Continuous Utility Rate Management and Forecasting

Taking the Anxiety Out of Rate Increases | BY JASON LOVELAND AND JP JOLY

Few things are more contentious in local government than utility rates. Rates matter to customers because of the impact they have on household and corporate budgets. Rates matter to a local government's utility because they need the resources to pay for meeting residents' demand for distributing and treating water, while operating within a regulatory environment that requires meeting quality standards for clean water, water conservation, safe treatment, and environmentally organic discharge.

Typically, local governments conduct five-year studies to determine rates. These studies are time-consuming, difficult, and often expensive, and the resulting rate increases can evoke consumer surprise, shock, and anxiety. In 2018, the City of Northglenn, Colorado, had substantial rate increases for the water and sewer utilities, so substantial that the Northglenn management team decided the city needed to change its practice of analyzing user charges once every five years and instead employ a process that brings digital intelligence into continuous utility rate management and forecasting.

It had become abundantly clear that the financial health of the city's enterprise fund depended on continual rate reviews that were a built-in component of a sound, long-term financial plan—one that addresses both the needs of today and the needs of the future, including planning for emergencies such as COVID-19. Consequently, the city considered the following five strategic financial management goals:

1. Continually monitor the impact on rates, in real time, of operating expenses and capital budget outlays.

2. Use predictive analytics to forecast futures rates.

3. Provide data-driven evidence for rate-setting policy development.

4. Communicate the impact of current and future policies to engage in more successful conversations with elected officials, residents, and external stakeholders (such as rating agencies, bond investors, and regulators).

5. Ensure the successful transfer of critical knowledge for succession planning.

Water and sewer utilities

The city originally provided water and wastewater services through the facilities of the City of Thornton, Colorado. In 1976, Northglenn started developing its own water and wastewater system by purchasing facilities from Thornton that were located within Northglenn's boundaries, constructing additional facilities to provide a complete water and wastewater system, and acquiring the necessary water supplies.

Northglenn separated from the Thornton water system in December 1980 and from the Thornton wastewater system in July 1982. Northglenn's system currently provides water and wastewater service to approximately 10,200 residential and commercial customers, distributing 1.6 billion gallons of water annually and collecting and treating 1.2 billion gallons of wastewater.

Revenues. The primary revenue source for both water and sewer comes from utility rates and charges, which had historically been adjusted every five years. But there are other significant revenues: city sales taxes, use taxes, and building materials use taxes specifically approved by

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voters with various limitations as to their use. The majority of these taxes is transferred to a tax fund, however, and can only be used to purchase new water rights. The food sales tax, on the other hand, can be used for the fund's debt service payments. In addition to the user charges and tax sources, the fund also receives miscellaneous non-rate-related revenue from various sources, and the sum of these revenues is treated as a direct reduction to the revenue that would otherwise need to be collected via rates and charges to customers. Water and sewer utility expenses include operating expenses, cash-funded capital improvements, and annual debt service payments for debt-funded capital improvements.

Water usage charges. Charges for water services are currently based on a tiered rate structure and offset the operating costs associated with providing clean and safe drinking

water to the city's inhabitants. In 2009, the city council approved a rate increase and modified the tier structure of the water rates schedule. In 2017, rates were increased from three percent to 4.5 percent for 2018 to 2022. Revenue forecasts were based on customer trends, changes to the rate structure, and estimates regarding annual precipitation.

Sewer usage charges. Charges for wastewater services are based on scheduled rate structures and offset the operating costs associated with providing the services. In 2017, the city council approved a rate increase and slight modification of the wastewater rate schedule of 9.75 percent to begin in 2018. Just as with the water rates, sewer rates were also increased in 2018 to meet ongoing funding needs. Revenue forecasts closely match those of the water usage charges and are based on historical trends. Rate increases ranging from eight percent to 9.75 percent from 2019 to 2022 have been approved by ordinance.

Debt service

The city issued wastewater revenue bonds in 2021 to finance

capital improvements to the city's wastewater system for the purpose of increasing the system's capacity to serve customers, replacing older components and deteriorating infrastructure, and improving the efficacy of the system.

Requirements

As part of its transformation initiatives, Northglenn looked for cloud technology that met its specific requirements.

Data input. The city required an easy interface to integrate multiple data sets, because when setting rates, as well as developing the annual water and sewer budget, the city used historical and current financial system outputs, along with guiding and foundational documents including the comprehensive plan for equivalent dwelling unit growth (residential, commercial, industrial), the water treatment plant master plan, the wastewater utility plan, the water conservation plan, the integrated resources plan, and the water and wastewater rate study for its short- and long-term infrastructure needs and strategic priorities.

Information processing. Data from the city's financial system and the above studies needed to be reviewed, cleaned, and integrated to turn it into digitally consumable information. Because of the complex mixture of resources (rates, sales tax, and other revenues) available, the model needed flexible design components to incorporate the city's finance structure.

Gaining insights. A comprehensive financial analysis and data analytical model with user-friendly interface was desired to gain insights, identify outliers, discover patterns, predict future consumption, and forecast rates.

Providing evidence. The city also needed the tool to apply the insights and test hypotheses against current and future rate targets. The tool would need graphic displays and data tables to provide data-driven evidence that supported operational tactics, capital investment plans, and strategic rate recommendations.

Monitoring execution. The model had to offer the ability to input current actual revenue and expense activities and then forecast into new models that recalibrate rates on a continuous basis. This generates new feedback data for Step 1 of the continuous business intelligence rate forecasting cycle.

Solution

The city implemented a web-based platform that enables water and sewer utilities to optimize water rates and save for infrastructure upgrades, and the cloud solution met the requirements. Northglenn started the process of continuous utility rate management and forecasting by setting up the system, a process not unlike the preparation for a typical five-year rate study.

Financial data have been uploaded into the forecasting model since June 2016. This has included operating and maintenance expenses, capital expenses, debt service payments,

and pooled cash. Inputs are broken down by category—for revenues, as an example, these would be usage charges, borrowed funds, grants, taxes, connection and shut-off fees, interest income, and more. The city uploaded its capital plans, which included both renewal and expansion projects for the planned medium-to-long-term investments in the water and sewer system. The forecasting model enabled the city to explore borrowing scenarios by automatically calculating future year debt service to maturity schedules. The city also plans to upload an inventory of tangible capital assets to help determine what its average future capital reinvestment rate should be, so it can determine if it is on track for long-term sustainability.

Then, after all the revenue requirements for the city's water and sewer system were uploaded into the model—historical operating/maintenance expenses, cash-funded capital, annual debt service expenses, cash reserves, debt service coverage requirements, water and sewer usage charges, and non-rate revenues (like borrowed funds, grants, taxes, connection and shut-off fees, and interest income)—the model projected these costs and the corresponding revenue requirements for 25 years. (See Exhibit 1.)

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Continual monitoring

Continual monitoring means that once a system is set up, little effort is required to maintain it. Unlike a typical rate study, there is no longer a need for meetings and workshops to review and determine modeling assumptions and inputs (for example, the upfront initial setup costs in a quinquennial rate study don't have to be repeated). The model provides staff with the intelligence from trends to make better-informed

EXHIBIT 1

NORTHGLENN WASTEWATER FUND 25-YEAR PRO FORMA CASHFLOW MODEL
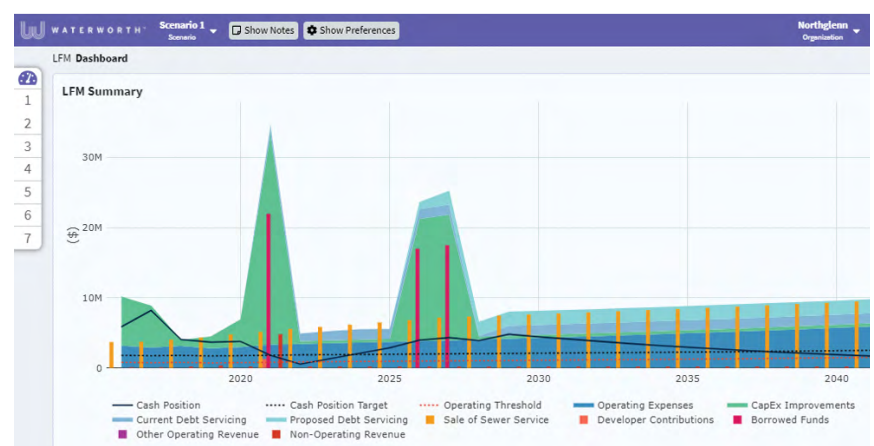
and multiple assumptions, and then to test these assumptions against desired outcomes.

The value of this was highlighted by the economic impact of the COVID-19 pandemic on revenues, especially taxes. Scenarios of economic recovery were modeled so that staff could make operating and capital spending adjustments in real-time to have adequate cash flow while examining reserve requirements and reserve usage plans. Continual monitoring provided management with more insight into the drivers of revenues and expenses. Accordingly, management is poised to make these tactical adjustments when needed as they emerge and then adapt to stay on course for managing within the current rate structure. (See Exhibit 2.)

Impact on future rates

Now that the city can continually monitor the business of water and sewer utilities, the model can extrapolate the drivers of revenues and expenses and forecast the impacts on future water and sewer rates. This makes it possible for the city to tactically adjust operating and capital spending to meet future rate targets. (See Exhibit 3.)

Develop water conservation policies

Water conservation is taken very seriously in the City of Northglenn. Water sales revenues need to be accurately forecasted and balanced against current and long-term future water supply and treatment costs. Conservation and efficiency reduce long-term costs and often provide the most cost-effective "new water supply" option available. Planning for water conservation programs must be done carefully, however, to avoid revenue instability issues. Northglenn is discovering that the solution it has implemented could permit the city to focus on developing and stress-testing conservation-oriented water rates to:

- Reduce water consumption without negative impacts on utility revenues.

- Reward customers financially for choosing water-efficient appliances and changing water use behavior.

- Target inefficiency in discretionary water uses such as landscape irrigation.

- Delay costly water supply expansion projects.

- Avoid financial hardships for low-income customers.

Communications

Northglenn's internal and external communications have helped the city have more-informed discussions since the continuous utility rate management and forecasting initiative was implemented. The cloud-based software allows for better and more effective collaboration among finance, public works, city management, and the city council. Northglenn also plans to use the software to inform compliance regulators, rate payers, and residents about the ongoing performance and utility rates.

In 2021, the city issued $27 million in wastewater revenue bonds to finance the costs of constructing a new lift station, force main, and related improvements. (See Exhibit 4.) In the Operational Management Assessment of Standard & Poor's rating criteria, the rating agency gave the city a strong rating for its compliance with regular rate reviews. Commenting on Northglenn's continuous utility rate management and forecasting practice, S&P's rating review said, "Good financial management practices and policies, which include regular review of rates and budget performance, regularly updated long-term capital planning and financial forecasting, and formal debt management and liquidity policies."

Conclusion

The City of Northglenn has incorporated continuous utility rate management and forecasting into its strategic financial management portfolio. The web-based analytical platform makes it possible for the city to optimize water and sewer rates and to save for infrastructure upgrades so it can achieve a financially sustainable water and wastewater system.

Using data to make better decisions. Northglenn has found that by using data to drive better decisions, it makes better capital investments that are based on projected infrastructure renewal and replacement costs. This has given the city and the city council confidence that they are replacing infrastructure fast enough to stay ahead of a crisis. Budgeting has greatly improved because the city can
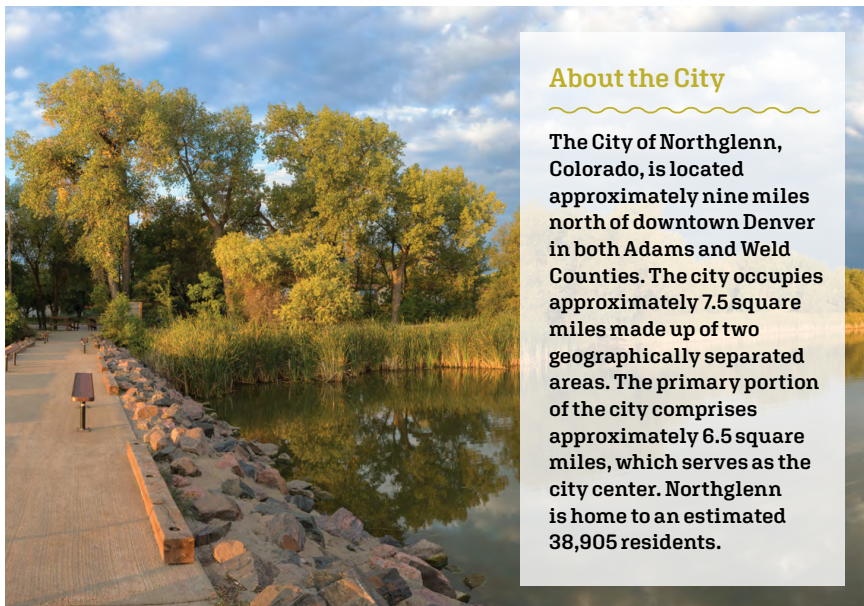
About the City

The City of Northglenn, Colorado, is located approximately nine miles north of downtown Denver in both Adams and Weld Counties. The city occupies approximately 7.5 square miles made up of two geographically separated areas. The primary portion of the city comprises approximately 6.5 square miles, which serves as the city center. Northglenn is home to an estimated 38,905 residents.

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now benchmark the amount that should be invested in capital renewal annually to sustainably finance the system.

Telling a better story. Northglenn can now tell a compelling story with easy-to-use interactive graphs and visualizations that everyone can understand. Because the city can easily model different scenarios on the impact of changes on affordability and financial sustainability, it has better conversations with elected officials and the public about capital spending, borrowing, and setting rates. Making use of historical data to identify trends that are unique to the city's situation means that management has moved from short-sighted planning to comprehensive long-term roadmaps—up to 25 years. After testing its capital plans, master water and sewer plans, bonding options, and fiscal policies, the city can reveal gaps that internal stakeholders immediately grasp and act upon.

Growing revenues sustainably. In 2022, Northglenn will recommend a new rate structure for its water and sewer utility. The city's management is confident that their ability to test different rate structures means that the utility rates they recommend will maximize revenue. Continuous utility rate management and forecasting eliminates contention created by rate-setting and facilitates more efficient decision-making, ensuring, fair, equitable, and sustainable rate-setting for local government utilities. 🅐

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EXHIBIT 2 | NORTHGLENN WASTEWATER CASH POSITION AND TARGETS
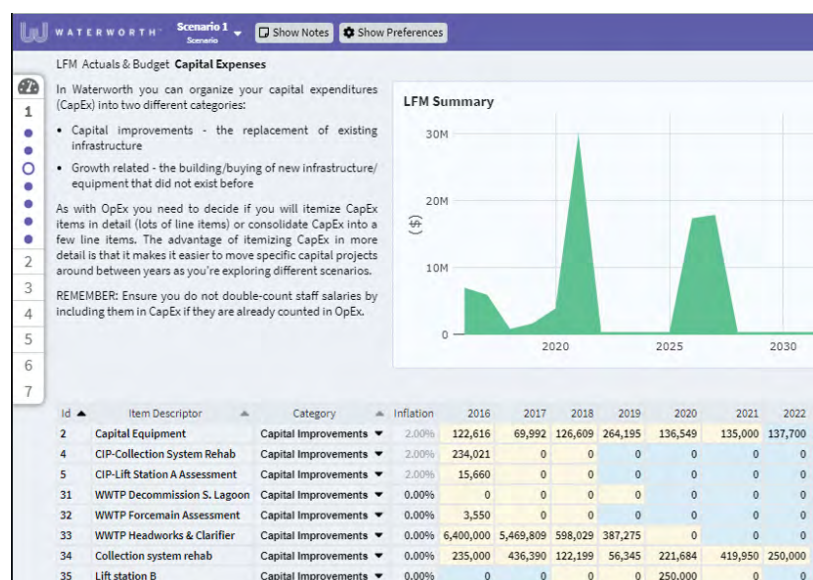

EXHIBIT 3 | NORTHGLENN WASTEWATER CAPITAL EXPENDITURES

EXHIBIT 4 | NORTHGLENN EXISTING AND PROPOSED DEBT FUNDING