



# Water Rate Model Discussion

May 4th, 2022



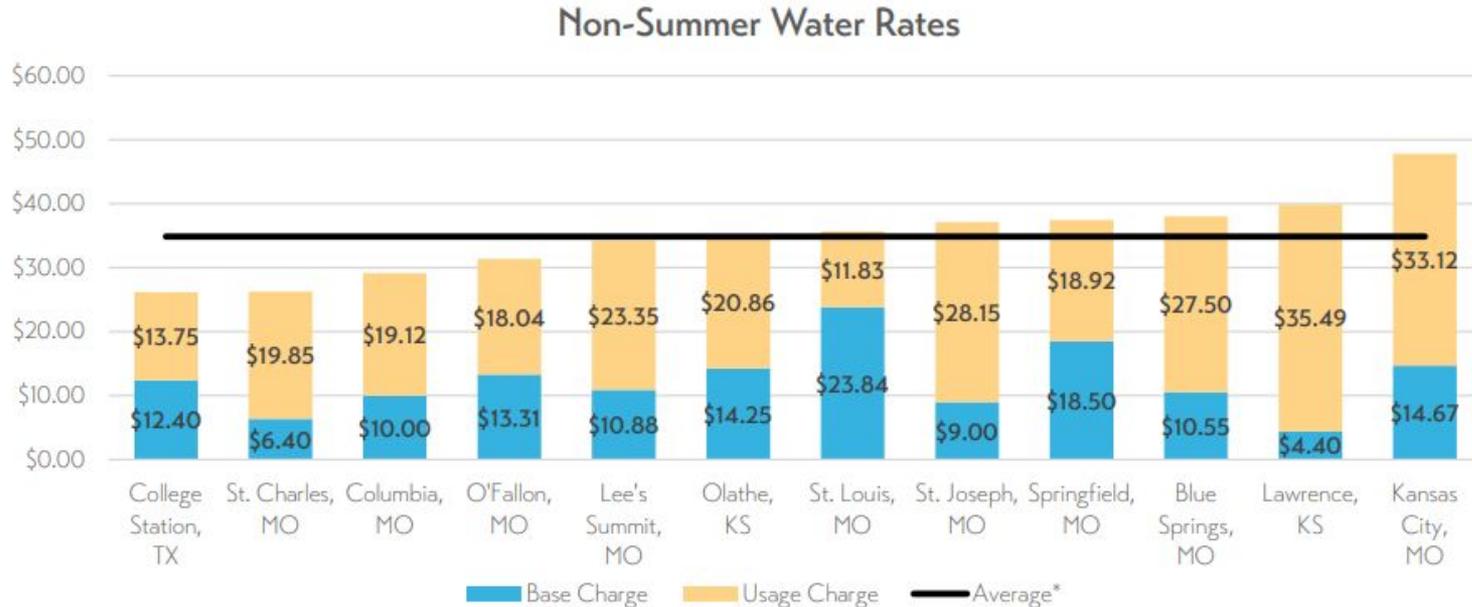
# Overview

Two components:

- **Water rate comparison**
  - Across State and Similar University Towns
  - Boone County
- **5-year Water Utility Forecast Model**
  - Business-as-Usual
  - Alternative Scenarios

# Rate Comparison

Figure 1. Non-summer base and usage-based water rate comparison across cities for 5,000 gallons of water consumption



\*Average total summer water rates across all cities considered in this study region.

Source:

<https://www.como.gov/wp-content/uploads/2022/04/Comprehensive-Water-Rate-Analysis-2021.pdf>

# Boone County Water Rates

Water Rate comparison for 5,000 gallons of water usage

<b>Boone County Water Providers</b>	<b>Base Rates</b>	<b>Usage Rate</b>	<b>Units</b>	<b>Total Charges*</b>
Consolidated Public Water Supply District No. 1	\$15.0	\$6.80	/1000 gallons	\$49.00
Public Water Supply District No. 10	\$12.5	\$5.94	/1000 gallons	\$42.20
Water District No. 4	\$9.0	\$5.00	/1000 gallons	\$34.00
Water District No. 9	\$12.0	\$3.95	/1000 gallons	\$31.75
City of Columbia	\$10.0	\$2.86	/1 ccf	\$29.10

\*excluding other fees

- Within Boone County, City of Columbia's Water Rates are the lowest

# **5-year Water Utility Forecast Model**

# Water Utility Model Overview

- We modeled only the demand side and revenues
- Expense, including capital improvement projects, as well as related information were provided by the Water Utility
- Demand for each of the following categories of Columbia's Water Utility customers are modeled:
  - Residential
  - Commercial
  - Large commercial
  - Master Meter
  - Airport
  - Irrigation
    - Commercial
    - Residential
- The model also includes both inside and outside city limit customers' summer and non-summer usage

# Assumptions

- Per capita water consumption is assumed to be the average of their historical usage
- Annual population growth rate of around 1% is assumed
- Elasticity assumption: -0.41  
(<https://extension.unr.edu/publication.aspx?PubID=3559>)
  - As the water usage rate increases by 1% usage declines by 0.41%
- Consumption is perfectly inelastic to the base rate
- No conservation practice measures are assumed, but the model is able to include such assumptions if required
- We expect the operating expenses to grow at the average annual inflation rate of 2%, starting in 2024

Based on these assumptions, we are proposing three alternative rate structures from FY 23 onwards

# How the Model Works

- The model has several components:
  - Base Fees
  - Usage Fees
  - Backflow Charges
  - Fire Flow Charges
- $\text{Fee Revenue} = \text{Total Customers} * (\text{Base Fees} + \text{Per capita water consumption} * \text{Usage Fees})$
- Total usage related revenue is summarized into Residential and Commercial Fees
- Other revenues are Miscellaneous Revenue and Interest Revenue
- The model is capable of analyzing the impact of alternative rate structures on the Water Utility Fund's cash reserve
- Model forecast 6-year: FY 2022 - FY 2027, relying on the population growth
- Study also includes three alternative rate scenarios

# Financial Trend Manual

- Estimated cash reserve: At the end of FY 2021, Water Utility has \$7.987 million in available cash

ESTIMATED CASH RESERVE					
	FY 17	FY 18	FY 19	FY 20	FY 21
Cash and Cash Equivalents	3,171,253	4,060,408	9,049,494	8,334,114	9,069,227
Receivables	3,725,814	3,960,931	3,191,783	3,261,378	3,234,279
GASB 31 Adjustment	1,340,893	1,831,864	1,395,232	1,384,467	1,535,342
Current Liabilities	(2,239,166)	(2,518,369)	(1,951,034)	(2,103,236)	(2,176,397)
Next Year CIP	(3,895,192)	(492,520)	(1,675,000)	(740,000)	(3,675,000)
<b>Ending Available Cash</b>	<b>2,103,602</b>	<b>6,842,314</b>	<b>10,010,475</b>	<b>10,136,723</b>	<b>7,987,451</b>
Expenditures excluding Depreciation, Interest Expense, and Loss on Disposal	19,278,203	19,716,201	18,672,540	19,655,423	20,699,953
Debt Service Obligations	4,877,333	5,430,266	5,887,289	5,923,823	6,165,352
<b>Total Expenses</b>	<b>24,155,537</b>	<b>25,146,467</b>	<b>24,559,829</b>	<b>25,579,247</b>	<b>26,865,305</b>
Cash Reserve Target (20% of total current year expenses)	4,831,107	5,029,293	4,911,966	5,115,849	5,373,061
<b>Cash above/below Target</b>	<b>(2,727,505)</b>	<b>1,813,021</b>	<b>5,098,509</b>	<b>5,020,874</b>	<b>2,614,390</b>

# Current Situation: Baseline

- No rate change: By FY 24, the Water Fund could face an operating cash deficit of around \$4.8 million

Cash Reserve Estimates							
	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
Beginning Unassigned Cash Reserve		7,987,451	5,502,222	164,807	(4,797,414)	(8,174,882)	(12,779,451)
Estimated Financial Sources		27,537,733	27,915,727	28,325,446	28,770,762	29,260,313	29,749,864
Estimated Financial Uses		27,522,962	30,353,141	30,963,667	31,098,230	31,614,883	32,143,813
Next Year CIP	3,675,000	2,500,000	2,900,000	2,324,000	1,050,000	2,250,000	550,000
Ending Cash Reserve less CIP	7,987,451	5,502,222	164,807	(4,797,414)	(8,174,882)	(12,779,451)	(15,723,400)
Current Year Operating Uses	26,137,326	27,522,962	30,353,141	30,963,667	31,098,230	31,614,883	32,143,813
Cash Target (20% of total expenses)	5,227,465	5,504,592	6,070,628	6,192,733	6,219,646	6,322,977	6,428,763
Cash above (below) Target	2,759,986	(2,371)	(5,905,821)	(10,990,147)	(14,394,528)	(19,102,428)	(22,152,163)
Debt Ratio with PILOT	1.24	1.09	0.75	0.67	0.72	0.72	0.70
Debt Ratio without PILOT	1.70	1.55	1.13	1.12	1.17	1.17	1.15

# Tier 3 rate change

- One-time rate increase: Only Tier 3 and Summer irrigation rate increase by 50% in FY 23

	Proposed Rates					
Bill Types	Current	FY 23	FY 24	FY 25	FY 26	FY 27
Base Fees	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Usages Fees						
<i>Residential Tier 1</i>	\$2.86	\$2.86	\$2.86	\$2.86	\$2.86	\$2.86
<i>Commercial Tier 1</i>	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70
<i>Summer Tier 2</i>	\$4.01	\$4.01	\$4.01	\$4.01	\$4.01	\$4.01
<i>Summer Tier 3</i>	\$6.02	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03
<i>Airport</i>	\$4.22	\$4.22	\$4.22	\$4.22	\$4.22	\$4.22
<i>Irrigation Summer</i>	\$6.02	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03

# Tier 3 rate change Outcome

- With only a one-time 50% Tier 3 rate increase in FY 23, the City's Water Utility Fund ending cash reserves would still be -\$2.7 million in FY 24

Cash Reserve Estimates							
	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
<b>Beginning Unassigned Cash Reserve</b>		7,987,451	5,502,222	736,365	(2,703,643)	(4,519,586)	(7,521,566)
<b>Estimated Financial Sources</b>		27,537,733	28,528,106	29,956,376	30,443,812	30,977,361	31,510,911
<b>Estimated Financial Uses</b>		27,522,962	30,393,962	31,072,384	31,209,755	31,729,341	32,261,336
<b>Next Year CIP</b>	3,675,000	2,500,000	2,900,000	2,324,000	1,050,000	2,250,000	550,000
<b>Ending Cash Reserve less CIP</b>	7,987,451	5,502,222	736,365	(2,703,643)	(4,519,586)	(7,521,566)	(8,821,991)
<b>Current Year Operating Uses</b>	26,137,326	27,522,962	30,393,962	31,072,384	31,209,755	31,729,341	32,261,336
<b>Cash Target (20% of total expenses)</b>	5,227,465	5,504,592	6,078,792	6,214,477	6,241,951	6,345,868	6,452,267
<b>Cash above (below) Target</b>	2,759,986	(2,371)	(5,342,427)	(8,918,120)	(10,761,537)	(13,867,434)	(15,274,258)
<b>Debt Ratio with PILOT</b>	1.24	1.09	0.82	0.91	0.97	0.97	0.96
<b>Debt Ratio without PILOT</b>	1.70	1.55	1.20	1.36	1.42	1.43	1.42

# **Alternative Scenarios**

# Scenario 1

- Base fees: Increase by 7% in FY 23 and 4% annually in the following years
- Residential Tier 1: Annually increase by 5% for all years
- Commercial Tier 1: Increase by 15% in FY 23 and 5% in the following years
- Tier 2: Increase by 15% in FY 23 and 5% in the following years
- Tier 3 and Sum Irr: Increase by 30% in FY 23 and 5% in the following years

Bill Types	Proposed Rates					
	Current	FY 23	FY 24	FY 25	FY 26	FY 27
Base Fees	\$10.00	\$10.70	\$11.13	\$11.57	\$12.04	\$12.52
Usages Fees						
<i>Residential Tier 1</i>	\$2.86	\$3.00	\$3.15	\$3.31	\$3.48	\$3.65
<i>Commercial Tier 1</i>	\$2.70	\$3.11	\$3.26	\$3.42	\$3.59	\$3.77
<i>Summer Tier 2</i>	\$4.01	\$4.61	\$4.84	\$5.08	\$5.34	\$5.61
<i>Summer Tier 3</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51
<i>Airport</i>	\$4.22	\$4.43	\$4.65	\$4.89	\$5.13	\$5.39
<i>Irrigation Summer</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51

# Scenario 1 Outcome

- The outcome could be too risky as this might lead to less than \$1 million cash reserve in FY 24

Cash Reserve Estimates							
	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
Beginning Unassigned Cash Reserve		7,987,451	5,502,222	1,949,410	737,452	2,493,151	4,504,388
Estimated Financial Sources		27,537,733	29,827,788	32,343,555	34,270,543	36,348,626	38,426,710
Estimated Financial Uses		27,522,962	30,480,599	31,231,513	31,464,844	32,087,389	32,751,147
Next Year CIP	3,675,000	2,500,000	2,900,000	2,324,000	1,050,000	2,250,000	550,000
Ending Cash Reserve less CIP	7,987,451	5,502,222	1,949,410	737,452	2,493,151	4,504,388	9,629,951
Current Year Operating Uses	26,137,326	27,522,962	30,480,599	31,231,513	31,464,844	32,087,389	32,751,147
Cash Target (20% of total expenses)	5,227,465	5,504,592	6,096,120	6,246,303	6,292,969	6,417,478	6,550,229
Cash above (below) Target	2,759,986	(2,371)	(4,146,709)	(5,508,850)	(3,799,818)	(1,913,089)	3,079,721
Debt Ratio with PILOT	1.24	1.09	0.99	1.27	1.54	1.78	2.06
Debt Ratio without PILOT	1.70	1.55	1.37	1.72	2.00	2.23	2.51

# Scenario 2

- Base fees: Increase by 10% in FY 23 and 4% annually in the following years
- Residential Tier 1 & Airport: Annually increase by 5% for all years
- Commercial Tier 1: Increase by 15% in FY 23 and 5% in the following years
- Tier 2: Increase by 15% in FY 23 and 5% in the following years
- Tier 3 and Sum Irr: Increase by 30% in FY 23 and 5% in the following years

	Proposed Rates					
Bill Types	Current	FY 23	FY 24	FY 25	FY 26	FY 27
Base Fees	\$10.00	\$11.00	\$11.44	\$11.90	\$12.37	\$12.87
Usages Fees						
<i>Residential Tier 1</i>	\$2.86	\$3.00	\$3.15	\$3.31	\$3.48	\$3.65
<i>Commercial Tier 1</i>	\$2.70	\$3.11	\$3.26	\$3.42	\$3.59	\$3.77
<i>Summer Tier 2</i>	\$4.01	\$4.61	\$4.84	\$5.08	\$5.34	\$5.61
<i>Summer Tier 3</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51
<i>Airport</i>	\$4.22	\$4.43	\$4.65	\$4.89	\$5.13	\$5.39
<i>Irrigation Summer</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51

# Scenario 2 Outcome

- In this case, the Ending Cash Reserve less CIP could be always above \$1 million. However, cash reserve might be below target until FY 26.

Cash Reserve Estimates							
	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
Beginning Unassigned Cash Reserve		7,987,451	5,502,222	2,158,203	1,165,524	3,151,530	5,404,678
Estimated Financial Sources		27,537,733	30,051,493	32,578,495	34,517,300	36,607,814	38,698,328
Estimated Financial Uses		27,522,962	30,495,511	31,247,174	31,481,293	32,104,666	32,769,297
Next Year CIP	3,675,000	2,500,000	2,900,000	2,324,000	1,050,000	2,250,000	550,000
Ending Cash Reserve less CIP	7,987,451	5,502,222	2,158,203	1,165,524	3,151,530	5,404,678	10,783,710
Current Year Operating Uses	26,137,326	27,522,962	30,495,511	31,247,174	31,481,293	32,104,666	32,769,297
Cash Target (20% of total expenses)	5,227,465	5,504,592	6,099,102	6,249,435	6,296,259	6,420,933	6,553,859
Cash above (below) Target	2,759,986	(2,371)	(3,940,899)	(5,083,911)	(3,144,728)	(1,016,255)	4,229,850
Debt Ratio with PILOT	1.24	1.09	1.01	1.30	1.58	1.82	2.10
Debt Ratio without PILOT	1.70	1.55	1.39	1.76	2.03	2.27	2.56

# Scenario 3

- Base fee: Increase by 10% in FY 23 and 5% annually in the following years
- Residential Tier 1 & Airport: Annually increase by 5% for all years
- Commercial Tier 1: Increase by 15% in FY 23 and 5% in the following years
- Tier 2 & 3 and Sum Irr: Increase by 30% in FY 23 and 5% in the following years

	Proposed Rates					
Bill Types	Current	FY 23	FY 24	FY 25	FY 26	FY 27
Base Fees	\$10.00	\$11.00	\$11.55	\$12.13	\$12.73	\$13.37
Usages Fees						
<i>Residential Tier 1</i>	\$2.86	\$3.00	\$3.15	\$3.31	\$3.48	\$3.65
<i>Commercial Tier 1</i>	\$2.70	\$3.11	\$3.26	\$3.42	\$3.59	\$3.77
<i>Summer Tier 2</i>	\$4.01	\$5.21	\$5.47	\$5.75	\$6.03	\$6.34
<i>Summer Tier 3</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51
<i>Airport</i>	\$4.22	\$4.43	\$4.65	\$4.89	\$5.13	\$5.39
<i>Irrigation Summer</i>	\$6.02	\$7.83	\$8.22	\$8.63	\$9.06	\$9.51

# Scenario 3 Outcome

- In this case, the Ending Cash Reserve less CIP could be always above \$1.5 million. Cash reserve might be above target sooner than Scenario 2.

Cash Reserve Estimates							
	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
<b>Beginning Unassigned Cash Reserve</b>		7,987,451	5,502,222	2,300,104	1,749,035	4,284,410	7,205,303
<b>Estimated Financial Sources</b>		27,537,733	30,203,528	33,051,646	35,105,904	37,323,250	39,540,596
<b>Estimated Financial Uses</b>		27,522,962	30,505,646	31,278,715	31,520,529	32,152,357	32,826,911
<b>Next Year CIP</b>	3,675,000	2,500,000	2,900,000	2,324,000	1,050,000	2,250,000	550,000
<b>Ending Cash Reserve less CIP</b>	7,987,451	5,502,222	2,300,104	1,749,035	4,284,410	7,205,303	13,368,988
<b>Current Year Operating Uses</b>	26,137,326	27,522,962	30,505,646	31,278,715	31,520,529	32,152,357	32,826,911
<b>Cash Target (20% of total expenses)</b>	5,227,465	5,504,592	6,101,129	6,255,743	6,304,106	6,430,471	6,565,382
<b>Cash above (below) Target</b>	2,759,986	(2,371)	(3,801,025)	(4,506,708)	(2,019,696)	774,832	6,803,605
<b>Debt Ratio with PILOT</b>	1.24	1.09	1.03	1.38	1.67	1.92	2.23
<b>Debt Ratio without PILOT</b>	1.70	1.55	1.41	1.83	2.12	2.38	2.68

# City Recommendation

While in none of the cases, **Debt ratio with PILOT** in FY 23 and FY 24 are above 1.11 (industry standard), the proposed 10% annual base fee increase in FY 23 and 4% increasing annually, along with 5% annual increase in Tier 1 usage rate (scenario 2) would definitely be beneficial for the City's Water Utility to perform all the essential maintenance in a timely manner. Due to the additional economic burden to the citizens, however, City administration recommends the following rate increase:

- Base fees: Increase by 10% in FY 23 and 4% annually in the following years
- Residential Tier 1: Annually increase by 5% for all years
- Commercial Tier 1: Increase by 15% in FY 23 and 5% in the following years
- Tier 2 : Increase by 15% in FY 23 and 5% in the following years
- Tier 3 and Sum Irr: Increase by 30% in FY 23 and 5% in the following years

# An example of proposed bill: Scenario 2

## Current Bill



### City of Columbia, Missouri

Utilities Department  
701 E. Broadway  
P.O. Box 1676  
Columbia, MO 65205

Billing Questions:  
(573) 874-7380  
ucs@como.gov

Pay Bill: (573) 874-7694  
Online - <https://myutilitybill.como.gov>

Customer - Account #: XXXXXXXX  
Name: XXXX XXXX

Service Address: CUNNINGI

Utility after-hours emergency: (573) 875-2555

## Proposed Bill



### City of Columbia, Missouri

Utilities Department  
701 E. Broadway  
P.O. Box 1676  
Columbia, MO 65205

Billing Questions:  
(573) 874-7380  
ucs@como.gov

Pay Bill: (573) 874-7694  
Online - <https://myutilitybill.como.gov>

Customer - Account #: XXXXXXXX  
Name: XXXX XXXX

Service Address: CUNNINGI

Utility after-hours emergency: (573) 875-2555

Winter Average Consumption	5.46		
Customer Base Charge			\$10.00
Water CCF Tier 1 Summer	3.73	\$2.86	\$10.67
Water CCF Tier 2 Summer	2.27	\$4.01	\$9.10
Water - PILOT Fee			\$2.36
State Regulatory Fee - Water			\$0.13
Fire Flow Charge			\$1.59
Water Tax			\$0.85
<b>Water Total</b>			<b>\$34.70</b>

Winter Average Consumption	5.46		
Customer Base Charge			\$11.00
Water CCF Tier 1 Summer	3.73	\$3.00	\$11.19
Water CCF Tier 2 Summer	2.27	\$4.61	\$10.46
Water - PILOT Fee			\$2.59
State Regulatory Fee - Water			\$0.13
Fire Flow Charge			\$1.59
Water Tax			\$0.93
<b>Water Total</b>			<b>\$37.89</b>

- Assuming that customers will not adjust their water usage, their bill could increase around \$3.19 for the initial increase (estimated).
- However, if the user adjust their water usage based on the rate increase then their bill might increase only by \$1.74 to \$36.44 during the same month (estimated based on the -0.41 elasticity assumption).

Questions?

