

Budget Analysis and Decision Support 101



**Government Finance Officers
Association of South Carolina**
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[What's “decision support?”]

Decision support in the area of finance and budgets involves:

- the effort by staff to provide financial data and analysis of that data
- to assist executives and governing bodies in making wise decisions
- about the allocation of the limited resources available to the organization.

Outline

- I. Introduction: How We Usually “Do” Budgets
- II. Review of Financial Concepts We Learned in School (or should have learned)
- III. Moving on Up: Financial Analysis in Budgeting
- IV. Moving Forward: Overcoming the Impediments to Budget Analysis (and effective decision support

I. Introduction – How We Usually “Do” Budgets

[Typical Budget Preparation Flow]

1. Establishment of preparation forms and process for single year budget preparation:
 - a. Direction from organization's executive staff
 - b. Consistency with governing body's policies and the law
 - c. Shared responsibility for budget preparation among departmental and central finance/budget
 - d. Definition of financial and programmatic data to be provided by central office and by departments
 - e. Communication/guidance on process for departmental staff

[Typical Budget Preparation Flow]

2. Base (“continuing”) budget revenue projections
 - Historical trend analysis & informed judgment
 - Input from departmental & revenue collection staff
3. Identification and projection of new revenue sources or existing sources that could be increased
4. Base budget cost projections:
 - a. Personal services: on a position-by-position basis
 - b. Fringe benefits: projected personal services & rate changes
 - c. Fixed cost projections: contractual commitments
 - d. Utilities projections: expected rate and consumption changes
 - e. Incremental costs for: materials/supplies, contractual services, & equipment; historical data & expected price fluctuations

Typical Budget Preparation Flow

5. Compilation and presentation of performance data
6. Proposed departmental budget changes
 - a. Costs/justification for service expansion proposals
 - b. Detail of service impacts of proposed budget changes
7. Executive proposal to governing body
 - a. Base (“continuing”) budget – current service levels
 - b. Proposed revenue enhancements
 - c. Change proposals – increases & (less frequently) reductions/ redirection of funding in base budget
 - d. Performance data
8. Review and approval by governing body
9. Communication of approved budget

Typical Budget Execution and Monitoring Tasks

1. Communicating approved budgets to departments
2. Posting budgets to financial and HR systems
3. Ongoing budget/financial reviews:
 - a. Comparison of budget vs. actuals: expenditure & revenue
 - b. Identification of exceptions/problem areas
 - c. Recommendations of budget corrections or opportunities
 - d. Communication of reviews in summary to executives
4. Budget amendments within restrictions of governing body
5. Accounting adjustments as necessary
6. Year-end closing – close coordination with executives & departments

II. Review: Concepts We Learned in School

[Basic Budget Elements]

- **Inputs** – dollars, facilities, other fixed assets, management systems
- **Process** – how services delivered
- **Outputs** – services/products provided by program
- **Outcomes** – results and benefits of process; impact on service recipients

Relationship of Budget Elements

Inputs → Process → Outputs → Outcomes

dollars, FTE's,
facilities,
management
systems

tons of refuse,
counseling hours,
gallons of water,
police patrol hours,
emergency
responses, students
served

citizen satisfaction
w/ services,
reduction crime rate,
reduced recidivism,
improved student
test scores

Source: adapted from Lynch, Public Budgeting in America

GASB Performance Measurement Concepts*

What is service efforts and accomplishments reporting?

Service efforts and accomplishments (SEA) reporting refers to the *communication of selected measures of a government's performance results*. This includes the public reporting of key service performance indicators that provide *decision-useful information* about the government's actual accomplishments achieved in pursuit of its goals and objectives.

Why is SEA reporting important for governments and their constituents?

Traditional financial statements provide financial performance information about a government's fiscal and operational accountability, but they do not provide all of the information needed to *determine the degree to which the government was successful*. Without SEA performance information, it is impossible to know how *efficiently* government services were provided and how *effective* those services were. The objective of SEA reporting is to provide the public with just this kind of information.

* [Governmental Accounting Standards Board](#) – general purpose financial reporting guidance

GASB Performance Measurement Concepts

Definitions of Service Efforts and Accomplishments (SEAs)

- Measures of Service Efforts: inputs
 - Financial Measures: cost of providing services
 - Non-financial measures: FTE's, square footage, vehicles
- Measures of Service Accomplishments: what was accomplished with inputs
 - Output measures – quantity of services
 - Outcome measures – results from services delivered
- Measures that Relate Service Efforts to Service Accomplishments
 - Efficiency measures relating service efforts to service outputs – cost per unit of service (productivity)
 - Cost-outcome measures relating service efforts to outcomes

* Governmental Accounting Standards Board – general purpose financial reporting guidance

Cost* Concepts

- Recurring costs
 - Start-up/ one-time costs
-

- Fixed Costs
 - Variable Costs
-

- Marginal Cost
-

- Incremental Costs

- Controllable costs
 - Uncontrollable costs
-

- Indirect (overhead) costs
 - Direct costs
-

- Sunk costs
- Opportunity costs

* Cost – value of money used to produce something; input to acquire something

Price Concepts

- Real or constant dollars
- Nominal dollars
-
- Present value
-
- Price indices – time/ geographic comparisons
 - Narrow cost classification – gas, oil, water
 - Broader category of purchase – utilities
 - Market basket for type of consumer/organization

Price Concepts – Selected Indices

- Consumer Price Index – monthly measure of effects of inflation on urban consumers by geographic area
- Higher Education Price Index – annual measure of higher education market basket (CommonFund)
- Municipal Cost Index – monthly measure of local government market basket (Amer. City & County)

Principal Data Source: U.S. Department of Labor,
Bureau of Labor Statistics

Selected Basic Math/Statistical/ Economics Functions in Financial Analysis

- Cause and effect relationships:
 - Independent variables
 - Dependent variables
- Elementary algebra: cross multiplication to solve for missing variable
- Supply and demand analysis
 - Elastic versus inelastic demand
- Bond amortization calculation/table
- Cost allocation

III. Moving on Up: Financial Analysis in Budgeting

- Results-Based Budgeting
 - Linkage of dollars and performance/outcomes
- Analysis of Base Budgets
 - Decision packages/change proposals
- Analysis in Cost Projections
- Analysis in Revenue Projections
- Multi-Year Budget Projections

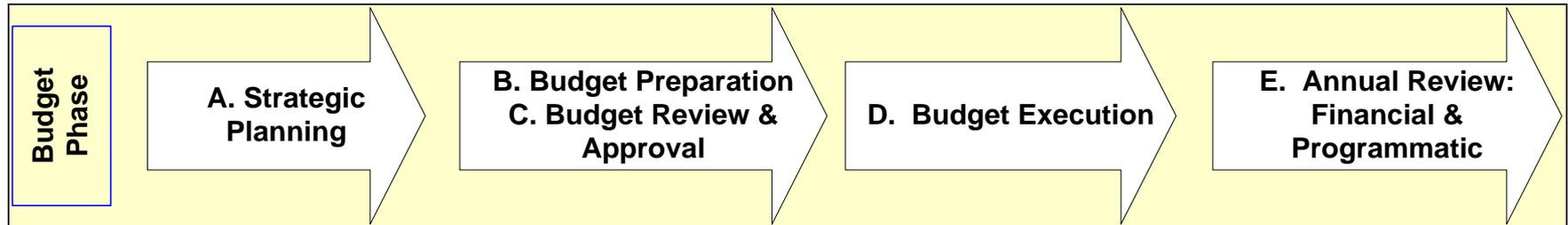
[Results/Performance-Based Budgeting]

Any effort that ties the allocation of program dollars to measures that indicate how well services or products are being delivered.

Reasons for Results/Performance-Based Budgeting?

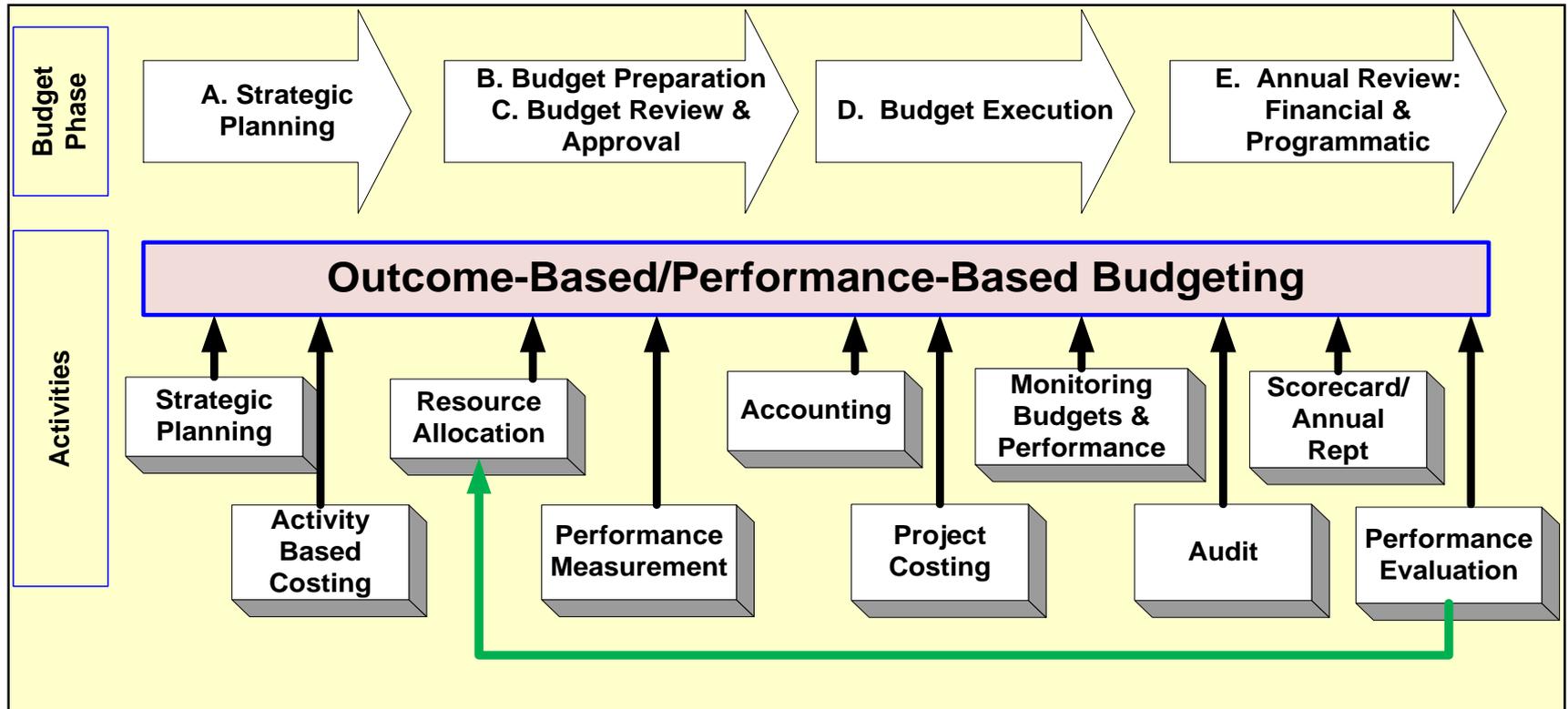
- *More rational allocation of resources:*
 - Establishment of service objectives focusing on customers
 - Linkage of budget review and preparation to service planning
 - Targeting resources to address objectives
- *Improved management of resources:*
 - Participative management in budget and plan preparation
 - Turn around “spend it or lose it” approach to budgeting
 - Reward excellent performance - incentives for managers to seek:
 - Process improvement - focus on customers
 - Reengineering of methods

Overview of Results/Performance-Based Budgeting in Government



Modified from: Bruel and Moravitz, *Integrating Performance and Budgets* (Rowman & Littlefield, 2007)

Overview of Results/Performance-Based Budgeting in Government



Source: Adapted from Bruel and Moravitz, *Integrating Performance and Budgets* (Rowman & Littlefield, 2007)

Decision Packages – Vehicles for Setting Policy Making Agenda

- Tool applied in zero-base budgeting to:
 - Examine incremental changes to base budget: reductions *and* increases
 - Identify impacts on services to citizens/ customers of various funding levels such as 105%, 95%
 - Identify alternate ways of “doing business”
- Packages prepared by program – “decision unit”
- Packages ranked by chief executive for presentation to legislators
- Performance impacts of changes identified using efficiency and effectiveness measures
 - Business case made for (or against) change

Example Forms: [Georgia Tech](#) (under “GT Budget Process”) and [State of South Carolina](#)

Decision Packages – Key Elements of Expansion Proposals

Budget:

- High level of detail by major object codes
- Separate identification of one-time/start-up and recurring budget
- Projections for budget year and at least 2 out-years
- Detailed listing of all new positions requested
- Internal unit funding to be applied to initiative: *“What are you doing for yourself?”*
- Impact on revenue: for central budget and revenue proposed to be retained by unit
- Net cost to General Fund after internal funding and revenue

Decision Packages – Key Elements of Expansion Proposals

Narrative:

- Expected results/benefits from initiative, including appropriate metrics to describe impact of initiative
- How the program will link to current programs in place
- Criteria for evaluating the success of initiative
- Description of other resources to be applied to program
- Consequences if the program is NOT approved

Decision Packages –Reduction/ Reallocation Proposals

Purposes:

- Requiring units to find ways to accomplish objectives with fewer funds
- Redirection of reduced funding to high priority items

Sample message to Georgia Tech managers:

- You will be informed of a redirection adjustment to your budget based on the proposals that you have submitted.
- I know that you will do your best to minimize the impact of this action on the most important functions of your organization.
- All campus units will experience some level of reduction, with some absorbing larger adjustments than others.
- *The Office of the President has redirected the funding generated by this action to important university priorities. These actions are permitting Georgia Tech to stretch the budget further and afford items that we could not fund through the state-approved budget and approved tuition levels. .*

Decision Packages –Reduction/ Reallocation Proposals

Contents:

- Definition of reduction targets for units:
 - Differential targets for units and possible exemption of some units from process
 - Possible exemption of some portions of unit budgets such as fixed contracts
- List of *reasonable* (& politically acceptable) reduction actions:
 - Projected impact for proposed budget year and at least 2 out-years
 - Actions listed in priority order, with most likely to least likely if reductions are imposed
 - Impact statements w/ performance measures, if appropriate

Example: Georgia Tech (under “GT Budget Process”)

“Bottom Up” Cost Projections

- Bottom (ground) up →
number of units X cost per unit
- Personal services projections – position by position projections
- Analysis of vacancy history and budgeting for turnover
- New program projections – work with departmental staff on estimates
- Application of price/cost indices to cost per unit computation

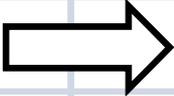
Cost Estimates: Funding History/ Trends or Alternate Delivery Methods

- Cost estimates based on funding history:
 - By program and line item
 - Adjusted for projected cost & consumption/usage changes
 - Specialized cost estimates for utilities
 - Fringe benefit estimates: health insurance base on mix of plan participants
- Budget analysis based on modeling alternate service delivery methods – e.g. projected savings from:
 - Contracting out
 - Consolidation of offices/functions

Analysis in Budget Preparation: Revenue Projections

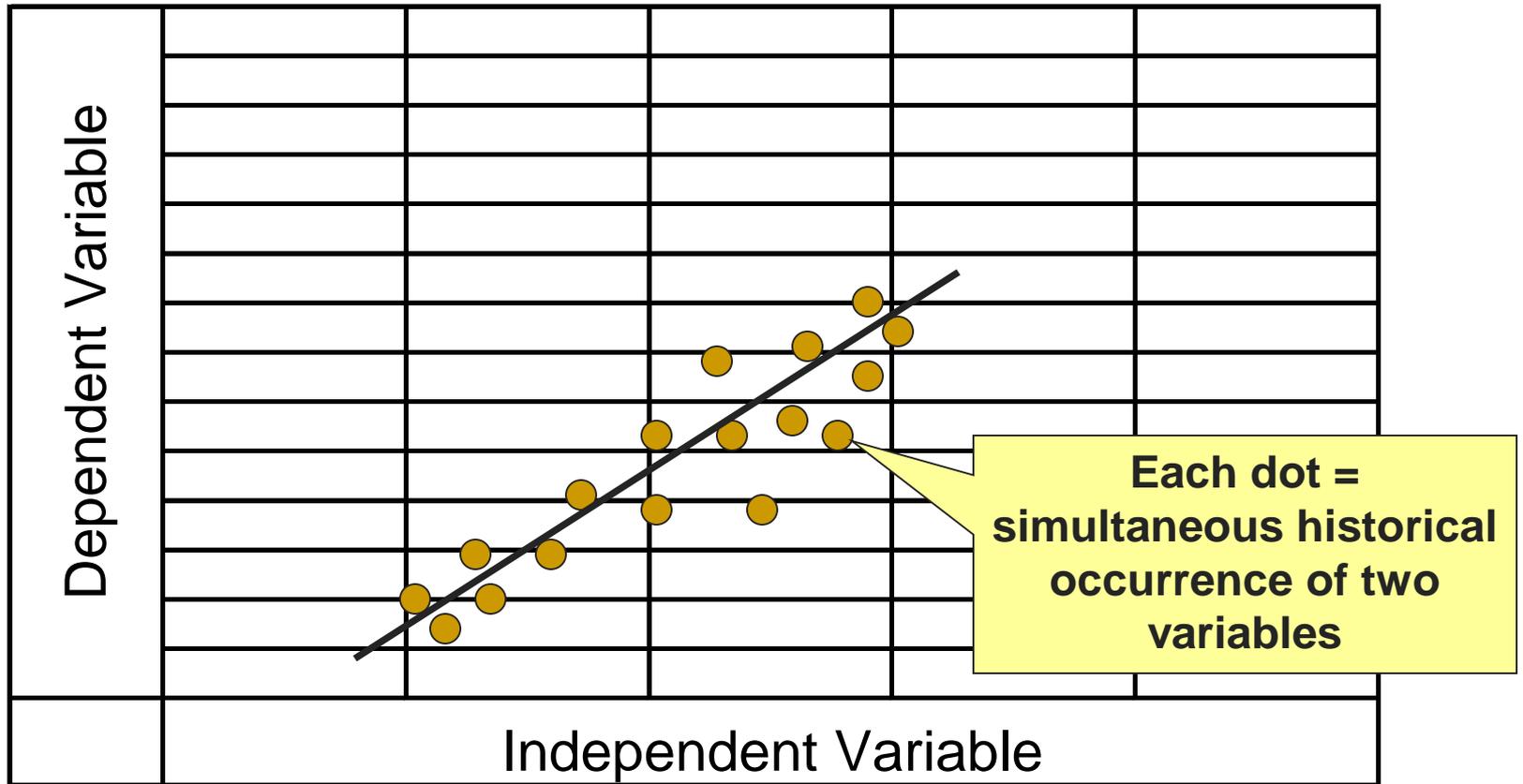
- Application of multivariate analysis
- Application of regression analysis
- Revenue projections linked to other indicators:
 - Scatter charts and regression analysis
 - Multivariate analysis – numerous variables examined at same time
- Moving average – the average of average changes over time period
- Informed judgment of economic conditions

Simple Moving Average Example

	Actual Rev	Chg Prior Yr	% Chg
FY2011	224,908		
FY2012	231,405	6,497	2.89%
FY2013	246,843	15,438	6.67%
FY2014	251,098	4,255	1.72%
FY2015	259,005	7,907	3.15%
FY2016 Est	<u>270,854</u>	11,849	<u>4.57%</u>
	X 1.038	Avg Chg 	3.80%
FY2017 Proj	<u><u>281,146</u></u>		

Average of average increases used to project next year's revenue

Scatter Diagram – Regression Analysis



Use of regression analysis to determine relationship between two variables; independent variable used to predict dependent variable: if X, then Y

[Multivariate Analysis]

Examples:

- Projection model for property taxes – variables:
 - Building permits
 - Trends in assessed values by type of property
 - Delinquency trends
 - Assessment trends for types of property
- Projection model for tuition & fees – variables:
 - Student classifications and applicable tuition rates
 - Various tuition/fee levels by discipline
 - Tuition and fee waivers

[Multi-Year Budget Projections]

Recommended Characteristics of Models::

- Minimum 5 year time span for *projections*
- Use of minimum 5 years of *historical data*
- Model for entire organization; drill-down by fund
- Financial data collected and projected:
 - Revenue
 - Expenditures
 - Revenue net of expenditures
 - Measures of financial health – cash balances, reserves, outstanding debt, debt service payments

Multi-Year Budget Projections

Recommended Characteristics of Models::

- Focus on major spending and revenue categories
- Projections based on trend analysis and adjustment of independent (spending and revenue) variables* such as:
 - Pay and fringe benefit increases
 - Utility costs
 - Changes in tax/fee rates and policies
- Considers changes in customer/citizen base & service mix
- Bottom line – model provides guidance to executive staff and governing body on results of their policy decisions

* Sensitivity analysis or “what if” analysis

Georgia Institute of Technology
Projected Net Revenues - Base Scenario

	Projection				
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Revenue					
Education & General					
Tuition	348,329,075	370,261,382	388,690,832	407,990,203	428,200,463
State	228,800,720	235,664,741	242,734,683	250,016,724	257,517,226
Indirect Cost Recoveries	131,677,498	134,969,435	139,018,518	143,189,074	147,484,746
Student Fees and Other	126,059,515	127,141,228	128,241,766	129,361,557	130,501,041
Private Philanthropy	92,476,546	94,862,725	97,316,608	99,840,188	102,435,516
Total Education & General	927,343,354	962,899,512	996,002,408	1,030,397,745	1,066,138,991
Auxiliary / Sales and Services	222,255,675	296,419,098	241,823,679	236,416,745	245,331,378
Research Grants/Contracts	614,053,873	632,475,489	651,449,754	670,993,247	691,123,044
Total Revenue	1,763,652,903	1,891,794,099	1,889,275,841	1,937,807,737	2,002,593,413
Expense					
Education & General					
Faculty	240,548,106	248,195,574	255,701,192	263,434,470	271,402,339
Student/Staff	240,515,226	247,846,131	255,286,815	262,952,793	270,850,953
Fringe Benefits	102,996,813	110,496,699	118,574,017	127,274,247	136,646,480
Total Personal Services	584,060,144	606,538,404	629,562,024	653,661,510	678,899,772
Other Operating Expenses	324,587,367	334,797,160	345,285,752	355,094,720	364,708,379
Sub-Total Ed & Gen (No Facilities)	908,647,511	941,335,564	974,847,776	1,008,756,230	1,043,608,151
Educ & Gen - Facilities					
Mtnc and Related Costs	103,742,625	105,406,713	107,113,562	108,864,287	110,660,034
New Construction	88,355,522	154,593,869	91,756,371	77,777,675	77,777,675
Total Educ & Gen - Facilities	192,098,147	260,000,582	198,869,933	186,641,962	188,437,710
Total Education & General	1,100,745,658	1,201,336,146	1,173,717,709	1,195,398,192	1,232,045,861
Research Grants/Contracts					
Faculty	109,562,429	112,849,302	116,234,781	119,721,825	123,313,480
Student/Staff	96,925,204	99,832,960	102,827,949	105,912,787	109,090,171
Fringe Benefits	54,289,297	55,917,976	57,595,515	59,323,381	61,103,082
Total Personal Services	260,776,930	268,600,238	276,658,246	284,957,993	293,506,733
Other Operating Expenses	400,897,034	412,923,909	425,311,590	438,070,901	451,212,990
Total Research Grants/Contracts	661,673,964	681,524,148	701,969,836	723,028,894	744,719,723
Total Expense	1,762,419,622	1,882,860,293	1,875,687,545	1,918,427,086	1,976,765,583
Projected Net Revenue	1,233,280	8,933,806	13,588,297	19,380,652	25,827,830

Georgia Tech
Example:
Projected Total
Net Revenues
(“Net Income”)
Under Base
Scenario

Georgia Tech Multi-Year Plan Example: Sensitivity of Major Variables

- What if – there's a 1% change in the following factors:

	Single Year Impact	Cumulative 5-Year Impact
<u>Revenue Factors:</u>		
State appropriations	\$2.2	\$12.8
Indirect cost recoveries	\$1.4	\$4.3
Private philanthropy	\$0.7	\$4.1
Undergrad Enrollment	\$0.6	\$5.2
Resident tuition rate	\$1.6	\$6.6
Non-resident tuition rate	\$3.6	\$16.4
<u>Cost Factors:</u>		
Faculty and staff salary increases	\$4.0	\$22.9
Fringe benefits	\$0.8	\$5.6
Other operating expenses	\$3.3	\$18.3

Examples of Other Special Analyses in Budget and Finance

- Managing with less
- Health/human services programs: dollar following the client
- Analysis of fee capacity
- Combining functions across organizations/sharing of staff
- Higher education: improving summer school revenue
- Contracting out services
- Rent versus buy decisions
- Renovate versus re-build versus rent decisions
- Total service cost computations
- Trend analysis with inflation removed – based on real costs