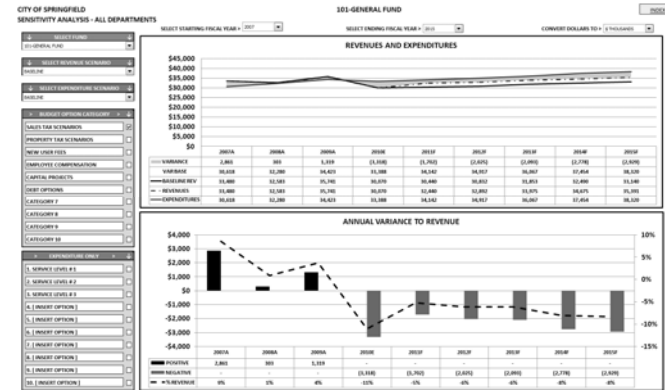


Financial Modeling and Forecasting Smart Practices

Presented by Christopher J. Swanson
Government Finance Research Group

Financial Modeling & Forecasting Smart Practices



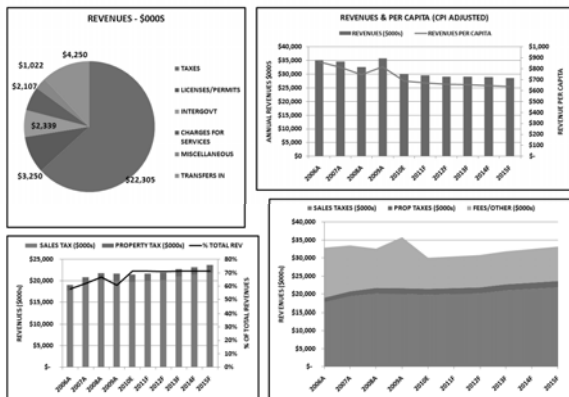
Smart Practices

- Annual Forecasting Model – Key Elements
- Selecting Forecasting Techniques
- Alternative Scenarios – Global & Surgical
- Projecting Impacts on Fund Balances
- Monthly Forecasting & Variance Model
- Budget vs Actual Variance Analysis

Annual Forecasting Model – Key Elements

1. Detailed historic financial, economic and statistical data (5-10 year minimum)
2. Forecast horizon, minimum 10 years
3. Forecast assumptions data input template
4. Pro forma financial summary and metrics
5. Charts, Graphs and Tables depicting historic trends, key ratios and future projections
6. Interactive ability to test alternative forecast assumptions, budget options and adjust timeline (starting and ending dates)

Annual Revenue Forecasting



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Selecting Forecasting Techniques - Revenues

1. *Deterministic/Econometric Examples*
 - a) Change in assessed valuation and rates for property taxes
 - b) Change in business activity and rates for sales taxes
 - c) Consumption and use patterns, rates & fees for services
 - d) Population and CPI change impacting recurring revenues such as fines & forfeitures, licenses & permits, etc.
 - e) Interest rates applied to projected cash balances
2. *Expert Judgment Examples*
 - a) Intergovernmental revenues
 - b) Differentiating recurring and non-recurring revenue sources

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Example – Property Tax Forecast

PROPERTY TAX VARIABLES	2009A	2010B	2011F	2012F	2013F	2014F	2015F
>>>> INPUT RATE FACTORS FOR THESE KEY VARIABLES <<<<<							
PRIOR NET ASSESSED VALUATION	\$4,708,144,136	\$4,637,521,974	\$4,637,521,974	\$4,730,272,413	\$4,895,831,948	\$5,091,665,226	\$5,295,331,835
NET NEW CONSTRUCTION %	0.00%	0.50%	1.00%	2.00%	2.50%	2.50%	2.50%
MARKET VALUE ADJ %	-1.50%	-0.50%	1.00%	1.50%	1.50%	1.50%	1.50%
NEW NET A.V. TAX BASE	4,637,521,974	4,637,521,974	4,730,272,413	4,895,831,948	5,091,665,226	5,295,331,835	5,507,145,108
EFFECTIVE LEVY RATE	1.4176	1.4176	1.4176	1.4176	1.4176	1.4176	1.4176
PROPERTY TAX REVENUE	\$ 65,741,512	\$ 65,741,512	\$ 67,056,342	\$ 69,403,314	\$ 72,179,446	\$ 75,066,624	\$ 78,069,289
ANNUAL RATE OF CHANGE	-0.1%	0.0%	2.0%	3.5%	4.0%	4.0%	4.0%

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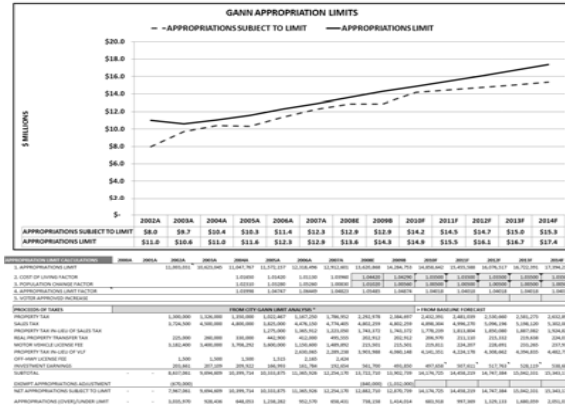
Example – Sales Tax Forecast

SALES BY CATEGORY	2005A	2006A	2007A	2008A	2009A	2010B	2011E	2012E	2013E	2014E	2015E
APPAREL STORES	\$ 13,496,000	\$ 27,891,000	\$ 26,637,000	\$ 25,771,000	\$ 26,187,000	\$ 25,925,130	\$ 25,925,130	\$ 26,443,633	\$ 27,781,680	\$ 28,615,131	\$ 28,615,131
GENERAL MERCHANDISE	34,063,000	37,098,000	40,417,000	41,646,000	44,762,000	\$ 46,274,580	\$ 46,274,580	\$ 47,200,072	\$ 48,144,679	\$ 49,108,393	\$ 50,076,047
FOOD STORES	24,532,000	25,487,000	24,770,000	26,401,000	28,261,000	\$ 29,110,890	\$ 29,984,217	\$ 30,863,763	\$ 31,816,255	\$ 32,764,563	\$ 33,747,500
EATING & DRINKING PLACES	42,724,000	49,794,000	54,049,000	54,383,000	61,370,000	\$ 63,211,100	\$ 65,107,433	\$ 67,060,656	\$ 69,072,476	\$ 71,144,600	\$ 73,278,989
BUILDING MATERIALS	40,876,000	43,343,000	50,085,000	49,600,000	53,000,000	\$ 54,600,000	\$ 55,363,000	\$ 56,149,800	\$ 57,111,104	\$ 58,245,296	\$ 59,469,296
AUTO DEALERS & SUPPLIES	108,533,000	135,124,000	166,442,000	170,000,000	145,000,000	\$ 137,750,000	\$ 137,750,000	\$ 140,505,000	\$ 143,115,100	\$ 147,614,533	\$ 152,042,990
SERVICE STATIONS	25,172,000	30,668,000	36,443,000	41,343,000	43,192,000	\$ 46,547,790	\$ 47,944,193	\$ 49,382,533	\$ 50,863,994	\$ 52,389,934	\$ 53,963,611
OTHER RETAIL STORES	54,721,000	70,612,000	77,213,000	89,771,000	91,923,000	\$ 93,000,790	\$ 93,800,790	\$ 94,863,860	\$ 96,002,382	\$ 97,322,854	\$ 100,445,539
ALL OTHER OUTLETS	110,200,000	113,896,000	125,280,000	118,932,000	128,530,000	\$ 128,530,000	\$ 128,530,000	\$ 131,100,600	\$ 133,722,612	\$ 137,734,790	\$ 141,866,939
TOTAL TAXABLE SALES	\$486,945,000	\$538,253,000	\$601,506,000	\$417,197,000	\$608,209,000	\$603,005,210	\$607,171,303	\$630,745,087	\$634,631,258	\$653,672,256	\$673,282,423
CITY DIRECT SALES TAX RATE	1.00%	1.00%	1.00%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
SALES TAX RECEIPTS	\$ 4,869,450	\$ 5,382,530	\$ 6,015,060	\$ 4,628,978	\$ 4,561,568	\$ 4,522,519	\$ 4,551,785	\$ 4,730,740	\$ 4,804,542	\$ 4,961,819	\$ 5,064,818
Annual Rate of Change	16.3%	12.2%	23.0%	-1.5%	-0.9%	0.7%	2.2%	2.2%	3.0%	3.0%	3.0%

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Statutory Revenue Constraints – Gann Example



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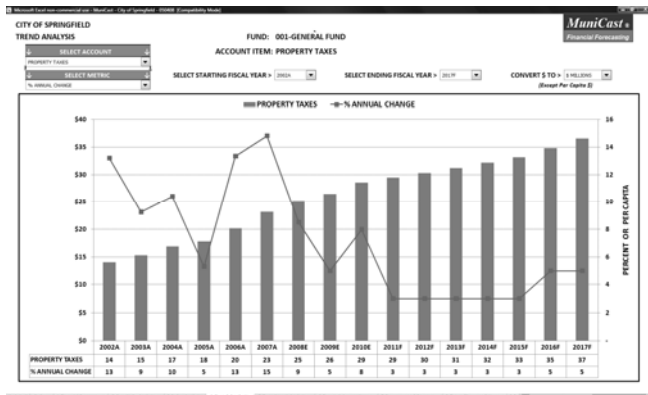
Trend and Correlation Analysis

- Analyze trend in recurring revenues – determine annual growth rate by revenue type, and other key metrics such as per capita and % of total revenue measurements.
- Identify recurring and non-recurring factors impacting revenue growth.
- Analyze relationships between major variables such as, property and sales tax revenues compared with residential and commercial development, economic cycles, population growth, etc.

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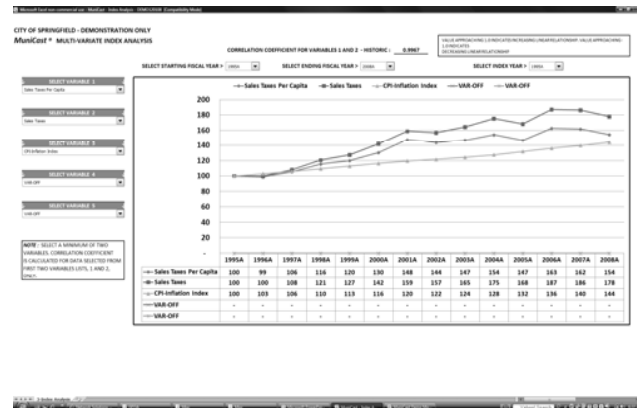
Trend Analysis - Ex: Property Tax, % Annual Change



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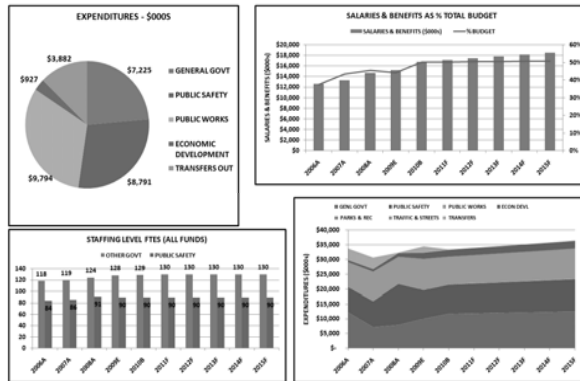
Correlation Analysis – Sales Taxes Nominal, Per Capita and CPI



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Annual Expenditure Forecasting



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Selecting Forecasting Techniques - Expenditures

1. Deterministic Examples

- Salaries and Benefits based on FTE positions
- Compensation factors related to collective bargaining
- Variable costs tied to personnel
- Costs as a function of revenues and service levels

2. Liabilities and Fixed Costs

- Debt service/lease/contractual obligations
- Capital improvement program commitments
- Internal loans and interfund transfers

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Preparing the Baseline Forecast

- Collect historic revenue data for trend analysis (minimum 5-10 years – the more data the better for trend and correlation analysis).
- Identify key indicators and revenue drivers and collect relevant historic data.
- Determine level of detail to forecast, i.e. individual or grouped accounts.

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Imbalances and Gap Analysis

- Multi-year forecasts reveal possible structural deficits that may not be apparent in short-range financial plans.
- Projected negative imbalances between revenue and spending can be addressed more proactively with creation of alternative strategies for increasing resources and/or decreasing spending BEFORE a crisis erupts.

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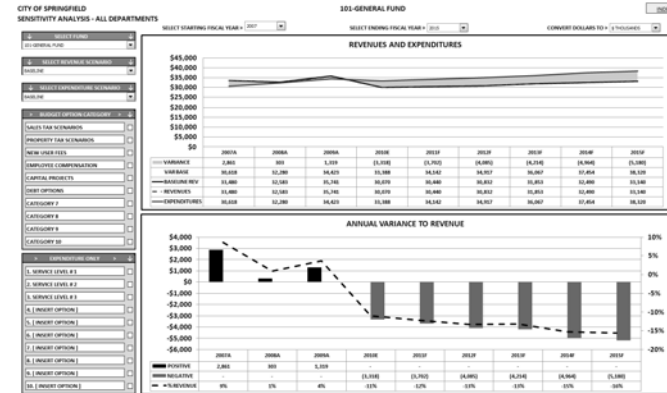
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Establish Alternative Scenarios

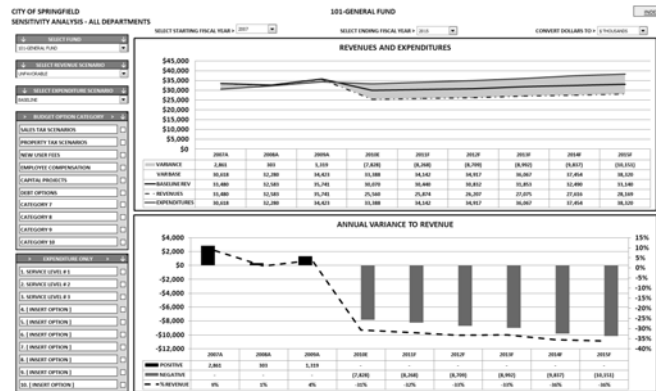
- Baseline Scenario – aka Most Likely or Expected Scenario
- Favorable or “Best Case” Scenario
- Unfavorable or “Worst Case” Scenario

Note: “Favorable” and “Unfavorable” labels imply one of a numerous range of possible scenarios rather than only two alternative future possibilities. Other labels could be “High Growth” and “Low Growth” scenarios.

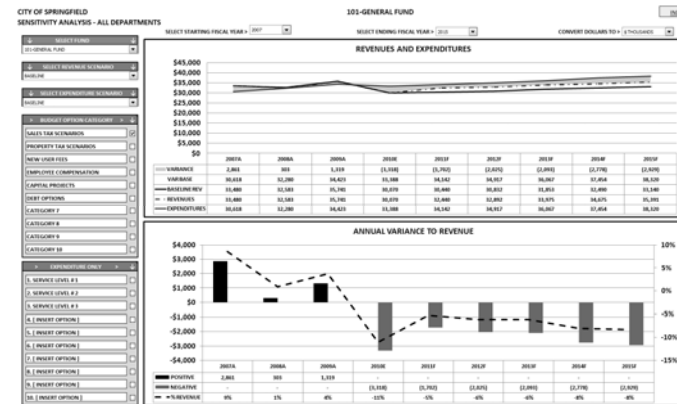
Sensitivity Analysis – Ex. Baseline Scenario – FY2015



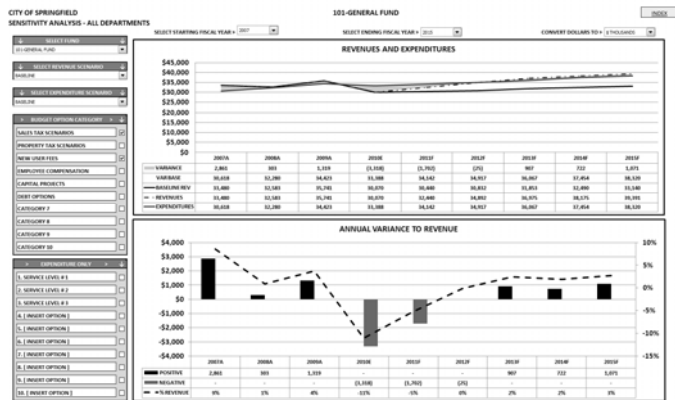
Sensitivity Analysis – Ex. Unfavorable Scenario – Global



Sensitivity Analysis – Ex. Higher Sales Taxes



Sensitivity Analysis – Ex. Higher Sales Taxes & Users Fees



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Capital & Debt Scenarios

Baseline Scenario:

Capital and debt expenditures based on existing commitment, resource and service levels.

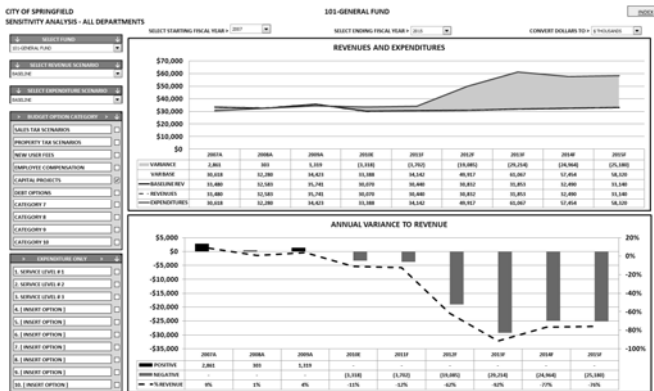
Alternative Scenarios:

Can include a menu of scenarios pertaining to capital projects and possible funding mechanisms such as pay-as-you-go, debt, intergovernmental and/or other fund sources.

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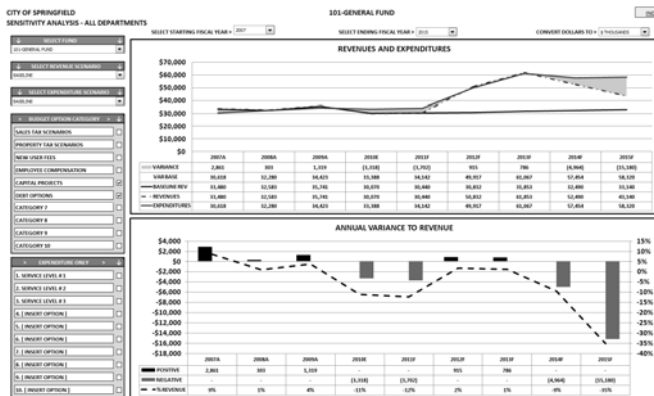
Sensitivity Analysis – Ex. Capital Project Requirements



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Sensitivity Analysis – Ex. CIP and Debt Funding Option



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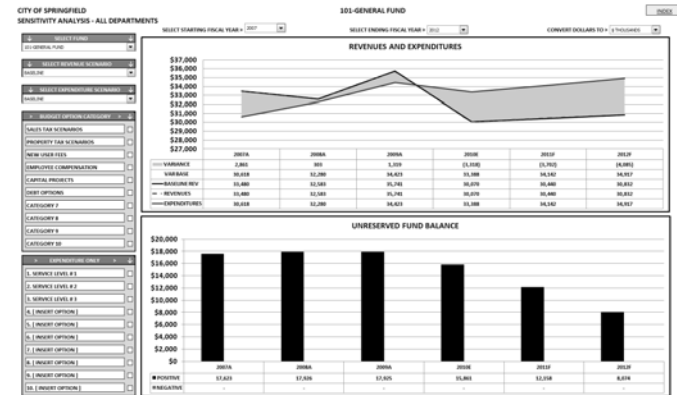
Fund Balance Forecasting

- Analyze historic fund balances and reserves and include in forecasting model.
- Establish fund balance policy, usually based on a minimum % of annual appropriations which varies with the organization's size and life cycle (eg. common % threshold among municipalities is 10-20%).
- Model should include projected sources and uses of funds and a resulting range of fund balances, based on the selected revenue and spending scenario.

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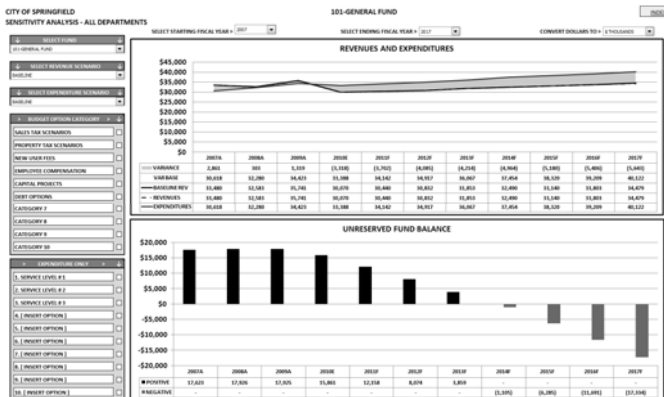
Sensitivity Analysis – Ex. Unreserved Fund Balance 2012



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Sensitivity Analysis – Ex. Unreserved Fund Balance 2017



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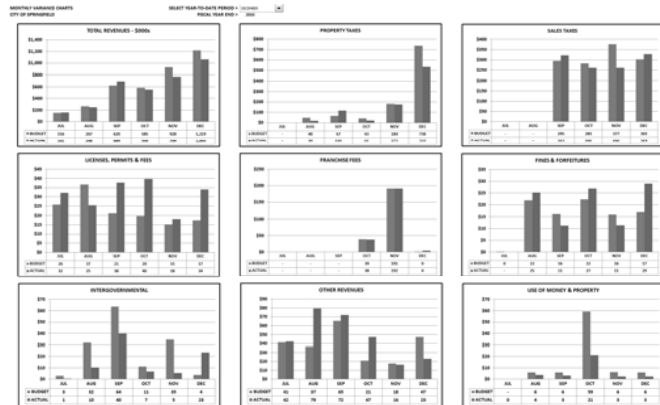
Monthly Forecasting & Variance Analysis Model

1. Detailed historic monthly financial data (24-36 months minimum)
2. Mechanism for monthly allocation of annual budget
3. Ability to readily download monthly actual revenues & expenditures
4. Monthly forecasting and revision of year-end estimate
5. Charts, Graphs and Tables depicting budget vs. actual and variances on a monthly, year-to-date, YTD vs. prior year basis, and annual budget vs. year-end estimate

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Monthly Variance Charts



Variance and YTD Tables

MONTHLY VARIANCE TABLES - CITY OF SPRINGFIELD
GENERAL FUND ONLY
SELECT YEAR-TO-DATE PERIOD: DECEMBER
FISCAL YEAR END: 2020

ALL REVENUES SOURCES	ANNUAL BUDGET		YTD BUDGET		YTD ACTUAL		FAVORABLE		YTD ACTUAL N OF MONTHS	YTD PERCENT	CHANGE		ANNUAL ESTIMATE	VARIANCE TO	
	ADOPTED	REVALUED	DECEMBER	YTD	DECEMBER	YTD	DECEMBER	YTD			FROM PRIOR YEAR	PERCENT		ADOPTED BUDGET	PERCENT
	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)			(\$)	(\$)		(\$)	(\$)
PROPERTY TAXES	2,148,887	2,148,887	1,678,986	1,678,986	1,688,848	1,688,848	10,862	0%	6	100%	\$ 9,862	0%	2,148,887	\$ 460,901	21%
SALES TAXES	4,855,886	4,855,886	1,257,841	1,257,853	1,252,285	1,252,285	-5,566	-1%	6	26%	\$ -5,566	-1%	4,254,712	(601,174)	-12%
LICENSES, PERMITS & FEES	287,852	287,852	238,347	247,246	243,895	243,895	4,898	2%	6	75%	\$ 5,549	2%	287,281	565	0%
FRANCHISE FEES	4,490,453	4,490,453	280,213	234,444	230,512	230,512	-48,691	-1%	6	5%	\$ -48,691	-1%	4,451,966	38,487	1%
FINES & FORFEITURES	226,318	226,318	34,626	34,797	35,376	35,376	650	3%	6	6%	\$ 650	3%	226,248	70	0%
INTERGOVERNMENTAL	4,532,745	4,532,745	146,265	146,271	142,307	142,307	-3,964	-1%	6	3%	\$ -3,964	-1%	4,123,265	409,480	10%
OTHER REVENUES	458,820	458,820	228,296	246,762	241,488	241,488	-5,274	-1%	6	53%	\$ -5,274	-1%	461,553	(1,065)	-0%
USE OF MONEY & PROPERTY	228,781	228,781	81,389	81,728	82,676	82,676	487	0%	6	35%	\$ 487	0%	228,073	704	0%
TOTAL OPERATING REVENUE	11,688,109	11,688,113	3,258,880	3,244,250	3,244,625	3,244,625	375	0%	6	27%	\$ 375	0%	11,111,722	572,903	5%
TRANSFERS IN & ALLOCATIONS	1,832,898	1,832,898	338,494	338,494	-	-	-338,494	-18%	6	20%	\$ -338,494	-18%	1,832,898	-	0%
TOTAL REVENUES & SOURCES	\$ 13,520,977	\$ 13,520,973	\$ 3,597,374	\$ 3,582,744	\$ 3,244,625	\$ 3,244,625	\$ -342,649	-2%	6	24%	\$ -342,649	-2%	\$ 13,144,620	\$ 378,357	3%

ALL EXPENDITURES FUNCTIONS	ANNUAL BUDGET		YTD BUDGET		YTD ACTUAL		FAVORABLE		YTD ACTUAL N OF MONTHS	YTD PERCENT	CHANGE		ANNUAL ESTIMATE	VARIANCE TO	
	ADOPTED	REVALUED	DECEMBER	YTD	DECEMBER	YTD	DECEMBER	YTD			FROM PRIOR YEAR	PERCENT		ADOPTED BUDGET	PERCENT
	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)			(\$)	(\$)		(\$)	(\$)
ADMINISTRATIVE SERVICES	3,832,575	3,832,575	1,095,787	1,095,800	1,098,826	1,098,826	3,039	0%	6	28%	\$ 3,039	0%	3,832,575	(4,746)	-0%
DEVELOPMENT SERVICES	973,329	973,329	423,000	378,829	372,175	372,175	-56,654	-6%	6	38%	\$ -56,654	-6%	1,011,579	(38,440)	-4%
GENERAL GOVERNMENT	1,452,474	1,452,474	366,287	426,269	424,548	424,548	17,281	1%	6	29%	\$ 17,281	1%	1,452,474	29,074	2%
PUBLIC SAFETY	7,845,352	7,845,352	3,788,684	3,770,613	3,799,899	3,799,899	19,286	0%	6	48%	\$ 19,286	0%	7,823,761	21,638	0%
PUBLIC WORKS	1,862,474	1,862,474	566,287	576,762	572,247	572,247	-4,515	-0%	6	30%	\$ -4,515	-0%	1,877,962	(15,489)	-1%
TOTAL EXPENDITURES & USES	\$ 11,866,212	\$ 11,866,212	\$ 3,768,451	\$ 3,768,451	\$ 3,768,451	\$ 3,768,451	\$ -	0%	6	32%	\$ -	0%	\$ 12,201,461	(335,209)	-3%
REVENUES & SOURCES	\$ 13,520,977	\$ 13,520,973	\$ 3,597,374	\$ 3,582,744	\$ 3,244,625	\$ 3,244,625	\$ -342,649	-2%	6	24%	\$ -342,649	-2%	\$ 13,144,620	\$ 378,357	3%
EXPENDITURES & USES	11,866,212	11,866,212	3,768,451	3,768,451	3,768,451	3,768,451	-	0%	6	88%	\$ -	0%	11,201,461	666,751	6%
SURPLUS/DEFICIT	\$ 1,654,765	\$ 1,654,761	\$ 828,923	\$ 814,293	\$ 476,174	\$ 476,174	\$ -408,579	-25%	6	18%	\$ -408,579	-25%	\$ 1,140,000	\$ 514,761	45%

Break for Excel Demonstration and Conclusion