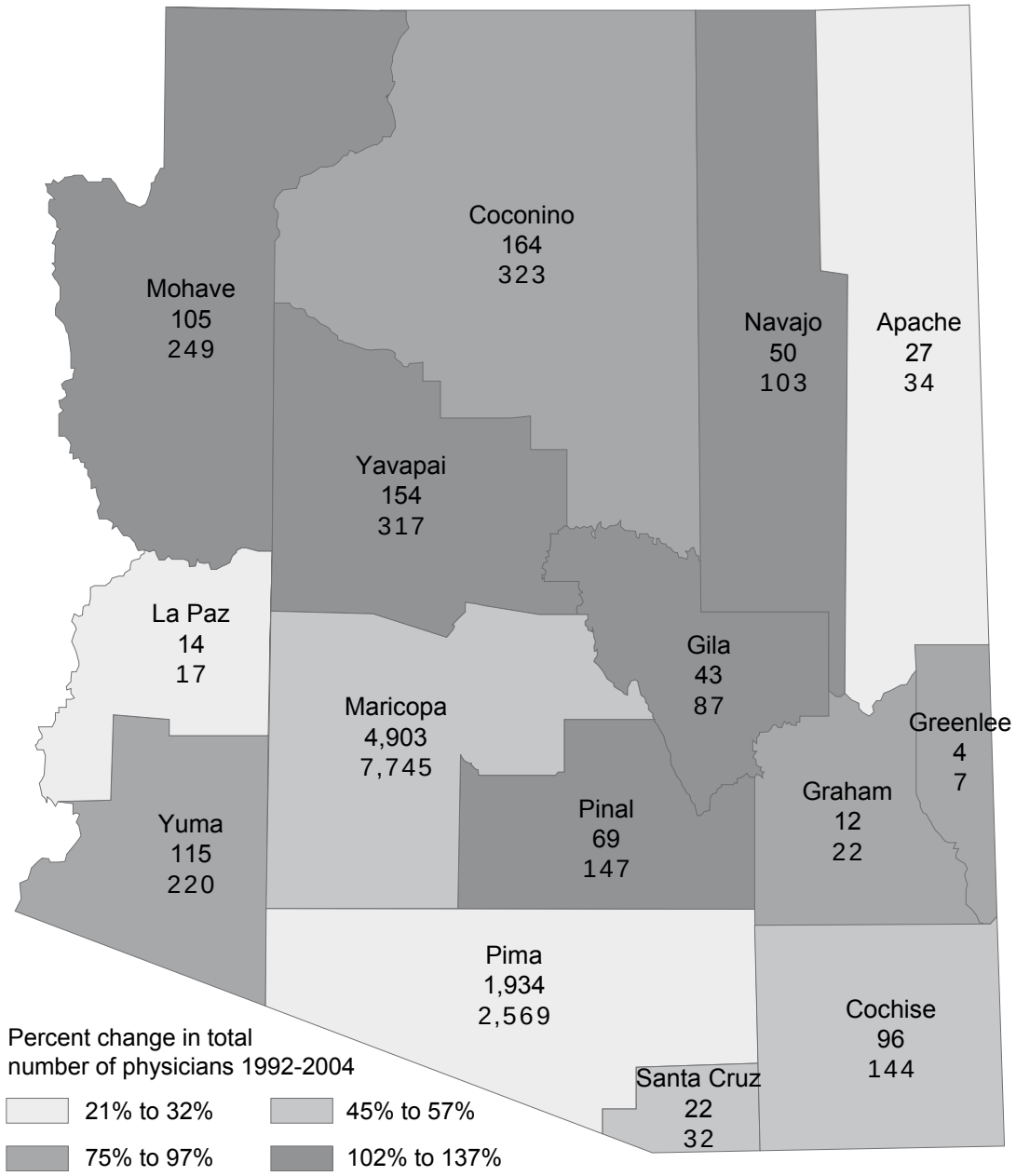


Source: MBD, January 5, 2005 and 1992; Arizona Department of Economic Security Population Projections, July 1, 2004; and Census Population Estimates, July 1, 1992. Data compiled by the ASU HDRG.

Note: Physician is defined as a MD or DO who practices medicine in Arizona, as of January 5, 2005. Map excludes retired physicians. Physicians practicing solely in a federal facility may be excluded because they are not required to have an Arizona license.

*Lightface numbers represent the number of physicians in 1992. Boldface numbers represent number of physicians in 2004.

Figure 8. Number of Physicians by County, 1992 and 2004*



Source: MBD, January 5, 2005 and 1992. Data compiled by the ASU HDRG.

Note: Physician is defined as a MD or DO practicing medicine in Arizona, January 5, 2005. Map excludes retired physicians; and physicians practicing solely in a federal facility may not be included because they are not required to have an Arizona license. Seven allopathic physicians and one osteopathic physician are missing county location. Consult Appendix 5 table for detailed information regarding the distribution of the allopathic and osteopathic physician population by county for Arizona in 2004.

*Lightface numbers represent the number of physicians in 1992. Boldface numbers represent number of physicians in 2004.

Trends in Physician to Population Ratios

The number of physicians per 100,000 people for Arizona increased from 197 in 1992 to 207 in 2004. The rate of increase in the number of physicians exceeded the rate of increase in the population in both rural and urban areas, but did not eliminate the existing rural to urban disparities in physician to population ratios (Table 5, Figure 7).

The past reports on Arizona's physician workforce differ in many respects, but agree that the statewide ratio of physicians to population has been below the national average. The reasons for the persistent shortage of physicians, at least by reference to the physician to population ratios, are less well known. Much of the difference may simply reflect the rather marked differences in population density between Arizona's urban and rural counties. Approximately 86% of the Arizona population lives in urban areas compared to 81% of the U.S. population. The physician to population ratios in one urban area of Arizona (Pima County) is historically much closer to the national averages than the ratios in the rural counties. Indeed, the data for 2004 show that the ratio in Pima County is similar to the national averages (Table 5, Figure 6).

One must be cautious in using national averages as a basis for comparison. Differences among the states in needs for care and the health care environment can, if not controlled, bias the conclusions drawn by comparing Arizona's physician to population ratios with the national averages. The bias could be in either direction, possibly understating or overstating the adequacy of the physician workforce in Arizona. We will address this question in Part II of this report, to be issued later this year.

Table 5. Arizona Physician to Population Ratios by County, 1992 and 2004

County	*1992*	*2004*
	Total Physicians Per 100,000 People	*Total Physicians Per 100,000 People*
All Physicians	*197*	*207*
Urban	*230*	*231*
Maricopa	216	220
Pima	277	276
Rural	*93*	*124*
Apache	43	48
Cochise	95	111
Coconino	160	249
Gila	103	161
Graham	43	61
Greenlee	47	84
La Paz	95	80
Mohave	97	138
Navajo	62	96
Pinal	55	67
Santa Cruz	72	76
Yavapai	130	161
Yuma	97	121

Source: January 5, 2005 and 1992 MBD; July 1, 2004 Arizona Department of Economic Security Population Projections; and July 1, 1992 Census Population Estimates.

Note: Consult Appendix 5 table for detailed information regarding the distribution of the allopathic and osteopathic physician population by county for Arizona in 2004.

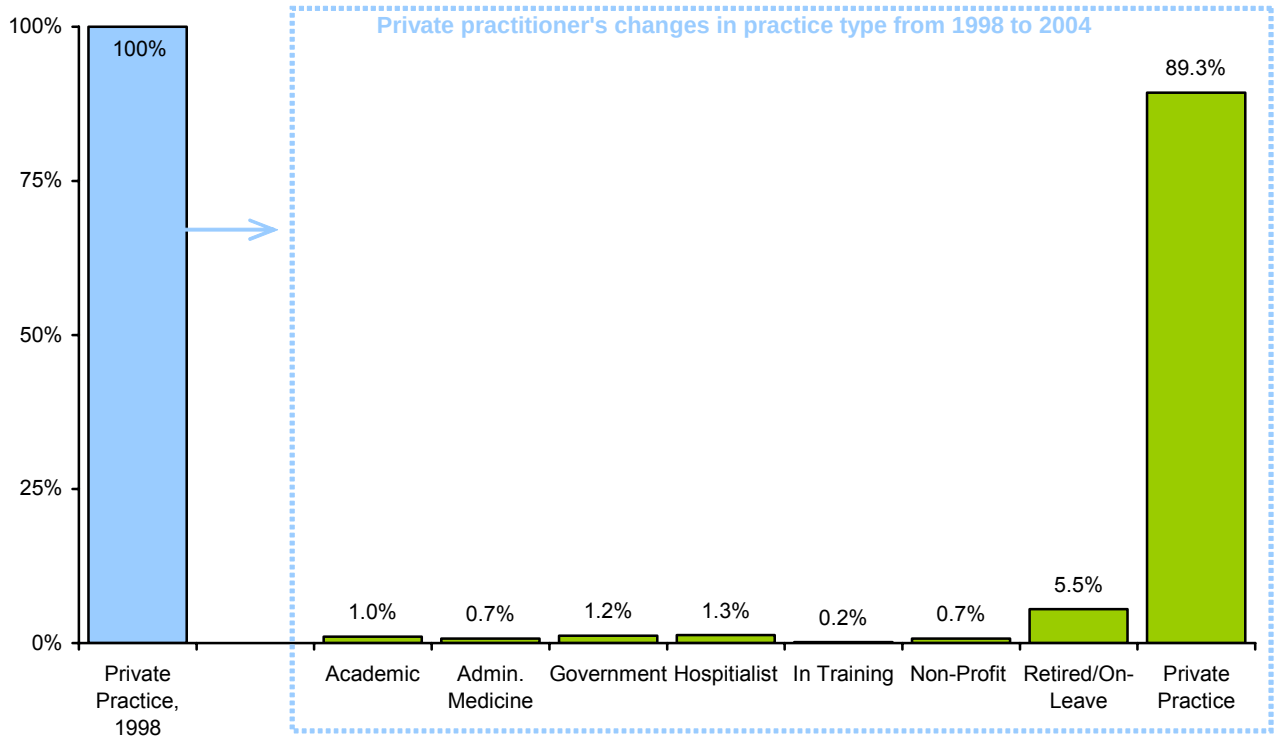
Trends in Types of Practice

Physicians who respond to the 2004 PPS are asked to compare the nature of their practices in 1998 with their practice at the time of survey. The question is an attempt to partially eliminate the gap in information on trends caused by the termination of the ASU/AzCGME project on the physician workforce in 1997. The recall period is long for a survey question, but the subject is of such fundamental importance to the respondents that recall error is not likely to be a significant problem.

Approximately 4,501 physicians responded to the question. There were 2,884 physicians surveyed who were in private group or solo practice in 1998. Six percent of the 2,884 physicians were retired/on-leave by 2004, and the remaining 5% had switched from private

practice to other types of practice (Figure 9). In other words 89% of the physicians who were in private practice in 1998 were in private practice in 2004.

Figure 9: Changes in Private Practice from 1998 to 2004 (n=2,884)



Source: PPS, 2004

Note: N=4,501 and includes academic, administrative medicine, government, group practice, hospitalist, in training, non-profit, retired/on-leave, and solo practice. 2,884 respondents were in private practice in 1998; private practice includes group practice and solo practice.

Trends in Arizona Physician Specialties

The primary specialties of Arizona physicians in 2004 are shown in Table 4. The number of primary care physicians, hospital-based physicians, surgeons, and other specialists increased between 1992 and 2004. However, the number of physicians with medical specialties declined from 911 in 1992 to 829 in 2004 (Table 4). Within the medical specialties, decreases occurred in the number of physicians specializing in allergy, cardiovascular diseases, endocrinology, gastroenterology, hematology, and infectious disease. The number of surgeons practicing in Arizona increased by 40% since 1992, but there has been a decrease in the number of surgeons who reported cardiovascular surgery, colorectal surgery, hand surgery, and thoracic surgery as their primary specialty since 1992. There has also been a decrease in the number of

child psychiatrists and gynecologists. The decrease in the number of medical specialists was predicted by our research group in 1996 when we noted decreasing numbers of medical school graduates entering specialty training.

Approximately 38% of all physicians in the U.S. are primary care specialists. In 1994, the COGME recommended that 50% of all U.S. physicians should be primary care specialists (family/general practice, geriatrics, internal medicine, and pediatrics). But their most recent report rescinded that recommendation. Currently, they recommend that the federal government conduct a study to determine the specialty-specific need, demand, and desired distribution of physicians at the regional level. Thus, they offer no guidance for determining the ideal specialty mix of physicians. There are, however, a growing number of reports suggesting national shortages in the number of specialty physicians including radiology, anesthesiology, cardiology, rheumatology, nephrology, pulmonary disease, child psychiatry, and pediatric subspecialties (Health Resources and Services Administration, 2005).

The Dynamics of Physician Supply in Arizona

Physician supply changes in Arizona have been described in the previous sections. The next step is to begin to understand the process of these changes.

Retirements/Departures

Physician retirements are another factor that influences the composition and size of the physician workforce. Many expect that the exit of the baby boom cohort of physicians from the labor market will substantially reduce the supply of physicians. Approximately 42% (5,285) of Arizona physicians are 50 years old or older in 2004 and can be expected to retire in the next 10 to 15 years. Approximately 49% of the medical and pediatric specialists are 50 years old or older. In contrast, only 39% of primary care specialists and 41% of hospital-based specialists are 50 years old or older.

Arizona Entrants

At the state level, the number of new entrants into practice is a function of the number of new graduates from internships, residencies, or fellowships who are attracted to the state as well as in-migration of established physicians who choose to relocate. The proportion of residents/fellows likely to choose to practice in a state is higher for those who complete

residencies/fellowships within the state or grew up there. Residency training programs in Arizona are sponsored by hospitals or medical schools. The programs are accredited by the ACGME to train physicians who have graduated from medical schools in clinical specialties, including primary care specialties and other specialties. Currently, approximately 59% of Arizona's physicians in residency training are trained in teaching hospitals in Phoenix. These programs are based in private community hospitals as well as the county's only public hospital, Maricopa Medical Center. Residency programs with their faculty and residents in training also provide the teaching faculty for the clinical training of medical students working towards their MD and DO degrees. These programs are expensive to maintain and some hospitals have closed selected residency training programs because of financial costs and/or the failure to maintain accreditation. Closure of these programs can have an adverse effect on the supply of physicians in the state, as well as the ability to support undergraduate medical education.

Changes in Residencies in Arizona, 1992-2004

There were 1,010 physicians in residency training in Arizona in 1992. Approximately 58% of the residents (581) received training at three Phoenix hospitals (Maricopa Medical Center, St. Joseph's Hospital, and Good Samaritan Regional Medical Center) and approximately 39% of the residents (392) received training at the UA College of Medicine. In 1992, 41% (412) of the residents in training were in primary care training (pediatrics, family medicine, internal medicine). Only 15% (147) of the residents were training in surgical specialties. There were 71 residents in obstetrics/gynecology, 64 in anesthesiology, 62 in psychiatry, and 44 in emergency medicine (Meenan *et al.*, 1995).

By 1996, there were 1,166 residents in training in Arizona in 96 programs. The number of residents at the UA College of Medicine decreased to 371 while the number of Mayo Clinic Scottsdale residents increased from eight residents in 1992 to 31 in 1996. Eight of the 96 training programs in 1996 were osteopathic programs (Arizona Council for Graduate Medical Education, 1998).

In 2004, there were 1,076 residents in 84 training programs in Arizona, a decrease from 1996 (Table 6). There were decreases in the number of programs in anesthesiology, family practice, internal medicine, and obstetrics while the number of programs in cardiology increased. However, because some of these decreases were due to program mergers, the total number of

residents in training only decreased in anesthesiology and family practice. By 2004, almost all of the osteopathic training programs closed. These programs largely trained family physicians or general practitioners although there had been one program in obstetrics/gynecology. In contrast, there has been a large increase in the number of residents and training programs at the Mayo Clinic Scottsdale which has helped offset the closure of other Arizona programs. In 1992, Mayo had only two training programs and eight residents; whereas in 2004 Mayo has 30 residency programs with 110 residents. The number of residents trained at the UA College of Medicine also increased to 437 in 2004. Table 6 shows the current number of residents in training by specialty.

Table 6. Arizona Residency Training Programs, 2004

Specialty	*Number of Programs*	*Number of Residents*
Anesthesiology	1	29
Emergency Medicine	2	63
Family Practice	6	132
Internal Medicine	5	229
Neurosurgery	2	13
Obstetrics	3	73
Orthopedics	2	27
Pathology	2	23
Pediatrics	3	103
Psychiatry	3	53
Radiology	2	38
General Surgery	4	109
Cardiovascular Disease	3	25
Gastroenterology	3	18
Neurology	3	19
Other	40	122
Total	84	1,076

Source: AzCGME, www.acgme.org, Sept. 14, 2004

The number of residency training program positions available for graduating medical students limits the number of physicians who can train in each specialty. For example, in internal medicine, there are 263 residency positions available in Arizona and over 22,000 positions available nationally, but there are only 20 residency positions in neurosurgery in Arizona and only 800 positions available nationally.

The number and type of residency program positions available in the U.S. affects the supply of practicing physicians. In addition, residents are more likely to practice in the state in which they completed their residency. In a 1992 survey of graduating Arizona residents, 52 of the 88 respondents (59%) chose to practice in Arizona after completing their training. In Part II of our study we will report on the location of practice for Arizona residents who graduate this year (2005).

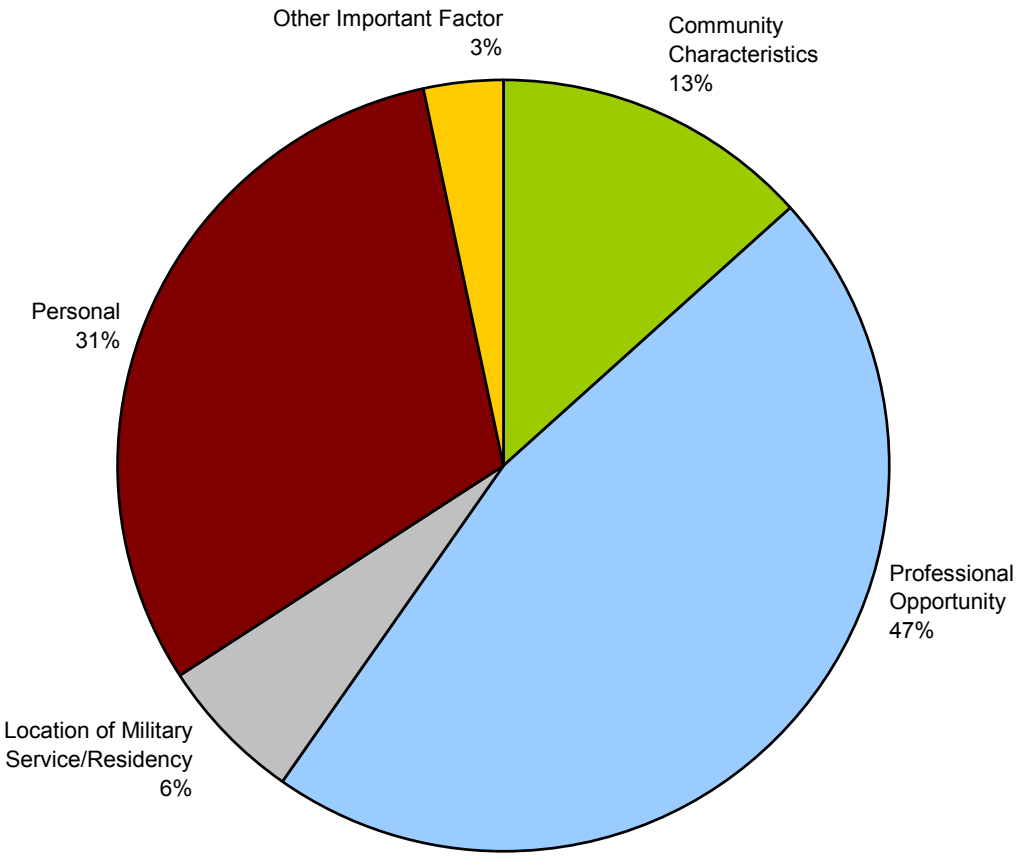
While training in Arizona is not synonymous with a decision to practice in Arizona upon completion of the training, there is an important link between the two. We next consider the reasons that lead graduating residents from Arizona and graduating residents and practicing physicians from other states to locate in Arizona.

Why Physicians Choose to Practice in Arizona

The factors that influence the supply of physicians include compensation, work environment, location of medical school and residency training, employment opportunities, and personal preferences. The living environment, including the quality of schools, cultural and recreational resources, and the climate are key factors as well. The growth in two career families means that the choice of jobs and location is increasingly a joint decision by spouses based on the best job opportunities and characteristics for both. Finally, since medical liability premiums vary from state to state, they also may play a role.

In cooperation with the AMB and the AOB, we developed the NPS of first time applicants for Arizona licenses (Appendix 1 and 2). The survey collects information on the reasons that lead physicians to practice in Arizona. We received 453 new applicant surveys. Approximately 39% of new applicants to date in 2005 were recent graduates of residencies or fellowships in Arizona. Applicants were asked about the most important reasons for choosing to practice in Arizona. The most frequently cited reasons included: “the characteristics of the community,” “the best professional opportunity available,” and “personal ties to the community.” Almost half (47%) cited “professional opportunity,” including factors such as earning potential, work hours, opportunity to serve a particular population, colleagues, and professional contacts as the reason they decided to practice in an Arizona community. Personal factors were cited by 31%, including factors such as “grew up in the community,” “influence of spouse,” and “personal ties to the community” (Figure 10).

Figure 10. Single Most Important Reason Influencing Physicians to Practice in Arizona (N=496)



Source: NPS, 2004.

Note: Number of non-respondents = 43; respondents include 366 MDs and 87 DOs. Professional opportunity includes earning potential, environment/hours of work, best professional opportunity available, recruited by colleagues, opportunity to serve a particular group of people, and professional contacts. Personal includes grew up in area, personal ties in the community, and influence of spouse.

The survey of new applicants provides valuable information on the physicians who choose to locate in Arizona but omits physicians who decide to locate in other states. The Goldwater Institute report concluded, without direct empirical support, that relatively low levels of compensation for physicians was a significant obstacle to attracting and retaining individuals to practice in Arizona. The next section addresses the question of physician compensation. The two most important elements of compensation are the potential gross earnings associated with a practice and the expenses associated with a practice, of which premium payments for medical liability are an important element.

Compensation

Differences in compensation can influence a physician's choice of practice location, but there are few differences in physician income across the U.S. Census divisions, and the income of physicians in the Mountain States is similar to the rest of the U.S. (Pasko & Smart, 2004). Table 7 compares median wages of four medical specialties among regions based upon MGMA surveys. While limited in scope, the data show that in three of the four specialties shown, Arizona physicians earned median wages comparable to the median wages earned at a national and regional level.

Although it has been argued that the disparities in physician to population ratios between urban and rural areas are due to decreased compensation for physicians in rural communities, the Center for Studying Health System Change recently reported that primary care physicians working in rural areas actually make 6% more than urban PCPs, and specialists working in rural areas make 3% less than urban specialists. Since the cost of living is often less in rural communities, these findings suggest that the disparities in physician distribution are not due to differences in compensation (Reschovsky & Staiti, 2005).

Table 7. Physician Median Income, Selected Specialties by Region, 2003

Specialty	*Arizona*		*U.S.*		*Alaska, California, Hawaii*		*Rocky Mountain*		*Midwest*	
	Providers	*Median Income ($)*	*Providers*	*Median Income ($)*	*Providers*	*Median Income ($)*	*Providers*	*Median Income ($)*	*Providers*	*Median Income ($)*
Cardiology: Invasive-Interventionalist	13	$562,800	731	$439,221	40	$372,210	65	$468,608	138	$532,251
Dermatology	11	$305,000	287	$280,121	49	$273,480	39	$277,460	37	$321,350
Family Practice (without OB)	33	$126,727	4,336	$152,478	266	$151,186	360	$149,363	684	$170,628
Internal Medicine: General	46	$160,722	4,216	$159,252	818	$163,421	295	$152,920	506	$160,959

Source: 2004 MGMA Physician Compensation and Production Survey.

Note: Number of providers refers to number responding to the survey. Physicians with less than one year in specialty are excluded.

Medical Liability (Malpractice) Insurance Costs

There is an ongoing national debate over the effects of increasing medical liability premiums on the physician workforce, including allegations that large numbers of physicians are abandoning medical practice or changing their method of practice to exclude high risk patient care. The AMA has designated 20 states—Arkansas, Connecticut, Florida, Georgia, Illinois, Kentucky, Massachusetts, Mississippi, Missouri, Nevada, New York, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, Texas, Washington, West Virginia, and Wyoming—as "crisis" states based on the size of medical liability insurance premium increases and the adverse effects of these increases on medical practice as reported by their medical society. Arizona and 23 other states are classified as "showing problem signs," and six states (California, Colorado, Indiana, Louisiana, New Mexico, and Wisconsin) are "currently okay."

Federal legislation has been proposed but not passed that would reduce medical liability. Twenty-seven states, not including Arizona, have laws which cap non-economic damages in malpractice cases. In Arizona, physician groups have sought legislation that includes a cap on payments and changes in the litigation process. Legislation was passed in Arizona in 2005 changing the qualifications of expert witnesses in medical liability litigation and limiting the admissibility of apologies made by a physician after a medical error has occurred.

Increases in insurance premiums, whether caused by tort awards, settlements or reduced rates of return on insurer's investments, pose a problem for physicians who usually are unable to increase their revenue to offset these increased costs. There is concern, therefore, that these increases in medical liability premiums may result in decreases in the Arizona physician workforce.

The GAO investigated the reductions in physician supply in the "crisis" states that propose medical societies attributed to the effects of increasing medical liability insurance premiums. They found that since 1990 the increases in medical liability premium rates have varied greatly by state and by specialty. Additionally, falling investment income and rising reinsurance rates have contributed to recent rate increases in addition to losses on medical liability claims. The GAO also found that other factors, including high investment income or lower-than-expected losses, can exacerbate the market cycles by encouraging insurers to price insurance below the expected cost of paying claims which can lead to large premium rate hikes when increasing

losses ultimately are recognized (US General Accounting Office, 2003). While the GAO findings did not support the claim that out-of-control jury awards causes premiums to skyrocket or that access to services was restricted because of rising medical liability premium rates, evidence suggests that premium increases are one of several influences affecting physician supply.

In a recent study Encinosa analyzed the effect of state caps on non-economic damage awards between 1985 and 2000. He determined these were associated with a 2% increase in the number of physicians practicing in these states, but that these increases occurred three or more years after the cap was instituted. The effect of caps was greater in rural counties than urban areas and seemed to affect the supply of surgeons and obstetricians more than other categories of physicians. Interestingly, other medical liability reforms (e.g., caps on punitive damages) did not affect physician supply (Encinosa & Hellinger, 2005; Kessler *et al.*, 2005).

A medical liability crisis is characterized by both the decreasing availability and affordability of insurance coverage (Studdert et al., 2004). Medical liability premiums have increased in Arizona in recent years, but other states (e.g., Florida, Nevada, Pennsylvania, and Texas) have had even higher increases (US General Accounting Office, 2003). It is worth noting that the predictions regarding a severe reduction in physician supply due to medical liability premiums in Nevada have not been realized. An article just published (June 4-5) in a Nevada newspaper reports that "2004 saw the highest gain of licensed Nevada physicians since the board (the Nevada State Board of Medical Examiners) began keeping that statistic in 1987" (Kanigher, 2005). Although the data from Nevada do not prove that medical liability premiums had no effect on physician supply, they are a reminder that the premiums are but one of many influences on the supply of physicians in a state.

The major medical liability insurance carrier in Arizona is the MICA. In 2005, MICA's annual premiums for physicians range from approximately $11,000 (psychiatrists) to over $124,000 (neurosurgeons). Primary care physician premiums range from approximately $18,000 to $28,000 (Figure 11). Since Arizona must rely on other states to train the majority of our physicians, maintaining availability and affordability of medical liability insurance may be an important factor in attracting physicians to our state. Arizona rates were increased by MICA by only 6% in most specialties between 2004-2005. Rates increased by approximately 16% in the previous year (Dr. Carland, MICA, personal communication, June 14, 2005).

In 2002, Arizona's medical liability rates were moderately high (e.g., top 25%) compared to other states for internists, surgeons, and obstetricians but equal to or lower than other states for some specialties. In addition, MICA medical liability rates for Arizona physicians were higher for some specialties and lower for others in other states served by MICA including Colorado and Utah (Figure 11). In 2005, the survey of first time applicants for Arizona licenses included a question regarding high medical liability rates in other states as one of the possible reasons that physicians chose to locate in Arizona. Twelve percent (60/496) of the new applicants for an Arizona license listed high medical liability insurance rates as one of, but not the most important, reason for coming to Arizona. Interestingly, 72% (43/60) of the physicians who cited medical liability costs as an influence had relocated to Arizona from states that were considered "in crisis" in terms of medical liability by the AMA.[5]

The results suggest that medical liability premiums relative to higher premium states play a minor but positive role in the decisions of physicians to practice in Arizona. That conclusion is, however, constrained by the fact that we do not, as yet, have data that identify physicians who decided not to enter practice in Arizona or of physicians who moved to other states or retired.

Part of the gap in information on the effect of medical liability premiums will be filled from the results of the ongoing survey of residents in Arizona who are graduating. The data will be available for those who continue to practice in Arizona as well as those who go to other states. Results from the survey of residents graduating in 2005 from Arizona residencies will be available for Part II of this report. Information on practicing physicians who leave the state would require a survey that is outside the scope of the current project.

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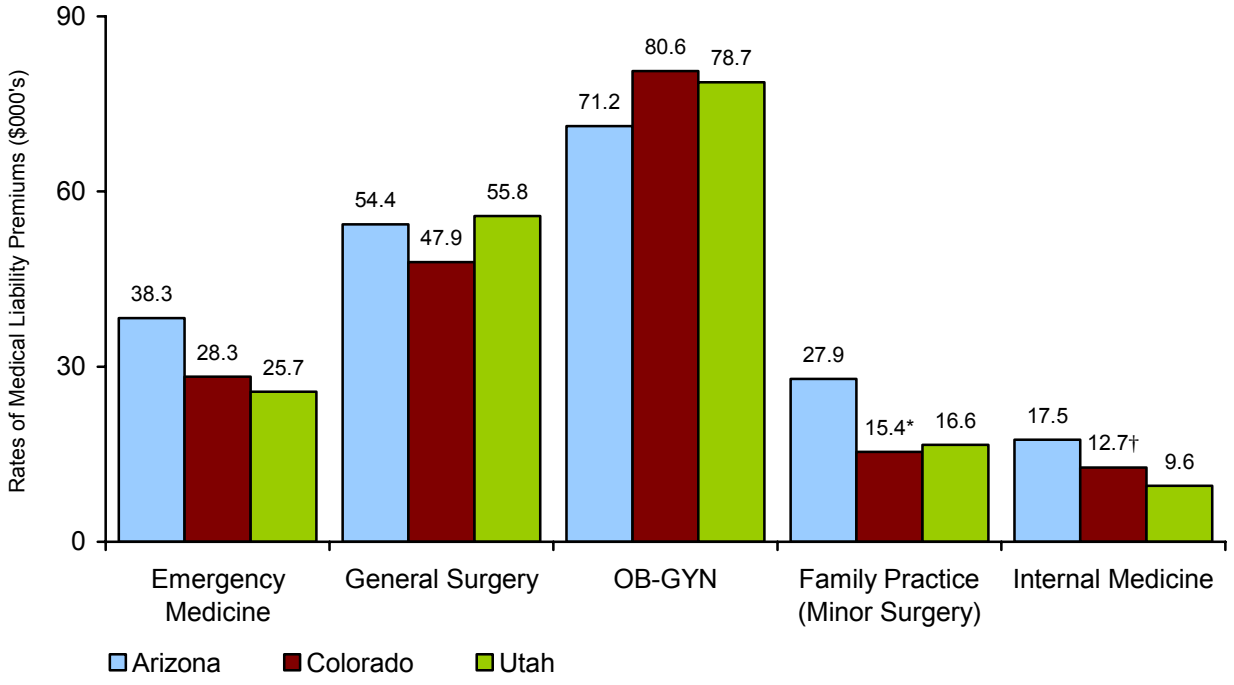
[5] The AMA classification scheme for determining whether a state is "in crisis," "showing problem signs," or is "currently okay" in terms of medical liability is based on the rating of three general criteria including: the loss of patient's access to health care; a state's legislative, legal, and judicial climates; and affordability and availability of professional liability insurance. For more information on these criteria Daniel Blaney-Koen of the AMA can be contacted at daniel_blaney-koen@amam-assn.org. The crisis map can be seen at the following website: www.ama-assn.org/ama/noindex/category/11871.html.

Figure 11. Medical Liability Premiums by Practice for Three Western States, 2005.



Source: MICA, April 3, 2005 and May 3, 2005. Compiled by the ASU HDRG.
Note: Comparisons are 2005 MICA; premiums for a 1,000,000/3,000,000 claims made mature policy.
*Non-ER, minor surgery; †includes minor surgery

Location of Medical Schools and Residencies

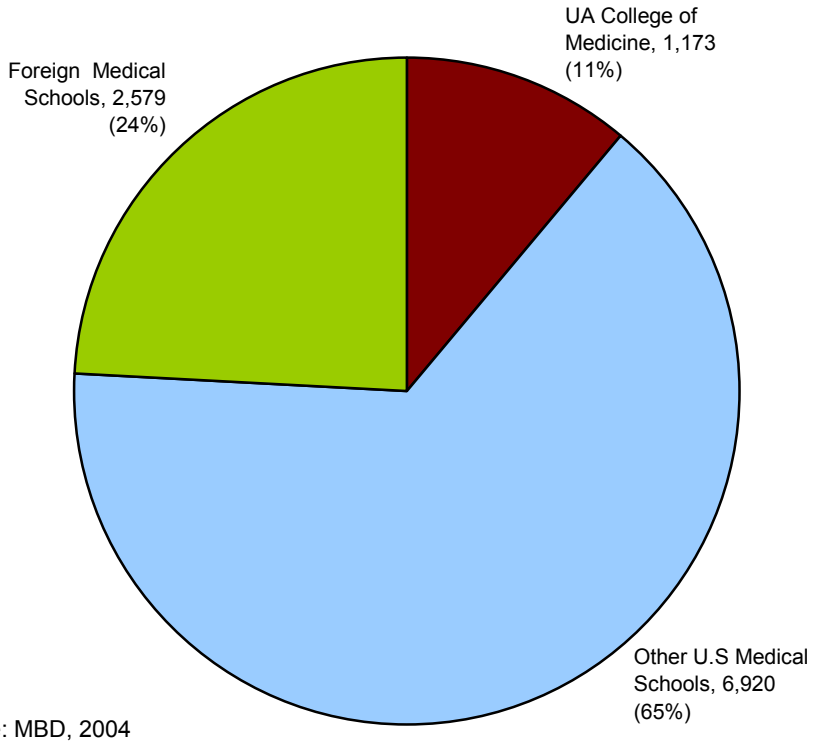
The relationship between attending a medical school and subsequent practice in the same state as the school is rather ambiguous. Arizona has, for many years, been an importer of physicians, the majority of whom attended medical schools in other states or other countries. On the other hand, it is true that increasing the size of a medical school or adding a new school to a state is likely to increase the number of graduates who eventually practice in the state. It is, however, difficult to predict the proportion of students who will remain in the state to practice.

There are two medical schools in Arizona: the UA College of Medicine, a public allopathic school, and Midwestern University AZCOM, a private osteopathic school. These two schools graduated 196 new physicians in 2000 or 3.9/100,000 population. The national average is 6.4/100,000, and Arizona ranked 38th among the 48 states with medical schools in medical school graduates per capita in 2000 (Health Resources and Services Administration, 2005). The total enrollment of the two schools was 895 students in 2000-2001 or 16.9/100,000 population. This is an increase from 628 students (11.8/100,000 population) in 1998 (US General Accounting Office, 2003).

As discussed previously, there are 84 residency training programs in Arizona and 1,076 residents in training or 20/100,000 population (Table 6). Approximately one-third of all physicians who are now practicing in Arizona received their most recent residency training in Arizona (US General Accounting Office, 2003).

In 1990, 607 or 9% of the allopathic physicians practicing medicine in Arizona had graduated from the UA College of Medicine. In 2004, 1,173 physicians in active practice in Arizona are UA College of Medicine graduates. This is approximately 11% of the physicians practicing in Arizona. The majority of Arizona physicians (6,920) graduated from other U.S. medical schools. However, 2,579 of Arizona physicians graduated from foreign medical schools (Figure 12).

Figure 12. Site of Medical School Training for Arizona MDs, 2004 (N=10,672)



Source: MBD, 2004
Note: Number of non-respondents = 115

In 2004, 126 students graduated from Midwestern University AZCOM. The majority of the Midwestern University AZCOM graduates (73/126) are entering primary care residencies in family medicine, internal medicine, or pediatrics. Approximately 32 of the 126 graduates entered residencies in Arizona.

In 2004, an estimated 58% (723/1,237) of osteopathic physicians were practicing primary care compared to 39% (4,239/10,787) of allopathic physicians. The majority (530/723 or 73%) of osteopathic primary care physicians are family physicians or general practitioners, whereas only 28% (1,208/4,239) of allopathic primary care physicians are family physicians.

Summary

The ratio of practicing Arizona physicians per 100,000 people increased from 197 in 1992 to 207 in 2004, but the physician to population ratio in Arizona remains far below the national average of 283 (Table 1, Figure 6). The physician workforce in Arizona continues to increase, largely by in-migration. Only 10% of the physicians practicing in Arizona attended medical school in Arizona and only one-third of practicing Arizona physicians completed residency training in the state.

The large geographic disparities in the Arizona physician workforce which were noted in 1992 continue in 2004, although the physician to population ratio of rural counties has improved especially in the rural counties which have become more urbanized.

Approximately 41% of Arizona physicians were primary care specialists in 2004. Currently about 38% of all physicians in the U.S. are primary care specialists, so the percentage of primary care specialists in our state is greater than the national average. However, with the decreasing popularity of family medicine and decreased number of family medicine residency positions in the state, it is likely that the number of family physicians practicing in Arizona will decline in the future. It is also likely that osteopaths will comprise a higher percentage of family physicians practicing in Arizona since the number of osteopathic physicians in Arizona is increasing, and, historically, most osteopaths choose careers in family medicine. In general, the number of Arizona physicians practicing in non-primary care fields has increased except for subspecialties of internal medicine. The decrease in the number of residents in training programs in anesthesiology may impact the supply of physicians in this specialty in the future.

The gender and age distribution of the Arizona physician workforce has changed dramatically since 1992. Only 15% of Arizona physicians were women in 1992 compared to approximately 24% of Arizona's practicing physicians in 2004. In 1992, only 31.5% of Arizona physicians were over 50 years old; whereas in 2004, 42% of the physicians are over 50 years old. This has important implications for the Arizona physician workforce over the next 15 years.

Because of the five to 13 year lag between medical school matriculation and completing medical training, expanding the number of medical students in the state cannot have an immediate effect on the physician workforce even if a majority of these students choose to practice in Arizona. This is an especially important consideration for states, like Arizona, where population growth is much higher than the average in nearly all the other states and our current physician to population ratio is much less than the national ratio. It is unlikely that medical education in Arizona can expand to a level where even one-half of the practicing physicians will have attended medical school in Arizona. Therefore, Arizona will continue to rely on the in-migration of physicians to maintain its physician workforce.

We must continue to study the factors associated with physician in-migration since Arizona relies on continued in-migration of physicians trained in other states (and other nations) for the overwhelming majority of its physician workforce. Surveys of newly licensed physicians are one way we can monitor the reasons for in-migration. It would also be helpful to begin surveying physicians who leave Arizona to practice in other states. Finally, we must also examine the factors associated with physician retirement because the continued practice of medicine by physicians over 50 also can help us maintain and potentially increase the total physician workforce in our state.

This is the first of two reports on the supply of physician services in Arizona. A subsequent report (Part II), using the AZHQ, will combine the numbers of physicians in the workforce with measures of productivity and estimates of the population's health care needs. Using these techniques, we hope to estimate the current and future physician workforce needs in our state.

The data on the trends in physician supply include a number of years in which data are missing. The omissions result from the historical practice of state licensing agencies simply overwriting physician records at each renewal without saving backup copies of the data at the end of each year. Backup data for some years was obtained. The practice is consistent with the agency's primary function of maintaining current licensing records but creates problems with attempts to measure changes over time. It is our understanding that at least one of the agencies is changing this practice.

The data on past years were obtained from records available from the licensing agencies if backups existed and from annual records provided to ASU by the licensing agencies during the

previous study. The data were not, however, obtained at the same date in each year and do not refer, therefore, to the number of physicians at the same point in time in different years. The trend data should, therefore, be interpreted as being subject to some uncertainty.

The survey data from the practicing physicians survey on allopathic physicians represents approximately one-half of the allopathic physicians in Arizona. Allopathic physicians renew their licenses every two years on their birthdays. The current cycle is not yet complete, and the survey is continuing. The results from the current survey may, therefore, differ from the results when all surveys have been administered. The large percentage of physicians who have completed surveys and the selection by birthdays makes it extremely unlikely that the results are not representative of all allopathic physicians but that expectation cannot be confirmed until the survey process is complete. Osteopathic physicians renew as a group every two years so the survey results for the osteopathic physicians are complete.

Limitations of the Study

We have, hopefully, made it clear that the supply of physician services, rather than the number of physicians, is the best measure of the adequacy of the physician workforce. Part II of this study will be devoted to converting the numbers of physicians to physician services. One important element of the conversion that will be omitted is the number and placements of non-physician clinicians. The information is important as an influence on the productivity of physicians and, thereby, on the supply of physician services. Anecdotal information suggests that Arizona has an unusually large number of non-physician clinicians. It would, in our opinion, be both possible and useful to obtain information on the non-physician clinicians through the licensing agencies; however, that activity is outside the scope of the current project.

Another limitation of the study is the absence of data on physicians who have left the state. The licensing agency data include all physicians who maintain an Arizona license even if they do not practice within the state. If the current project is continued, it may be possible to survey physicians with recent changes from in-state to out-of-state addresses to obtain the reasons for their departures. Again, however, that is not within the scope of the current project.

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Appendix 1. New Physician Survey for Allopathic Physicians

Please complete the survey below and return with your application for licensure.

Applicant Name _____,

1. I'm applying for an Arizona license because: (select the three most important reasons from the "Reason for Applying for an AZ License": see box)

_____	_____	_____
Reason #1	Reason #2	Reason #3

REASON FOR APPLYING FOR AN AZ LICENSE
1. Completed a residency.
2. Considering retirement.
3. Bought into practice/became partner.
4. Opportunity to serve an underserved group.
5. Malpractice expenses too high in current practice state.
6. Position ended.
7. Too much paperwork.
8. To change the scope of practice.

2. Please indicate which of the following was important in influencing you to practice in Arizona. Circle **one** code number after each factor.

Factor	Important	Not Important	Does Not Apply
1. Grew up in the area	1	2	3
2. Personal ties in the community.....	1	2	3
3. Professional contacts.....	1	2	3
4. Characteristic of the community	1	2	3
5. Financial advantages.....	1	2	3
6. The opportunity to serve a particular group of people	1	2	3
7. Best professional opportunity available	1	2	3
8. Recruited by colleagues.....	1	2	3
9. Availability of adequate hospital facilities.....	1	2	3
10. Influence of Spouse	1	2	3
11. Location of military service.....	1	2	3
12. Location of residency.....	1	2	3
13. Earnings potential	1	2	3
14. Work environment/hours of work.....	1	2	3

15. If other important factor, specify_____

_____

3. Please list the code number from the list above which represents the SINGLE most important reason that influenced you to practice in Arizona.____

4. I am moving to (city/town)_____, Arizona from (city/town)_____ (state/country)_____.

Appendix 2. New Physician Survey for Osteopathic Physicians

Doctor's Name_____ AZ License Number: _____

5. COMPLIANCE WITH CME REQUIREMENT: Check how you complied and ATTACH the documentation:

____ I completed 20 hours of AOA approved category 1-A CME required during the calendar year 2004 or during an approved extension period; transcripts or certificates are attached

____ I completed or participated in an internship or residency program during 2004; a copy of a certificate of completion or a letter from the Dean of Medicine stating dates I was in residency is attached.

_____ I received a waiver of the CME requirement from the Board at their meeting on _____.

6. WORKFORCE SURVEY OF OSTEOPATHIC PHYSICIANS

A. I usually work _____ days per week (Mon- Fri) and _____ days per weekend (Sat-Sun).
B. I usually work _____ hours per day during the week (Mon-Fri) and _____ per day on the weekend (Sat-Sun).
C. I usually work _____ weeks per year, and _____ weekends per year.
D. I usually treat _____ patients in a typical week and _____ patients on a typical weekend.
E. My primary compensation is BEST described as (check only one);

	Base Salary/ Straight salary		Salary plus incentive		Production based

F. I can provide adequate care, without using a translator, to patients who speak the following languages: (check all that apply):

	English		French		Chinese		Hindi
	Spanish		Vietnamese		Arabic		Tagalog

G. What were the three most important reasons you did applied for an AZ license at the time you did so?

	Completed internship or PGY1 of residency		Bought practice / became partner		Changed specialty or scope of practice		Considering retiring / semi-retiring
	Completed full residency program		Employment opportunity		Malpractice rates more favorable		Other: please specify

H (a) How important were the following factors in your decision to practice in AZ? CIRCLE a number after each factor to answer.

FACTORS	Important	Not Important	Not Applicable
1. Grew up in the area	1	2	3
2. Personal ties in the community	1	2	3
3. Professional contacts	1	2	3
4. Characteristic of the community	1	2	3
5. Financial advantages	1	2	3
6. Opportunity to serve particular group of people	1	2	3
7. Best professional opportunity available	1	2	3
8. Recruited by colleagues	1	2	3
9. Availability of adequate hospital facilities	1	2	3
10. Influence of Spouse	1	2	3
11. Location of military service	1	2	3
12. Location of internship / residency	1	2	3
13. Earnings potential	1	2	3
14. Work environment/hours of work	1	2	3

15. If other important factor, specify_____

H. (b) Which was the SINGLE most important factor in your decision to practice in AZ? Factor #: _____

I. What city / town_____ and state _____did you move from, to practice in AZ?

7. SIGN AND DATE THIS FORM I, the undersigned, do hereby attest that the information I have provided the Board on this application and in the supporting documentation is true, complete, and accurate.
Signature _____ Date signed _____
License holder must sign the form; signature stamps are not accepted.

8. Mail to: AZ Board of Osteopathic Examiners, 9535 E Doubletree Ranch Road, Scottsdale AZ 85258.

Appendix 3. Practicing Physician Survey for Allopathic Physicians

Arizona License Number: _____ Name _____

A. My practice in 1998 and my current practice can be **BEST** described as (**check no more than two in each column**):

	In 1998		**Current**
	Not in Active Practice: Fully Retired		Not in Active Practice: Fully Retired
	Semi-Retired / On Leave		Semi- Retired / On Leave
	Group Practice		Group Practice
	Solo Practice		Solo Practice
	Hospitalist		Hospitalist
	Non-Profit Community Health Center		Non-Profit Community Health Center
	Government (VA, IHS, Public Health)		Government (VA, IHS, Public Health)
	Administrative Medicine		Administrative Medicine
	Academic/Teaching/Research		Academic/Teaching/Research
	In training (med school, intern, resident, fellow)		In training (med school, intern, resident, fellow)

B. My employment in 1998 and current can best be described as

	In 1998		**Current**
	Self-employed		Self-Employed
	Employee		Employee

C. My primary compensation is **BEST described as (check only one in each column)**

	In 1998		**Current**
	Base Salary/Straight Salary		Base Salary/Straight Salary
	Salary plus incentive		Salary plus incentive
	Production based		Production based

If **completely retired**, date of retirement _____ if **completely retired** this is the end of the survey, otherwise, please continue:

D. I usually work _____ days per week (Mon- Fri) and _____ days per weekend (Sat-Sun)

E. I usually work _____ hours per day during the week (Mon-Fri) and _____ per day on the weekend (Sat-Sun)

F. I usually work _____ weeks per year and _____ weekends per year

G. I usually treat _____ patients in a typical week and _____ patients on a typical weekend.

H. I can provide adequate care, without using a translator, to patients who speak the following languages: (check all that apply):

	English		French		Chinese		Hindi
	Spanish		Vietnamese		Arabic		Tagalog

I. What percent of your work time in a typical week is spent on each of the following?(Insert 0 if none)

1) Providing primary care to non-specialty patients _____ %
2) Providing primary care to continuing specialty patients _____ %
3) Providing specialty care only _____ %
4) Management of practice _____ %
5) Other _____ %

100%

Appendix 4. Practicing Physician Survey for Osteopathic Physicians

5. **COMPLIANCE WITH CONTINUING MEDICAL EDUCATION REQUIREMENT**
Initial the statement that describes how you complied with the requirement:

_____ I have completed at least 40 hours of category 1-A CME during the calendar years 2002 and 2003. I

_____ I have an approved extension, and have completed at least 40 hours of category 1-A CME between January 1, 2002 and May 30, 2004. I have attached transcripts or certificates showing my hours.

_____ I received a waiver from the Board at their meeting on _____.

6. WORKFORCE SURVEY OF OSTEOPATHIC PHYSICIANS
the Board is conducting a survey to assess the impact of the profession on the provision of health care in AZ. Please answer all questions.

A. I usually work _____days per week (Mon-Fri) and _____days per weekend (Sat-Sun).

B. I usually work _____hours per day during the week (Mon-Fri) and ___ hours per day on the weekends (Sat-Sun).

C. I usually work _____weeks per year, and _____ weekends per year.

D. I usually treat _____ patients in a typical week and ____ patients on a typical weekend.

E. My practice in 1998 and my current practice can be best described as (check only one in each column):

	In 1998		Current
	Group Practice		Group Practice
	Solo Practice		Solo Practice
	Hospitalist		Hospitalist
	Government (VA, IHS, Public Health)		Government (VA, IHS, Public Health)
	Administrative Medicine		Administrative Medicine
	Academic/Teaching/Research		Academic/Teaching/Research
	In training (med school, intern, resident, fellow)		In training (med school, intern, resident, fellow)
	Retired / On Leave		Retired / On Leave

F. My primary compensation is best described as (check only one in each column)

	In 1998		Current
	Self-employed		Self-employed
	Salaried		Salaried

G. I can provide adequate care, without using a translator, to patients who speak the following languages:
(check all that apply):

	Spanish		French		Chinese		Hindi
	Tagalog		Vietnamese		Arabic		English

&. SIGN AND DATE THIS FORM

I, the undersigned, do hereby attest that the information I have provided the Board on this application and in the supporting documentation is true, complete, and accurate.

Signature _____ Date signed _____

License holder must sign the form; signature stamps are not accepted.

8. MAIL FORM AND PAYMENT TO: AZ Board of Osteopathic Examiners
9535 E. Doubletree Ranch Road, Scottsdale AZ 85258

Appendix 5. Distribution of Practicing Physicians by County of Practice

County	2004						
	Allopathic Physicians		*Osteopathic Physicians*		*Total Physicians*		*Physicians per 100,000 People*
	N	*%*	*N*	*%*	*N*	*%*	*N*
All Physicians	*10,787**	*100%*	*1,237**	*100%*	*12,024**	*100%*	*207*
Urban	*9,307*	*86%*	*1,007*	*81%*	*10,314*	*86%*	*231*
Maricopa	6,906	64%	839	68%	7,745	64%	220
Pima	2,401	22%	168	14%	2,569	21%	276
Rural	*1,473*	*14%*	*229*	*19%*	*1,702*	*14%*	*124*
Apache	28	<1%	6	<1%	34	<1%	48
Cochise	118	1%	26	2%	144	1%	111
Coconino	306	3%	17	1%	323	3%	249
Gila	68	1%	19	2%	87	1%	161
Graham	21	<1%	1	<1%	22	<1%	61
Greenlee	7	<1%	-	-	7	<1%	84
La Paz	12	<1%	5	<1%	17	<1%	80
Mohave	195	2%	54	4%	249	2%	138
Navajo	88	1%	15	1%	103	1%	96
Pinal	124	1%	23	2%	147	1%	67
Santa Cruz	29	<1%	3	<1%	32	<1%	76
Yavapai	274	3%	43	3%	317	3%	161
Yuma	203	2%	17	1%	220	2%	121

Source: January 5, 2005 and 1992 MBD; July 1, 2004 Arizona Department of Economic Security Population Projections; and July 1, 1992 Census Population Estimates. Percentages may not add to 100% because of rounding. Compiled by the ASU HDRG.

Note: Includes MDs and DOs who practice medicine in Arizona. Excludes retired physicians; and physicians practicing solely in a federal facility may not be included because they are not required to have an Arizona medical license.

*Seven allopathic physicians and one osteopathic physician missing county location.

Appendix 6. Algorithm Used to Group Physician Specialties

Abbreviation	*Specialty Name*	*Osteopathic Specialty Abbreviation, 2004*	*Allopathic Specialty Abbreviation, 2004*	*General Medical Category*
ACU	Acupuncture		ACU	Other Specialty
ADM	Administrative medicine		ADM,MIN,MDM	Other Specialty
ADL	Adolescent		ADL,AMI	Other Specialty
AM	Aerospace medicine	AM/FP, AM/IM,AM/OE, AM/OM, AM/ONM, AM/PVM, AM/PM	AM	Other Specialty
A	Allergy	AI, AI/PUL	A,AI, IG	Medical
AN	Anesthesiology	AN, AN/FP, AN/GER, AN/GP, AN/IM	AN,APM	Hospital Specialty
CD	Cardiovascular Disease	C, C/IM, C/IM/NM, CD, CVD, CVD/IM	CD,IC,ICE	Medical Specialty
CCM	Critical care medicine		CCM,CCA,CCS,PCC	Hospital
D	Dermatology	D,D/AM,D/FP	D,DS	Medical
EM	Emergency Medicine	EM, EM/FP, EM/GP, EM/GP, EM/IM, EM/PVM	EM,PE, PEM	Hospital Specialty
END	Endocrinology		END,DIA	Medical
FP	Family Practice	FM, FP, FP/ADD, FP/AI, FP/AM,FP/BAR/OMM, FP/D, FP/EM,/FP/ER, FP/GE, FP/GER, FP/IM, FP/OBS, FP/OE,FP/OM, FP/OMM, FP/OMT, FP/OOM, FP/OOP, FP/OPH, FP/OS, FP/P, FP/PD, FP/PHP, FP/PVM, FP/S, FP/SM, GP, GP/ADD, GP/AN, GP/EM, GP/FP, GP/GER, GP/IM, GP/OBG, GP/OBS, GP/OM, GP/OMM, GP/OMT, GP/OMT/OE, GP/P,	FP,GP	Primary Care Specialty
GE	Gastroenterology	GE,GE/IM,	GE	Medical
GEN	Genetics		GEN,CBG,CG,	Other Specialty
GER	Geriatrics	GER	GER,FPG, IMG	Primary Care
GYN	Gynecology	GYN, GGYN/S, GYN/S, GO	GYN,GO	Other Specialty
HEM	Hematology	HEM/ON, HEO/IM,	HEM,HO	Medical
ID	Infectious Disease	ID/IM	ID	Medical

Abbreviation	*Specialty Name*	*Osteopathic Specialty Abbreviation, 2004*	*Allopathic Specialty Abbreviation, 2004*	*General Medical Category*
IM	Internal Medicine	IM, IM/AN, IM/C, IM/EM, IM/END, IM/FP, IM/GE, IM/GER, IM/GP, IM/HEO, IM/MDC, IM/N, IM/NEP, IM/NM/ENDO,IM/ON, IM/PD, IM/PDR, IM/PLM, IM/PUL, IM/RHU,IM/SM,	IM	Primary care Specialty
LM	Legal Medicine		LM	Other Specialty
NEP	Nephrology	NEP, NEP/IM,	NEP	Medical Specialty
N	Neurology	N, N/FP/OM, N/RM, N/SM	N,CN	Medical Specialty
NPM	Neonatology	NE	NPM	Pediatric Specialty
NM	Nuclear Medicine	NM	NM	Other Specialty
OBS	Obstetrics	OB/GYN, OBG, OBG/FP, OBG/OGS, OBG/S, OBG-GYN, OBGYN, OB-GYN, OGS	OBS,OBG	Surgery Specialty
OM	Occupational Medicine	OE, OE/FP, OE/GP,OM, OM/FP, OM/GP, OM/PD, OM/PM	OM	Other Specialty
ON	Oncology	ND, ON, ON/HEM	ON,OMO	Medical Specialty
OPH	Ophthalmology	OPH, OPH/OTL	OPH	Surgery Specialty
OTO	Otolaryngology	OTL, OTL/OPL, OTO,OTR, OTR/OOP,OTR/OPL, ENT, EENT	OTO,OFS,OT, HNS,NO, BE	Surgery Specialty
PNC	Pain Control		PNC	Other Specialty
PTH	Pathology	PTH. PTH/FP,PTH/GP PTH/NM, AP/D, AP/LBM, APL, FOP	PTH,ATP,BLB,CMP,LP ,FOP,IP,MP,DLI,NA,BB KDDL, HMP,NP,PCH, PCP,PP,SP	Hospital Specialty
PD	Pediatrics	PD, PD/AFP, PD/EM, PD/GP	PD,PDA	Primary Care Specialty
PDC	Pediatric Cardiology		PDC	Pediatric
PDE	Pediatric Endocrinology		PDE	Pediatric
PDG	Pediatric Gastroenterology		PDG,PG	Pediatric
PHO	Pediatric Hematology		PHO	Pediatric
PNP	Pediatric Nephrology		PNP,PN	Pediatric
PDP	Pediatric Pulmonary Disease		PDP	Pediatric
PA	Pharmacology		PA	Other Specialty

Abbreviation	*Specialty Name*	*Osteopathic Specialty Abbreviation, 2004*	*Allopathic Specialty Abbreviation, 2004*	*General Medical Category*
PM	Physical Medicine and Rehabilitation	PMPM/R,PM/RM,PM/RM/SM, PMR, RM, RM/OE/FP,RM/PM, PVM/RM	PM,PMM,PMR, SCI	Other Specialty
P	Psychiatry	P,P/ADD,P/EM,P/N,PYA	P,PYA,PFP,PYG	Other Specialty
CHP	Child Psychiatry	P/CHP, CHP, CHP/P	CHP	Other Specialty
PH	Public Health	PHP/PVM	EP	Other Specialty
PUD	Pulmonary Disease	PUD,PUL,PUL/IM	PUD	Medical
R	Radiology	R,R/AM,R/FP,R/N, R/NM, R/ON RADIO,RT,RTD,RTD/GP, DR	R,DR, PR, TR, AR,NBN,RNR,VIR	Hospital Specialty
RO	Radiation Oncology	RO	RO	Hospital
REN	Reproductive Endocrinology		REN	Other Specialty
RHU	Rheumatology	RHU,RHU/IM	RHU	Medical Specialty
SM	Sports Medicine	SM,SM/FP, SM/FP/OM, SM/RM	SM,ESM, FSM,ISM,PSM	Other Specialty
GS	General Surgery	S,S/DR, S/EM, S/FP, S/GP	GS,TRS,AS	Surgery Specialty
CDS	Cardiovascular Surgery	S/TCV, TCV, TCV/S, CTS,CVS	CDS,CTS	Surgery Specialty
CRS	Colorectal Surgery		CRS,ABS	Surgery
HS	Hand Surgery	OR/HS,ORS/HS	HS	Surgery
MFS	Maxillofacial Surgery		MFS,CFS	Surgery
NS	Neurosurgery		NS	Surgery
ORS	Orthopedic Surgery	OR,OR/S,ORS,ORS/S	ORS,OSM,OSS, OTR	Surgery
PDS	Pediatric Surgery		PDS	Surgery
PS	Plastic Surgery	OOP, PLR	PS,FRS,PSH	Surgery
TS	Thoracic Surgery	TS	TS	Surgery
U	Urology	U,U/URS,UR, URS	U	Surgery
VS	Vascular Surgery	S/GVS, GVS,	VS	Surgery
CCP	Pediatric Critical Care		CCP	Hospital Specialty
DBP	Developmental/Behavioral		DBP,NDP	Pediatric
NSP	Pediatric Neurosurgery		NSP	Surgery
OP	Pediatric Orthopedics		OP	Surgery
PAN	Pediatric Anesthesiology		PAN	Hospital Specialty
PDI	Pediatric Infectious Disease		PDI	Pediatric
PDO	Pediatric Otolaryngology		PDO	Surgery
PO	Pediatric Ophthalmology		PO	Surgery
PRO	Proctology	PR, PR/FP,	PRO	Surgery
SO	Surgical Oncology		SO	Surgery
UM	Underseas Hyperbaric Medicine		UM	Other specialty

Abbreviation	*Specialty Name*	*Osteopathic Specialty Abbreviation, 2004*	*Allopathic Specialty Abbreviation, 2004*	*General Medical Category*
UP	Pediatric Urology		UP	Surgery
VM	Vascular Medicine		VM	Other Specialty
RES	Research		RES	Other Specialty
INT	Intern		INT	Unknown
NK	Unknown Specialty		NK	Unknown
TTS	Transplant Surgery		TTS	Surgery
CMD	Addiction Medicine	ADD, ADD/FP	CMD ,ADP	Other Specialty
HYP	Hypnosis		HYP	Other Specialty
OS	Other Specialty	SCL	OS,MED,HSP,SRG,PLM, PYM	Other Specialty
TOX	Medical Toxicology		TOX ,ETX, PHM, PDT,PTX	Other Specialty
HOS	Hospitalist		HOS	Hospital
HEP	Hepatologist		HEP	Other Specialty
PMD	Pain Control		PMD	Other Specialty
OMM	Osteopathic Manipulative Medicine	NMM, OMM/FP, OMMOMM/GP, OMT		Other Specialty
PHP	Preventive Medicine	PVM, PVM/FP, PVM/OE,		Other Specialty

MEMORANDUM OF UNDERSTANDING REGARDING THE EXPANSION OF MEDICAL EDUCATION AND RESEARCH IN PHOENIX

August 4, 2004

The Arizona Board of Regents
The University of Arizona
The Arizona State University

The doctrinal mandate of the Arizona Board of Regents—Article XI, Sections 1, 2, 5, and 10 of the Arizona Constitution—distinctly vests in ABOR the general conduct and supervision of Arizona's universities. The Arizona Constitution also vests in the Arizona Legislature the power to appropriate tax monies for the establishment and maintenance of Arizona's universities. Thus, ABOR's constitutional autonomy is ultimately defined by judicial decisions confirming its general powers and by the Arizona Legislature's authority over appropriations for the general support of higher educational endeavors.

With this Constitutional mandate, ABOR is responsible for advancing the design and direction of our universities as they move forward to address the needs of the people of Arizona. In this design, ABOR manages a three-university system that has emerged from the original single university campus of the University of Arizona and the subsequent growth and maturation of Arizona State University and Northern Arizona University. As demand for higher education and advanced research services has increased in Arizona the Arizona University System has evolved and its design updated.

The University of Arizona was established by the 13th Territorial Legislature in 1885 as Arizona's land-grant university, with the first class held in 1891. With this history, a developed infrastructure, and its status as Arizona's first research university, the U of A was considered by all to be the natural choice for the location of Arizona's College of Medicine. Arizona's first and only public college of medicine was created by ABOR in 1962 and opened in the fall of 1967. Since 1992 the U of A College of Medicine has been conducting clinical instruction for medical students in conjunction with the major hospitals in Maricopa County, where approximately 40% of the MD students receive their third and fourth-year clinical education today, operating out of leased offices and classrooms in Phoenix with clinical instruction in nine area hospitals.

Arizona State University's status was changed from college to university in 1958 and its first Ph.D. was authorized by ABOR in 1958. ASU's trajectory, from a "normal" college just four years prior to the creation of the U of A's college of medicine, to its present status as a "Research Extensive" Carnegie level university makes it imperative that it participate in and benefit from the expansion of medical education and research in Arizona.

The need for expanding and enhancing the design is acute and ABOR has undertaken a broad redesign effort with regard to the overall system. In addition, but on a much narrower basis the time has come to begin the efforts of expanding the system's capacity in biomedical education and research. This acute need derives from the fact that as the state has grown in population and complexity the Phoenix metropolitan area and all of its healthcare enterprises have been left without the benefit of a fully developed, public, research-grade, teaching medical school. The absence of a fully developed college of medicine in Phoenix disadvantages Phoenix and Arizona now and will adversely influence the quality of healthcare and the environment for continued development of Arizona's biotechnology industry.

The U of A's college of medicine has a solid reputation and a proven record of obtaining medical research grants. The synergistic effect of the college of medicine and its teaching hospitals in Tucson, and surrounding areas, provides high quality healthcare services and a research environment conducive to the development of the biomedical and biotechnology industries. ABOR wishes to expand the operations of the U of A's college of medicine in Phoenix to include first and second year students and complementary research. It also wishes to build facilities on the Phoenix Biomedical Campus of the Arizona University System in conjunction with one or more existing teaching hospitals. The goal is to leverage cost efficiencies without uprooting the significant financial investment already vested in our statewide medical education and research efforts.

ABOR also wishes to reaffirm the planned relocation of ASU College of Nursing to the Phoenix Biomedical Campus, where ASU and the U of A are also planning research facilities to operated jointly by the U of A and ASU through the Arizona Biomedical Collaborative.

It was thought by some that ASU's ability to move from normal school status to Research Extensive University status would be impaired by its lack of a college of medicine. This has not proved to be the case as ASU has already achieved Research Extensive University status without the cost burdens associated with a medical school and a teaching hospital. Both ASU and U of A stand poised to advance significantly their research grants and their contribution to medical education in Arizona by cooperation and collaboration on an expanded U of A college of medicine in the greater Phoenix area. It is anticipated by ABOR that this expansion from Tucson to Phoenix will involve no less than the development of full-time faculty providing instruction to M.D. candidates for all four years while also engaging in research and clinical practice. ABOR wishes to advance this programmatic theme by providing for joint faculty appointments of basic science faculty at ASU and the U of A, and simultaneously expanding the faculties of both universities in fields related to the health sciences. ABOR will also rely on Arizona's pioneering Telemedicine Network to connect all medical education participants in a unified curriculum.

ABOR does not wish to build a separately accredited or separately managed college of medicine in Phoenix. It believes that a significantly expanded presence of the

U of A's college of medicine in Phoenix, with two synergistically related campuses, involving faculty from both the U of A and ASU is the best strategic choice to advance Arizona's healthcare needs and its expansion of bio-medical education, research and technology.

This Memorandum of Understanding[1] is intended to memorialize ABOR's commitment to this approach to the U of A College of Medicine's expanded presence on the Phoenix Biomedical Campus. It is not intended as a comprehensive agreement or as a path to the difficult funding and important collaborations and partnerships that must necessarily come from the healthcare industry in general and the many state, county and municipal interests that must be accommodated. Our purpose in executing this Memorandum of Understanding is to establish several First Principles that we determine critical to the design and development process.

First Principles

1. ABOR does not wish to entertain the funding, accrediting, logistical, or staffing hurdles that are inherent in building a second college of medicine in Arizona and firmly believes that its existing college of medicine should be expanded to meet Arizona's healthcare and medical education needs.
2. This method of expansion of the U of A college of medicine must serve the social and economic needs of the people of Arizona by fully developing a research grade medical school in Phoenix designed to address our 21st century healthcare challenges.
3. This method of expansion will involve both physical and intellectual assets of the U of A's college of medicine. It will link with and draw from other critical physical and intellectual assets from Arizona State University to complement its programs in teaching and research.
4. The design of the Phoenix-based expansion of the college of medicine will focus on the unique social, cultural and healthcare system needs in metropolitan Phoenix. Its training and research programs will be reflective of these needs and synergistic with existing capabilities at ASU, T-Gen and area hospitals, institutes and foundations.

[1] The understandings and policy implications inherent in this Memorandum of Understanding will be submitted for discussion and ratification by the Arizona Board of Regents at its August 19-20, 2004 meeting at Northern Arizona University.

5. The design of this expansion unit of the college of medicine will be done in a way that complements rather than replicates the research strengths of the Tucson campus of the medical school or the Tempe campus of Arizona State University.
6. The design is to be done in a way that maximizes the collective assets of the U of A and ASU and most efficiently builds upon existing capabilities throughout the State of Arizona.
7. The U of A college of medicine will offer a single united curriculum for accreditation, making efficient use of the Telemedicine Network for interconnecting all centers of learning.
8. ABOR wishes to avoid the political and cultural obstacles inherent in the historical development of its two Research Extensive Universities and does not wish to exacerbate the many obstacles that must be overcome to advance our approach to the building of a college of medicine for the betterment of the people of Arizona. ABOR therefore proposes that the U of A and ASU agree to collaborate in the development of the Phoenix Biomedical Campus and to give appropriate attention to the interests of both universities in this process.
9. ABOR has asked the U of A to assume the lead in conceptualizing the expansion of its college of medicine on the Phoenix Biomedical Campus. The U of A agrees to assume the lead position and to involve directly ASU's administration and faculty in the planning process.
10. ABOR has asked ASU to assume the lead in conceptualizing how it can serve this expansion of healthcare, medical research and medical education by making its faculty and research facilities available and to assist the U of A in a collaborative process of identifying faculty interested in joint appointments in the U of A's college of medicine. ASU agrees to take this initiative and to involve directly the U of A's administration and appropriate faculty as it evaluates its faculty and research offerings.
11. ABOR has asked the U of A and ASU to coordinate their mutual efforts in expanding medical education and research efforts to the mutual end that healthcare, biomedical science and biomedical engineering efforts are steadily advanced by the addition of a Phoenix campus to our existing college of medicine. Both

universities have pledged to ABOR that they will coordinate and cooperate and that they understand that this effort is considered by ABOR to be a primary policy initiative.

12. ABOR has asked the U of A and ASU to emphasize the advancement of the Arizona University System goals and public needs and to do everything possible to inhibit the natural tendencies of individual institutions to advance their own reputational interests to the possible detriment of the needs of medical education and research in Arizona.
13. ABOR, the U of A and ASU believe that the planning process should evolve over the short term. Attached hereto as "Addendum A" is the current understanding regarding the planning process. It is anticipated that other areas may be added as the partnerships and new collaborations come into being.

Summary

It is the intent of ABOR to advance our university system and our two Research Extensive universities to the level of national prominence in biomedical teaching and research. We intend to lay the foundation for the M.D. demands of a state of 8 to 10 million people and to expand our presence in the biomedical research arena.

This will be accomplished by expanding the college of medicine into Phoenix in a way that ensures the success of our community, the college of medicine and both the U of A and ASU.

The implementation of this planning, design and development process will occur at several levels as specified in the thirteen First Principles set forth above. Adherence to and implementation of these First Principles will require the ongoing participation and leadership of the presidents of ABOR, U of A, and ASU. It is anticipated that ABOR will ratify this Memorandum of Understanding at its August 2004 meeting and that the presidents of the U of A and ASU will present a design and development plan for these coordinated efforts on or before the ABOR January 2005 meeting.

The First Principles stated in the Memorandum of Understanding will be utilized in all forthcoming discussions and planning endeavors. The four areas of planning, design and development stated in Addendum A will be monitored and utilized as the development of the Phoenix Biomedical Campus of the Arizona University System evolves. Our purpose in signing this memorandum of understanding is to convey to the people of Arizona our joint commitment to the advancement of medical education and research in Arizona and to forestall tangential and historical arguments predicated on geographical boundaries or institutional perceptions of favoritism. By our signatures today, we commit to one another and to the people of Arizona our promise to work together to advance medical education and research under a single college of medicine in Arizona.

8/4/04

Gary L. Stuart, President
Arizona Board of Regents

Date

8/4/04

Peter W. Likins, President
University of Arizona

Date

8/4/04

Michael M. Crow, President
Arizona State University

Date

ADDENDUM "A" TO ABOR, U OF A, ASU MEMORANDUM OF UNDERSTANDING REGARDING EXPANSION OF MEDICAL EDUCATION AND RESEARCH IN PHOENIX

August 4, 2004

In expanding the college of medicine into Phoenix four areas of planning, design and development will be required. These areas are each essential to the success of this expansion and in a critically important way essential to the success of the further maturation of the university system and the development of a great biomedical teaching and research base in Phoenix. The four areas of planning, design and development include:

1. The Phoenix Biomedical Campus of the Arizona University System:

   The Phoenix Biomedical Campus will be linked to the planning of the capital center campus of ASU and a joint planning, design and development effort will be undertaken to establish a physical environment that can be the home for TGEN, the U of A College of Medicine, new hospital facilities and associated research and teaching enterprises. This will include the ASU College of Nursing and an appropriate presence for the U of A College of Pharmacy, and public health faculty from both universities. This campus must establish an environment for maximum cooperation.

2. The University of Arizona College of Medicine:

   An expansion plan must be carefully developed that positions the U of A college of medicine not only for expansion in M.D. production but also for research and clinical engagement. This plan will involve the U of A faculty and a wide range of healthcare provider organizations. In addition, this process will involve those elements available or developable at ASU that would complement the value and heighten the success of this expansion.

3. Arizona State University:

   It is anticipated that ASU will assist in the expansion of the college of medicine through a focused set of designed linkages. Each of these linkages

is intended to complement, augment and speed the expansion of the college of medicine and to secure for ASU a clearly articulated linkage in the best interests of the college of medicine, ASU, and the university system as a whole. The specific assets of ASU to be considered in this planning, design and development process include:

a. A medical undergraduate teaching linkage as required by the dean of the college of medicine.
b. Defined and specific research linkages through the Arizona Biomedical Collaborative in areas such as; personalized medicine research, urban health, Native American health and biodesign.
c. The development of a new department at ASU in Biomedical Informatics that would be a department in the Fulton School of Engineering and Applied Science and the U of A college of medicine, subject to the appropriate approvals of the academic community in both universities.
d. Specified linkages with the ASU College of Nursing and the ASU Nutrition Program.
e. Joint faculty appointments as approved by appropriate faculties in the same way as joint appointments are handled internal to either university.
f. Joint degrees with the college of medicine as developed and approved through the normal review process basis.

4 Telemedicine Teaching and Research:

It is anticipated that this planning, design and development process will make full use of emerging telemedicine teaching and research enhancement technologies between Tucson and Phoenix in both directions. This parameter is intended to illustrate that it is assumed that the level of cooperation between the campuses of the college of medicine will be unparalleled.

Executive Order 2004-25

Establishing the Arizona Commission on Medical Education and Research

WHEREAS, the delivery of health care is critical to the quality of life of all Arizonans; and

WHEREAS, we stand on the edge of a new age in medical research and the treatment of disease; and

WHEREAS, the State of Arizona has committed resources and leadership to the development of world class bio-medical education and research; and

WHEREAS, the Arizona Board of Regents, the University of Arizona and Arizona State University have signed a Memorandum of Understanding to partner in the expansion of the University of Arizona's College of Medicine in Maricopa County; and

WHEREAS, the success of the medical school and the bio-medical research efforts will be directly tied to relationships and affiliation agreements with the community's health care delivery system; and

WHEREAS, it is imperative that medical education, research and health care delivery systems in this state develop a shared vision for the future of healthcare education;

NOW THEREFORE, I, Janet Napolitano, Governor of the State of Arizona, by virtue of the powers vested in me by the Constitution and the laws of the State, do hereby establish the Arizona Commission on Medical Education and Research ("ACMER" or "Commission").

1. The Commission is charged with developing a plan to implement the principles outlined in the August 4, 2004 Memorandum Of Understanding regarding the "Expansion of Medical Education and Research in Phoenix" adopted by the Arizona Board of Regents, Arizona State University, and the University of Arizona.

   Specific areas of planning, design and development include:

   A. The organization and governance structure of the expansion;
   B. A curriculum that focuses on the unique social, cultural, and health care system needs in the Phoenix metropolitan region;
   C. The essential clinical linkages among regional teaching hospitals and research institutes to facilitate teaching of students and research collaboration;
   D. The financing of operations and capital needs;
   E. Facility planning, location and design; and

F. Such other matters as may be in the best interest of comprehensive, but cost effective, delivery of health care in the state of Arizona.

2. Members of the Council shall be appointed by and serve at the pleasure of the Governor. Initial Commission membership shall consist of the following:

The Honorable Janet Napolitano, Governor (chair)
The Honorable Phil Gordon, Mayor of Phoenix
Gary Stuart, President of the Arizona Board of Regents
Peter Likins, President of the University of Arizona
Michael Crow, President of Arizona State University
Peter Fine, President and CEO of Banner Health
Linda Hunt, Chief Executive Officer of St. Joseph's Hospital and Medical Center
Jim Kennedy, Chief Medical Officer, Maricopa County Hospital
Jeffrey Trent, President and Scientific Director of the Translational Genomics Research Institute
John Murphy, Executive Director, the Flinn Foundation

The Governor may appoint other members as may be necessary.

3. The Commission shall issue its initial recommendations to the Governor as early as possible, but by no later than
March 30, 2005.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Arizona

GOVERNOR

DONE at the Capitol in Phoenix on this 19th day of October in the Year of Our Lord Two Thousand and Four and of the independence of the United States of America the Two Hundred and Twenty Ninth.

ATTEST:

SECRETARY OF STATE

INTERIM EXECUTIVE REPORT

IMPLEMENTATION OF THE PHOENIX PROGRAM OF THE UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE: DIRECTIONS AND IMPERATIVES

Prepared for

ARIZONA COMMISSION FOR MEDICAL EDUCATION AND RESEARCH

JUNE 15, 2005

KURT SALMON ASSOCIATES
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A. Introduction and Context

In August 2004, the University of Arizona ("UA") and Arizona State University ("ASU") signed an historic Memorandum of Understanding ("MOU") under the aegis of their shared Board of Regents ("ABOR") to advance a major medical school presence in Phoenix. A second medical school program is clearly needed in Arizona, a State with a dramatically rising population and subsequent demand for health care. Arizona already is both underserved and training insufficient numbers of physicians and related health professionals to assure future access to quality health care for its citizens. The MOU is explicit in the intent to charter the new program by extending the State's only accredited medical school at UA into Phoenix, effectively creating the Phoenix Program of the University of Arizona College of Medicine ("Phoenix Program"). The MOU is similarly explicit that this extension is to be a collaborative effort involving the leadership, faculties, and strengths of both UA and ASU. The site of the medical school development is to be on the Phoenix Biomedical Campus ("PBC") provided by the City of Phoenix, adjacent to the new Translational Genomics ("TGen") research facility and planned related investments in biotechnology.

While the MOU addresses key educational and academic planning principles relating to UA and ASU, the document and process could not encompass the broad range of associated institutions that are beyond the fiduciary jurisdiction of the Regents. These include the current UA affiliated teaching hospitals in Phoenix, each governed through a range of public and private formats. Nor could the MOU effectively embrace the very sizeable UA affiliated, but private, clinical faculty physician staff currently organized at their respective affiliated teaching hospitals. Similarly, the City of Phoenix itself, although providing the land for the PBC as an essential partner, is accountable to its citizens for economic development extending beyond the elements addressed in the MOU. Finally, new organizations such as TGen have been chartered with their own missions for advancing biomedical science and economy on the PBC, and although key collaborators in the new medical school program, must nonetheless hold to their own purposes.

By Fall 2004, it was clear an even broader process and mandate were required to galvanize the necessary dialogue across such diverse participants. Governor Napolitano addressed this critical need through an executive order creating the Arizona Commission on Medical Education and Research ("ACMER"), with membership representative of the broad constituency. Kurt Salmon Associates ("KSA") was engaged to assist ACMER and on a monthly basis beginning in December, KSA has facilitated elements of the Commission's discussion. We have had further opportunities to meet with, and better understand the diverse aims of, the Universities, teaching hospitals, private faculty, TGen, the City, and the State. Following are our observations and counsel relating to the continuing implementation of the MOU in the context of these many stakeholders. Greater detail, where available, is contained in the accompanying Appendices.

B. The Phoenix Program on the PBC

Based on the specific circumstances in Phoenix relating to timing of budgets, accreditation, building, organizing, and the like, it is clear the full implementation of the final envisioned Phoenix Program must occur in phases.

Introduction

The initial phase – termed “Level I” – is immediate and oriented towards the inaugural matriculating class of 24 students based in the renovated Phoenix High School facilities on the PBC. The initial capital funding for this phase is identified with the PBC site itself, the High School renovations, and ABC1 are all advancing as well and an operating budget for the 24-student class is similarly identified through the steady state graduation cycle of the class. The current teaching hospital and clinical faculty arrangements in Phoenix will suffice to carry Level 1 implementation, with some adjustment for the envisioned Phoenix Track curriculum (the “Curriculum”). A new, dedicated teaching hospital is not needed for Level I, nor is one recommended for this first phase. In sum, this phase is planned in considerable detail, and certainly sufficiently understood to continue proceeding on the timeline envisioned.

The subsequent developments necessary to advance the class to upwards of 150 students – broadly classed as Level II – will require additional capacities and organizational alignments best undertaken once an actual Phoenix Program operation is up and running. Having the Program in place will provide both the dedicated leadership and organizational framework for advancing the range of topics necessary. We suggest these topics, all extensions of the Level I implementation, be based around nine key concepts. Following are brief overviews of these, our assessment of the firm agreements emerging for the Level I over the December 2004-May 2005 period of ACMER meetings, as well as our sense of the Level II considerations going forward.

1. Vision

Context

The collective vision must result in more and better health care for the citizens of Arizona and more physicians to serve the State's escalating need. However, the stated goal of the Regents, and also a goal for the City and TGen, is for the new medical school program to operate at research grade – an aspiration with implications beyond just educating more students. Research success must be nurtured in environments providing both peer collaborators and funding, and the combination of major biomedical education and research in a medical school setting is best advanced through the development of a broader academic medical center environment. Such a broader interpretation of vision, anchored in innovation and excellence in medical education, biomedical research, and clinical care, is believed to be essential to drive economic development through the PBC.

Level I Planning Outcomes

Significant progress has been made over the past few months in defining the Phoenix Program vision that will extend into successive phases. Agreement has been achieved through ACMER around:

- The need to train more and better physicians, a critical outcome for all concerned.
- The medical education provided must anticipate and adopt innovative curricula and teaching methods. This has been initiated via the facilitation of the Phoenix Track Design Team and the intellectual contributions of the UA, ASU, TGen, and related leadership.
- The principle of enhanced economic development through the activities related to the Phoenix Program on the PBC. A greater level of detailed agreement relative to the overall mission and build-out of the PBC site is still pending, although much of the discussion is contingent on the course of the Level II implementation.

At this point a good base of momentum exists around the Phoenix medical education program *per se*, important because this element is on a critical time path for a 2006/7 implementation.

Level II Considerations

Continuing consensus around the evolution of the PBC vision is essential over the coming months. The current work of the Task Forces related to the feasibility of clinical concepts, research concepts, master planning, and the like should provide the necessary factual backdrop for aligning the dialogue. Maintaining and agreeing on a vision should be a relatively high priority to minimize potential friction and conflict over how the PBC site is developed and the type of organizations that are invited, or accepted, as PBC facility occupants. While some stakeholders have advanced aggressive vision for the site to fully incorporate complementary research and clinical elements and operate as a full fledged academic medical center campus, others maintain that a clinical presence in particular is not needed in the current downtown Phoenix market because it likely would be redundant with existing investments. Further discussion of PBC planning occurs in Section 8 below.

2. Leadership

Context

Given the intent of the MOU to extend the UA College of Medicine (COM) and the accountability requirements of the LCME, it is clear the principal leadership in creating the Phoenix Program must flow from the Dean and Chairs of the UA College of Medicine. Given their mandate to collaborate with ASU and with the practical need to do the same with their affiliated Phoenix teaching hospitals and faculty, all located a fair distance from Tucson, this leadership mandate is not a simple task. It is, however, an essential outcome to the success of this entire endeavor as envisioned. (Further discussion of selected medical school organizational models appears in the Appendices.)

Level I Planning Outcomes

While each of the participating organizations has effective leadership structures for the conduct of their own affairs, the creation of a working set of structures across these entities and across geographies continues to be a significant challenge. This is particularly true of the Phoenix Program, of the University of Arizona College of Medicine, where the UA COM must retain clear operating authority while meaningfully factoring in roles and authorities for those organizations and individuals with whom they are collaborating. In what follows this enterprise is simply referred to as the "Phoenix Program."

A comprehensive process coordinated through ACMER has been identified, and is heavily in motion to support the implementation:

- Adoption of an overall process architecture through which the UA COM can productively engage the many constituencies of the Phoenix community in advancing the work. This is a strongly inclusive process involving multi-representative task forces and team constructs.
- Identification of individual leadership within this process from ABOR, UA, ASU, TGen, the City of Phoenix, the State of Arizona, the teaching hospitals, the voluntary clinical faculty, and other participants essential to the success of the implementation.

While a process is in place, sheer numbers of individuals and the multiplicity of communications will continue to challenge the motivation and patience of all concerned, although hopefully at reduced levels.

Level II Considerations

The express goal of most in both Tucson and Phoenix is to evolve the Phoenix Program over time to approximately 150 students per class. This would become perhaps an even larger program than Tucson itself (now at 110 per class) and, presuming the research activity of the faculty is appropriate to levels found in other outstanding programs, would involve a very significantly sized set of clinical departments and faculty – clearly much larger than what is in Phoenix today at the affiliated hospitals. While the Phoenix Program, regardless of its size, must continue to operate under the ultimate accountability of the UA COM Dean and Chairs, we

believe a full-time, geographic (i.e., Phoenix-based) leadership model must be developed for the Phoenix site at the program level, as well as at the departmental, level to best manage ongoing operational affairs successfully.

Specifically, the Phoenix Program involves a collaborative structure, with ASU providing significant academic elements of the program, and we therefore suggest that the UA Phoenix Program leader also have a meaningful joint appointment at ASU. The goal here is to ensure that the Phoenix Program leader can be effectively influential in the academic hierarchy of both universities. Joint academic appointments can be complex for all concerned; however, the Phoenix Program is being shaped in an environment that is in fact complex, diverse, and profoundly challenging. Connections that create relationships and communications among the organizations and people and across institutions will serve to advance implementation initially and solidify program components over the long term.

The evolution of a full-time geographic leadership structure does not obviate the need for the steering committees and current set of task forces, nor does it supplant the current leadership in these forums. The dedicated leadership we suggest is intended to provide a local focus for galvanizing the processes in place and to begin the necessary transition from the current planning-based initiatives to the more operational-based initiatives essential to commencing affairs in 2006/7.

3. Partnerships

Context

Collaborative partnerships across a broad range of public and private organizations are essential to capitalizing on local strengths and to achieving national distinction for the Phoenix Program. These partnerships must be forged and maintained across UA, ASU, the Phoenix teaching hospitals and their physician faculty, TGen, and other public and private sector organizations in the creation of the new faculty, programs, facilities and finances that will anchor the Phoenix Program. Given the multiplicity of participants, the range of missions and the invariable breaks in continuity, the "partnering" process requires more formalized structure to ensure uniform understandings going forward.

Level I Planning Outcomes

Other than the MOU that aligns the academic collaboration of UA and ASU, and the broader collaborative initiatives of ACMER to advance this MOU, there is as of yet no permanent organizational framework for defining relationships among the diverse Phoenix Program constituents beyond voluntary cooperation. A number of evolving relationships are now active in this early planning:

- Collaboration between UA, ASU, and TGen to define programs and faculty for both the educational and research enterprises.
- Collaboration and evolving land use agreements between the City and PBC occupants including UA, ASU, and possible hospital organizations for the provision of clinical actively on the site.
- Affiliation discussions between UA and the teaching hospitals and voluntary clinical faculty relating to the new and expanded training programs envisioned.

The MOU and other guidance such as the PBC master plan (discussed later in this report in Section 8) are invaluable in clarifying common goals and establishing parameters as implementation of the Phoenix Program evolves.

Level II Considerations

The formation of the Commission has enabled the primary stakeholders to conduct a dialogue and advance the planning for the Phoenix Program in a transparent, safe and mutually respectful environment. However, the financial and operational agreements that will need to be legally constructed to implement various aspects of the Phoenix Program will involve, almost exclusively, the University of Arizona COM in one-on-one negotiation with a range of independent entities. While some of these entities may be represented on ACMER, the Commission *per se* is unlikely to have a role in defining or executing these individual agreements.

Where possible, guidance similar to the MOU or the PBC master plan should be developed to provide a visible framework for partnerships and other formal collaborations around the Phoenix Program. The intent of such guidance should not be to inhibit or limit how and with whom partnerships are formed, but rather to ensure that relationships enhance the goals of the Phoenix Program and are creatively structured for flexibility as the initiative matures. Over time, it may be necessary to explore governance structures, at least on an advisory basis, across the many organizations participating on the PBC.

4. Teaching Hospitals

Context

The UA College of Medicine has in place in Phoenix a strong set of teaching hospital affiliations. The extension of clinical training to the full 4-year Phoenix Program must be focused through these institutions, given that the development of alternative venues is not practical in a near-term timeline. (Further discussion of hospital affiliation issues appears in the Appendices.)

Level I Planning Outcomes

After reviewing a range of models with ACMER over the past few months, agreement has been achieved on two key outcomes:

- The Phoenix Program will be initiated by building upon the current set of UA-affiliated teaching hospitals in Phoenix. Although nine such affiliations exist, four of these institutions – Good Samaritan, St. Joseph, Children's, and Maricopa County – have the largest activity levels. Several of these facilities provide superb levels of clinical care and have excellent market recognition.
- All of the hospital teaching programs are organized primarily for training 3rd and 4th year medical students and all will require expansions and adaptations of their programs and staff to accommodate the new curriculum and students.

Bottom line, the Phoenix teaching hospitals will meet the Phoenix Program Level I education requirements; however, they are not currently organized nor academically resourced to realize the vision of ABOR and the Commission beyond Level I.

Level II Considerations

The creation of the Phoenix Program in the 2006/7 timeframe is possible solely because of the current set of UA teaching hospitals in Phoenix and their medical education commitments to date. The diversity of participating institutions provides a further opportunity to extend the range of medical education experiences to be far more representative of actual practice than is often found in traditional "university hospital" environments. The challenge will be in extending the roles of these institutions to serve as the lead teaching hospitals for the envisioned 150-student, research intensive Phoenix Program. Specifically, these institutions are highly competitive with each other along a host of programmatic fronts. Most have made, or are planning to make, significant capital investments in both new and expanded programs and facilities. The result of these dynamics is that none of the hospitals will have any interest in added capacity in the Phoenix market unless they provide or control it. In addition, with the very notable exception of programs such as the Barrow Neurological Institute, the majority of the current Phoenix-based academic departments – and therefore their teaching hospitals by extension – are not engaged in levels of extramurally funded research approaching the Level II aspirations for the Phoenix Program. Even if based across several institutions, programs of the stature of the Barrow must be developed over the coming decade in at least one of *each* of the clinical departments.

Teaching Hospitals

Although a few models exist where distributed clinical sites are utilized – for example, in Boston – such settings have been a great many decades in the making, and this does not appear to be an acceptable timeframe for accomplishing the aims of the MOU in Phoenix. If a distributed teaching hospital model is to be sustained, then at least some of the current UA affiliated teaching hospitals in Phoenix will have to make major strategic and mission decisions to fully embrace the educational and research missions necessary to achieve comparability with the schools at "research" universities. This ultimately requires specific statements of intent and firm multiyear financial commitments by the hospitals. To the degree this does not occur, ABOR must consider alternative strategies to provide such settings over time. For the moment, the UA-affiliated Phoenix teaching hospitals essentially have the strategic "right of first refusal" to evolve into the necessary roles. For them to do so will be an ongoing process requiring transparency and structure to ensure progress.

5. Clinical Faculty

Context

The UA College of Medicine has in place a large number of private clinical faculty appointments in Phoenix and this complement will provide the core clinical training capacity for the Phoenix Program. The existence of these faculty is particularly critical for the 2006/7 start year, given the development of alternative venues is not practical in this near a timeline.

Level I Planning Outcomes

ACMER has also reviewed a range of clinical faculty organization models, and achieved agreement that:

- The core of the initial clinical faculty for the Phoenix Program will be constituted from the large private faculty staff currently in place at the Phoenix Track affiliated hospitals. However, once finalized, the new curriculum will call not only for an escalation in numbers of medical school students in Phoenix, but also for earlier clinical involvement – in the first and second years as well as in the third and fourth. Thus, there is no question that the clinical faculty must be expanded to provide both the needed capacity and skills.

To date, the clinical practice organization of such expansions has not been determined. Currently, virtually all the private clinical faculty are organized in practice plan arrangements based in their incumbent teaching hospitals. These practice arrangements have proven quite acceptable for the faculty and their hospital partners from both compensation and accountability perspectives. Significant anxiety does exist, however, around the possibility of any additional “University” based practice plans being created in Phoenix – the presumed concern being that such an entry may well signal the beginning of an eventual consolidation into a more traditionally structured medical school model.

Level II Considerations

As is the case with the teaching hospitals, the private practice plan structures as currently organized will not support the longer range Level II objectives envisioned for the Phoenix Program. Nationwide, partial allocations of practice plan revenues provide key sources for funding academic programs and for seeding research time for faculty in virtually all of major academic departments. Moreover, successfully accomplishing such faculty models requires that a fine balance of professional work contribution, compensation, and career satisfaction be achieved, and this not a simple task. While these funding models have on occasion been accomplished in private practice structures in New York and Boston, such structures typically do not reserve sufficient time and dollars to advance the research agenda. Rather, the private practice structures generally allocate more to individual compensation, do not build reserves for future academic investments, and do not attract and retain the numbers of promising investigators needed to drive the research agenda.

Clinical Faculty

The necessary expansion of the clinical faculty in Phoenix, and the basic economic structures underpinning their practice plans, are among the most important considerations in achieving the aims of the MOU and the aspirations for the Phoenix Program. These dynamics will influence not only the types and talent of clinical faculty that the Phoenix Program will be able to attract, but more importantly the caliber of departmental leadership and vision over time. The national experience is that while the quality of leadership is never assured by the correct structure, it is almost always defeated by the lack of it – i.e., your top candidates won't come.

One obvious course is to evolve the current set of private practice department structures already based in the hospitals, augmenting these with the academic objectives, research efforts, and funds flows necessary to advance their capabilities in line with Phoenix Program aspirations. This will be a challenging task, as the majority of private practice departments do not have a strong research ethos, nor can their expected compensation models easily accommodate the associated costs. Carefully planned evolutions are possible, but these require the utmost in collaboration between the private plan leadership and the Dean and Chairs of the College of Medicine. This avenue appears to be the best initial approach and should be pursued with those current Phoenix departments having the most compatible values and leadership with their counterparts in Tucson.

Another obvious response to the issue is to charter a new "University" plan for the more research oriented faculty and leave the private plans as currently structured. This can rapidly become contentious and potentially explosive for all concerned. Research intensive faculty still care for patients as practicing physicians and compete for these patients with like specialists from other groups. The cohabitation of economically separate UA-affiliated practice groups in the same specialties, particularly in the same hospital settings, represents at best an uneasy peace and more typically outright conflict. This approach can only be recommended as a transitional step and one taken only in the event the current private structures cannot or do not evolve as needed.

As with the teaching hospitals, the current private faculty structures must evolve very significantly to meet the scholarly challenges inherent in the vision of the MOU and the Commission. While the Phoenix Program does not necessarily require the typical "academic practice" plan model to thrive, neither will the typical "private staff" plan suffice.

6. PBC Clinical

Context

The initial development of a clinical enterprise on the PBC is a key element to both the research and economic development objectives of the campus. The initial activity should focus on programs with major clinical research and translational medicine applications to serve distinct market roles in Phoenix and align with the strengths of TGen. It is possible these initial facilities will begin from a base of ambulatory programs, perhaps with short-stay beds, and evolve over time to broader inpatient activity. The initial candidate anchor program is most likely cancer.

Level I Planning Outcomes

In evaluating the options for clinical development on the PBC, two directions have been agreed upon in ACMER:

- The principle of having clinical activity on the PBC. However, no firm consensus exists as to the specific clinical facility concept to be developed. This is particularly true of the current complement of major UA-affiliated hospitals, which have cited market feasibility, existing capital commitments, and physician support as potentially problematic to the concepts advanced to date. At the same time, while no one hospital has committed to a specific major development, none wishes to be left out of the PBC considerations. This has resulted in an underlying sentiment to somehow involve multiple interested institutions in complementary roles on the PBC. While possible, the reality of the competitive nature of these hospitals with one another complicates such an outcome, particularly for any inpatient capacity that might be envisioned.
- Consensus that the clinical activity has a specific programmatic focus, such as cancer, that would have synergy with the expected productivity of TGen. An objective of the Clinical Task Force is to further explore the question of pursuing a clinical concept that is solely ambulatory care versus a broader operation including inpatient services.

Further discussion of PBC clinical issues appears in the Appendices.

Level II Considerations

The full potential of the PBC and the Phoenix Program – educational, economic, talent, research, and clinical – likely will not be realized until a full academic medical center evolves on the campus. The demographics and demand curves in the greater Phoenix market will certainly support a substantial growth in clinical capacity, so this level of clinical development is not redundant over the longer term, nor does it cannibalize existing investments in clinical capacity that we believe will be fully utilized quickly.

This is clearly a long term process, with several possible end stages. One possible and attractive vector is for the PBC clinical enterprise to evolve into a more broadly defined “research hospital.” A facility with this profile would have a proscribed market niche and perhaps a complementary role vis-à-vis the strong set of existing

UA-affiliated teaching hospitals. As a new facility yet to be populated with medical staff, the concept also provides opportunities to consider new practice plan models, chiefs of service structure, roles for the Universities and the like. Also, the facility would be positioned to play a broader role in education as the clinical services broaden over time. In any case, the longer term view should be kept in sight such that any initial set of clinical programs, facilities, medical staff, and governance not only anticipates, but actively *enables* a thriving evolution towards this broader concept.

As to a number of separate fiduciary and competitive hospitals co-venturing with clinical programs on the PBC, this can certainly occur and is relatively simple to accomplish in the ambulatory development. Inpatient venturing is possible but more complex and probably unlikely in the highly competitive Phoenix hospital market. Beginning with an ambulatory development may be easier for the moment, but the issue of confronting which hospital(s) ultimately will sponsor beds on the PBC will not abate and must eventually be addressed.

7. Research

Context

Virtually all of the best medical schools educate students and conduct research and the quality of both is improved by the combination. Achieving the vision for the Phoenix Program as a peer of these medical schools will require additional basic science and clinical faculty, additional space at the PBC and at the teaching hospital sites, and reliable funding steams. TGen and the new Arizona Biomedical Collaborative (ABC) buildings at the PBC will clearly support the research priority, as will those facility expansions being pursued by the affiliated Phoenix hospitals.

Level I Planning Outcomes

The University of Arizona and Arizona State University both have distinguished research programs, and the MOU clearly expresses their desire to have research as an integral element of the developments in Phoenix. Agreement has been reached through the ACMER process on two key directions related to research:

- The Phoenix Track curriculum as envisioned by the ACMER Design Team will make research integral to the medical student experience, ensuring that all physicians graduating from the program are well-versed in managing the complex scientific data that will increasingly influence therapeutic decision-making and individual care. The clear intent is not to create more researchers nor is this to be expected, but to ensure the training experience creates better practicing physicians.
- Direct and major research development on the PBC is a high priority and should engage organizations beyond just the Universities. The opening of the TGen/IGC headquarters and the construction underway for the Barrow Neurological Institute are two striking initiatives which, when coupled with ASU's new Biodesign Institute in Tempe, represent a substantial infusion of new resources and capacity into the research and biotech communities.

The economic and societal impact of research initiatives on the State of Arizona is a broader topic than the level of physician training to be accomplished. As a result, research is expected to develop along an interrelated, but distinct track, over both the near and longer term.

Level II Considerations

While there is agreement the Phoenix Program must have a strong research base, the infrastructure necessary for attracting, nurturing and retaining a cadre of world class investigators, post-doctoral fellows and graduate students is not yet in place. This infrastructure includes not only the laboratories, libraries, animal facilities and grants and contract administration components that are fundamental to any robust research enterprise, but also dynamic clinical environments that embrace the "bench to bedside" imperative of translational and clinical research. To date, most of the attention of ACMER has focused, appropriately, on issues of the curriculum, the availability and configuration of affiliated clinical training sites and legislative funding. These have appeared to be the highest priorities for opening the new medical school

program, with the details of research to follow or to evolve in parallel. In fact, the sufficiency of the research infrastructure and related economics will quickly rise in importance as faculty recruitment begins and the candidates negotiate for lab space and start-up packages.

The profiles of successful – well-funded – "principal investigators" are varied. They may be clinical faculty at the affiliated hospitals with a part-time interest in research and industry contracts to conduct clinical trials in their private practices. These faculties may well choose to expand their research efforts if funding and space permit; however, the indisputable national experience shows that the most distinguished medical research is accomplished by full-time faculty with a very different profile. These investigators may be sponsored and organized through existing department and practice organizations, but they more likely are research "entrepreneurs" who teach occasionally and only see patients with conditions relevant to their research interests. They may have "hard-money" faculty lines at a university, but those dollars are incidental to their extramural funding or to the dollars accruing to their labs from licenses and patents.

The few hospitals which support research without university "hard money" faculty lines – the most notable being MGH and the Brigham in Boston – do so primarily with investigators who live on "soft money" and who fund their salaries, their labs and often their fellows and students with grants and contracts. These institutions routinely contribute 15% of the total research expenditures, transferring funding from their clinical enterprise to their research operations. These hospitals are committed to their research missions and make sustained capital investments in their research infrastructure. MGH this month is opening 300,000 square feet of new, leased research space adjacent to their campus and over the past decade has built-out the Charlestown Navy Yard as a vibrant research community with nearly a million square feet of space.

The Phoenix Program likely will have a research enterprise that combines models and supports principal investigators with an array of funding arrangements and this diversity, over time, will be one of the program's great strengths. The hurdle that requires considerable vigilance in the near-term is determining how best to jump-start the research engine and where to look for early and continuing commitments for research capital.

8. PBC Master Plan

Context

The PBC should be master planned to anticipate the needs of a major academic medical center, developed in conjunction with the City of Phoenix, and constructed as “modules” that provide space for initial educational, clinical and research activities and future growth.

Level I Planning Outcomes

The PBC development has as a major focus the infrastructure relating to the Phoenix Program, however, this is but one of several initiatives. ACMER has agreed that:

- The master plan for the initial 15 acres of PBC real estate and the remaining 500,000 square feet of facilities should be confirmed and priorities set on how the site is zoned for various occupancies.

The 15-acre campus has a potential urban build-out of a million square feet and has been planned for development of academic and research facilities with collaborative public-private partnerships. Facilities completed or currently in design will consume approximately a quarter of the million square feet and include the TGen/IGC Headquarters (170,000 SF) and Arizona Biomedical Collaborative, Building 1 (100,000 SF). In addition, design for the renovation of the Phoenix Union High School (62,000 SF) is underway for the opening class of the Phoenix Program of the University of Arizona College of Medicine. Continuing development anticipates ABC-2 (~100,000 SF), a vivarium (~50,000 SF), a new medical school building (~150,000 SF) and related parking structures as well as facilities for industry biotech companies. These facilities are likely to consume as much as another third of the PBC real estate.

As hoped, the opening of TGen and the aggressive planning for the Phoenix Program have attracted the attention not only of biotech companies, but also of clinical providers and other UA colleges interested in having proximity to TGen investigators and UA medical school faculty. Specifically, the UA College of Pharmacy is now exploring alternative PBC sites.

Level II Considerations

The critical challenge for the City in planning for the PBC and adjacent properties is to ensure that a preferred mix of occupancies is achieved and that campus development enables continuing growth of each enterprise. The set of occupancies assumed in the initial PBC master plan were academic (classroom and administrative facilities for Phoenix Program), collaborative research (bench and computational research facilities) and industry (translational research and biotech incubator facilities). As the Phoenix Program planning evolves, demand for real estate to accommodate clinical research and pure clinical occupancies as well as for other academic programs – in particular the UA College of Pharmacy – have arisen. The core 15-acre PBC site can accommodate these new occupancies, but only if the expansion of TGen, the ABC’s, and the medical school are limited.

Maturing (and mature) academic medical centers have voracious real estate appetites and many of the first tier medical schools nationwide are facing difficult and expensive decisions as they deplete their property portfolios. Consequently, it is imperative that the City establish priority occupancies for the core PBC site and continue to acquire adjacent real estate at a steady pace.

Master planning for the PBC should give careful consideration to several factors and recognize that the response to each of these factors will have an impact on the character of the campus environment both initially and over time.

- **Expansion**

  The 15 acres comprising the PBC will be quickly consumed. The size of the campus is relatively small. Multi-use academic and research campuses can rapidly grow to three times the projected PBC size in terms of occupant square footage, particularly if a clinical enterprise is included.

- **Highest and best use**

  Each of the scenarios defines the "highest and best use" of PBC real estate differently, ranging from Scenario 1 where the uses are narrowly defined to Scenario 4 where the most inclusive set of uses is proposed. The "preferred" master planning Scenario may well depend on the City's ability to continue to acquire adjacent properties and to view the initial 15 acres as the "core" of more extensive development. "Highest and best use" of the current PBC site also may be determined based on the most immediate needs of the confirmed occupants – TGen, ABC-1, ABC-2 and the UA College of Medicine – and careful evaluation of which synergistic or supporting functions can be farther away (including "off-site" parking) and/or developed later in their evolution.

- **Density**

  The initial master plan for the PBC creates a high density, urban environment which will include tall buildings and relatively little open space. Maximizing use of the PBC real estate surely has economic value; however, the quality and character of the campus environment, as well as access and traffic patterns, are easily compromised as density increases. Indeed, the density proposed for the PBC may be counter to the Phoenix "look and feel" and may create a downtown destination that is difficult to penetrate and enjoy.

- **Connectivity**

  The proposed light rail system will be four blocks west of the PBC – a convenient distance for many potential occupants, but prohibitive for others, in particular patients participating in clinical research. Evaluation of the master planning scenarios should consider connectivity issues for each of the occupants. Nursing students, for example, from the ASU downtown campus may be scheduled for classes or labs in College of Medicine or Pharmacy facilities. Assumptions about how these students make the "connection" – whether they drive, walk or take a multi-campus van – should be part of the master planning concept.

- **Zoning**

  Long-term viability of the PBC will be directly related to the clarity of the master plan in defining priority occupancies and preserving their options on the available real estate. Enforcement of the intent of the master plan will be easiest if the rationale for giving priority to these occupancies is stated and easily understood. Further, if the master plan limits the occupancies, then it should address where and how the “omitted” occupants who want proximity to the PBC can be accommodated (e.g., on adjacent parcels, along the light rail line, on properties being developed by others).

9. Stewardship

Context

The continued leadership of the Arizona Commission for Medical Education and Research (ACMER) and the Arizona Board of Regents (ABOR) will be necessary to ensure progress across the broad range of participants and constituencies involved in the Phoenix Program. This is likely to be the case for at least the initial years of implementation.

Level I Planning Outcomes

The ACMER must be credited with the significant progress that has been made in the implementation of the Phoenix Program. In bringing together the major constituents and providing a transparent forum for vetting issues, ACMER established a basis of trust among the members and served as a catalyst for addressing apprehensions and conflicting interests. Noteworthy among the accomplishments under ACMER auspices have been the work of the Design Team, which has produced the vision and themes for the Curriculum and the development of a task force structure that broadens the base of participation in the implementation process.

Level II Considerations

ACMER will continue to play a critical role in shaping the collaborations and partnerships – formal and informal – necessary for the Phoenix Program to succeed and in ensuring the timely development of the Curriculum. Even though it meets in a public forum, the Commission is viewed as a “safe haven” for discussion of challenging issues and for working through alternative approaches to addressing those issues. The Commission must recognize that it alone has the clout to orchestrate and meld the interests of the independent stakeholders and, in so doing, realize the aspirations and common goals of all.

Appendix E
FY 2006 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2006**					**FY 2005-06**						
Program Document										**COM CURRENT FUNDING**								
Start-up Class July 2007 - 24 Students (Years one and two)													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	224,460	224,460	1.0						224,460				224,460
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	155,875	155,875	1.0						155,875				155,875
	Dean, Academic Affairs		1	MD	1.0	231,445	231,445	1.0		231,445								231,445
1.0.1	Admissions/Records		1		1.0	57,448	57,448	1.0						57,448				57,448
10.15	Academic Support		1	PhD	1.0	87,290	87,290	1.0		87,290								87,290
1.0.2	Financial Aid/HR		1		1.0	53,440												
1.0.3	Exec. Assts.		1		1.0	80,160	80,160	1.0		80,160								80,160
1.0.4	Admin. Assistant		3		3.0	132,264	132,264	3.0		132,264								132,264
1.0.5	Admin Associate		2		2.0	106,880	106,880	2.0		95,190		11,690						106,880
1.0.6	Waiting / Reception		1		1.0	33,400	33,400	1.0		33,400								33,400
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	89,784	89,784	1.0		89,784								89,784
1.0.7	Accountant		1		1.0	53,440	53,440	1.0		53,440								53,440
1.0.8	Public Affairs		1		1.0	66,132	66,132	1.0			66,132							66,132
1.0.9	Development		1		1.0	94,772	94,772	1.0			94,772							94,772
1.0.9	Facilities/Scheduling		1		1.0	80,160												
1.0.10	Spec. Assist to Dean		1		1.0	81,055	81,055	1.0		81,055								81,055
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	34,916	34,916	0.2		34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	169,350												
1.0.15	Assoc Dean Resrch		1	PhD	0.5	112,230		0.3										0
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	22	0	20	1,944,501	1,529,321	17		918,944	160,904	11,690		437,783				1,529,321

Appendix E
FY 2006 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2006					FY 2005-06						
Program Document										**COM CURRENT FUNDING**								
														NEW	**NEW**		**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
2. Minority Affairs			*Staff*															
	Director		1		1.0	112,230	112,230	1.0				112,230						112,230
2.0.0	Student Recruiters		3		3.0	100,200	100,200	3.0				100,200						100,200
	Admin Assist		1		1.0	44,088	44,088	1.0				44,088						44,088
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		5.0	256,518	256,518	5		0	0	256,518		0	0		0	256,518
2.0.4																		
2.0.5																		
														NEW	**NEW**		**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
6. Faculty for first and second year basic science education																		
			Staff															
6.0.0	Faculty Offices - Basic Science		8	PhD	7.0	861,560	861,560	7.0						861,560				861,560
	Clinical Science		4	MD	3.0	547,200	547,200	3.0						547,200				547,200
6.0.1	Educational Consultants		20	MD		400,000	400,000							400,000				400,000
6.0.1	Admin Assistant		4		3.0	139,092	139,092	3.0						139,092				139,092
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	36		13.0	1,947,852	1,947,852	13		0	0	0		1,947,852	0		0	1,947,852
6.0.3																		
6.0.4																		
														NEW	**NEW**		**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
6.1 Research Faculty																		
	Faculty Offices - Research PI		4	PhD	0.0	0												
6.1.0	Research PI		2	MD	0.0	0												
	Research Staff		0		0.0													
	Admin Staff																	
		Total	6		0	0	0	0		0	0	0		0	0		0	0
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	0.0	0												0
6.0.1	Admin Assistant		0		0.0	0												0
		Total	0		0.0	0				0	0	0		0	0		0	0

Appendix E
FY 2006 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2006				FY 2005-06							
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**		
7.	**Information Technology**																	
7.0.0	Media Support	2		1.0	60,120		60,120	1.0					60,120				60,120	
	Medical Computing	2		1.0	162,110		81,055	1.0	81,055								81,055	
7.0.1	Server Room / Staging																	
7.0.1.5	Control Room																	
7.0.3	Editing Room																	
7.0.5	Total	4		2.0	222,230		141,175	2	81,055	0	0		60,120	0		0	141,175	
													NEW	**NEW**		**NEW**	**TOTAL**	
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**		
Laboratory and Laboratory Support for 24 Students																		
	Gross Anatomy Laboratory																	
8.0.0	Lab/Prep Room																	
	Gross Path Storage (vented)																	
8.0.1	Staff	1		1.0	46,760													
8.0.2	Total	1		1.0	46,760		0	0	0	0	0		0	0		0		
8.0.2																		
8.0.3																		
													NEW	**NEW**		**NEW**	**TOTAL**	
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**		
9. Pre-Clinical Training		*Staff*																
	Waiting / Discussion																	
9.0.0	Exam Rooms																	
	Video Feedback																	
9.0.1	Restrooms																	
9.0.2	Faculty Office	1	MD	1.0	169,350													
9.0.3	Admin. Assistant	1		1.0	44,088													
9.0.4	File / Storage																	
9.0.5																		
9.0.6	Total	2		2.0	213,438		0	0	0	0	0		0	0		0		
9.0.7																		

Appendix E
FY 2006 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2006					FY 2005-06						
Program Document										**COM CURRENT FUNDING**								
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		2.0	137,170	68,585	1.0						68,585				68,585
11.0.3	Librarian Support Staff		1		1.0	46,760	23,380	0.5						23,380				23,380
11.0.4	Workroom		1		1.0	44,088												0
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		4.0	228,018	91,965	2		0	0	0		91,965	0			91,965
11.0.8																		
11.0.9																		
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		1		1.0	44,088												
	Storage																	
12.0.1																		
12.0.2		Total	1		1.0	44,088	0	0		0	0	0		0	0			
														NEW	**NEW**		**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															
														NEW	**NEW**		**NEW**	**TOTAL**

Appendix E
FY 2006 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2006					FY 2005-06						
Program Document										**COM CURRENT FUNDING**								
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
14. Shared Support Facilities		*Staff*																
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**81**	**0**	**48**	**4,903,405**		**3,966,831**	**39**	**999,999**	**160,904**	**268,208**		**2,537,720**	**0**		**0**	**3,966,831**
Operations																		
Operations						693,000		693,000		224,400	184,000			284,600				693,000
Operations and Maintenance-PUH (89,000 sq ft @ $8)						712,000												
Operations and Maintenance-Research Space (82,000 sq ft @ $9)						738,000												
Lease (Rent until 7/1/06)						1,462,500		465,000		465,000								465,000
Teaching Faculty Set Up						1,112,000		290,000						290,000				290,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		305,000		305,000								305,000
Research Start Up-						4,840,000												
Clinical Research Start Up-																		
Travel						75,400		30,800		10,000				20,800				30,800
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000												
Computer Systems (inc software) (60 @ $1500)						90,000		16,880						16,880				16,880
Computers LRC (inc software) 24 @ 2000)						48,000												
Media Equipment (per consultant)						1,900,000		1,150,000						1,150,000				1,150,000
IT Infrastructure						1,000,000		1,000,000						1,000,000				1,000,000
Furnishings - PUH						900,000		700,000						700,000				700,000
GRAND TOTAL						**18,829,305**		**8,617,511**	**39**	**2,004,399**	**344,904**	**268,208**	**0**	**6,000,000**	**0**	**0**	**0**	**8,617,511**

Appendix E
FY 2007 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2007**					**FY 2006-07**						
Program Document										**COM CURRENT FUNDING**								
Start-up Class July 2007 - 24 Students (Years one and two)+ 80 3rd and 4th													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0		228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0					158,375					158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0		259,735								259,735
1.0.1	Admissions/Records		1		1.0	59,512	59,512	1.0						59,512				59,512
10.15	Academic Support		1	PhD	1.0	96,880	96,880	1.0					96,880					96,880
1.0.2	Financial Aid/HR		1		1.0	55,360	55,360	1.0		55,360								55,360
1.0.3	Exec. Assts.		1		1.0	83,040	83,040	1.0		83,040								83,040
1.0.4	Admin. Assistant		3		3.0	137,016	137,016	3.0		114,241			22,775					137,016
1.0.5	Admin Associate		2		2.0	110,720	106,880	2.0		81,820		11,690	13,370					106,880
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0						34,600				34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0		76,767			14,457					91,224
1.0.7	Accountant		1		1.0	55,360	55,360	1.0		55,360								55,360
1.0.8	Public Affairs		1		1.0	62,717	62,717	1.0			62,717							62,717
1.0.9	Development		1		1.0	94,772	94,772	1.0			94,772							94,772
1.0.9	Facilities/Scheduling		1		1.0	83,040		1.0										0
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0		82,355								82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2		34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	84,675	0.5		61,132			23,543					84,675
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5					112,230					112,230
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	22	0	20	2,013,272	1,837,707	20		1,132,786	157,489	11,690	441,630	94,112	0	0	0	1,837,707

Appendix E
FY 2007 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2007					FY 2006-07						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		1.0	114,030	114,030	1.0				114,030						114,030
2.0.0	Student Recruiters		3		3.0	103,800	103,800	3.0				103,800						103,800
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		5.0	263,502	263,502	5		0	0	263,502		0	0		0	263,502
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	12.0	1,419,040	861,560	7.0						861,560				861,560
	Clinical Science		4	MD	3.0	547,200	547,200	3.0						547,200				547,200
6.0.1	Educational Consultants			MD		400,000	400,000							400,000				400,000
6.0.1	Admin Assistant		4		4.0	426,272	139,092	3.0						139,092				139,092
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		19.0	2,792,512	1,947,852	13		0	0	0		1,947,852	0		0	1,947,852
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6.1 Research Faculty																		
	Faculty Offices - Research PI		4	PhD	8.0	1,089,620	1,089,620	8.0						476,709	476,708	136,203		1,089,620
6.1.0	Research PI		2	MD	4.0	684,000	684,000	4.0						342,000	342,000			684,000
	Research Staff		0		18.0	1,245,600	1,245,600	18.0							1,245,600			1,245,600
	Admin Staff				12.0	548,064	548,064	12.0						548,064				548,064
		Total	6		42	3,567,284	3,567,284	42		0	0	0	0	1,366,773	2,064,308	136,203	0	3,567,284
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	0.0	0												0
6.0.1	Admin Assistant		0		0.0	0												0
		Total	0		0.0	0				0	0	0		0	0		0	0
													NEW	**NEW**	**NEW**	**NEW**		

Appendix E
FY 2007 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2007					FY 2006-07						
Program Document									**COM CURRENT FUNDING**									
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	2		1.0	62,280		62,280	1.0					62,280				62,280
	Medical Computing	2		1.0	164,710		81,055	1.0	81,055								81,055
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	4		2.0	226,990		143,335	2	81,055	0	0	0	62,280	0	0	0	143,335
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
Laboratory and Laboratory Support for 24 Students																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	1		1.0	48,440		48,440	48,440					48,440				48,440
8.0.2	Total	1		1.0	48,440		48,440	48,440	0	0	0		48,440	0		0	48,440
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	1	MD	1.0	171,000												
9.0.3	Admin. Assistant	1		1.0	45,672												
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	2		2.0	216,672		0	0	0	0	0	0	0	0	0	0	
9.0.7																	

Appendix E
FY 2007 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2007					FY 2006-07						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		2.0	139,370	69,685	1.0						69,685				69,685
11.0.3	Librarian Support Staff		1		1.0	47,180	23,590	0.5						23,590				23,590
11.0.4	Workroom		1		1.0	44,484												0
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		4.0	231,034	93,275	2		0	0	0	0	93,275	0	0	0	93,275
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		1		1.0	44,484												
	Storage																	
12.0.1																		
12.0.2		Total	1		1.0	44,484	0	0		0	0	0	0	0	0	0	0	
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**

Appendix E
FY 2007 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2007				FY 2006-07						
Program Document										**COM CURRENT FUNDING**							
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**61**	**0**	**96**	**9,404,190**		**7,901,395**	**48,524**	**1,213,841**	**157,489**	**275,192**	**441,630**	**3,612,732**	**2,064,308**	**136,203**	**0**	**7,901,395**
Operations																		
Operations						956,000		956,000		224,822	184,000		61,178	360,000	126,000			956,000
Operations and Maintenance-PUH (89,000 sq ft @ $8)						712,000		712,000					712,000					712,000
Operations and Maintenance-Research Space(82,000 sq ft @ $9)						738,000		246,000									246000	246,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		406,000						188,400		217,600		406,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		305,000		305,000								305,000
Research Start Up-						4,840,000		650,000									650,000	650,000
Clinical Research Start Up-																		
Travel						75,400		45,071		10,000				35,071				45,071
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000												
Computer Systems (inc software) (60 @ $1500)						90,000		53,797						53,797				53,797
Computers LRC (inc software) 24 @ 2000)						48,000												
Media Equipment (per consultant)						1,900,000		750,000						750,000				750,000
IT Infrastructure						1,000,000												0
Furnishings - PUH						900,000												0
GRAND TOTAL						**23,593,090**		**13,487,763**	**48,524**	**2,216,163**	**341,489**	**275,192**	**1,214,808**	**6,000,000**	**2,190,308**	**353,803**	**896,000**	**13,487,763**

Appendix E
FY 2008 Phoenix Program Budget Detail

University of Arizona																	
Medical School																	
SG Project No. 19564.000																	
University of Arizona																	
Medical School																	
SG Project No. 19564.000							**FY 2008**				**FY 2007-08**						
Program Document										**COM CURRENT FUNDING**							
Start-up Class July 2007 - 24 Students (Years one and two)+ 80 3rd and 4th - 104 total												**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE	**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**												
1. Administration		*Staff*															
	Assoc. Dean of Student Affairs	1	PhD	1.0	228,060		228,060	1.0	228,060								228,060
1.0.0	Assoc Dean-Curriculum	1	PhD	1.0	158,375		158,375	1.0	158,375								158,375
	Dean, Academic Affairs	1	MD	1.0	259,735		259,735	1.0	259,735								259,735
1.0.1	Admissions/Records	1		1.0	59,512		59,512	1.0	59,512								59,512
10.15	Academic Support	1	PhD	1.0	96,880		96,880	1.0	475			96,405					96,880
1.0.2	Financial Aid/HR	1		1.0	55,360		55,360	1.0	55,360								55,360
1.0.3	Exec. Assts.	1		1.0	83,040		83,040	1.0	64,532				18,508				83,040
1.0.4	Admin. Assistant	3		3.0	137,016		137,016	3.0	114,241				22,775				137,016
1.0.5	Admin Associate	2		2.0	110,720		106,880	2.0	81,820		11,690		13,370				106,880
1.0.6	Waiting / Reception	1		1.0	34,600		34,600	1.0					34,600				34,600
1.0-.6.5	Workroom / Files																
1.065B	Director Bus. Affairs	1		1.0	91,224		91,224	1.0	91,224								91,224
1.0.7	Accountant	1		1.0	55,360		55,360	1.0	55,360								55,360
1.0.8	Public Affairs	1		1.0	62,717		62,717	1.0		62,717							62,717
1.0.9	Development	1		1.0	94,772		94,772	1.0		94,772							94,772
1.0.9	Facilities/Scheduling	1		1.0	83,040		83,040	1.0	83,040								83,040
1.0.10	Spec. Assist to Dean	1		1.0	82,355		82,355	1.0	82,355								82,355
1.0.12	Conf. Rm.(12)																
1.0.12A	Staff Lounge																
1.0.12B	Storage																
1.0.13	Asst Dean-Student Counseling	1	MD	0.2	35,476		34,916	0.2	34,916								34,916
1.0.14	Assoc Dean Clin. Aff	1	MD	0.5	171,000		84,675	0.5	84,675								84,675
1.0.15	Assoc Dean Resrch	1	PhD	0.5	114,030		112,230	0.5	112,230								112,230
1.0.16	Conf. Rm.(30)Mediated																
1.0.17	Total	22	0	20	2,013,272		1,920,747	20	1,565,910	157,489	11,690	96,405	89,253	0	0	0	1,920,747

Appendix E
FY 2008 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2008					FY 2007-08						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		1.0	114,030	114,030	1.0				114,030						114,030
2.0.0	Student Recruiters		3		3.0	103,800	103,800	3.0				103,800						103,800
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		5.0	263,502	263,502	5		0	0	263,502	0	0	0	0	0	263,502
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	16.0	1,900,500	1,900,500	16.0						1,900,500				1,900,500
	Clinical Science		4	MD	4.0	684,000	684,000	4.0						684,000				684,000
6.0.1	Educational Consultants		20	MD		400,000	400,000							400,000				400,000
6.0.1	Admin Assistant		4		6.0	517,616	517,600	6.0						517,600				517,600
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	36		26.0	3,502,116	3,502,100	26		0	0	0	0	3,502,100	0	0	0	3,502,100
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6.1 Research Faculty																		0
	Faculty Offices - Research PI		4	PhD	16.0	2,179,240	2,179,240	16.0						1,089,620	544,810	544,810		2,179,240
6.1.0	Research PI		2	MD	8.0	1,368,000	1,368,000	8.0						684,000	342,000	342,000		1,368,000
	Research Staff		0		36.0	2,839,968	2,839,968	36.0							2,839,968			2,839,968
	Admin Staff				16.0	753,472	753,472	16.0						376,736		376,736		
		Total	6		76	7,140,680	7,140,680	76		0	0	0	0	2,150,356	3,726,778	1,263,546	0	7,140,680
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	0.0	0												0
6.0.1	Admin Assistant		0		0.0	0												0
		Total	0		0.0	0				0	0	0	0	0	0	0	0	0
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	

Appendix E
FY 2008 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2008					FY 2007-08						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	2		2.0	62,280		124,562	1.0					124,562				124,562
	Medical Computing	2		2.0	164,710		164,710	1.0	82,355				82,355				164,710
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	4		4.0	226,990		289,272	2	82,355	0	0	0	206,917	0	0	0	289,272
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
Laboratory and Laboratory Support for 24 Students																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	2		2.0	96,880		96,880	2					96,880				96,880
8.0.2	Total	1		2.0	96,880		96,880	2	0	0	0	0	96,880	0	0	0	96,880
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	1	MD	1.0	171,000		171,000	1.0					171,000				171,000
9.0.3	Admin. Assistant	1		1.0	45,672		45,672	1.0					45,672				45,672
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	2		2.0	216,672		216,672	2	0	0	0	0	216,672	0	0	0	216,672
9.0.7																	

Appendix E
FY 2008 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2008					FY 2007-08						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		2.0	139,370	69,685	1.0						69,685				69,685
11.0.3	Librarian Support Staff		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.4	Workroom		1		1.0	44,484												0
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		4.0	231,034	116,865	2		0	0	0	0	116,865	0	0	0	116,865
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		1		1.0	44,484	44,484	1.0									**44484**	44,484
	Storage																	
12.0.1																		
12.0.2		Total	1		1.0	44,484	44,484	1		0	0	0	0	0	0	0	44,484	44,484
														NEW	**NEW**		**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**

Appendix E
FY 2008 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2008				FY 2007-08						
Program Document										**COM CURRENT FUNDING**							
	Interaction Space			**Degree**	**# FTE**	**TOTAL**			**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partner**	**Other**	
14. Shared Support Facilities		*Staff*															
	Faculty Mail/Copy Room																
14.0.0																	
		Total	0														
14.0.1																	
Personnel including ERE		**0**	**81**	**0**	**140**	**13,735,629**		**13,591,202**	**136**	**1,648,265**	**157,489**	**275,192**	**96,405**	**6,379,043**	**3,726,778**	**1,263,546**	**44,484**	**13,591,202**
Operations																	
Operations						1,314,200		1,314,200		224,800	184,000			510,000	252,000		143400	1,314,200
Operations and Maintenance-PUH (89,000 sq ft @ $8)						712,000		712,000					347,000	365,000				712,000
Operations and Maintenance-Research Space (82,000 sq ft @ $9)						738,000		738,000									738,000	738,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		280,000						100,000			180,000	280,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		305,000		305,000								305,000
Research Start Up-						4,840,000		2,300,000									2,300,000	2,300,000
Clinical Research Start Up-																		
Travel						75,400		57,200						57,200				57,200
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000												
Computer Systems (inc software) (60 @ $1500)						90,000		64,757						64,757				64,757
Computers LRC (inc software) 24 @ 2000)						48,000		24,000						24,000				24,000
Media Equipment (per consultant)						1,900,000												0
IT Infrastructure						1,000,000												0
Furnishings - PUH						900,000		200,000									200,000	200,000
GRAND TOTAL						**28,282,729**		**21,048,859**	**136**	**2,640,565**	**341,489**	**275,192**	**443,405**	**8,500,000**	**3,978,778**	**1,263,546**	**3,605,884**	**21,048,859**

Appendix E
FY 2009 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2009**				**FY 2008-09**							
Program Document									**COM CURRENT FUNDING**									
Start-up Class July 2007 & July 2008- 48 Students (Years one and two) + 80 3rd and 4th - 128 total students												**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**	
Draft								FTE	**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**		
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0	228,060									228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0	158,375									158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0	259,735									259,735
1.0.1	Admissions/Records		1		1.0	59,512	59,512	1.0	59,512									59,512
10.15	Academic Support		1	PhD	1.0	96,880	96,880	1.0	96,880									96,880
1.0.2	Financial Aid/HR		1		1.0	55,360	55,360	1.0	55,360									55,360
1.0.3	Exec. Assts.		1		1.0	83,040	83,040	1.0	64,532			18,508						83,040
1.0.4	Admin. Assistant		3		3.0	137,016	137,016	3.0	114,241			22,775						137,016
1.0.5	Admin Associate		2		2.0	110,720	106,880	2.0	81,820		11,690	13,370						106,880
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0				34,600						34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0	91,224									91,224
1.0.7	Accountant		1		1.0	55,360	55,360	1.0	55,360									55,360
1.0.8	Public Affairs		1		1.0	62,717	62,717	1.0		62,717								62,717
1.0.9	Development		1		1.0	94,772	94,772	1.0		94,772								94,772
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,840	1.0					83,840					83,840
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0	82,355									82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2	15,793			19,123						34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	84,675	0.5					84,675					84,675
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5	112,230									112,230
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	22	0	20	2,013,272	1,921,547	20	1,475,477	157,489	11,690	108,376	168,515	0	0	0		1,921,547

Appendix E
FY 2009 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2009					FY 2008-09						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		1.0	114,030	114,030	1.0				114,030						114,030
2.0.0	Student Recruiters		3		3.0	103,800	103,800	3.0				103,800						103,800
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		5.0	263,502	263,502	5		0	0	263,502	0	0	0	0	0	263,502
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	20.0	2,381,960	2,381,960	20.0						2,381,960				2,381,960
	Clinical Science		4	MD	6.0	1,094,400	1,094,400	6.0						1,094,400				1,094,400
6.0.1	Educational Consultants		20	MD		400,000	400,000							400,000				400,000
6.0.1	Admin Assistant		4		10.0	519,000	519,000	10.0						519,000				519,000
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	36		36.0	4,395,360	4,395,360	36		0	0	0	0	4,395,360	0	0	0	4,395,360
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty																		
	Faculty Offices - Research PI		4	PhD	22.0	3,015,460	3,015,460	22.0						1,089,580	962,920	962,960		3,015,460
6.1.0	Research PI		2	MD	12.0	2,052,000	2,052,000	12.0						1,026,000	513,000	513,000		2,052,000
	Research Staff		0		51.0	4,023,288	4,023,288	51.0							4,023,288			4,023,288
	Admin Staff				22.0	1,141,800	1,141,800	22.0						765,064		376,736		1,141,800
		Total	6		107	10,232,548	10,232,548	107		0	0	0	0	2,880,644	5,499,208	1,852,696	0	10,232,548
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	0.0	0												0
6.0.1	Admin Assistant		0		0.0	0												0
		Total	0		0.0	0				0	0	0		0	0		0	0
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	

Appendix E
FY 2009 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2009					FY 2008-09						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	2		2.0	62,280		124,562	1.0					124,562				124,562
	Medical Computing	2		2.0	164,710		164,710	1.0	82,355				82,355				164,710
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	4		4.0	226,990		289,272	2	82,355	0	0	0	206,917	0	0	0	289,272
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support for 24 Students																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	2		2.0	96,880		96,880	2					96,880				96,880
8.0.2	Total	1		2.0	96,880		96,880	2	0	0	0	0	96,880	0	0	0	96,880
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	1	MD	1.0	171,000		171,000	1.0					171,000				171,000
9.0.3	Admin. Assistant	1		1.0	45,672		45,672	1.0					45,672				45,672
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	2		2.0	216,672		216,672	2	0	0	0	0	216,672	0	0	0	216,672
9.0.7																	

Appendix E
FY 2009 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2009					FY 2008-09						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		2.0	139,370	69,685	1.0						69,685				69,685
11.0.3	Librarian Support Staff		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.4	Workroom		1		1.0	44,484	44,484	1.0						44,484				44,484
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		4.0	231,034	161,349	3		0	0	0	0	161,349	0	0	0	161,349
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		1		1.0	44,484	44,484	1.0									**44484**	44,484
	Storage																	
12.0.1																		
12.0.2		Total	1		1.0	44,484	44,484	1		0	0	0	0	0	0	0	44,484	44,484
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix E
FY 2009 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2009					FY 2008-09						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**81**	**0**	**181**	**17,720,742**		**17,621,614**	**178**	**1,557,832**	**157,489**	**275,192**	**108,376**	**8,126,337**	**5,499,208**	**1,852,696**	**44,484**	**17,621,614**
Operations																		
Operations						1,701,800		1,701,800		224,800	184,000			1,199,400			93600	1,701,800
Operations and Maintenance-PUH (89,000 sq ft @ $8)						712,000		712,000					376,332	335,668				712,000
Operations and Maintenance-Research Space (82,000 sq ft @ $9)						738,000		738,000									738,000	738,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		278,000						278,000				278,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		305,000		305,000								305,000
Research Start Up-						4,840,000		2,060,000									2,060,000	2,060,000
Clinical Research Start Up-																		
Travel						75,400		75,400						75,400				75,400
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000												
Computer Systems (inc software) (60 @ $1500)						90,000		86,195						86,195				86,195
Computers LRC (inc software) 24 @ 2000)						48,000		24,000						24,000				24,000
Media Equipment (per consultant)						1,900,000		300,000						300,000				300,000
IT Infrastructure						1,000,000		300,000						300,000				300,000
Furnishings - PUH						900,000		275,000						275,000				275,000
GRAND TOTAL						**32,655,442**		**25,939,509**	**178**	**2,550,132**	**341,489**	**275,192**	**484,708**	**12,000,000**	**5,499,208**	**1,852,696**	**2,936,084**	**25,939,509**

Appendix E
FY 2010 Phoenix Program Budget Detail

University of Arizona																	
Medical School																	
SG Project No. 19564.000																	
University of Arizona																	
Medical School																	
SG Project No. 19564.000							**FY 2010**				**FY 2009-10**						
Program Document										**COM CURRENT FUNDING**							
Class July 2007, July 2008, July 2009 - 152 Students (Years one, two, Three)+ 40 4th - total 192 students												**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE	**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**												
1. Administration		*Staff*															
	Assoc. Dean of Student Affairs	1	PhD	1.0	228,060		228,060	1.0	228,060								228,060
1.0.0	Assoc Dean-Curriculum	1	PhD	1.0	158,375		158,375	1.0	158,375								158,375
	Dean, Academic Affairs	1	MD	1.0	259,735		259,735	1.0	259,735								259,735
1.0.1	Admissions/Records	1		1.0	59,512		59,512	1.0	59,512								59,512
10.15	Academic Support	1	PhD	2.0	193,760		193,760	2.0	96,880			96,880					193,760
1.0.2	Financial Aid/HR	1		1.0	55,360		55,360	1.0	55,360								55,360
1.0.3	Exec. Assts.	3		2.0	249,120		83,040	1.0	64,532			18,508					83,040
1.0.4	Admin. Assistant	6		3.0	290,640		137,016	3.0	114,241			22,775					137,016
1.0.5	Admin Associate	2		4.0	221,440		106,880	4.0	81,820		11,690	13,370					106,880
1.0.6	Waiting / Reception	1		1.0	34,600		34,600	1.0				34,600					34,600
1.0-.6.5	Workroom / Files																
1.065B	Director Bus. Affairs	1		1.0	91,224		91,224	1.0	26,506			64,798					91,304
1.0.7	Accountant	1		2.0	110,720		55,360	2.0	55,360								55,360
1.0.8	Public Affairs	1		1.0	62,717		62,717	1.0		62,717							62,717
1.0.9	Development	1		1.0	94,772		94,772	1.0		94,772							94,772
1.0.9	Facilities/Scheduling	1		1.0	83,040		83,040	1.0				83,040					83,040
1.0.10	Spec. Assist to Dean	1		1.0	82,355		82,355	1.0				82,355					82,355
1.0.12	Conf. Rm.(12)																
1.0.12A	Staff Lounge																
1.0.12B	Storage																
1.0.13	Asst Dean-Student Counseling	1	MD	0.2	35,476		34,916	0.2				34,916					34,916
1.0.14	Assoc Dean Clin. Aff	1	MD	0.5	171,000		84,675	0.5				84,675					84,675
1.0.15	Assoc Dean Resrch	1	PhD	0.5	114,030		112,230	0.5				112,230					112,230
1.0.16	Conf. Rm.(30)Mediated																
1.0.17	Total	27	0	25	2,595,936		2,017,627	24	1,200,381	157,489	11,690	648,147	0	0	0	0	2,017,707

Appendix E
FY 2010 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2010				FY 2009-10						
Program Document										**COM CURRENT FUNDING**							
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs		*Staff*															
	Director	2		1.0	228,060		228,060	2.0			228,060						228,060
2.0.0	Student Recruiters	4		3.0	138,400		138,400	4.0			138,400						138,400
	Admin Assist	1		1.0	45,672		45,672	1.0			45,672						45,672
2.0.1	Work Room																
2.0.2	Storage																
2.0.3	Total	7		5.0	412,132		412,132	7	0	0	412,132	0	0	0	0	0	412,132
2.0.4																	
2.0.5																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																	
6.0.0	Faculty Offices - Basic Science	8	PhD	23.0	2,711,380		2,711,380	23.0					2,711,380				2,711,380
	Clinical Science	4	MD	7.0	1,231,200		1,231,200	7.0					1,231,200				1,231,200
6.0.1	Educational Consultants		MD		20,000		20,000						20,000				20,000
6.0.1	Admin Assistant	4		11.0	570,900		570,900	11.0					570,900				570,900
6.0.1.5	Swing Offices																
	Work Rm/Files																
6.0.2	Total	16		41.0	4,533,480		4,533,480	41	0	0	0	0	4,533,480	0	0	0	4,533,480
6.0.3																	
6.0.4																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty																	
	Faculty Offices - Research PI	4	PhD	28.0	3,851,680		3,851,680	28.0					1,925,860	962,910	962,910		3,851,680
6.1.0	Research PI	2	MD	15.0	2,508,000		2,508,000	15.0					1,254,000	627,000	627,000		2,508,000
	Research Staff	0		65.0	5,127,720		5,127,720	65.0						5,127,720			5,127,720
	Admin Staff			43.0	2,231,700		2,231,700	43.0					1,115,850		1,115,850		2,231,700
	Total	6		151	13,719,100		13,719,100	151	0	0	0		4,295,710	6,717,630	2,705,760	0	13,719,100
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																	
	Faculty Offices - Clinical Science	0	MD	44.0	7,690,257		7,690,257	44.0					1,153,539			6,536,718	7,690,257
	Faculty Offices - Clinical Science		MD	44.0	7,690,257		7,690,257	44.0					1,153,539	2,691,590		3,845,128	7,690,257
	Research Staff			264.0	17,635,200		17,635,200	264.0						17,635,200			17,635,200
6.0.1	Admin Assistant	0		13.0	651,300		651,300	13.0					325,650		325,650		651,300
	Total	0		365.0	33,667,014		33,667,014	365.0	0	0	0	0	2,632,728	20,326,790	325,650	10,381,846	33,667,014
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	

Appendix E
FY 2010 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2010					FY 2009-10						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0		655,245	0		0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0		145,320	0		0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0		466,560	0		0	466,560
9.0.7																	

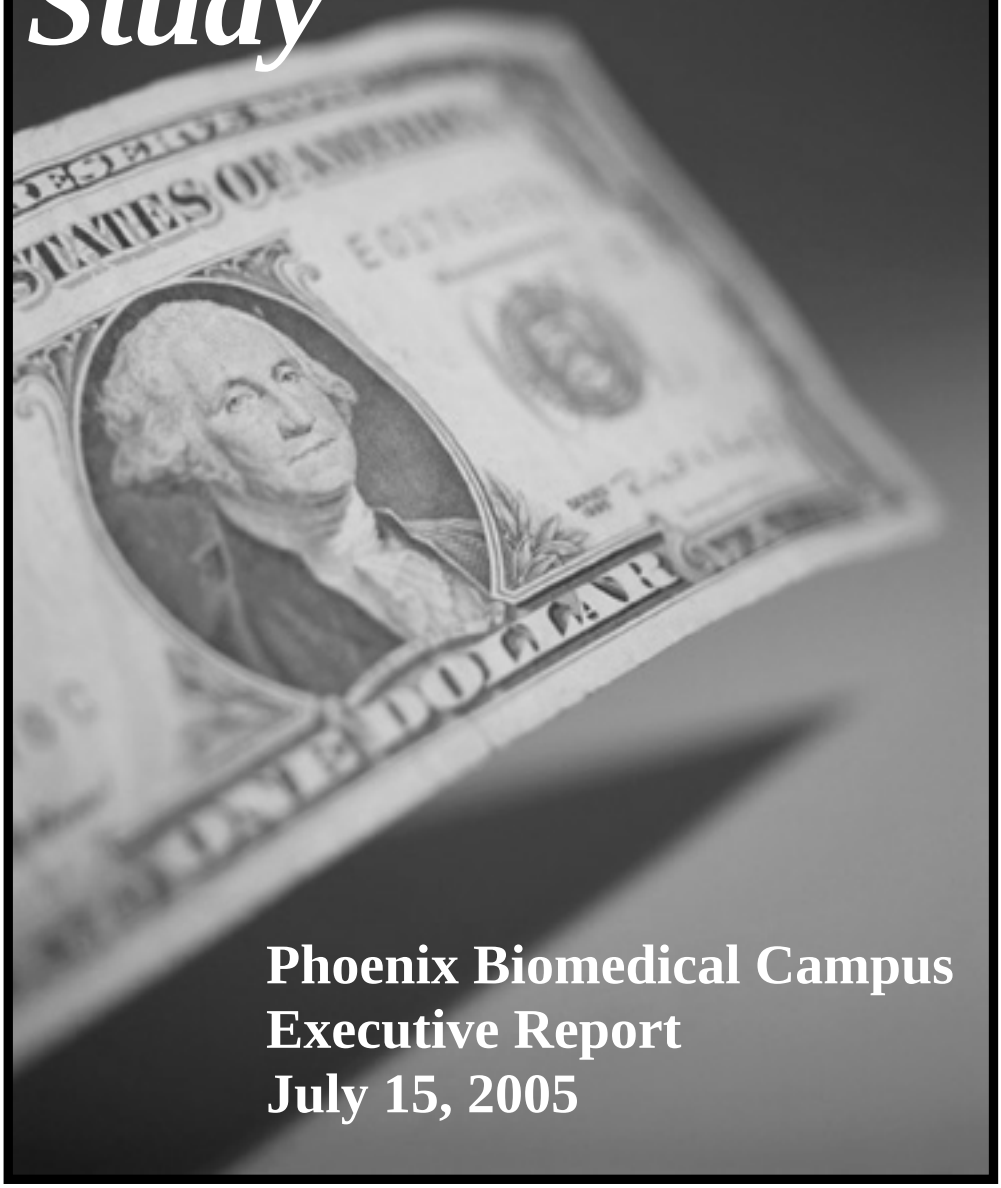
Appendix E
FY 2010 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2010					FY 2009-10						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0	0	396,560	0	0	0	396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0		0	0		94,360	94,360
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix E
FY 2010 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2010				FY 2009-10						
Program Document										**COM CURRENT FUNDING**							
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**			**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*														
	Faculty Mail/Copy Room																
14.0.0																	
		Total	0														
14.0.1																	
Personnel including ERE		**0**	**73**	**0**	**610**	**56,768,062**	**56,189,753**	**611**	**1,282,736**	**157,489**	**423,822**	**648,147**	**13,125,603**	**27,044,420**	**3,031,410**	**10,476,206**	**56,189,833**
Operations																	
Operations						4,039,800	4,039,800		224,800	184,000			1,328,000	455,000		1,848,000	4,039,800
Operations and Maintenance-PUH (89,000 + 320,000 sq ft @ $8 s						3,272,000	3,272,000					584,033	2,340,197			347,770	3,272,000
Operations and Maintenance Research Space (82,000 sq ft @ $9)						738,000	738,000									738,000	738,000
Lease PUH						1,462,500	1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000	188,000						188,000				188,000
Hospital Arrangements-ADH/ClerkshipDir						1,805,000	1,805,000		305,000							1,500,000	1,805,000
Research Start Up-						4,840,000	2,030,000									2,030,000	2,030,000
Clinical Research Start Up-						2,968,000	2,968,000									2,968,000	2,968,000
Travel						111,800	111,800						111,800				111,800
Capital (Copiers, postal, etc)																	
Office Machines (Copiers, Postal)						50,000	46,400						46,400				46,400
Computer Systems (inc software) (60 @ $1500)						90,000	60,000						60,000				60,000
Computers LRC (inc software) 150 @ 2000)						300,000	300,000						300,000				300,000
Media Equipment (per consultant)--new building est						3,000,000	2,500,000						2,500,000				2,500,000
IT Infrastructure-- new building est						3,000,000	2,500,000						2,500,000				2,500,000
Furnishings - PUH						900,000											0
GRAND TOTAL						**84,457,162**	**78,211,253**	**611**	**2,275,036**	**341,489**	**423,822**	**1,232,180**	**23,500,000**	**27,499,420**	**3,031,410**	**19,907,976**	**78,211,333**
Estimated 258,000 sq ft new research space O & M not included in this budget										**NEW BUILDING COSTS**			2,500,000	O & M Annual			
													2,500,000	New Media Equip			
													2,500,000	New IT Equip/Install			
													16,000,000				

Economic Quantification Study



Phoenix Biomedical Campus
Executive Report
July 15, 2005

TrippUmbach
research ▪ strategy ▪ impact

Executive Summary

Introduction

The State of Arizona is in a unique position to become a national center for advanced healthcare research, teaching and clinical care through the development of the Phoenix Biomedical Campus. Such a campus will incorporate the existing strengths of the University of Arizona College of Medicine, Arizona State University's Bioinformatics Program, TGen and existing Phoenix-area healthcare systems. The Phoenix Biomedical Campus that will be developed over the next 20 years will become an important economic engine for the entire State of Arizona as well as a magnet in downtown Phoenix for local, regional, national, and international healthcare research and clinical organizations. The Phoenix Biomedical campus will also foster the development of biomedical start-ups.

Arizona is the second fastest growing state in the nation; however, it has lagged behind other states in its ability to attract resources for advanced research and the culmination of this research into commercialization the formation of strong biomedical companies and start-ups. The Phoenix Biomedical Campus will do more than train the physicians Arizona needs for the future, it will attract industries that will help build economic infrastructure, develop medical research and improve the health of its citizens. The ultimate goal of the campus is to become an international destination for patients, researchers, students, and industry leaders.

Nationally, the biosciences comprise an average of 57 percent of total university research dollars. In Arizona, the figure is just 44 percent ($229 million in 2000). From 1996 to 2000, the state's total biosciences research funding grew 27 percent, compared to a 36 percent gain for the nation. Thus, Arizona is losing its market share of the national research budget and will need to make up lost ground to become competitive. The Milken Institute's 2004 study, America's Biotech and Life Science Clusters: San Diego's Position and Economic Contributions, states that regional leaders across the United States are "fighting hard to lure what they believe is the economic growth industry of the 21st century – biotechnology." Arizona has a significant role to play in this emerging high-tech economy. "Hospitals and clinics are the primary sources of clinical trials and much innovation. However, there is an important race underway – the one to determine where the dominant health care centers will be located."[1]

National Growth in Biomedical Development

Healthcare and the life sciences comprise one of the largest sectors of the United States' $10 trillion economy: comprising 13 percent of the economy. This $1.3 trillion slice spent on health care is only expected to grow, reaching 17 percent by 2010 and more than 20 percent by 2040. This will continue a decades-long trend; in 1945 health care spending was only 4 percent of the U.S. economy. The rising cost of health care will be one of the greatest economic challenges in our current century.

[1] Ross DeVol and Rob Koepp (August 2003). America's Healthcare Economy, Milken Institute

The scientific promise of biotechnology and genomics will change medicine forever, in ways that were previously inconceivable. The field's potential for early diagnosis and treatment of diseases could reduce the suffering of patients not only in the U.S. but throughout the world and result in significant cost savings. Important medical discoveries already have been made by research institutions and private business in the biotechnology sector. Annually, $11 billion is invested in research and development, not including funds expended on higher education and other nonprofit organizations. In fact, between 1993 and 1999, the biotech industry doubled in size, producing revenues of $20 billion directly and $27 billion indirectly.

Economic Impact Quantification Study Objectives

It is within this framework that Tripp Umbach was retained in May 2005 to quantify the potential range of economic impact of the Phoenix Biomedical Campus.[2] This report represents an Executive Summary limited to the economic, employment and government revenue impact of the Phoenix Biomedical Campus. More detailed study findings for the University of Arizona College of Medicine Phoenix Program are provided in Tripp Umbach's full report. These additional findings include the quantification of the following: social and community benefits, cost-savings benefits derived from increased physician resources, student and faculty spending and impacts related to medical tourism. The goals of this study include:

- To estimate the economic impact of the Phoenix Biomedical Campus in 2007, when the first class of medical students from the University of Arizona College of Medicine are in their newly renovated facilities on the Phoenix campus;

- To project the economic impact of the entire Phoenix Biomedical Campus in 2010, 2015 and 2025; and

- To evaluate various scenarios of the potential economic impact of the Phoenix Biomedical Campus including:

  - ***Scenario A: Stand-alone University of Arizona medical school, ASU Bioinformatics Program and TGen***
  - ***Scenario B: Medical school with research and outpatient clinical function***
  - ***Scenario C: Fully-integrated biomedical campus including teaching, research, outpatient care, inpatient care and business spin-offs.***

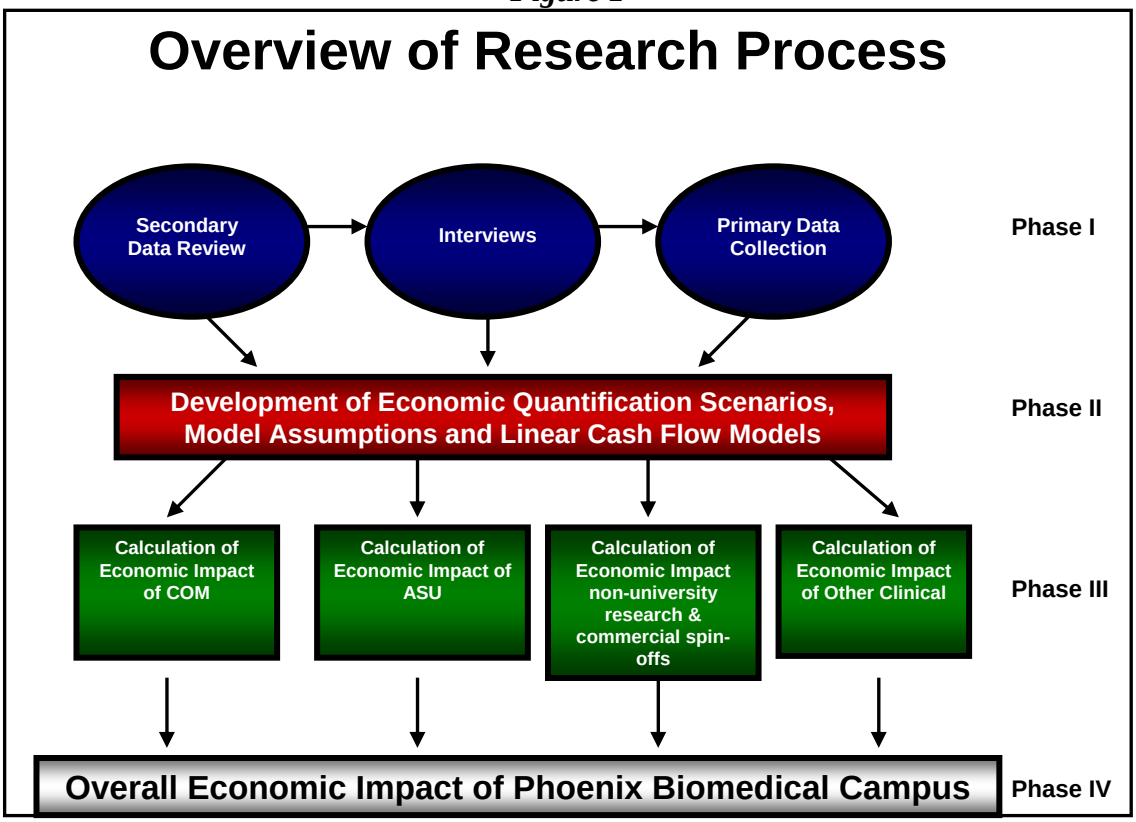
[2] For the purposes of this report, the Phoenix Biomedical Campus includes the following entities: The University of Arizona College of Medicine, Arizona State University Bioinformatics Program, TGen, and other research and clinical entities yet to be defined.

Economic Quantification Study Process

To calculate the economic impact of the Phoenix Biomedical Campus on the state of Arizona, Tripp Umbach facilitated a visioning process with the University of Arizona College of Medicine and other key partners, such as the Arizona Board of Regents, in which detailed projections related to the teaching, research and clinical elements of the College of Medicine's Phoenix program were developed. Tripp Umbach's scope of services included conducting interviews with key stakeholders, collecting existing data from the College and other participants on the campus, reviewing all existing planning reports and documents, and interface with the City of Phoenix.

The research process was conducted in four phases: ***Phase I:*** Data Collection; ***Phase II:*** Economic Quantification Scenario, Model and Assumption Development; ***Phase III:*** Calculation of Economic Quantification of the COM Phoenix Program, Arizona State University, non-university research and commercial spin-offs and Business Spin-offs; and ***Phase IV:*** Calculation of the Overall Economic Impact of the Phoenix Biomedical Campus on the state of Arizona (See Figure 1.)

Figure 1



In developing customized economic impact models, Tripp Umbach used a methodology derived from the original set of research tools and techniques developed for the American Council on

Education (ACE).[3] The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area.

Tripp Umbach researchers developed a series customized economic impact models based upon data supplied by the University of Arizona College of Medicine, Arizona State University, and assumptions based upon Tripp Umbach's national economic impact database of 126 medical schools. The basic architecture of these models is the methodology most widely accepted within the industry. Due to the complexity of measuring the impact of biotechnology, Tripp Umbach researchers developed a series of customized economic impact models showing the economic, employment and government revenue impacts of both campus participants (individually as well as collectively) and potential business spin-offs.

Tripp Umbach developed these models based on three scenarios presented below:

- ***Scenario A: Stand-alone University of Arizona medical school, ASU Bioinformatics Program and TGen***
- ***Scenario B: Medical school with research and outpatient clinical function***
- ***Scenario C: Fully-integrated biomedical campus including teaching, research, outpatient care, inpatient care and business spin-offs.***

Economic impact projections were calculated for the opening year (2007) of the University of Arizona College of Medicine Phoenix Program. Additional projections for 2010, 2015, and 2025 were calculated based on the three scenarios outlined above. The linear cash flow models developed for this project represent annual, point-in-time economic, employment, and government revenue impact projections.

In addition to the linear cash flow models described above, Tripp Umbach utilized a forward-linkage modeling methodology to measure the potential impact of the College of Medicine program in the state of Arizona. Traditional economic impact studies are based on direct spending and re-spending within the economy (multiplier effect) driven from the institution itself. Forward-linkage models measure the broader impacts that occur or may occur in the economy as a result of the research and development activities of an institution – beyond the traditional direct and indirect impact. Examples of forward-linkage impacts include businesses that spin-off of research activities, to new and existing businesses, and sponsored research relationships.

Tripp Umbach facilitated the creation of a project development strategy for the Phoenix Biomedical Campus that provides an overview of timeframes and campus participants (see Figure 2).

[3] Caffrey, J., and Isaacs, H. *Estimating the Impact of a College or University on the Local Economy*. American Council on Education, 1971.

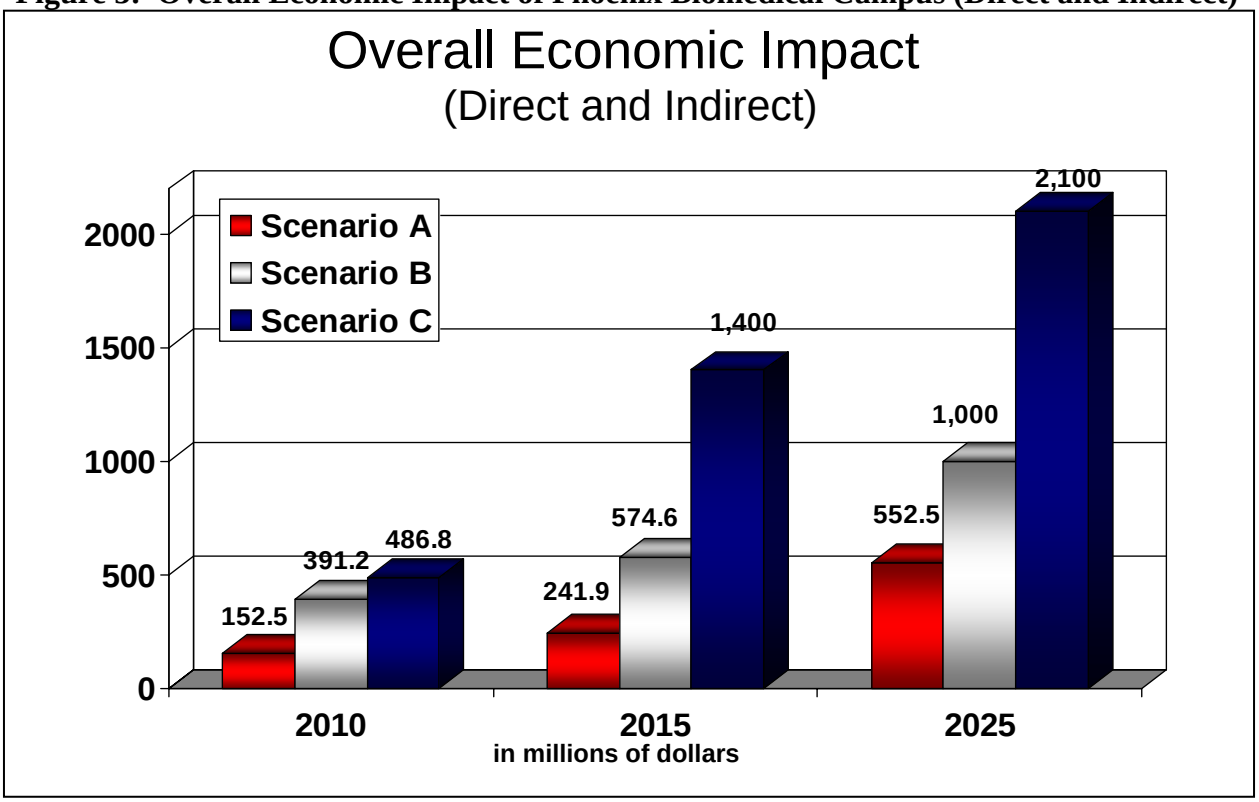
Figure 2: Campus Participants and Timetable for the Phoenix Biomedical Campus

	2007 – Level I	2010 – Level II	2015	2025
Opening	• College of Medicine with no research or clinical component • ASU • TGen			
Scenario A		• College of Medicine • ASU • TGen	• College of Medicine • ASU • TGen	• College of Medicine • ASU • TGen
Scenario B		• College of Medicine • UA Research • UA Clinical (outpatient) • ASU • TGen • Other Research Partners	• College of Medicine • UA Research • UA Clinical (outpatient) • ASU • TGen • Other Research Partners	• College of Medicine • UA Research • UA Clinical (outpatient) • ASU • TGen • Other Research Partners
Scenario C			• College of Medicine • UA Research • UA Clinical (outpatient) • ASU • TGen • Other Research Partners • Other Clinical Partners (inpatient) • Other Commercial Partners	• College of Medicine • UA Research • UA Clinical (outpatient) • ASU • TGen • Other Research Partners • Other Clinical Partners (inpatient) • Other Commercial Partners

The Economic Potential is Significant

The overall economic impact[4] of the Phoenix Biomedical Campus on the state of Arizona in 2025 could range from $552.5 million (Scenario A) to $2.1 billion (Scenario C). By 2015, the overall impact could range from $241.9 million (Scenario A) to $1.4 billion (Scenario C). In 2010, the overall impact could range from $152.5 million (Scenario A) to $486.8 million (Scenario C). The overall economic impact of the Phoenix Biomedical Campus in 2007 is expected to equal $77.1 million. (See Figure 3)

Figure 3: Overall Economic Impact of Phoenix Biomedical Campus (Direct and Indirect)



The total economic impact of individual entities and projected research, clinical, and commercial spin-offs is detailed in Table 1 below.

[4] The overall economic impact of the Phoenix Biomedical Campus equals both direct and indirect business volume. Direct impact is defined as the sum of total expenditures for capital, goods and services, and staff spending within in the study area. It also includes out-of area spending from patients and visitors. Indirect impact is defined as the standard multiplier as recommended by American Council on Education representing the re-spending taking place in the study area.

Table 1: Overall Economic Impact (Direct and Indirect)[5]

Year	Scenario	Total	UA COM[6]	ASU[7]	Non university research & Commercial Spin-offs[8]	Other Clinical[9]
2007		$77.1 million	$18.0 million	$671,332	$58.4 million	--
2010	A	$152.5 million	$81.0 million	$1.5 million	$70.0 million	--
	B	$391.2 million	$272.9 million	$1.5 million	$116.8 million	--
	C	$486.8 million	$272.9 million	$1.5 million	$212.4 million	--
2015	A	$241.9 million	$101.9 million	--	$140.0 million	--
	B	$574.6 million	$341.0 million	--	$233.6 million	--
	C	$1.4 billion	$341.0 million	--	$423.9 million	$600.0 million
2025	A	$552.5 million	$132.2 million	--	$420.3 million	--
	B	$1.0 billion	$414.6 million	--	$591.2 million	--
	C	$2.1 billion	$414.6 million	--	$762.5 million	$950.0 million

5 The overall economic impact of the Phoenix Biomedical Campus equals both direct and indirect business volume. Direct impact is defined as the sum of total expenditures for capital, goods and services, and staff spending within in the study area. It also includes out-of area spending from patients and visitors. Indirect impact is defined as the standard multiplier as recommended by American Council on Education representing the re-spending taking place in the study area.

6 University of Arizona College of Medicine includes all education, research, and clinical components that are owned and operated by the University.

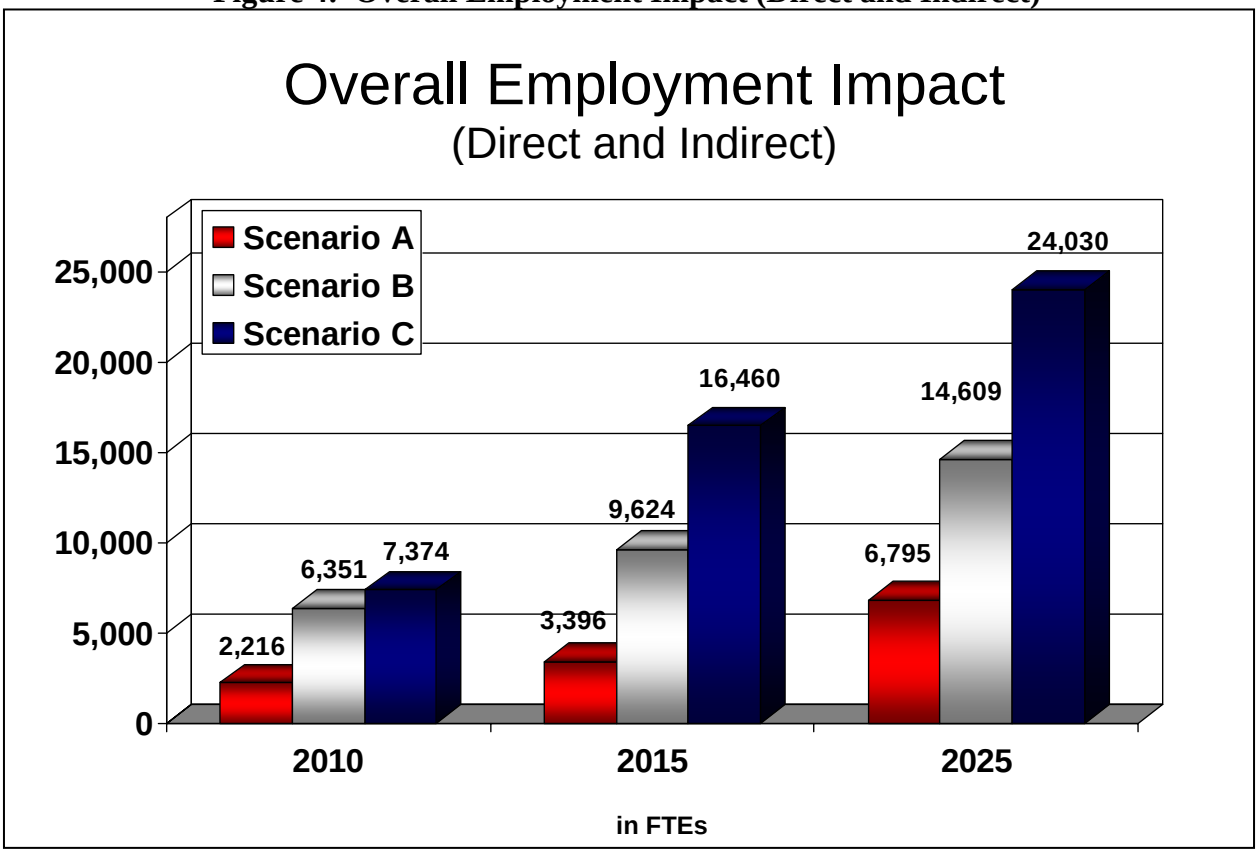
7 ASU has been modeled only for years 2007 and 2010 due to the fact that data was unavailable for projections past 2010. It is also noteworthy that the economic impact presented herein for ASU only includes the direct spending of staff, faculty and students.

8 Includes all non university research, such as economic impact generated by TGen as well as other commercial spin-offs resulting from biomedical and medical innovation. The economic impact of business spin-offs were calculated utilizing a standard multiplier developed by the Association of University Technology Managers (AUTM).

9 Tripp Umbach assumes that a teaching hospital will be developed on the Phoenix Biomedical Campus by 2015.

Tripp Umbach calculated both direct and indirect employment numbers for the Phoenix Biomedical Campus for all scenarios and all benchmark years. In 2025, under Scenario A, the Phoenix Biomedical Campus potentially could generate 6,795 new direct and indirect jobs, Scenario B shows the potential of 14,609 new jobs and in Scenario C, 24,030 jobs could be generated. In 2015, under Scenario A the Phoenix Biomedical Campus could create 3,396 new jobs, and under Scenario C, 16,460 new jobs could be created. The overall employment generated by the Phoenix Biomedical Campus in 2010, under Scenario A is projected to be 2,216, under Scenario B, 6,351 new jobs and in 2025 there is the potential to generate 7,374 jobs. In 2007, the overall employment impact of the Phoenix Biomedical Campus will be 981 new direct and indirect jobs. (See Figure 4).

Figure 4: Overall Employment Impact (Direct and Indirect)



The overall employment impact of individual entities and projected research, clinical, and commercial spin-offs is detailed in Table 2 below.

Table 2: Employment Impact for Phoenix Biomedical Campus (Direct and Indirect)[10]

Year	Scenario	Total Employment (FTEs)	UA COM[11]	ASU[12]	Non university research & Commercial Spin-offs[13]	Other Clinical[14]
2007		981 jobs	357 jobs	--	624 jobs	--
2010	A	2,216 jobs	1,467 jobs	--	749 jobs	--
	B	6,351 jobs	5,102 jobs	--	1,249 jobs	--
	C	7,374 jobs	5,102 jobs		2,272 jobs	--
2015	A	3,396 jobs	1,899 jobs	--	1,497 jobs	--
	B	9,624 jobs	7,126 jobs	--	2,498 jobs	--
	C	16,460 jobs	7,126 jobs	--	4,534 jobs	4,800 jobs
2025	A	6,795 jobs	2,300 jobs	--	4,495 jobs	--
	B	14,609 jobs	8,286 jobs	--	6,323 jobs	--
	C	24,030 jobs	8,286 jobs	--	8,144 jobs	7,600 jobs

[10] Direct employment is the total number of employees based on Full-Time Equivalents (FTEs). Indirect employment is the additional jobs created as a result of the institution's economic impact. Local companies that provide goods and services to an institution increase their number of employees as purchasing increases, creating an employment multiplier.

[11] University of Arizona College of Medicine includes all education, research, and clinical components that are owned and operated by the University.

[12] Due to limited information, Tripp Umbach was not able to complete comprehensive modeling for the ASU Bioinformatics program. All student, faculty and support staff have been incorporated into the total number of FTEs.

[13] Includes all non university research, such as economic impact generated by TGen as well as other commercial spin-offs resulting from biomedical and medical innovation on the Phoenix Biomedical Campus. Employment related to business spin-offs were calculated utilizing a standard multiplier of 1 job for every $3,000,000 in external grant funding as estimated by the Association of University Technology Managers (AUTM).

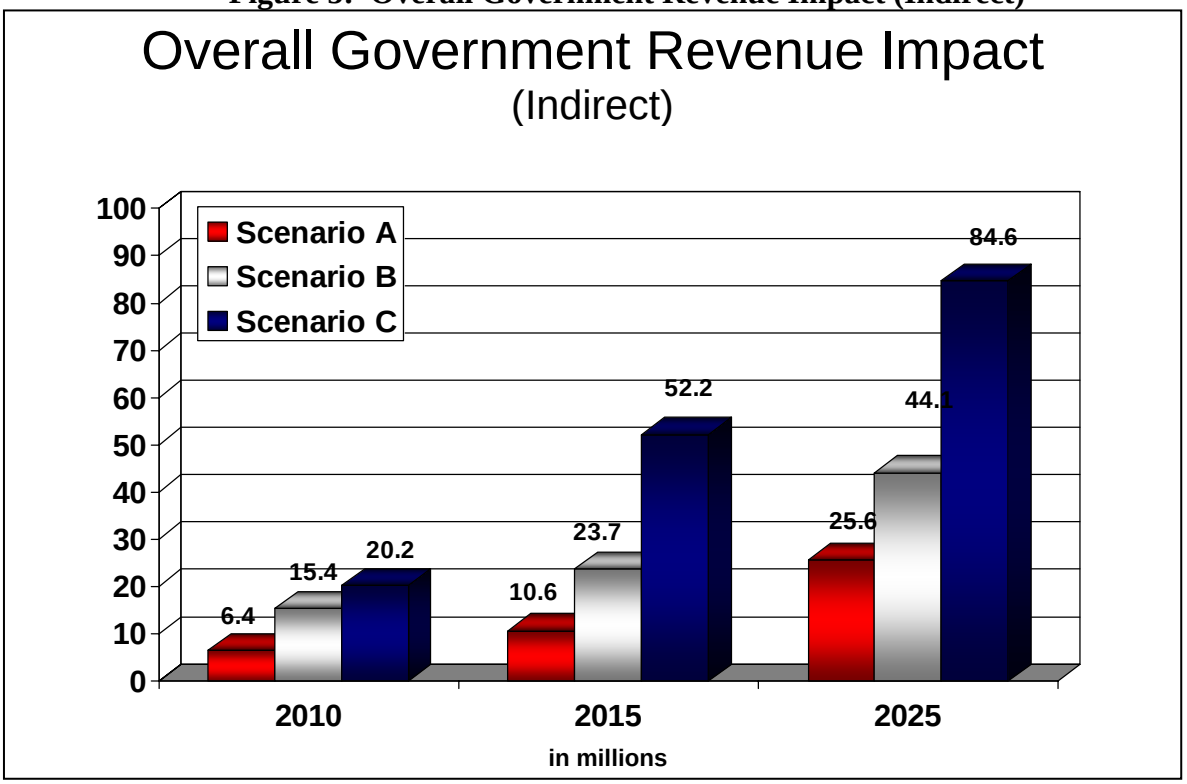
[14] Tripp Umbach assumes that a teaching hospital will be developed on the Phoenix Biomedical Campus by 2015.

Government Revenue Impact for Phoenix Biomedical Campus

In order to quantify the financial returns to the state of Arizona, the models include a government revenue impact component, which calculates the indirect government revenue received by the state of Arizona from the Phoenix Biomedical Campus. In 2010, Scenario A shows that the state could receive $6.4 million in indirect revenues from the Phoenix Biomedical Campus and by 2025 could receive $25.6 million. The Phoenix Biomedical Campus government revenue projections in Scenario B could range from $15.4 million in 2010 to $44.1 million in 2025. The indirect government revenue impact generated by the Phoenix Biomedical Campus in Scenario C could reach as high as $52.2 million in 2015 and by 2025 could equal $84.6 million. In 2007, the overall indirect government revenue generated by the Phoenix Biomedical Campus is projected to be $3.6 million.

Tripp Umbach estimates that by 2025, assuming a fully integrated campus (Scenario C), total state government revenue generated by the Phoenix Biomedical Campus would equal $84.6 million. Therefore, the return on investment for the state of Arizona, assuming $40 million in annual support, will be $2 generated for every $1 of state funds invested. An even dollar for dollar return on state investment will occur in 2015 (Scenario C) when the Phoenix Biomedical Campus will generate $52.2 million in government revenue. Tripp Umbach cautions that a return on investment to the state of Arizona will not be achieved with a stand alone medical school as modeled in Scenario A.

Figure 5: Overall Government Revenue Impact (Indirect)



The annual government revenue impact (indirect only) of individual entities and projected research, clinical, and commercial spin-offs is detailed in Table 3 below.

Table 3: Annual Government Revenue (Indirect only)[15]

Year	Scenario	Total	UA COM[16]	ASU[17]	Non university research & Commercial Spin-offs[18]	Other Clinical[19]
2007		$3.6 million	$655,672	--	$2.9 million	--
2010	A	$6.4 million	$2.9 million	--	$3.5 million	--
	B	$15.4 million	$9.6 million	--	$5.8 million	--
	C	$20.2 million	$9.6 million	--	$10.6 million	--
2015	A	$10.6 million	$3.6 million	--	$7.0 million	--
	B	$23.7 million	$12 million	--	$11.7 million	--
	C	$52.2 million	$12 million	--	$21.2 million	$19.0 million
2025	A	$25.6 million	$4.6 million	--	$21.0 million	--
	B	$44.1 million	$14.5 million	--	$29.6 million	
	C	$84.6 million	$14.5 million	--	$38.1 million	$32 million

[15] Government revenue that is collected by governmental units in addition to those paid directly by an institution, including taxes paid directly by employees of the institution, visitors to the institution, and vendors who sell products to the institution.
[16] University of Arizona College of Medicine includes all education, research, and clinical components that are owned and operated by the University.
[17] ASU has been modeled only for years 2007 and 2010 due to the fact that data was unavailable for projections past 2010. Government revenue impact for ASU is included under UACOM.
[18] Includes all non university research, such as economic impact generated by TGen as well as other commercial spin-offs resulting from biomedical and medical innovation.
[19] Tripp Umbach assumes that a teaching hospital will be developed on the Phoenix Biomedical Campus by 2015.

Conclusions

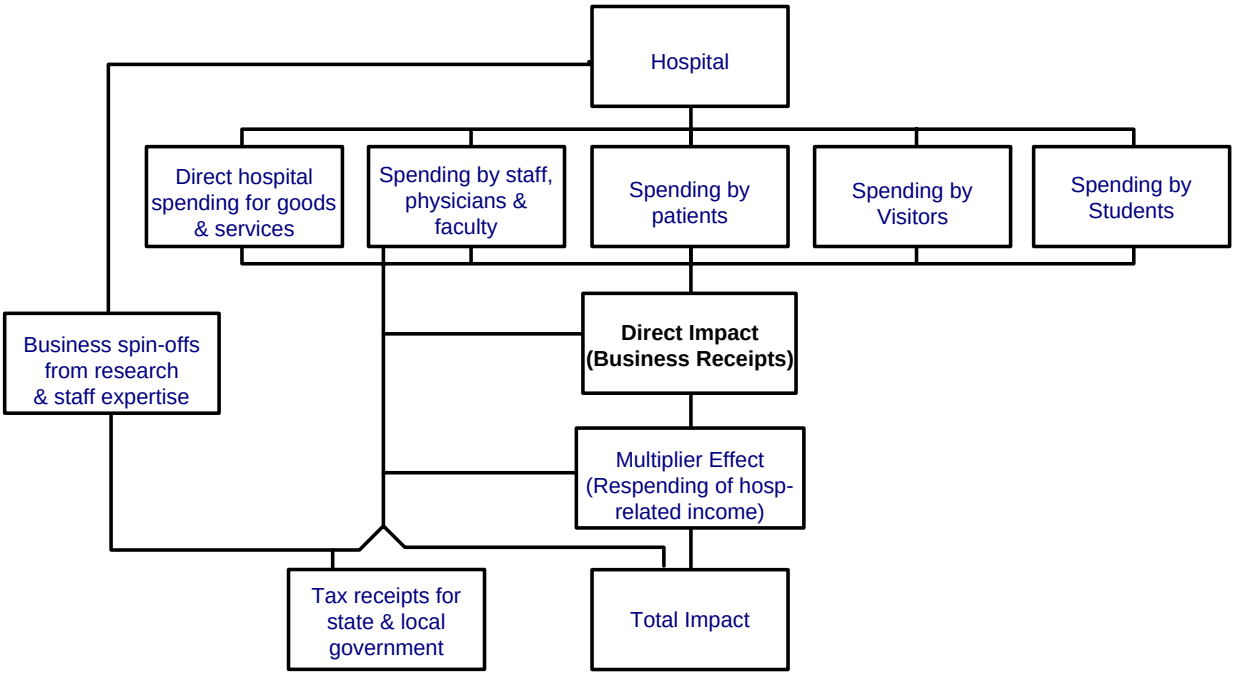
Tripp Umbach estimates that the Phoenix Biomedical Campus will rank among the state of Arizona's leading economic engines by 2025 when the campus has the potential to generate $2.1 billion in annual economic impact and generate employment for 24,000 Arizona residents. Further, the campus has the opportunity to generate more than $80 million annually in government revenue providing the state of Arizona with $2 in government revenue for every $1 invested.

Appendix A: Methodology Employed in the Economic Quantification Study

Tripp Umbach has performed more than 100 economic impact studies for both academic institutions and large health care systems, including for the Mayo Clinic Rochester, Mayo Clinic – Arizona entities, UPMC Health System, and North Mississippi Health System. The methodology generally employed in these studies was originally derived from a set of research tools and techniques developed for the American Council on Education (ACE).[20] The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area. While this methodology is generally well suited to evaluate a hospital's impact on its local service area, it tends to be too limiting for a project with the complexity of a medical schools with an integrated systems.

Based on previous economic impact studies performed for academic health centers in Pennsylvania and Virginia, Tripp Umbach recommended that the traditional model of economic impact for hospitals *(see Figure 1)*, based on the ACE model, be modified for the purposes of this research.

Figure 1
Hospital Economic Impact
(A Traditional Model)

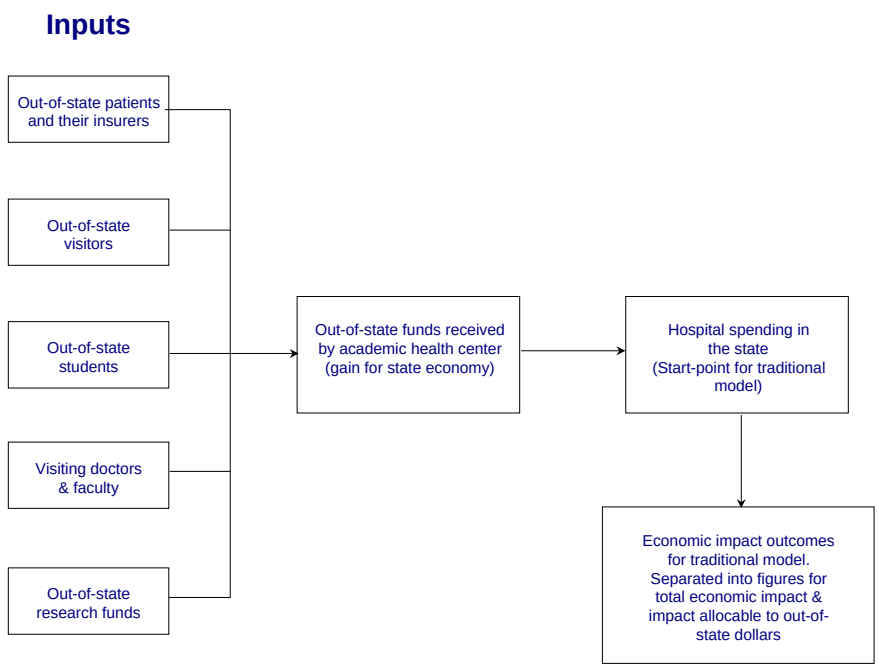


[20] Caffrey, John and Isaacs, Herbert, "Estimating the Impact of a College or University on the Local Economy," American Council on Education, 1971.

The "traditional" model of hospital economic impact provides a good measure of the impact of hospital expenditures and their flow within an economy. However, the model does not account for the origination of hospital revenues, and thus counts the spending of revenues received by the hospital from in-state sources. The traditional model counts some of the spending of dollars that already existed in the Arizona economy.

The Tripp Umbach research team felt it important to distinguish the economic impact of the individual entities who will occupy the Phoenix Biomedical Campus that are attributable to funds brought into the state from out-of-state sources. The application of this "fresh dollar" model provides a first-line measure of the initial direct expansion in the state economy caused by the Phoenix Biomedical Campus. The final model concept evolved into a hybrid model including a fresh-dollar approach feeding into a traditional model which tracks in-state spending. Thus the final model used for this research *(see Figure 3)* measures funds brought into the state together with the ultimate flow of these funds through the Arizona economy and the effect on economic expansion, job growth and enterprise development. The final methodology closely matches the impact study methodology recommended for individual medical schools by the Association of American Medical Colleges.

Figure 2
Phoenix Biomedical Campus
Economic Impact Model



Tripp Umbach Healthcare researchers worked closely with representatives from the University of Arizona College of Medicine and other key stakeholders at an all day planning session to collect the data required to conduct the study.

Appendix B: Definition of Terms

TOTAL ECONOMIC IMPACT	The total economic impact of an institution includes both the direct economic impact and the indirect economic impact, generated in the economy as a result of the direct impact. Direct impact includes items such as institutional spending, employee spending, and spending by out-of-area visitors to the institution. Indirect economic impact, also known as the multiplier effect, includes the re-spending of dollars within the local economy.
TOTAL STATE BUSINESS VOLUME	Total sales receipts generated within a given geographic area (State of Arizona). Business volume includes wholesale, retail, service sector spending as well as value added in the manufacturing process.
MULTIPLIER EFFECT	The multiplier effect is the additional economic impact created as a result of the institution's direct economic impact. Local companies that provide goods and services to an institution increase their purchasing, creating a multiplier.
DIRECT TAX PAYMENTS	Direct tax payments made by an institution to a unit of government.
INDIRECT TAX PAYMENTS	Government revenue that is collected by governmental units in addition to those paid direct by an institution, including taxes paid directly by employees of the institution, visitors to the institution, and vendors who sell products to the institution.
DIRECT EMPLOYMENT	Total Employees based on Full-Time Equivalents (FTEs)
INDIRECT EMPLOYMENT	Indirect employment is the additional jobs created as a result of the institution's economic impact. Local companies that provide goods and services to an institution increase their number of employees as purchasing increases, creating an employment multiplier.

Phoenix Program
of
The University of Arizona
College of Medicine

LEVEL I -- Five Year Projection

"Our Stand: Medical School in Phoenix Vital"
– Arizona Republic, 4/8/05

Table of Contents

Memorandum of Understanding	**3-8**
Phoenix Program UA College of Medicine State Budgets for FY 06 and FY 07	**9**
Incremental Expenses—Phoenix Program of the UA COM—Chart	**10**
Phoenix Program UA College of Medicine Budget Breakdown FY 07	**11**
State Funding Requirements (six year projection) Phoenix Program, LEVEL I The University of Arizona College of Medicine	**12-13**
State Funding Requirements (five year projection) Department of Biomedical Informatics Arizona State University	**14**
Biomedical Informatics Department at Arizona State University	**15-16**
Arizona Republic Editorial	**17**
Appendix	**18**

Preservation Plan for Phoenix Union High School Building One

Preservation Plan for Phoenix Union High School Building Two

Preservation Plan for Phoenix Union High School Building Three

"Arizona has among the lowest number of working nurses and physicians per capita of all 50 states." **-**"Meds and Eds", March 2005 edition

Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING REGARDING THE EXPANSION OF MEDICAL EDUCATION AND RESEARCH IN PHOENIX

August 4, 2004
The Arizona Board of Regents
The University of Arizona
The Arizona State University
The doctrinal mandate of the Arizona Board of Regents—Article XI, Sections 1, 2, 5, and 10 of the Arizona Constitution—distinctly vests in ABOR the general conduct and supervision of Arizona's universities. The Arizona Constitution also vests in the Arizona Legislature the power to appropriate tax monies for the establishment and maintenance of Arizona's universities. Thus, ABOR's constitutional autonomy is ultimately defined by judicial decisions confirming its general powers and by the Arizona Legislature's authority over appropriations for the general support of higher educational endeavors.

With this Constitutional mandate, ABOR is responsible for advancing the design and direction of our universities as they move forward to address the needs of the people of Arizona. In this design, ABOR manages a three-university system that has emerged from the original single university campus of the University of Arizona and the subsequent growth and maturation of Arizona State University and Northern Arizona University. As demand for higher education and advanced research services has increased in Arizona the Arizona University System has evolved and its design updated.

The University of Arizona was established by the 13th Territorial Legislature in 1885 as Arizona's land-grant university, with the first class held in 1891. With this history, a developed infrastructure, and its status as Arizona's first research university, the U of A was considered by all to be the natural choice for the location of Arizona's College of Medicine. Arizona's first and only public college of medicine was created by ABOR in 1962 and opened in the fall of 1967. Since 1992 the U of A College of Medicine has been conducting clinical instruction for medical students in conjunction with the major hospitals in Maricopa County, where approximately 40% of the MD students receive their third and fourth-year clinical education today, operating out of leased offices and classrooms in Phoenix with clinical instruction in nine area hospitals.

Arizona State University's status was changed from college to university in 1958 and its first Ph.D. was authorized by ABOR in 1958. ASU's trajectory, from a "normal" college just four years prior to the creation of the U of A's college of medicine, to its present status as a "Research Extensive" Carnegie level university makes it imperative that it participate in and benefit from the expansion of medical education and research in Arizona.

Memorandum of Understanding
(Continued)

The need for expanding and enhancing the design is acute and ABOR has undertaken a broad redesign effort with regard to the overall system. In addition, but on a much narrower basis the time has come to begin the efforts of expanding the system's capacity in biomedical education and research. This acute need derives from the fact that as the state has grown in population and complexity the Phoenix metropolitan area and all of its healthcare enterprises have been left without the benefit of a fully developed, public, research-grade, teaching medical school. The absence of a fully developed college of medicine in Phoenix disadvantages Phoenix and Arizona now and will adversely influence the quality of healthcare and the environment for continued development of Arizona's biotechnology industry.

The U of A's college of medicine has a solid reputation and a proven record of obtaining medical research grants. The synergistic effect of the college of medicine and its teaching hospitals in Tucson, and surrounding areas, provides high quality healthcare services and a research environment conducive to the development of the biomedical and biotechnology industries. ABOR wishes to expand the operations of the U of A's college of medicine in Phoenix to include first and second year students and complementary research. It also wishes to build facilities on the Phoenix Biomedical Campus of the Arizona University System in conjunction with one or more existing teaching hospitals.

The goal is to leverage cost efficiencies without uprooting the significant financial investment already vested in our statewide medical education and research efforts. ABOR also wishes to reaffirm the planned relocation of ASU College of Nursing to the Phoenix Biomedical Campus, where ASU and the U of A are also planning research facilities to operated jointly by the U of A and ASU through the Arizona Biomedical Collaborative.

It was thought by some that ASU's ability to move from normal school status to Research Extensive University status would be impaired by its lack of a college of medicine. This has not proved to be the case as ASU has already achieved Research Extensive University status without the cost burdens associated with a medical school and a teaching hospital. Both ASU and U of A stand poised to advance significantly their research grants and their contribution to medical education in Arizona by cooperation and collaboration on an expanded U of A college of medicine in the greater Phoenix area. It is anticipated by ABOR that this expansion from Tucson to Phoenix will involve no less than the development of full-time faculty providing instruction to M.D. candidates for all four years while also engaging in research and clinical practice. ABOR wishes to advance this programmatic theme by providing for joint faculty appointments of basic science faculty at ASU and the U of A, and simultaneously expanding the faculties of both universities in fields related to the health sciences. ABOR will also rely on Arizona's pioneering Telemedicine Network to connect all medical education participants in a unified curriculum.

Memorandum of Understanding
(Continued)

ABOR does not wish to build a separately accredited or separately managed college of medicine in Phoenix. It believes that a significantly expanded presence of the U of A's college of medicine in Phoenix, with two synergistically related campuses, involving faculty from both the U of A and ASU is the best strategic choice to advance Arizona's healthcare needs and its expansion of bio-medical education, research and technology.

This Memorandum of Understanding[1] is intended to memorialize ABOR's commitment to this approach to the U of A College of Medicine's expanded presence on the Phoenix Biomedical Campus. It is not intended as a comprehensive agreement or as a path to the difficult funding and important collaborations and partnerships that must necessarily come from the healthcare industry in general and the many state, county and municipal interests that must be accommodated. Our purpose in executing this Memorandum of Understanding is to establish several First Principles that we determine critical to the design and development process.

First Principles

1. ABOR does not wish to entertain the funding, accrediting, logistical, or staffing hurdles that are inherent in building a second college of medicine in Arizona and firmly believes that its existing college of medicine should be expanded to meet Arizona's healthcare and medical education needs.
2. This method of expansion of the U of A college of medicine must serve the social and economic needs of the people of Arizona by fully developing a research grade medical school in Phoenix designed to address our 21st century healthcare challenges.
3. This method of expansion will involve both physical and intellectual assets of the U of A's college of medicine. It will link with and draw from other critical physical and intellectual assets from Arizona State University to complement its programs in teaching and research.
4. The design of the Phoenix-based expansion of the college of medicine will focus on the unique social, cultural and healthcare system needs in metropolitan Phoenix. Its training and research programs will be reflective of these needs and synergistic with existing capabilities at ASU, T-Gen and area hospitals, institutes and foundations.
5. The design of this expansion unit of the college of medicine will be done in a way that complements rather than replicates the research strengths of the Tucson campus of the medical school or the Tempe campus of Arizona State University.
6. The design is to be done in a way that maximizes the collective assets of the U of A and ASU and most efficiently builds upon existing capabilities throughout the State of Arizona.
7. The U of A college of medicine will offer a single united curriculum for accreditation, making efficient use of the Telemedicine Network for interconnecting all centers of learning.
8. ABOR wishes to avoid the political and cultural obstacles inherent in the historical development of its two Research Extensive Universities and does not wish to exacerbate the many obstacles that must be overcome to advance our approach to the building of a college of medicine for the betterment of the people of Arizona ABOR therefore proposes that the U of A and ASU agree to collaborate in the development of the Phoenix Biomedical Campus and to give appropriate attention to the interests of both universities in this process.

Memorandum of Understanding
(Continued)

9. ABOR has asked the U of A to assume the lead in conceptualizing the expansion of its college of medicine on the Phoenix Biomedical Campus. The U of A agrees to assume the lead position and to involve directly ASU's administration and faculty in the planning process.
10. ABOR has asked ASU to assume the lead in conceptualizing how it can serve this expansion of healthcare, medical research and medical education by making its faculty and research facilities available and to assist the U of A in a collaborative process of identifying faculty interested in joint appointments in the U of A's college of medicine. ASU agrees to take this initiative and to involve directly the U of A's administration and appropriate faculty as it evaluates its faculty and research offerings.
11. ABOR has asked the U of A and ASU to coordinate their mutual efforts in expanding medical education and research efforts to the mutual end that healthcare, biomedical science and biomedical engineering efforts are steadily advanced by the addition of a Phoenix campus to our existing college of medicine. Both universities have pledged to ABOR that they will coordinate and cooperate and that they understand that this effort is considered by ABOR to be a primary policy initiative.
12. ABOR has asked the U of A and ASU to emphasize the advancement of the Arizona University System goals and public needs and to do everything possible to inhibit the natural tendencies of individual institutions to advance their own reputational interests to the possible detriment of the needs of medical education and research in Arizona.
13. ABOR, the U of A and ASU believe that the planning process should evolve over the short term. Attached hereto as "Addendum A" is the current understanding regarding the planning process. It is anticipated that other areas may be added as the partnerships and new collaborations come into being.

"The school won't get sidetracked from educating doctors."
-"Doctor Deficiency", Arizona Republic 4/8/05

Summary
It is the intent of ABOR to advance our university system and our two Research Extensive universities to the level of national prominence in biomedical teaching and research. We intend to lay the foundation for the M.D. demands of a state of 8 to 10 million people and to expand our presence in the biomedical research arena. This will be accomplished by expanding the college of medicine into Phoenix in a way that ensures the success of our community, the college of medicine and both the U of A and ASU.

The implementation of this planning, design and development process will occur at several levels as specified in the thirteen First Principles set forth above. Adherence to and implementation of these First Principles will require the ongoing participation and leadership of the presidents of ABOR, U of A, and ASU. It is anticipated that ABOR will ratify this Memorandum of Understanding at its August 2004 meeting and that the presidents of the U of A and ASU will present a design and development plan for these coordinated efforts on or before the ABOR January 2005 meeting.

Memorandum of Understanding
(Continued)

The First Principles stated in the Memorandum of Understanding will be utilized in all forthcoming discussions and planning endeavors. The four areas of planning, design and development stated in Addendum A will be monitored and utilized as the development of the Phoenix Biomedical Campus of the Arizona University System evolves. Our purpose in signing this memorandum of understanding is to convey to the people of Arizona our joint commitment to the advancement of medical education and research in Arizona and to forestall tangential and historical arguments predicated on geographical boundaries or institutional perceptions of favoritism. By our signatures today, we commit to one another and to the people of Arizona our promise to work together to advance medical education and research under a single college of medicine in Arizona.
Gary L. Stuart, President
Arizona Board of Regents
Peter W. Likins, President
University of Arizona
Michael M. Crow, President
Arizona State University

ADDENDUM "A" TO ABOR, U OF A, ASU MEMORANDUM OF UNDERSTANDING REGARDING EXPANSION OF MEDICAL EDUCATION AND RESEARCH IN PHOENIX

August 4, 2004

In expanding the college of medicine into Phoenix four areas of planning, design and development will be required. These areas are each essential to the success of this expansion and in a critically important way essential to the success of the further maturation of the university system and the development of a great biomedical teaching and research base in Phoenix. The four areas of planning, design and development include:
1. The Phoenix Biomedical Campus of the Arizona University System:The Phoenix Biomedical Campus will be linked to the planning of the capital center campus of ASU and a joint planning, design and development effort will be undertaken to establish a physical environment that can be the home for TGEN, the U of A College of Medicine, new hospital facilities and associated research and teaching enterprises. This will include the ASU College of Nursing and an appropriate presence for the U of A College of Pharmacy, and public health faculty from both universities. This campus must establish an environment for maximum cooperation.
2. The University of Arizona College of Medicine: An expansion plan must be carefully developed that positions the U of A college of medicine not only for expansion in M.D. production but also for research and clinical engagement. This plan will involve the U of A faculty and a wide range of healthcare provider organizations. In addition, this process will involve those elements available or developable at ASU that would complement the value and heighten the success of this expansion.

Memorandum of Understanding
(Continued)

3. Arizona State University: It is anticipated that ASU will assist in the expansion of the college of medicine through a focused set of designed linkages. Each of these linkages is intended to complement, augment and speed the expansion of the college of medicine and to secure for ASU a clearly articulated linkage in the best interests of the college of medicine, ASU, and the university system as a whole. The specific assets of ASU to be considered in this planning, design and development process include:

a. A medical undergraduate teaching linkage as required by the dean of the college of medicine.

b. Defined and specific research linkages through the Arizona Biomedical Collaborative in areas such as; personalized medicine research, urban health, Native American health and biodesign.

c. The development of a new department at ASU in Biomedical Informatics that would be a department in the Fulton School of Engineering and Applied Science and the U of A college of medicine, subject to the appropriate approvals of the academic community in both universities.

d. Specified linkages with the ASU College of Nursing and the ASU Nutrition Program.

e. Joint faculty appointments as approved by appropriate faculties in the same way as joint appointments are handled internal to either university.

f. Joint degrees with the college of medicine as developed and approved through the normal review process basis.

4. Telemedicine Teaching and Research: It is anticipated that this planning, design and development process will make full use of emerging telemedicine teaching and research enhancement technologies between Tucson and Phoenix in both directions. This parameter is intended to illustrate that it is assumed that the level of cooperation between the campuses of the college of medicine will be unparalleled.

"This isn't unknown territory. We're already educating medical doctors in the Valley. About 40 percent of the University of Arizona's medical students come here for clinical study...." -Doctor Deficiency, Arizona Republic 4/8/05

Phoenix Program
UA College of Medicine
State Budgets for FY 06 and FY 07

Narrative

The start-up process for the UA College of Medicine Phoenix Program is quite complex but relatively inexpensive for Level I operations, which can accommodate 24 first year students in each class in renovated Phoenix Union High School buildings and build toward a steady-state operation with 48 students combined in the first and second years and almost 150 students in the third and fourth years, including medical students who began their medical training in Tucson. Level I operations also require State investments in the ASU Biomedical Informatics Program, which is budgeted separately.

Level II operations, which could have as many as 150 new students starting medical education in Phoenix each year, is also not included in this budget summary, as it will require separate actions by the State several years into the future.

If the Phoenix Program steps up to 150 new students at Level II and the Tucson Program expands slightly to 120 new medical students each year, Arizona will be producing as many as 270 practicing physicians every year in response to the keenly felt societal need for doctors in this growing state.

In order to secure permission from the accrediting body (the Liaison Committee for Medical Education) to enroll new medical students in Phoenix when the academic year begins in July, we must host a site visit the preceding Fall and demonstrate that standards are met in three areas: Facilities, Faculty and Curriculum.

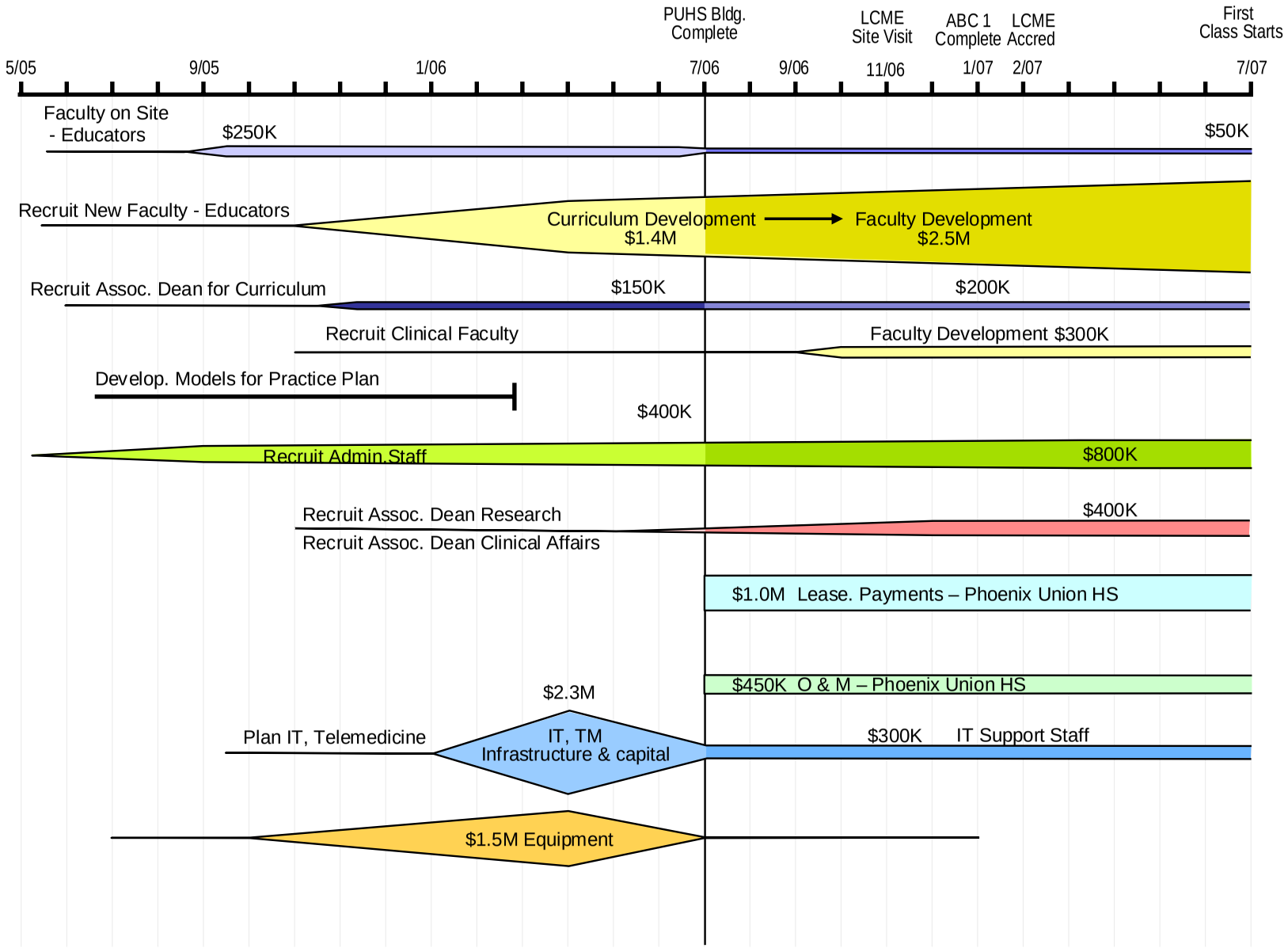
The renovated facilities will be available in July 2006, when about 100 upper division students already in Phoenix will move with faculty and staff from leased facilities elsewhere in Phoenix. If we add $6.0 million in new State funds for FY06 to the $2.8 million of UA funds currently committed, the facilities will be equipped and the faculty in place for the LCME site visit, tentatively scheduled for November of ’06, with the curriculum in an advanced stage of development.

The attached flow chart illustrates schematically how the $6.0 million in State funds will be used in FY06 and FY07. Although the dollars are the same for both years, the uses of funds are quite different. In FY06 approximately $3.8 million of the $6.0 million would be invested in equipping the facilities, which must be adequate to meet very high telecommunications standards as required by the telemedicine program that enables the UA College of Medicine to serve the entire State. The balance would be used to begin assembling the required faculty and staff.

The budget for the second year, FY07, is displayed schematically in the attached flow chart and described in more detail in the second attachment, which shows $6.0 million in State funds in combination with $2,774,000 in UA funds.

PL/ls
Attachment 1. Flow chart for FY06, FY07
Attachment 2. Budget for FY07

Incremental Expenses- Phoenix Program UA COM



Phoenix Program – University of Arizona College of Medicine
Budget Breakdown FY 07
(in thousands, $K)

	Existing UA Funds/Grants ($K)	Total ($K)	Requested ($K)
OPERATIONS AND MAINTENANCE			
Operations	509	909	400
Lease Costs	448	1,448	1,000
Operations and Maintenance	0	450	450
Travel	175	175	0
EDUCATION			
Administration			
Dean of Academic Affairs (1)	1,223	1,823	600
Associate and Assistant Deans (5)			
Admissions/Academic/Financial Support (3)			
Admin Assistant and Admin Associates/Reception (6)			
Business Affairs/Development/Facilities (3)			
Special Assistant to Dean (2)			
Minority Affairs			
Director	257	257	0
Student Recruiters (3)			
Administrative Assistant (1)			
Basic Science Faculty for Year 1 and 2 Students			
Ph.D. faculty (6)	0	2,640	2,640
M.D. faculty (2)			
Clinical Science half-time M.D. (6)			
Clinical Science M.D. (3)			
Educational Consultants M.D., part-time (20)			
Administrative Assistant (5)			
Information Technology			
Media support (2)	162	462	300
Medical computing (2)			
Gross Anatomy Lab			
Staff (1)	0	47	47
Pre-Clinical Training			
Faculty M.D. (1)	0	210	210
Administrative Assistant (1)			
Medical Library			
Librarian (1)	0	309	309
Library Support staff (2)			
Computer staff (1)			
Medical Bookstore			
Office staff (1)	0	44	44
TOTALS ($K)	**2,774**	**8,774**	**6,000**

State Funding Requirements (six year projection)
Phoenix Program, LEVEL I
The University of Arizona College of Medicine
(Not including related budget for ASU, which starts at $1.0 Million)

FISCAL YEAR	UA	NEW REQUEST
	$ M	Δ$ M
06	6.00	6.00
07	6.00	0.00
08	8.50	2.50
09	12.00	3.50
10	16.00	4.00
11	20.00	4.00

The appropriations for LEVEL I funding will provide the following:

- Start-up: Facilities, equipment, faculty and staff
- Year 1 – 24 new students, plus 100 students from the Tucson campus in clinical rotations, or 124 students
- Year 2 – 24 new students, plus 24 second year students, plus 100 in clinical rotations, or 148 new students
- Year 3 – 24 new students, plus 48 second and third year students, plus 100 in clinical rotations, or 172 students
- Year 4 – 24 new students, plus 72 second, third and fourth year students, plus 100 in clinical rotations, or 196 students

NOTE: These are LEVEL I funding requirements, at which level the facilities on the Phoenix Biomedical Campus are limited to the renovated Phoenix Union High School buildings, with maximum capacity of 24 first year medical students per year, for a total capacity of approximately 100 medical school students (first through fourth year). However, the funding requirement reflects increases in the number of students supported by the Phoenix campus. Currently, there are approximately 100 third and fourth year medical students doing clinical rotations in Phoenix. At full complement, LEVEL I will support nearly 200 students (48 first and second year students and about 148 third and fourth year students).

During the first two years of the program, faculty and staff are needed for the basic science education. Paid clinical faculty are required as more students transition into this area of training. Currently, the UA College of Medicine utilizes 400 volunteer, unpaid faculty in Phoenix, however, clinical faculty will need to be paid as they contribute a greater portion of their time to the training of medical students.

State Funding Requirements (six year projection)
Phoenix Program, LEVEL I
The University of Arizona College of Medicine
(Continued)

The funding requirements display a tremendous cost savings by utilizing shared resources with the Tucson campus. In addition to the requested state appropriation the UA is contributing over these six years approximately $21 million in operating costs and investing over $17 million in Phoenix Biomedical Campus capital facilities.

In addition, tremendous cost savings are achieved through the use of the land (valued at approximately $3.2 million), the use of the Phoenix Union High School buildings (purchased by the City of Phoenix at a cost of approximately $10 million) and through the utilization of federal "New Market Tax Credits" by the City of Phoenix for $25 million.

A business plan will be developed in CY05 for LEVEL II operations, permitting up to 150 first year medical students per year, but requiring major public and private investments in facilities and operations. The timing of the move to LEVEL II will depend on the final recommendations of the Arizona Commission on Medical Education and Research, the type of public-private partnerships formed through the City of Phoenix's biomedical campus and the desire of the Arizona State Legislature and Governor to increase class size in the future. Current state policy-makers cannot bind future legislators, or Governors, to a pre-set appropriation. LEVEL I funding is the only commitment being sought.

"Metropolitan Phoenix was the 14th largest metropolitan area in the nation in the 2000 census – and it is by far the largest metro area in the nation without a four-year allopathic medical school and major academic medical center."

-"Meds and Eds", March 2005 edition

Contrary to certain perceptions, only a fraction of medical school graduates focus solely on research. It is anticipated that the students graduating from the Phoenix Program of The University of Arizona College of Medicine will practice in hospitals, private offices and clinics throughout the state. Moreover, expansion of the Arizona telemedicine program will increase our capacity to serve all areas of Arizona, especially the most remote. Currently, Arizona has a shortage of physicians (45th per capita in number of physicians) and lacks the academic support in Maricopa County to retain many of these physicians.

State Funding Requirements (five year projection)
Department of Biomedical Informatics
Arizona State University

Category of Expense	FY06	FY07	FY08	FY09	FY10
Faculty	600000	1200000	1800000	2100000	2400000
Staff	75000	150000	200000	250000	250000
Student assistants	50000	100000	250000	350000	500000
Operations	100000	150000	200000	225000	250000
Library/Information Resources	100000	150000	200000	200000	200000
Rent	75000	250000	350000	375000	400000
Totals	**1000000**	**2000000**	**3000000**	**3500000**	**4000000**

Notes: Facilities and classroom renovations are not included; Rental calculation based on 25/sq ft starting mid year 06

Faculty: The funds for faculty hires are for full-time faculty in Biomedical Informatics Department and joint faculty hired with Computer Science and Engineering Department (CSE), Bioengineering Department (BE) and the School of Life Sciences (SOLS) at ASU.

Staff: The funds are for staff positions for administering the department, educational programs (including student advising) and technical support.

Student Assistants: These are for research and teaching assistants to help with the curriculum/ laboratory design and instructional support.

Library/Information Resources: This is required for faculty and students to have access to the medical information databases and publications.

Implementation Plan

FY06
- 4 Faculty, 1.5 staff, and 1 teaching assistant and 0.5 research assistant
- Students: 10 graduate students in BMI concentrations (through CSE, BE and SOLS)

FY07
- 8 Faculty, 3 staff, and 2 teaching assistants and 1 research assistant
- Students: 10 in graduate degree program, 10 in BMI concentrations; Informatics instruction for 24 medical students (Year 1)

FY08
- 12 Faculty, 4 staff, and 4 teaching assistants and 3 research assistants
- Students: 20 in graduate program, 10 in BMI concentrations; Informatics instruction for 48 medical students (Year 1 and Year 2)

FY09
- 14 Faculty, 5 staff, 6 teaching assistants and 4 research assistants
- Students: 30 in graduate program; 10 graduate and 20 undergraduate in BMI concentrations; Informatics instruction for 72 medical students (Years 1, 2 and 3)

FY10
- 16 Faculty, 6 staff, 6 teaching assistants, 4 research assistants and 3 Fellowships
- Students: 40 in graduate program; 10 graduate and 20 undergraduate in BMI concentrations; Informatics instruction for 96 medical students (Years 1 to 4)

Biomedical Informatics Department
Arizona State University

Biomedical informatics (BMI) is a rapidly expanding field that merges biological/medical sciences and public health with the latest advances in computer science, information technology and telecommunications.

- **Mission**: The BMI department at ASU will be a world-class partnership between academic researchers, clinical practitioners, and regional healthcare providers to advance research and education in the science and practice of biomedical informatics. Working with partners such as TGen, the University of Arizona College of Medicine, BNI and the Mayo Clinic, the Department will bring together a unique synthesis of biomedical informatics and experimental investigations seamlessly integrated to predict, test, and elucidate the connections in the continuum from genotype to phenotype to provide the highest quality of care. The Department will prepare individuals who are capable of making major contributions to the creation and evaluation of computational and informatics tools and their application to biomedical or clinical research, health care practice and administration, public health, and the education of health professionals and patients.

- **Establishing Biomedical Informatics Education**: Arizona is one of very few states that does not yet have a strong university-based biomedical informatics program. Biomedical informatics is one of the areas of biotech that is growing fastest. To remain competitive in the bioscience sphere, Arizona needs to develop a doctoral-level training program in biomedical informatics, as well as masters and undergraduate programs. The Department will offer graduate and undergraduate degrees in biomedical informatics, joint degrees with the medical school and other allied health professional programs, and continuing and executive education for health professionals.

- **Advancing & Supporting Medical School Development:** The integration of biomedical informatics into the new medical school curriculum will ensure that the Phoenix track of the University of Arizona College of Medicine develops a world-class medical education program and research program. Educating physicians about the use of information technology is an essential component of physician education and training in the future including President Bush's plan to establish a national system for electronic medical records and health information technology.

- **Enhancing Relationships with Clinical Partners**. A strong biomedical informatics program at ASU will help to leverage the related resources in Phoenix and further develop Arizona as a bioscience hub. By combining ASU's expertise in computing and informatics with the resources of our partners such as the University of Arizona College of Medicine, TGen, BNI and the Mayo Clinic, the ASU Department of Biomedical Informatics will help solidify Phoenix's position as a leader in the biosciences.

"Arizona has 195 doctors for every 100,000 population – a figure well below the national average of 253. Furthermore, the pool of physicians practicing in Arizona is aging rapidly, and the 200-250 physicians per year graduating is barely enough to keep up with the growing population."

-"Meds and Eds", March 2005 edition

Biomedical Informatics Department
Arizona State University
(continued)

- **Attracting New NIH Research Funding**: Biomedical and Bioinformatics are a key element of the NIH strategic plan, the *NIH Roadmap: Accelerating Medical Discoveries to Improve Health*. As a result, a great number of NIH requests for research funding require a biomedical informatics component. Existing biomedical informatics' programs bring large funding and prestige to their universities. For example, Ohio State University has received over $18 million and the Virginia Bioinformatics Institute at Virginia Tech has received over $12 million in such funding.

- **Improving Healthcare**. A strong biomedical informatics program at ASU will ensure that Arizonans have access to state-of-the art, efficient, safe, and low-cost clinical care. For example, Columbia University's Department of Biomedical Informatics has played an instrumental role in advancing health care in New York City hospitals through the development of a patient record database that can be accessed by physicians from a variety of locations, a superior system for securing patients' electronic data records, and a computerized event monitor that alerts physicians when a patient's vital signs rise to critical levels.

- **Building the Arizona Knowledge Economy**. The BMI Department at ASU will yield many economic benefits to the local and regional economy.

  ■ A recent industry survey found that the market for bioinformatics products is estimated to be as much as $37 billion in 2006.

  ■ Over 20,000 new positions for people with bioinformatics degrees will open by the end of 2005, with even more opportunities for those who receive masters and graduate degrees. Salaries for those with bioinformatics training are high, ranging from $40,000 for those with a Bachelor's degree to over $100,000 for those with a doctoral degree

  ■ Biomedical informatics tools and applications will lead to the establishment of several new companies in Arizona creating numerous new jobs for Arizonans.

"According to the AzHHA Healthcare Institute, in 2001, virtually all hospitals in the state experienced severe problems in dealing with overcrowding and capacity – a vastly different picture than the rest of the nation…"

-"Meds and Eds", March 2005 edition.

The Arizona Republic 4/8/05

Doctor deficiency

Our stand: Medical school in Phoenix vital

The diagnosis: physician deficiency.

The symptoms: Arizona's population is growing at a feverish pace, adding nearly the equivalent of three Flagstaffs every year.

Our white-coat count is low: The number of doctors per 100,000 residents is 23 percent below the national average. We have a touch of economic anemia.

The treatment: Establish a medical school in downtown Phoenix.

The Arizona Republic

Another medical school could ease Arizona's shortage of physicians.

As the Legislature negotiates with Gov. Janet Napolitano over the state budget, lawmakers should make sure that it includes $7 million in start-up funding for the medical school.

This isn't a start-from-scratch project. It will be a joint endeavor between the University of Arizona and Arizona State University, landmark cooperation between the two traditional rivals, with the blessing of the Arizona Board of Regents. Technically, it will be part of UA's College of Medicine.

Napolitano's budget proposal includes the medical school funding. The Legislature passed a budget without it, even though the Senate proposal had been for $5 million.

The hang-up shouldn't be the dollars. We're talking about less than 1/1,000th of an $8 billion-plus budget.

And we hope that lawmakers will set aside political gamesmanship for a project so vital to the health of Arizonans.

A few clouds of concern need blowing away. For starters:

■ **This isn't unknown territory.** We're already educating medical doctors in the Valley. About 40 percent of the University of Arizona's medical students come here for clinical study in hospitals in their third and fourth years.

■ **The school won't get sidetracked from educating doctors.** Skeptics predict the medical school will overemphasize research because it will be in downtown Phoenix by Translational Genomics Research Institute and the universities' planned bioscience facilities. But the location is a crucial link, giving future doctors a chance to learn about cutting-edge science and to forge relationships that they can draw on once they're in practice.

■ **Approving the initial funding doesn't commit us to a full-blown medical complex.** The plans for the medical school are divided into two levels. The first one is very defined and limited: using the historic Phoenix Union High School buildings to create a campus that admits two dozen medical students a year. Including 100 students in clinical rotations, the campus eventually would serve about 200 students annually. It would house a telemedicine facility to connect with rural Arizona.

■ **This isn't the start of a massive drain on state coffers.** States typically fund just 10 to 15 percent of a medical school's operations. The rest comes from such sources as federal grants, private endowments and partnerships.

Yes, there are ambitious plans for a full medical campus, including colleges of pharmacy and nursing, and a hospital, which may be a specialty facility.

Yes, those plans are still being pulled together. Many players need to work together to develop the best strategies.

But we would be shortsighted to delay starting a medical school that we urgently need.

In the four years that a student takes to go through medical studies, Arizona is adding more than two-thirds of a million people.

We need to put up the money now to supply the doctors for tomorrow.

Appendix

Preservation Plan for Phoenix Union High School Building One

Preservation Plan for Phoenix Union High School Building Two

Preservation Plan for Phoenix Union High School Building Three

Preservation Plan for Site Plan and Landscape

"...the lack of a fully developed major medical school and academic medical center in Phoenix has been an enormous gap in the state's Meds and Eds infrastructure."

-"Meds and Eds", March 2005 edition.

ARIZONA COMMISSION ON MEDICAL EDUCATION AND RESEARCH (ACMER) COUNCIL

Charge: The Commission is charged with developing a plan to implement the principles outlined in the August 4, 2004 Memorandum of Understanding regarding the "Expansion of Medical Education and Research in Phoenix" adopted by the Arizona Board of Regents, Arizona State University, and The University of Arizona.

Chair: The Honorable Janet Napolitano, Governor

Members:
Michael Crow, President of Arizona State University
Peter Fine, President and CEO of Banner Health
The Honorable Phil Gordon, Mayor of Phoenix
Linda Hunt, Chief Executive Officer of St. Joseph's Hospital and Medical Center
Jim Kennedy, Chief Medical Officer, Maricopa County Hospital
Peter Likins, President of The University of Arizona
John Murphy, Executive Director, the Flinn Foundation
Gary Stuart, President of the Arizona Board of Regents
Jeffrey Trent, President and Scientific Director of the Translational Genomics Research Institute

ACMER TASK FORCES

ACADEMIC

Charge: To help expedite and coordinate development of the Phoenix Track curriculum and to provide the Commission with a broad understanding and a forum for discussion of the theme, differentiating attributes, timetable for implementation and other aspects of the Phoenix Track initiative as it emerges from the faculty working groups.

Co-Chairs:
Kenneth Ryan, Dean, Academic Affairs, The University of Arizona College of Medicine
David Young, College of Arts and Sciences, Arizona State University

Members:
Judy Bernas, Associate Vice President, The University of Arizona
Ellen Feigal, Vice President, Clinical Sciences and Deputy Scientific Director, TGen
Fred Karnas, Policy Advisor, Governor's Office
Alan Leibowitz, Chairman of Medicine, Banner Health
Timothy Vollmer, Chairman of Neurology, St. Joseph's Hospital and Medical Center
David Wisinger, Program Director, Maricopa Medical Center

BUSINESS/COMMUNITY AND GOVERNMENT RELATIONS

Charge: To assist the Commission in ensuring appropriate and timely communications with a full range of constituent groups as the Phoenix Track program is initiated and fully developed.

Co-Chairs: Darcy Renfro, Policy Advisor, Governor's Office
Greg Stanton, Councilman, City of Phoenix

Members: Judy Bernas, Associate Vice President, The University of Arizona
Susan Doria, Senior Vice President for Strategic Development, Banner Health
Fred DuVal, Principal, DuVal and Associates
Steve Miller, Deputy Vice President, Public Affairs, Arizona State University
Jaime Molera, Consultant, Arizona Board of Regents
Scott Nordlund, Vice President for Strategic Planning and Business Development, St. Joseph's Hospital and Medical Center
Jill Peters, Program Development Director, TGen
Richard White, Maricopa Medical Center

CLINICAL CARE

Charge: To explore opportunities to advance an appropriate clinical infrastructure, faculty, and involvement of Phoenix health care provider organizations and physicians in the development of clinical and research programs on the Phoenix Biomedical Campus related to the Phoenix Track.

Co-Chairs: George Poste, Director, Biodesign Institute, Arizona State University
Daniel Von Hoff, Executive Vice President and Director, Translational Drug Division, TGen

Members: Peggy Bilsten, Councilwoman, City of Phoenix
Jacqueline Chadwick, Vice Dean of Academic Affairs, The University of Arizona College of Medicine – Phoenix
Ellen Feigal, Vice President for Clinical Sciences and Deputy Scientific Director, TGen
Barry Hendin, Neurologist, Banner Health
Larry Mandarino, Chair, Department of Kinesiology, Arizona State University
Kathy Matt, Associate Director, Biodesign Institute, Arizona State University
Bob Pryor, Chief Medical Officer, St. Joseph's Hospital and Medical Center
Tony Rodgers, Director, AHCCCS/Governor's Office
Steve Stapczynski, Chair of Emergency Medicine, Maricopa Medical Center

FINANCE, ADMINISTRATION AND IT

Charge: To provide the Commission with detail on the budget requirements for all aspects of the Phoenix Track implementation, the supporting organization and management structure, and the information technology and requirements.

Co-Chairs: Kathy Bedard, Assistant, Business and Finance, Arizona Board of Regents
Pat St. Germain, Associate Dean for Administration and Financial Services, The University of Arizona College of Medicine
Gary Yaquinto, Director, Office of Strategic Planning and Budgeting, Governor's Office

Members: Susan Doria, Senior Vice President, Strategic Development, Banner Health
Mary Ann Guerra, Vice President, Research Operations, TGen
Dennis Laraway, Chief Financial Officer, St. Joseph's Hospital and Medical Center
Sheryl Sculley, Assistant City Manager, City of Phoenix
Richard Stanley, Senior Vice President and University Planner, Arizona State University

PHOENIX BIOMEDICAL CENTER MASTER PLANNING

Charge: To provide the Commission with details on facility renovations for the '06 Phoenix Track class and on investments and commitments related to the continuing development of the Phoenix Biomedical Center and proximate downtown Phoenix properties.

Co-Chairs: Sheryl Sculley, Assistant City Manager, City of Phoenix
David Harris, Senior Project Manager, Arizona Board of Regents

Members: Kim Burke, System Vice President of Design and Construction, Banner Health
Fred Karnas, Policy Advisor, Governor's Office
Ann Libecap, Director, Facilities Management, AHSC, University of Arizona
College of Medicine
Richard Love, Chief Operating Officer, TGen
Steve Nielsen, University Physical Planner, Arizona State University

RESOURCE DEVELOPMENT

Charge: To provide the Commission with approaches and updates related to raising capital and stimulating investment from public and private sources for the sustaining support of the Phoenix Track and related clinical research programs and facilities at the Phoenix Biomedical Center.

Co-Chairs:	Lisa Fahey, Executive Director of Development, The University of Arizona College of Medicine
	Ira Jackson, President, ASU Foundation, Arizona State University
Members:	Mike Bassoff, Director of Development, TGen
	Christopher Champion, System Director, Grants and Appropriations, Banner Health
	Dean Coonrod, Director of Clinical Research, Maricopa Medical Center
	Mary Jane Crist, Vice President of Philanthropy, St. Joseph's Hospital and Medical Center
	Fred Karnas, Policy Advisor, Governor's Office
	Tom Simplot, Councilman, City of Phoenix
	Gary Stuart, Regent, Arizona Board of Regents

SCIENCE AND TECHNOLOGY

Charge: To advance basic science and clinical research initiatives related to the Phoenix Track program, the commercialization of research results, and the process for collaborating on these activities across, the Phoenix Biomedical Campus.

Co-Chairs:	Ellen Feigal, Vice President of Clinical Sciences and Deputy Scientific Director, TGen
	Jonathan Fink, Vice President of Research and Economic Affairs
Members:	Curt Bay, Director of Residency Research Support, Maricopa Medical Center
	Anne Cress, Associate Dean of Research, The University of Arizona College of Medicine
	Eric Reiman, Professor of Psychiatry (UA COM), Banner Health
	Joan Shapiro, Vice President of Research and Development, St. Joseph's Hospital and Medical Center
	Janette Torres, Technology Business Program Manager, City of Phoenix

DEPARTMENT OF BIOMEDICAL INFORMATICS

DRAFT BUSINESS & IMPLEMENTATION PLAN

July 17, 2005

Arizona State University

TABLE OF CONTENTS

Background 3

Vision 3

Market Opportunity 5

Program 8

Faculty 10

Research 12

Administration 14

Location and Facilities 17

Partnerships 19

Financing 21

Implementation Plan 23

Anticipated Milestones 26

Appendix A: 5-Year Operational Budget 27

Appendix B: Capital Budget 29

Appendix C: Anticipated Space Requirements 31

Appendix D: Top Programs in Biomedical Informatics 44

Appendix E: Student-Faculty Ratios at other BMI Departments 45

Appendix F: S.W.O.T. Analysis 46

Appendix G: Endnotes 48

1.0 Background

The Arizona Board of Regents, in its August 4, 2004 Memorandum of Understanding Regarding the Expansion of Medical Education and Research in Phoenix, charged Arizona State University with the planning, design, and development of a new Department of Biomedical Informatics.[1]

In response to this charge, a small group of representatives from key departments at Arizona State University and two of its partner institutions, the Mayo Clinic and the Barrow Neurological Institute, met during the months of October and November, 2004 to discuss initial planning for the Department of Biomedical Informatics. The taskforce was co-chaired by Drs. Sethuraman Panchanathan and George Poste of Arizona State University.

A taskforce report was issued on December 10, 2004. The report presented a vision for a Department of Biomedical Informatics at Arizona State University and a justification for the development of such a program. The report also contained a comprehensive assessment of the strengths of Arizona State University and its partner institutions in the area of biomedical informatics; a comprehensive listing of research grants, investigators, and courses currently available at ASU in the area of biomedical informatics; and potential initial research foci for the program based on ASU's research strengths.

Biomedical informatics is an emergent field, grounded in the principles of computer and information sciences, telecommunications, mathematics and statistics, cognitive and social sciences, biological signal processing, clinical and basic biological and medical science, decision science, epidemiology and biostatistics, and public health. In accordance with the definition by the American College of Medical Informatics and supported by the National Institutes of Health, the taskforce uses the term "biomedical informatics" to describe the union of computing and informatics with basic biological and medical research, clinical practice, imaging, and public health.[2] The primary subdisciplines within biomedical informatics—bioinformatics, clinical informatics, and public health informatics—are more fully defined in the taskforce report.

2.0 Vision and Mission

Arizona State University aspires to develop a world-class partnership between academic researchers, clinical practitioners, and regional healthcare providers to advance research and education in the science and practice of biomedical informatics. The programs and degrees administered through the department will prepare individuals who are capable of making major contributions to the creation and evaluation of computational and informatics tools and their application to biomedical or clinical research, health care practice and administration, public health, and the education of health professionals and patients. The department will bring together a unique synthesis of biomedical informatics and experimental investigations seamlessly integrated to predict, test, and elucidate the connections in the continuum from genotype to phenotype.

The department will define "health" in accordance with the World Health Organization's view that it is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[3] Thus, research conducted by the department and its partners will focus on breakthroughs in basic biological research and improvements in the prevention, diagnosis, treatment, cure, and management of chronic disease, and the maximization of quality of life.

This vision statement was developed in accordance with the guiding principles set forth by the American College of Medical Informatics, the National Institutes of Health, and the American Association of Medical Colleges.[4] Moreover, the goals for the department have been developed with the design imperatives set forth by the Arizona Board of Regents and President Michael Crow for transforming ASU into a leading public metropolitan research university.[5] The emergent Department of Biomedical Informatics embodies many of the principles of President Crow's vision for a New American University, including intellectual fusion, social embedment, use-inspired scholarship, entrepreneurship, and knowledge without boundaries.

The goals of the Department of Biomedical Informatics are to:

1. Focus on use-inspired research that will result in demonstrable improvements in patient care and biomedical research.

2. Become a nationally recognized leader in biomedical informatics research.

3. Embrace new types of collaborations with local and regional partners.

4. Leverage research expertise in Arizona.

5. Provide an educational experience that is truly interdisciplinary, by bridging traditional boundaries in scientific and medical education.

6. Train a new generation of physicians and other health care professionals facile in biomedical computing.

7. Serve as a resource to Arizona's biomedical/bioscience community and public health agencies.

8. Contribute to the economic development and well-being of the community by supporting and advancing bioscience and biomedical research in Arizona.

3.0 Market Opportunity

3.1 Need for a BMI training program in Arizona

Recent reports by the Arizona Department of Commerce and the Battelle Technology Partnership Practice cite the need for increased capacity in the area of biomedical informatics in Arizona.[6] Yet in this state there are no doctoral-level or academic master's programs specifically dedicated to training future scientists, physicians, and health-care practitioners in biomedical informatics. Nearly all of the other Western states, notably California, New Mexico, Oregon, Texas, Utah, and Washington have at least one strong biomedical informatics department.[7] These academic departments play a vital support role to scientists in realizing the promise of the genomic revolution. Considering President Bush's call for a national health information technology infrastructure, electronic medical records, and interoperability among healthcare providers within the next decade, there will be a great need among hospitals for information technology professionals and medical providers skilled in biomedical informatics. Moreover, with the prospect of eleven new hospitals being built in the Phoenix area alone, the need for BMI expertise in Arizona could not be greater. To remain competitive, Arizona needs to develop doctoral-level, masters-level, and undergraduate training programs in biomedical informatics.

The Department of Biomedical Informatics is expected to play a critical role in enabling translational research through bridging genomic research (genotype) with clinical outcomes (phenotype). Facilitating the translation of research from laboratory bench to bedside and from the bedside back to the bench is a necessary ingredient for Arizona to "leapfrog" ahead of the bioscience competition and become a major player in the biology century.[8]

3.2 Benefits to Arizona

A Department of Biomedical Informatics at Arizona State is predicted to yield many economic benefits to the local and regional economy. A recent industry survey found that the market for bioinformatics is estimated to be as high as $37 billion in 2006.[9] Biomedical informatics tools and applications developed in Arizona by university researchers will likely lead to development of new companies in Arizona. Those companies will employ workers, creating jobs for Arizonans.

The integration of biomedical informatics into the new Phoenix medical school curriculum will ensure that the Phoenix medical school becomes a world-class institute. Comfort with information technology in the medical arena will be essential under President Bush's plan to establish a national health information technology infrastructure. Furthermore, the medical school has the potential to become a leader in medical education by training a new type of physician who is comfortable in utilizing and developing information technology. Computer-assisted training will make medical training less expensive, more comprehensive, and safer. Utilizing computer simulation and visualization techniques, medical students will benefit from learning about the human

body in three dimensions as opposed to two dimensions (such as from a text book). An informatics-based curriculum has implications for improved patient safety. For example, students can practice surgery using computer simulations before attempting risky procedures on live patients.

3.3 Employment outlook for biomedical informatics

The field of bioinformatics has exploded in recent years to become one of the fastest-growing professions in the nation. Over 20,000 new positions for people with bioinformatics degrees will open by the end of 2005, with even more opportunities for those who receive master's and graduate degrees.[10] Salaries for those with bioinformatics training are high, ranging from $40,000 for those with a bachelor's degree to over $100,000 for those with a doctoral degree.[11] According to the trade press, biotech and pharmaceutical companies will soon expect the persons they employ to have computer expertise as well as expertise in the biological/medical sciences.[12] If Arizona does not produce sufficient graduates with these capabilities, the state will not be a competitive location for biomedical industries to relocate.

3.4 Competitor Analysis

In developing a vision for the Department of Biomedical Informatics, the taskforce conducted a review of 75 programs involved in biomedical informatics at 62 major institutions in the United States. The taskforce found that few BMI programs provide the full spectrum of training—undergraduate through doctoral degrees and post-doctorate educational offerings—creating a significant opportunity for the department. At present, more than one-third of the 75 programs reviewed by the taskforce offer a doctoral degree, and over two-thirds offer a master's degree. Only nine programs offer undergraduate degrees. In terms of research foci, only four of the 75 programs span the three domains of bioinformatics, clinical informatics, and public health informatics. Most focus their research in one or two domains; a number of institutions have either refrained from or have been unable to integrate their research programs across the different domains. Thus, there are a number of unique niches an ASU Department of Biomedical Informatics could occupy. Appendix C provides list of the major schools with programs in biomedical informatics.

3.5 Degrees Offered in BMI

The Department of Biomedical Informatics anticipates offering the following degree-granting programs:

1. Master of Science in Biomedical Informatics. The anticipated start date for this program is the fall of 2007.

2. Doctor of Philosophy in Biomedical Informatics. The anticipated start date for this program is the fall of 2008.

3. Joint Master of Science and Doctor of Philosophy degrees with the University of Arizona College of Medicine and the Arizona State University College of Nursing.[13] These joint programs will begin once the master's and doctoral programs are fully established.

4. Undergraduate concentrations in biomedical informatics in conjunction with the Department of Computer Science and Engineering and the School of Computing and Informatics. The Information Sciences program is likely to define how this will be done. These concentrations will begin in the fall of 2009 once the master's and doctoral programs are firmly established.

The Department of Biomedical Informatics anticipates offering the following activities and programs as non-degree programs:

1. Instruction in biomedical informatics to medical students in the Phoenix track of the University of Arizona College of Medicine. Instruction is anticipated to begin in the fall of 2007.

2. Continuing medical and nursing education courses. The Department also anticipates offering a certificate program for local practitioners, and possibly some distance education courses. The certificate program will only start once the master's and doctoral programs have been established.

The curricula developed by BMI faculty and co-location of the Department of Biomedical Informatics at the downtown bioscience campus will create a model for new types of collaboration and partnership across the Arizona university system.

The Department of Biomedical Informatics will evolve new kinds of interdisciplinary and transdisciplinary courses that bridge diverse domains and cultures in the biological, medical, and computing sciences. These courses will provide for an educational curriculum based on the cross-disciplinary and interdisciplinary model outlined in ASU President Michael Crow's concept paper, the *New American University*.

ASU professors and researchers will play a lead role in providing instructional support in information literacy to medical students at the University of Arizona, and in so doing will shape a new type of physician able to harness the power of informatics. Researchers and practitioners from the clinical community will actively participate in the Department, ensuring that the curriculum provides both a strong theoretical foundation in biomedical informatics as well as translational applications focused on breakthroughs in basic biological research and improvements in the prevention, diagnosis, treatment, cure, and management of chronic disease, and the maximization of quality of life. In this new Department, health care providers will train and work alongside biomedical informaticians to create a new level of comfort and interaction between informatics researchers, life science researchers, and healthcare practitioners.

4.0 Program Information

4.1 Projected Enrollment

In the fall of 2006, it is estimated that 10 graduate students will enroll in BMI concentrations through existing units, such as the Department of Computer Science and Engineering and the School of Life Sciences. Over time, it is anticipated that the interest in BMI concentrations at the graduate level may grow to as many as 25 students per year. It is anticipated that other units on campus, such as the Harrington Department of Bioengineering, may also wish to offer graduate concentrations in biomedical informatics in conjunction with the Department of Biomedical Informatics.

ANTICIPATED BMI MAJORS & STUDENTS RECEIVING BMI INSTRUCTION

Projected majors and students w focus on BMI	FY 06	FY 07	FY 08	FY 09	FY10	FY11	FY 12	FY13	Long Term
Graduate concentrations in BMI (through existing departments at ASU)	Faculty hired and new courses developed	10	10	10	20	20	20	25	25
Masters students		--	10	15	20	30	40	50	50
Doctoral students		--	--	5	10	15	20	25	25
Medical students receiving BMI instruction*		24	48	72	96	96	96	96	150**
Undergraduate concentrations		--	--	--	20	30	35	40	40
Totals		**34**	**68**	**102**	**166**	**191**	**211**	**236**	**290**

* The University of Arizona College of Medicine anticipates enrolling 24 new students each year. Thus, by FY10 the Department of Biomedical Informatics will provide medical instruction to 96 medical students annually. It is anticipated that the Department will offer one course in informatics literacy for each medical school class (i.e., one class for first through fourth year students).

** The University of Arizona College of Medicine is planning to apply for Level II status which will allow it to expand the number of students in the Phoenix track. Level II medical schools typically enroll 110-150 students.

When the Master of Science degree in Biomedical Informatics is launched in the fall of 2007, an enrollment of at least 10 master's students is projected. When the Doctor of Philosophy program is launched in the fall of 2008, an enrollment of at least 5 doctoral students is projected. It is expected that enrollment in the masters and doctoral programs will grow steadily as the Department hires new faculty and gains prominence.

The Department of Biomedical Informatics will also offer biomedical informatics instruction to medical students at the University of Arizona College of Medicine starting in the fall of 2007. The Department expects to offer one informatics literacy course per year for each of the four years of medical school. The University of Arizona predicts the medical college will enroll 24 students per class.*

In the fall of 2009, the Department expects to add undergraduate concentrations in biomedical informatics. It anticipates that approximately 20 undergraduates from across

the university will participate in the concentration the first year. This number is expected to grow to about 40 undergraduate students over the long-term.

After the master's and doctoral degrees are launched, the Department will consider offering other programs such as combined degrees with the medical and nursing colleges, executive and continuing education, and perhaps an undergraduate degree-granting program. Based on early discussions with community clinicians and local health care providers, there is great interest in executive and continuing education courses in biomedical informatics.

4.2 Capacity

Ultimately, the Department of Biomedical Informatics expects graduate enrollment of between 75 students in the master's and doctoral programs, 25 graduate students in the BMI concentrations, 40 undergraduate students in the BMI concentrations, and 150 medical students receiving informatics instruction.** The numbers are comparable with other BMI programs around the country. (See Appendix D).

4.3 Student Composition

The Department of Biomedical Informatics will recruit exceptional students with strong backgrounds in the computing and information sciences (mathematics, electrical engineering, computer engineering, bioengineering) or the relevant application domains (clinical, basic biological sciences, public health, etc). The American College of Medical Informatics recently conducted a broad-based study of informatics programs in which it found trainees with strong informational and computer science backgrounds offer perspectives that are complementary to those of trainees with strong biological and medical domain backgrounds.[14]

It is expected that in the year the BMI graduate program is launched some of the students in BMI concentrations will transfer directly into master's and doctoral degree-programs. It is also expected that some students graduating from the professional master's program in Computational Biology at ASU may also wish to enroll in the BMI doctoral program.

4.4 Student Recruitment

In order to attract the best and the brightest students in this competitive environment, it will be necessary for the Department of Biomedical Informatics to devote a great deal of time and energy into recruitment, especially during the early years of the program. The Department plans to host at least one open house at ASU, invite and host a number of prospective candidates to visit ASU and meet with faculty. As an enticement to attend the BMI program, especially during the first several years of operation, the Department will need to offer as many graduate research assistant positions as possible as well as summer fellowships.

4.5 Graduation Rates

The first class of master's students is expected to graduate in the spring of 2009 and the first class of doctoral students is expected to graduate in the spring of 2011 at the earliest. Students enrolling in graduate and undergraduate concentrations will graduate in accordance with their departments' schedules.

ANTICIPATED GRADUATION RATES FOR BMI DEGREES AND MAJORS									
Graduation Rates	**FY 07**	**FY 08**	**FY 09**	**FY10**	**FY11**	**FY 12**	**FY13**	**FY13**	**Long Term**
Graduate concentrations in BMI (through existing departments at ASU)			10	10	10	20	20	20	25
Masters students	--	--	--	10	15	20	30	40	50
Doctoral students	--	--	--	--	--	5	10	15	25
Undergraduate concentrations (through existing departments at ASU)	--	--	--	--	--	20	30	35	40
Totals	**--**	**--**	**10**	**20**	**25**	**65**	**80**	**110**	**140**

5.0 Faculty

It is anticipated that the Departmental faculty will be comprised of a broad range of academic, clinical, and professional backgrounds. There will be a strong core of BMI faculty, bolstered by joint hires and affiliate positions with community clinicians and health professionals. The charts below reflect potential hiring scenarios for the Department of Biomedical Informatics' anticipated 16 faculty lines.

PROJECTED FACULTY HIRING							
Year	**FY06**	**FY07**	**FY08**	**FY09**	**FY10**	**FY11**	**Long-term**
Total Lines	1.5*	4	8	12	14	16	16
Core BMI Faculty	--	4	6	8	8	9	9
Joint Faculty	4	--	4	8	12	14	14
Affiliates	12	14	14	14	20	20	20
Total Faculty	16	20	24	30	40	43	43

* These faculty will receive a two-year contract. At the end of two years, some may join the permanent faculty.

Departments at ASU that are likely to hire jointly with the Department of Biomedical Informatics include: the Department of Computer Science and Engineering, Harrington

Department of Bioengineering, Department of Mathematics and Statistics, Department of Psychology, W.P Carey School of Business, College of Nursing, and the College of Law. In addition, BMI's partnering hospitals, such as Barrow Neurological Institute and the Mayo Clinic and School of Medicine, are also likely to appoint joint hires with the Department of Biomedical Informatics.

POTENTIAL BREAKOUT FOR JOINT HIRING							
Year	**CSE**	**SOLS**	**BME**	**CLAS**	**LAW**	**NURS**	**CLIN**
FY06	0.5 Full	0.25 Assoc		0.25 Asst			0.25 Prof Prac.
FY07							
FY08	1 Assoc	1 Assoc	1 Assist			1 Assist	
FY09	1 Full			1 Assoc			1 Assoc 1 Full
FY10				1 Assoc	1 Assoc		2 Full
FY11		1 Assist	1 Assist				

Affiliate hires will play an important role in bridging computing and informatics with the clinical and public health sciences. Affiliates will come from local hospitals, research facilities, and public health agencies. They will be non-paid faculty who will oversee internships and student projects, teach modules in courses, train BMI graduate students, apply for joint grants with the core faculty, provide input into the curriculum, and help to ensure that the program trains graduates with skill sets and expertise necessary to work in biomedical institutions in Arizona and throughout the nation.

During the planning year, the Department of Biomedical Informatics will offer a number of short-term appointments (anticipated duration of one to two years) as a means of developing a skeleton faculty. The Department anticipates hiring three post-doctoral researchers, one for each of the three proposed areas of focus.

Presented below is a list of faculty likely to participate in the Department in FY 2006:

FACULTY PARICIPATING THE BMI DEPARTMENT IN FY06					
Last Name	**First Name**	**Rank**	**Degree**	**Involvement***	**Position**
Panchanathan	Sethuraman	Professor	Ph.D.	High	Interim Director
Baral	Chitta	Professor	Ph.D.	Moderate	Affiliate/CSE
Chen	Grace	Asst. Prof	Ph.D.	Moderate	Joint Faculty/Math
Farin	Gerald	Professor	Ph.D.	Moderate	Affiliate/CSE
Kim	Seungchan	Asc. Prof	Ph.D.	Moderate	Affiliate/TGen
Kumar	Sudhir	Asc. Prof	Ph.D.	Moderate	Joint Faculty/SOLS
Partovi	Shahram	Prof Practice	M.D.	Moderate	Joint Faculty/BNI
Ye	Jeiping	Asst. Prof	Ph.D.	Moderate	Affiliate/CSE
Akay	Metin	Asc. Prof	Ph.D.	Low	Affiliate/BME
Bitner	Mike	Prof Practice	Ph.D.	Low	Affiliate/TGen
Castillo-Chavez	Carlos	Professor	Ph.D.	Low	Affiliate/Math
Frey	Keith	Prof Pracice	M.D.	Low	Affiliate/Mayo
Hrabe	David	Professor	Ph.D.	Low	Affiliate/Nursing
Johnson	William	Professor	Ph.D.	Low	Affiliate/HP
Kirkman-Liff	Bradford	Professor	Ph.D.	Low	Affiliate/HP
Renaut	Rosemary	Professor	Ph.D.	Low	Affiliate/Comp Bio
Stephen	Johnston	Professor	Ph.D.	Low	Affiliate/SOLS

* Faculty joining the Department of Biomedical Informatics at the moderate level may either join as joint faculty, faculty receiving a faculty buyout, or faculty donating time as part of their service requirement.

6. 0 Research Focus for the Department

The seed intellectual focus of the Department of Biomedical Informatics is based on the needs of clinical partners in Arizona, the existing and evolving competencies at ASU, and its external partners. The focus is targeted to realize the vision of personalized medicine. The specific focus areas will include:

- Genome informatics - focused in areas of genomics and proteomics
- Heath/Clinical informatics - focused in areas of clinical medicine and patient care
- Imaging informatics - focused in areas of multi-dimensional image analysis

Genome Informatics:

Genotyping and molecular profiling is driving new diagnostic and treatment modalities, leading to a transformation in the design, manufacture, testing, and development of drugs and biologics. Moreover, with the maturation of genomics and proteomics, molecular medicine can now become personalized. This research focus leverages on the strengths already available in Arizona at the Translational Genomics Institute (TGen), University of Arizona College of Medicine, The Biodesign Institute, School of Life Sciences,

Mathematics, and Computer Science and Engineering Departments at ASU. This focus involves design and development of advanced informatics techniques and tools for sequence analysis, gene mapping, identification of patterns in large datasets and functional elements in complex genomes, and mapping of complex traits and genetic variations (for example, single nucleotide polymorphisms). The management and analysis of genome data and comparisons within and among species and strains and the design of effective algorithms to identify regulatory sequence motifs are important in advancing the diagnosis, prognosis, and treatment selection; genebased therapies; pharmacogenomics; and basic biomedicine utilizing animal models of human diseases to identify critical genetic interactions and profiles.

Health/Clinical Informatics:

Health informatics facilitates integration of data, information and knowledge to support physicians, nurses, public health officials, patients and health care administrators in their decision-making in all roles and settings. This focus area integrates health science, computer science, and information science to manage and communicate data, information, and knowledge in healthcare practice to support evidence-based medicine, thereby facilitating individualized and high-quality patient care. This support is accomplished through the use of information structures, information processes, and information technology. In addition, ubiquitous monitoring of patients anywhere and anytime, coupled with sophisticated rehabilitation approaches enables patients and healthcare specialists to proactively assist individuals and manage their illnesses. ASU is uniquely positioned to advance research in this area with research in the areas of information architectures, distributed computing, ubiquitous computing, nano-bio on-body/in-body sensors, and imaging in premier research institutes such as the Biodesign Institute and the Institute for Computing and Information Science and Engineering (InCISE). These core strengths along with strong schools in nursing and health policy leverage the strong partnership with world-class medical establishments such as Banner Health, Barrow Neurological Institute and Mayo Clinic as well as leading high-tech industries such as Intel, Motorola, Medtronic, and MediServe.

Imaging Informatics:

Imaging informatics is an increasingly critical component in advancing biomedical informatics research in the genotype-phenotype spectrum spanning a variety of diseases such as cancer, cardio-vascular and neurology. Most existing imaging informatics research is focused on issues such as standards for image information exchange, communication protocols, image data and knowledge representations, image compression and indexing, vocabulary for including imaging information in electronic medical records and security and confidentiality of imaging records. However, there is a critical need to focus the research on imaging methods in different clinical contexts for delivering cost effective personalized health care.

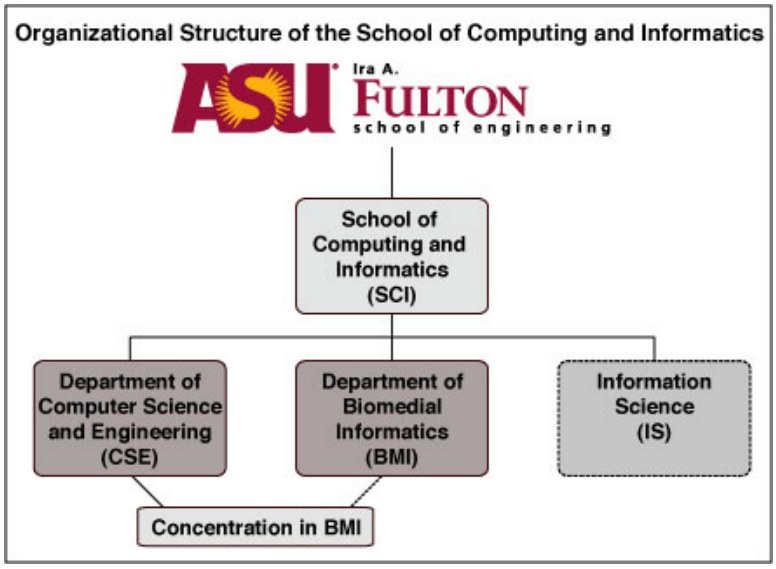
The focus of this research is therefore targeted at addressing the following informatics issues: (i) human-computer interaction models for health care that integrates advanced

graphics and visualization tools with psychophysical and cognitive science studies for effective perception and interpretation of visual data; (ii) advanced techniques for automatic registration, segmentation, abstraction, summarization, and graphical representation of multi-modal (2D, video, 3D, etc.) medical data, (iii) representation of biological variability across repositories of biomedical imaging data to interpret across populations and link phenotype to genotype data; (iv) annotation languages for extracting key patient findings and creating underlying computer-based representations of knowledge (ontologies, atlases, etc.) to capture the novelty, thus enabling new discoveries. ASU is endowed with a number of high-caliber researchers in the departments of mathematics, computer science, psychology, electrical engineering and bioengineering, as well as in InCISE and Biodesign Institutes who are focused on 2D, 3D and multidimensional imaging, graphics and virtual reality, mathematical modeling, image analysis and processing, computer vision, cognitive science and human-computer interface design. A world-class Decision Theater recently established at ASU provides the unique capability of immersive visualization and decision making. These intellectual assets combined with the significant imaging strengths of the clinical partners such as Mayo Clinic, Banner Health and Barrow Neurological Institute make this focus one of the unique features of the biomedical informatics activity at ASU.

7.0 Administration

7.1 Organizational Structure of the School of Computing and Informatics

The Department of Biomedical Informatics will reside in a newly established School of Computing and Informatics within the Fulton School of Engineering (see diagram). The mission of the School of Computing and Informatics is to bridge computing and informatics with a broad range of academic disciplines with the express purpose of enhancing research, teaching, and scholarship. The School will be comprised of the existing Department of Computer Science and Engineering, the new Department of Biomedical Informatics, and an emerging program in Information Sciences. The Department of Biomedical Informatics is the first such expression of an informatics-oriented department targeted to the biological and medical sciences.



7.2 Reporting Structure of the Department of Biomedical Informatics

The Director of the School of Computing and Informatics will be Dr. Sethuraman Panchanathan. The chair of the Department of Biomedical Informatics will report to the Director of the School of Computing and Informatics.

7.3 Selection of Chair and Senior Faculty Member to Oversee Curriculum

In the near-term, Dr. Sethuraman Panchanathan will serve as the interim head of Department of Biomedical Informatics. A targeted faculty search committee has been convened and is searching for a chair for the department.

The taskforce will seek a chair with broad-based knowledge of biomedical informatics. Ideally, the candidate will have experience leading a university-based department. He/she will be a person with experience in both informatics and the biological and/or clinical sciences, and a track record of success in winning federal grants. The taskforce will work closely with the BMI advisory boards and local leaders to select a high caliber candidate who can lead the Department of Biomedical Informatics as well as build strong links between the BMI program and community partners in Phoenix.

In the near-term, the Department of Biomedical Informatics will seek a senior faculty member who can interface with the University of Arizona College of Medicine and provide direction to the BMI portion of the medical school curriculum. Ideally, this person would also play a major role in developing the core curriculum for the Department of Biomedical Informatics. This person could become an Associate Chair for the Department. Until a suitable faculty member is selected, Dr. Panchanathan will also fulfill this role with the help of BMI faculty and the Dean of Academic Affairs for the School of Computing and Informatics.

7.4 Academic Structure

Ultimately, the departmental chair will be responsible for developing an academic structure for the Department of Biomedical Informatics. The faculty structure is likely to contain:

- *Chair*. Responsible for overall program direction and research focus for the Department of Biomedical Informatics, linkages with partners, affiliations and other on-campus units, and fundraising.

- *Associate Chair – Graduate Studies.* Responsible for curriculum and program administration related to graduate studies.

- *Assistant Chair – Undergraduate Studies.* Responsible for curriculum and program administration related to undergraduate studies.

7.5 Administrative Structure

Ultimately, the chair will be responsible for developing an administrative structure for the Department of Biomedical Informatics. In the planning year, when resources are limited, staffing will be kept to a minimum. As the program expands, additional staff will be required. It is expected that many of these positions will be shared with the School of Computing and Informatics. The Department of Biomedical Informatics anticipates hiring the following administrative staff:

Hiring Plans for Administrative Staff		
	Name	***Roles & Responsibilities***
2006		
Associate Director	E. Kittrie	Overall administration and strategic planning
Office Specialist Senior	TBD	Administrative support
2007		
Accountant	TBD	Accounting
Academic Advisor	TBD	Student advising and curriculum support
Systems Administrator	TBD	Specialized IT support for biological and medical connectivity
2008*		
Grantwriter/coordinator	TBD	Grant writing and coordination of large-scale proposals
Systems Administrator	TBD	Specialized IT support for biological and medical connectivity
Office Specialist Senior	TBD	Administrative support

* In FY08 the Department of Biomedical Informatics moves to the ABC Building I. A second Office Specialist Senior and IT Systems Administrator will be needed to support the downtown campus.

7.6 Advisory Boards and Committees

The following three advisory boards and committees will be developed to provide strategic direction and oversight for the Department of Biomedical Informatics. Each board is expected make a unique contribution to the Department, as articulated below:

ANTICIPATED BOARDS FOR THE BMI DEPARTMENT			
Type of Committee	**Strategic Advisory Board**	**Arizona-based Community Board**	**ASU Curriculum Committee**
Purpose	• Provide scientific direction • Ensure visibility of BMI and scientific research at ASU • Establish linkages to other BMI programs • Provide input on hiring	• Identify community needs • Ensure relevance of BMI program to community • Represent needs of BMI to key Arizona constituents	• Ensure linkages b/w BMI and broader university • Assist with curriculum development
Memberships	• Leaders of BMI program • Nationally recognized experts and leaders	• CIOs from clinical, bioscience, research organizations • Key leaders in health policy for the state	• Chairs or designees from the key departments involved in BMI • Reps from the ASU upper administration
Size	8-10 members	10-12 members	10-12 members
Meetings	Fall & Spring	Summer & Winter	Weekly
Start Date	Fall 2005	Winter 2006	Summer 2005

Development of the scientific advisory board and the Arizona community board are likely to have broad benefits for the university and the biomedical community beyond the establishment of a Department of Biomedical Informatics at ASU. By inviting national experts to join the scientific advisory board and visit the campus, the Department will bring visibility to the university's research programs. Moreover, bringing national experts to Phoenix will help to publicize the growth of biosciences in Arizona. By inviting key representatives from clinical, public health, and health policy organizations to join the community board, the Department will further strengthen linkages between ASU and the community. Board members and partnering institutions may become aware of new faculty, programs, and pockets of expertise both at ASU and within the community at large.

8.0 Location and Facilities

The Department of Biomedical Informatics will be primarily housed in the Bank of America building at the Brickyard on Mill (Tempe campus, 660 S. Mill) and the Arizona Biomedical Collaborative Building I under construction in downtown Phoenix. In

addition, a number of joint hires will be located in existing institutes and collaborating departments on campus.

Over the next six years, the Department anticipates needing approximately 59,166 square feet of space for the 23 faculty, 115 graduate students, 7 teaching assistants, and 24 post-doctoral/technical staff it anticipates housing.

Anticipated Space Needs for the BMI Department						
Space Allocation (GSF)	**FY06**	**FY07**	**FY08***	**FY09**	**FY10**	**FY11**
Administrative	833	1800	7506	8669	9637	9637
Faculty Offices	484	1693	2660	4342	5298	6265
Faculty Labs	1455	5818	11727	19818	25454	28363
Graduate Space	262	873	2007	6021	8067	10036
Post-docs/Tech staff	725	967	725	2418	2660	2902
Multimedia/instructional	0	0	2510	2510	2510	2510
Totals	**3759**	**11151**	**27135**	**43778**	**53626**	**59713**

* In FY08 the Department of Biomedical Informatics moves to the ABC Building I. The administrative space requirement jumps to 7506 because the department can no longer utilize CSE departmental space. The research space increases because several of the faculty will have won research grants, creating larger projects that need additional research space.
** The Department of Biomedical Informatics will begin offering undergraduate concentrations in biomedical informatics in conjunction with the School of Computing and Informatics.

During FY06, while the Department of Biomedical Informatics begins operations and recruits faculty, it anticipates needing about 3,759 square feet of space in the Brickyard for the initial core of administrative staff, post-doctoral researcher scientists, and research assistants. During the following year, the Department anticipates needing about 11,151 square feet of space in the Brickyard for administrative space, faculty lab and office space, and offices for post-doctoral research scientists. The rest of the space will be allotted with in existing facilities, such as the Biodesign Institute at Arizona State University. At present it is difficult to project which buildings the faculty will reside in as it will depend on the specialties of the faculty hired. In FY08, when the Arizona Biomedical Collaborative Building I becomes available, it is anticipated that many of the joint hires will be primarily located in the new facility. It is also anticipated that by FY08, fully two years after initiation of the Department of Biomedical Informatics and the School of Computing and Informatics, ASU faculty will obtain grant funding in biomedical informatics. Many of them will need to move to larger spaces to accommodate their research and research staff. In subsequent years, it is anticipated that space may become available at our clinical partners' research facilities.

The Department of Biomedical Informatics will require one collaborative student laboratory that can serve as a forum for small group projects, team learning, and seminar-style instruction on specialized topics. Such a laboratory will be critical for integrating medical students, health professional students, and biomedical informatics students into

an interdisciplinary learning environment. It is not yet clear where this facility will be housed.

Brickyard Facility

The School of Computing and Informatics is to be housed administratively and academically in the Brickyard at 600 S. Mill Ave. in Tempe. As part of the School, the Department of Biomedical Informatics will also have its administrative and academic space there, using the central services of the School as much as possible for efficiency. Thus, the academic advising, curricular, and administrative functions of the Department will reside at the Brickyard building. Plans are currently underway to move certain functions out of the Brickyard in order to make space for the Department of Biomedical Informatics.

ABC Building I

The Arizona Biomedical Collaborative will be located on the Phoenix bioscience campus, next to the Translational Genomics Research Institute building. The Department of Biomedical Informatics will occupy approximately 27,000 square feet in the Arizona Biomedical Collaborative. The anticipated move-in date is spring of 2007. This space will consist primarily of faculty labs and offices, several conference rooms, and minimal administrative space.

Funding has been provided for the Arizona Biomedical Collaborative Building I through Laws 2003, Chapter 267 - HB 2529 (university research infrastructure financing). Planning staff are working with the Capital Programs Management Group to design a space suitable for biomedical informatics research.

Affiliated Departments and Institutions

During the first two years of the Department of Biomedical Informatics' existence, joint ASU hires are likely to be located in collaborating institutes and departments on campus, such as the Biodesign Institute, Department of Bioengineering, Department of Mathematics and Statistics, College of Nursing, W.P. Carey School of Business, Department of Psychology, and the School of Life Sciences, all of which are existing facilities on campus.

The Department of Biomedical Informatics' partnering institutions, including the Translational Genomics Research Institute, the Barrow Neurological Institute, Banner Health, and the University of Arizona College of Medicine, are expected to provide clinical and wet laboratory research space for joint clinical faculty as part of their collaboration; reciprocally the Department of Biomedical Informatics expects to provide computational laboratory space for the faculty as part of ongoing research programs.

9.0 Partnerships

Partnerships with the local and regional biomedical community will be critical to the success of the Department of Biomedical Informatics. It is these strong community collaborations that will give the program its distinctive mark and its relevance to the region. These partnerships are expected to enhance the Department's and the region's ability to become a leader in both applied and theoretical biomedical informatics:

ASU will explore the following types of collaborations with its partners:

- Joint hires with community partners
- Adjunct teaching positions
- Joint research grants and contracts
- Internships in clinical facilities, public health agencies, and research organizations
- Sponsored fellowships
- Co-sponsorship of seminars, visiting speakers, conferences
- Co-sponsored educational outreach to the high schools
- Continuing education courses for health care professionals

The Department of Biomedical Informatics is currently exploring partnership possibilities with Barrow Neurological Institute, the Translational Genomics Research Institute, the Mayo Clinic and Medical School, the University of Arizona Medical College, and Banner Health. Listed below are some examples of potential collaborative opportunities:

EXAMPLES OF COLLABORATIVE OPPORTUNITIES WITH ASU PARTNERS	
Partner	Opportunities
Catholic Health Care West/ Barrow Neurological Institute	Joint faculty member [e.g., Shahram Partovi]; joint focus on hospital-based informatics; potential for clinical research space at the Barrow Neurological Institute.
Translational Genomics Research Institute	Joint focus on genomics and proteomics-based informatics; potential research space at TGen; potential joint hires in the area of proteomics; collaborative work involving the TGen/ASU IBM supercomputer for genomic research in areas such as cancer genome informatics.
Mayo Clinic and Medical School	Potential for collaboration regarding clinical informatics/cancer imaging; potential for affiliates [e.g., Frank Prendergast, Larry Miller, Keith Frey]; current discussion with the Mayo Clinic and Medical School's Information Technology regarding funding a joint hire and fellowships; joint applications for ASU/Mayo grant seed funding.
University of Arizona Medical College	Use of medical school conference facilities; joint research opportunities; integration of medical student learning with other health professionals through team exercises; potential for joint hires in medical informatics.
Banner Health	Potential collaboration in the arrears of health informatics, imaging informatics, and Alzheimer research; potential for shared clinical research space in the new Banner facility; potential joint hires.

The Department of Biomedical Informatics will explore additional partnership possibilities with the Veterans Administration, Sun Health, Maricopa Medical Center, Phoenix Children's Hospital, National Institute of Diabetes and Digestive and Kidney Diseases, Chaparral Biomedical Campus, Arizona Cancer Institute, Arizona Heart Institute, Arizona Department of Health Services, Maricopa County Department of Health Services, Intel, General Electric, Blue Cross/Blue Shield of Arizona, and the Arizona Peer Review Organization, among other potential partners.

10.0 Financing of the Department of Biomedical Informatics

The Department of Biomedical Informatics will begin operations with seed funding from the Legislature and the University. From the beginning, the Department will aggressively seek funding from external sources through research grants and contracts, corporate sponsorship, and in-kind gifts.

10.1 Seed Funding for the Department of Biomedical Informatics

For Fiscal Year 2006, the Legislature has committed to providing as much as $1 million for the Department of Biomedical Informatics as part Laws 2005, Chapter 330 - SB 1517 (higher education; budget). Arizona State University has committed an additional $500,000 toward operating expenses.

Funding for the Arizona Biomedical Collaborative Building I is being provided through the University Research Infrastructure Bill [Laws 2003, Chapter 267 - HB 2529]. The total amount committed from the research infrastructure funds for this project is anticipated to be $29.6 million. Arizona State University is committing $12.4 million to cover the shell space, information technology infrastructure, audiovisual equipment, and outfitting of the ABC Building I.

10.2 External Funding

The Department of Biomedical Informatics plans to seek funding from the following sources:

Federal Agencies: Faculty within the Department of Biomedical Informatics will seek individual investigator and multi-disciplinary grants from national funding agencies. Bioinformatics is currently a key focus of the National Institutes of Health's strategic plan, the NIH Roadmap: *Accelerating Medical Discoveries to Improve Health.* As a result, a number of Institutes at NIH including the National Library of Medicine, the National Cancer Institute, the National Institute of General Medical Sciences, the National Institute of Biomedical Imaging and Bioengineering, and the National Human Genome Research Institute are funding research in specific facets of biomedical informatics. Other likely funding sources include: the National Science Foundation, Health Resources and Service Administration, Agency for Healthcare Research and

Quality, National Aeronautics and Space Administration, Department of Energy, and the Department of Defense.

The Department of Biomedical Informatics will seek training grants for its graduate students. For example, the Department may wish to apply for an Integrated Graduate Education and Research Traineeship related to biomedical informatics in collaboration with other programs on campus, or individual fellowships and grants for informatics training from the National Library of Medicine.

Private Sources: The Department of Biomedical Informatics will aggressively seek funding from external sources. It expects to secure $2 -$3 million from in-kind gifts, seed funding, joint positions, and clinical space over a period of five years.

The Department of Biomedical Informatics will seek funding from industry partners from established corporations that have a business and strategic interest in biologically- and medically- based informatics systems. Possible partners include: International Business Machines Corporation, Sun Microsystems, General Electric, Novel, Seimens, Cerner and Intel. The Department will also explore the possibility of partnerships with local companies such as the Eller Media Company and MediServe. Funding from these sources will be sought for establishing research infrastructure and graduate fellowships.

Where appropriate, the Department of Biomedical Informatics will work with its clinical and research partners [e.g., Catholic Health Care West, Mayo Clinic and Medical School, Banner Health, and the Translational Genomics Institute] to leverage existing partnerships and to develop new corporate sponsorships. The Department's clinical partners have a number of existing partnerships and funding relationships that are beneficial. For example, The Mayo Clinic and Medical School has an existing informatics partnership with International Business Machines Corporation; Catholic Health Care West has existing partnerships with IBM and with Pro Systems; and the Barrow Neurological Institute has received considerable funding and in-kind gifts from the Eller Media Company.

The Department of Biomedical Informatics and School of Computing and Informatics anticipate high potential for private support. Naming and other such funding possibilities will be explored.

National Foundations: The Department of Biomedical Informatics will also explore funding from major foundations such as the W. M. Keck Foundation, Alfred P. Sloan Foundation, and the Robert Wood Johnson Foundation. Our initial analysis has revealed that each of these organizations is actively funding training programs and projects in the area of biomedical informatics.

It is anticipated that faculty in the Department of Biomedical Informatics will generate a minimum of $125,000 – $400,000 in grants per annum (depending on their level of seniority), based on grant expenditures of faculty at the Fulton School of Engineering. During the first two years of the program, expenditures at the Department may be lower

than expected as a high proportion of faculty time will be devoted to developing the curriculum, recruiting faculty and students, integrating BMI into the bioscience campus, cultivating partnerships, and applying for grants. However, based on the experiences of bioinformatics researchers on the ASU campus and our research into programs at other campuses, it is expected that the funding for biomedically-oriented research may yield more than would be expected for Schools of Engineering. Moreover, researchers at ASU in the area of bioinformatics are earning more per square foot on average than other types of biomedicine researchers.[15]

PROJECTED RESEARCH EXPENDITURES FOR BMI FACULTY*						
FY07	FY08	FY09	FY10	FY11	FY12	Long-term
$375K	$1M	$2.9M	$4.8M	$6.2M	$7M	$8M

* Assumes approximately one year between faculty hiring and receipt of expenditures. Also assumes that BMI faculty will receive their requested research space.

Research expenditures are anticipated to grow as the Department of Biomedical Informatics hires new faculty and post-doctoral research scientists, and is able to compete for large-scale proposals from the major funding agencies. Starting in FY08, the co-location of the Department with researchers on the Phoenix Bioscience campus will increase the range of federally-sponsored grants for which the BMI faculty are eligible.

Moreover, by investing in biomedical informatics expertise at ASU, both the University and the region will become even more competitive in its grants. Bioinformatics is currently one key focus of the NIH's strategic plan; as a result, a great number of the NIH's requests for proposals include a bioinformatics component. By investing in a Department of Biomedical Informatics, ASU will be in a favorable position to serve as a core biomedical informatics facility in intramural and extramural collaborative grants. Investing in biomedical informatics is expected to have secondary effects on ASU's clinical partners. Through collaborative ASU-community projects, ASU anticipates developing new types of tools and systems that will benefit our hospitals and public health agencies.

11.0 Implementation Plan

Planning Year (2005-2006)

The Department of Biomedical Informatics will focus on the following activities in addition to faculty recruitment:

- *Submission of ABOR paperwork.* The BMI planning team (comprised of the Dean of the School of Computing and Informatics, the Associate Director for BMI, and joint and affiliated faculty) will spend most of the summer and fall of 2005 putting together the required paperwork necessary to gain authorization from the Arizona Board of Regents for the Department of Biomedical Informatics and its degree-granting programs.

Approval documents for the new Department of Biomedical Informatics will be submitted by July of 2005, and approval documents for the new BMI degrees will be submitted no later than December 2005.
- *Development of Boards and Taskforces.* The Department of Biomedical Informatics will convene a scientific advisory board, a community board, and a curriculum committee. Elaboration on the purpose and composition of the boards can found on pages 14-15.

- *Course Development and Integration with the Medical School Curriculum.* During the summer and fall of 2005, faculty at the Department of Biomedical Informatics will focus on developing curriculum and integrating informatics into the medical school curriculum.

- *Major Gifts Campaign.* The Department of Biomedical Informatics will develop extensive "ask" plans for each of the major categories of potential funders and partners. These "ask" plans will identify the Department's needs, as well as the benefits to the funders and partners. The Department of Biomedical Informatics will work closely with the ASU Foundation in putting together these documents.

- *Symposium on Biomedical Informatics.* The Department of Biomedical Informatics will host a one-day symposium on biomedical informatics in the winter of the 2005 in conjunction with the American College of Medical Informatics Meeting, which will be held in Phoenix. The purpose of this symposium will be to recruit potential senior and junior faculty and to explore emerging trends in biomedical informatics.

- *BMI Educational Outreach.* In addition to a one-day symposium, the Department of Biomedical Informatics will host an ongoing BMI seminar series. It is anticipated that ASU may be able to host these seminars in collaboration with its research partners. A collaborative seminar series would provide an ideal opportunity for ASU to begin immediate work with its partners in the area of biomedical informatics and to demonstrate to funding agencies its commitment to collaborative work with the local community. Another important aspect of community outreach will involve educational outreach via through the media (newspapers, editorials, and ASU magazines, etc). The planning team will work with local newspapers to educate the community about importance of biomedical informatics.

- *Site Visits to Schools and Funding Agencies.* ASU teams will conduct site visits to other successful BMI programs. In June 2005, the departmental staff conducted their first site visit at the School of Health Information Sciences at the University of Texas at Houston. Site visits are being arranged at the Department of Biomedical Informatics at Columbia University, the Department of Medical Informatics at the University of Utah School of Medicine, the Department of Medical Informatics at Stanford University, and the School of Informatics at Indiana University.

BMI faculty will be in Washington, DC in October for the annual American Medical Informatics Association meeting. At that time, they will arrange visits to the major funding agencies in Washington, DC, including the National Institutes of Health and the

National Science Foundation, to explore federal funding priorities for biomedical informatics.

First Year (2006-2007)

- *Marketing of BMI Program.* A key focus of this year will involve marketing the program to prospective students. The Department of Biomedical Informatics expects to develop a prototype website, brochures, and other marketing material. It will also plan to host an open house, attend a few select graduate school fairs, and fly promising prospective students to ASU to meet with faculty. Administrative staff will meet with ASU's specialists in public affairs to learn more about branding and best practices in marketing and recruitment.

- *Expanded Course Development.* During this year, the BMI concentrations will be underway at the Department of Computer Science and Engineering. This will serve as an important year in providing a baseline data for gauging student interest in BMI and for receiving student feedback on BMI courses. The School of Computing and Informatics anticipates hiring a curriculum specialist to assist faculty in putting together new teaching modules, syllabi, and instructional materials. It is anticipated that this individual will provide support to the Department of Biomedical Informatics.

Second Year (2007-2008) and Beyond

- *Expand Educational Offerings*. Once the master's and doctoral degree programs have been established, the Department of Biomedical Informatics will explore the possibility of joint degrees with the medical and nursing schools. It will also explore the possibility of becoming officially certified to offer continuing medical education (CME) credits to physicians and other health care professionals.

- *Internal Evaluation*. The planning team will conduct an internal evaluation of the program after the first full year of operation. Metrics will be developed to assess the return-on-investment generated by the Department of Biomedical Informatics, workforce contributions, technology transfer, and partnerships. This type of evaluation will provide the following types of benefits: 1) required information to the Legislature; 2) guidance to administrators in developing benchmarks for the program and establishing markers for success; 3) feedback to the faculty and administration on areas for improvement; and 4) useful programmatic information for future grant applications and funding proposals.

The North Central Association has a pilot program, known as the Academic Quality Improvement Program (AQIP), that provides an evaluation process for programs at accredited organizations. The Department of Biomedical Informatics also plans to work with AQIP to define performance measures. Such collaboration is expected to add to the visibility of the Department of Biomedical Information, to aid the administration in

evaluating the success of the department, and to assist the AQIP in defining performance measures for the emerging field of biomedical informatics.

12.0 Major Milestones and Expected Accomplishments: 2005-2008

ANTICIPATED MILESTONES AND EXPECTED ACCOMPLISHMENTS	
Date	**Milestone**
August - October 2005	Start with joint and affiliate appointments. Start curriculum meetings. Interviews for new faculty hires and hire post-doc/research faculty
November, 2005	BMI Department to launch a seminar series on biomedical informatics.
November, 2005	Paperwork establishing the Department of Biomedical Informatics and the School of Computing and Informatics is accepted by internal ASU faculty and submitted to ABOR for establishment. Paperwork also submitted for establishment of BMI concentrations and degrees.
December-January 2006	New post-doctoral fellows/research faculty and full-time tenure track faculty join the department
January, 2006	BMI Department to host dinner with BMI thought leaders and a one-day symposia on biomedical informatics in conjunction with annual meeting of the American College of Medical Informatics. First advisory board meeting to be held at this time.
January, 2006	ABOR approves establishment of the School of Computing and Informatics and the Department of Biomedical Informatics. Approval of degree programs to follow shortly thereafter.
May, 2006	Second advisory board meeting held in conjunction with the Spring conference of the American Medical Informatics Association.
June, 2006	Chair or Associate Chair of BMI Department to arrive at ASU.
July, 2006	Architectural plans for ABC I Building are finalized.
August, 2006	Graduate concentrations in BMI available through CSE. ASU faculty to begin providing BMI instruction to medical students.
August, 2007	First class of master's students to matriculate.
March, 2008	Department moves into the Arizona Biomedical Collaborative Bldg I.
August, 2008	First class of doctoral students to matriculate.

APPENDIX A: DRAFT 5-YEAR BUDGET FOR THE BMI DEPARTMENT

BMI Legislature Budget					
Personnel	**FY06**	**FY 07**	**FY08**	**FY 09**	**FY 10**
Faculty					
Chair		$ 200,000	$ 200,000	$ 200,000	$ 200,000
Associate Chair		$ 175,000	$ 175,000	$ 175,000	$ 175,000
Professor			$ 450,000	$ 900,000	$ 900,000
Associate Professor		$ 187,500	$ 187,500	$ 500,000	$ 625,000
Assistant Professor		$ 200,000	$ 200,000	$ 300,000	$ 500,000
Faculty Buyouts (see bugdet details)	$300,000				
Faculty Total:	**$300,000**	**$ 762,500**	**$ 1,212,500**	**$2,075,000**	**$ 2,400,000**
SubtotaL Faculty w/ERE:	**$300,000**	**$ 953,125**	**$ 1,515,625**	**$2,593,750**	**$ 3,000,000**
-	-				
Administrative					
Associate Director @ 50%	$45,000	$90,000	$90,000	$90,000	$90,000
Accountant, Sr.					$55,000
Office Specialist	$32,000	$ 32,000	$ 32,000	$ 32,000	$ 32,000
Academic Advisor		$ 40,000	$ 40,000	$ 40,000	$ 40,000
Systems Admin/Tech Support		$ 70,000	$ 70,000	$ 70,000	$ 70,000
Total:	**$77,000**	$ 232,000	$ 232,000	$ 232,000	$ 287,000
Administrative w/ERE:	**$100,100**	**$ 301,600**	**$ 301,600**	**$ 301,600**	**$ 373,100**
-	-	-			
Student Assistants, Workers, and Stipends					
Student Worker (includes 8 percent additional) Blake Atkinson	$15,000	$ 30,000	$ 30,000	$ 60,000	$ 60,000
Teaching Assistants (includes ERE)		$ 68,000	$ 68,000	$ 170,000	$ 170,000
Research Assistants (includes ERE)	$35,000	$ 35,000			
PostDocs	$135,000	$ 100,000			
Summer fellowships and stipends.			$ 30,000	$ 50,000	$ 90,000
Other Personnel :	**$185,000**	**$ 233,000**	**$ 128,000**	**$ 280,000**	**$ 320,000**
Total Personnel:	**$585,100**	**$ 1,487,725**	**$ 1,945,225**	**$3,175,350**	**$ 3,693,100**
Operations					
Services	$20,000	$ 25,000	$ 30,000	$ 35,000	$ 40,000
Materials and Supplies	$20,000	$ 25,000	$ 52,525	$ 94,400	$ 83,650
Voice and Data Communication	$10,000	$ 15,000	$ 20,000	$ 25,000	$ 30,000
Software Licenses	$50,000	$ 125,000	$ 125,000	$ 50,000	$ 25,000

Travel In-State (see budget details)	$1,000	$ 2,000	$ 3,000	$ 4,000	$ 5,000
Travel Out-of-State	$6,000	$ 7,000	$ 5,000	$ 6,000	$ 7,000
Travel Foreign	$3,000	$ 4,000	$ 8,000	$ 9,000	$ 10,000
Non-capital Equipment & software (See budget details)	$34,900	$ 6,250	$ 11,250	$ 26,250	$ 31,250
Other capital (general construction & space reconfigure - see budget details)	$50,000		$ 100,000	$ 25,000	$ 25,000
Equipment		$ 153,025	$ 500,000	$ 25,000	$ 25,000
Other (see budget details)	$220,000	$ 150,000	$ 200,000	$ 25,000	$ 25,000
Total Operations:	**$414,900**	**$ 512,275**	**$ 1,054,775**	**$ 324,650**	**$ 306,900**
Total Budget:	**$1,000,000**	**$ 2,000,000**	**$ 3,000,000**	**$3,500,000**	**$ 4,000,000**
BMI President Budget					
Faculty					
Professor	$150,000	$ 225,000	$ 225,000	$ 225,000	$ 225,000
Associate Professor	$125,000				
Assistant Professor	$100,000				
Total:	**$375,000**	**$225,000**	**$225,000**	**$225,000**	**$225,000**
Subtotal w/ERE:	**$468,750**	**$ 281,250**	**$ 281,250**	**$ 281,250**	**$ 281,250**
Operations					
Materials & Supplies	$31,250				
Non-capital equipment		$ 218,750	$ 218,750	$ 218,750	$ 218,750
Total Operations:	$31,250	$ 218,750	$ 218,750	$ 218,750	$ 218,750
Total Budget:	**$1,500,000**	**$ 2,500,000**	**$ 3,500,000**	**$4,000,000**	**$ 4,500,000**

APPENDIX B: CAPITAL BUDGET FOR ASU'S PORTION OF THE ARIZONA BIOMEDICAL COLLABORATIVE BUILDING I

The following capital budget provides a breakdown of anticipated expenses for ASU's portion of the Arizona Biomedical Collaborative Building I.

PROJECT BUDGET REPORT

PROJECT NAME: AZ Biomedical Collaborative (ABC Building)
PROJECT NUMBER: 2004-13011
AREA/ORG: PB6 2404
PM: ~~Joseph Marra~~ Vance Linden
PROJECT / FILING TYPE: MAJOR

DATA DATE: 06/30/05
RUN DATE: 06/30/05
FILE NAME: Excel: F:\BUDGET\2004-13011pbr.xls
AREA/ORG MGR: Dave Brixen

Object Code	Cost Item	A Appropriated Budget	B Budget Adjustments	C A+B Adjusted Budget	D Encumbered & Expensed To Date	E (Potential) Costs To Date	F C-D-E Uncommitted Budget
7880.01-10	LAND ACQUISITION (1)						
7880.16-20	New Construction (2A)	0	0	0	0.00	0.00	0.00
7880.11-20	Remodeling Renovation	6,359,480	1,000,000	7,359,480	0.00	0.00	7,359,480.00
7880.95-20	Specialized Equip (2C)	110,280	1,050,000	1,160,280	0.00	0.00	1,160,280.00
7880.06-20	Site Development (2D)	257,320	0	257,320	0.00	0.00	257,320.00
7880.06-20	Parking/Landscaping (2E)	220,560	0	220,560	0.00	0.00	220,560.00
7880.06-20	Utilities Ext. (2F)	183,800	0	183,800	0.00	0.00	183,800.00
XXXX.XX-XX	State Sales Tax Resrch Exemption	0	0	0	0.00	0.00	0.00
XXXX.XX-20	Directives - Potential	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**7,131,440**					
7880.21-30	Constr. Manager (3A)	73,520	0	73,520	0.00	0.00	73,520.00
7880.21-30	Architect/Engineer (3B)	883,343	222,350	1,105,693	0.00	0.00	1,105,693.00
7880.21-30	IDC (3C)	0	0	0	0.00	0.00	0.00
7880.21-30	Preprogramming (3C)	0	0	0	0.00	0.00	0.00
XXXX.XX-30	Other (Move Mgmt)(3C)	35,657	0	35,657	0.00	0.00	35,657.00
	SUBTOTAL	**992,520**					
7325.XX-40	Furniture, Fixtures & Equipment (4)	294,080	0	294,080	0.00	0.00	294,080.00
	SUBTOTAL	**294,080**					
7330.16-50	Telephone Off-Site	0	0	0	0.00	0.00	0.00
7330.16-50	Telephone Inside	0	0	0	0.00	0.00	0.00
7330.16-50	Equip, Cable, Move-In (Telecom Equip) (8)	0	0	0	0.00	0.00	0.00
7330.16-50	Special Phones/Connections	294,080	0	294,080	0.00	0.00	294,080.00
7330.16-50	Special System Interface	0	0	0	0.00	0.00	0.00
	SUBTOTAL	**294,080**					
7310.52-60	Physical Plant SWOs (10E)	0	0	0	0.00	0.00	0.00
7890.21-70	Surveys & Tests (10A)	7,352	0	7,352	0.00	0.00	7,352.00
7390.99-70	Move-In Costs (10B)	33,084	0	33,084	0.00	0.00	33,084.00
7810.65-70	Public Art (10C)	0	0	0	0.00	0.00	0.00
7310.19-70	Adver/Printing (10D)	3,676	0	3,676	0.00	0.00	3,676.00
7310.99-70	Signage (10E)	14,704	0	14,704	0.00	0.00	14,704.00
7310.52-70	Keying (10E)	14,704	0	14,704	0.00	0.00	14,704.00
7310.52-70	Grounds (10E)	0	0	0	0.00	0.00	0.00
7890.11-70	Asbestos (10E)	0	0	0	0.00	0.00	0.00
7810.99-70	Trash Compactor (10E)	2,843	0	2,843	0.00	0.00	2,843.00
7390.99 – Parking Replacement Reserve		0	0	0	0.00	0.00	0.00

XXXX.XX-70 Other (10E)	0	0	0	0.00	0.00	0.00
XXXX.XX-XX Project Mgt Fees (.015)	149,981	0	149,981	0.00	0.00	149,981.00
7390.69xxx State Risk Management Ins. (.0034)	28,489	0	28,489	0.00	0.00	28,489.00
XXXX.XX-Sci-Quest	2,487	0	2,487	0.00	0.00	2,487.00
7390.00-XX Financial Services Assessment (.0005)	4,993		4,993	0.00	0.00	4,993.00
SUBTOTAL	**262,313**					
Design Phase Contingency (5)	220,560	127,650	348,210	0.00	0.00	348,210.00
Inflation Adjustment (7)	441,120	0	441,120	0.00	0.00	441,120.00
Constn Phase Contingency (6)	363,887	0	363,887	0.00	0.00	363,887.00
SUBTOTAL	**1,025,567**					
TOTALS	10,000,000	2,400,000	12,400,000	0.00	0.00	12,400,000.00

Advantage (APPR Table) Uncommitted Amount as of 06/30/05 $12,400,000.00

Advantage VS PROJECT BUDGET REPORT RECONCILIATION (Advantage less Totals E and F) $0.00

APPENDIX C: SPACE REQUIREMENTS FOR THE BMI DEPARTMENT

FY 06 (2005-2006)

Revised June 07, 2005

Tempe Campus

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices	2	133	266	484
Open Work Stations (stud & grad space, etc)	3	64	192	349
Filing Space	0	133	0	0
Reception Area	0	128	0	0
Small Conference Room	0	266	0	0
Server Room	0	320	0	0
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*458*	*833*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Student Spaces*	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Full Professor - Office	0	133	0	0

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices	0	133	0	0
Open Work Stations (stud & grad space, etc)	0	64	0	0
Filing Space	0	133	0	0
Reception Area	0	128	0	0
Conference Room	0	666	0	0
Server Room	0	320	0	0
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*0*	*0*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Student Spaces	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Full Professor - Office	0	133	0	0

Full Professor - Student Spaces*	0	48	0	0	Full Professor - Student Spaces	0	48	0	0
Full Professor - Lab	0	800	0	0	Full Professor - Lab	0	800	0	0
Full Professor - Add't Interface Space	0	300	0	0	Full Professor - Add't Interface Space	0	300	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0	Post Doc/Technical Staff (2 per office)	0	133	0	0
Assoc Professor - Office	2	133	266	484	Assoc Professor - Office	0	133	0	0
Assoc Professor - Student Spaces*	3	48	144	262	Assoc Professor - Student Spaces	0	48	0	0
Assoc Professor - Lab**	0	600	0	0	Assoc Professor - Lab	0	600	0	0
Assoc Professor - Add't Interface Space	0	250	0	0	Assoc Professor - Add't Interface Space	0	250	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0	Post Doc/Technical Staff (2 per office)	0	133	0	0
Assistant Professor - Office	0	133	0	0	Assistant Professor - Office	0	133	0	0
Assistant Professor - Student Spaces*	0	48	0	0	Assistant Professor - Student Spaces	0	48	0	0
Assistant Professor - Lab	2	400	800	1455	Assistant Professor - Lab	0	400	0	0
Assistant Professor - Add't Interface Space	0	200	0	0	Assistant Professor - Add't Interface Space	0	200	0	0
Post Doc/Technical Staff (2 per office)	3	133	399	725	Post Doc/Technical Staff (2 per office)	0	133	0	0
Subtotal			*1609*	*2200*	*Subtotal*			*0*	*0*
Sutbtotal Faculty Offices	2		266	484	*Sutbtotal Faculty Offices*	0		0	0
Subtotal Graduate Student Spaces	3		144	262	*Subtotal Graduate Student Spaces*	0		0	0
*Subtotal Faculty Labs***	2		800	1455	*Subtotal Faculty Labs*	0		0	0
Subtotal Add't Interface Space	0		0	0	*Subtotal Add't Interface Space*	0		0	0
Subtotal Post Doc	3		399	725	*Subtotal Post Doc/Tech Staff (2 per office)*	0		0	0
Total Request			***2067***	***3758***	***Total Request***			***0***	***0***

Space Plan Narrative: The BMI Department's space needs for this year will be minimal. We anticipate that all BMI faculty and staff hired during the first year (approximately four) will be housed in the Brickyard. We expect a delay between the hiring of BMI faculty and the arrival of their graduate students -- thus we assume no student space for this year. We also anticipate that two of the faculty may share a laboratory space during the first year.
Space Plan Narrative: The BMI Department's space needs for this year will be minimal. We anticipate hiring 2 staff, 1 student worker, 3 research faculty (e.g. post docs on a two-year contract), and 3 graduate research assistants. Two graduate TA's will be carried over from the Department of Computer Science and Engineering. We will provide about 800 NSF of lab space for the post-docs. We will also hire 3 joint associate professors (on a two-year contract) and will provide them with two shared offices in the Brickyard; it is assumed that they will maintain their lab space elsewhere.

FY 07 (2006-2007) *Revised June 01, 2005*

Tempe Campus

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices	5	133	665	1209
Open Work Stations (stud & grad space, etc)	3	64	192	349
Filing Space	1	133	133	242
Reception Area	0	128	0	0
Small Conference Room	0	266	0	0
Server Room	0	320	0	0
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*990*	*1800*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	1	266	266	484
Chair - Student Spaces	3	48	144	262
Chair - Lab	1	800	800	1455
Post Doc/Technical Staff (2 per office)		133	0	0
Full Professor - Office	0	130	0	0

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices	0	133	0	0
Open Work Stations (stud & grad space, etc)	0	64	0	0
Filing Space	0	133	0	0
Reception Area	0	128	0	0
Small Conference Room	0	266	0	0
Server Room	0	320	0	0
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*0*	*0*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Student Spaces	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Full Professor - Office	0	133	0	0

Full Professor - Student Spaces	0	48	0	0		Full Professor - Student Spaces	0	48	0	0
Full Professor - Lab	0	800	0	0		Full Professor - Lab	0	800	0	0
Full Professor - Add't Interface Space	0	300	0	0		Full Professor - Add't Interface Space	0	300	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0		Post Doc/Technical Staff (2 per office)	0	133	0	0
Assoc Professor - Office	4	133	532	967		Assoc Professor - Office	0	133	0	0
Assoc Professor - Student Spaces	5	48	240	436		Assoc Professor - Student Spaces	0	48	0	0
Assoc Professor - Lab	2	600	1200	2182		Assoc Professor - Lab	0	600	0	0
Assoc Professor - Add't Interface Space	0	250	0	0		Assoc Professor - Add't Interface Space	0	250	0	0
Post Doc/Technical Staff (2 per office)	1	133	133	242		Post Doc/Technical Staff (2 per office)	0	133	0	0
Assistant Professor - Office	1	133	133	242		Assistant Professor - Office	0	133	0	0
Assistant Professor - Student Spaces	2	48	96	175		Assistant Professor - Student Spaces	0	48	0	0
Assistant Professor - Lab	3	400	1200	2182		Assistant Professor - Lab	0	400	0	0
Assistant Professor - Add't Interface Space	0	200	0	0		Assistant Professor - Add't Interface Space	0	200	0	0
Post Doc/Technical Staff (2 per office)	3	133	399	725		Post Doc/Technical Staff (2 per office)	0	133	0	0
Subtotal			*5143*	*8625*		*Subtotal*			*0*	*0*
Sutbtotal Faculty Offices	6		931	1693		*Sutbtotal Faculty Offices*	0		0	0
Subtotal Graduate Student Spaces	10		480	873		*Subtotal Graduate Student Spaces*	0		0	0
*Subtotal Faculty Labs***	6		3200	5818		*Subtotal Faculty Labs*	0		0	0
Subtotal Add't Interface Space	0		0	0		*Subtotal Add't Interface Space*	0		0	0
Subtotal Post Doc/Tech Staff (2 per office)	4		532	967.3		*Subtotal Post Doc/Tech Staff (2 per office)*	0		0	0
Total Request			***6133***	***11151***		***Total Request***			***0***	***0***

Space Plan Narrative: Assume that four additional faculty (one chair, two assoc profs, and one asst. prof) and three staff are hired during FY07. Assume that the research faculty and graduate students hired during FY06 maintain space over 2 years (this will be the second year); we will continue to provide shared office space for the joint associate hires. CSE to begin offering a graduate concentration in BMI during this year. BMI faculty to begin providing instruction in biomedical informatics to medical school students. We assume that most of the faculty will be housed in the Brickyard; there is also some possibility of space being available downtown.

FY 08 (2007-2008) *Revised June 01, 2005*

Tempe Campus

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	2	64	128	233
Filing Space	1	133	133	242
Reception Area	0	128	0	0
Receptionist Mail Person	0	64	0	0
Small Conference Room	0	266	0	0
Server Room	0	320	0	0
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*793*	*1442*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	1	800	800	1455
Subtotal			*800*	*1455*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Student Space	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Full Professor - Office	0	133	0	0

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Filing Space	1	133	133	242
Reception Area	1	128	128	233
Receptionist Mail Person	1	64	64	116
Conference Room w ability to partition	1	666	666	1211
Server Room	3	320	960	1745
Copy/Mail/Misc Work room	1	266	266	484
IT space with room for strorage	1	330	330	600
Subtotal			*3335*	*6064*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	1	580	580	1055
Subtotal			*580*	*1055*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	1	266	266	484
Chair - Student Space	3	48	144	262
Chair - Lab	1	800	800	1455
Post Doc/Technical Staff (2 per office)	1	133	133	242
Full Professor - Office	2	133	266	484

Full Professor - Student Space	0	48	0	0	Full Professor - Student Spaces	6	48	288	524
Full Professor - Lab	0	800	0	0	Full Professor - Lab	2	800	1600	2909
Full Professor - Add't Interface Space	0	300	0	0	Full Professor - Add't Interface Space	0	300	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0	Post Doc/Technical Staff (2 per office)	1	133	133	242
Assoc Professor - Office	0	133	0	0	Assoc Professor - Office	4	133	532	967
Assoc Professor - Student Spaces	0	48	0	0	Assoc Professor - Student Spaces	8	48	384	698
Assoc Professor - Lab	0	600	0	0	Assoc Professor - Lab	4	600	2400	4364
Assoc Professor - Add't Interface Space	0	250	0	0	Assoc Professor - Add't Interface Space	1	250	250	455
Post Doc/Technical Staff (2 per office)	0	133	0	0	Post Doc/Technical Staff (2 per office)	1	133	133	242
Assistant Professor - Office	0	133	0	0	Assistant Professor - Office	3	133	399	725
Assistant Professor - Student Spaces	0	48	0	0	Assistant Professor - Student Spaces	6	48	288	524
Assistant Professor - Lab	0	400	0	0	Assistant Professor - Lab	3	400	1200	2182
Assistant Professor - Add't Interface Space	0	200	0	0	Assistant Professor - Add't Interface Space	1	200	200	364
Post Doc/Technical Staff (2 per office)	0	133	0	0	Post Doc/Technical Staff (2 per office)	0	133	0	0
Subtotal			*0*	*0*	*Subtotal*			*9416*	*16756*
Sutbtotal Faculty Offices	0		0	0	*Sutbtotal Faculty Offices*	10		1463	2660
Subtotal Graduate Student Spaces	0		0	0	*Subtotal Graduate Student Spaces*	23		1104	2007
Subtotal Faculty Labs	0		0	0	*Subtotal Faculty Labs*	10		6000	10909
Subtotal Add't Interface Space	0		0	0	*Subtotal Add't Interface Space*	2		450	818
Subtotal Post Doc/Tech Staff (2 per office)	0		0	0	*Subtotal Post Doc/Tech Staff (2 per office)*	3		399	725
Total Request			***1593***	***2896***	***Total Request***			***13331***	***24238***

Space Plan Narrative: The BMI Department adds 2 full profs, 2 assoc profs, and 2 asst profs, for a total of 10 faculty. The Department adds two new teaching assistants. The Department adds 3 more staff, for a total of 8 staff. Assume that all of the faculty and half of the administrative staff move to ABC 1. The academic advisor will stay on the Tempe campus with the advising center of the School of Computing and Informatics, as will some of the other personnel whose functions are integrated with the School. Assume that the post-docs hired in FY06 move to ABC (so of these may later convert to full faculty). BMI Department to begin offering Master's degrees during this year. The number of medical students receiving instruction doubles to 48 from 24.

FY 09 (2008-2009) *Revised June 01, 2005*

Tempe Campus or Research Partners

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	0	128	0	0
Filing Space	1	133	133	242
Reception Area	0	128	0	0
Receptionist Mail Person	0	64	0	0
Small Conference Room	0	266	0	0
Server Room	1	320	320	582
Copy/Mail/Misc Work room	0	266	0	0
Subtotal			*1241*	*2256*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	1	800	800	1455
Subtotal			*800*	*1455*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Grad Student Space	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	1	128	128	233
Filing Space	1	197	197	358
Reception Area	1	128	128	233
Receptionist Mail Person	1	64	64	116
Conference Room w ability to partition	1	666	666	1211
Server Room	3	320	960	1745
Copy/Mail/Misc Work room	1	266	266	484
IT space with room for strorage	1	330	330	600
Subtotal			*3527*	*6413*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	1	580	580	1055
Subtotal			*580*	*1055*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair and Assoc Chair - Office	2	266	532	967
Chair and Assoc Chair - Student Spaces	8	48	384	698
Chair and Assoc Chair - Lab	2	800	1600	2909
Post Doc/Technical Staff (2 per office)	1	133	133	242

Full Professor - Office	2	130	260	473
Full Professor - Student Spaces	10	48	480	873
Full Professor - Lab	2	800	1600	2909
Full Professor - Add't Interface Space	0	300	0	0
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assoc Professor - Office	3	133	399	725
Assoc Professor - Student Spaces	15	48	720	1309
Assoc Professor - Lab	3	600	1800	3273
Assoc Professor - Add't Interface Space	0	250	0	0
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	2	133	266	484
Assistant Professor - Student Spaces	6	48	288	524
Assistant Professor - Lab	2	400	800	1455
Assistant Professor - Add't Interface Spaces	0	200	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Subtotal			*7145*	*12991*
Sutbtotal Faculty Offices	7		925	1682
Subtotal Graduate Student Spaces	31		1488	2705
Subtotal Faculty Labs	7		4200	7636
Subtotal Add't Interface Space	0		0	0
Subtotal Post Doc/Tech Staff (2 per office)	4		532	967
Total Request			***9186***	***16702***

Full Professor - Office	2	133	266	484
Full Professor - Student Spaces	10	48	480	873
Full Professor - Lab	2	800	1600	2909
Full Professor - Add't Interface Space	1	300	300	545
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assoc Professor - Office	4	133	532	967
Assoc Professor - Student Spaces	14	48	672	1222
Assoc Professor - Lab	3	650	1950	3545
Assoc Professor - Add't Interface Space	1	250	250	455
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	2	133	266	484
Assistant Professor - Student Spaces	6	48	288	524
Assistant Professor - Lab	2	400	800	1455
Assistant Professor - Add't Interface Space	1	200	200	364
Post Doc/Technical Staff (2 per office)	1	133	133	242
Subtotal			*10918*	*19245*
Sutbtotal Faculty Offices	10		1596	2902
Subtotal Graduate Student Spaces	38		1824	3316
Subtotal Faculty Labs	9		5950	10818
Subtotal Add't Interface Space	3		750	1364
Subtotal Post Doc/Tech Staff (2 per office)	6		798	1451
Total Request			***15025***	***27318***

Space Plan Narrative: The program adds an assoc chair, two full profs, and two assoc profs, for a total of 16 faculty. Eight of these faculty are anticipated to be joint hires and 8 are anticipated to be core hires. The Department adds two more teaching assistants, for a total of five. Assume 10 offices are needed in ABC I, so that if necessary the clinical research space can be turned into research space for a tenth faculty member. Assume 10 offices are needed, so that if necessary the clinical research space can be turned into research space for a tenth faculty member. The BMI Department to begin offering doctoral degrees. The number of medical students receiving instruction increases to 72 from 48. Growth of the program will depend on space available through our partnering departments or partnering institutions. The Department will need a collaborative BMI lab for student projects -- not clear if it will be housed in the ABC building, or med school, or elsewhere downtown. It is assumed that the Tempe campus will be able to connect to the holodeck room through the Decision Theatre; if not, then separate space may be needed.

FY10 (2009-2010) *Revised June 01, 2005*

Tempe Campus or Research Partners

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	0	128	0	0
Filing Space	1	133	133	242
Reception Area	0	128	0	0
Receptionist Mail Person	0	64	0	0
Small Conference Room	1	266	266	484
Server Room	1	320	320	582
Copy/Mail/Misc Work room	1	266	266	484
Subtotal			*1773*	*3224*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	1	800	800	1455
Subtotal			*800*	*1455*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	1	128	128	233
Filing Space	1	197	197	358
Reception Area	1	128	128	233
Receptionist Mail Person	1	64	64	116
Conference Room w ability to partition	1	666	666	1211
Server Room	3	320	960	1745
Copy/Mail/Misc Work room	1	266	266	484
IT space with room for strorage	1	330	330	600
Subtotal			*3527*	*6413*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	1	580	580	1055
Subtotal			*580*	*1055*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair - Office	0	266	0	0
Chair - Grad Student Space	0	48	0	0
Chair - Lab	0	800	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Full Professor - Office	4	130	520	945
Full Professor - Student Spaces	20	48	960	1745
Full Professor - Lab	4	800	3200	5818
Full Professor - Add't Interface Spaces	1	300	300	545
Post Doc/Technical Staff (2 per office)	3	133	399	725
Assoc Professor - Office	5	133	665	1209
Assoc Professor - Student Spaces	25	48	1200	2182
Assoc Professor - Lab	5	600	3000	5455
Assoc Professor - Add't Interface Spaces	0	250	0	0
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	2	133	266	484
Assistant Professor - Student Spaces	6	48	288	524
Assistant Professor - Lab	2	400	800	1455
Assistant Professor - Add't Interface Spaces	0	200	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Subtotal			*11864*	*21571*
Sutbtotal Faculty Offices	11		1451	2638
Subtotal Graduate Student Spaces	51		2448	4451
Subtotal Faculty Labs	11		7000	12727
Subtotal Add't Interface Space	1		300	545
Subtotal Post Doc/Tech Staff (2 per office)	5		665	1209
Total Request			***14437***	***26249***

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair and Assoc Chair - Office	2	266	532	967
Chair and Assoc Chair - Student Spaces	8	48	384	698
Chair and Assoc Chair - Lab	2	800	1600	2909
Post Doc/Technical Staff (2 per office)	1	133	133	242
Full Professor - Office	2	133	266	484
Full Professor - Student Space	10	48	480	873
Full Professor - Lab	2	800	1600	2909
Full Professor - Add't Interface Space	1	300	300	545
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assoc Professor - Office	4	133	532	967
Assoc Professor - Student Space	14	48	672	1222
Assoc Professor - Lab	3	650	1950	3545
Assoc Professor - Add't Interface Space	1	250	250	455
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	2	133	266	484
Assistant Professor - Student Space	6	48	288	524
Assistant Professor - Lab	2	400	800	1455
Assistant Professor - Add't Interface Space	1	200	200	364
Post Doc/Technical Staff (2 per office)	1	133	133	242
Subtotal			*10918*	*19245*
Sutbtotal Faculty Offices	10		1596	2902
Subtotal Graduate Student Spaces	38		1824	3316
Subtotal Faculty Labs	9		5950	10818
Subtotal Add't Interface Space	3		750	1364
Subtotal Post Doc/Tech Staff (2 per office)	6		798	1451
Total Request			***15025***	***27318***

Space Plan Narrative: Two additional full profs and two assoc profs are added, for a total of 20 faculty. Assume 10 offices are needed in ABC I, so that if necessary the clinical research space can be turned into research space for a tenth faculty member. Twelve of these faculty are anticipated to be joint hires and 8 are anticipated to be core hires Two more teaching assistants are added. The number of medical students receiving instruction increases to 96 from 72. The Department will need a collaborative BMI lab for student projects -- not clear if it will be housed in the ABC building, or med school, or elsewhere downtown. It is assumed that the Tempe campus will be able to connect to the holodeck room through the Decision Theatre; if not, then separate space may be needed.

FY11 (2010-2011) -- ASSUME THIS REPRESENTS LONG-TERM SPACE NEEDS *Revised June 01, 2005*

Tempe Campus or Research Partners

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	0	128	0	0
Filing Space	1	133	133	242
Reception Area	0	128	0	0
Receptionist Mail Person	0	64	0	0
Small Conference Room	1	266	266	484
Server Room	1	320	320	582
Copy/Mail/Misc Work room	1	266	266	484
Subtotal			*1773*	*3224*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
	1	800	800	1455
Subtotal			*800*	*1455*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
	0	580	0	0
Subtotal			*0*	*0*

ABC I

BMI Administration	No of Units	Unit Size	NSF	GSF
Staff Offices (regular)	4	133	532	967
Open Work Stations (stud & grad space, etc)	4	64	256	465
Open Work Stations	1	128	128	233
Filing Space	1	197	197	358
Reception Area	1	128	128	233
Receptionist Mail Person	1	64	64	116
Conference Room w ability to partition	1	666	666	1211
Server Room	3	320	960	1745
Copy/Mail/Misc Work room	1	266	266	484
IT space with room for strorage	1	330	330	600
Subtotal			*3527*	*6413*

BMI Instructional Lab Space	No of Units	Unit Size	NSF	GSF
Instructional Lab (for 10 to 15 students)	0	800	0	0
Subtotal			*0*	*0*

Holadeck Interactive Room	No of Units	Unit Size	NSF	GSF
Holadeck room	1	580	580	1055
Subtotal			*580*	*1055*

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair (Undergraduate) - Office	1	266	266	484
Chair - Student Spaces	3	48	144	262
Chair - Lab	1	800	800	1455
Post Doc/Technical Staff (2 per office)	1	133	133	242
Full Professor - Office	4	130	520	945
Full Professor - Student Spaces	20	48	960	1745
Full Professor - Lab	4	800	3200	5818
Full Professor - Add't Interface Spaces	1	300	300	545
Post Doc/Technical Staff (2 per office)	3	133	399	725
Assoc Professor - Office	5	133	665	1209
Assoc Professor - Student Spaces	25	48	1200	2182
Assoc Professor - Lab	5	600	3000	5455
Assoc Professor - Add't Interface Spaces	0	250	0	0
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	4	133	532	967
Assistant Professor - Student Spaces	8	48	384	698
Assistant Professor - Lab	4	400	1600	2909
Assistant Professor - Add't Interface Spaces	0	200	0	0
Post Doc/Technical Staff (2 per office)	0	133	0	0
Add'lGA spaces to ensure 1:5 faculty/GA ratio	21	48	1008	1833
Subtotal			*14369*	*26125*
Sutbtotal Faculty Offices	14		1983	3605
Subtotal Graduate Student Spaces	56		3696	6720
Subtotal Faculty Labs	14		8600	15636
Subtotal Add't Interface Space	1		300	545
Subtotal Post Doc/Tech Staff (2 per office)	6		798	1451
Total Request			***17650***	***32091***

BMI Faculty Space (Office, Students, Labs)	No of Units	Unit Size	NSF	GSF
Chair and Assoc Chair - Office	2	266	532	967
Chair and Assoc Chair - Student Spaces	8	48	384	698
Chair and Assoc Chair - Lab	2	800	1600	2909
Post Doc/Technical Staff (2 per office)	1	133	133	242
Full Professor - Office	2	133	266	484
Full Professor - Student Space	10	48	480	873
Full Professor - Lab	2	800	1600	2909
Full Professor - Add't Interface Space	1	300	300	545
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assoc Professor - Office	4	133	532	967
Assoc Professor - Student Space	14	48	672	1222
Assoc Professor - Lab	3	650	1950	3545
Assoc Professor - Add't Interface Space	1	250	250	455
Post Doc/Technical Staff (2 per office)	2	133	266	484
Assistant Professor - Office	2	133	266	484
Assistant Professor - Student Space	6	48	288	524
Assistant Professor - Lab	2	400	800	1455
Assistant Professor - Add't Interface Space	1	200	200	364
Post Doc/Technical Staff (2 per office)	1	133	133	242
Subtotal			*10918*	*19245*
Sutbtotal Faculty Offices	10		1596	2902
Subtotal Graduate Student Spaces	38		1824	3316
Subtotal Faculty Labs	9		5950	10818
Subtotal Add't Interface Space	3		750	1364
Subtotal Post Doc/Tech Staff (2 per office)	6		798	1451
Total Request			***15025***	***27318***

Narrative: A chair for undergraduate studies is added, as well as two assistant professors. The faculty now totals about 23. Nine of these faculty are anticipated to be joint hires and 14 are anticipated to be core hires. Assume 10 offices are needed in ABC I, so that if necessary the clinical research space can be turned into research space for a tenth faculty member. There are 8 staff, 7 teaching assistants, and spaces for 115 graduate assistants. It is expected that a number of graduate assistants will come from other departments. The BMI Department starts offering undergraduate concenrations in BMI in conjunction with the Department of Computer Science. The Department will need a collaborative BMI lab for student projects -- not clear if it will be housed in the ABC building, or med school, or elsewhere downtown. It is assumed that the Tempe campus will be able to connect to the holodeck room through the Decision Theatre; if not, then separate space may be needed. An instructional lab will also be needed for undergraduates, but it is likely that this will be developed as part of the School of Computing and Informatics.

APPENDIX D: SELECTED LIST OF TOP BIOMEDICAL INFORMATICS PROGRAMS

Department of Biomedical Informatics, Columbia University
http://www.dbmi.columbia.edu/index2.html

Stanford Medical Informatics, Stanford University
http://camis.stanford.edu/main.html

Program in Biomedical Informatics, Harvard-MIT Division of Health Sciences & Technology
http://www.mi-boston.org/fellowship/miboston/bmi_home.htm

Center for Biomedical Informatics, University of Pittsburgh
www.cbmi.pitt.edu

Department of Medical Informatics, University of Utah School of Medicine
http://uuhsc.utah.edu/medinfo/

Department of Medical Informatics and Clinical Epidemiology, Oregon Health and Science University School of Medicine
http://www.ohsu.edu/dmice/

School of Health Information Sciences, University of Texas at Houston
http://www.shis.uth.tmc.edu/

Department of Medical Informatics, Vanderbilt University
http://www.mc.vanderbilt.edu/dbmi/education/

Department of Medical Education and Biomedical Informatics, University of Washington
http://www.dbhi.washington.edu/

Graduate Program in Biological and Medical Informatics, University of California at San Francisco
http://www.bmi.ucsf.edu/mission.html

Biostatistics and Medical Informatics, University of Wisconsin-Madison
http://www.biostat.wisc.edu/

School of Informatics, University of Edinburgh
http://www.inf.ed.ac.uk/

Graduate Program in Bioinformatics, Boston University
http://www.bu.edu/bioinformatics/

Lewis-Stigler Institute for Integrative Genomics, Princeton University
http://www.genomics.princeton.edu/

APPENDIX E: FACULTY AND STUDENTS AT OTHER DEPARTMENTS OF BIOMEDICAL INFORMATICS

NUMBER OF FACULTY AND STUDENTS AT OTHER DEPARTMENTS OF BIOMEDICAL INFORMATICS										
School	***Full-Time Faculty***	***Joint Faculty***	***Adjunct Faculty***	***Total Faculty***	***Undergrads Enrolled in Program***	***Masters Students***	***Doctoral Students***	***Post Doc Students***	***Total Students***	***Faculty-Student Ratio***
Columbia University	10	19	3	32	0	21	27	7	55	0.6
Stanford University	4	9	7	20	7	16	27	0	50	0.4
University of Pittsburgh	12	0	0	12	0	34	0	0	34	0.4
University of Utah	11	38	0	49	0	79	0	0	79	0.6
Oregon Health and Science University	18	25	0	43	0	55	0	4	59	0.7
Duke University	9	2	0	11	0	0	3	0	3	3.7
University of Texas	16	0	0	16	0	0	0	43	43	0.4
Vanderbilt University	23	10	0	33	0	23	0	0	23	1.4
University of Minnesota	14	9	0	23	0	0	19	0	19	1.2
University of California Health Systems-- Davis	15	17	3	35	12	0	0	0	12	2.9
Indiana University	40	26	9	75	1,183	0	227	2	1412	0.1
University of Washington	16	24	0	40	0	14	17	0	31	1.3
University of Wisconsin-Madison	31	0	0	31	0	17	71	0	88	0.4
University of Edinburgh	80	100	80	260	200	0	0	0	200	1.3
Duke (Bioinformatics and Genome Technology)	48	0	0	48	0	0	7	0	7	6.9
Princeton	14	0	0	14	0	0	5	0	5	2.8
Mean Average	**23**	**17**	**6**	**46**	**88**	**16**	**25**	**4**	**133**	**2**
Median	**16**	**10**	**0**	**33**	**0**	**7**	**4**	**0**	**39**	**1**

APPENDIX F: S.W.O.T ANALYSIS

Strengths

- Arizona State University is a nationally recognized leader in fostering new types of interdisciplinary education (Chronicle of Higher Education, 2002).

- Research excellence at ASU in the areas of bioimaging and analysis, signal processing and analysis, multi-dimensional visualization, developmental gene expression profiling, comparative genomics, DNA and protein sequencing analysis, artificial intelligence, assistive devices and technology, neural engineering and rehabilitation, among other areas. ASU has over a hundred faculty with research interests in biomedical informatics and over 50 active grants from NIH and NSF worth over $32 million.

- Arizona State University recently established the Biodesign Institute—a multidisciplinary research and education institute designed to integrate advances in computing, optoelectronics, biomimetic materials and directed molecular assembly. George Poste, named Scientist of the Year in 2004 by R&D Magazine, is Director of the Biodesign Institute.

- Arizona State University also recently established the Institute for Computing and Information Sciences and Engineering (InCISE) – a multidisciplinary research and education institute. One of InCISE's nine centers, the Center for Cognitive Ubiquitous Computing (CUbiC), was named Innovator of the Year for Academia in 2004 by the Governor's Office for its iCARE research project.

- Many of the schools and departments supporting ASU's efforts in biomedical informatics—such as the programs in biological sciences, bioengineering, computer science, business, applied mathematics, nursing, psychology and health administration—are highly ranked by *U.S. News and World Report*.

- Clinical partners with reputations for excellence. The Mayo Clinic and Mayo Clinic School of Medicine are premier institutions for medical research and patient care; Barrow Neurological Institute is a leader in neuroscience and neurosurgery; and Sun Health is home to a world-renowned brain bank.

- Strong existing relationships and partnerships with the clinical community, public health agencies, and industry in Phoenix. For example, ASU recently signed a Memorandum of Understanding with the University of Arizona to develop an expanded medical school to be located on the Phoenix Biomedical Campus. ASU also recently signed a Memorandum of Understanding with the Mayo Foundation for Medical Education and Research to engage in joint research projects and develop joint educational degree programs and a Memorandum of Understanding with the Barrow Neurological Institute and Banner Health for bioimaging research. ASU also has strong existing relationships with industry groups such Intel and Cisco in information systems facilitation.

- Innovative state-wide public health databases. Arizona is one of the few states in which the largest county health department (Maricopa County Department of Health Services) and the state health department (Arizona Department of Health Services) are headquartered in the same city. Furthermore, Arizona houses two uniquely comprehensive databases: Arizona was the first state to develop a national Medicaid Management Information System specifically designed to support fee-for-service and managed care; Arizona also houses the most comprehensive database available in the nation of childhood immunization (the Arizona State Immunization Information System – a system that has links to major health care systems databases across the state). Access to these databases, and interaction with the creators and users of these databases, provides ASU with a unique resource in the area of public health informatics.

Weaknesses

- Historical lack of a medical school affiliated with ASU. As a result, ASU's research efforts have been primarily bench-focused. Mechanisms for interfacing with primary and tertiary care facilities are limited.

- Need for critical mass and broader expertise in the areas of: healthcare economics, health systems management, population genetics, health law and regulation, context-dependent data optimization, informatics for large-scale imaging, consumer health informatics, e-health supply logistics, and interactions between software design and clinical care. ASU, like other university-based departments of biomedical informatics, needs to enhance its translational capacity for bridging bioinformatics to healthcare informatics.

- There are few biomedicine/bioinformatics companies headquartered in Phoenix.

Opportunities

- Phoenix is rapidly becoming a hub for the emerging biosciences industry in Arizona. A number of companies with interests and expertise in informatics, such as TGen and IGC, have recently moved into the Valley.

- The Arizona Roadmap highlighted a number of strategic areas in the biosciences—including neurocomputation and neural signal processing – as areas of opportunity (Battelle, 2004). Both require a strong foundation in biomedical informatics.

- The American Association of Medical Colleges (AAMC) is interested in expanding informatics training in medical school curricula. Yet, according to the AAMC, only about one-quarter of medical schools in North America offer training in biomedical informatics.

- The development of a medical school that incorporates biomedical informatics into all aspects of the curriculum has the potential to bring Arizona recognition as a leader of medical education for the 21st century.

- The National Institutes of Health has recognized the centrality of informatics to biomedical research, and is funding efforts to integrate the study of informatics with biomedicine.

- Many of the other Western states, notably California, New Mexico, Oregon, Texas, Utah, and Washington, have nationally recognized programs in biomedical informatics. These academic departments serve as important partners in areas such as molecular profiling and image analysis. They also play a vital support role to scientists in realizing the promise of the genomic revolution.

- Currently, there are no doctoral-level, research-oriented programs dedicated to biomedical informatics in Arizona. There are three programs in Arizona geared to masters-level education: the distance-learning master's degree at the Arizona School of Health Sciences, Systems Information Management Program at the School of Nursing (with a subspecialization in Informatics) at University of Arizona, and the Professional Master's Program in Computational Biology at Arizona State University.

- The diversity of Arizona's population presents new opportunities for ASU to provide access to post-secondary education for state residents, including minorities, in the burgeoning field of biomedical informatics.

Threats

- Competition from other programs in biomedical informatics. We identified approximately 75 programs related to the broad field of biomedical informatics in the United States. While most of these schools were developed in the past five years, many already have significant financial backing and faculty resources. Thus, it is important that we develop unique strengths and remain regionally relevant.

- Because of the plethora of programs and intense demand for researchers trained in biomedical informatics it may be a challenge to attract qualified faculty.

- Proliferation of distance-learning programs in biomedical informatics by nationally recognized programs.

APPENDIX G: ENDNOTES

[1] Arizona Board of Regents, Memoranda of Understanding Regarding the Expansion of Medical Education and Research in Phoenix. (August 4, 2004).
[2] According the American College of Medical Informatics, "Biomedical informatics is the union of the basic informational and computing sciences […], with biomedicine as an application domain. Biomedicine is a broad application domain spanning all health professional practice (including public health and bioimaging); basic biological research; clinical research; education of future and current health professionals; and the administration of practice, research, and education. See Charles P. Friedman, et al.,Training the Next Generation of Informaticians: The Impact of "BITSI" and Bioinformatics — A Report from the American College of Medical Informatics. Journal of the American Medical Informatics Association 11 (3) (May/June 2004), 167-172.
[3] World Health Organization, WHO Definition of Health. Accessed at http://www.who.int/about/definition/en/ (November 27, 2004).
[4] See Association of American Medical Colleges, Report II: Contemporary Issues in Medicine: Medical Informatics and Population Health, Medical School Objectives Project (June 1998); and National Institutes of Health, NLM Research Grants in Biomedical Informatics and Informatics (R01), PA number: PA-04-141 (Release Date: August 13, 2004); and Charles P. Friedman, et al., Training the Next Generation of Informaticians: The Impact of "BITSI" and Bioinformatics — A Report from the American College of Medical Informatics, Journal of the American Medical Informatics Association 11 (3) (May/June 2004), 167-172
[5] Michael M. Crow, "A New American University: The New Gold Standard" Accessed at http://www.asu.edu/president/newamericanuniversity/ (November 4, 2004).
6 Battelle Technology Partnership Practice, Report prepared for the Flinn Foundation, Overview of Technology Platform Strategies, (June, 2004); and Collaborative Economics, Report Prepared for the Arizona Department of Commerce, The Bioindustry in Arizona (June, 2001).
7 California (Stanford, Stanford Medical Informatics; University of California Davis, Medical Informatics; University of California San Francisco, Biological and Medical Informatics; University of California Irvine, Informatics in Biology and Medicine); Colorado (University of Colorado Health Sciences Center Health Care Informatics); New Mexico (University of New Mexico, Health Sciences Library and Informatics Center) Oregon (Oregon Health and Science University); Texas (University of Texas Houston Health Science Center Health Informatics); Utah (University of Utah, Department of Medical Informatics); and Washington (University of Washington, Department of Medical Education and Biomedical Informatics), among others.
[8] Mary Jo Waits on behalf of the Health Sciences CEO Input Group, Meds and Eds: The Key to Arizona Leapfrogging Ahead in the 21st Century, March 2005.
[9] "The race to computerise biology", The Economist, Volume 365, Issue 8303, 14 Dec 2002. Accessed at C:\Documents and Settings\erobboy.ASURITE\Local Settings\Temporary InternetFiles\OLK14\Bioinformatics Economist Article 2002 (2).htm (Accessed at March 25, 2004)
[10] Alison McCook, Life Science Jobs 2005, *The Scientist*, Volume 18, Issue 24, 20 Dec 2004
[11] Becky Ham, "Careerview", *Chemistry*, Winter, 2004
[12] Bob Calandra, "Bioinformatics Knowledge Vital to Careers", The Scientist, Volume 16, Issue 17, 2 Sept 2002.
[13] The College of Nursing is expected move to the downtown campus in August of 2006, providing a geographical synergy between the BMI Department and the College of Nursing.
14 Charles P. Friedman, et al., Training the Next Generation of Informaticians: The Impact of "BITSI" and Bioinformatics — A Report from the American College of Medical Informatics, Journal of the American Medical Informatics Association 11 (3) (May/June 2004), 167-172.
[15] Ohio State University Department of Biomedical Informatics generates about $6 million in research expenditures and has received total funding of $20,730,193. The Department of Biomedical Informatics at Ohio State University, which has 8 faculty, 10 research staff, 6 tech/admin staff, 3 post docs, 13 grad students, and 4 undergraduates. See http://bmi.osu.edu/funding/index.cfm?listby=status for more information. Sudhir Kumar's bioinformatics laboratory at ASU yields currently brings in $355 per square foot, a much higher dollar figure than most other labs at the Biodesign Institute.

Appendix J
FY 2011 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2011**					**FY 2010-11**						
Program Document										**COM CURRENT FUNDING**								
Class July 2007, July 2008, July 2009, July 2010) 272 Students (Years one, two, three, four)- 272 total students													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0		228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0		158,375								158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0		259,735								259,735
1.0.1	Admissions/Records		1		1.0	59,512	59,512	1.0		59,512								59,512
10.15	Academic Support		1	PhD	2.0	193,760	193,760	2.0		96,880				96,880				193,760
1.0.2	Financial Aid/HR		1		1.0	55,360	55,360	1.0		55,360								53,440
1.0.3	Exec. Assts.		1		3.0	249,120	83,040	3.0		64,532				18,508				83,040
1.0.4	Admin. Assistant		3		6.0	290,640	137,016	3.0		114,241				22,775				137,016
1.0.5	Admin Associate		2		4.0	221,440	106,880	2.0		81,820		11,690		13,370				106,880
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0						34,600				34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0		91,224								91,224
1.0.7	Accountant		1		2.0	110,720	55,360	1.0		55,360								55,360
1.0.8	Public Affairs		1		2.0	125,433	62,717	1.0			62,717							62,717
1.0.9	Development		1		2.0	189,544	94,772	1.0			94,772							94,772
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,040	1.0		83,040								83,040
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0		82,355								82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2		7,361				27,555				34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	84,675	0.5						84,675				84,675
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5		112,230								112,230
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	22	0	31	2,753,424	2,017,627	23		1,550,085	157,489	11,690	0	298,363	0	0	0	2,017,627

Appendix J
FY 2011 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2011				FY 2010-11							
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		2.0	228,060	228,060	2.0				228,060						228,060
2.0.0	Student Recruiters		3		4.0	138,400	138,400	4.0				138,400						138,400
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		7.0	412,132	412,132	7		0	0	412,132	0	0	0	0	0	412,132
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	26.0	3,091,480	3,091,480	26.0						3,091,480				3,091,480
	Clinical Science		4	MD	7.0	1,231,200	1,231,200	7.0						1,231,200				1,231,200
6.0.1	Educational Consultants			MD		20,000	20,000							20,000				20,000
6.0.1	Admin Assistant		4		11.0	570,900	570,900	11.0						570,900				570,900
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		44.0	4,913,580	4,913,580	44		0	0	0	0	4,913,580	0	0	0	4,913,580
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty																		0
	Faculty Offices - Research PI		4	PhD	42.0	5,701,500	5,701,500	42.0						2,850,750	1,425,375	1,425,375		5,701,500
6.1.0	Research PI		2	MD	21.0	2,508,000	2,508,000	21.0						1,254,000	627,000	627,000		2,508,000
	Research Staff		0		95.0	7,494,360	7,494,360	95.0							7,494,360			7,494,360
	Admin Staff				63.0	3,269,700	3,269,700	63.0						1,634,850		1,634,850		3,269,700
		Total	6		221	18,973,560	18,973,560	221		0	0	0	0	5,739,600	9,546,735	3,687,225	0	18,973,560
													NEW	**NEW**	**NEW**	**NEW**		
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	58.0	10,249,080	10,249,080	58.0						1,338,000			8,911,080	10,249,080
	Faculty Offices - Clinical Science			MD	58.0	10,249,080	10,249,080	58.0						1,338,000	3,587,178		5,323,902	10,249,080
	Research Staff				348.0	23,246,400	23,246,000	348.0							23,246,000			23,246,000
6.0.1	Admin Assistant		0		21.0	1,052,100	1,052,100	21.0						526,050			526,050	1,052,100
		Total	0		485.0	44,796,660.0	44,796,260	485.0		0	0	0		3,202,050	26,833,178		14,761,032	44,796,260
													NEW	**NEW**	**NEW**	**NEW**		

Appendix J
FY 2011 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2011					FY 2010-11						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**					**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0						332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0		82,355				323,085				405,440
7.0.1	Server Room / Staging																	
7.0.1.5	Control Room																	
7.0.3	Editing Room																	
7.0.5	Total	6		8.0	737,600		737,600	8		82,355	0	0		655,245	0		0	737,600
7.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**					**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																		
	Gross Anatomy Laboratory																	
8.0.0	Lab/Prep Room																	
	Gross Path Storage (vented)																	
8.0.1	Staff	3		3.0	145,320		145,320	3						145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3		0	0	0	0	145,320	0	0	0	145,320
8.0.2																		
8.0.3																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**					**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*																
	Waiting / Discussion																	
9.0.0	Exam Rooms																	
	Video Feedback																	
9.0.1	Restrooms																	
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0						342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0						124,560				124,560
9.0.4	File / Storage																	
9.0.5																		
9.0.6	Total	4		4.0	466,560		466,560	4		0	0	0	0	466,560	0	0	0	466,560
9.0.7																		

Appendix J
FY 2011 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2011					FY 2010-11						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0	0	396,560	0	0	0	396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0	0	0	0	0	94,360	94,360
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix J
FY 2011 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2011				FY 2010-11							
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**66**	**0**	**811**	**73,689,756**		**72,953,559**	**803**	**1,632,440**	**157,489**	**423,822**	**0**	**15,817,278**	**36,379,913**	**3,687,225**	**14,855,392**	**72,953,559**
Operations																		
Operations						5,156,700		5,156,700		224,800	184,000			1,646,900	665,000		2,436,000	5,156,700
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000		3,272,000		398			1,645,362	1,626,240				3,272,000
Operations and Maintenance Research Space(82,000 sq ft @ $9)						738,000		738,000									738,000	738,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		165,000						165,000				165,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		610,000									610,000	610,000
Research Start Up-						4,840,000		2,745,000									2,745,000	2,745,000
Clinical Research Start Up-						2,968,000		2,184,000									2,184,000	2,184,000
Travel						149,500		149,500						149,500				149,500
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000		60,082						60,082				60,082
Computer Systems (inc software) (60 @ $1500)						90,000		60,000						60,000				60,000
Computers LRC (inc software) 150 @ 2000) refresh)						50,000		50,000						50,000				50,000
Media Equipment (per consultant)--new building est						3,000,000		250,000						250,000				250,000
IT Infrastructure-- new building est						3,000,000		325,000						325,000				325,000
Furnishings - PUH						900,000												0
GRAND TOTAL						**100,783,456**		**90,181,341**	**803**	**2,320,138**	**341,489**	**423,822**	**1,645,362**	**21,150,000**	**37,044,913**	**3,687,225**	**23,568,392**	**90,181,341**

Appendix J
FY 2012 Phoenix Program Budget Detail

University of Arizona																	
Medical School																	
SG Project No. 19564.000																	
University of Arizona																	
Medical School																	
SG Project No. 19564.000							**FY 2012**				**FY 2011-12**						
Program Document										**COM CURRENT FUNDING**							
4 year classes - 352 Students													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE	**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**												
1. Administration		*Staff*															
	Assoc. Dean of Student Affairs	1	PhD	1.0	228,060		228,060	1.0	228,060								228,060
1.0.0	Assoc Dean-Curriculum	1	PhD	1.0	158,375		158,375	1.0	158,375								158,375
	Dean, Academic Affairs	1	MD	1.0	259,735		259,735	1.0	259,735								259,735
	Assistant Deans	3		4.0	285,075		190,050	2.0	190,050								190,050
1.0.1	Admissions/Records	1		2.0	124,560		119,024	1.0	119,024								119,024
10.15	Academic Support	1	PhD	2.0	193,760		193,760	2.0	193,760								193,760
1.0.2	Financial Aid/HR	1		2.0	110,720		110,720	2.0	110,720								110,720
1.0.3	Exec. Assts.	1		3.0	249,120		149,064	2.0	149,064								149,064
1.0.4	Admin. Assistant	3		6.0	290,640		290,641	2.0	290,641								290,641
1.0.5	Admin Associate	2		4.0	221,440		210,948	3.0	179,025		11,690	20,233					210,948
1.0.6	Waiting / Reception	1		1.0	34,600		34,600	1.0				34,600					34,600
1.0-.6.5	Workroom / Files																
1.065B	Director Bus. Affairs	1		1.0	91,224		91,224	1.0	91,224								91,224
1.0.7	Accountant	1		2.0	110,720		55,360	2.0	55,360								55,360
1.0.8	Public Affairs	1		2.0	125,433		125,433	2.0		125,433							125,433
1.0.9	Development	1		2.0	189,544		189,544	2.0		189,544							189,544
1.0.9	Facilities/Scheduling	1		1.0	83,040		83,040	1.0	83,040								83,040
1.0.10	Spec. Assist to Dean	1		1.0	82,355		82,355	1.0	82,355								82,355
1.0.12	Conf. Rm.(12)																
1.0.12A	Staff Lounge																
1.0.12B	Storage																
1.0.13	Asst Dean-Student Counseling	1	MD	0.2	35,476		34,916	0.2	34,916								34,916
1.0.14	Assoc Dean Clin. Aff	1	MD	0.5	171,000		169,350	1.0	84,675			84,675					169,350
1.0.15	Assoc Dean Resrch	1	PhD	0.5	114,030		112,230	0.5				112,230					112,230
1.0.16	Conf. Rm.(30)Mediated																
1.0.17	Total	25	0	37	3,158,907		2,888,429	29	2,310,024	314,977	11,690	251,738	0	0	0	0	2,888,429

Appendix J
FY 2012 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2012				FY 2011-12						
Program Document										**COM CURRENT FUNDING**							
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs		*Staff*															
	Director	1		2.0	228,060		228,060	2.0			228,060						228,060
2.0.0	Student Recruiters	3		4.0	138,400		138,400	4.0			138,400						138,400
	Admin Assist	1		1.0	45,672		45,672	1.0			45,672						45,672
2.0.1	Work Room																
2.0.2	Storage																
2.0.3	Total	5		7.0	412,132		412,132	7	0	0	412,132	0	0	0	0	0	412,132
2.0.4																	
2.0.5																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																	
6.0.0	Faculty Offices - Basic Science	8	PhD	28.0	3,344,880		3,344,880	28.0					3,344,880				3,344,880
	Clinical Science	4	MD	7.0	1,231,200		1,231,200	7.0					1,231,200				1,231,200
6.0.1	Educational Consultants		MD		20,000		20,000						20,000				20,000
6.0.1	Admin Assistant	4		11.0	570,900		570,900	11.0					570,900				570,900
6.0.1.5	Swing Offices																
	Work Rm/Files																
6.0.2	Total	16		46.0	5,166,980		5,166,980	46	0	0	0	0	5,166,980	0	0	0	5,166,980
6.0.3																	
6.0.4																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty for ABC 1 A171																	0
	Faculty Offices - Research PI	4	PhD	56.0	7,627,340		7,627,340	56.0					3,813,670	1,906,835	1,906,835		7,627,340
6.1.0	Research PI	2	MD	28.0	4,788,000		4,788,000	28.0					2,394,000	1,197,000	1,197,000		4,788,000
	Research Staff	0		125.0	9,861,000		9,861,000	125.0						9,861,000			9,861,000
	Admin Staff			84.0	4,359,600		4,359,600	84.0					2,179,800		2,179,800		4,359,600
	Total	6		293	26,635,940		26,635,940	293	0	0	0	0	8,387,470	12,964,835	5,283,635	0	26,635,940
												NEW	**NEW**	**NEW**	**NEW**		
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																	
	Faculty Offices - Clinical Science	0	MD	72.0	12,653,937		12,653,937	72.0					1,898,090			10,755,847	12,653,937
	Faculty Offices - Clinical Science		MD	72.0	12,653,937		12,653,937	72.0					1,898,090	4,428,879		6,326,968	12,653,937
	Research Staff			432.0	28,857,600		28,857,600	432.0						28,857,600			28,857,600
6.0.1	Admin Assistant	0		24.0	1,202,400		1,202,400	24.0					601,200			601,200	1,202,400
	Total	0		600.0	55,367,874.0		55,367,874	600.0	0	0	0		4,397,380	33,286,479		17,684,015	55,367,874
												NEW	**NEW**	**NEW**	**NEW**		

Appendix J
FY 2012 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2012					FY 2011-12						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0	0	655,245	0	0	0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0	0	145,320	0	0	0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0	0	466,560	0	0	0	466,560
9.0.7																	

Appendix J
FY 2012 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2012					FY 2011-12						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0	0	396,560	0	0	0	396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0	0	0	0	0	94,360	94,360
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix J
FY 2012 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2012				FY 2011-12							
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**69**	**0**	**1,006**	**92,582,233**		**92,311,755**	**998**	**2,392,379**	**314,977**	**423,822**	**251,738**	**19,615,515**	**46,251,314**	**5,283,635**	**17,778,375**	**92,311,755**
Operations																		
Operations						6,248,400		6,248,400		224,800	184,000			1,265,600	875,000	675,000	3,024,000	6,248,400
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000		3,272,000					1,549,722	1,722,278				3,272,000
Operations and Maintenance Research Space (82,000@ $9)						738,000		738,000									738,000	738,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		120,000						120,000				120,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		1,200,000									1,200,000	1,200,000
Research Start Up- ABC 1 UA						4,840,000		3,205,000									3,205,000	3,205,000
Clinical Research Start Up-						2,968,000		1,912,000									1,912,000	1,912,000
Travel						149,500		183,300						183,300				183,300
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000		83,307						83,307				83,307
Computer Systems (inc software) (60 @ $1500)						90,000		60,000						60,000				60,000
Computers LRC (inc software) 150 @ 2000) refresh)						50,000		50,000						50,000				50,000
Media Equipment (per consultant)--new building est						3,000,000												0
IT Infrastructure-- new building est						3,000,000												0
Furnishings - PUH						900,000												0
GRAND TOTAL						**120,767,633**		**110,846,262**	**998**	**3,079,679**	**498,977**	**423,822**	**1,801,460**	**24,100,000**	**47,126,314**	**5,958,635**	**27,857,375**	**110,846,262**

Appendix J
FY 2013 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2013**				**FY 2012-13**							
Program Document										**COM CURRENT FUNDING**								
4 classes 456 students													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0		228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0		158,375								158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0		259,735								259,735
	Assistant Deans		3		4.0	285,075	190,050	2.0		190,050								190,050
1.0.1	Admissions/Records		1		2.0	124,560	119,024	1.0		119,024								119,024
10.15	Academic Support		1	PhD	2.0	193,760	193,760	2.0		193,760								193,760
1.0.2	Financial Aid/HR		1		2.0	110,720	110,720	2.0		110,720								110,720
1.0.3	Exec. Assts.		1		3.0	249,120	149,064	3.0		149,064								149,064
1.0.4	Admin. Assistant		3		6.0	290,640	193,760	4.0		193,760								193,760
1.0.5	Admin Associate		2		4.0	221,440	210,948	3.0		199,258		11,690						210,948
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0		11,464			23,136					34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0		91,224								91,224
1.0.7	Accountant		1		2.0	110,720	55,360	2.0		55,360								55,360
1.0.8	Public Affairs		1		2.0	125,433	125,433	2.0			125,433							125,433
1.0.9	Development		1		2.0	189,544	189,544	2.0			189,544							189,544
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,040	1.0		83,040								83,040
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0		82,355								82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2		34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	169,350	1.0					84,675					169,350
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5		112,230								112,230
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	25	0	37	3,158,907	2,791,548	32		2,272,395	314,977	11,690	107,811	0	0	0	0	2,791,548

Appendix J
FY 2013 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2013					FY 2012-13						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		2.0	228,060	228,060	2.0				228,060						228,060
2.0.0	Student Recruiters		3		4.0	138,400	138,400	4.0				138,400						138,400
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		7.0	412,132	412,132	7		0	0	412,132		0	0		0	412,132
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	30.0	3,572,940	3,572,940	30.0						3,572,940				3,572,940
	Clinical Science		4	MD	7.0	1,231,200	1,231,200	7.0						1,231,200				1,231,200
6.0.1	Educational Consultants			MD		20,000	20,000							20,000				20,000
6.0.1	Admin Assistant		4		12.0	622,800	622,800	12.0						622,800				622,800
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		49.0	5,446,940	5,446,940	49		0	0	0		5,446,940	0		0	5,446,940
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty																		0
	Faculty Offices - Research PI		4	PhD	69.0	9,375,800	9,375,800	69.0						4,687,900	2,343,950	2,343,950		9,375,800
6.1.0	Research PI		2	MD	33.0	5,608,800	5,608,800	33.0						2,804,400	1,402,200	1,402,200		5,608,800
	Research Staff		0		155.0	12,283,000	12,283,000	155.0							8,189,000	4,094,000		12,283,000
	Admin Staff				102.0	5,293,800	5,293,800	102.0						1,660,800		3,633,000		5,293,800
		Total	6		359	32,561,400	32,561,400	359		0	0	0		9,153,100	11,935,150	11,473,150	0	32,561,400
													NEW	**NEW**	**NEW**	**NEW**		
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	86.0	13,986,777	13,986,777	86.0						2,018,016			11,968,761	13,986,777
	Faculty Offices - Clinical Science			MD	86.0	13,986,777	13,986,777	86.0						2,018,016	5,594,711		6,374,050	13,986,777
	Research Staff				516.0	28,857,600	28,857,600	516.0							28,857,600			28,857,600
6.0.1	Admin Assistant		0		30.0	1,503,000	1,503,000	30.0						751,500			751,500	1,503,000
		Total	0		718.0	58,334,154.0	58,334,154	718.0		0	0	0		4,787,532	34,452,311		19,094,311	58,334,154
													NEW	**NEW**	**NEW**	**NEW**		

Appendix J
FY 2013 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2013					FY 2012-13						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0	0	655,245	0	0	0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0	0	145,320	0	0	0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0	0	466,560	0	0	0	466,560
9.0.7																	

Appendix J
FY 2013 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2013					FY 2012-13						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0	0	396,560	0	0	0	396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**		
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0		0	0		94,360	94,360
														NEW	**NEW**		**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**		**State**	**Grants**		**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix J
FY 2013 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2013					FY 2012-13						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**69**	**0**	**1,193**	**101,753,933**		**101,386,574**	**1,188**	**2,354,750**	**314,977**	**423,822**	**107,811**	**21,051,257**	**46,387,461**	**11,473,150**	**19,188,671**	**101,386,574**
Operations																		
Operations						7,315,800		7,315,800		224,800	184,000			2,210,000	1,085,000		3,612,000	7,315,800
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000		3,272,000					2,349,632	922,368				3,272,000
Operations and Maintenance Research Space (82,000 sq ft @ $9)						738,000		738,000									738,000	738,000
Operations and Maintenance Research Space (258,000 sq ft @ $9)						2,322,000		2,322,000									2,322,000	2,322,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		101,000						101,000				101,000
Hospital Arrangements-ADH/ClerkshipDir						305,000		1,200,000									1,200,000	1,200,000
Research Start Up-						4,840,000		2,985,000									2,985,000	2,985,000
Clinical Research Start Up-						2,968,000		1,368,000									1,368,000	1,368,000
Travel						149,500		149,500						149,500				149,500
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000		30,875						30,875				30,875
Computer Systems (inc software) (60 @ $1500)						90,000		60,000						60,000				60,000
Computers LRC (inc software) 150 @ 2000) refresh)						50,000		50,000						50,000				50,000
Media Equipment (per consultant)--new building est						4,000,000		150,000						150,000				150,000
IT Infrastructure-- new building est						4,000,000		150,000						150,000				150,000
Furnishings - PUH						900,000												0
GRAND TOTAL						**135,328,733**		**122,741,249**	**1,188**	**3,042,050**	**498,977**	**423,822**	**2,457,443**	**25,875,000**	**47,472,461**	**11,473,150**	**31,413,671**	**122,741,249**

Appendix J
FY 2014 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2014**				**FY 2013-14**							
Program Document										**COM CURRENT FUNDING**								
4 classes - 536 students													**NEW**	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0		228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0		158,375								158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0		259,735								259,735
	Assistant Deans		3		4.0	285,075	190,050	2.0		190,050								190,050
1.0.1	Admissions/Records		1		2.0	124,560	119,024	1.0		59,512				59,512				119,024
10.15	Academic Support		1	PhD	2.0	193,760	193,760	2.0		193,760								193,760
1.0.2	Financial Aid/HR		1		2.0	110,720	110,720	2.0		110,720								110,720
1.0.3	Exec. Assts.		1		3.0	249,120	149,064	3.0		149,064								149,064
1.0.4	Admin. Assistant		3		6.0	290,640	193,769	4.0		193,769								193,769
1.0.5	Admin Associate		2		4.0	221,440	210,948	3.0		81,820		11,690		93,784				210,948
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0		34,600								34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0		91,224								91,224
1.0.7	Accountant		1		2.0	110,720	55,360	1.0		55,360								55,360
1.0.8	Public Affairs		1		2.0	125,433	125,433	2.0			125,433							125,433
1.0.9	Development		1		2.0	189,544	189,544	2.0			189,544							189,544
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,040	1.0		83,040								83,040
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0		82,355								82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2		34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	169,350	1.0		84,675				84,675				169,350
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,120	0.5		112,120								112,120
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	25	0	37	3,158,907	2,791,447	31		2,203,155	314,977	11,690	0	237,971	0	0	0	2,791,447

Appendix J
FY 2014 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2014					FY 2013-14						
Program Document										**COM CURRENT FUNDING**								
								30.7										
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		2.0	228,060	228,060	2.0				228,060						228,060
2.0.0	Student Recruiters		3		4.0	138,400	138,400	4.0				138,400						138,400
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		7.0	412,132	412,132	7		0	0	412,132		0	0		0	412,132
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	30.0	3,572,940	3,572,940	30.0						3,572,940				3,572,940
	Clinical Science		4	MD	8.0	1,413,600	1,413,600	8.0						1,413,600				1,413,600
6.0.1	Educational Consultants			MD		20,000	20,000							20,000				20,000
6.0.1	Admin Assistant		4		14.0	726,600	726,600	14.0						726,600				726,600
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		52.0	5,733,140	5,733,140	52		0	0	0	0	5,733,140	0	0	0	5,733,140
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty for ABC 1 A171																		0
	Faculty Offices - Research PI		4	PhD	83.0	11,276,300	11,276,300	83.0						5,638,150	2,819,075	2,819,075		11,276,300
6.1.0	Research PI		2	MD	40.0	6,840,000	6,840,000	40.0						3,420,000	1,710,000	1,710,000		6,840,000
	Research Staff		0		185.0	14,594,280	14,594,280	185.0							4,864,760	9,729,520		14,594,280
	Admin Staff				120.0	6,601,680	6,601,680	120.0						2,200,560		4,401,120		6,601,680
		Total	6		428	39,312,260	39,312,260	428		0	0	0	0	11,258,710	9,393,835	18,659,715	0	39,312,260
													NEW	**NEW**	**NEW**	**New**	**NEW**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	100.0	17,617,617	17,617,617	100.0						1,142,642			16,474,975	17,617,617
	Faculty Offices - Clinical Science			MD	100.0	17,617,617	17,617,617	100.0						1,142,642	7,666,167		8,808,808	17,617,617
	Research Staff				600.0	45,691,200	40,080,000	600.0							40,080,000			40,080,000
6.0.1	Admin Assistant		0		35.0	1,753,500	1,753,500	35.0						876,750			876,750	1,753,500
		Total	0		835.0	82,679,934.0	77,068,734	835.0		0	0	0		3,162,034	47,746,167		26,160,533	77,068,734
													NEW	**NEW**	**NEW**	**New**	**NEW**	

Appendix J
FY 2014 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2014					FY 2013-14						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0		655,245	0		0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0		145,320	0		0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0		466,560	0		0	466,560
9.0.7																	

Appendix J
FY 2014 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2014					FY 2013-14						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0		396,560	0			396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**New**		
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0		0	0		94,360	94,360
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix J
FY 2014 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2014					FY 2013-14					
Program Document										**COM CURRENT FUNDING**							
													NEW	**NEW**	**NEW**	**New**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**69**	**0**	**1,382**	**133,136,773**		**127,158,113**	**1,376**	**2,285,510**	**314,977**	**423,822**	**0**	**22,055,540**	**57,140,002**	**18,659,715**	**26,254,893**	**127,158,113**
Operations																		
Operations						8,400,800		8,400,800		226,763	184,000			2,495,037	1,295,000		4,200,000	8,400,800
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000		3,272,000		1,098,675			2,173,325					3,272,000
Operations and Maintenance- Research Space(82,000 sq ft @ $9)						738,000		738,000									738,000	738,000
Operations and Maintenance- Research Space(258,000 sq ft @ $9						2,322,000		2,322,000									2,322,000	2,322,000
Lease PUH						1,462,500		1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000		68,000						68,000				68,000
Hospital Arrangements-ADH/ClerkshipDir						1,200,000		1,200,000									1,200,000	1,200,000
Research Start Up- ABC 1 UA						4,840,000		3,430,000									3,430,000	3,430,000
Clinical Research Start Up-						2,968,000		1,464,000									1,464,000	1,464,000
Travel						149,500		248,300						248,300				248,300
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						50,000		48,123						48,123				48,123
Computer Systems (inc software) (60 @ $1500)						90,000		60,000						60,000				60,000
Computers LRC (inc software) 150 @ 2000) refresh)						50,000		50,000						50,000				50,000
Media Equipment (per consultant)--new building est						3,000,000												0
IT Infrastructure-- new building est						3,000,000												0
Furnishings - PUH						900,000												0
GRAND TOTAL						**166,691,573**		**149,921,836**	**1,376**	**4,073,448**	**498,977**	**423,822**	**2,173,325**	**26,025,000**	**58,435,002**	**18,659,715**	**39,608,893**	**149,921,836**

Appendix J
FY 2015 Phoenix Program Budget Detail

University of Arizona																	
Medical School																	
SG Project No. 19564.000																	
University of Arizona																	
Medical School																	
SG Project No. 19564.000							**FY 2015**				**FY 2014-15**						
Program Document										**COM CURRENT FUNDING**							
Classes with 606 students (294 1 & 2 - 312 3 & 4)													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE	**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**											
1. Administration			*Staff*														
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0	228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0	158,375								158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0	259,735								259,735
	Assistant Deans		3		4.0	285,075	190,050	2.0	190,050								190,050
1.0.1	Admissions/Records		1		2.0	124,560	119,024	1.0	119,024								119,024
10.15	Academic Support		1	PhD	2.0	193,760	193,760	2.0	193,760								193,760
1.0.2	Financial Aid/HR		1		2.0	110,720	110,720	2.0	110,720								110,720
1.0.3	Exec. Assts.		1		3.0	249,120	149,064	3.0	149,064								149,064
1.0.4	Admin. Assistant		3		6.0	290,640	193,760	4.0	193,760								193,760
1.0.5	Admin Associate		2		4.0	221,440	210,948	3.0	175,604		11,690						210,948
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0	34,600								34,600
1.0-.6.5	Workroom / Files																
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0	91,224								91,224
1.0.7	Accountant		1		2.0	110,720	110,720	2.0	110,720								110,720
1.0.8	Public Affairs		1		2.0	125,433	125,433	2.0		125,433							125,433
1.0.9	Development		1		2.0	189,544	189,544	2.0		189,544							189,544
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,040	1.0	83,040								83,040
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0	82,355								82,355
1.0.12	Conf. Rm.(12)																
1.0.12A	Staff Lounge																
1.0.12B	Storage																
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2	34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	169,350	1.0	169,350								169,350
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5	112,230								112,230
1.0.16	Conf. Rm.(30)Mediated																
1.0.17		Total	25	0	37	3,158,907	2,846,908	32	2,496,587	314,977	11,690	0	0	0	0	0	2,846,908

Appendix J
FY 2015 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2015					FY 2014-15						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		2.0	228,060	228,060	2.0				228,060						228,060
2.0.0	Student Recruiters		3		4.0	138,400	138,400	4.0				138,400						138,400
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		7.0	412,132	412,132	7		0	0	412,132	0	0	0	0	0	412,132
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	34.0	4,054,400	4,054,400	34.0						4,054,400				4,054,400
	Clinical Science		4	MD	8.0	1,413,600	1,413,600	8.0						1,413,600				1,413,600
6.0.1	Educational Consultants			MD		20,000	20,000							20,000				20,000
6.0.1	Admin Assistant		4		24.0	1,185,811	1,185,811	24.0						1,185,811				1,185,811
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		66.0	6,673,811	6,673,811	66		0	0	0	0	6,673,811	0	0	0	6,673,811
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty																		0
	Faculty Offices - Research PI		4	PhD	96.0	13,075,440	13,075,440	96.0			0	0		6,537,720	3,268,860	3,268,860		13,075,440
6.1.0	Research PI		2	MD	48.0	8,208,000	8,208,000	48.0						4,104,000	2,052,000	2,052,000		8,208,000
	Research Staff		0		216.0	17,039,808	17,039,808	216.0							5,679,936	11,359,872		17,039,808
	Admin Staff				130.0	6,747,000	6,747,000	130.0						2,249,000		4,498,000		6,747,000
		Total	6		490	45,070,248	45,070,248	490		0	0	0	0	12,890,720	11,000,796	21,178,732	0	45,070,248
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	115.0	20,161,503	20,161,503	115.0					0	3,024,225			17,137,278	20,161,503
	Faculty Offices - Clinical Science			MD	115.0	20,161,503	20,161,503	115.0						3,024,225	7,056,527		10,080,751	20,161,503
	Research Staff				690.0	46,092,000	46,092,000	690.0							46,092,000			46,092,000
6.0.1	Admin Assistant		0		53.0	2,655,300	2,655,300	53.0						2,124,039			531,261	2,655,300
		Total	0		973.0	89,070,306.0	89,070,306	973.0		0	0	0	0	8,172,489	53,148,527	0	27,749,290	89,070,306
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**

Appendix J
FY 2015 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2015					FY 2014-15						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0		655,245	0		0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0		145,320	0		0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0		466,560	0		0	466,560
9.0.7																	

Appendix J
FY 2015 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2015					FY 2014-15						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0		396,560	0			396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0		0	0		94,360	94,360
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix J
FY 2015 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2015				FY 2014-15						
Program Document										**COM CURRENT FUNDING**							
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**			**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*														
	Faculty Mail/Copy Room																
14.0.0																	
		Total	0														
14.0.1																	
Personnel including ERE		**0**	**69**	**0**	**1,596**	**146,225,804**	**145,913,805**	**1,591**	**2,578,942**	**314,977**	**423,822**	**0**	**29,400,705**	**64,149,323**	**21,178,732**	**27,843,650**	**145,913,805**
Operations																	
Operations						9,462,400	9,462,400		225,800	184,000			1,410,600	1,512,000	1,300,000	4,830,000	9,462,400
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000	3,272,000		972,986			2,143,106	155,908				3,272,000
Operations and Maintenance Research Space(82,000 sq ft @ $9)						738,000	738,000									738,000	738,000
Operations and Maintenance Research Space(258,000 sq ft @ $9)						2,322,000	2,322,000									2,322,000	2,322,000
Lease PUH						1,462,500	1,462,500		462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000	68,000						68,000				68,000
Hospital Arrangements-ADH/ClerkshipDir						305,000	1,200,000									1,200,000	1,200,000
Research Start Up-						4,840,000	3,740,000									3,740,000	3,740,000
Clinical Research Start Up-						2,968,000	1,464,000									1,464,000	1,464,000
Travel						149,500	248,300						248,300				248,300
Capital (Copiers, postal, etc)																	
Office Machines (Copiers, Postal)						200,000	96,487						96,487				96,487
Computer Systems (inc software) (80 @ $1500)						120,000	120,000						120,000				120,000
Computers LRC (inc software) 150 @ 2000) refresh)						300,000	100,000						100,000				100,000
Media Equipment (per consultant)--new building est						4,000,000	500,000						500,000				500,000
IT Infrastructure-- new building est						4,000,000	500,000						500,000				500,000
Furnishings - PUH						900,000											0
GRAND TOTAL						**182,377,204**	**171,207,492**	**1,591**	**4,240,228**	**498,977**	**423,822**	**2,143,106**	**33,600,000**	**65,661,323**	**22,478,732**	**42,137,650**	**171,207,492**
Estimated 523,000 sq ft new research space added between 2010 and 2015 O & M not included in this budget																	

Appendix K
FY 2025 Phoenix Program Budget Detail

University of Arizona																		
Medical School																		
SG Project No. 19564.000																		
University of Arizona																		
Medical School																		
SG Project No. 19564.000							**FY 2025**					**FY 2024-25**						
Program Document										**COM CURRENT FUNDING**								
Classes with 680 students (300 1 & 2 + 380 3 & 4)													**NEW**	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
Draft								FTE		**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**												
1. Administration			*Staff*															
	Assoc. Dean of Student Affairs		1	PhD	1.0	228,060	228,060	1.0		228,060								228,060
1.0.0	Assoc Dean-Curriculum		1	PhD	1.0	158,375	158,375	1.0		158,375								158,375
	Dean, Academic Affairs		1	MD	1.0	259,735	259,735	1.0		259,735								259,735
	Assistant Deans		3		4.0	285,075	190,050	2.0		190,050								190,050
1.0.1	Admissions/Records		1		2.0	124,560	119,024	1.0		119,024								119,024
10.15	Academic Support		1	PhD	2.0	193,760	193,760	2.0		193,760								193,760
1.0.2	Financial Aid/HR		1		2.0	110,720	110,720	2.0		110,720								110,720
1.0.3	Exec. Assts.		1		3.0	249,120	149,064	3.0		149,064								149,064
1.0.4	Admin. Assistant		3		6.0	290,640	193,760	4.0		193,760								193,760
1.0.5	Admin Associate		2		4.0	221,440	210,948	3.0		199,258		11,690						210,948
1.0.6	Waiting / Reception		1		1.0	34,600	34,600	1.0		34,600								34,600
1.0-.6.5	Workroom / Files																	
1.065B	Director Bus. Affairs		1		1.0	91,224	91,224	1.0		91,224								91,224
1.0.7	Accountant		1		2.0	110,720	110,720	2.0		110,720								110,720
1.0.8	Public Affairs		1		2.0	125,433	125,433	2.0			125,433							125,433
1.0.9	Development		1		2.0	189,544	189,544	2.0			189,544							189,544
1.0.9	Facilities/Scheduling		1		1.0	83,040	83,040	1.0		83,040								83,040
1.0.10	Spec. Assist to Dean		1		1.0	82,355	82,355	1.0		82,355								82,355
1.0.12	Conf. Rm.(12)																	
1.0.12A	Staff Lounge																	
1.0.12B	Storage																	
1.0.13	Asst Dean-Student Counseling		1	MD	0.2	35,476	34,916	0.2		34,916								34,916
1.0.14	Assoc Dean Clin. Aff		1	MD	0.5	171,000	169,350	1.0		169,350								169,350
1.0.15	Assoc Dean Resrch		1	PhD	0.5	114,030	112,230	0.5		112,230								112,230
1.0.16	Conf. Rm.(30)Mediated																	
1.0.17		Total	25	0	37	3,158,907	2,846,908	32		2,520,241	314,977	11,690	0	0	0	0	0	2,846,908

Appendix K
FY 2025 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							**FY 2025**				**FY 2024-25**							
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Offices			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
2. Minority Affairs			*Staff*															
	Director		1		2.0	228,060	228,060	2.0				228,060						228,060
2.0.0	Student Recruiters		3		4.0	138,400	138,400	4.0				138,400						138,400
	Admin Assist		1		1.0	45,672	45,672	1.0				45,672						45,672
2.0.1	Work Room																	
2.0.2	Storage																	
2.0.3		Total	5		7.0	412,132	412,132	7		0	0	412,132	0	0	0	0	0	412,132
2.0.4																		
2.0.5																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for first and second year basic science education																		
6.0.0	Faculty Offices - Basic Science		8	PhD	34.0	4,054,400	4,054,400	34.0						4,054,400				4,054,400
	Clinical Science		4	MD	8.0	1,413,600	1,413,600	8.0						1,413,600				1,413,600
6.0.1	Educational Consultants			MD		20,000	20,000							20,000				20,000
6.0.1	Admin Assistant		4		24.0	1,185,811	1,185,811	24.0						1,185,811				1,185,811
6.0.1.5	Swing Offices																	
	Work Rm/Files																	
6.0.2		Total	16		66.0	6,673,811	6,673,811	66		0	0	0	0	6,673,811	0	0	0	6,673,811
6.0.3																		
6.0.4																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6.1 Research Faculty for ABC 1 A171																		0
	Faculty Offices - Research PI		4	PhD	153.0	20,838,982	20,838,982	153.0						10,419,491	5,209,745	5,209,746		20,838,982
6.1.0	Research PI		2	MD	77.0	13,167,000	13,167,000	77.0						6,583,500	3,291,750	3,291,750		13,167,000
	Research Staff		0		345.0	27,216,360	27,216,360	345.0							9,072,120	18,144,240		27,216,360
	Admin Staff				130.0	6,747,000	6,747,000	130.0						4,498,000		2,249,000		6,747,000
		Total	6		705	67,969,342	67,969,342	705		0	0	0	0	21,500,991	17,573,615	28,894,736	0	67,969,342
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Private and Open Office			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
6. Faculty for third and fourth year clinical education																		
	Faculty Offices - Clinical Science		0	MD	140.0	24,544,438	24,544,438	140.0						3,681,666			20,862,772	24,544,438
	Faculty Offices - Clinical Science			MD	140.0	24,544,438	24,544,438	140.0						3,681,666	8,590,553		12,272,219	24,544,438
	Research Staff				875.0	58,450,000	58,450,000	875.0							58,450,000			58,450,000
6.0.1	Admin Assistant		0		53.0	2,655,300	2,655,300	53.0						2,124,039			531,261	2,655,300
		Total	0		1,208.0	110,194,176.0	110,194,176	1,208.0		0	0	0	0	9,487,371	67,040,553	0	33,666,252	110,194,176
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**

Appendix K
FY 2025 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							**FY 2025**					**FY 2024-25**						
Program Document										**COM CURRENT FUNDING**								
	Private and Open Office		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
7.	**Information Technology**																	
7.0.0	Media Support	3		4.0	332,160		332,160	4.0					332,160				332,160
	Medical Computing	3		4.0	405,440		405,440	4.0	82,355				323,085				405,440
7.0.1	Server Room / Staging																
7.0.1.5	Control Room																
7.0.3	Editing Room																
7.0.5	Total	6		8.0	737,600		737,600	8	82,355	0	0		655,245	0		0	737,600
7.0.6																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
8. Gross Anatomy Laboratory			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
Laboratory and Laboratory Support																	
	Gross Anatomy Laboratory																
8.0.0	Lab/Prep Room																
	Gross Path Storage (vented)																
8.0.1	Staff	3		3.0	145,320		145,320	3					145,320				145,320
8.0.2	Total	1		3.0	145,320		145,320	3	0	0	0		145,320	0		0	145,320
8.0.2																	
8.0.3																	
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Pre-Clinical Training Classroom		**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
9. Pre-Clinical Training		*Staff*															
	Waiting / Discussion																
9.0.0	Exam Rooms																
	Video Feedback																
9.0.1	Restrooms																
9.0.2	Faculty Office	2	MD	2.0	342,000		342,000	2.0					342,000				342,000
9.0.3	Admin. Assistant	2		2.0	124,560		124,560	2.0					124,560				124,560
9.0.4	File / Storage																
9.0.5																	
9.0.6	Total	4		4.0	466,560		466,560	4	0	0	0		466,560	0		0	466,560
9.0.7																	

Appendix K
FY 2025 Phoenix Program Budget Detail

Medical School																		
SG Project No. 19564.000							FY 2025					FY 2024-25						
Program Document										**COM CURRENT FUNDING**								
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Lecture / Discussion			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
10. Mediated Classrooms			*Staff*															
	Mediated Classroom - 30 seats																	
10.0.0	Group Discussion- 10 Seats																	
	Learning Resource Center																	
10.0.1	Mediated Classroom Storage																	
10.0.2	Control Room																	
10.0.3	Equipment Room																	
10.0.4																		
10.0.5		Total	0															
10.0.6																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Learning Resources			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
11. Medical Library			*Staff*															
	Ready Reference																	
11.0.0	Reference Desk																	
	Librarian		2		3.0	228,060	228,060	3.0						228,060				228,060
11.0.3	Librarian Support Staff		1		2.0	121,320	121,320	2.0						121,320				121,320
11.0.4	Workroom		1		1.0	47,180	47,180	1.0						47,180				47,180
11.0.5	Computer Room																	
11.0.6	MCMS Collection																	
11.0.7		Total	4		6.0	396,560	396,560	6		0	0	0		396,560	0			396,560
11.0.8																		
11.0.9																		
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Retail Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
12. Medical Bookstore			*Staff*															
	Sales Floor																	
12.0.0	Office		2		2.0	94,360	94,360	2.0									94,360	94,360
	Storage																	
12.0.1																		
12.0.2		Total	2		2.0	94,360	94,360	2		0	0	0		0	0		94,360	94,360
													NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
13. Student Commons			*Staff*															
	Casual Seating																	
13.0.0	Mail / Lockers																	
	Café																	
13.0.1	Quiet Study																	
13.0.2		Total	0															

Appendix K
FY 2025 Phoenix Program Budget Detail

Medical School																	
SG Project No. 19564.000							FY 2025				FY 2024-25						
Program Document										**COM CURRENT FUNDING**							
												NEW	**NEW**	**NEW**	**NEW**	**NEW**	**TOTAL**
	Interaction Space			**Degree**	**# FTE**	**TOTAL**				**Dean**	**Dept**	**Grants**	**Tuition**	**State**	**Grants**	**Resch Partners**	**Other**	
14. Shared Support Facilities			*Staff*															
	Faculty Mail/Copy Room																	
14.0.0																		
		Total	0															
14.0.1																		
Personnel including ERE		**0**	**69**	**0**	**2,046**	**190,248,768**	**189,936,769**		**2,041**	**2,602,596**	**314,977**	**423,822**	**0**	**39,325,858**	**84,614,168**	**28,894,736**	**33,760,612**	**189,936,769**
Operations																		
Operations						11,551,800	11,551,800			225,800	184,000			1,500,000	2,512,000	2,300,000	4,830,000	11,551,800
Operations and Maintenance-PUH (89,000 +320000sq ft @ $8)						3,272,000	3,272,000			2,088,646			1,183,354					3,272,000
Operations and Maintenance (82,000 sq ft @ $9)						738,000	738,000										738,000	738,000
Operations and Maintenance (258,000 sq ft @ $9)						2,322,000	2,322,000										2,322,000	2,322,000
Lease PUH						1,462,500	1,462,500			462,500				1,000,000				1,462,500
Teaching Faculty Set Up						1,112,000	68,000							68,000				68,000
Hospital Arrangements-ADH/ClerkshipDir						1,200,000	1,200,000										1,200,000	1,200,000
Research Start Up- ABC 1 UA						5,740,000	5,740,000										5,740,000	5,740,000
Clinical Research Start Up-						2,968,000	1,464,000										1,464,000	1,464,000
Travel						248,300	248,300							248,300				248,300
Capital (Copiers, postal, etc)																		
Office Machines (Copiers, Postal)						250,000	137,842							137,842				137,842
Computer Systems (inc software) (80 @ $1500)						120,000	120,000							120,000				120,000
Computers LRC (inc software) 150 @ 2000) refresh)						300,000	100,000							100,000				100,000
Media Equipment (per consultant)--new building est						6,000,000	1,250,000							1,250,000				1,250,000
IT Infrastructure-- new building est						6,000,000	1,250,000							1,250,000				1,250,000
Furnishings - PUH						900,000												0
GRAND TOTAL						**234,433,368**	**220,861,211**		**2,041**	**5,379,542**	**498,977**	**423,822**	**1,183,354**	**45,000,000**	**87,126,168**	**31,194,736**	**50,054,612**	**220,861,211**
Estimated 528,000 sq ft of new research space added between 2015 and 2025 O & M is not included in this budget.																		

WHEN RECORDED RETURN TO:

Jane E. Pincus, Esq.
City of Phoenix
200 West Washington, Suite 1300
Phoenix, Arizona 85003-1611

Intergovernmental Agreement
between City of Phoenix and
Arizona Board of Regents

City Contract No. 109415

THIS INTERGOVERNMENTAL AGREEMENT ("Agreement") is entered into as of the 5th day of February, 2004, by and between the CITY OF PHOENIX, an Arizona municipal corporation ("City") and the ARIZONA BOARD OF REGENTS, a body corporate ("ABOR").

RECITALS

A. Arizona Revised Statutes, Sections 11-951 through 11-954, provide that public agencies may enter into intergovernmental agreements for the provision of services or for joint or cooperative action.

B. The City is empowered by Chapter II, Section 2 of the City of Phoenix Charter to enter into this Agreement and has, by Ordinance S-30511 adopted on December 3, 2003, authorized the undersigned to execute this Agreement on behalf of the City.

C. ABOR is empowered to enter into this Agreement and has, by resolution, dated January 23, 2004, resolved to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of ABOR.

D. The City has designated approximately 15 acres of City-owned land located between Van Buren, Fillmore, Fifth and Seventh Streets in downtown Phoenix for the establishment of the Phoenix Bioscience Center ("Center"), to be developed for life science-based research, office and academic uses. The former Phoenix Union High School ("PUHS") campus is located within the Center.

E. ABOR desires the opportunity to lease portions of the Center (collectively, the "Site") from the City to provide for the rehabilitation and adaptive reuse of up to three historic structures ("Historic Structures") located thereon and for the construction of up to three new facilities for academic, life science, biomedical and health professions educational programs and supportive administrative activities (collectively, the "Permitted Uses").

F. The City desires to have the Historic Structures rehabilitated and for vacant property designated for new construction within the Site at three locations in the vicinity of the Historic Structures ("Building Pads") to be developed for the Permitted Uses in furtherance of the City's goals and objectives for the Center.

G. The purpose of this Agreement is to set forth the parties' respective rights and obligations with respect to the Site.

Now, therefore, in consideration of the mutual promises contained herein, the receipt and sufficiency of which is hereby acknowledged, the parties hereby agree as follows:

AGREEMENTS

ARTICLE I. SUBJECT OF AGREEMENT

§ 101. <u>The Site</u>

The Site is approximately 4.5 acres located on the north side of Van Buren Street between Fifth and Seventh Streets in downtown Phoenix within the southern portion of the Center.

The Site is improved with three Historic Structures facing Van Buren Street, hereinafter referred to, from west to east, as "H-1", "H-2" and "H-3". The first phase of the historic rehabilitation undertaken pursuant to this Agreement will consist of the rehabilitation of buildings H-1 and H-3. Any rehabilitation of H-2 (the "Auditorium") may be undertaken by ABOR with participation from other entities in a later phase. The Auditorium will serve the entire campus and include an area designated for a collection of memorabilia from the PUHS alumni association.

The three Building Pads are situated on the Site to the north of the Historic Structures.

§ 102. Parties to the Agreement

§ 102.1 The City

The City is a municipal corporation of the State of Arizona, a public body corporate. The principal office of the City is located at 200 West Washington Street, Phoenix, Arizona, 85003-1611. The obligations, approvals and other actions by the City under this Agreement are undertaken as the owner of real property acting in a proprietary capacity and not as a municipality exercising regulatory powers. ABOR understands and agrees that development of the Site hereunder still must be in compliance with applicable land use regulations, codes and laws affecting the development, improvement, occupancy, use, acquisition and ownership of property. Nothing in this Agreement constitutes an exemption or grant of a variance from applicable codes and laws.

§ 102.2 ABOR

ABOR is a body corporate of the state of Arizona. The principal office of ABOR is located at 2020 North Central Avenue, Suite 230, Phoenix, Arizona 85004-4593.

§ 102.3 Assignment of Agreement

This Agreement and the rights granted hereunder may only be assigned by ABOR in accordance with the express provisions of this Agreement or as agreed to in writing by the City.

ARTICLE II. LEASE OF REAL PROPERTY

§ 201. Option to Lease

Subject to the terms and conditions set forth in this Agreement and in consideration of the payment by ABOR to the City of One Dollar ($1.00) per year, the receipt and sufficiency of which are hereby acknowledged, the City hereby grants to ABOR the right to lease (the "Option" or "Options") the three Historic Structures and three Building Pads, which may be exercised by ABOR or a nominee previously approved by the City in writing (each, an "Approved Tenant") for a period of five (5) years ("Option Period") from the date hereof. At the end of the Option Period, any unexercised Option(s) will terminate without further action or notice by the City required.

§ 202. Exercise of Options

The Options granted herein may be exercised by ABOR or an Approved Tenant at any time during the Option period by ABOR giving written notice to the City ("Notice of Exercise"), identifying the Historic Structure and/or Building Pad proposed to be leased, provided that ABOR's right to exercise the Option shall be conditioned upon ABOR not being in default hereunder and the Approved Tenant not being in default under any Lease (as defined in § 203 below) or other agreement regarding or relating to the Site. The exact locations and configurations of the Building Pads to be leased pursuant to this Agreement shall be determined by the parties prior to delivery of any Notice of Exercise.

§ 203. Lease Agreements

The lease agreements to be entered into pursuant to this Agreement (the "Leases") shall be in a mutually acceptable form and shall each contain provisions set forth in this § 203, in addition to such other terms and conditions agreed to by the parties. The following provisions shall be included in all Leases:

(a) The term of each Lease will be forty (40) years, unless a longer period is required to finance the improvements required under the Lease, in which event the term may be extended by up to twenty (20) years.

(b) The City's fee interest in the leased premises shall not be subordinated.

(c) In the event that a parking structure is constructed to serve the Site, each Approved Tenant will be responsible for paying a proportionate share of the operation, maintenance and debt service costs associated with the financing and construction of the parking structure, based upon a minimum allocation of two structured parking spaces per 1,000 square feet of rentable building area, as determined by applicable Building Owners and Managers Association International (BOMA) standards.

(d) The parties will each execute any additional documents as may be reasonably required in connection with the use of the leased premises and for vehicular and pedestrian access, ingress, egress and movement within the Center.

(e) In accordance with mutually acceptable Lease provisions, each Approved Tenant will be responsible for its proportionate share of the costs incurred by the City in connection with designing, financing, constructing, installing, maintaining, operating, repairing and replacing the improvements and amenities located within the common areas of the Center (those portions of the Center which have not been leased or sold by the City) based upon the ratio of the rentable area of the leased premises to the total rentable

area of all buildings at the Center, as determined by Landlord and set forth in written notice to Tenant promptly following completion of any new building at the Center.

(f) Each Approved Tenant will be required to comply with all normal and customary reviews, permits and approvals required by the City's Development Services Department and any applicable historic preservation requirements as well as certain design standards, conditions, covenants and restrictions and rules and regulations to be developed by the City for the Center, copies of which will be provided to ABOR when finalized.

(g) The City of Phoenix Community and Economic Development Department ("CEDD") must approve basic drawings and related documents for each facility on the Site, including building elevations, landscape, hardscape and offsite improvements (collectively, the "Site Plan"), which approvals shall be in writing and are separate from and in addition to the approvals and requirements referred to in subsection (f) above.

(h) Regardless of the uses which would otherwise be allowed pursuant to the applicable zoning classification, the Site will be devoted only to the Permitted Uses.

§ 203.1 <u>Historic Structure Leases</u>

The Leases to be entered into for the Historic Structures ("Building Leases") shall each contain the following business terms:

(a) In consideration of the rehabilitation of the Historic Structures in accordance with certificates of appropriateness obtained from the City's Historic Preservation Office pursuant to Section 812 of the Phoenix Zoning Ordinance and the use of the leased premises solely for Permitted Uses, the annual rent for each Historic Structure will be One Dollar ($1) per year, payable in advance upon execution of each Building Lease.

(b) The City will retain ownership of each Historic Structure at the end of the Lease term; provided, however, that upon written request prior to the final year of the term, the City will enter into good faith discussions regarding an extension of the Lease term upon such terms and conditions as may be negotiated by the parties at the time. The terms of any Lease term extension will require Phoenix City Council authorization.

(c) The Approved Tenant will be required to maintain each Historic Structure, its exterior surfaces (the "Facades") and any fences, walls or fixtures on the leased premises in a good and sound state of repair in accordance with the City's existing guidelines for the historic district in which the Site is located (the "Standards") so as to prevent the deterioration of the Facades or any portion thereof; and to prevent visual obstruction of the Facades from public viewpoints such as adjacent streets. The Approved Tenant will

be required to obtain approval from the City Historic Preservation Office prior to implementing any physical changes to the Historic Structures, Facades or to the leased premises.

§ 203.2. Building Pad Leases

The Leases to be entered into for the Building Pads ("Development Leases") shall each contain the following business terms:

(a) The Approved Tenant shall construct a facility of a size acceptable to the City on the Building Pad, to be used solely for the Permitted Uses.

(b) Each Development Lease will include the option to purchase the Building Pad at the end of the Lease term. Lease payments, which will commence upon issuance of a certificate of occupancy for each facility, will consist of installments of the purchase price as set forth in a rent schedule to be calculated based on an agreed upon percentage of the fair market value of the Building Pad at the time of execution of each Development Lease.

(c) At the end of the Lease term and upon payment of all obligations thereunder, the purchase price for the Building Pad will have been paid and title will be conveyed to ABOR or the Approved Tenant, as provided in the Lease.

§ 204. Conveyance of Leasehold

§ 204.1 Title Insurance

Within thirty (30) calendar days following delivery of a Notice of Exercise, the City and each Approved Tenant shall request a preliminary title commitment from a title insurance company acceptable to the City, reflecting the condition of title in anticipation of the issuance of a lessee's extended leasehold title insurance policy prior to Lease execution; provided, however, that the City shall be under no obligation to cure any title exceptions contained therein but will use reasonable efforts to cure any defect created by the City and listed as a title exception in the preliminary title report.

The City and the Approved Tenant shall each pay half of the following fees and costs in connection with conveyance of the leasehold:

(a) The cost of any standard form title insurance policy. The Approved Tenant shall pay for any special endorsements or extended coverage desired by the Approved Tenant.

(b) Recording fees.

(c) Notary fees.

§204.2 Conveyance of Leasehold Interest and Delivery of Possession

Conveyance of the leasehold interest shall be completed promptly after all prerequisites for conveyance set forth in § 204.8 below have been satisfied. Possession shall be delivered to the Approved Tenant concurrently with the conveyance of the leasehold interest, except that access and entry by ABOR or the Approved Tenant may be granted before conveyance as permitted pursuant to § 204.7 below.

§ 204.3 Execution of Lease by City

Subject to any mutually agreed upon extensions of time, the City shall execute the Lease, a memorandum for recording purposes ("Memorandum of Lease") and any other documents required in connection with the conveyance of the leasehold upon receipt of all fees and other amounts required to be paid by Approved Tenant prior to Lease execution pursuant to this Agreement.

§ 204.4 Recordation of Documents

The City shall file the Memorandum of Lease and any other instruments which are necessary and proper to vest the leasehold interest for recordation among the land records in the Office of the County Recorder for Maricopa County, State of Arizona. The Lease shall not be recorded.

§ 204.5 Taxes and Assessments

Ad valorem taxes and assessments, if any, on the Site and taxes upon this Agreement or any rights thereunder, levied, assessed, or imposed for any period prior to the conveyance of any leasehold and other interests thereto, shall be borne by the City. Any taxes and assessments levied, assessed or imposed during the term of the leasehold shall be borne by the Approved Tenant.

§ 204.6 Condition of the Site

The Site and all portions thereof and improvements thereon shall be conveyed in an "as is" condition with no warranty, express or implied, by the City as to title or the condition of the soil, its geology or the presence of known or unknown faults. It shall be the sole responsibility of the Approved Tenant at its expense to investigate and determine whether or not the proposed development can be constructed on the Site. If, in

the opinion of Approved Tenant, the conditions are not in all respects suitable for the use or uses to which the parcels will be put, and Approved Tenant still wishes to proceed with the leasing of the property, then it is the sole responsibility and obligation of the Approved Tenant, at Approved Tenant's expense, to take such action as may be necessary to place the property in a condition suitable for its development.

§ 204.7 Access to and Entry Upon the Site

Prior to the conveyance of the leasehold, representatives of ABOR or its agents, employees, designees and nominees, shall have the right of access to and entry upon the Site to be leased at all reasonable times, for the purpose of obtaining data and making surveys and tests necessary to carry out this Agreement. ABOR agrees to and shall indemnify and hold the City harmless from any and all injuries or damages arising out of any work or activity of ABOR, its agents, employees, contractors, designees and nominees; provided, however, that ABOR shall have no liability for hazardous substances, contamination or environmental violations existing on the Site prior to the effective date of the Lease except to the extent disturbed, aggravated or exacerbated by ABOR, its agents, employees, designees or nominees.

ABOR and its agents, employees, contractors, designees and nominees will hold all goods, materials, furniture, fixtures, equipment, machinery and other property whatsoever in the Site and improvements thereon at their sole risk and ABOR shall save the City harmless from any loss or damage thereto by any cause whatsoever.

The City will provide to ABOR all data and information pertaining to the Site available to the City.

§ 204.8 Conditions Precedent to Lease Execution

(a) The obligation of City to execute each Lease is conditioned upon the following:

(i) Delivery to Escrow Agent of all fees payable by Approved Tenant pursuant to this § 204;

(ii) Delivery to the City of a Lease and Memorandum of Lease previously approved as to form by the City and signed (in triplicate) by the Approved Tenant;

(iii) Approval by the City of a legal description of the premises to be leased and a Site Plan, which shall have been prepared by Approved Tenant at Approved Tenant's sole expense; and

(iv) For each Historic Structure, issuance of a Certificate of Appropriateness from the City of Phoenix Historic Preservation Office.

(b) Notwithstanding any provision contained herein to the contrary, the parties hereto agree that Approved Tenant shall have no obligation to execute the Lease if, in the opinion of Approved Tenant, conditions are not in all respects suitable for the use or uses to which the leased premises will be put or if Approved Tenant has not approved any aspects of its due diligence with respect to the leased premises including, without limitation, title review and approval, environmental review and approval, infrastructure review and approval and other planning approvals.

ARTICLE III. DEVELOPMENT OF THE SITE

§ 301. Uses

The Site shall be used only for the Permitted Uses and for no other purpose.

§ 302. Liens and Encumbrances

ABOR shall not place, or allow to be placed, any lien or encumbrance on any portion of the Site prior to the execution of the Leases and, thereafter, no liens or encumbrances other than a mortgage or other financing instrument permitted by the applicable Lease shall be placed or allowed to be placed on the Site by or on behalf of Approved Tenant.

§ 303. City and Other Governmental Agency Permits

In addition to any other approvals required by this Agreement or the Leases, before commencement of rehabilitation, construction or development of any buildings, structures or other work of improvement upon any of the Site (but not necessarily before the conveyance of possession), the Approved Tenant shall secure, or cause to be secured, any and all permits which may be required by the City or any other governmental agency affected by such rehabilitation, construction, development or work thereon.

§ 304. Indemnification

Each party (as "Indemnitor") agrees to indemnify, defend, and hold harmless the other party (as "Indemnitee") from and against any and all claims, losses, liability, costs, or expenses (including reasonable attorney's fees) (hereinafter collectively referred to as "Claims") arising out of bodily injury of any person (including death) or property damage but only to the extent that such claims which result in vicarious/derivative liability to the Indemnitee, are caused by the act, omission, negligence, misconduct, or other fault of the Indemnitor, its officers, officials, agents, employees, or volunteers.

In addition, ABOR shall cause its contractor(s), if any, to indemnify, defend, save and hold harmless the City of Phoenix, any jurisdiction or agency issuing any permits for any work arising out of this Agreement, and their respective directors, officers, officials, agents, and employees (hereinafter referred to as "Indemnitee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees, and costs of claim processing, investigation and litigation) (hereinafter referred to as "Claims") for bodily injury or personal injury (including death), or loss or damage to tangible or intangible property caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of ABOR'S contractor or any of the directors, officers, agents, or employees or subcontractors of such contractor. This indemnity includes any claim or amount arising out of or recovered under the Workers' Compensation Law or arising out of the failure of such contractor to conform to any federal, state or local law, statute, ordinance, rule, regulation or court decree. It is the specific intention of the parties that the Indemnitee shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of the Indemnitee, be indemnified by such contractor from and against any and all claims. It is agreed that such contractor will be responsible for primary loss investigation, defense and judgment costs where this indemnification is applicable.

If any claim, action or proceeding is made or brought against the City by reason of any event to which reference is made in this Section, then, upon demand by the City, ABOR, at its sole cost and expense, shall resist or defend such claim, action or proceeding in the City's name, if necessary, by the attorneys for ABOR's insurance carrier (if such claim, action or proceeding is covered in its entirety by insurance), otherwise by such attorneys as the City shall approve, which approval shall not be unreasonably withheld or delayed. Notwithstanding the foregoing, in the event that the City does not approve the attorneys retained in connection with such matter, the City may engage its own attorneys to defend it or to assist in its defense and ABOR shall pay the reasonable fees and disbursements of such attorneys.

§ 305. <u>Insurance</u>

ABOR shall require all of its contractors undertaking any work on the Site pursuant to this Agreement to obtain and maintain for the duration of their respective contracts with ABOR insurance coverage in accordance with the requirements set forth in Exhibit A, attached hereto and incorporated herein by this reference.

The obligations of ABOR under this § 305 shall not, in any way, be affected by the absence in any case of covering insurance or by the failure of any insurance carrier to perform any obligation on its part to be performed under insurance policies affecting the Site.

§ 306. Local, State and Federal Laws

All activities undertaken on the Site pursuant to this Agreement shall be in compliance with all applicable laws, including all applicable federal and state labor standards.

ARTICLE IV. DEFAULTS, REMEDIES AND TERMINATION

§ 401. Defaults - General

Subject to the extensions of time set forth in § 505, failure or delay by any party to perform any term or provision of this Agreement constitutes a default under this Agreement. Except as provided in § 201 above, the party who so fails or delays must immediately commence to cure, correct, or remedy such failure or delay after written notice thereof, and shall complete such cure, correction or remedy with reasonable diligence.

A nondefaulting party shall give written notice of default to the party in default as provided in § 406.1 below, specifying the default complained of by the injured party. Failure or delay in giving such notice shall not constitute a waiver of any default, nor shall it change the time of default.

Except as otherwise expressly provided in this Agreement, any failure or delay by any party in asserting any of its rights or remedies as to any default shall not operate as a waiver of any default, or of any such rights or remedies, or deprive either such party of its right to institute and maintain any actions or proceedings which it may deem necessary to protect, assert or enforce any such rights or remedies.

§ 402. Institution of Legal Actions

In addition to any other rights or remedies, either party may institute legal action to cure, correct or remedy any default, to recover damages for any default, or to obtain any other remedy consistent with the purpose, terms and conditions of this Agreement. Such legal actions may be instituted in the County of Maricopa, State of Arizona, or in the Federal District Court in the District of Arizona.

If any legal action is instituted pursuant to this Agreement, the prevailing party in such action shall be reimbursed by the other party for all costs and expenses of such action, including reasonable attorneys' fees as may be fixed by the Court.

§ 403. Applicable Law

The laws of the State of Arizona shall govern the interpretation and enforcement of this Agreement.

§ 404. Acceptance of the Legal Process

In the event that any legal action is commenced by ABOR against the City, service of process on the City shall be made by personal service upon the City Clerk of the City of Phoenix, or in such other manner as may be provided by law.

In the event that any legal action is commenced by the City against ABOR, service of process shall be made by personal service upon the ABOR Executive Director, or in such other manner as may be provided by law, whether made within or without the State of Arizona.

§ 405. Rights and Remedies Are Cumulative

Except as otherwise expressly stated in this Agreement, the rights and remedies of the parties are cumulative, and the exercise by any party of one or more of such rights or remedies shall not preclude the exercise by it, at the same time or different times, of any other rights or remedies for the same default or any other default by such defaulting party.

§ 406. Remedies

§ 406.1. Damages

(a) Notice and Cure

If any party defaults with regard to any of the provisions of this Agreement except § 201, default of which shall result in immediate termination of this Agreement without notice or time to cure, a nondefaulting party shall deliver written notice of such default upon the defaulting party. If the default is not commenced to be cured within thirty (30) calendar days after service of the notice of default and is not cured promptly in a continuous and diligent manner within a reasonable period of time after commencement, the defaulting party shall be liable to the nondefaulting parties for any damages caused by such default, and the nondefaulting parties may thereafter (but not before) commence an action for damages against the defaulting party with respect to such default.

(b) Limitation on Damages

Anything herein to the contrary notwithstanding, neither City nor ABOR shall in any event be responsible or liable for consequential, exemplary or punitive damages as a result of any act or omission in connection with this Agreement.

§ 406.2 Rights of Termination

(a) Termination by ABOR

ABOR, at its option, may terminate this Agreement prior to conveyance of the leasehold if the condition of the Site is determined to be unsuitable for development in ABOR's sole and absolute discretion. In the event of such termination, neither party shall have any further rights or liabilities hereunder.

(b) Termination by City

After any applicable notice and cure period, the City at its option may terminate this Agreement immediately and without further notice or action by City if ABOR assigns or attempts to assign and/or convey this Agreement (or any rights therein) in violation of this Agreement.

ARTICLE V. GENERAL PROVISIONS

§ 501. Notices, Demands and Communications Between the Parties

All notices, demands or other writings in this Agreement provided to be given, made or sent by any party hereto to other parties shall be deemed to have been fully given, made or sent when made in writing and personally delivered, transmitted by telefax or received by United States postpaid registered or certified mail and addressed as follows:

To City:

Director of the Community and
Economic Development Department
200 West Washington Street, 20th Floor
Phoenix, Arizona 85003-1611
FAX: (602) 495-5097

and

City Clerk
City of Phoenix
200 West Washington, 15th Floor
Phoenix, Arizona 85003-1611

To ABOR:

Executive Director
Arizona Board of Regents
2020 North Central Avenue, Suite 230
Phoenix, Arizona 85004-4593
FAX: (602) 229-2555

The address to which any notice, demand or other writing may be given, made or sent to any party may be changed by written notice given by such party as above provided.

§ 502. Conflict of Interests

No official, officer or employee of either party shall have any direct or indirect interest in this Agreement, nor participate in any decision relating to the Agreement which is prohibited by law. The parties hereto acknowledge that this Agreement is subject to cancellation pursuant to the provisions of A.R.S. § 38-511.

§ 503. No Payment of Consideration for Agreement

ABOR represents that it has not paid or given, and will not pay or give, any third person any money or other consideration for obtaining this Agreement, other than normal costs of conducting business and costs of professional services such as architects, engineers, realtors and attorneys.

§ 504. Nonliability of Officials and Employees

No official, officer or employee of the City or ABOR shall be personally liable to the other party, or any successor in interest, in the event of any default or breach by either the City or ABOR of any obligation under the terms of this Agreement.

§ 505. Enforced Delay: Extension of Time of Performance

In addition to specific provisions of this Agreement, performance by any party hereunder shall not be deemed to be in default where delays or defaults are due to war; insurrection; strikes; lock-outs; riots; floods; earthquakes; fires; casualties; acts of

God; acts of the public enemy; epidemics; quarantine restrictions; freight embargoes; lack of transportation; governmental restrictions or priority; litigation; unusually severe weather; inability (when either party is faultless) of any contractor, subcontractor or supplier; acts of the other party. An extension of time for any such cause shall only be for the period of the enforced delay, which period shall commence to run from the time of the commencement of the cause. If, however, notice by the party claiming such extension is sent to the other parties more than thirty (30) calendar days after the commencement of the cause, the period shall commence to run only thirty (30) calendar days prior to the giving of such notice. Times of performance under this Agreement may also be extended in writing by the parties hereto.

§ 506. Approvals by the City and ABOR

Wherever this Agreement requires the City or ABOR to approve any contract, document, plan, proposal, specification, drawing or other matter, such approval shall not be unreasonably withheld or delayed with respect to all commercially reasonable requests from the other party.

§ 507. Submission of Documents for Approval

Whenever this Agreement requires one party to submit plans, drawings or other documents to another party for approval, the items shall be accompanied by a letter stating that they are being submitted pursuant to this Agreement and that they will be deemed approved unless rejected within the time stated in the Agreement.

§ 508. Time of Essence

Time is of the essence of this Agreement and of every term, condition and covenant hereof.

§ 509. No Waiver

Except as otherwise expressly provided in this Agreement, any failure or delay by any party in asserting any of its rights or remedies as to any default shall not operate as a waiver of any default, or of any such rights or remedies, or deprive any such party of its right to institute and maintain any actions or proceedings which it may deem necessary to protect, assert or enforce any such rights or remedies.

§ 510. Severability

If any provision of this Agreement shall be found invalid or unenforceable by a court of competent jurisdiction, the remaining provisions of this Agreement shall not be affected thereby and shall be valid and enforceable to the fullest extent permitted by law.

§ 511. Captions

The captions contained in this Agreement are merely a reference and are not to be used to construe or limit the text.

§ 512. Entire Agreement, Waivers and Amendments

This Agreement is executed in three (3) duplicate originals each of which is deemed to be an original. This Agreement contains seventeen (17) pages of text and the below listed exhibit, which is incorporated herein by this reference, and constitutes the entire understanding and agreement of the parties.

Exhibit A – Contractor Insurance Requirements

This Agreement integrates all of the terms and conditions mentioned herein or incidental hereto, and supersedes all negotiations or previous agreements between the parties with respect to all or any part of the subject matter hereof.

All waivers of the provisions of this Agreement must be in writing and signed by the appropriate authorities of the City or ABOR, and all amendments hereto must be in writing and signed by the appropriate authorities of the parties hereto.

§ 513. Nondiscrimination

The parties agree to be bound by applicable city, state and federal rules governing Equal Employment Opportunity and Nondiscrimination.

§ 514. State Obligation

The parties recognize that, to the extent performance by ABOR is dependent upon the appropriation of funds by the State Legislature of Arizona, if the Legislature fails to appropriate the necessary funds, or if the appropriation is reduced during the fiscal year, then ABOR may reduce the scope of this Agreement if appropriate or cancel the Agreement without further duty or obligation. ABOR agrees to notify other party(ies) as soon as reasonably possible after becoming aware of the unavailability of said funds.

[SIGNATURES FOLLOW ON NEXT PAGE]

ARIZONA BOARD OF REGENTS,
a body corporate

By: _____
Chris Herstam
President

CITY OF PHOENIX, a municipal corporation

By: _____
Phil Gordon, Mayor

By: _____
Greg Stanton, Councilmember

FRANK FAIRBANKS, City Manager

By: _____
Sheryl Sculley
Assistant City Manager

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

STATE OF ARIZONA)
) ss.
County of Maricopa)

On this, the 5th day of February, 2004, before me, the undersigned Notary Public, personally appeared Sheryl Sculley, who acknowledged herself to be the Assistant City Manger of the City of Phoenix, a municipal corporation of the State of Arizona, and that she as such officer, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Bette Herrera
Notary Public

My Commission Expires:

OFFICIAL SEAL
BETTE HERRERA
NOTARY PUBLIC - STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires June 12, 2004

STATE OF ARIZONA)
) ss.
County of Maricopa)

On this, the 5th day of February, 2004, before me, the undersigned Notary Public, personally appeared Chris Herstam, who acknowledged himself to be the President of the Arizona Board of Regents, a body corporate of the State of Arizona, and that he as such officer, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Bette Herrera
Notary Public

My Commission Expires:

OFFICIAL SEAL
BETTE HERRERA
NOTARY PUBLIC - STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires June 12, 2004

Exhibit A
Contractor Insurance Requirements

The insurance requirements herein are minimum requirements and in no way limit the indemnity covenants contained in the Intergovernmental Agreement. The City in no way warrants that the minimum limits contained herein are sufficient to protect ABOR or any contractor of ABOR (each a "Contractor") from liabilities that might arise out of the performance of the work by the Contractor, its agents, representatives, employees or subcontractors, and Contractor and ABOR are free to purchase additional insurance as may be determined necessary.

A. MINIMUM SCOPE AND LIMITS OF INSURANCE: Contractor shall provide coverage with limits of liability not less than those stated below.

1. Commercial General Liability – Occurrence Form

Policy shall include bodily injury, property damage and broad form contractual liability coverage.

- General Aggregate $2,000,000
- Products – Completed Operations Aggregate $1,000,000
- Personal and Advertising Injury $1,000,000
- Each Occurrence $1,000,000

a. The policy shall be endorsed to include the following additional insured language: "The City of Phoenix shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor."

(Note that ABOR is also required to be additional insured and should supply the Contractor with its own list of persons to be insured.)

b. Policy shall contain a waiver of subrogation against the City of Phoenix.

2. Automobile Liability

Bodily Injury and Property Damage for any owned, hired, and non-owned vehicles used in the performance of this Agreement.

Combined Single Limit (CSL) $1,000,000

a. The policy shall be endorsed to include the following additional insured language: "The City of Phoenix shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor, including automobiles owned, leased, hired or borrowed by the Contractor."

(Note that ABOR is also required to be additional insured and should supply the Contractor with its own list of persons to be insured.)

3. Worker's Compensation and Employers' Liability

Workers' Compensation	Statutory
Employers' Liability	
Each Accident	$100,000
Disease – Each Employee	$100,000
Disease – Policy Limit	$500,000

a. Policy shall contain a waiver of subrogation against the City of Phoenix.

B. ADDITIONAL INSURANCE REQUIREMENTS: The policies are to contain, or be endorsed to contain, the following provisions:

1. On insurance policies where the City of Phoenix is named as an additional insured, the City of Phoenix and ABOR shall be additional insureds to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by the Agreement.

2. The Contractor's insurance coverage shall be primary insurance and non-contributory with respect to all other available sources.

3. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability. Coverage provided by the Contractor shall not be limited to the liability assumed under the indemnification provisions of its contract with ABOR.

C. NOTICE OF CANCELLATION: Each insurance policy required by the insurance provisions of this Agreement shall provide the required coverage and shall not be suspended, voided, canceled, reduced in coverage or endorsed to lower limits except after thirty (30) days prior written notice has been given to the City. Such notice shall be sent directly to City of Phoenix Community and Economic Development Department, 200 West Washington, 20th Floor, Phoenix, Arizona 85003-1611, and shall be sent by certified mail, return receipt requested.

D. ACCEPTABILITY OF INSURERS: Insurance is to be placed with insurers duly licensed or approved unlicensed companies in the State of Arizona and with an "A.M. Best" rating of not less than B+ VI. The City in no way warrants that the above-required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.

E. VERIFICATION OF COVERAGE: Contractor shall furnish the City with certificates of insurance (ACORD form or equivalent approved by the City) as required by this Agreement. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

All certificates and endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Agreement must be in effect at or prior to commencement of work under this Agreement and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Agreement or to provide evidence of renewal is a material breach of contract.

All certificates required by this Agreement shall be sent directly to City of Phoenix Community and Economic Development Department, 200 West Washington, 20th Floor, Phoenix, Arizona 85003-1611. The City project/Agreement number and project description are to be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Agreement at any time. DO NOT SEND CERTIFICATES OF INSURANCE TO THE CITY'S RISK MANAGEMENT DIVISION.

F. SUBCONTRACTORS: Contractor's certificate(s) shall include all subcontractors as additional insureds under its policies or Contractor shall furnish to the City separate certificates for each subcontractor. All coverages for subcontractors shall be subject to the minimum requirements identified above.

G. APPROVAL: Any modification or variation from the insurance requirements in any Intergovernmental Agreement must have prior approval from the City of Phoenix Law Department, whose decision shall be final. Such action will not require a formal Agreement amendment, but may be made by administrative action.

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