Too many jurisdictions have found out the hard way what can happen in the absence of a realistic forecast model.

Cities, counties, and other local government agencies are increasingly adopting long-term financial forecasting as a critical component of their financial management practices. Too many governments have found out the hard way what can happen in the absence of a realistic forecast model, one that projects and quantifies the impact of potential revenue shortfalls and increased liabilities well into the future. Forecasts can be used to create a strategic context for evaluating the annual budget, to establish a baseline for measuring the long-term effects of decisions, to test the economic effects of best-case and worst-case funding scenarios, and to establish a baseline projection of revenues, expenditures, and future cash flows and fund balances.

An effective forecast model is not a budget, nor is it a Soviet-style “5-year plan” that remains static and sits on a shelf. It is also not an absolute prediction of the future. Instead, a forecast model projects a range of possible outcomes, based on a set of known variables and assumptions. As with a weather forecast, a financial forecast is always subject to revision based on new information, and an effective budgeting and planning process provides a consistent routine for updating the forecast. If prepared and managed properly, a forecast can also help public officials evaluate the financial effects of proposed initiatives, and it can help educate constituents about an organization’s present and potential financial capabilities. In particular, forecast models that include well-designed charts and tables can be used as visual aids in public presentations about the organization’s finances, helping elected officials, citizens, and other stakeholders gain a better understanding of financial issues.

**FORECASTING TECHNIQUES**

Baseline forecasts are based on recurring revenues and expenditures, projected at least five years into the future. It is recommended they be projected much further out, as far as 20 years, depending on known commitments and liabilities such as employee benefit and debt obligations. Proposed new revenues and expenditures that the organization has not committed to can be included in the forecast model as “optional” variables, the future effects of which can be measured against the baseline forecast.

Local governments typically use one or a mixture of three techniques for forecasting revenues and expenditures: expert judgment and analysis, deterministic forecasting, and econometric modeling. The methods used depend on the type of revenue being forecasted and the availability of historical and current economic data, along with other factors that drive the revenue.

Expert judgment and analysis can be used when data are limited. This
### Exhibit 1: Factors that Influence Revenue

<table>
<thead>
<tr>
<th>Revenue Source, Type</th>
<th>Influence Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Tax</td>
<td>Impact from housing market, home sales, foreclosure activity, assessed valuation trend, population, personal income, unemployment rate</td>
</tr>
<tr>
<td>Property Transfer Tax</td>
<td>See Property Tax</td>
</tr>
<tr>
<td>Sales Tax</td>
<td>Retail/commercial activity, consumer trends, impact of housing market, population growth, impact of regional economic forces, planned developments, personal income, unemployment rate</td>
</tr>
<tr>
<td>Franchise Tax</td>
<td>Population change, general demand, new development, per unit usage, potential rate increases (external providers and city rates)</td>
</tr>
<tr>
<td>Transient Occupancy Tax</td>
<td>Hotel/motel development, occupancy rate trends, travel &amp; tourism trends</td>
</tr>
<tr>
<td>Other Tax</td>
<td>Impact factors affecting other taxes</td>
</tr>
<tr>
<td>Intergovernmental—Federal</td>
<td>Availability of federal grants and reimbursements, legislative and budget actions</td>
</tr>
<tr>
<td>Intergovernmental—State</td>
<td>For vehicle in lieu fees, similar to factors that affect property and sales taxes; availability of state grants and reimbursements, legislative and budget actions</td>
</tr>
<tr>
<td>Licenses &amp; Permits</td>
<td>Similar factors as property and sales taxes</td>
</tr>
<tr>
<td>Fines &amp; Forfeitures</td>
<td>Fines and penalty rates; similar to factors that affect property and sales taxes</td>
</tr>
<tr>
<td>Charges for Service</td>
<td>Similar to factors that affect taxes, cost of providing services, and rate schedule for cost recovery</td>
</tr>
</tbody>
</table>

### Exhibit 2: Baseline Assumption

![Baseline Assumption](image-url)
method relies on simple trend analysis and requires alternative scenarios to measure the broadest range of probable outcomes. For example, a forecast of fines and forfeitures might be based on historical trends but modified to account for expected inflation — assuming fines are adjusted according to the Consumer Price Index (CPI) — and population growth.

An organization should develop alternative favorable and unfavorable (or best- and worst-case) scenarios in a way that represents the broadest range of possible forecast outcomes. The primary purpose for creating alternative scenarios is to support sensitivity analysis, which attempts to identify what area of uncertainty makes the most difference in the forecast. Sensitivity analysis allows for “what-if” testing of various assumptions and outcomes, and their likely impact on the organization’s finances. Quantifying unfavorable scenarios, in particular, allows a local government or agency to make contingency plans that can be implemented earlier and more thoughtfully than the reactionary measures that would likely be put in place after the day of revenue shortfall reckoning occurs.

Deterministic and econometric forecasts are based on one or more correlated underlying factors that directly affect revenues and, to a lesser case, expenditures. For instance, changes in assessed property values and millage rates, or the amount per $1,000 that is used to calculate property taxes, will directly affect property tax revenues. Commercial and residential development, along with local economic conditions, will affect permit and planning fees, franchise income, and sales taxes. These forecast techniques require not only availability of historical data but an understanding of the relationship among myriad variables such as population, inflation, local economic activity, tax rates, consumption patterns and consumer trends, property values, construction activity, and so on. Exhibit 1 shows examples of key revenue types and associated forecasting factors.

**PREPARING THE BASELINE FORECAST**

The first step in establishing the baseline forecast for a recurring revenue type is to collect historical data for
trend analysis. While historical trends are not necessarily predictive, they do establish a base for future projections. In Exhibit 2, historic sales tax receipts for the fictional city of Springfield are broken out by business category, allowing for greater insight into revenue sources and trends. In this case, while overall sales tax receipts are on a downward trend, certain components such as service stations and food stores continue to show positive growth.

**TREND AND CORRELATION ANALYSIS**

Once historical data have been gathered, they can be further analyzed by using trend and correlation analysis. In trend analysis, metrics such as per capita, percentage of annual growth, and percentage of total revenue indices provide further understanding of real growth rates and help identify recurring and non-recurring elements that can be factored into the forecast. (See Exhibit 3 for a per capita trend analysis.) Correlation analysis can be used to analyze relationships among major revenue sources such as property and sales taxes, in comparison with residential and commercial development, economic cycles, population growth, inflation, and so forth (see Exhibit 4).

In Exhibit 3, Springfield’s sales tax revenues are illustrated in nominal and per capita values. Once per capita trends are established, those numbers can then be compared with inflation to provide a clearer understanding of real growth versus nominal growth rates, as shown in Exhibit 4. Both examples are based on the sales tax revenue data from Exhibit 2. The correlation analysis shows that while Springfield’s receipts are relatively flat between fiscal 2007 and 2008, they in fact are falling when compared with CPI inflation growth for the same period.

**ALTERNATIVE SCENARIOS**

Once the baseline forecast is established, alternative scenarios can be prepared that depict favorable and unfavorable variations on the baseline scenario. The degree to which the baseline and alternative scenario differ will depend on how much the revenue type tends to vary, historically, and the organization’s degree of confidence that the baseline forecast is accurate. As variability
Exhibit 5: Sensitivity Analysis, Baseline Scenario

Exhibit 6: Sensitivity Analysis, Unfavorable Scenario
increases, and as confidence decreases, the distance between baseline and alternative positive and negative scenarios should increase to capture the full range of probable outcomes.

The baseline scenario shown in Exhibit 5 illustrates a positive gap between revenues and expenditures, resulting in an increasing fund balance over time. This scenario was constructed using an interactive forecasting model, which allows various assumptions and budget options to be activated, instantaneously demonstrating positive or negative impacts on projected fund balances, as shown in Exhibit 6.

In the interactive forecasting model illustrated in this article, the projected fund balance is used as a proxy for the organization’s financial health and solvency. Organizations also need to analyze historical trends in their fund balances, using measures such as unreserved fund balance as a percentage of annual appropriations, and compare historical and projected balances with the organization’s minimum policy requirements. The unreserved fund balance, or fund balance available, is a critical benchmark for evaluating an organization’s ability to meet unexpected funding shortfalls and is often used as one way of measuring solvency.

**EXPENDITURE FORECASTING**

Expenditure forecasting is similar to revenue forecasting. To create the baseline expenditure forecast, first identify recurring expense types, and then analyze historical trends for expenditures that are related to labor and those that are not. Common expense types include: salaries and wages, employee benefits, materials and supplies, professional and contract services, minor capital (office equipment), capital projects, debt, and other operating expenses.

The baseline forecast should be based on existing and recurring staff levels, operating expenditures, and other expenses the government or agency has already committed to, including capital programs, debt, and contractual commitments such as employee compensation and benefits. The latter example illustrates the need for longer-term forecasting to measure future impact, as employee retirement and health-care benefits are the fastest-growing components of most government budgets.
Alternative expenditure forecasts can reflect spending levels that mirror potential increased department missions (i.e., “augmented” scenarios based on what departments might spend if additional resources were available). They can also reflect restrained or contingent spending plans that could be implemented in response to reduced resources. Exhibit 7 shows the way a restrained spending plan improves the impact on fund balance from the unfavorable revenue scenario from Exhibit 6. This forecast model can also factor in itemized spending options, in addition to or in place of an organization-wide expenditure scenario.

CONCLUSION

Long-term financial forecasts are not absolute predictions of the future, but projections of possible future states based on known assumptions. The best forecasts are based on a solid understanding of historical trends combined with a range of future scenarios derived from a detailed analysis of known factors that can affect revenues and spending. Longer forecasting horizons can reveal structural imbalances that are not yet apparent, giving an organization time to take corrective action in a proactive way, thus optimizing the use of public funds over the long term.

Interactive forecasting models not only help organizations analyze trends and identify possible future financial states, but they also help communicate financial issues to key constituents.

CHRISTOPHER J. SWANSON is the founder of Government Finance Research Group (GFRG), a financial management consulting firm specializing in financial planning, cost analysis, econometric modeling, benchmarking, and optimization modeling for local governments throughout the United States. GFRG designed and developed the MuniCast interactive financial forecasting model. Swanson can be contacted at 949-412-6078 or Chris@MuniCast.com.