



Research Enterprise Economic and Resource Planning Solutions

*Higher Education / Non-profit Performance Improvement Practice
A Division of PricewaterhouseCoopers' Advisory Services*

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PRICEWATERHOUSECOOPERS 

Agenda

Institutional Planning – A Business Plan Approach

- **Introduction**
 - **Complexity of the Research University & Academic Medical Center Finances**
 - **Defining the Line of Business and Funds Flow**
- **Higher Education Financial Uncertainty**
- **An Approach to Research Enterprise Modeling**
- **Components of the Research Enterprise Model**
- **Research Enterprise Model Assumptions (And Example)**
- **Summary and Discussion**

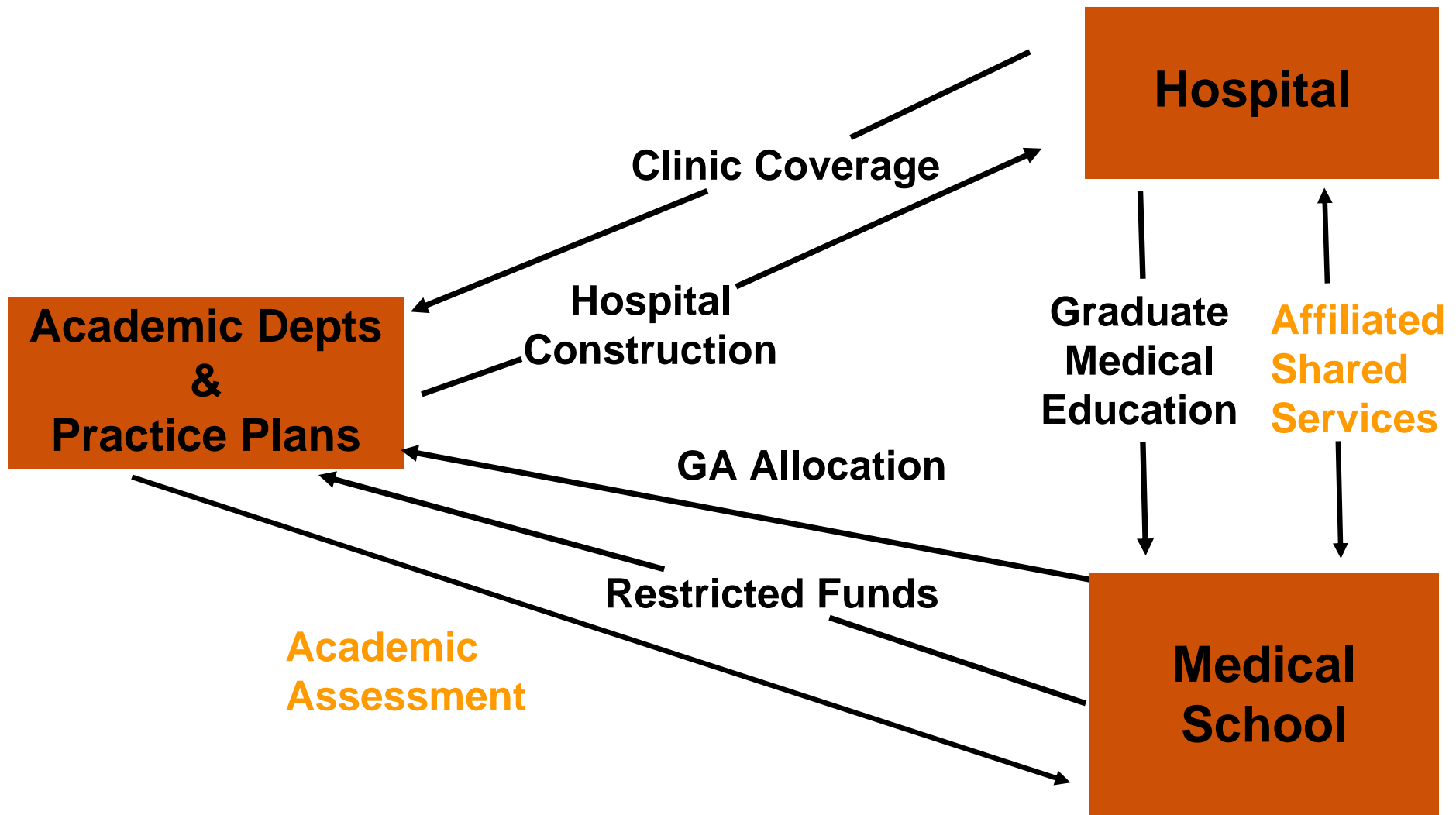
What is Forcing Research Enterprise Cost Analysis?

- Impact of consumerism and market place competition for students, faculty and patients has restricted price increases.
- Resulting in reduced ability for clinical or tuition revenues to subsidize research.
- Institutions are increasingly expected to share in the cost of federally sponsored research.
- Trustees are asking, “*What is the value of research?*”

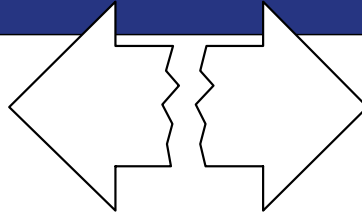
What is Forcing Research Enterprise Cost Analysis? (Cont.)

- Universities and Academic Medical Centers have been forced to manage its resources and define support subsidies.
- Institutions are seeking to develop a "cost benefit" methodology.
- Institutions are seeking to employ these methods to better manage a shrinking pool of resources.
- Academic and health care institutions need to organize and monitor the “Funds Flow” to explain the following chart to the Trustees.....

Financial Analysis Is Difficult As The Flow of Funds Are Complex...



...and Funding Source Does Not Typically Relate to Function



Function

- Instruction / Dept Res.
- Organized Research
- Patient Care
- Hospital Administration
- Graduate Med. Education
- Other Academic Activities
- Affiliated Support Activities

Funding

- State or General Funds
- Grants and Contracts
- FPP Professional Fees
- Hospital Contract
- GME Hospital Transfer
- Endowment & Gifts
- Affiliated Service Agreements

It Is Important To *Specifically* Define The Functions of Each LOB...

Instruction:

- Undergraduate Instruction
- Graduate Instruction
- Medical Student Instruction
- Graduate Research Training
- Graduate Medical Education

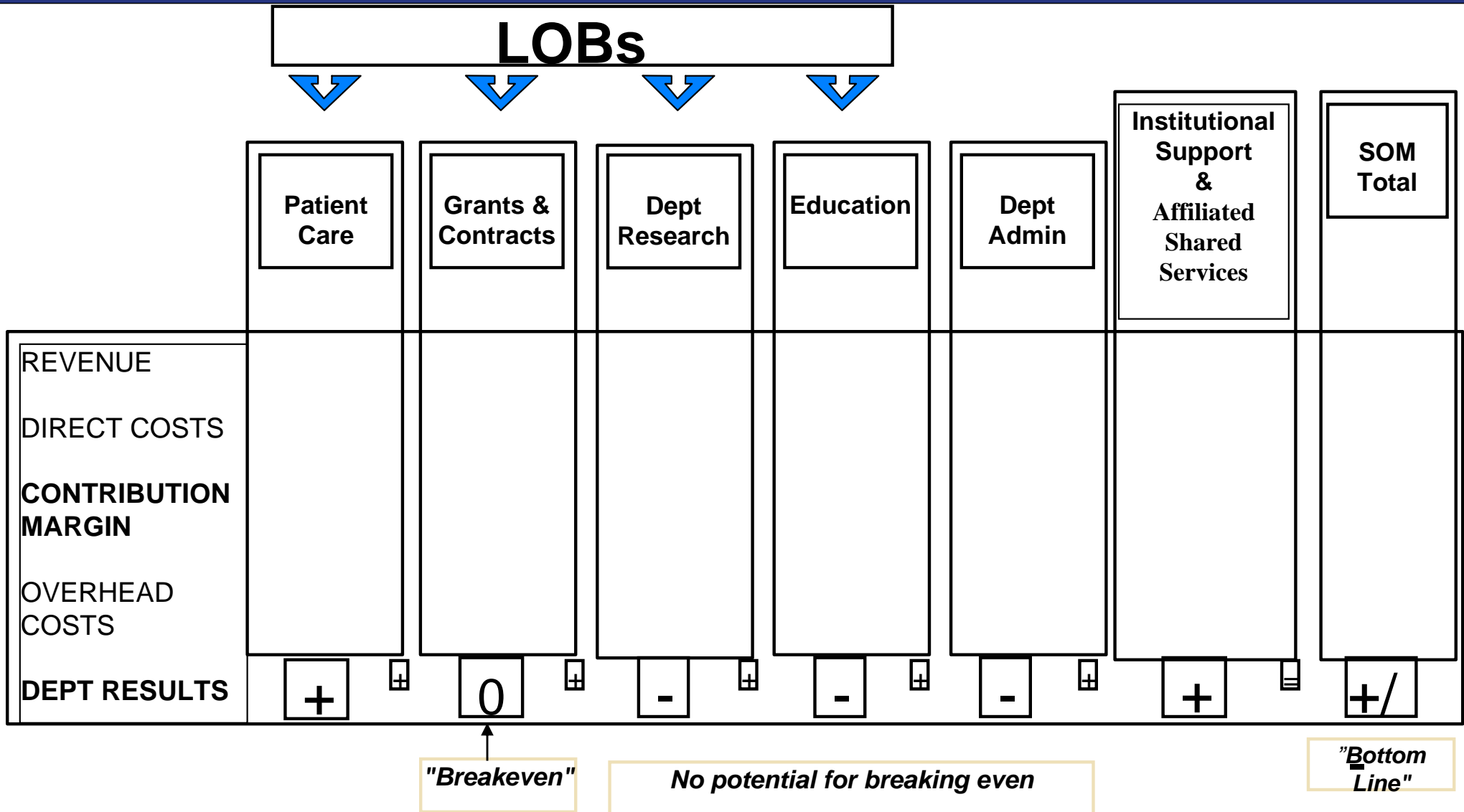
Patient Care:

- Clinical Activities
- Hospital Activities
- Affiliated Shared Services Agreement

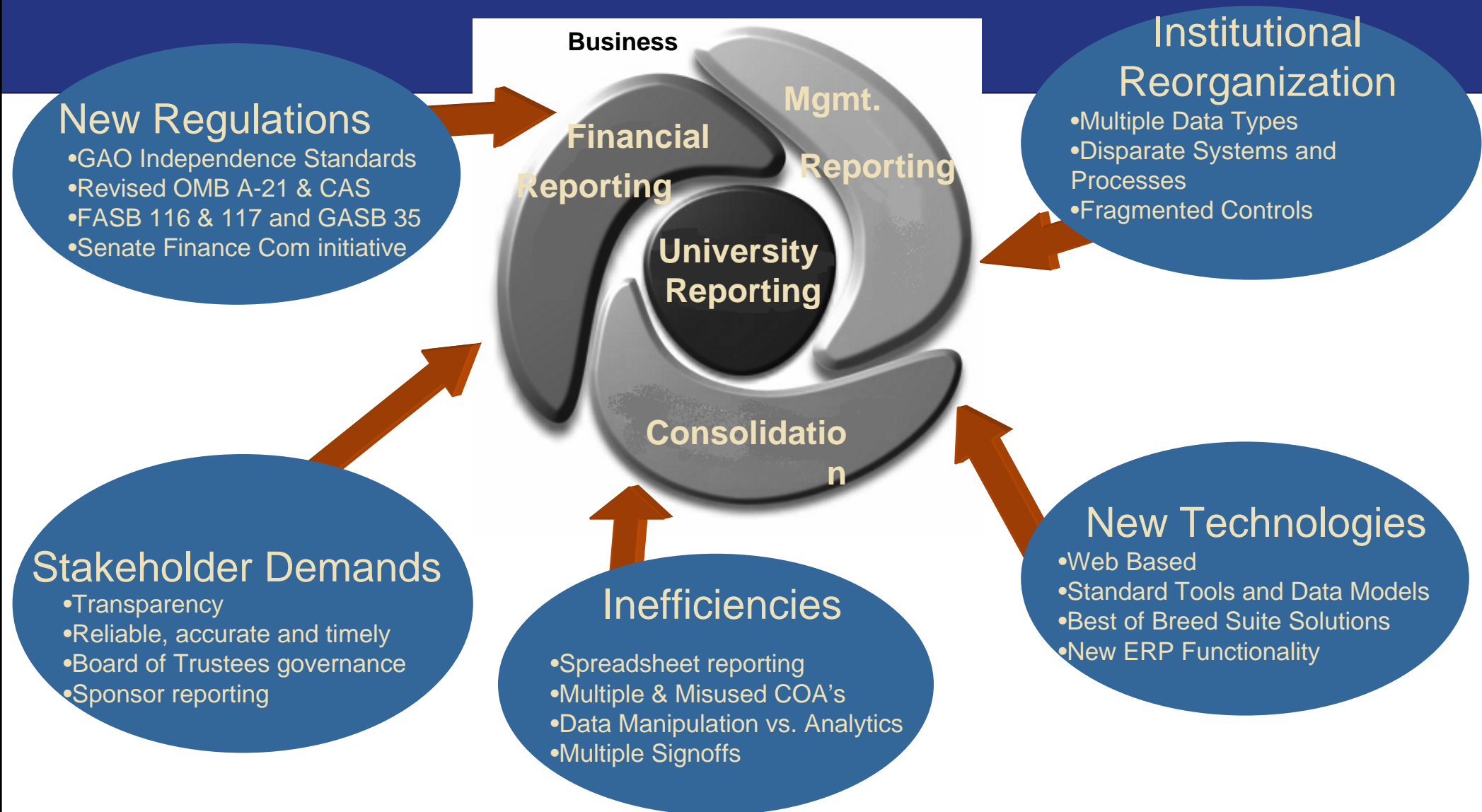
Research:

- Sponsored Research
- Institutionally Funded Research
- Clinical Research

Under LOB, Department Revenues and Expenses May Be Aligned Like This:



Industry Drivers Shaping Financial Management



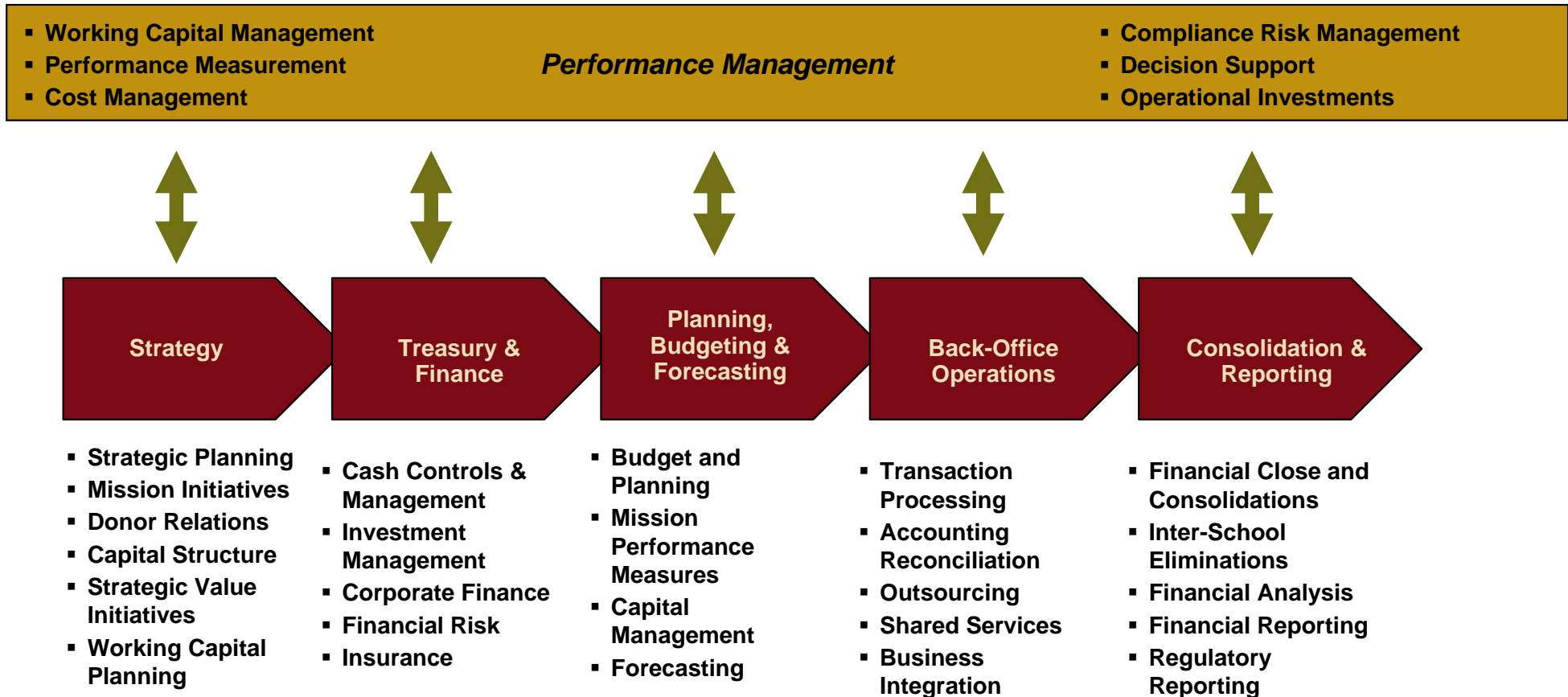
Current Trends Impacting Finance and Accounting Operations

- Market and regulatory conditions have placed greater importance on operational and research finance / accounting operations:
 - Greater focus on timely and accurate information and internal controls and compliance.
 - Need to increase quality of skills and re-balance competencies and headcount between transaction processing, control and analysis.
 - Continued implementation of outsourcing and shared services for high volume transaction processing.
 - Deployment of new enterprise wide risk and treasury management tools.

Current Trends Impacting Finance and Accounting Operations (Cont.)

- Under delivery of the Enterprise Resource Planning systems (ERP) promise has resulted in increased finance reengineering and system tuning:
 - ERP systems implemented in prior years do not currently support changing business model.
 - Need for development of common data model and processes to link planning, budgeting and reporting.
 - Better processes and tools to analyze customer, channel and/or product profitability.
 - Increased investment and integration of performance management tools, self service and web deployed processing.

Improvement Opportunities



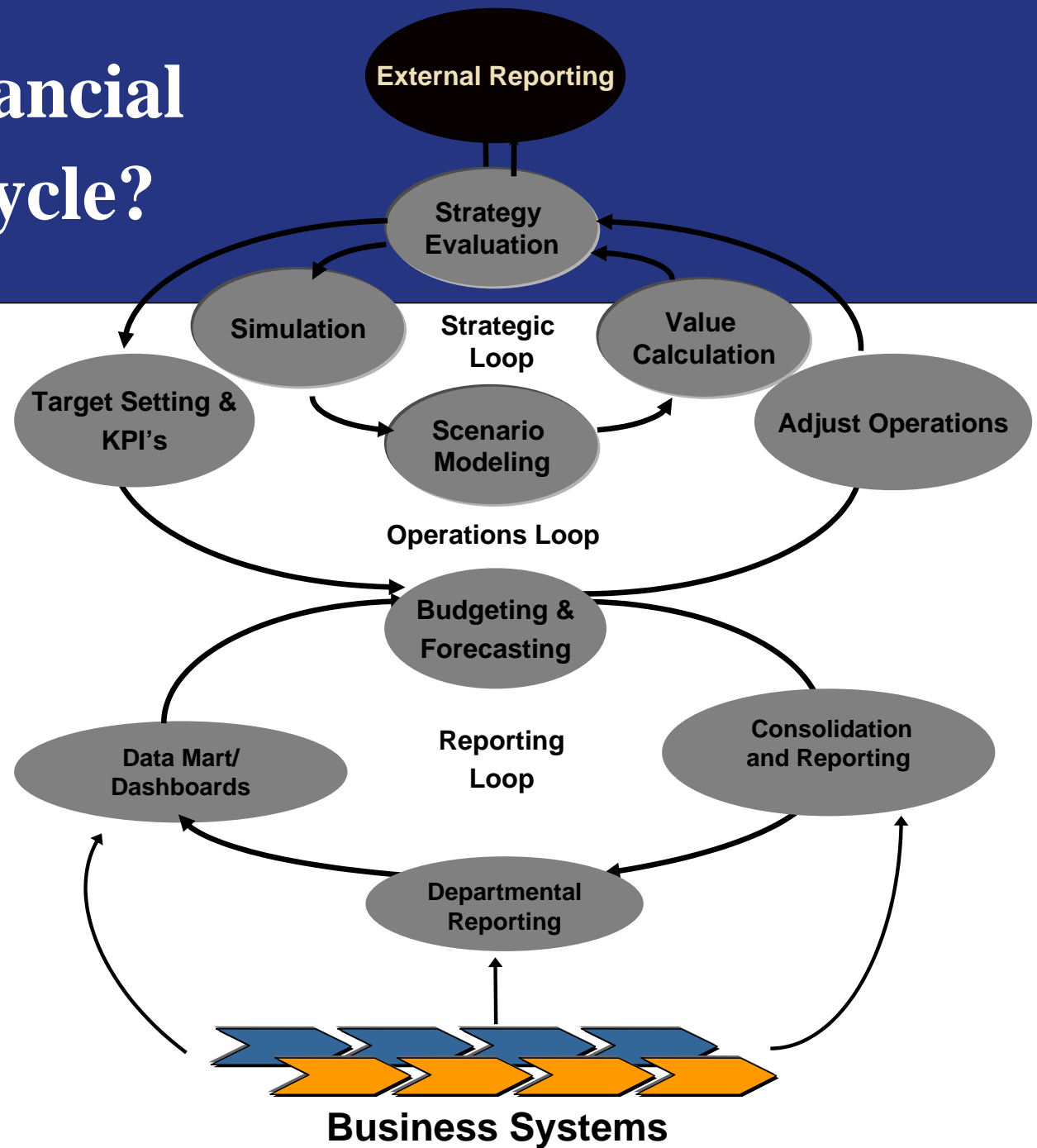
What is the Financial Management Cycle?

Who needs financial data?

Department Chairs/Directors
 Presidents/ Deans / VP's
 Board of Trustees

How will it all fit together?

- ✓ Policy / Procedure
- ✓ Data
- ✓ Technology
- ✓ Measures
- ✓ Processes
- ✓ Organization



Department Administrators Faculty Academic Administration

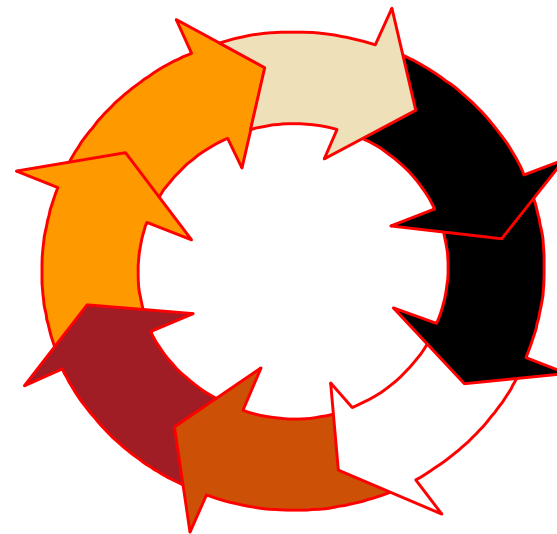
This Leads to Overall Financial Framework and Best Practices

Strategic Planning

- Vision for the Future
- Strategic Goals and Objectives
- Programmatic initiatives

Accountability

- Performance vs. Goals
 - Strategic & financial goals
 - Dept -> Division -> Investigator
- Faculty Compensation Plan
- Resource Re-allocation
 - Internal Funds
 - Space



Performance Management

- Measurable Goals
- Key Performance Indicators
- Balanced Scorecards
- Accuracy– Systems/ Data Management

Financial / Tactical Plan

- Financial Plan of action for achieving goals
- Profit & Loss/ Cash Flow Impact of investing in new recruits, facilities, equipment, I/T, etc.
- Departmental Business Plans (Programmatic & Financial Goals)

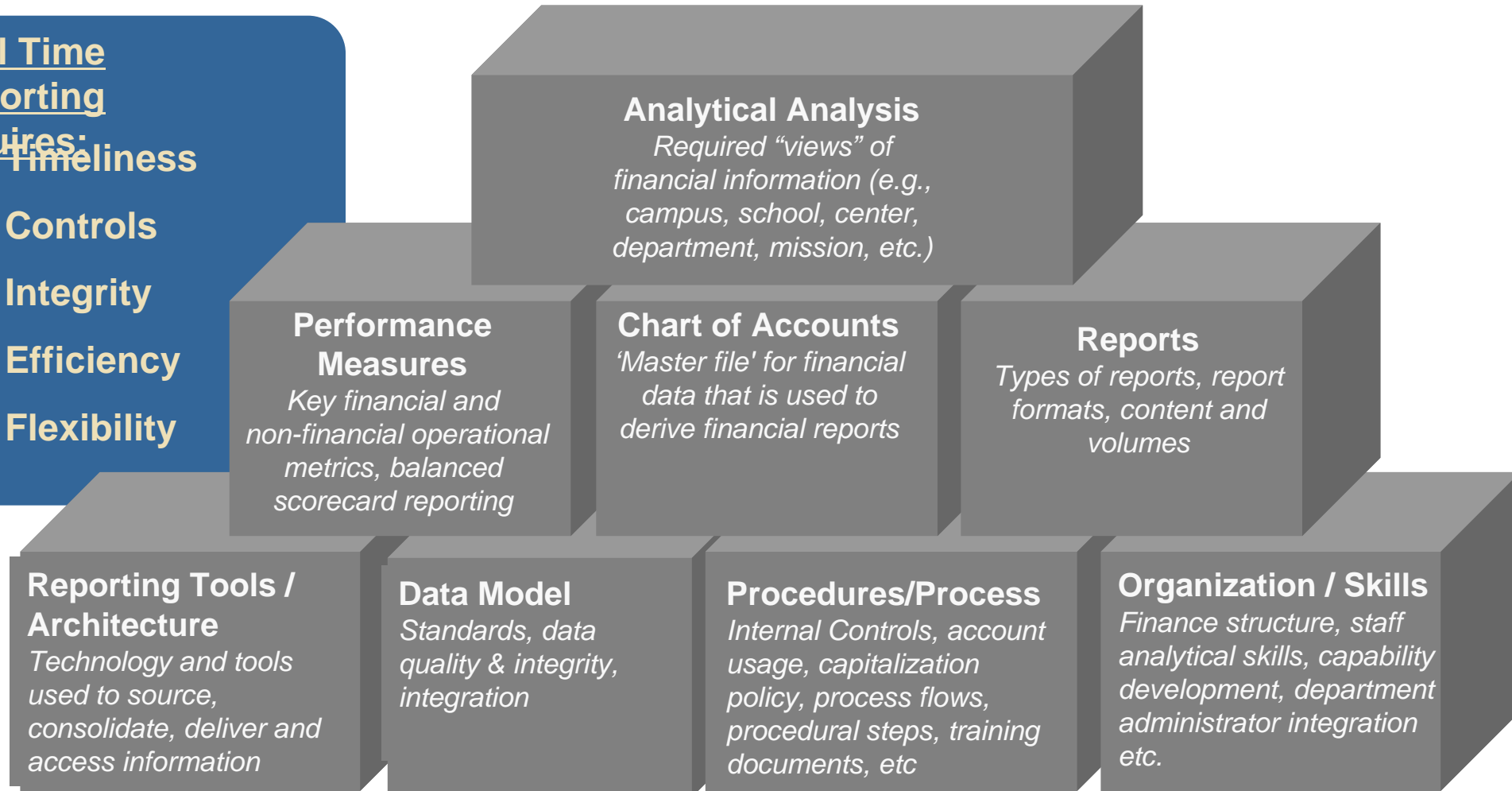
Annual Budget:

- Operationalize strategy through the annual budget process
- Setting priorities when aligning resources to achieve goals
- Mission-based / All Funds Budget

Financial Management Building Blocks

Real Time Reporting
requires:

- ✓ **Timeliness**
- ✓ **Controls**
- ✓ **Integrity**
- ✓ **Efficiency**
- ✓ **Flexibility**



Detailed Institutional and Unit Analyses (Department, Program, Center)

Estimated Profit & Loss Statement: TOTAL RX Summary, Forecast and Risk Assessment Model			
	SCENARIO #1		
	Fiscal 1999 (recast)	Fiscal 2000	Fiscal 2001
Net Surplus/(Deficit) with OH & Adjustments:	\$ (5,415,141)	\$ (6,937,572)	\$ (6,773,598)
BASIC SCIENCE			
Historical Research Revenues:			
Tuition Revenues	\$ (409)	\$ (425)	\$ (442)
Research Revenues	\$ 68,533,304	\$ 71,274,636	\$ 74,125,621
IDC Research Revenues	\$ 24,464,743	\$ 25,443,333	\$ 26,461,066
Additional IDC Revenue from 1% Increased Rate:	\$ 685,333	\$ 712,746	\$ 741,256
Other Revenues	\$ -	\$ -	\$ -
Subtotal, Historical Research Revenues	\$ 93,682,971	\$ 97,430,290	\$ 101,327,502
Forecasted-Related Research Revenues:			
Gain from Possible Sale of Building	\$ -	\$ -	\$ -
Lease Revenue from Possible Lease of Building	\$ -	\$ -	\$ -
Supplemental Grant Income from Current Staff	\$ -	\$ 6,853,314	\$ 7,127,447
Supplemental IDC Revenue from Current Staff	\$ -	\$ 2,810,580	\$ 2,923,003
Additional Grant Funding from New Hires	\$ -	\$ 202,500	\$ 623,700
Federal IDC Support of New Grants	\$ -	\$ 80,089	\$ 246,873
Industrial IDC Support of New Grants	\$ -	\$ 6,075	\$ 18,711
Foundation IDC Support of New Grants	\$ -	\$ 1,620	\$ 4,990
Endowment Revenue (5% of Principal)	\$ -	\$ 1,300,000	\$ 1,704,198
Technology Transfer Revenue	\$ -	\$ 1,211,297	\$ 1,392,992
Subtotal, Forecasted-Research Revenues	\$ -	\$ 12,465,475	\$ 14,041,713
Total research revenues	\$ 93,682,971	\$ 109,895,765	\$ 115,369,215
Forecast-Related Expenses:			
IDC, Real Estate, and Technology Transfer Costs			
Direct Expenses for Additional Grants	\$ -	\$ 8,114,186	\$ 8,913,819
Real Estate Rental Costs	\$ -	\$ -	\$ -
Technology Transfer Costs	\$ -	\$ 601,651	\$ 631,734
Scientific Advisory Committee Costs	\$ -	\$ 150,000	\$ 156,000
Subtotal, IDC, RE, Tech X-fer Costs:	\$ -	\$ 8,865,837	\$ 9,701,552
Repair, Renovation, Reorganization Costs			
Depreciation Expense on IS Improvements	\$ -	\$ 250,000	\$ 500,000
Research Administration Reorganization Costs	\$ -	\$ 500,000	\$ 250,000
Interest on Capital Improvement Bond	\$ -	\$ 3,285,622	\$ 3,072,190
Depreciation on Capital Improvements	\$ -	\$ 317,940	\$ 636,880
Depreciation on Research Equipment Investment	\$ -	\$ -	\$ -
Subtotal, Repair and Renovation Costs	\$ -	\$ 4,363,562	\$ 4,458,070
Subtotal, Forecast-Related Costs	\$ -	\$ 13,229,399	\$ 14,159,622
Historical Research Variable Expenses:			
New Hire Salary Obligations	\$ -	\$ 240,750	\$ 235,125
New Hire Total Recruitment Obligations	\$ -	\$ 1,270,000	\$ 2,540,000
Salaries and Fringe Benefits	\$ 51,261,629	\$ 53,312,094	\$ 55,444,578
Supplies	\$ 8,357,876	\$ 8,692,191	\$ 9,039,878
Purchased Services and Fees	\$ 9,535,369	\$ 9,916,784	\$ 10,313,455
Other Expenses	\$ 2,068,000	\$ 2,150,720	\$ 2,236,749
<i>Reduction in OH from sale of building</i>	\$ -	\$ -	\$ -
Subtotal	\$ 71,222,874	\$ 75,582,539	\$ 79,809,786
Total Research Variable Expenses	\$ 71,222,874	\$ 88,811,939	\$ 93,969,408
Profit/Loss Before Adjustments and Overhead Allocations	\$ 22,460,097	\$ 21,083,826	\$ 21,399,807

Institutional P&L



Unit P&Ls

Estimated Profit & Loss Statement				% Change in IDC Rate: 15%	
				SCENARIO #1	
	Fiscal 1999 (recast)	Fiscal 2000	Fiscal 2001		
Net Surplus/(Deficit), before OH:	\$ 1,115,948	\$ 1,256,586	\$ 1,306,850		
Historical Research Revenues:					
Tuition Revenues	\$ -	\$ -	\$ -		
Research Revenues	\$ 2,462,318	\$ 2,560,811	\$ 2,663,243		
IDC Research Revenues	\$ 1,155,956	\$ 1,202,194	\$ 1,250,282		
Other Revenues	\$ -	\$ -	\$ -		
Subtotal, Historical Research Revenues	\$ 3,618,274	\$ 3,763,005	\$ 3,913,525		
Forecast-Related Research Revenues:					
Gain from Possible Sale of Building	\$ -	\$ -	\$ -		
Lease Revenue from Possible Lease of Building	\$ -	\$ -	\$ -		
Supplemental Direct Revenue from Current Staff	\$ -	\$ 246,232	\$ 256,081		
Supplemental IDC Revenue from Current Staff	\$ -	\$ 132,935	\$ 138,252		
Additional Grant Funding from New Hires	\$ -	\$ -	\$ -		
Federal IDC Support of New Grants	\$ -	\$ -	\$ -		
Industrial IDC Support of New Grants	\$ -	\$ -	\$ -		
Foundation IDC Support of New Grants	\$ -	\$ -	\$ -		
Endowment Revenue (5% of Principal)	\$ -	\$ -	\$ -		
Technology Transfer Revenue	\$ -	\$ -	\$ -		
Subtotal, Forecasted-Research Revenues	\$ -	\$ 379,167	\$ 394,333		
Total research revenues	\$ 3,618,274	\$ 4,142,172	\$ 4,307,859		
Forecast-Related Expenses:					
IDC, Real Estate, and Technology Transfer Costs					
Direct Expenses for Additional Grants	\$ -	\$ 283,167	\$ 294,493		
Real Estate Rental Costs	\$ -	\$ -	\$ -		
Technology Transfer Costs	\$ -	\$ -	\$ -		
Scientific Advisory Committee Costs	\$ -	\$ -	\$ -		
Subtotal, IDC, RE, Tech X-fer Costs:	\$ -	\$ 283,167	\$ 294,493		
Repair, Renovation, Reorganization Costs					
Depreciation Expense on IS Improvements	\$ -	\$ -	\$ -		
Research Administration Reorganization Costs	\$ -	\$ -	\$ -		
Depreciation on Research Equipment Investment	\$ -	\$ -	\$ -		
Subtotal, Repair and Renovation Costs	\$ -	\$ -	\$ -		
Subtotal, Forecast-Related Costs	\$ -	\$ 283,167	\$ 294,493		
Historical Research Variable Expenses:					
New Hire Salary Obligations	\$ -	\$ -	\$ -		
New Hire Total Recruitment Obligations	\$ -	\$ -	\$ -		
Salaries and Fringe Benefits	\$ 1,793,533	\$ 1,865,274	\$ 1,939,885		
Supplies	\$ 468,512	\$ 487,252	\$ 506,743		
Purchased Services and Fees	\$ 28,060	\$ 29,162	\$ 30,360		
Other Expenses	\$ 212,221	\$ 220,710	\$ 229,538		
<i>Reduction in OH from sale of building</i>	\$ -	\$ -	\$ -		
Subtotal	\$ 2,502,326	\$ 2,602,419	\$ 2,706,516		
Total Research Variable Expenses	\$ 2,502,326	\$ 2,885,586	\$ 3,001,009		
Profit/Loss Before Adjustments and Overhead Allocations	\$ 1,115,948	\$ 1,256,586	\$ 1,306,850		
Adjustments and OH Allocation Estimates					
Insurance	\$ -	\$ -	\$ -		
Bad Debt	\$ -	\$ -	\$ -		

Research Enterprise Approach

AMC

- Maintain the quality of academic research experience
- Continue to position the AMC as an effective competitor among research institutions
- Aim for AMC research standing of the highest grade

Challenges

- Very competitive environment
- Financial Uncertainty
- Uniqueness of financial operations
- Operational complexity

Enablers

- Proactive Planning
- Institutional and departmental business planning
- Facilities master plans linked to institutional plans and needs
- Multi year plans which provide decision support

Results

- The ability to respond rapidly to a changing environment
- The ability to revise priorities and maintain momentum
- The ability to optimize revenues and manage expenses
- Communication among institutional constituencies

Resource Management

Issues

How do we optimize the utilization of existing facilities?

- How do we plan for the renovation of existing facilities?
- How do we maximize the return/revenue on newly constructed facilities?
- What are the risks and challenges facing Academic Medical Center?

All of these issues will affect the bottom line of the institution

How can you develop financial planning models with so many variable and so many uncertainties?

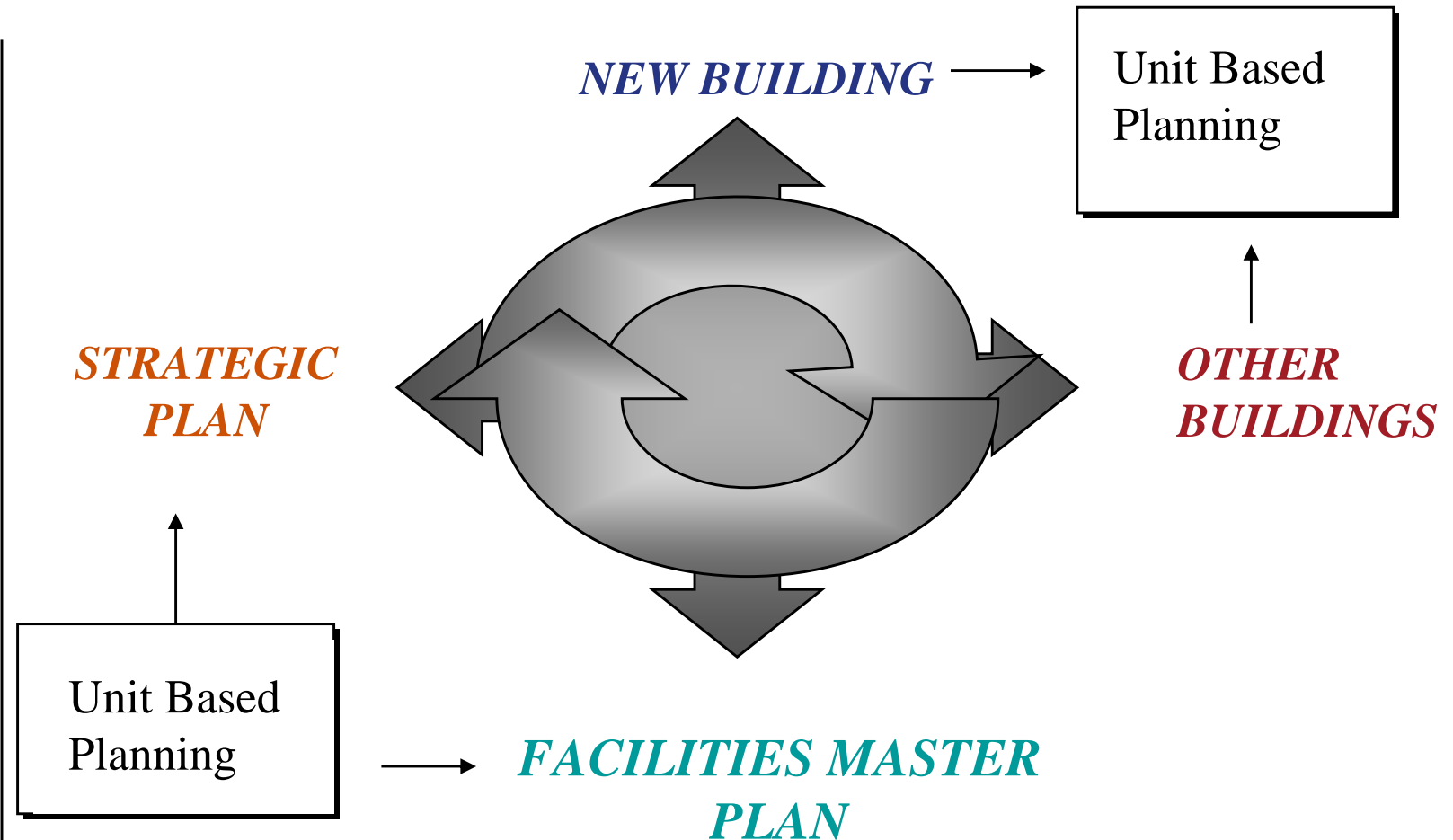
Why can't you just average and hope for the best?

Because of the Uncertainty You Face..

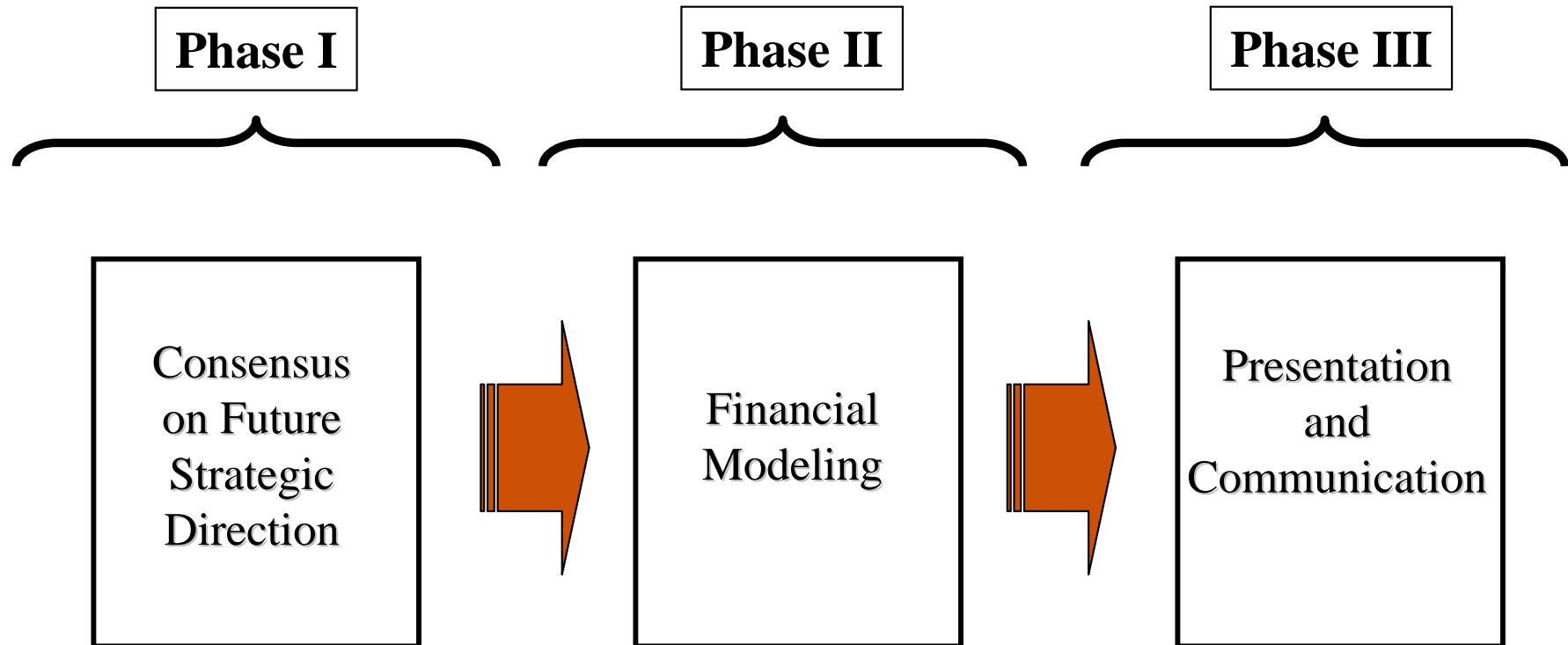
Our Approach builds upon modules...

We begin with the key driver for the organization

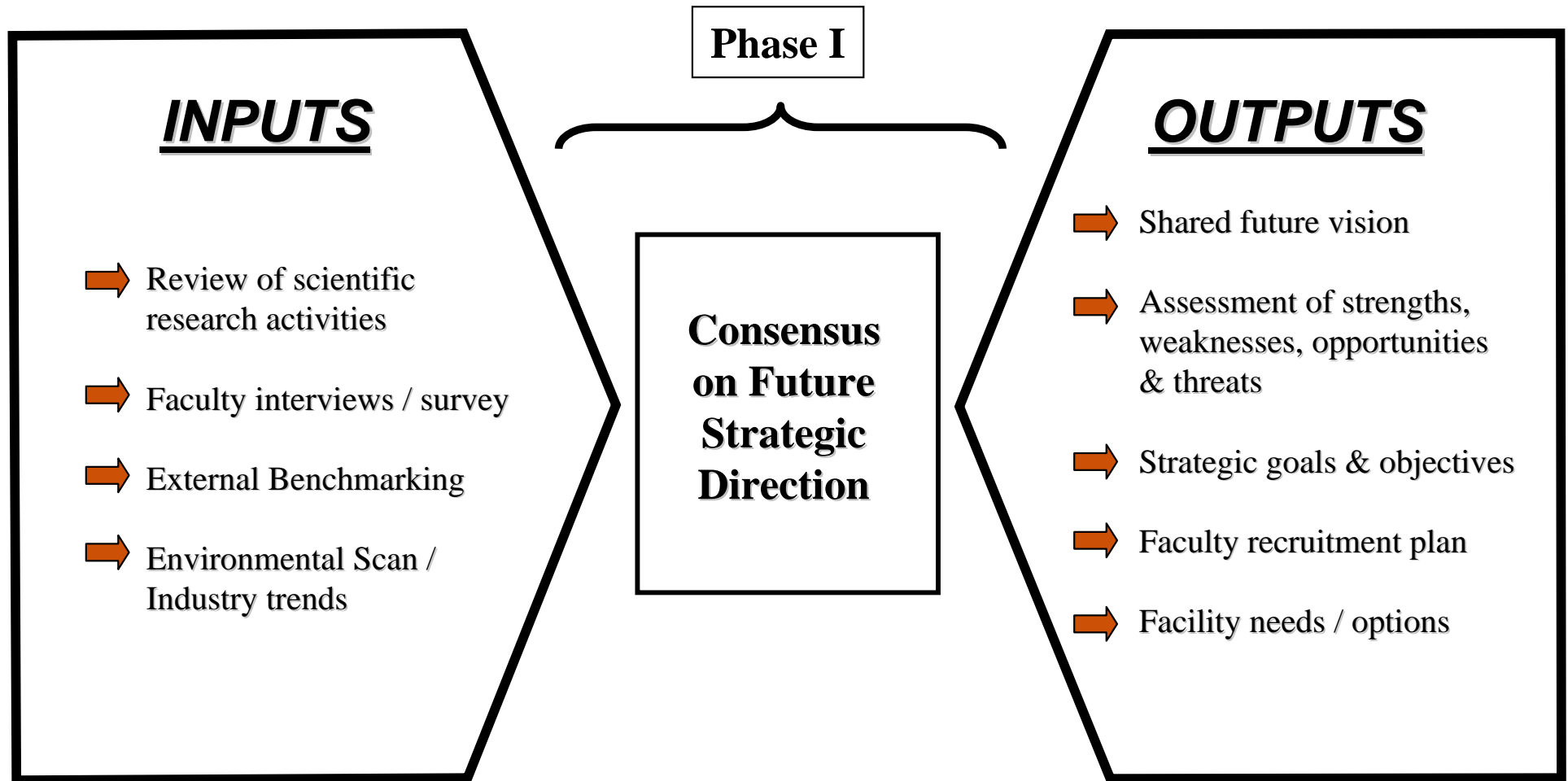
... for example the construction of a new building



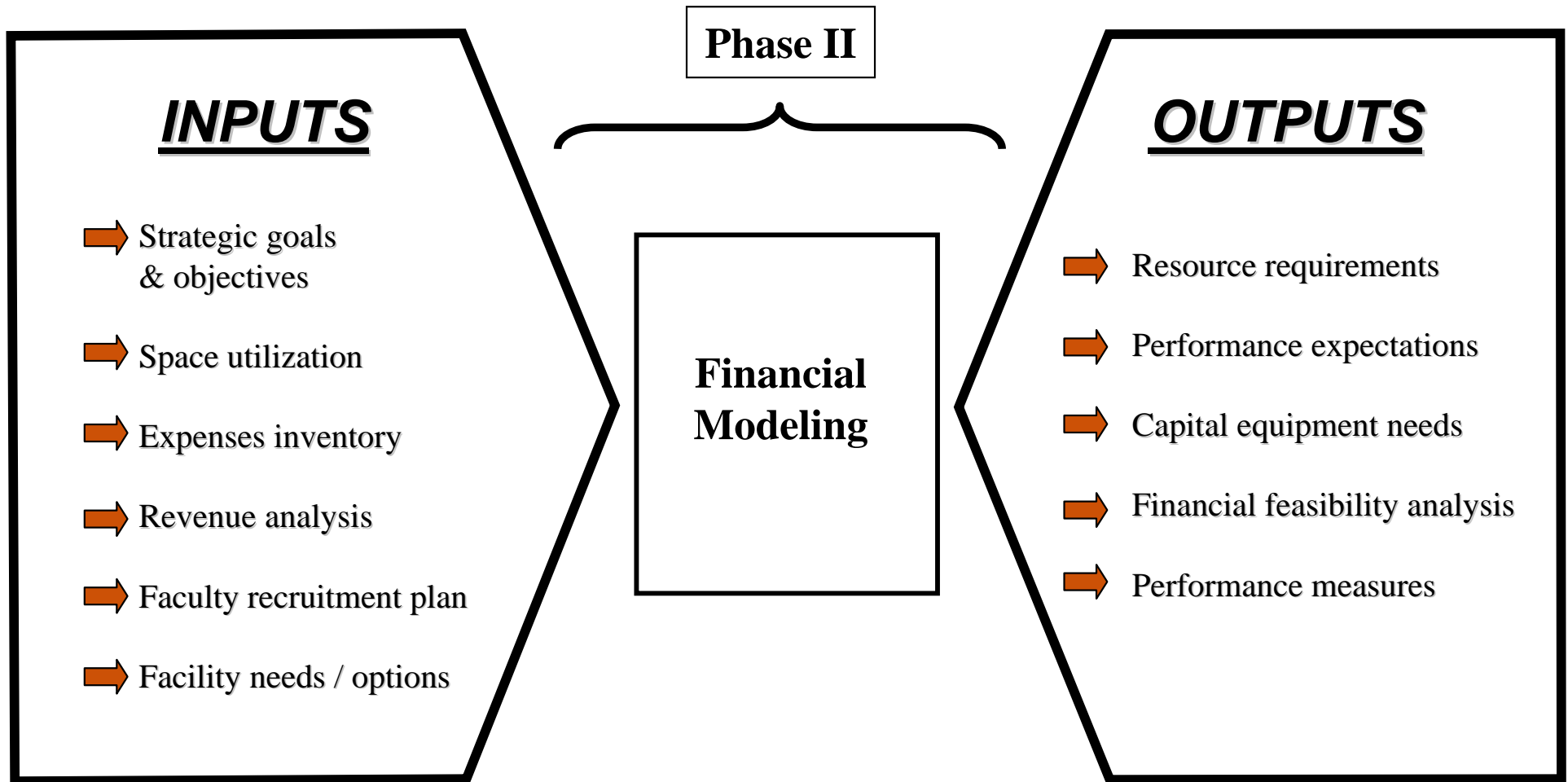
One Approach to Research Enterprise Planning



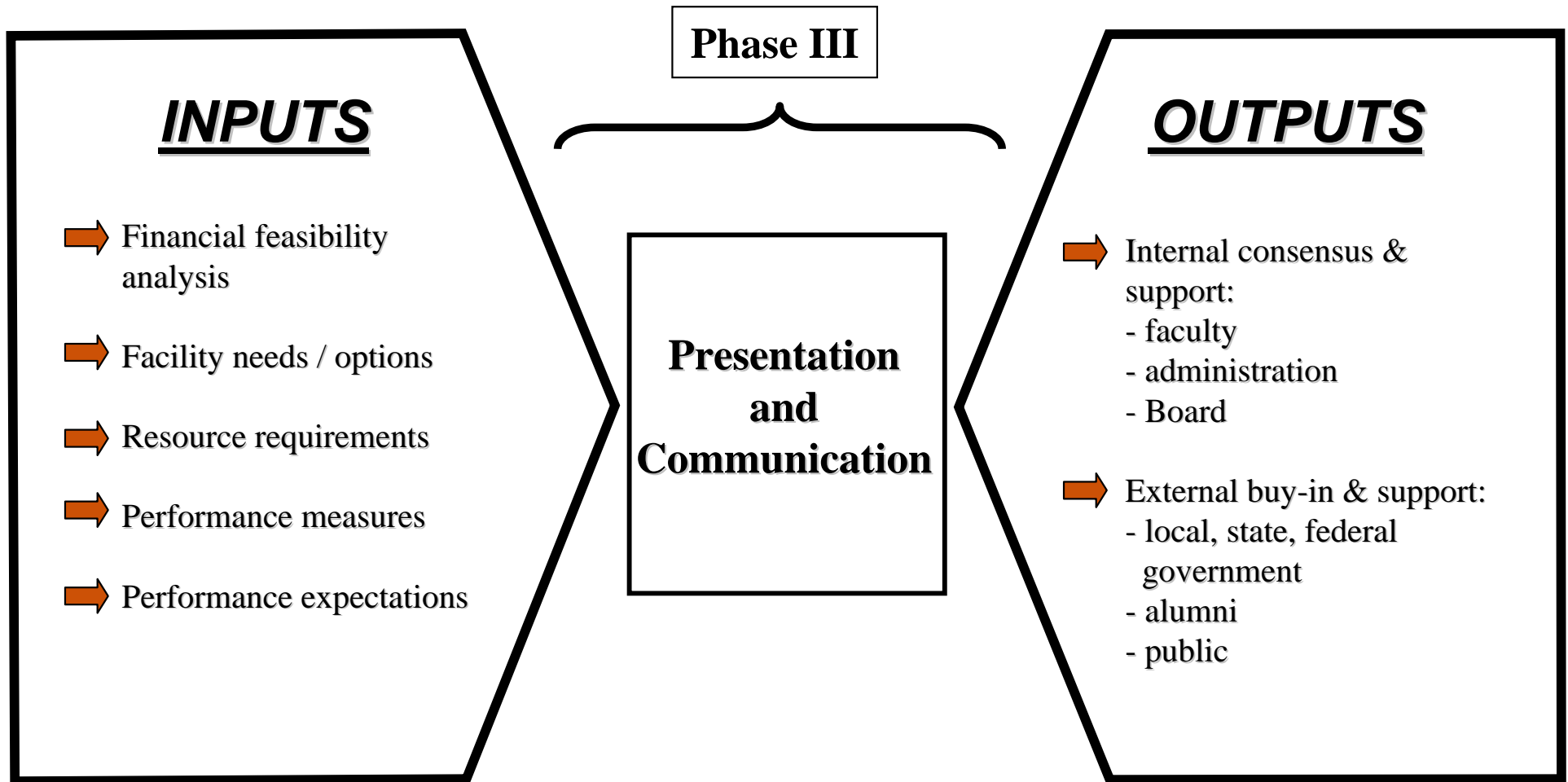
One Approach to Research Enterprise Planning (Cont.)



One Approach to Research Enterprise Planning (Cont.)

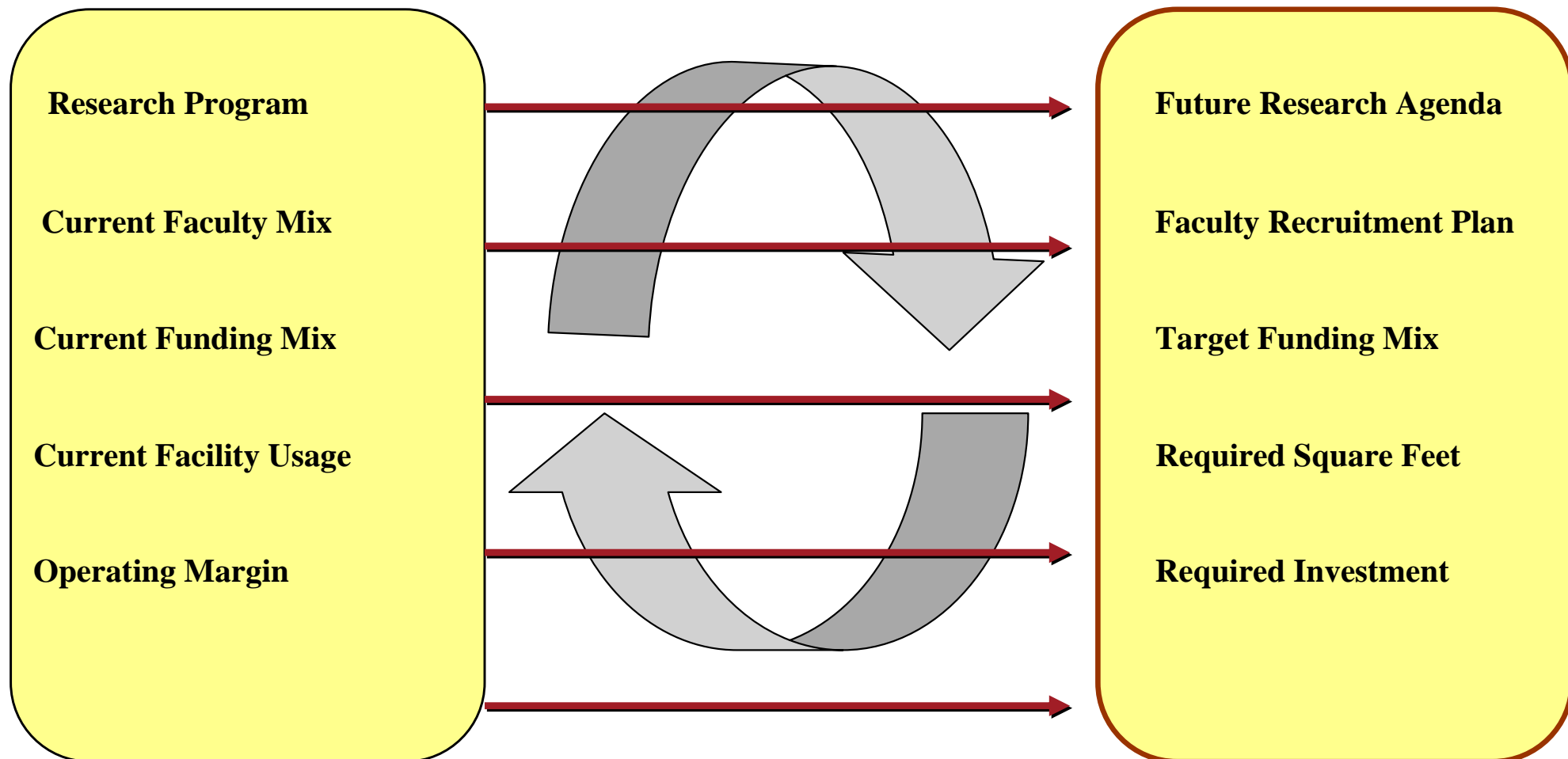


One Approach to Research Enterprise Planning (Cont.)



Components of the Research Enterprise Model

Development of the financial model is an iterative, rather than a linear process . . .



Research Enterprise Modeling

Our recent research strategic planning engagements have focused on the development of financial models which:

- Define the costs and associated revenues (direct and indirect) of the research enterprise.
- Assess the bottom-line impact of strategic and operational initiatives, including new research facilities and faculty recruitment plans.
- Establish benchmarked parameters to measure and monitor research faculty performance.

Research Enterprise Modeling (Cont.)

A research financial planning model is utilized to define and update a multi-year business plan for investment in the research enterprise. The primary objectives are to:

- To communicate with faculty:
 - Clarify the goals of the research enterprise
 - Define actions and resources needed to meet these goals
- To communicate with management:
 - Provide clear expectations of activities and results expected from participating units
 - Provide the means (performance measures, etc.) for assessing the progress of individual units of the research enterprise
- To communicate with the Board:
 - Consequences of various levels of investment

Research Enterprise Modeling (Cont.)

The following are the core issues with which we typically propose to work in establishing the organization's multi-year business planning model. The model should:

- Include faculty research, research training and educational activities at the research division and central administration levels;
- Provide flexibility to forecast the potential financial impact of various scenarios, and perform other sensitivity analysis with respect to research strategies;
- Include multi-year projections of revenue, expense, and cash flows at the division, school and organization levels; and
- Assist in the identification of opportunities and vulnerabilities that will impact the implementation of the research strategic plan.

Components of the Research Model

The components of the financial model, by their nature, not only define the research enterprise, but help to establish strategic direction and performance expectations

Defining Program Requirements:

- Research agenda/ program requirements
- Training / education program needs
- Faculty recruitment / retention plan
- Facility needs assessment
 - Current Space utilization / decompression
 - New programs / faculty recruits
 - Scientific Cores / centralized facility needs
- Administrative infrastructure support requirements
 - Administrative processes
 - Information systems

Components of the Research Model (Cont.)

Defining Resource Requirements for Recruitment Planning:

- Number and rank of new faculty needed over time by Department / Program
- Financial investment in new faculty
- Contribution margin/return on investment of recruitment plans

Expense Assumptions:

- Salary support (grant, institutional support)
- Start-up costs
- Recruitment costs (search and hire)
- Laboratory/ office space needs
- Capital equipment needs
- Administrative support costs

Revenue Assumptions:

- Sponsored Research Direct Revenue goals *by faculty level*
- Sponsored research mix (federal, non-federal, training grants, etc.)
- F&A (indirect cost) recovery

Components of a Research Model (Cont.)

Defining Resource Requirements for Facilities Planning:

- What is existing space utilization?
 - Identify space used for sponsored research
 - Identify space used for training and education
 - Determine the dollar density values for existing research faculty
- Assess the amount of new space needed for
 - Decompression of crowded labs
 - New programs / faculty
 - Projected growth of young investigators
 - Shared facilities / support services

Sample Assumptions Categories From Other Models:

GENERAL

- Annual inflation: 3%
- General administrative allocation: 21%
- Prime rate: 8.50%
- Bond Rate: 8.25%

STAFF

- Attrition rate of existing staff
- Retention rate of existing and new staff
- Number of admin staff
- For x number new faculty

REVENUE

- Productivity increase (current staff)
- Percent of new hires expected to be productive
- Research Mix -grants increase in proportion to NIH funding increase
- Funding goals for new faculty by rank:
- Endowment spend level
- Endowment growth
- Other (technology transfer)

FACILITIES

- Total available GSF
- Percent of building utilization by: research, education, service
- Discount of space for common use
- Construction schedule
- Real estate inflation costs
- Lab rental costs
- Operations and maintenance

Metrics Analysis

- Identification of key assumptions and the supporting metrics is a key component of our facilities model
- Metrics to model recruitment plan
 - Investment in faculty
 - Support personnel
 - Space
 - Infrastructure support
 - Shared services
- The financial impact extends far beyond salary and set-up
 - Is affected by discipline and by FTE commitment to research, clinical and teaching missions
- The return on the investment is also complicated, involving a number of metrics such as the expected research funding portfolio

Incorporation of the Recruitment Strategy: Expenses

*Start Up Expenses**

Over Three Years	Institution A	Institution B	Institution C	Institution D	Institution E
Chair	\$890,000	\$1,000,000	\$1,200,000	\$1,000,000	\$1,300,000
Professor	\$890,000	\$ 500,000	\$ 650,000	\$ 500,000	\$ 600,000
Associate	\$225,000	\$ 350,000	\$ 400,000	\$ 350,000	\$ 350,000
Assistant	\$190,000	\$ 250,000	\$ 300,000	\$ 200,000	\$ 325,000

Does not include salary expense

*Salary Expenses**

	Institution A	Institution B	Institution C	Institution D	Institution E
Chair					
Professor	\$110,000	\$145,000	\$130,000	\$142,000	\$140,000
Associate	\$ 75,000	\$110,000	\$100,000	\$115,000	\$105,000
Assistant	\$ 60,000	\$ 70,000	\$ 65,000	\$ 80,000	\$ 72,000

* *Sample Benchmarking Data From Other Planning Efforts*

- Salaries
- Set Up
- Recruitment Initiative
- Infrastructure Support
- Admin Support

Incorporation of Recruitment Strategy: Revenues

- Awards
- Tuition
- Clinical
- Endowment
- Fundraising

*Sample Funding Targets**

Faculty	
Chair	\$400,000
Professor	\$500,000
Associate	\$200,000
Assistant	\$150,000

*Sample Phase-In Schedules**

Faculty	Year One	Year Two	Year Three	Year Four
Chair	50%	75%	100%	100%
Professor	50%	75%	100%	100%
Associate	25%	50%	100%	100%
Assistant	0%	25%	50%	100%

**Sample Benchmarking Data From Other Planning Efforts*

Link to Research Funding Sponsor Mix

Maximize revenues.

By diversification of funding portfolio.

Align portfolio with faculty rank, tenure at institution, career path.

*Sample Research Funding Mix**

	<i>Institution A</i>	<i>Institution B</i>	<i>Institution C</i>	<i>Institution D</i>
Federal	70%	70%	80%	76%
Industrial	10%	15%	10%	22%
Foundation	7%	10%	10%	-
Other	9%	5%		2%
Clinical Trials	4%			

**Sample Benchmarking Data From Other Planning Efforts*

Link to Space Utilization

Maximize utilization of resources including space.

Ensure top performers have the space necessary to maintain and increase funding revenues.

*Space Allocation and Performance Metrics**

	Research Space (sq. ft.)	Cores & Local Shared Services (sq. ft.)	Total (sq. ft.)	Dollar Density (equals total direct costs/net sq. ft.)
Institution A				
<i>Chair</i>	1,800	400 (22%)	2,200	\$150
<i>Professor</i>	1,800	400 (22%)	2,200	\$250
<i>Associate</i>	1,350	300 (22%)	1,650	\$200
<i>Assistant</i>	900	200 (22%)	1,100	\$175
Institution B				
<i>Chair</i>	1,200	200 (16%)	1,400	\$230
<i>Professor</i>	1,200	200 (16%)	1,400	\$230
<i>Associate</i>	925	150 (16%)	1,075	\$230
<i>Assistant</i>	660	110 (16%)	770	\$230
Institution C	1,500		1,500	\$300-\$325
Institution D (new building) (existing facilities)				\$350 \$250-300

**Sample Benchmarking Data From Other Planning Efforts*

Resource Business Planning

What Are The Cash Implications?

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
1 REVENUE					
2 Tuition					
3 Direct Grant (Current and Projected)	\$ 1,293,750	\$ 4,819,500	\$ 8,479,413	\$ 13,212,559	\$ 17,625,151
4 Indirect	569,250	2,202,156	3,980,564	6,195,449	8,247,778
5 Subtotal	\$ 1,863,000	\$ 7,021,656	\$ 12,459,977	\$ 19,408,008	\$ 25,872,929
6 Endowment Principal		5,291,000	13,006,336	21,170,706	29,810,243
7 Endowment Income	250,000	614,550	100,317	1,408,535	1,840,512
8 Total, Revenue	2,113,000	7,636,206	12,560,294	20,816,543	27,713,441
9 Direct Expenses					
10 Research	\$ 1,293,750	\$ 4,819,500	\$ 8,479,413	\$ 13,212,559	\$ 17,625,151
11 Faculty Comp (Grant Supported)	\$ 1,091,015	\$ 2,712,861	\$ 4,478,037	\$ 5,957,702	\$ 7,481,804
12 Faculty Comp (non-supported)	\$ 2,356,250	\$ 4,139,204	\$ 4,696,544	\$ 3,941,514	\$ 4,364,203
13 Other Direct Expenses	\$ 194,063	\$ 722,925	\$ 1,271,912	\$ 1,981,884	\$ 2,643,773
14 Operations and Maintenance	\$ 697,246	\$ 1,394,493	\$ 1,743,116	\$ 2,091,739	\$ 2,091,739
15 Interest Expense	\$ 9,827,168	\$ 9,687,931	\$ 9,541,111	\$ 9,386,292	\$ 9,223,040
16 Subtotal	\$ 15,459,492	\$ 23,476,914	\$ 30,210,133	\$ 36,571,690	\$ 43,429,710
17 Indirect Expenses					
18 Faculty Start-Up Costs	\$ 3,530,000	\$ 8,516,100	\$ 10,420,877	\$ 8,590,052	\$ 5,272,259
19 Annual Staff Support	\$ 94,500	\$ 203,000	\$ 252,000	\$ 301,000	\$ 339,500
20 Administrative Assessment "Tax"	271,688	1,012,095	1,780,677	2,774,637	3,701,282
21 Subtotal	\$ 3,896,188	\$ 9,731,195	\$ 12,453,554	\$ 11,665,689	\$ 9,313,041
22 Total, Cash Expenses	\$ 19,355,680	\$ 33,208,109	\$ 42,663,687	\$ 48,237,379	\$ 52,742,751
23 NET CASH FLOW:	\$ (17,242,680)	\$ (25,571,903)	\$ (30,103,393)	\$ (27,420,836)	\$ (25,029,310)

Decision Point: Example Facilities Master Plan

Possible scenarios include:

- Adequate space exists for now-management and utilization are the key drivers.
- Adequate space exists but significant renovations will be needed to improve utilization.
- Space is needed and new construction has been planned.

Existing Space

Existing Facilities	NASF
	Total
Building A	130,010
Building B	53,753
Building C	30,157
Building D	46,324
Building E	38,822
Building F	54,499
Building G	57,324
Building H	52,027
Services	4,408
	467,324

How much is available for program expansion?

What are our options?

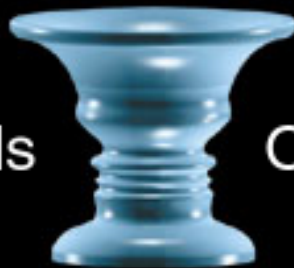
- Renovate**
- Buy**
- Build**
- Lease**

How do we manage renovations with minimal disruption to investigators?

Summary and Questions: How Can This Approach Help You?

PRICEWATERHOUSECOOPERS 

Your worlds



Our people