Debt Modeling

North Carolina Local Government Investment Association

July 24, 2025

Financial/Debt Modeling – GFOA Perspective

GFOA Perspective – Financial Forecasting

GFOA Best Practice – Financial Forecasting

GFOA recommends that all governments prepare and maintain a long-term financial plan that projects revenues, expenses, financial position, and external factors for all key funds and government operations at least five years into the future.

Beyond the annual budget cycle and multi-year capital plan, governments need to identify long-term financial trends. Long-term financial planning involves projecting revenues, expenses, and key factors that have a financial impact on the organization.

Understanding long-term trends and potential risk factors that may impact overall financial sustainability allows the finance officer to proactively address these issues.

Going through a long-term financial planning process allows decision makers to focus on long-term objectives, encourages strategic thinking, and promotes overall awareness for financial literacy in an organization.

Long-term financial planning creates commitment and motivation to provide a guide for decision-making.

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Long Term Financial Planning

- Benefits of long-term financial planning include:
  - Creating a long-term outlook into other planning processes (budgeting, capital planning, revenue forecasting, etc.)
  - Helping to diagnose potential risks and causes of fiscal distress
  - Stimulating "big-picture thinking"
  - Providing a tool for evaluating long-term compliance with financial policies
  - Allowing for pre-emptive action to mitigate forecasted financial distress
  - Defining parameters for decision-making
  - Communicating long-term financial position to residents and other stakeholders, including rating agencies and bond investors

Best Practices

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Long-Term Financial Planning

Primary Planning Purpose	Financial Planning	Strategic Planning	Financial Policies	CIP Planning	Budget
Establish an organizational vision		✓	✓		
Achieve organizational alignment	✓	✓	✓	✓	✓
Forecast long-term revenue	✓			✓	
Forecast long-term expenses	✓			✓	
Setting utility rates	✓				
Identify unfunded liabilities	✓			✓	
Assessing infrastructure condition				✓	
Determine long-term debt capacity	✓				
Conduct a general environmental scan		✓			
Conduct analysis of the external economic environment	✓	✓			
Conduct analysis of the fiscal environment	✓		✓		
Prioritize services, initiatives, and programs and set goals		✓			
Determine long-term financial impact of priorities /goals	✓			✓	
Allocate resources to address priorities / accomplish goals				✓	✓
Set goals based on priorities (short-term and long-term)					✓

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Financial Forecasting

GFOA Best Practice – Financial Forecasting

The GFOA recommends that governments at all levels forecast major revenues and expenditures. The forecast should extend several years into the future. The forecast, along with its underlying assumptions and methodology, should be clearly stated and made available to stakeholders in the budget process. It also should be concisely presented in the final budget document. The forecast should be regularly monitored and periodically updated.

Key Steps Include:

- *Define Assumptions*
- *Gather Information*
- *Preliminary/Exploratory Analysis*
- *Select Methods*
- *Implement Methods*
- *Use Forecasts*

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Financial Forecasting

Use of Forecasts

Creditability

- Have a transparent forecast process
- Address how the forecast compares to forecasts from outside organizations
- Outline forces acting on your revenues or expenditures that might cause the actual results to vary from your forecast
- Stay within acceptable accuracy tolerances
- Avoid over-promising on the level of forecast accuracy to set appropriate expectations. Note that years estimated farther out are less reliable
- Be careful about using forecasts to raise an alarm about an impending crisis

Presentation

- Build the message around a baseline set of assumptions that represent a reasonable level of status quo conditions
- Assumptions should be made very clear, and be supplemented with salient information
- The message should address the implications of the forecast in terms of budget shortfalls or surpluses, changes in reserve levels, and other meaningful metrics
- Involving other staff in the forecasting process will also help ensure that the understanding of the method is shared by key potential supporters

Linking to Decision-Making

- Emphasize the importance of the forecast as a key factor in the planning and budgeting process.
- Include the following financial policies to promote interest in financial forecasting:
  - A reserve policy
  - A policy on maintaining structural balance
  - A long-term financial planning policy
  - Capital improvement plans (should employ a long-term planning horizon)

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Multi-year Capital Planning

GFOA Best Practice – Multi-year Capital Planning

GFOA recommends that state and local governments prepare and adopt comprehensive, fiscally sustainable, and multi-year capital plans to ensure effective management of capital assets. A prudent multi-year capital plan identifies and prioritizes expected needs based on a strategic plan, establishes project scope and cost, details estimated amounts of funding from various sources, and projects future operating and maintenance costs. A capital plan should cover a period of five to 25 years or more

State and local governments should prepare and adopt comprehensive, fiscally sustainable, and multi-year capital plans to ensure effective management of capital assets.

Infrastructure, technology, and major equipment are the physical foundation for providing services to constituents. The procurement, design, construction, maintenance, and operation of capital assets are a critical activity of governments and therefore require careful planning.

Capital planning is critical to water, sewer, transportation, sanitation, and other essential public services. It is also an important component of a community's economic development program and strategic plan. Capital facilities and infrastructure are important legacies that serve current and future generations. It is extremely difficult for governments to address the current and long-term needs of their citizens without a sound multi-year capital plan that clearly identifies capital needs, funding options, and operating budget impacts.

A properly prepared capital plan is essential to the future financial health of an organization and continued delivery of services to citizens and businesses.

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective –Multi-year Capital Planning

Use of Forecasts

Step 1 — Identify needs

Step 2 — Determine Financial Impacts (Costs)
- Scope and Timing

Step 3 — Prioritize Capital Requests
- Rating System Driven by Needs/Goals

Step 4 — Develop a **Comprehensive Financial Plan**

Source: GFOA Best Practices (gfoa.org)

GFOA Perspective – Multi-year Capital Planning

Comprehensive Financial Plan

- *GFOA recommends that governments develop a viable overall multi-year financing plan covering the multi-year period of the capital plan to ensure that the proposed capital plan is achievable within expected available resources.*
- Governments undertaking a capital financing plan should:
  - Anticipate expected revenue and expenditure trends including their relationship to multi-year financial plans and ongoing impacts to the operating budget due to the capital plan
  - Prepare cash flow projections of the amount and timing of the capital financing
  - Continue compliance with all established financial policies
  - Recognize appropriate legal constraints
  - Consider and estimate funding amounts from all appropriate funding alternatives
  - Consider sources and uses for debt services
  - Ensure the reliability and stability of identified funding sources
  - Evaluate the affordability of the financing strategy, including the impact on debt ratios, applicable tax rates, and/or service fees

Best Practices

Source: GFOA Best Practices (gfoa.org)

Financial/Debt Modeling – Rating Agency Perspective

Rating Agency Methodologies

Moody's Rating Methodology

Category	Rating Percentage	Short Term Control	Long Term Control
Economy	30%		✓
Financial Performance	30%	✓	✓
Institutional Framework	10%		✓
Leverage	30%	✓	✓

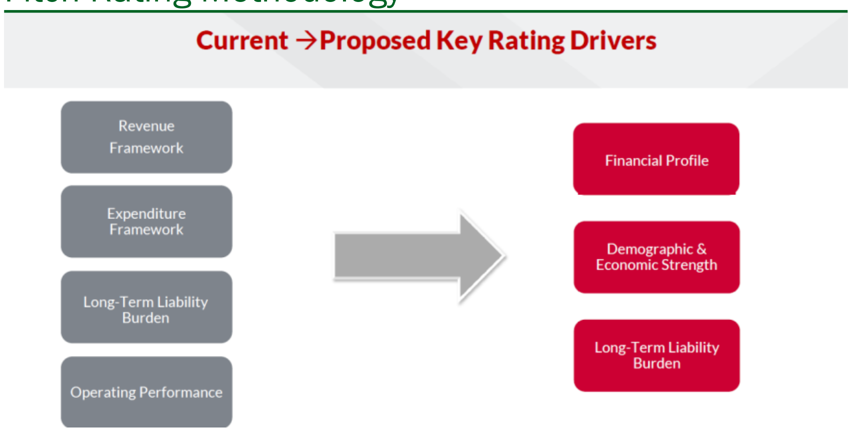
Source: Moody's US Cities and Counties Rating Methodology.

S&P Rating Methodology - Individual Credit Profile

Category	Rating Percentage	Short Term Control	Long Term Control
Economy	20%		✓
Financial Performance	20%	✓	✓
Reserves & Liquidity	20%	✓	✓
Management	20%	✓	✓
Debt & Liabilities	20%	✓	✓

Note: All NC Cities and Counties score a 1 on institutional Framework.
Source: S&P U.S. Governments Rating Methodology.

Fitch Rating Methodology



Moody's

- On November 2, 2022, Moody's updated its US Local Governments General Obligation Debt methodology and assumptions.
- Under the new methodology, an initial indicative rating is calculated from a weighted average of four key factors.
- 5 defined below the line qualitative adjustments can be made based upon certain factors not included in the quantitative score.
- While the defined notching factors have been reduced, a new category for other considerations will allow for any other factor deemed appropriate by the rating analysts and committee to be considered in the rating outcome.

S&P

- On September 9, 2024, Standard & Poor's updated its US Local Governments General Obligation Ratings methodology and assumptions.
- Under the new methodology, an issuers' rating is based on a scoring matrix of Institutional Framework score and Individual Credit Profile.
- Up to a one-notch adjustment can be made from the indicative rating (derived from the scoring matrix) based on other qualitative factors not included in the quantitative score.

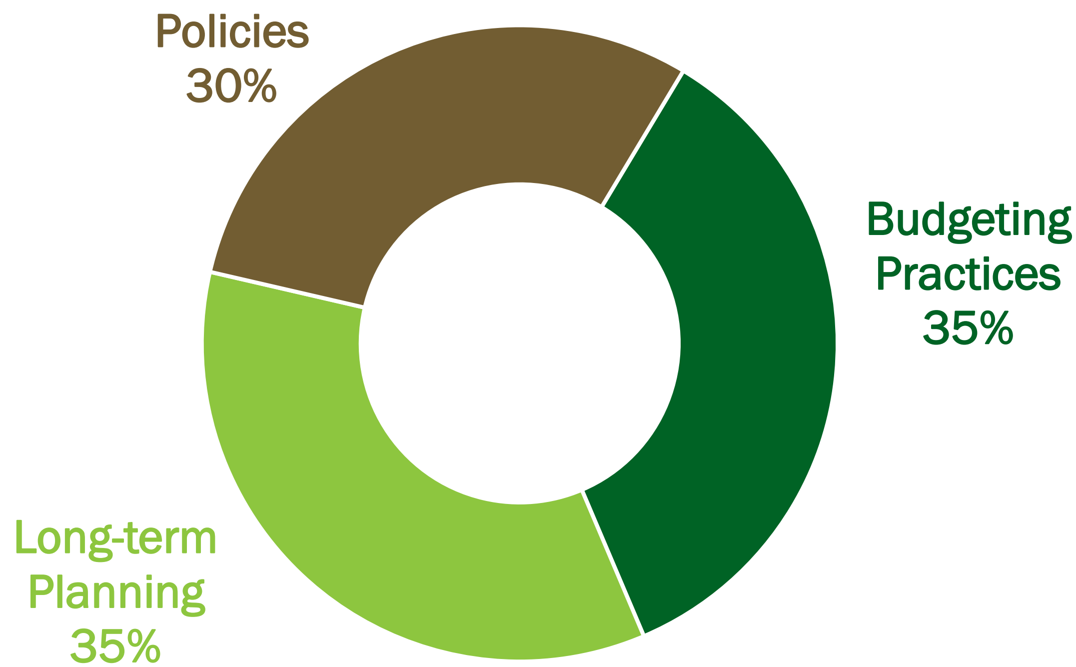
Fitch

- On April 2, 2024, Fitch updated its US Local Governments General Obligation Ratings methodology and assumptions.
- Under the new methodology, a Metric Profile is calculated from Fitch's Local Government Rating Model, which represents a comparative evaluation of an issuers overall credit quality based on 11 key metrics related to 3 Key Rating Driver categories.
  - Metrics may be adjusted to account for historical data anomalies, forward-looking performance shifts or nonrecurring events that skew the results.

Source: Moody's & S&P Databases

S&P: Initial Management Assessment

- The initial management assessment considers three subfactors:



- The final management assessment is determined using adjustments to the initial assessment for:
  – Transparency and reporting
  – Governance structure; and
  – Risk management, credit culture, and oversight.

Source: S&P Methodology For Rating U.S. Governments

S&P: Long-Term Planning Assessment

Robust culture of long-term planning	– Multiyear financial and capital plans are based on realistic assumptions that support long-term structural balance and strategic decision-making – Plans are regularly updated and both demonstrate clear funding for projects
Some long-term planning	– One multiyear financial or capital plan exists and is based on historical trends that help to informal financial decision-making – Plans are regularly updated but funding is only partially identified
Informal long-term planning	– Multiyear financial or capital plan may exist but assumptions are optimistic – Plans are not regularly updated and capital funding is not identified
No long-term planning	– No multiyear planning exists. Budgeting is done annually with no long-term strategy to identify shortfalls – Planning is done when needed

Better Score to Lower Score

Source: S&P Methodology For Rating U.S. Governments

Debt Modeling
Overview, Considerations and Examples

Debt Service Modeling

- Key Factors to modeling individual debt issuance include:
  - **Amortization Structure** (e.g. level principal, level debt service, other)
  - **Term** (years to final maturity)
  - **Interest Rate**
  - **Timing of Issuance** (including interest accrual date)
  - **Timing of First Principal and Interest Payments**
    - Interest only periods
    - Interest deferral periods
  - **Other/Unique Terms and Conditions**
    - Draw Down Loans
    - Variable Rates / Rate Resets
    - Financing Costs (upfront and ongoing)
    - Pricing Structure

View Assumptions

Assumptions From Debt Dashboard 2

Debt Series Assumptions

Credit Type	General Obligation
BANs (Y/N)	No
Amount	$26,940,000
Bonds FY Issued	2027
Issuance Month	October
Principal Payment Date	April
Term (Years)	20
Interest Rate	5.000%
Amortization Structure	Level Principal
Interest Frequency	Semi-Annual
Interest Only Period (Years)	0
Cost of Issuance	$0
Premium	$0

Debt by Fund

Debt Service Fund	$26,940,000
Electric Fund	$0
Fund 3	$0
Fund 4	$0
Fund 5	$0
Fund 6	$0

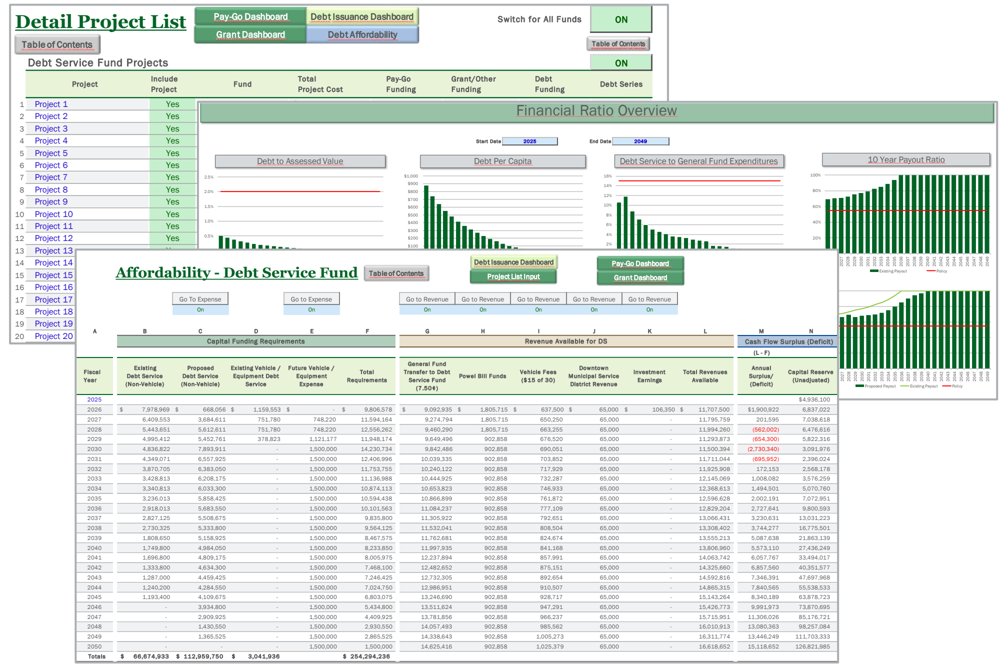
Series 2027 GO

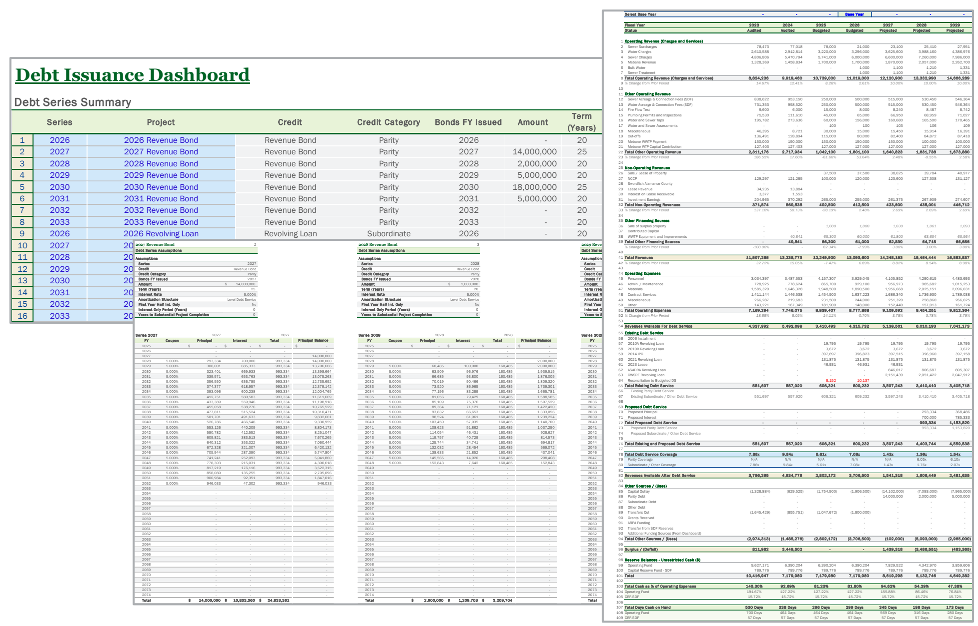
FY	Coupon	Principal	Interest	Total	Principal Balance
2025		$ -	$ -	$ -	$ -
2026		-	-	-	-
2027		-	673,500	673,500	26,940,000
2028	5.000%	1,347,000	1,347,000	2,694,000	26,940,000
2029	5.000%	1,347,000	1,279,650	2,626,650	25,593,000
2030	5.000%	1,347,000	1,212,300	2,559,300	24,246,000
2031	5.000%	1,347,000	1,144,950	2,491,950	22,899,000
2032	5.000%	1,347,000	1,077,600	2,424,600	21,552,000
2033	5.000%	1,347,000	1,010,250	2,357,250	20,205,000
2034	5.000%	1,347,000	942,900	2,289,900	18,858,000
2035	5.000%	1,347,000	875,550	2,222,550	17,511,000
2036	5.000%	1,347,000	808,200	2,155,200	16,164,000
2037	5.000%	1,347,000	740,850	2,087,850	14,817,000
2038	5.000%	1,347,000	673,500	2,020,500	13,470,000
2039	5.000%	1,347,000	606,150	1,953,150	12,123,000
2040	5.000%	1,347,000	538,800	1,885,800	10,776,000
2041	5.000%	1,347,000	471,450	1,818,450	9,429,000
2042	5.000%	1,347,000	404,100	1,751,100	8,082,000
2043	5.000%	1,347,000	336,750	1,683,750	6,735,000
2044	5.000%	1,347,000	269,400	1,616,400	5,388,000
2045	5.000%	1,347,000	202,050	1,549,050	4,041,000
2046	5.000%	1,347,000	134,700	1,481,700	2,694,000
2047	5.000%	1,347,000	67,350	1,414,350	1,347,000
2048		-	-	-	-
2049		-	-	-	-
2050		-	-	-	-
Total		$ 26,940,000	$ 14,817,000	$ 41,757,000	

Debt Modeling Approaches

- Approaches to Debt modeling should be determined based on the individual needs of your organization. Some alternative approaches to debt modeling include:

1. Individual Issuance Level – Series by Series
2. Overall Comprehensive Budget Level
   – General / Governmental Funds
   – Enterprise Funds
3. Aggregate Debt Portfolio or Capital Fund Level
   – Debt Service / Debt Fund
   – Comprehensive CIP / Capital Fund





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