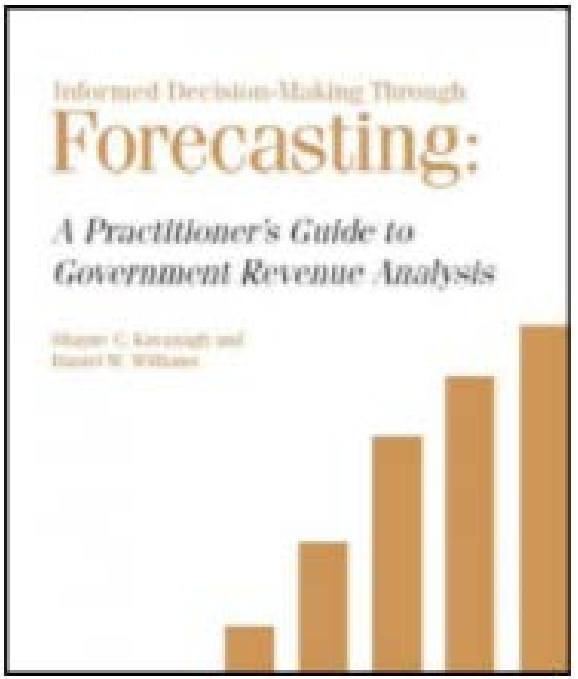
Informed Decision Making Through Revenue Analysis

Shayne Kavanagh, GFOA
Grace Leung, Assistant City Manager, City of Irvine

From GFOA's New Book

Informed Decision Making Though Forecasting: A Practitioners Guide to Revenue Analysis



"The book is easy to read and understand, with helpful examples. I heartily recommend it to all public finance officials"
Dianne Shannon, Deputy Director, Management & Budget, City of Dayton, Ohio

"This book is a fantastic resource for forecasting of all experience levels; a must have for every budget office."
Dawn Buckland, Administrative Services Director City of Paradise Valley, Arizona

The City of Irvine

- Incorporated 1971
- Population 268,000 and Growing
- 66 Square Miles
  - 1/3 Residential
  - 1/3 Commercial/Retail
  - 1/3 Permanent Open Space
- Several Services provided by County or Special District
  - Fire, Library, Utilities

The Forecasting Environment

- Intense demand for quality information for decision making
  - Increase scrutiny on forecasts
- Uncertainty about the future
  - No one person will have the answers
  - Skepticism about projections, especially long-term.
- “New Normal” economy calls value of historical data into question
  - Can’t rely on purely quantitative techniques

Focus on Process

- Need to constantly reflect on *not* just accuracy of forecast, but on *how* the forecast was reached
  - Understand what you can control and recognize/describe what you can't.

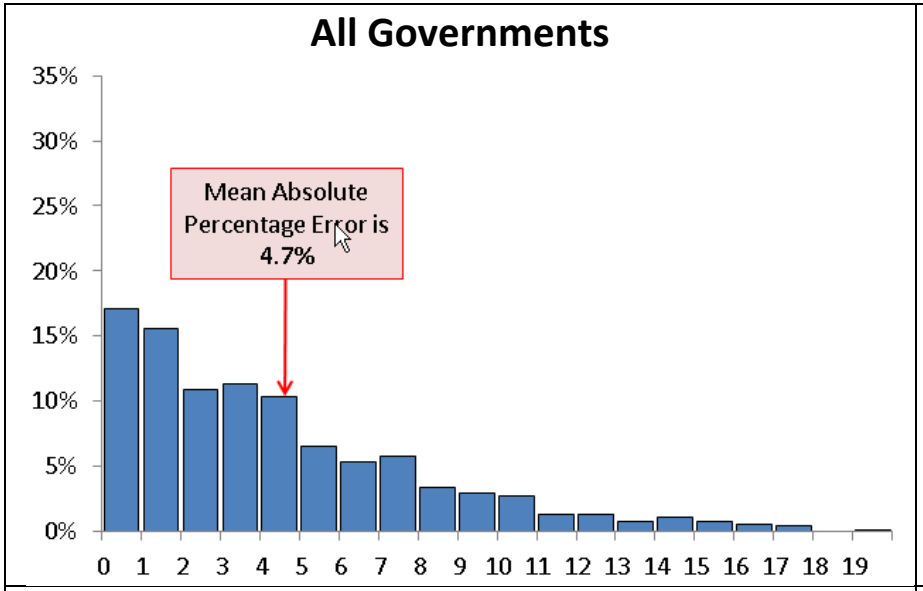
Some Definitions

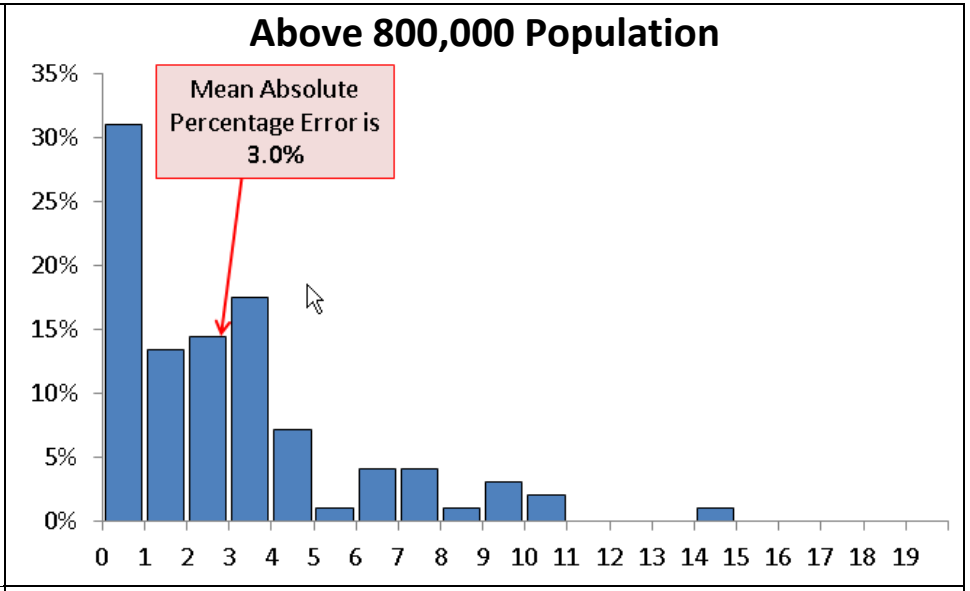
- **Accurate**: The difference between the forecast and the actual number (the error) is minimized.

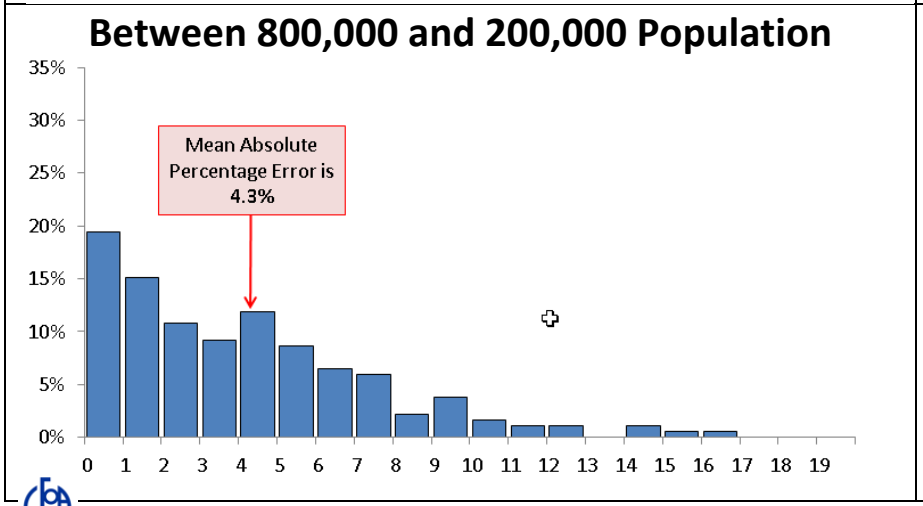
- **Effective**: The forecast impacts real-life decisions

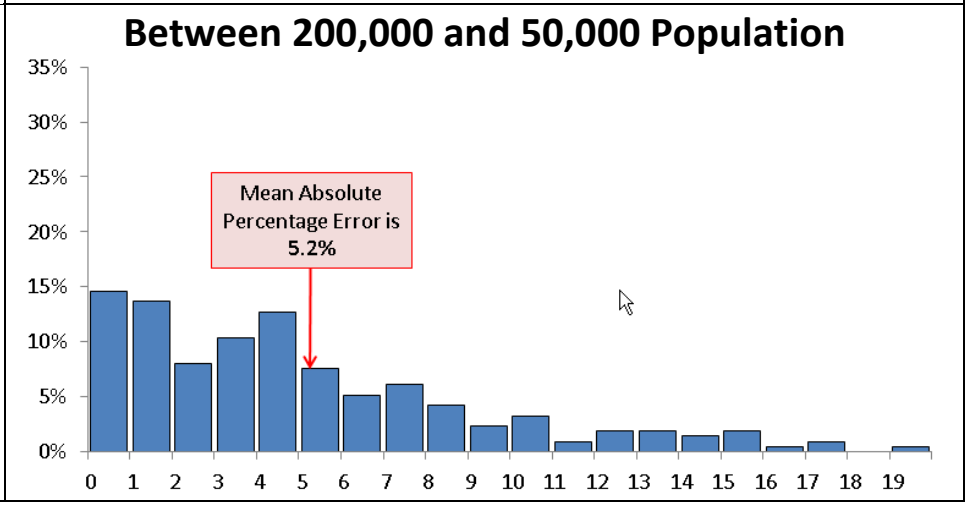
Accurate Forecasts

How Accurate is Accurate?

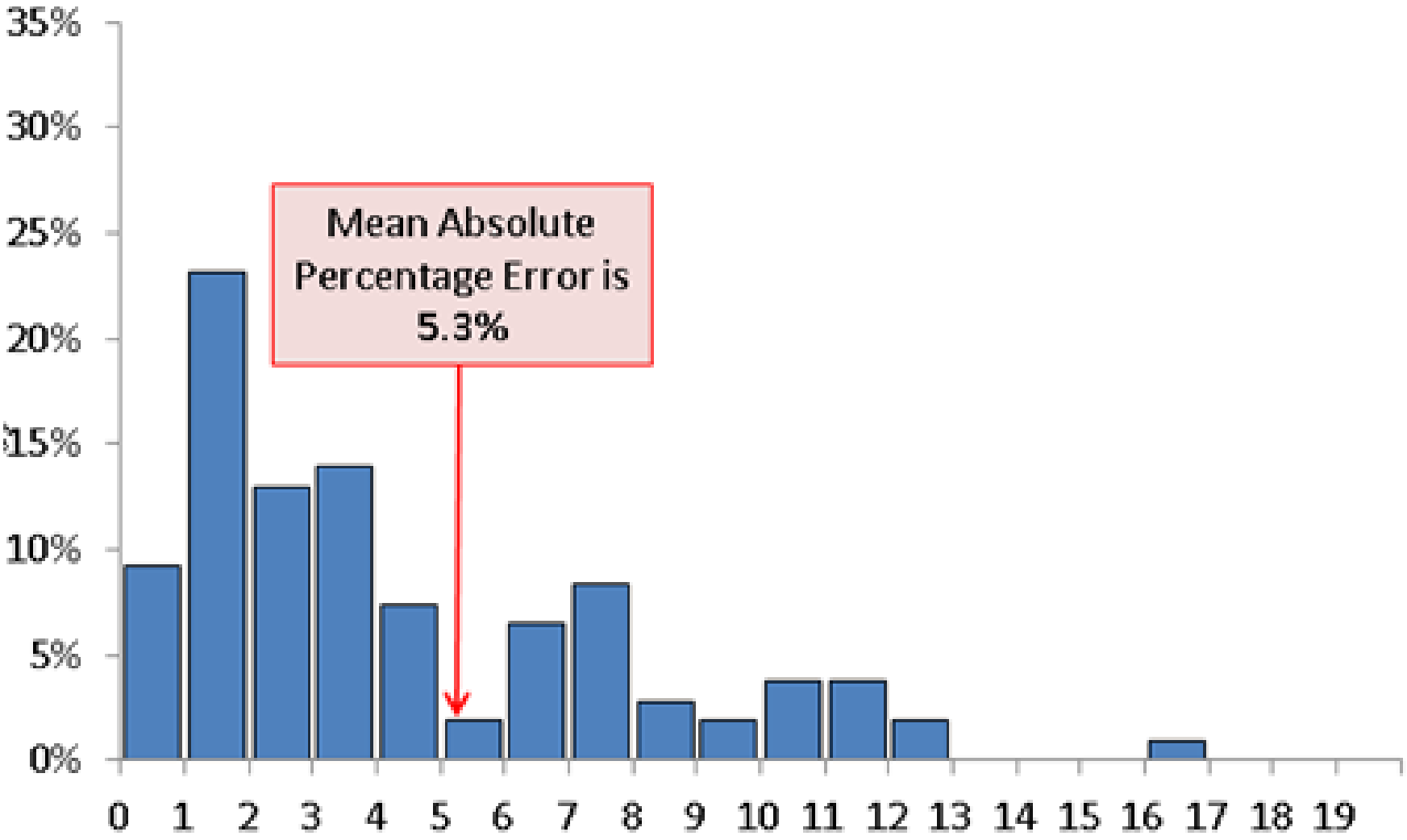








Less than 50,000



Performance Metrics for Revenue Forecasting

- Sets expectations and communicates to policymakers
- City of Sunnyvale – General Fund revenues come within 5% of May revised estimate
- City of Riverside – Difference between year-end actual General Fund Revenues and approved biennial budgeted revenues – maintain below 2%

What Technique is Most Accurate?

1. Forecast software
2. Exponential smoothing
3. Honorable mention: last real observation
4. Dark horse: Mathematical model
5. Special mention: hybrid techniques

How to Be More Accurate

- First point…

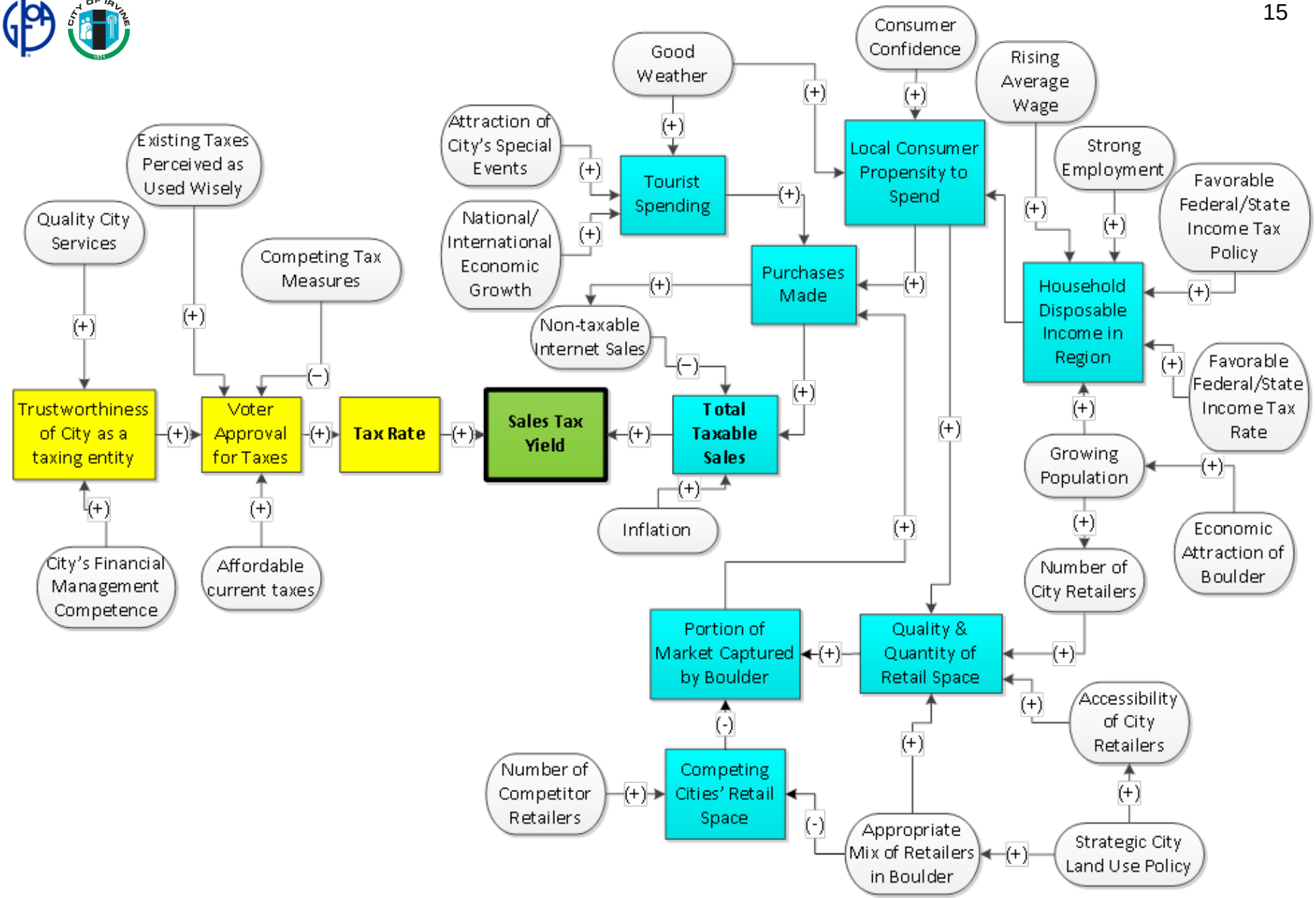
Adopting highly sophisticated forecasting methods are probably not the answer

Step 1

- Investigate your errors
- Gather historical forecasts and actuals and look into why the forecast was off
  - Basic assumptions not met?
  - Data of poor quality?
  - Does the quantitative forecasting technique provide a poor fit to the data?
  - Are quantitative forecasts being over-adjusted?
  - Have policy changes after the forecast was made had an unanticipated effect on revenues?
- Make this a continuous process

Better Know Your Revenue

- “Relentlessly” investigate your revenue
- Talk to people close to the action
- Document an explicit model


Consumer Confidence
Good Weather
Rising Average Wage
Attraction of City's Special Events
Local Consumer Propensity to Spend
Strong Employment
Existing Taxes Perceived as Used Wisely
Tourist Spending
Favorable Federal/State Income Tax Policy
Quality City Services
National/ International Economic Growth
Competing Tax Measures
Purchases Made
Household Disposable Income in Region
Non-taxable Internet Sales
Favorable Federal/State Income Tax Rate
Trustworthiness of City as a taxing entity
Voter Approval for Taxes
Tax Rate
Sales Tax Yield
Total Taxable Sales
Growing Population
Inflation
Economic Attraction of Boulder
City's Financial Management Competence
Affordable current taxes
Number of City Retailers
Portion of Market Captured by Boulder
Quality & Quantity of Retail Space
Accessibility of City Retailers
Number of Competitor Retailers
Competing Cities' Retail Space
Appropriate Mix of Retailers in Boulder
Strategic City Land Use Policy

Use Past Experience

- History does not repeat itself, but it does rhyme
  - Should use history to scenario-build, particularly in downturns

"In hindsight, people consistently exaggerate what could have been anticipated in foresight." – Baruch Fischhoff

Polish Up Your Data

- Garbage in, Garbage Out
- Invest in data cleaning
  - Find and adjust outliers and anomalies
    - Revenue audit?
  - Correct for accounting idiosyncrasies
    - Processing issues?
  - Consider seasonality
    - Christmas shopping?
  - Build a forecasting database

Get More Perspectives

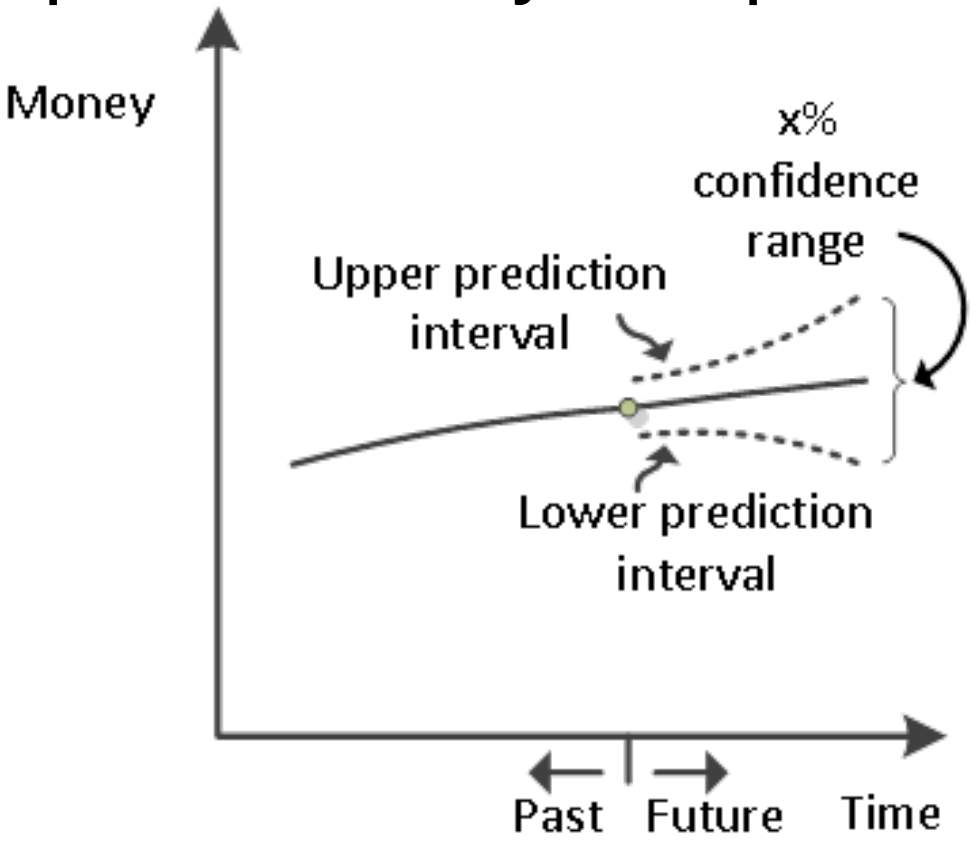
- Quantitative
  - Use more than one forecasting technique
  - Average the results
- Judgmental
  - Widen the circle
  - Manage the team carefully
- Think like a fox

Make things as simple as possible, but not simpler

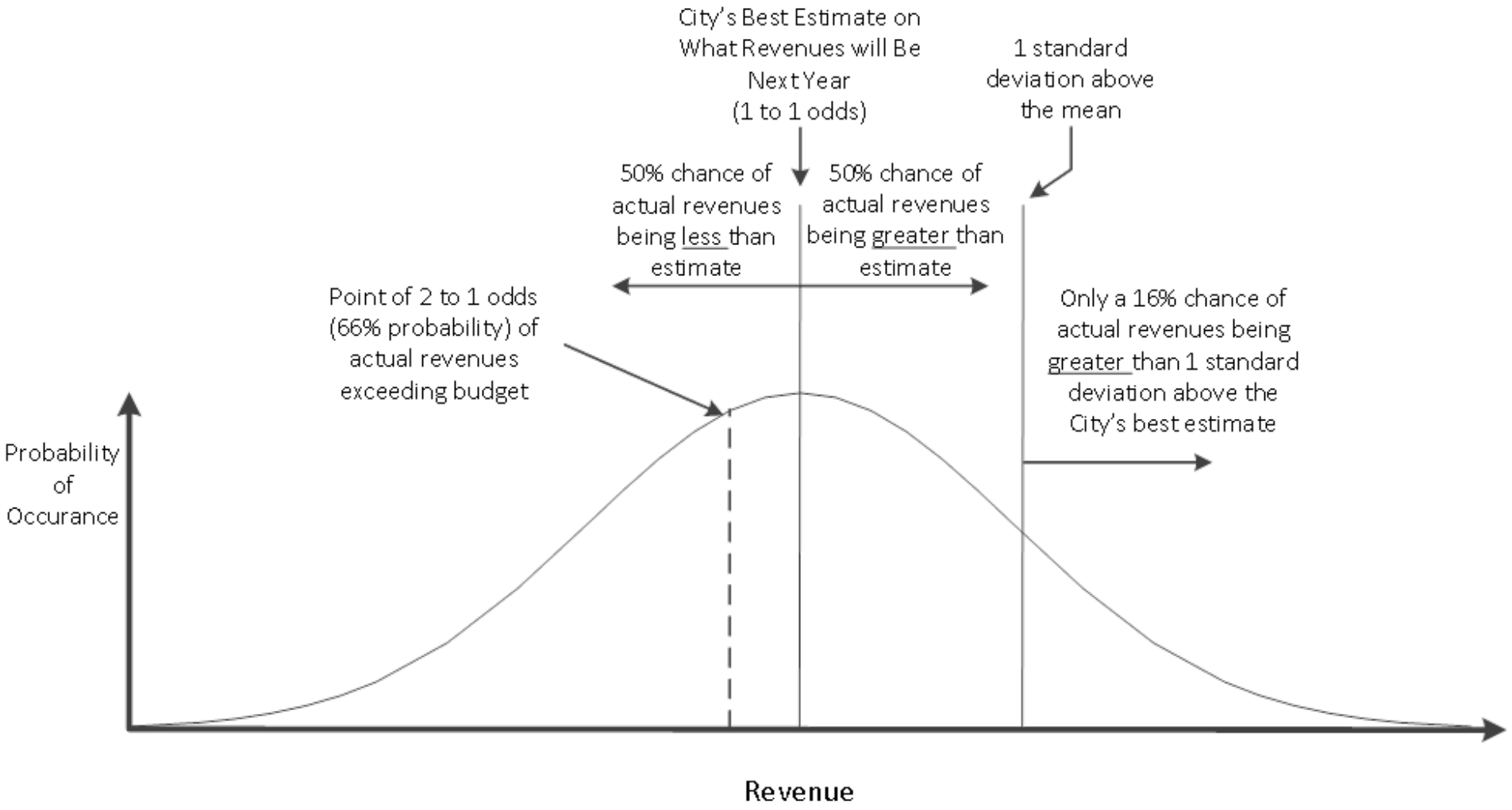
- Perhaps your model is too complex…
  - Inherited a model that is poorly documented
  - Overreaches on what it tries to accomplish
- City of Irvine made major gains by simplifying

Accept Uncertainty

- Your forecast will be wrong…
- …so accept uncertainty and plan for it

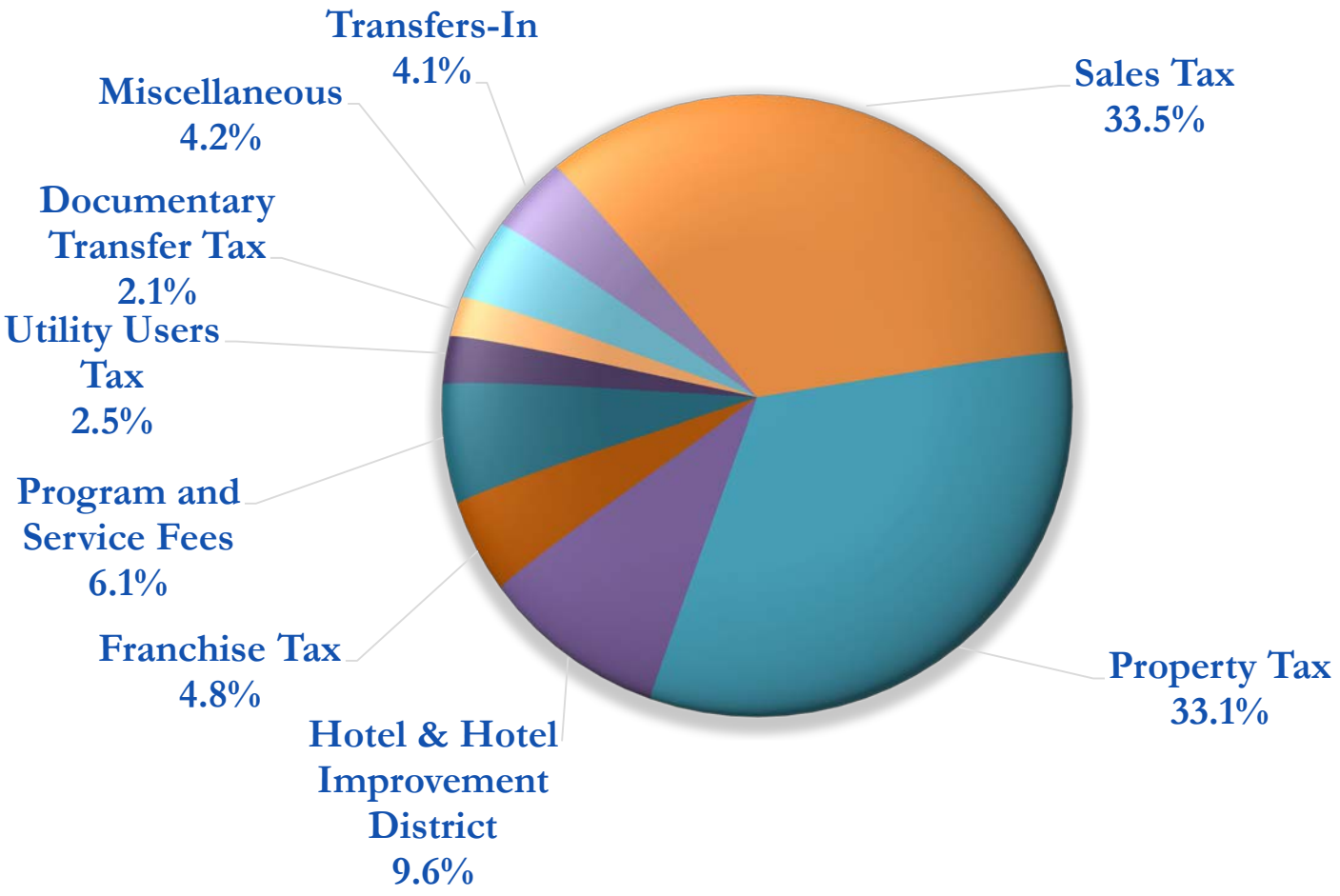


Colorado Springs Approach



City of Irvine General Fund Revenues

FY 2017-18



$191.9M

Revenue Forecasting Tools

- Forecasting and Trend Analysis Modeling
- Monthly Revenue/Expenditure Updates
- Expert Opinion – Sales/Property Tax Consultants
- Institutional Forecasts
- Established Formulas

Forecasting Model

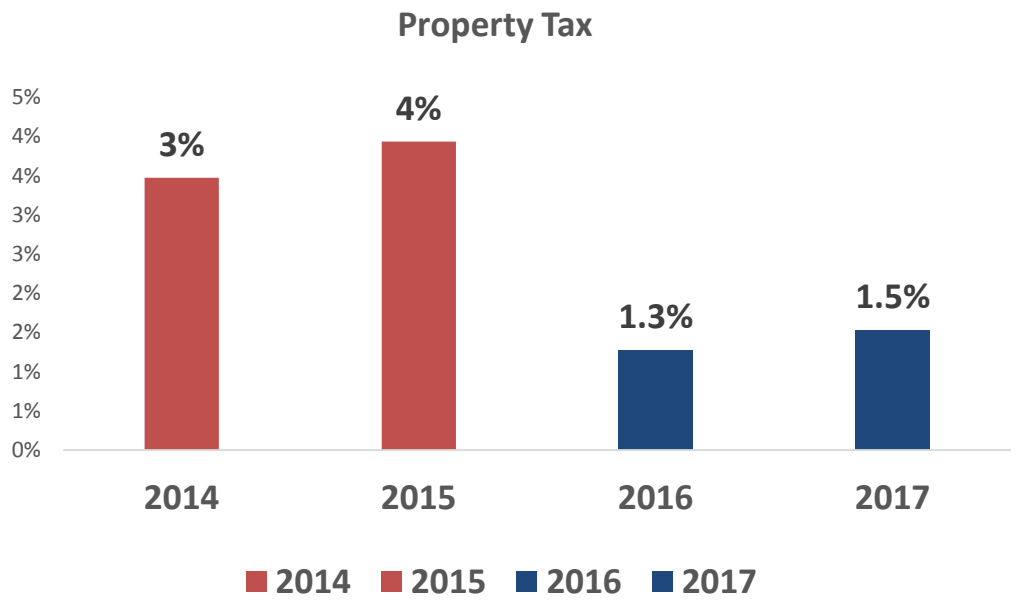
- Excel based
- Documents forecast methodology for all General Fund revenues
- Forecast for 25 years
- Source for Revenue Section of Strategic Business Plan

Forecast Assumptions

HOTEL TAX	*(Room inventory * average room rental * occupancy rate * tax rate); Based on sales tax growth*	14,666,000	14,959,320	15,258,506
			15,270,527	15,569,025
		-0.3%	2.0%	2.0%
UTILITY USERS TAX	*Residential, commercial, public facilities utilities demand (SoCal Edison, SoCal Gas, Cable, Refuse); City contractual terms; Assume pop. & inflation pending revised forecast assumptions*		0.0%	0.0%
		4,794,000	4,991,607	5,195,053
			4,794,000	4,991,607
		-4.6%	4.1%	4.1%
FRANCHISE TAX	*Use of public infrastructure franchise access (SoCal Edison, SoCal Gas, Cable, Refuse); City contractual terms; Assume pop. & inflation*		0.0%	0.0%
		9,218,000	9,597,963	9,989,152
			9,218,000	9,597,963
		-6.8%	4.1%	4.1%

Forecast Modeling Challenges

- Outdated Information
- Formulas no longer made sense



Forecast Modeling Challenges

Property Tax Old Data Inputs

- More than 76 Data Inputs
  - Market Value of Homes by 6 Categories
  - Turnover of Residential Property Each Year
  - Dwelling Units by 7 Categories
  - Square Footage Summary

New Data Inputs

- Prior year assessed valuation
- Market value change
- Transaction Factor
- Prop. 13 2% Cap
- New Construction
- Tax Rate
- Population/Inflation

Forecast Modeling Challenges

Sales Tax Old Data Inputs

- More than 54 Data Inputs
  - % of Resident Spending in City/Outside
  - Employee Annual Spending
  - % of Employees Live Outside of Irvine
  - Projected Cumulative Value of New Homes
  - Sales Tax Per 24 Categories

New Data Inputs

- Sales Tax Receipts by Business Category
- Tax Rate
- Population/Inflation

Sales Tax Forecasting Challenges

- Understanding mix of businesses
  - Retail vs. Business to Business
  - Growing vs. Stable Population
- Understanding longer-term trends
- Year-to-year volatility
- Past history no longer applicable
- Using reserves to deal with uncertainty

Hotel Tax Forecasting (TOT)

- Current Formula
  - Room inventory * average room rental * occupancy rate * tax rate

- Factors to Consider
  - New Construction/Remodel
  - Types of Hotels
  - Business and Travel Trends
  - Number of Hotels

Lessons Learned

- Know your community characteristics
- Understand your inputs
- Assess risks across your major revenues
- Regularly review and update assumptions

Effective Forecasts

How do you know if forecasts are effective?

- ✓ Finance staff is brought into decisions with financial implications, before the decision is made.
- ✓ Decision-makers request a forecast, rather than the forecaster needing to push one.
- ✓ Officials ask questions about overall, long-term financial health, such as changes in one-time versus on-going revenues and how that relates to expenditure plans.
- ✓ Officials support recommendations from staff that are aligned with the forecast. Officials change their position on issues because of information provided by the forecast.

How do you know if forecasts are effective?

- ✓ When there is not enough money in the budget, officials talk about re-prioritizing and re-structuring expenditures rather than about changing the forecast estimate.
- ✓ Departments change their budget requests in response to forecast information.
- ✓ Departments offer information to help refine the forecast.

Demonstrate Command of the Details

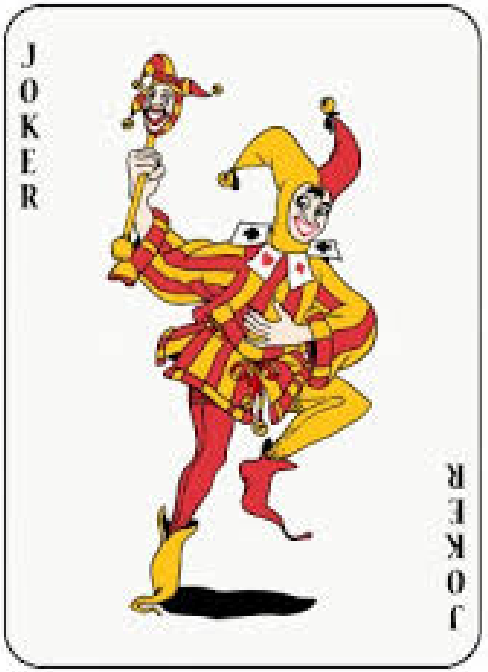
- When the forecaster shows command of the details behind the forecast…
- …The audience will have more confidence in the forecast

- Build command by through the analysis of the financial environment

Show a Clear set of Assumptions

- Show a set of assumptions that tell a story about forecast expectations

- Highlight wildcards



Create a Supportive Environment

City "A"	City "B"
Has adopted a set of financial policies so that everyone knows the standards of good financial management and guidelines for decision-making.	No written financial policies exist. Responses to issues have to be regularly re-invented.
Officials are regularly provided with survey data and other objective indicators of citizen views.	Officials only citizen input from those that come to public meetings and talk the most and/or loudest.
Staff systematically helps officials recall good decisions	Good decisions are not memorialized or used as learning devices
Have taken steps to gain broad, explicit agreement to a set of formal goals for the city.	No formal goals exist. Everyone has their own idea about what the goals are.
The budget process asks officials to consider how all available revenues can be used to best achieve the community's goals and priorities.	The budget process starts with last year's expenditures and officials focus on changes at the margins.
A strategic financial plan asks officials to think about how service priorities can be pursued over a multi-year period in a way that will result in a legacy of financially sustainability.	Budgeting is done year-to-year. The process does not ask officials to consider the long-term service or financial implications of their decisions.

Develop a Compelling Presentation

- What does the audience want to know?
  - Be sure to account for “messy” issues
- Bring the numbers down to a personal level
  - Per unit figures
  - Street-level illustrative examples
- Include a surprise
- Get emotional
  - Appeal to identity

Simulate the Future

- Help the audience put themselves in the future that is being forecasted
  - Interactive what-if analysis
  - Simulation
  - Scenario analysis

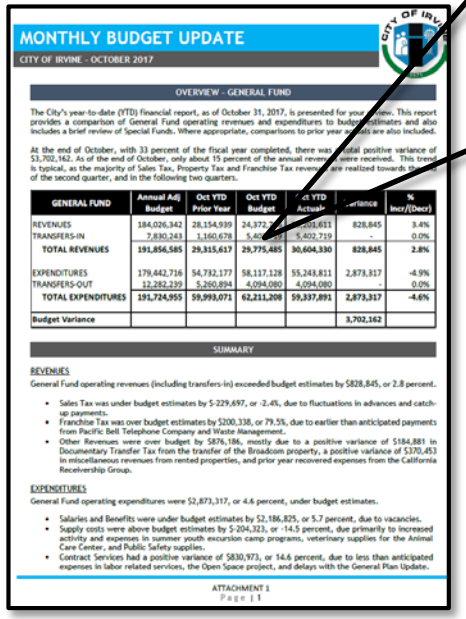
City of Irvine Strategic Business Plan

- Five-year forecast
- High-level summary
- Communication
  - Finance Commission
    - Present assumptions and scenarios
  - City Council
    - Prepare for decision making

City of Irvine Strategic Business Plan

Summary Forecast	2017-18B	2018-19F	2019-20F	2020-21F	2021-22F
Total Resources	191,856,585	194,264,240	200,883,200	207,714,088	214,194,481
Total Expenses	191,724,955	198,125,805	202,331,284	210,111,445	205,057,505
Forecast Balance	131,630	(3,861,564)	(1,448,084)	(2,397,358)	9,136,975

GENERAL FUND	Annual Adj Budget	Oct YTD Prior Year	Oct YTD Budget	Oct YTD Actuals	Variance	% Incr/(Decr)
REVENUES	184,026,342	28,154,939	24,372,766	25,201,611	828,845	3.4%
TRANSFERS-IN	7,830,243	1,160,678	5,402,719	5,402,719	-	0.0%
TOTAL REVENUES	**191,856,585**	**29,315,617**	**29,775,485**	**30,604,330**	**828,845**	**2.8%**
EXPENDITURES	179,442,716	54,732,177	58,117,128	55,243,811	2,873,317	-4.9%
TRANSFERS-OUT	12,282,239	5,260,894	4,094,080	4,094,080	-	0.0%
TOTAL EXPENDITURES	**191,724,955**	**59,993,071**	**62,211,208**	**59,337,891**	**2,873,317**	**-4.6%**
Budget Variance					**3,702,162**	



MONTHLY BUDGET UPDATE

CITY OF IRVINE - OCTOBER 2017

OVERVIEW - GENERAL FUND

The City's year-to-date (YTD) financial report, as of October 31, 2017, is presented for your review. This report provides a comparison of General Fund operating revenues and expenditures to budget estimates and also includes a brief review of Special Funds. Where appropriate, comparisons to prior year actuals are also included.

At the end of October, with 33 percent of the fiscal year completed, there was a total positive variance of $3,702,162. As of the end of October, only about 15 percent of the annual revenues were received. This trend is typical, as the majority of Sales Tax, Property Tax and Franchise Tax revenues are realized towards the end of the second quarter, and in the following two quarters.

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Budget Variance					**3,702,162**	

SUMMARY

REVENUES

General Fund operating revenues (including transfers-in) exceeded budget estimates by $828,845, or 2.8 percent.

- Sales Tax was under budget estimates by $-229,697, or -2.4%, due to fluctuations in advances and catch-up payments.
- Franchise Tax was over budget estimates by $200,338, or 79.5%, due to earlier than anticipated payments from Pacific Bell Telephone Company and Waste Management.
- Other Revenues were over budget by $876,186, mostly due to a positive variance of $184,881 in Documentary Transfer Tax from the transfer of the Broadcom property, a positive variance of $370,453 in miscellaneous revenues from rented properties, and prior year recovered expenses from the California Receivership Group.

EXPENDITURES

General Fund operating expenditures were $2,873,317, or 4.6 percent, under budget estimates.

- Salaries and Benefits were under budget estimates by $2,186,825, or 5.7 percent, due to vacancies.
- Supply costs were above budget estimates by $-204,323, or -14.5 percent, due primarily to increased activity and expenses in summer youth excursion camp programs, veterinary supplies for the Animal Care Center, and Public Safety supplies.
- Contract Services had a positive variance of $830,973, or 14.6 percent, due to less than anticipated expenses in labor related services, the Open Space project, and delays with the General Plan Update.

ATTACHMENT 1

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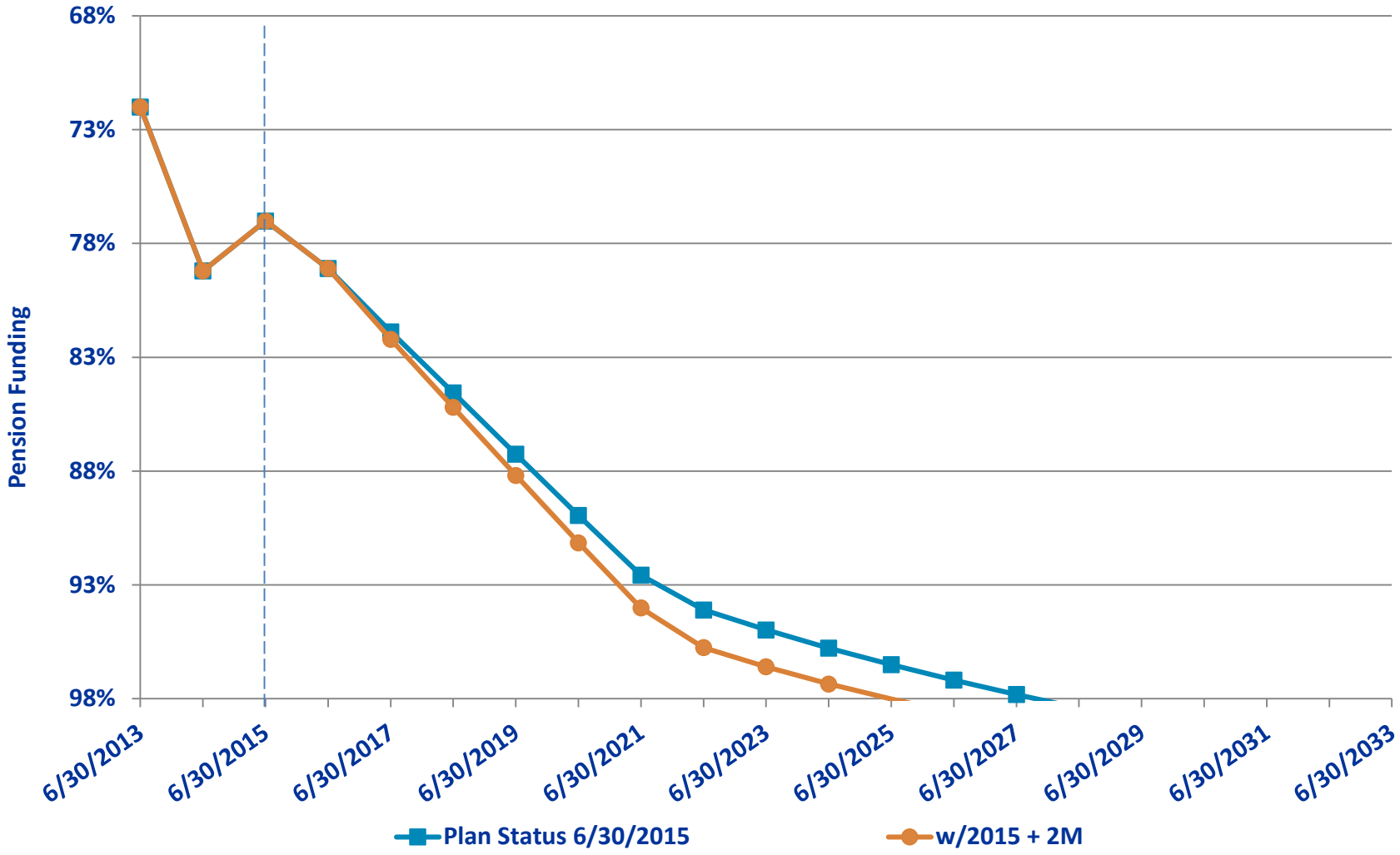
Pension Scorecard



Building Your Own Forecast Model

Government Finance Officers Association

Non-Statistical Model

- When to use one?
  - Historical data unavailable or low predictive value
  - You have access to detailed info on tax/fee rates and units on which those taxes are paid

Effectiveness

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Actual Revenues						
Sales Tax	39,735	45,788	49,226	51,065	55,580	58,767
Total Revenues	118,874	127,972	134,745	138,066	147,868	160,240
Forecasts Made in 2009						
Sales Tax	49,421	53,040	56,342	60,397	63,589	N/A
Total Revenues	129,576	136,830	145,820	155,388	164,641	N/A
Sales Tax Error	-24.4%	-15.8%	-14.5%	-18.3%	-14.4%	N/A
Total Revenues Error	-9.0%	-6.9%	-8.2%	-12.5%	-11.3%	N/A
Forecasts Made in 2010						
Sales Tax	N/A	44,763	47,987	50,565	53,685	56,830
Total Revenues	N/A	124,048	130,105	137,887	146,461	157,848
Sales Tax Error	N/A	2.2%	2.5%	1.0%	3.4%	3%
Total Revenues Error	N/A	3.1%	3.4%	0.1%	1.0%	2%

1-2-4-All

- Our Discussion Question
  - What are YOUR secrets to accurate and effective forecasting? What are you doing now that others might learn from? Feel free to use the presentation as inspiration.
- Steps
  - Silent self-reflection – 1 minute
  - Expand on your ideas in pairs – 2 minutes
  - Share & develop ideas in foursome – 4 minutes
  - Each group shares one important idea with all – 5 minutes
    - What ideas stood out in your conversation?