

Understanding Costs and Revenues

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



The Parker Ranch installation in Hawaii

Glenn Barnes

UNC Environmental Finance Center

919-962-2789

glennbarnes@sog.unc.edu

Better Buildings Workshop

October 26, 2011

- Highlight the elements of an income statement
- Discuss methods for forecasting costs and revenues
- Explain the importance of performance measurement
- Introduce potential revenue streams

- Looking at an organization's financial structure allows it to evaluate its sources and uses of program funding and track them over time
- Some questions for programs to consider in evaluating financial structure include:
 - What are the revenues and payment streams for the business?
 - What is the cost to operate the business?
 - What are the cost and revenue drivers for the business?
 - How does the business finance investments?

Source: Booz Allen Hamilton

- Key elements of a firm's financial structure include:
 - **Income Statement:** An accounting of sales, expenses and profit for a given period
 - **Pro Forma:** A descriptive term for a financial statement such as an income statement or balance sheet that has one or more assumptions or hypothetical conditions built into it (e.g., forecast sales for a specific period)
 - **Hurdle Rate:** The required rate of return on an investment above which the investment is profitable, below which it is not

Source: Booz Allen Hamilton

The purpose of the income statement is to track a company's profitability over time

Revenue is the total amount of money received by the company for goods sold or services provided during a certain time period.

Program Examples: Interest paid by customers on loans, fees paid by contractors for training

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	\$ 700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	\$ 80	\$ 100	\$ 220
Total Revenues	\$ 640	\$ 780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Loan Buy Down Cost	\$ (300)	\$ (400)	\$ (500)	\$ (1,200)
Contractor Sales Training Materials	\$ (20)	\$ (40)	\$ (50)	\$ (110)
Total COGS	\$ (2,320)	\$ (440)	\$ (550)	\$ (3,310)
Gross Margin (Tot Revenue - COGS)	\$ (1,680)	\$ 340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	\$ (10)	\$ (10)	\$ (30)
Rent & Utilities	\$ (100)	\$ (120)	\$ (135)	\$ (355)
Total Overhead Cost	\$ (110)	\$ (130)	\$ (145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	\$ 210	\$ 205	\$ (1,375)

Source: Booz Allen Hamilton

The purpose of the income statement is to track a company's profitability over time

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	80	\$ 100	\$ 220
Total Revenues	\$ 640	780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Loan Buy Down Cost	\$ (300)	(400)	(500)	\$ (1,200)
Contractor Sales Training Materials	\$ (20)	(40)	(50)	\$ (110)
Total COGS	\$ (2,320)	(440)	(550)	\$ (3,310)
Gross Margin (Tot Revenue - COGS)	\$ (1,680)	340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	(10)	(10)	\$ (30)
Rent & Utilities	\$ (100)	(120)	(135)	\$ (355)
Total Overhead Cost	\$ (110)	(130)	(145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	210	\$ 205	\$ (1,375)

Cost of Goods Sold are the direct costs attributable to the production of the goods sold by a company. This amount includes the cost of the materials used in creating the good along with the direct labor costs used to produce the good. It excludes indirect expenses such as distribution costs and sales force costs. (also known as **variable costs**).

Program Examples: Cost of loan buy down, contractor training material development

Source: Booz Allen Hamilton

The purpose of the income statement is to track a company's profitability over time

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	\$ 700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	\$ 80	\$ 100	\$ 220
Total Revenues	\$ 640	\$ 780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Loan Buy Down Cost	\$ (300)	\$ (400)	\$ (500)	\$ (1,200)
Contractor Sales Training Materials	\$ (20)	\$ (40)	\$ (50)	\$ (110)
Total COGS	\$ (2,320)	\$ (440)	\$ (550)	\$ (3,310)
Gross Margin (Tot Revenue - COGS)	\$ (1,680)	\$ 340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	\$ (10)	\$ (10)	\$ (30)
Rent & Utilities	\$ (100)	\$ (120)	\$ (135)	\$ (355)
Total Overhead Cost	\$ (110)	\$ (130)	\$ (145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	\$ 210	\$ 205	\$ (1,375)

Gross Margin is the difference between sales revenues and production costs, excluding costs associated with overhead, payroll, interest and taxes. It is generally used to determine the incremental value of sales.

Program Use: Measure what services are most profitable

Source: Booz Allen Hamilton

The purpose of the income statement is to track a company's profitability over time

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	\$ 700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	\$ 80	\$ 100	\$ 220
Total Revenues	\$ 640	\$ 780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Loan Buy Down Cost	\$ (300)	\$ (400)	\$ (500)	\$ (1,200)
Contractor Sales Training Materials	\$ (20)	\$ (40)	\$ (50)	\$ (110)
Total COGS	\$ (2,320)	\$ (440)	\$ (550)	\$ (3,310)
Gross Margin (Tot Revenue - COGS)	\$ (1,680)	\$ 340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	\$ (10)	\$ (10)	\$ (30)
Rent & Utilities	\$ (100)	\$ (120)	\$ (135)	\$ (355)
Total Overhead Cost	\$ (110)	\$ (130)	\$ (145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	\$ 210	\$ 205	\$ (1,375)

Overhead is the operating expenses of a business which cannot be attributed to any one specific business activity, but which are still necessary for a business to function (also known as fixed costs)

Program Examples:
Reporting administration, rent, utilities

Source: Booz Allen Hamilton

The purpose of the income statement is to track a company's profitability over time

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	\$ 700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	\$ 80	\$ 100	\$ 220
Total Revenues	\$ 640	\$ 780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Loan Buy Down Cost	\$ (300)	\$ (400)	\$ (500)	\$ (1,200)
Contractor Sales Training Materials	\$ (20)	\$ (40)	\$ (50)	\$ (110)
Total COGS	\$ (2,320)	\$ (440)	\$ (550)	\$ (3,310)
Gross Margin (Tot Revenue - COGS)	\$ (1,680)	\$ 340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	\$ (10)	\$ (10)	\$ (30)
Rent & Utilities	\$ (100)	\$ (120)	\$ (135)	\$ (355)
Total Overhead Cost	\$ (110)	\$ (130)	\$ (145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	\$ 210	\$ 205	\$ (1,375)

Net Profit is the total amount a firm makes after all expenses have been accounted for. Positive net profit is critical for a business to stay viable over time.

Program Use: Measure long term sustainability

Source: Booz Allen Hamilton

The Income Statement

The purpose of the income statement is to track a company's profitability over time

Sample Income Statement

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$ 600	\$ 700	\$ 800	\$ 2,100
Contractor Training Fees	\$ 40	\$ 80	\$ 100	\$ 220
Total Revenues	\$ 640	\$ 780	\$ 900	\$ 2,320
Cost of Goods Sold (COGS)				
Initial Fund Investment	\$ (2,000)	\$ -	\$ -	\$ (2,000)
Program Admin	\$ (300)	\$ (400)	\$ (500)	\$ (1,200)
Contracting Materials	\$ (20)	\$ (40)	\$ (50)	\$ (110)
Total COGS	\$ (2,320)	\$ (440)	\$ (550)	\$ (3,310)
Revenue - COGS	\$ (1,680)	\$ 340	\$ 350	\$ (990)
Overhead Costs				
Program Admin	\$ (10)	\$ (10)	\$ (10)	\$ (30)
Rent & Utilities	\$ (100)	\$ (120)	\$ (135)	\$ (355)
Total Overhead Cost	\$ (110)	\$ (130)	\$ (145)	\$ (385)
Net Profit (Tot. Revenue - Tot. Cost)	\$ (1,790)	\$ 210	\$ 205	\$ (1,375)

Revenues	2010	2011	2012 (Forecast)	Total
Customer Interest Payments	\$600	\$700	\$800	\$2,100

Source: Booz Allen Hamilton

- For you, as a management tool for your day-to-day work
- For you, as a planning tool for the future of your program
- For funders, as a way to understand your financial position and needs
- For lenders and bond rating analysts, as a way to judge your credit worthiness



Ready

1. Revenue and Cost Manual



Aim

2. Use appropriate estimation methods
3. Test different assumptions
4. Project multiple years



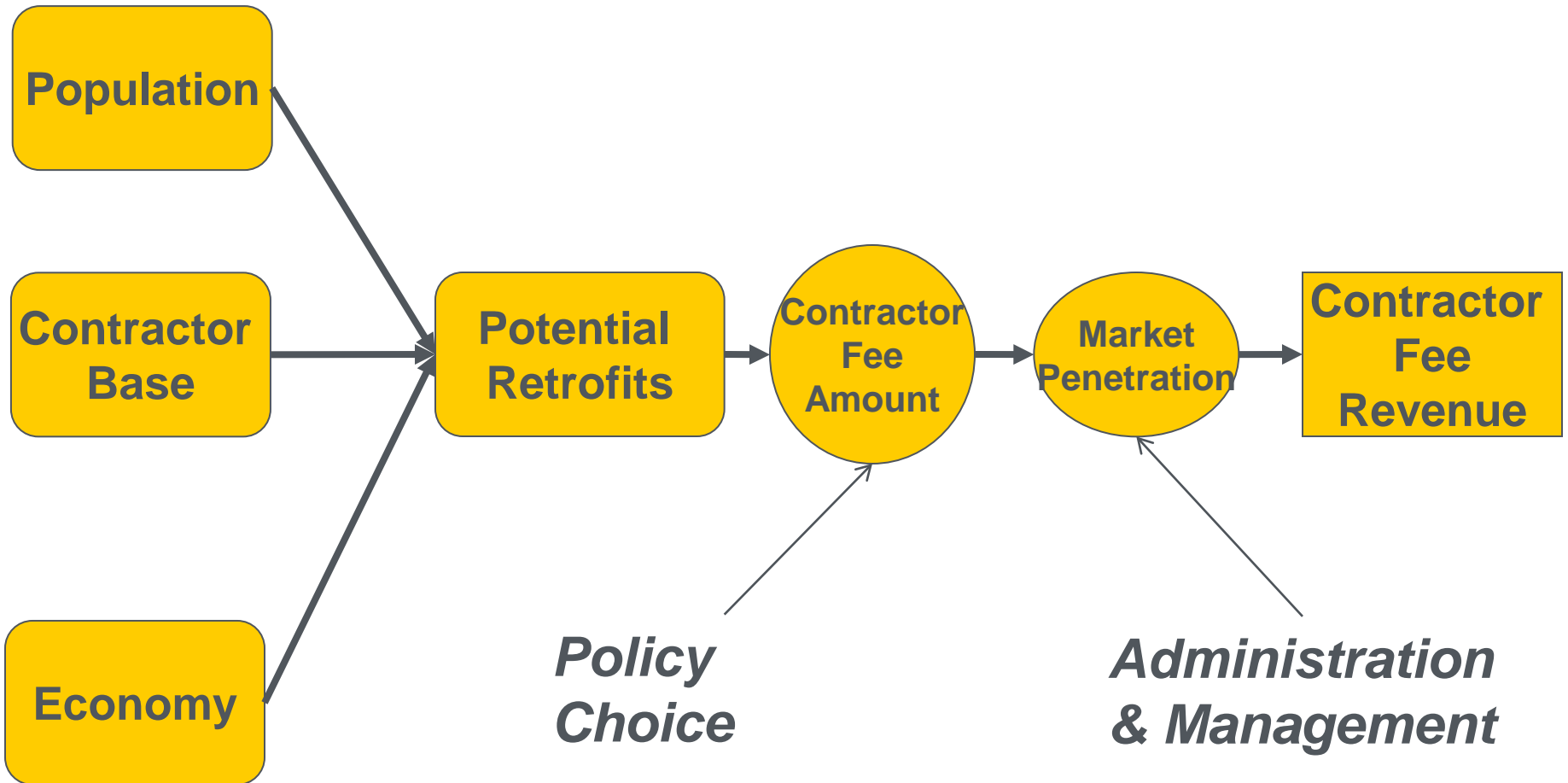
Fire

5. Update estimates over the year for adjustment
6. Verify accuracy of estimates for future projections

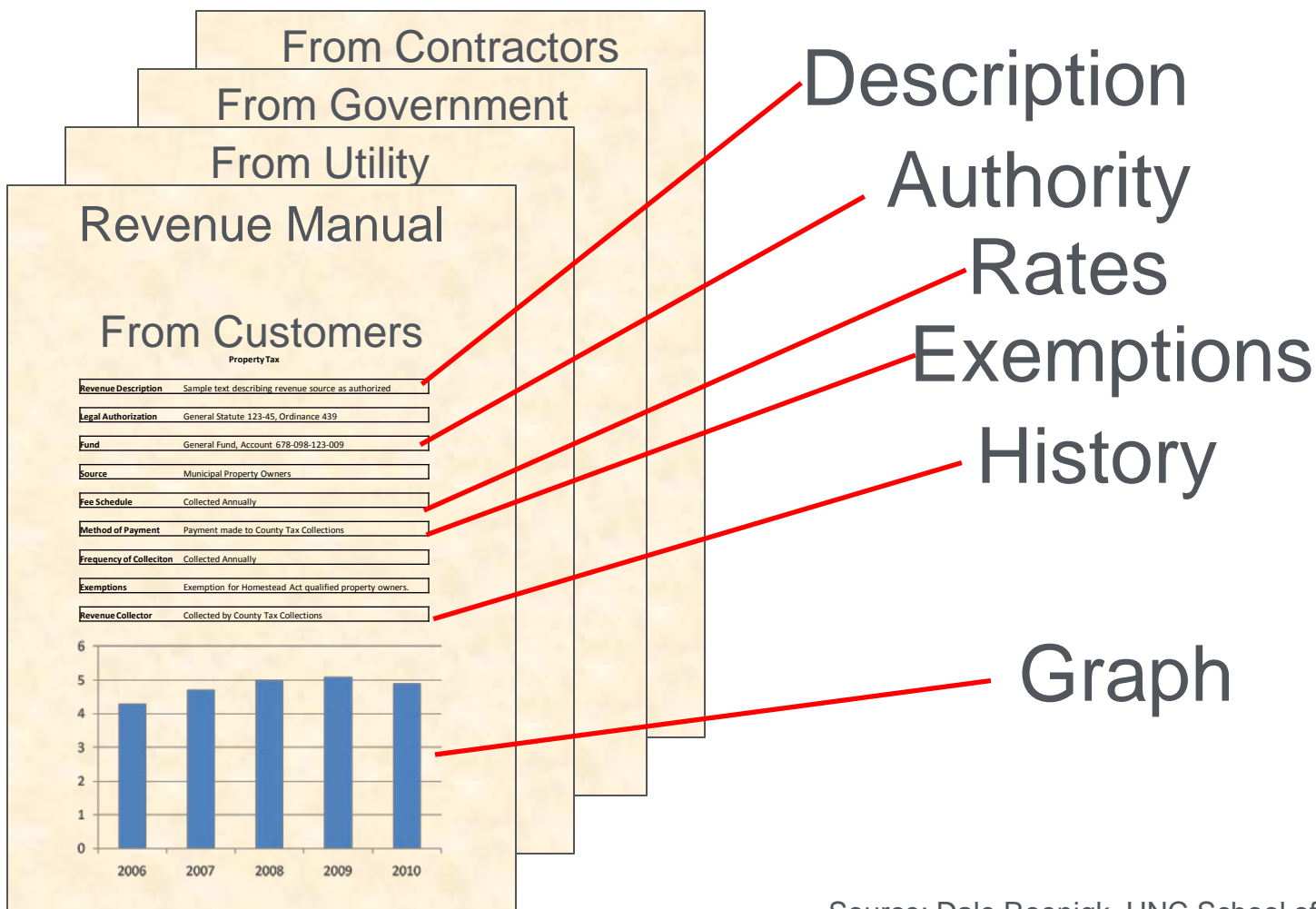
- To get ready, we need to understand our revenue sources and costs to know what we are aiming at



Every revenue source has a basic set of factors which determines its amount



Best Practice #1 is to create and use a revenue manual



Source: Dale Roenigk, UNC School of Government

- There are certain costs that should be expected for your program regardless of size or performance. These are ***fixed costs***
- Other costs vary depending on the success of your program effort and the volume of your work. These are ***variable costs***. The accuracy of your estimate here depends on how well you anticipate the market demand for your services

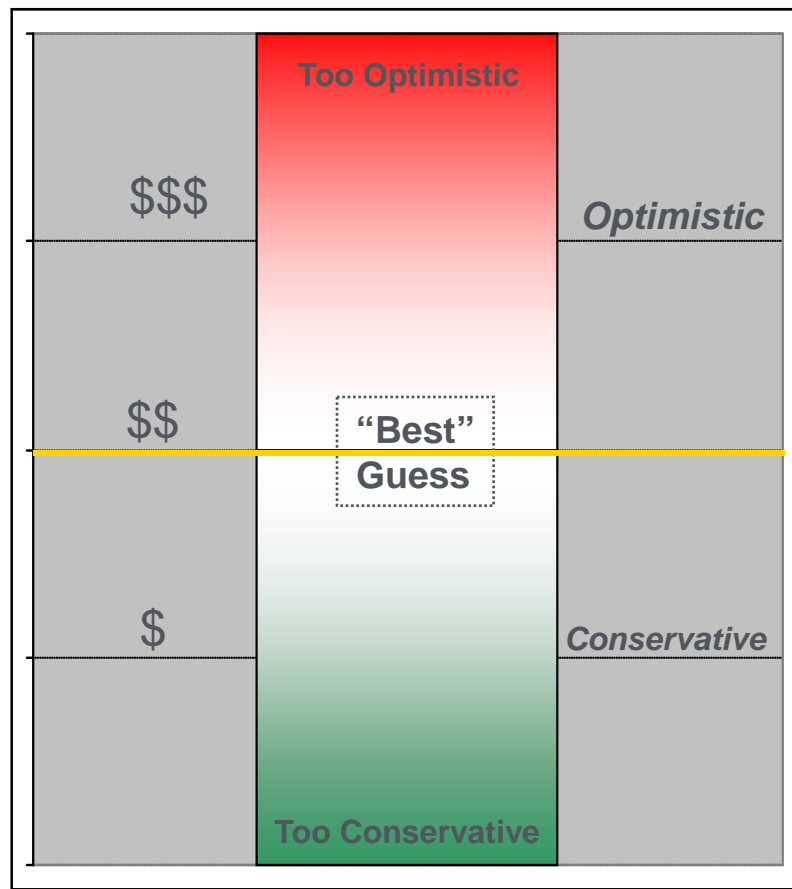
Fixed Costs

- Salaries and benefits of employees for administration and management
- Office expenses
- Other overhead
- Marketing

Variable Costs

- Rebates
- Loan buydowns
- Contractor training costs
- Salaries and benefits of employees for energy concierge service time

There are consequences on both sides of missing estimates



- **Too Optimistic**
 - *Insufficient Revenues and/or excess costs*
 - Mid-year cutbacks
 - Tapping into reserves
- **Too Conservative**
 - *Excess Revenues and/or lower costs*
 - Seems like a good thing, but it may mean services are priced incorrectly

- We need a set of tools or methods for making revenue estimations
- They can be either qualitative or quantitative



Source: Dale Roenigk, UNC School of Government

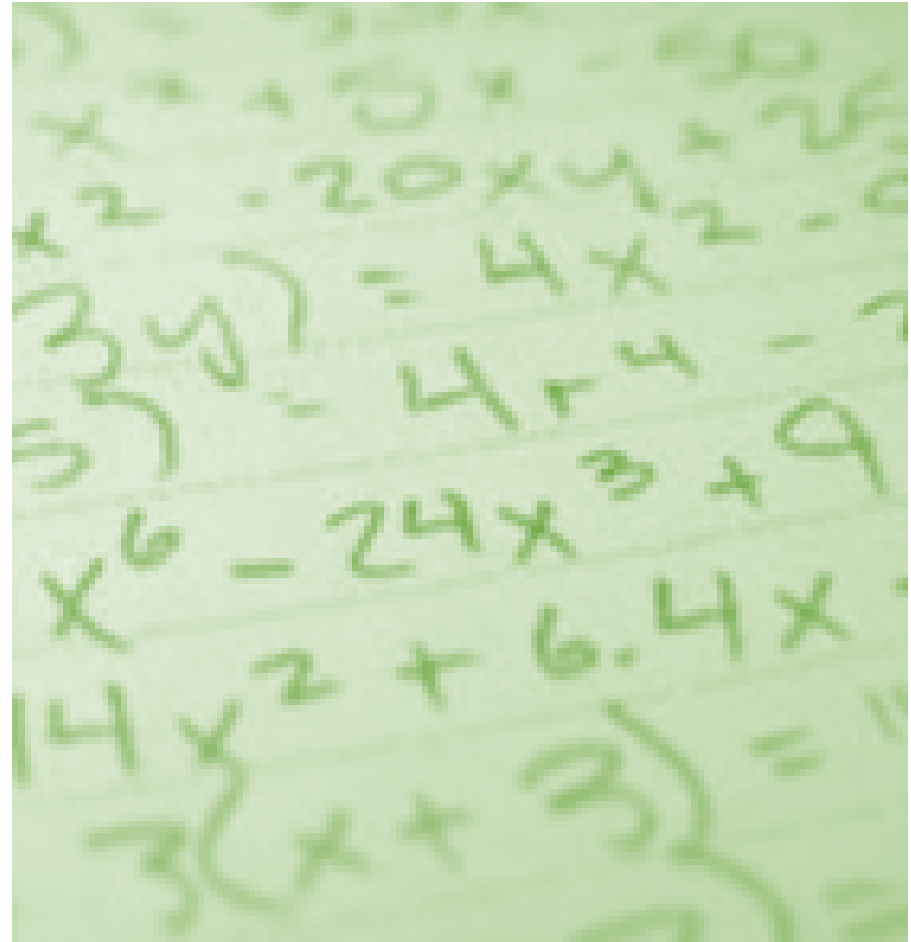
Qualitative methods rely on some expert judgment to make estimates

- Quick and easy, though subject to biases and inconsistency
- Perhaps best for programs without years of data



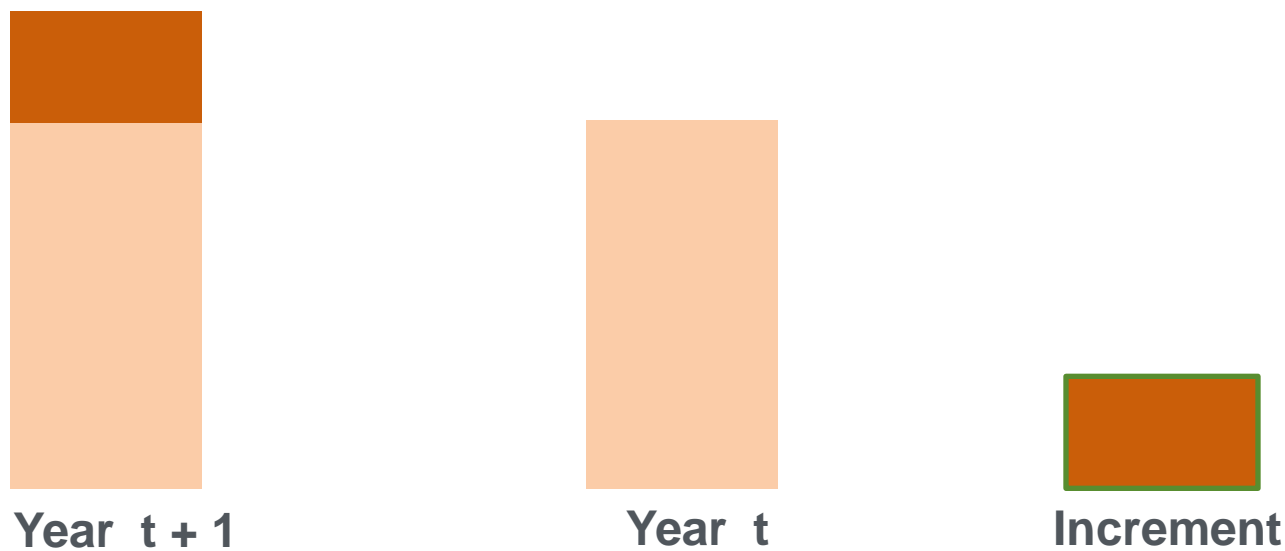
Quantitative methods rely on numbers to make estimates

- The most common quantitative methods are trend models
 - Incremental
 - Moving Average
 - Time Series Simple Regression



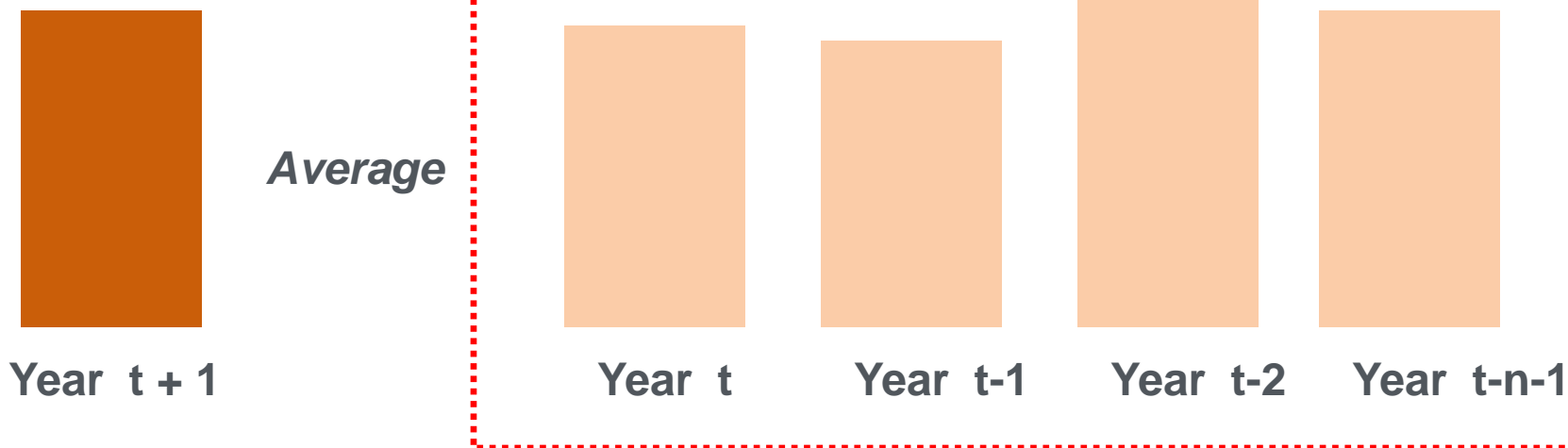
- Add an increment to prior years to produce the estimate

$$\text{Expected}_{t+1} = \text{Actual}_t + \textit{increment}$$



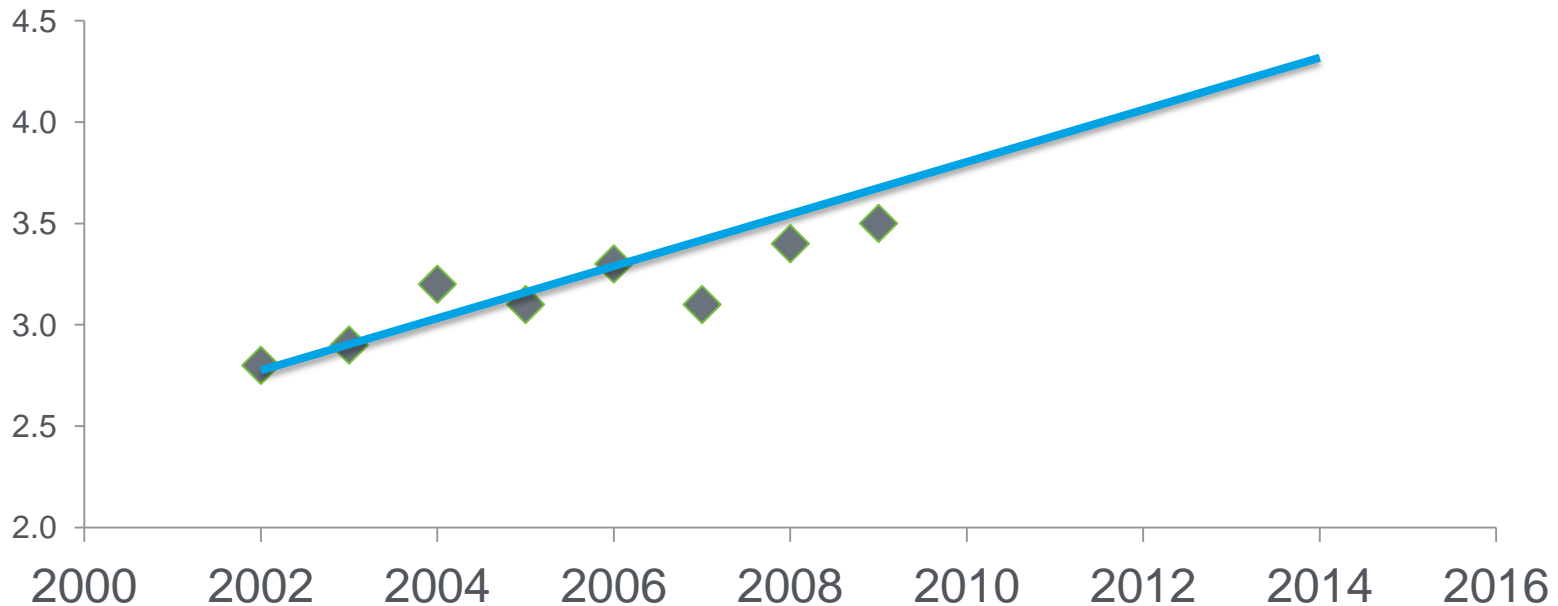
Uses average of last “n” years. The average “moves” as it goes forward each year.

$$\text{Expected}_{t+1} = \text{Average} (\text{Actual}_t, \text{Actual}_{t-1}, \dots, \text{Actual}_{t-n-1})$$



Uses a simple statistical regression to estimate an equation

$$\text{Expected}_t = \text{intercept} + (\text{slope} * \text{year})$$



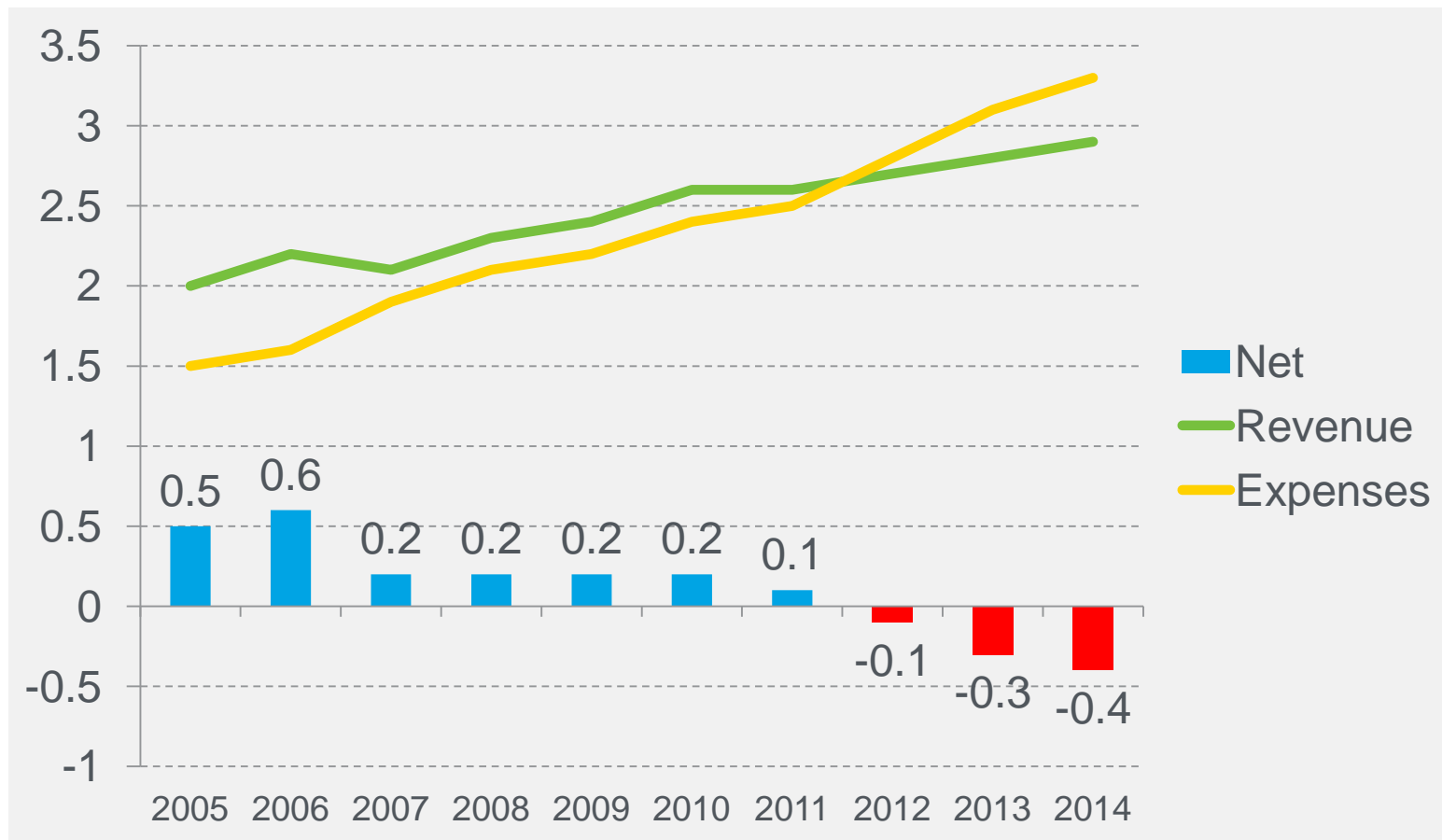
- *The slope is the estimated increment for a single year*
- *Regression estimates are usually linear but can take other forms*

Best Practice #2: Select appropriate method to use for estimation

Comparing Estimation Methods			
Method	Accuracy	Effort	Transparency
<i>Judgmental</i>	Low to Moderate May be reasonably high if expert is good	Low	Low to Moderate as it depends on "expert"
<i>Trend</i>	Moderate to high when stable	Low to Moderate	Moderate to High

- As part of the projection process, alternative assumptions should be tested to understand the range of possibilities and sensitivity of results to key assumptions
 - Number of retrofits
 - Number of participating contractors
- Assumptions causing wider variation may warrant additional analysis and discussion among decision makers. Consider best and worst case scenarios

Best Practice #4: Project finances for 3-5 years



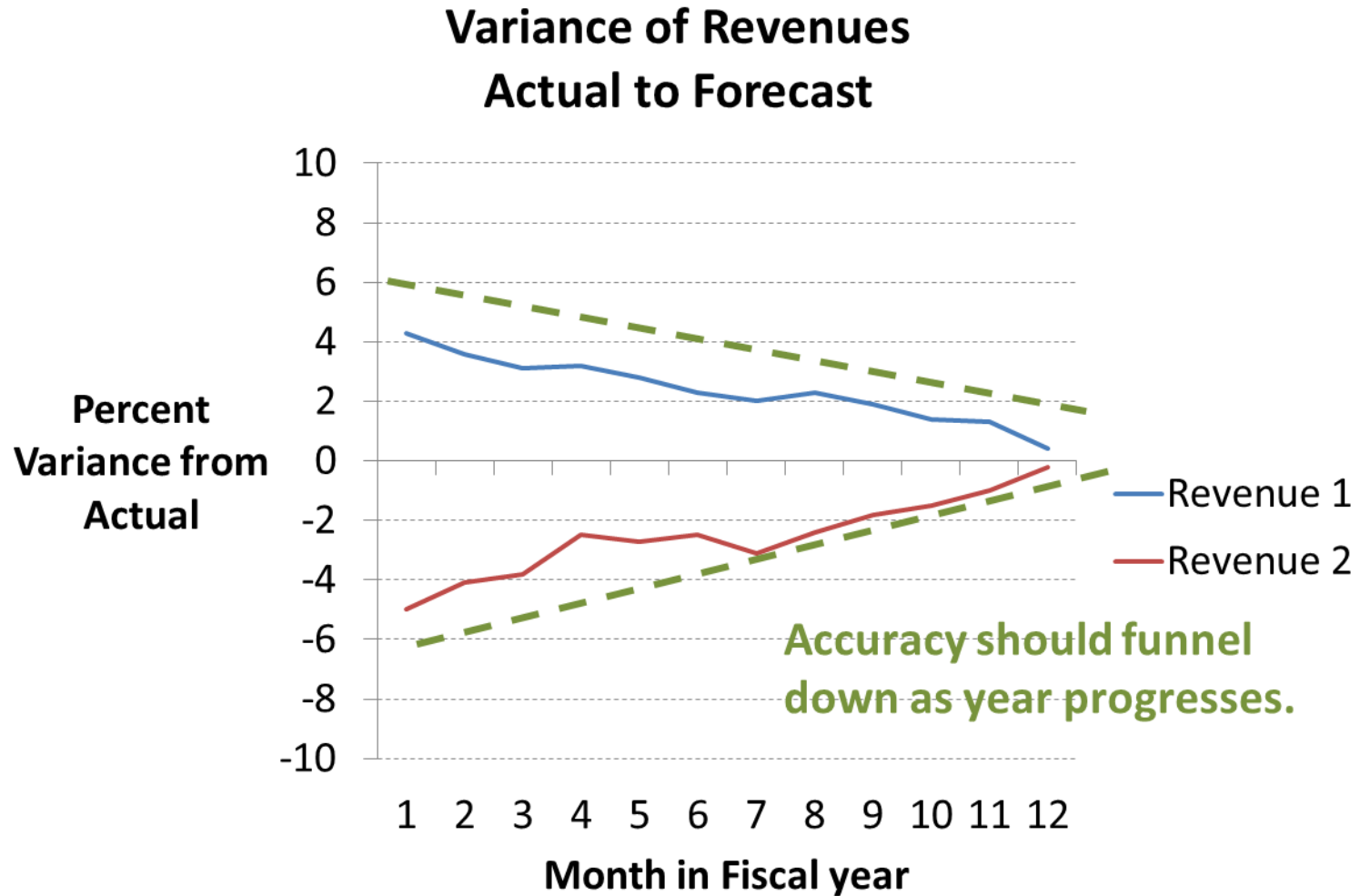
Source: Dale Roenigk, UNC School of Government

- After the budget estimates have been made, the forecaster's job is not over. You need to monitor the accuracy of the forecasts both for current needs and for improving the accuracy of future projections



Source: Dale Roenigk, UNC School of Government

Best Practice #5: Track actual costs and revenues against estimates



Source: Dale Roenigk, UNC School of Government

Example of a quarterly revenue monitoring dashboard

Town of Blue Heaven

Fiscal Report on General Fund Revenues and Expenditures

FY 2006-2007, Year to Date Through March 31, 2007

Overall revenues collected are on target through the end of March.

Total general fund revenues collected are within historical expectations, only 1.6% lower than average.

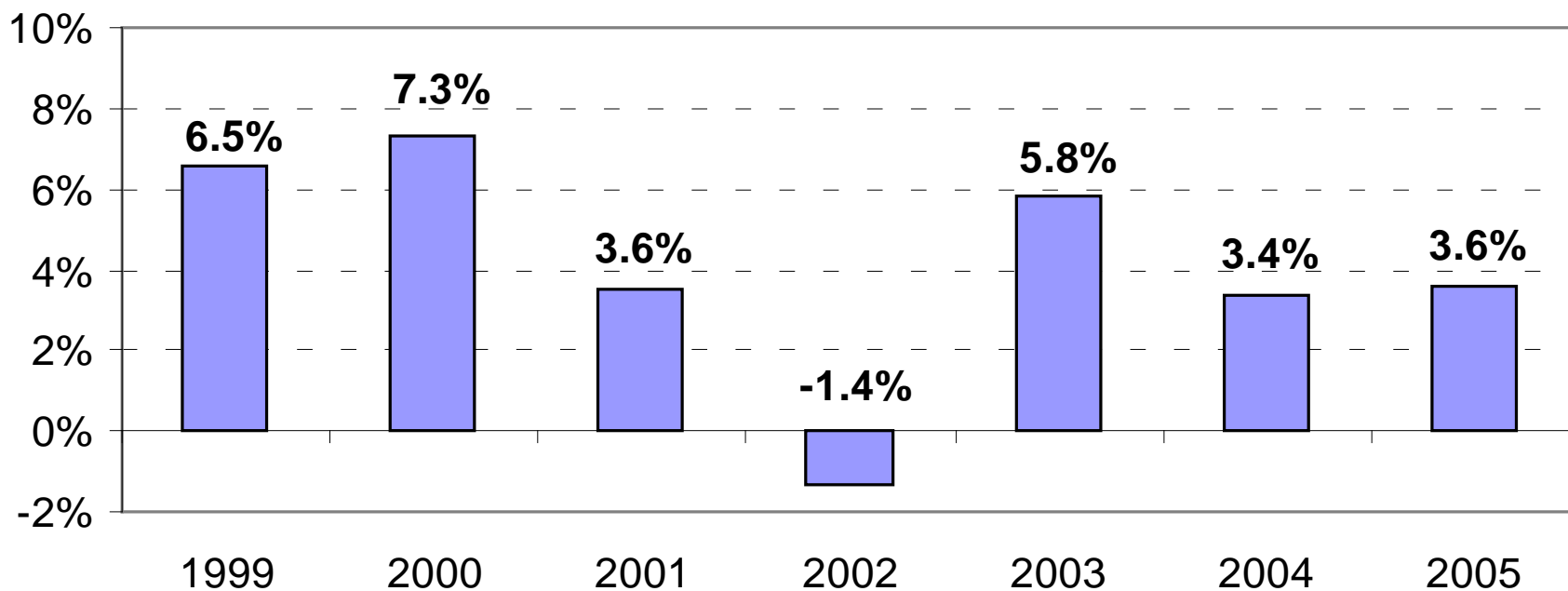
GENERAL FUND REVENUES	AMENDED FY06-07 BUDGET	YTD COLLECTIONS	% COLLECTED YTD	EXPECTED (avg of last 5 years)	Status of Collections	ALERT (over 5% variance)
Ad Valorem Taxes	\$9,385,980	\$9,495,059	101.2%	96.5%		
Local Sales Taxes*	\$3,159,428	\$1,593,415	50.4%	51.0%		
Permits and Fees	\$932,828	\$748,656	80.3%	85.6%		● -5%
Restricted Intergovernmental	\$712,136	\$654,588	91.9%	80.0%		● 12%
Unrestricted Intergovernmental	\$575,853	\$321,306	55.8%	73.2%		● -17%
Other Taxes/Licenses	\$449,199	\$352,219	78.4%	68.3%		● 10%
Sales and Services	\$277,400	\$222,907	80.4%	84.1%		
Investment Earnings	\$75,000	\$296,996	396.0%	114.9%		● 281%
Other Revenues	\$46,203	\$60,456	130.8%	121.3%		● 10%
Other Financing Sources	\$3,786,939	\$0	0.0%	3.8%		
TOTAL REVENUES	\$19,400,966	\$13,745,603	70.9%	72.5%		-1.6%

Target Zone is defined as 5% in both directions from expected level of collections

Target Zone Budget

Best Practice #6: Verify accuracy of estimates against actual results

Comparison of Actual Revenues to Budgeted Revenues General Fund



Source: Dale Roenigk, UNC School of Government

- Uncertainty and variability cannot be eliminated.
- A degree of conservatism is warranted particularly for more volatile revenue sources.
- Adequate reserves can help with the inevitable misses.
- Adopt best practices where possible.

- Profits are key to the long-term sustainability of your programs. But don't lose sight of whether your program is spending money *efficiently* to meet your program goals

Three examples of performance measures are:

- **Workload measures**
 - tell you “how much” or “how many” (e.g. # of retrofits, # of contractor trainings)
- **Efficiency measures**
 - relate outputs to resources consumed (e.g., retrofits per dollar spent, KWH saved per dollar spent, leads generated per unique website hit)
- **Effectiveness measures**
 - tell you “how well” (e.g., % energy reduction per project, penetration rate of energy projects)

- Accountability/Communication
- Support of Planning/Budgeting Efforts
- To Motivate Operational Improvement
- Program Evaluation
- Reallocation of Resources
- Directing Operations/Contract Monitoring
- Benchmarking

© 2004 Ted Goff



“This part of the plan will be funded with all the unused money we must have laying around someplace.”

5 Breakout Sessions on Revenue Streams

- Customer-Based Revenue Streams
 - (e.g., fee for service)
- Contractor-Based Revenue Streams
 - (e.g., fee for service)
- Utility-Based Revenue Streams
 - (e.g., system benefits charge)
- Financial Institution-Based Revenue Streams
 - (e.g., referral fees)
- Local Government-Based Revenue Streams
 - (e.g., bonds, fees, general revenues)

Questions?

Glenn Barnes

UNC Environmental Finance Center

glennbarnes@sog.unc.edu

919-962-2789