

METROPOLITAN UTILITIES DISTRICT
Committee Meetings

8:15 a.m.

November 3, 2021

AGENDA

1. Safety Briefing
2. Roll Call
3. Open Meetings Act Notice

Construction and Operations – Frost, Friend, Cavanaugh

1. Capital Expenditures [Jim Knight - VP, Gas Operations] – **Tab 5**
2. Acceptance of Contracts and Payment of Final Estimates
[Stephanie Henn – Director, Plant Engineering] – **Tab 6**
3. Bids on Materials and Contracts
[Jon Zellars – VP, Procurement & Enterprise Services] – **Tab 7**

Services & Extensions – Friend, Begley, Howard

1. Main Extensions [Jeff Schovanec – Director, Engineering Design] – **Tab 8**

Personnel – Begley, Frost, Friend

1. Wage and/or Salary Increases and Ratifications
[Bonnie Savine – VP, Human Resources] - **Tab 9**

Insurance & Pension – Howard, McGowan, Cook

1. Experience Study for Pension Plan, Period Ending December 31, 2020
[Joseph Schaffart, SVP and Chief Financial Officer & Pat Beckham, Principal and Consulting Actuary with Cavanaugh MacDonald] - **Tab 10**
2. Fiduciary Recommendation for 457B Defined Contribution Plan
[Mark Mendenhall – SVP & General Counsel - **Tab 11**

Accounts, Expenditures, Finance & Rates – McGowan, Begley, Cook

1. 2022 Budget Workshop – Personnel & Capital [Joseph Schaffart – SVP & Chief Financial Officer & Mark Myers – VP, Accounting] – **Tab A [INFORMATION ONLY]**

(Turn over for regular Board Meeting agenda)

METROPOLITAN UTILITIES DISTRICT
Regular Monthly Board Meeting

9:00 a.m.

November 3, 2021

AGENDA

1. Roll Call
2. Open Meetings Act Notice
3. Pledge of Allegiance
4. Approval of Minutes – Committee Meetings & Regular Board Meeting for October 6, 2021
- CONSTRUCTION & OPERATIONS 5. Capital Expenditures
6. Acceptance of Contracts and Payment of Final Estimates
7. Bids on Materials and Contracts
- SERVICES & EXTENSIONS 8. Main Extensions
- PERSONNEL 9. Wage and/or Salary Increases and Ratifications
- INSURANCE & PENSION 10. Experience Study for the Pension Plan, Period Ending December 31, 2020
11. Fiduciary Recommendation for 457B Defined Contribution Plan
- BOARD 12. Other Matters of District Business for Discussion
13. **CLOSED SESSION – Litigation, Personnel & Real Estate**

Adjourn Regular Monthly Board Meeting

(Turn over for Committee Meetings agenda)

METROPOLITAN UTILITIES DISTRICT
Minutes of Committee Meetings
October 6, 2021

Chairperson Mike McGowan called to order the Committee meetings of the Metropolitan Utilities District Board of Directors at 8:15 a.m. at its headquarters building located at 7350 World Communications Drive.

Advance notice of the meetings was published in the print version of *The Omaha World-Herald* on Sunday, September 26, 2021, and the online version from September 26, 2021, through October 2, 2021. Notice was also provided on the M.U.D. website at www.mudomaha.com and other social media platforms. Agendas and pertinent documents to be presented at the October 6, 2021, meetings were delivered to Board Members and posted to the M.U.D. website on September 30, 2021.

Chairperson McGowan announced that the meeting was being livestreamed and a recording of the meeting would be uploaded to the M.U.D. website after the meeting's conclusion. He also announced that due to COVID, the number of attendees at the meeting was limited to the extent possible, unvaccinated people were required to wear masks, and all attendees were encouraged to abide by the six-foot social distancing rule.

Safety Briefing

Vice-President of Safety, Security and Business Continuity Shane Hunter provided a safety briefing for all individuals attending the meeting in-person regarding the protocol in the event of an emergency.

Roll Call

On a roll call vote, the following Directors acknowledged their presence: Jack Frost, Mike McGowan, Gwen Howard, Tim Cavanaugh, Jim Begley, Tanya Cook, Dave Friend. All attending Directors participated in-person.

Open Meetings Act Notice

Chairperson McGowan announced that a copy of the Open Meetings Act was located on the wall in the back of the Board Room as well as in the conference room designated for any members of the public who may attend.

Construction and Operations – Frost, Friend, Cavanaugh

Senior Vice-President & Chief Operations Officer Gina Langel reviewed the proposed capital expenditures as outlined in her letter to the Committee dated September 28, 2021.

Vice-President of Engineering & Construction Cory O'Brien reviewed the Acceptance of Contracts and Payment of Final Estimates as outlined in the letter from Director of Plant Engineering Stephanie Henn dated September 29, 2021.

Vice-President of Procurement and Enterprise Services Jon Zellars reviewed the bids on materials and contracts as outlined in the letter from Director of Procurement Sherri Meisinger to the Committee dated September 24, 2021.

Senior Vice-President and General Counsel Mark Mendenhall reviewed the proposed renewal of the water franchise agreement with the City of LaVista as outlined in his letter to the Committee dated September 29, 2021.

Services & Extensions – Friend, Begley, Howard

Mr. Mendenhall reviewed the proposed installation of the water main district in Earl Avenue, Bruhn Estates as outlined in his letter to the Committee dated September 30, 2021. Mr. Mendenhall pointed out that the Board previously approved the creation of the water main district (WMD) at the September 1, 2021 Board Meeting, and that the present proposal being presented to the Board is to approve a Resolution to install the WMD as well as affirm the District's compliance with state statutory requirements and the District's Procedures Manual.

Mr. O'Brien reviewed the proposed main extensions as outlined in his letter to the Committee dated September 29, 2021.

Personnel - Begley, Frost, Friend

Vice-President of Human Resources Bonnie Savine provided an update on the current number of employees and the current status of open employee positions and job applicants. Ms. Savine also reviewed the proposed wage and/or salary increases and ratifications as outlined in her letter to the Committee dated September 23, 2021.

Accounts, Expenditures, Finance & Rates - McGowan, Begley, Cook

Manager of Rates & Regulatory Affairs Geneva Patterson reviewed the proposed changes to the gas rate schedule ("CS-1") for contract gas service as outlined in her letter dated September 28, 2021. Ms. Patterson reported that the CS-1 gas rate schedule pertains to contracted service that is available only for commercial and industrial natural gas customers who have access to competitive alternate fuel capabilities or alternate energy choices and also to potential economic development customers. The proposed changes eliminate the three-year contract term limitation and clarify that the contracted monthly customer charge shall not be less than the customer charge as provided in the customer's applicable firm / interruptible service gas rate schedule.

Judicial & Legislative – Cook, Cavanaugh, Howard

Mr. Mendenhall reviewed the proposed lease to OPPD of approximately 27 acres near the District's LNG Plant property as outlined in his letter to the Committee dated September 30, 2021. The terms of the lease as negotiated by the parties will allow the District to retain ownership of the property while allowing OPPD to construct and operate the Standing Bear Lake Station electrical generating facility associated with its Power with Purpose initiative. The lease agreement for what had previously been undeveloped property will benefit M.U.D. ratepayers by generating additional revenue. Board approval will authorize President Mark Doyle to execute the lease agreement.

Mr. Mendenhall reviewed the ratification of the property purchase near the Platte South Water Treatment Plant as outlined in his letter to the Committee dated September 29, 2021. The property acquisition will benefit the District by providing space for a future development of a solids reduction facility if needed for compliance with EPA regulations, will eliminate the use of pesticides and herbicides in farming operations on this property that is adjacent to part of the well field, and it will add a greater security buffer for the District's facilities and wells in the vicinity.

Committee of the Whole

Vice-President of Gas Operations Jim Knight reviewed the update to the LNG Capital Improvement Project as outlined in his letter to the Committee dated September 29, 2021. The original proposal to upgrade the LNG plant was approved by the Board at the February 2021 Board Meeting but due to a mutually agreed upon revision to the initial project plan by the District's project team and its design consultant, CHI Engineering, the scope of the project and associated costs have been changed. Relocation of certain equipment will improve the layout and provide greater efficiencies. Though Board approval is not required for project cost increases under 10% (and this was an increase of 4.1% or \$3.1 million), Management recommended presenting the updated information to the Board.

At the request of Chairperson McGowan, Mr. Knight also provided a status report of the District's long-term gas purchases through Central Plains Energy Project (CPEP) and M.U.D. storage capacities and he also addressed recent news reports of a natural gas price surge. He first addressed the gas pricing issues, noting that in 2020 natural gas traded as low as \$1.40 and oil traded around \$30/barrel, the lowest since 1995. However, the disruption caused by the pandemic has also prompted a decline in energy demands and oil drilling, impacting economies around the world. Currently, demand is exceeding energy production levels (5% vs. 1%) and natural gas storage continues to lag at levels 15% below last year (which set a record) and 6% below the 5-year average. Natural gas prices are currently trading at \$6.00/Dth and oil is close to \$80/barrel. Various sectors of the economy, such as air travel have experienced an upturn but not yet to the extent of pre-pandemic levels. Some industry experts are expecting that the storage deficit will decrease given the mild temperatures forecasted for the month of October.

As for M.U.D. gas purchases and storage facilities, Mr. Knight reviewed the array of strategies that the District employs to secure economical gas supplies for its customers, including: the Northern Natural Gas (NNG) pipeline storage; M.U.D.'s onsite storage facilities (peak shaving plants); long-term gas purchases from Central Plains Energy Project (CPEP); and the long-term transportation contract with Northern Natural Gas.

M.U.D. leases 2.7 million Dth of storage annually from Northern Natural Gas (NNG) which accounts for approximately 12% of the District's winter needs. This, coupled with the District's on-site natural gas storage facilities (peak shaving plants), provides us with the capacity to meet customer demand for the winter months. Long-term gas purchases acquired through CPEP and other natural gas pre-pay contracts will supply 60% of needed gas supplies in 2022 at a fixed discount to market pricing, yielding savings in the amount of \$4.5 million in 2021, \$7.5 million in 2022, and \$12.0 million/year from 2023 to 2026. And lastly, the District's long-term transportation contract with NNG saves M.U.D. customers \$8.0 million annually as compared with their tariff rate.

Chairperson McGowan commended President Mark Doyle on his editorial recently published in the Omaha World-Herald detailing the various safety nets that shielded MUD ratepayers from the economic repercussions of the February 2021 polar vortex. Mr. Doyle thanked Director McGowan but pointed out the editorial was the product of a collective effort by a number of contributors.

Chairperson McGowan asked whether any Board Members had any further comments. There were none.

Chairperson McGowan announced that due to COVID-related precautions, any members of the public interested in speaking at the meeting were provided access via a Webex connection set up in a conference room adjacent to the Board Room at the Headquarters Building. He asked whether any members of the public were present and wished to speak, and if so, to please relay that information to the conference room moderator. There were none.

At 9:46 a.m., Chairperson McGowan announced that the Committee Meetings had concluded and that the Board would convene at 9:55 a.m. for the regular monthly Board Meeting.



Mark E. Doyle
Secretary and President

MED/mjm

METROPOLITAN UTILITIES DISTRICT
Minutes of the Regular Monthly Board Meeting
October 6, 2021

Chairperson McGowan called to order the Board Meeting of the Metropolitan Utilities District Board of Directors at 9:55 a.m. at its headquarters building located at 7350 World Communications Drive.

Advance notice of the meetings was published in the print version of *The Omaha World-Herald* on Sunday, September 26, 2021, and the online version from September 26, 2021, through October 2, 2021. Notice was also provided on the M.U.D. website at www.mudomaha.com and other social media platforms. Agendas and pertinent documents to be presented at the October 6, 2021, meetings were delivered to Board Members and posted to the M.U.D. website on September 30, 2021.

Chairperson McGowan announced that the meeting was being livestreamed and a recording of the meeting would be uploaded to the M.U.D. website after the meeting's conclusion. He also announced that due to COVID, the number of attendees at the meeting was limited to the extent possible, unvaccinated people were required to wear masks, and all attendees were encouraged to abide by the six-foot social distancing rule.

AGENDA NO. 1

ROLL CALL

On a roll call vote, the following Directors acknowledged their presence: Jack Frost, Mike McGowan, Gwen Howard, Tim Cavanaugh, Jim Begley, Tanya Cook, Dave Friend. All attending Directors participated in-person.

AGENDA NO. 2

OPEN MEETINGS ACT NOTICE

Chairperson McGowan announced that a copy of the Open Meetings Act was located on the wall in the back of the Board Room as well as in the conference room designated for any members of the public who may attend.

AGENDA NO. 3

PLEDGE OF ALLEGIANCE

Chairperson McGowan invited all who wished to participate to recite the Pledge of Allegiance.

AGENDA NO. 4

APPROVAL OF MINUTES FOR COMMITTEE MEETINGS AND REGULAR MONTHLY BOARD MEETING FOR SEPTEMBER 1, 2021

Director Frost moved to approve the minutes for the Committee Meetings and regular monthly Board Meeting for September 1, 2021, which was seconded by Director Begley and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 5

CAPITAL EXPENDITURES

Director Frost moved to approve the capital expenditures as outlined in Ms. Langel's letter to the Committee dated September 28, 2021, which was seconded by Director Cavanaugh and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 6

ACCEPTANCE OF CONTRACTS AND PAYMENT OF FINAL ESTIMATES

Director Frost moved to approve the acceptance of contracts and payment of final estimates as outlined in the letter from Ms. Henn to the Committee dated September 29, 2021, which was seconded by Director Cook and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 7

BIDS ON MATERIALS AND CONTRACTS

Director Frost moved to approve Management's recommendations regarding the bids on materials and contracts as reviewed by Mr. Zellars at the Committee Meetings and as outlined in the letter to the Committee from Director of Procurement Sherri Meisinger dated September 24, 2021. The motion was seconded by Director Friend and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 8

NOTICE OF PURCHASES BETWEEN \$25,000 & \$50,000

Director Frost requested that the Notice of Purchases letter be placed on file.

AGENDA NO. 9

RENEWAL OF LAVISTA WATER FRANCHISE AGREEMENT

Director Frost moved to approve the renewal of the LaVista water franchise agreement as outlined in Mr. Mendenhall's letter to the Committee dated September 29, 2021, which was seconded by Director Cavanaugh and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 10

AUTHORIZATION TO INSTALL WATER MAIN DISTRICT ON EARL AVENUE, BRUHN ESTATES (RESOLUTION)

Director Friend moved to approve the proposed authorization and Resolution to install a water main district on Earl Avenue in Bruhn Estates as outlined in Mr. O'Brien's letter to the Committee dated September 30, 2021, which was seconded by Director Begley and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 11

MAIN EXTENSIONS

Director Friend moved to approve the proposed main extensions as outlined in Mr. O'Brien's letter to the Committee dated September 30, 2021, which was seconded by Director Cavanaugh and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 12

WAGE AND/OR SALARY INCREASES AND RATIFICATIONS

Director Begley moved to approve the wage and/or salary increases and ratifications as outlined in Ms. Savine's letter to the Committee dated September 23, 2021. The motion was seconded by Director Howard and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend

Voting No: None

AGENDA NO. 13

PROPOSED CHANGES TO GAS RATE SCHEDULE FOR CONTRACT GAS SERVICE

Chairperson McGowan moved to approve the proposed changes to the Gas Rate Schedule CS-1 for Contract Gas Service as outlined in Ms. Patterson's letter to the

Committee dated September 28, 2021. The motion was seconded by Director Frost and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend
Voting No: None

AGENDA NO. 14
OPPD LEASE AT LNG PROPERTY

Director Cook moved to approve the proposed OPPD lease of District property located near its LNG Plant as outlined in Mr. Mendenhall's letter to the Committee dated September 30, 2021, which was seconded by Director Howard and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend
Voting No: None

AGENDA NO. 15
RATIFICATION OF PROPERTY PURCHASE NEAR PLATTE SOUTH WATER TREATMENT PLANT

Director Cook moved to approve the ratification of the property purchase near Platte South Water Treatment Plant as outlined in Mr. Mendenhall's letter to the Committee dated September 29, 2021, which was seconded by Director Frost and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend
Voting No: None

AGENDA NO. 16
OTHER MATTERS OF DISTRICT BUSINESS FOR DISCUSSION

Chairperson McGowan asked whether any Board Members had any further comments. There were none.

President Mark Doyle announced that Director Tanya Cook was recently named one of the "50 over 50" individuals by The Bloc, a philanthropic nonprofit organization that honors Nebraskans who have made a positive impact in their communities. He commended Director Cook's tenure with the National Black Caucus of State Legislators, as well as her public service for two terms as a Nebraska State Senator and now with the MUD Board of Directors and congratulated her on the recognition.

Chairperson McGowan announced that due to COVID-related precautions, any members of the public interested in speaking at the meeting were provided access via a Webex connection set up in a conference room adjacent to the Board Room at the

Headquarters Building. He asked whether any members of the public were present and wished to address the Board. There were none.

AGENDA NO. 17
CLOSED SESSION

Chairperson McGowan announced that a Closed Session was not necessary.

Director Friend moved to adjourn the regular monthly Board Meeting, which was seconded by Director Begley and carried on a roll call vote.

Voting Yes: Frost, McGowan, Howard, Cavanaugh, Begley, Cook, Friend
Voting No: None

The regular monthly meeting was adjourned at 10:06 a.m.



Mark E. Doyle
Secretary and President

MED/mjm

METROPOLITAN UTILITIES DISTRICT
Inter-Department Communication

October 26, 2021

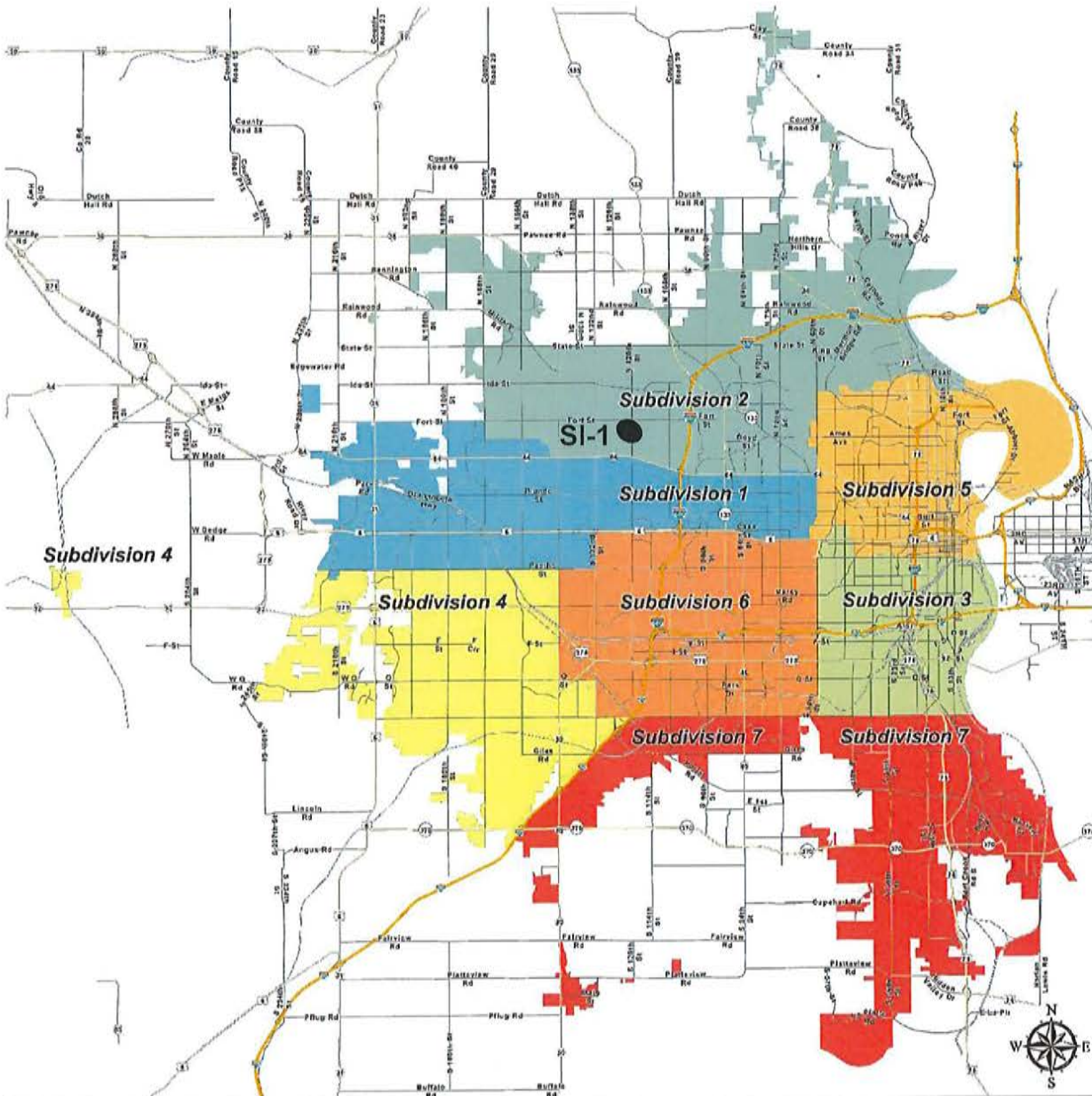
Subject: CAPITAL EXPENDITURES

To: Committee on Construction and Operations

cc: all Board Members, Doyle, Mendenhall, Schaffart, Ausdemore, Langel, Lobsiger
and all Vice Presidents

From: Gina Langel, Senior Vice President, Chief Operations Officer

The following items will be on the November 3, 2021, Committee Agenda for consideration and the Board Agenda for approval:



MUD Subdivision Map

SYSTEM IMPROVEMENTS

1. R 2170 (100053001509, 100067001487) - \$134,000 – 120th Street and Roanoke Blvd, Abandon 245 feet +/- of 8 inch ductile iron water main. Install 325 feet +/- of 8 inch ductile iron water main. This work is required to eliminate conflicts with proposed grading, sewers, retention basins, and buildings on the Roanoke Apartments Development. The existing ductile iron water main is in vacated right of way and will be relocated into the current right of way. This project is anticipated to start November 2021. This work is reimbursable as the project is private in nature. No service reconnects are required for this project. **(Subdivision 2 – Friend)**

BUILDINGS, PLANTS AND EQUIPMENT

1. 100087000642 - \$55,000 - Purchase one (1) 30,000 lb. tandem axle trailer for use in Construction. This trailer will be used to move equipment, materials and tools, and will be assigned to a main gang that currently operates without a 30,000 lb. trailer. This trailer will increase efficiency for the crew as they routinely borrow trailers from other crews.

2. 100087000641 - \$165,000 - Purchase one (1) mini-excavator for use in Construction. Mini-excavators have become vital assets used daily by Construction main gang crews. This unit will be assigned to a crew that currently is only equipped with a larger 710 loader/backhoe. This excavator will replace the 710 loader/backhoe and allow the larger backhoe to be assigned to the equipment pool replacing a unit no longer economical to maintain. The requested mini-excavator will be equipped with a quick coupler, multiple size buckets, a hydraulic breaker, a vibratory compactor, and a rolling sheepsfoot.

3. 100088000794 - \$385,000.00 - Purchase three (3) regular cab, single axle cab & chassis for use in Construction. Single axle pipe tractors are used by main gang crews to transport water and gas pipe and equipment around and between job sites. The requested trucks will have diesel engines as they are kept on job sites and do not return to District facilities often. They are fueled on site by the District's mobile fuel truck while other equipment is being fueled. The units will be equipped with a 5th wheel hitch and pintle hitch allowing multiple trailer configurations to be pulled. The trucks will be replacements for 30-year-old trucks that have reached a point wherein they are no longer economical to maintain for use within the District's fleet. The surplus units will be sold at auction to recover the remaining value. Due to current supply constraints, delivery time is estimated to be approximately one year from order placement.

INFORMATION TECHNOLOGY

1. 100086000741 - \$350,000.00 – Implementation of the Document Presentment OpenText Solution. This project consists of implementing the previously purchased Document Presentment Opentext Solution. This product will be used for District-wide for customer communications.

OpenText Document Presentment provides a platform for the enterprise-wide design, deployment and multi-channel delivery of documents and correspondence. Whether digital or conventional, in batch or interactive, Document Presentment turns documents into dialogues and enables business users to generate personalized and real-time changeable correspondence while maintaining central control of branding and corporate identity.

Document Presentment will replace iTeres and provide greater flexibility and enable business users to create and edit letters. Information Technology Services (ITS) plans to use the RFP process to find a partner for implementation of this product.

2. 100086000743 - \$400,000.00 – Purchase additional SAP Licenses. This C&A will purchase additional SAP user licenses as needed by the business. Growth in on-line usage and additional field use of SAP via the mobile application over time drives the need for additional licenses to remain compliant. Additionally, the solution that keeps data synchronized between SAP and GIS will be going out of support. ITS has identified SAP's Geo Enablement Frame (GEF) as the next generation product to replace Geo.e. SAP has offered a bundling discount that provides a cost savings of \$38,208.75 and an annual maintenance savings of \$8,405.93 if the additional licenses and GEF are acquired together.


Gina Langel
Senior Vice President, Chief Operations Officer

Approved:


Mark E. Doyle
President

METROPOLITAN UTILITIES DISTRICT
Inter-Department Communication

October 25, 2021

Subject: ACCEPTANCE OF CONTRACTS AND PAYMENT OF FINAL ESTIMATES

To: Committee on Construction and Operations
cc: all Board Members, Doyle, Mendenhall, Schaffart, Ausdemore, Langel, Lobsiger and all Vice Presidents

From: Stephanie L. Henn, Director, Plant Engineering

The following items will be on the November 3, 2021 Committee Meeting for consideration and the Board Meeting Agenda for approval. Work has been satisfactorily completed on the following contracts and final payment is recommended:

Contract	Contract Approval Date	Amounts	
		Contract Bid	Actual
a. Commonwealth Electric Company, 100083001087, Variable Frequency Drive Installation at 78 th Street, Skyline, and Rainwood Pump Stations	September 4, 2019	\$1,286,239.80	\$1,286,239.80

Comments: All work required by the contract has been completed by the contractor and is acceptable and in compliance with the contract and specifications.

Contract	Contract Approval Date	Amounts	
		Contract Bid	Actual
b. Commonwealth Electric Company, WP 1630, 100083001080, 36 th & Edna Pump Station Upgrade	February 7, 2020	\$1,022,525.00	\$1,065,683.00

Comments: There was an overall net increase of \$43,158 due to a previously approved change order primarily for modifications needed to accommodate a fuel tank, emergency lighting, and transformer pad changes.

Contract	Contract Approval Date	Amounts	
		*Unit Price Bid	Actual
c. Q3 Contracting, Inc., GP 2497, 100092001631, Contracted Cast Iron Gas Main Replacement, N 37 th St. & Ames Ave to N. 37 th & Pratt St to N. 48 th St & Pratt St.	January 7, 2021	\$792,389.17	\$278,456.28

Comments: There was a net overall decrease \$513,932.89 primarily due less pavement replacement than originally estimated. Most of the gas mains were able to be installed on the back side of the curb rather than in the roadway, after the project was originally estimated.

Contract	Contract Approval Date	Amounts	
		*Unit Price Bid	Actual
d. Cedar Construction, WP 1649, 100055001285, Install Water Mains in Vistancia Subdivision, 204 th & Fort	December 5, 2019	\$948,604.50	\$1,020,823.20

Comments: There was an overall net increase of \$72,218.70, including Change Order No. 1 for \$41,150 for installing v-bio polyethylene wrap, additional taping to adhere the polyethylene to the water main and adherence to new shoring standards that were implemented after the project was bid. Additional unit quantities were also needed due to the contractor mobilizing to the project site multiple times as the developer completed additional portions of the pavement in the subdivision. Approval of this final will also approve Change Order No. 1. The developer approved these additional costs.

Contract	Contract Approval Date	Amounts	
		*Unit Price Bid	Actual
e. Thompson Construction, WP 1791, 100055001351, 100055001054, Install Water Mains in G & G Subdivision, Lots 1-8, 204 th & West Dodge Road & Skyline Drive	February 4, 2021	\$219,890.00	\$205,698.00

Comments: There was an overall net decrease of \$14,192.00, primarily due to needing less pipe and bends than originally estimated.

Contract	Contract Approval Date	Amounts	
		*Unit Price Bid	Actual
f. M.E. Collins Contracting, Co. Inc., R 2053, 100093001307, 100041000094, Cast Iron Water Main Replacement, 132 nd St. & Renfro Circle	November 5, 2020	\$159,988.00	\$164,243.50

Comments: There was an overall net increase of \$4,255.50, primarily due to the existing main being deeper than expected so additional excavation was required and an additional vault was needed.

**Based upon Engineering's estimated unit quantities.*



Stephanie L. Henn
Director, Plant Engineering

Approved:



Cory J. O'Brien
Vice President, Engineering & Construction



Gina Langel
Senior Vice President, Chief Operations Officer



Mark E. Doyle
President

APPROVED by BOARD
Except for Serenity Estates main installation
November 3, 2021

METROPOLITAN UTILITIES DISTRICT
Inter-Department Communication

October 22, 2021

Subject: BIDS ON MATERIALS AND CONTRACTS DURING THE MONTH OF OCTOBER

To: Construction & Operations Committee
cc: All Board Members, Doyle, Ausdemore, Langel, Lobsiger, Mendenhall, Schaffart
and all Vice Presidents

From: Sherri A Meisinger, Director, Procurement

The following items will be on the November 3, 2021 Committee Agenda for consideration and the November 3, 2021 Board Agenda for approval. The recommended bid is bolded and listed first. Nonlocal bidders have been indicated in italics.

WATER/GAS MAIN CONTRACTS

<u>Item</u>	<u>Bids Sent / Rec'd</u>	<u>Bidders</u>	<u>Bid Amount</u>
Install Water Mains in Serenity Estates, Stanford St and Skyline Drive 100055001384 WP1858 Engineering Estimate: \$216,080.00 (A C&A in the amount of \$273,333.00 will be presented to the Board on November 3, 2021 for Approval.)	18/1	Cedar Construction	\$180,776.00

RATIFICATION

<u>Item</u>	<u>Bids Sent / Rec'd</u>	<u>Bidders</u>	<u>Bid Amount</u>
Network Lifecycle Refresh and Upgrades 100086000736 (C&A for 100086000736 approved April 7, 2021 in the amount of \$330,000.00.)	1/1	OneNeck	\$204,737.23

OTHER

<u>Item</u>	<u>Bids Sent / Rec'd</u>	<u>Bidders</u>	<u>Bid Amount</u>
Three (3) Regular Cab, Single Axle Cab and Chassis 100088000794 (A C&A in the amount of \$385,000.00 will be presented to the Board on November 3, 2021 for approval.)	2/2	Truck Center, Inc <i>Midwest Peterbilt Group</i>	\$281,814.00 291,180.00
One (1) Mini Excavator 100087000641 (A C&A in the amount of \$165,000.00 will be presented to the Board on November 3, 2021 for approval.)	1/1	Kubota of Omaha	\$136,219.66
One (1) 30,000lb Dual Wheel Tandem Axle Trailer 100087000642 (A C&A in the amount of \$55,000.00 will be presented to the Board on November 3, 2021 for approval.)	2/2	Ditch Witch (Felling) NMC, Inc (Trail King)	\$40,845.00 42,978.00

ANNUALS

<u>Item</u>	<u>Bids Sent / Rec'd</u>	<u>Bidders</u>	<u>Bid Amount</u>
Ductile Iron Retainer Glands, MJ Accessory Packs and Gland Packs (January 1, 2022 to December 31, 2022) *Bid rejected, non-responsive	5/2	Omaha Winwater American Ungrd	\$245,302.63 199,655.20*
Carbon Dioxide, CO2 for Florence Water Treatment Plant (275 Tons) (January 1, 2022 to August 31, 2022)	4/1	Air Products	\$28,875.00
Residential Meter Set Kits (7" W.C.) (1500 Units)	8/3	Reliable Mfg <i>Ay McDonald</i> <i>Georg Fischer</i>	\$158,775.00 194,481.00 203,316.48

Residential Meter Set Kits Sets (2PSIG) (1800 Units)	8/3	Reliable Mfg Georg Fischer Ay McDonald	\$190,530.00 227,957.81 233,200.80
Rotary Gas Meters (Sizes 1MT, 2MT, 3MT, 5MT, 6MT, and 7MT) (January 1, 2022 to December 31, 2022)	8/3	Dresser Measurement Energy Economics Groebner	\$105,970.00 115,430.00 170,682.15
Water Meters (Sizes ¾", 1 ½" and 2") (January 1, 2022 to December 31, 2022)	6/2	Master Meter Sensus	\$547,654.00 633,450.00
The District's Traffic Model Fire Hydrants (168 units) (January 1, 2022 to December 31, 2022)	4/1	Clow Valve Co.	\$293,882.40



Sherri A. Meisinger
Director, Procurement
(402) 504-7253

Approved:



Jon Zellars
Vice President, Procurement and Enterprise Services



Steven E. Ausdemore
Senior Vice President, Safety, Security and Field Operations



Mark E. Doyle
President

METROPOLITAN UTILITIES DISTRICT
Inter-Department Communication

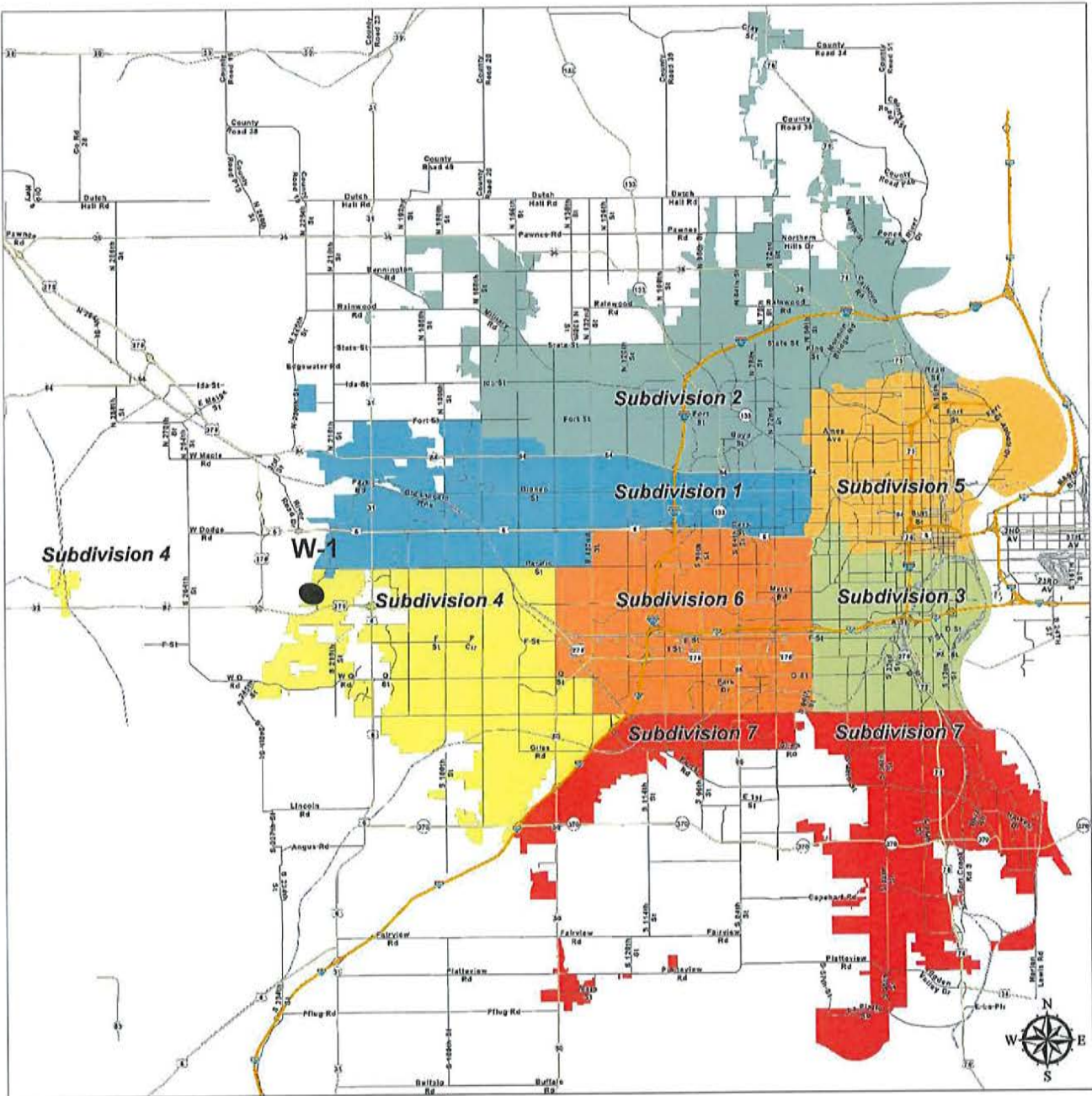
October 26, 2021

Subject: MAIN EXTENSIONS

To: Services and Extensions Committee
cc: All Board Members, Doyle, Mendenhall, Schaffart, Ausdemore, Langel, Lobsiger,
and all Vice Presidents

From: Cory J. O'Brien, Vice President, Engineering & Construction

The following main extension will be on the November 3, 2021, Committee Agenda for consideration and the Board Agenda for approval:



MUD Subdivision Map

WATER MAINS:

- 1. Subdivision 4, Cavanaugh:** These mains are being installed to provide domestic water service and fire protection to 21 single-residence lots in Serenity Estates Subdivision at Stanford St. & Skyline Dr. A pioneer main fee in the amount of \$31,342 is due to the existing 16-inch water main in 222nd St. Work is requested to be completed by March 2022. Applicant has also requested District gas service. (City of Omaha Zoning, Skyline Ridge Estates, LLC)

Subdivision: Serenity Estates

Project Number: WP 1858

Project Cost \$273,333

Applicant Contribution: \$304,675

Construction by Applicant: \$0

MUD Contribution: \$0



Cory J. O'Brien

Vice President, Engineering & Construction

Approved:



Gina Langel

Sr. Vice President, Chief Operations Officer



Mark E. Doyle

President

METROPOLITAN UTILITIES DISTRICT
Inter-Department Communication

October 20, 2021

Subject: Wage and/or Salary Increases and Ratifications, November 2021 Board Meeting

To: Personnel Committee members Begley, Friend, and Frost

cc: Board Members Cavanaugh, Cook, Howard, and McGowan
President Doyle, and Senior Vice Presidents Ausdemore, Langel, Lobsiger, Mendenhall, and Schaffart

From: Bonnie Savine, Vice President, Human Resources

The Human Resources Department is recommending the Board of Directors approve the wage or salary increases outlined below. All positions involve District employees earning more than \$10,000 per year and therefore require your approval.

1. Operating and Clerical (OAC) Wage Increases Due To Promotion

The Human Resources Department is recommending the Board of Directors approve wage increases for the following Employees within the OAC classification. These wage increases are based on a job selection process, are in compliance with the Collective Bargaining Agreement, and are made following the posting and application process for a job opening in the District. The effective date for these increases will be the beginning of the next OAC pay period following Board approval.

Employee:	Virgil Craig
Current position (department):	Water Plant Operator (Platte West)
New position (department):	Water Plant Engineer (Platte West)
Current rate; step/grade:	\$38.25; Step 4
Proposed rate; step/grade:	\$42.08; Step 4
Percent of increase:	10.01%
District hire date:	August 15, 2000
Employee:	Christopher Ethen
Current position (department):	Customer Service Clerk I (Customer Service)
New position (department):	Meter Reader – Car Route (Meter Services)
Current rate; step/grade:	\$26.15; Step 2
Proposed rate; step/grade:	\$28.16; Step 1
Percent of increase:	7.69%
District hire date:	April 1, 2019
Employee:	Ronald Henderson
Current position (department):	Water Plant Maintenance Mechanic (Platte West)
New position (department):	Water Plant Operator (Platte West)
Current rate; step/grade:	\$35.80; Step 4
Proposed rate; step/grade:	\$38.25; Step 4
Percent of increase:	6.84%
District hire date:	September 19, 2016

Employee: Cesar Rivera
Current position (department): Auto Service Person (Transportation)
New position (department): Stores Clerk II (Transportation)
Current rate; step/grade: \$21.19; EN
Proposed rate; step/grade: \$27.38; EN
Percent of increase: 29.21%
District hire date: August 9, 2021

2. Operating and Clerical (OAC) Wage Increases Due To Job Transfer

The Human Resources Department is recommending the Board of Directors approve wage increases for the following Employees within the OAC classification. A transferring employee who is at less than Standard Wage will be moved to an equal rate in the new job classification or, if there is not an identical wage rate, to the nearest higher wage rate in the new job classification. These wage increases are based on a formal selection process, are in compliance with the Collective Bargaining Agreement, and are made following the posting and application process for a job opening in the District. The effective date for these increases will be the beginning of the next OAC pay period following Board approval.

There are no recommendations for approval this month

3. Operating and Clerical (OAC) Wage Increases Due To Job Progression

The Human Resources Department is recommending the Board of Directors approve the following wage increases for the OAC employees who have successfully completed required training and who have been recommended by their supervisor for promotion as they progress within their job family. All increases are based on the bargaining unit wage structure. The effective date for these increases will be the beginning of the next OAC pay period following board approval.

Employee: Steven Bonge
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: September 23, 2019

Employee: Shawn Dewitz
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: September 30, 2019

Employee: **Tel-Michael Hess**
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: September 23, 2019

Employee: **Colton Meador**
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: July 31, 2017

Employee: **Tony Pirruccello**
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: September 23, 2019

Employee: **Jacob Poteet**
Current position (department): Pipe Layer Trainee (Construction)
New position (department): Pipe Layer (Construction)
Current rate; step/grade: \$28.53; Step 4
Proposed rate; step/grade: \$30.65; Step 2
Percent of increase: 7.43%
District hire date: September 9, 2019

4. Supervisory, Professional and Administrative (SPA) Salary Increases Due To Job Promotion

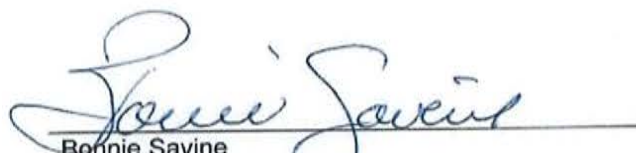
The following SPA employees are selected for promotion. It is recommended the President be authorized to increase the salary of these employees. These SPA positions have been evaluated, graded, appropriate job descriptions completed, and posting guidelines fulfilled. The effective date for these salaries will be the beginning of the next SPA pay period following board approval.

Employee: **Annette O'Brien**
Current position (department): Customer Account Clerk VI (Customer Accounting)
New position (department): ERP Technical/Functional Analyst Trainee (Information Technology)
Current rate; step/grade: \$36.52; Step 4
Proposed rate; step/grade: \$79,760; SPA – 02
Percent of increase: 5.00%
District hire date: July 8, 1996

5. Supervisory, Professional and Administrative (SPA) New Hire Ratification

Board of Director Ratification of salaries, for new SPA employees hired from outside the District, is required to confirm the salary within the grade established for the position. Authorization to ratify the annual salary of SPA employees hired from outside the District will be requested each month, if appropriate.

Employee:	Venkateswarlu Bethapudi
Current position (department):	ERP Technical/Functional Analyst II (Information Technology)
Current rate; step/grade:	\$108,000; SPA – 05
District hire date:	October 4, 2021


Bonnie Savine
Vice President, Human Resources

APPROVED:



Mark A. Mendenhall
Senior Vice President, General Counsel



Mark E. Doyle
President

METROPOLITAN UTILITIES DISTRICT

Inter-Departmental Communication

October 26, 2021

Subject: Four Year "Experience Study" for the Retirement Plan – Period Ending December 31, 2020

To: Insurance and Pensions Committee
CC: All Board Members; Doyle, Ausdemore, Langel, Lobsiger, Mendenhall and all Vice Presidents

From: Joseph J. Schaffart, Senior Vice President, Chief Financial Officer

The District is required by statute to perform a periodic "Experience Study" for the Retirement Plan of our employees. The purpose of the "Experience Study" is to determine whether the actuarial assumptions currently in use are consistent with actual emerging experience. To that end, Cavanaugh Macdonald consulting recently completed an Experience Study of the retirement plan for the four-year period ending December 31, 2020, a copy of which is attached. The findings of this study were presented at the October 18, 2021, meeting of the Insurance and Pension Committee of the Board.

Pursuant to discussion at the October 18, 2021 Committee Meeting, the Insurance and Pension Committee and the Management Pension Committee recommend that the Board approve the following pension-related recommendations as determined by the Experience Study:

Actuarial Methods

All current actuarial methods are to be retained, including:

- "Entry Age Normal" actuarial cost method for allocating pension costs over a participant's working career and for determining pension contribution levels.
- "Asset Smoothing Method" for determining pension asset valuation.
- "Amortization Method" for addressing unfunded actuarial liabilities.

Economic Assumptions

- Investment Return: 6.75% annual return, net of investment expenses (decrease from 6.9%)
- Inflation Assumption: 2.50% (decrease from 2.60%)
- Cost of Living Adjustment: 2.50% (decrease from 2.60%)
- General Wage Increase: 3.40% (decrease from 3.50%)

Demographic Assumptions

- Modify the current mortality assumption by changing to table based solely on public plan data, the Pub-2010 General Employees Median Mortality Table.
- Change the probability of retirement at various ages to better align with observed experience.
- Modify the termination of employment rates to align with observed actual experience.

Financial Recommendations/Implications

- Adoption of the revised assumptions recommended by the Experience Study would have increased the District's 2020 actuarial required pension contribution to approximately \$10 million, an increase of \$.5 million as compared with the actuarial required contribution based on prior assumptions (for the last several years, the District has contributed at levels higher than the actuarial required levels to contribute towards the unfunded pension liability; the District's 2020 actual pension contribution was \$12.3 million). Though 2021's actuarially required contribution will not be known until the January 1, 2022 valuation is completed, the District is contributing \$11.4 million to the pension plan in 2021, consistent with the 2021 budget.

- The recommended changes to our pension assumptions increases the Unfunded Actuarial Liability by \$5.8 million, and thereby reduces the actuarial funded ratio from 94.00% to 92.92% at January 1, 2021 (had the revised assumptions been in place at that time).

Pat Beckham will present a summary of the Experience Study at the November 3, 2021, Board Meeting and will be available to address any questions at that time.



Joseph J. Schaffart
Senior Vice President, Chief Financial

Officer

Approved:



Mark A. Doyle
President

Attachment

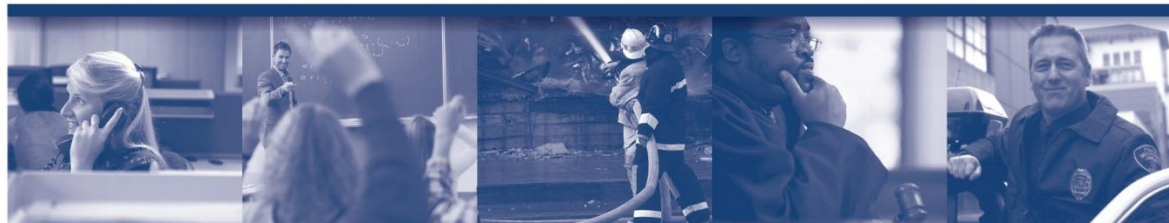


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CONSULTING, LLC

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The Retirement Plan For Employees of Metropolitan Utilities District

Summary of Experience Study Findings November 3, 2021





Purpose of Experience Study

- Required every four years by statute
- Review and evaluate the current actuarial assumptions and methods
 - How well did they model actual experience?
 - Should they continue to be used?
- Input from plan sponsor and advisors also considered
- Given size of group, professional judgement heavily drives recommendations
- Develop appropriate assumptions to prepare future valuations



Types of Assumptions

What Are They?

Economic

- Price Inflation
- Investment Return
- Wage Growth
- COLA
- Payroll Growth
- Individual Salary Increases

Demographic

- Retirement
- Disability
- Termination
- Mortality
- Refund

Who Selects Them?

Economic

- Board
- Actuary
- Other Advisors

Demographic

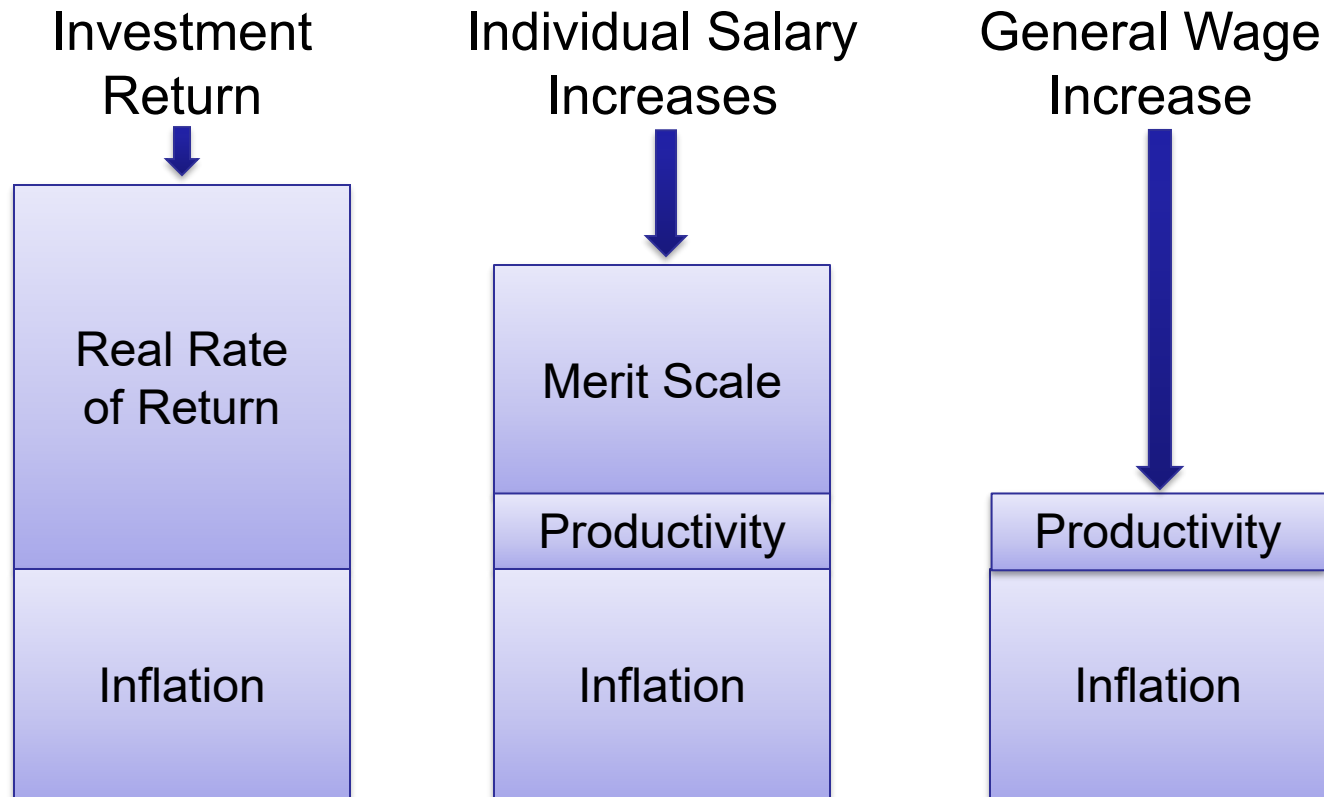
- Mostly Actuary
- Board Approves

Considerations in Setting Assumptions



- No “correct” assumptions
 - Blend of art and science
 - Range of acceptable assumptions
- Tend to prefer periodic incremental changes via regular experience studies (partially recognize differences between actual and expected results)
- Balance allocation of costs to generations of members and ratepayers
 - Too aggressive shifts current costs to future and too conservative shifts future costs to present
- Actuary makes recommendations, but the ultimate responsibility for selection of assumptions resides with the Board

Economic Assumptions “Building Block Method”

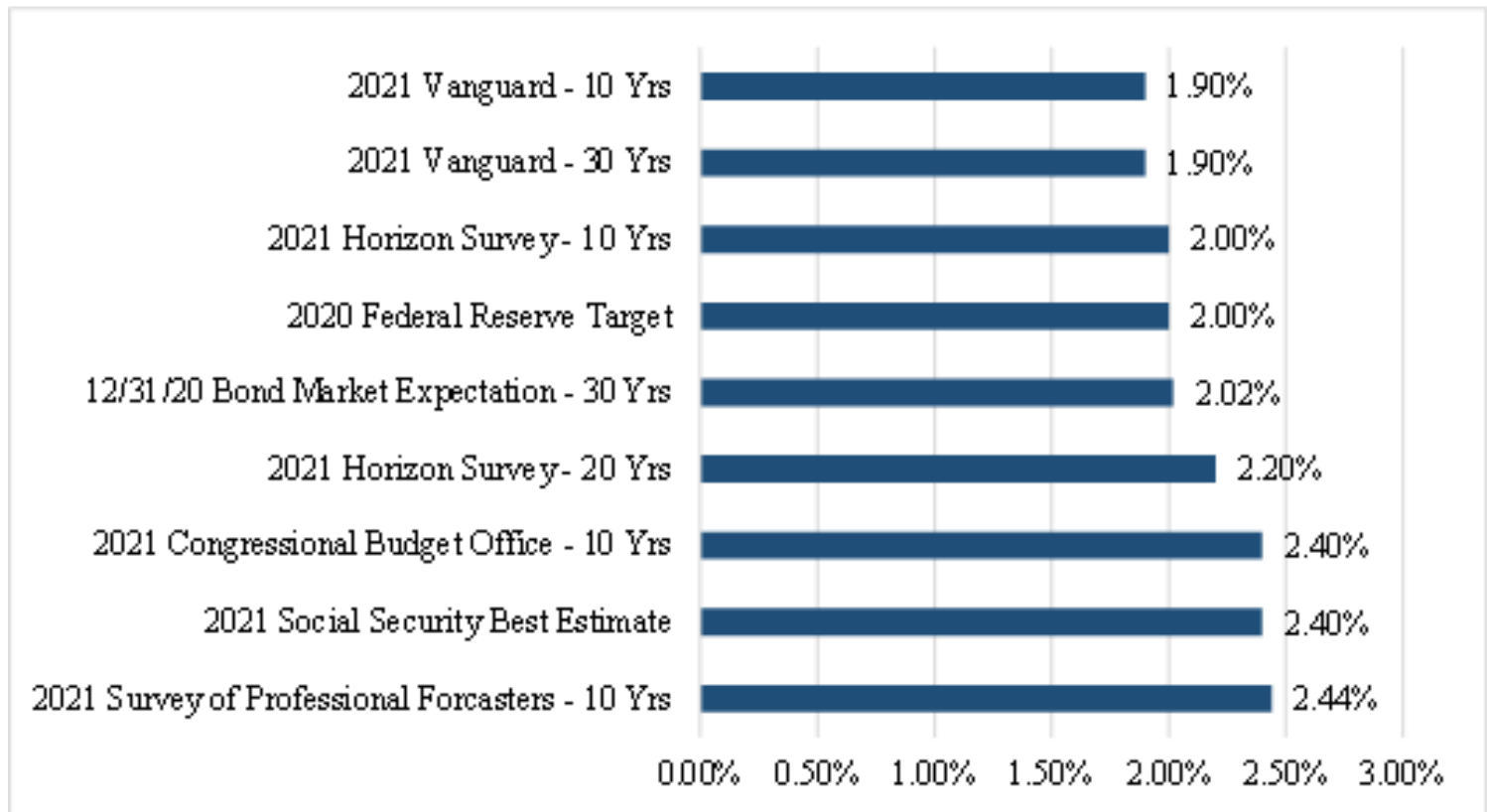


Note: inflation assumption and productivity must be consistent in all assumptions.



Price Inflation Assumption

- Forward looking assumptions from various sources

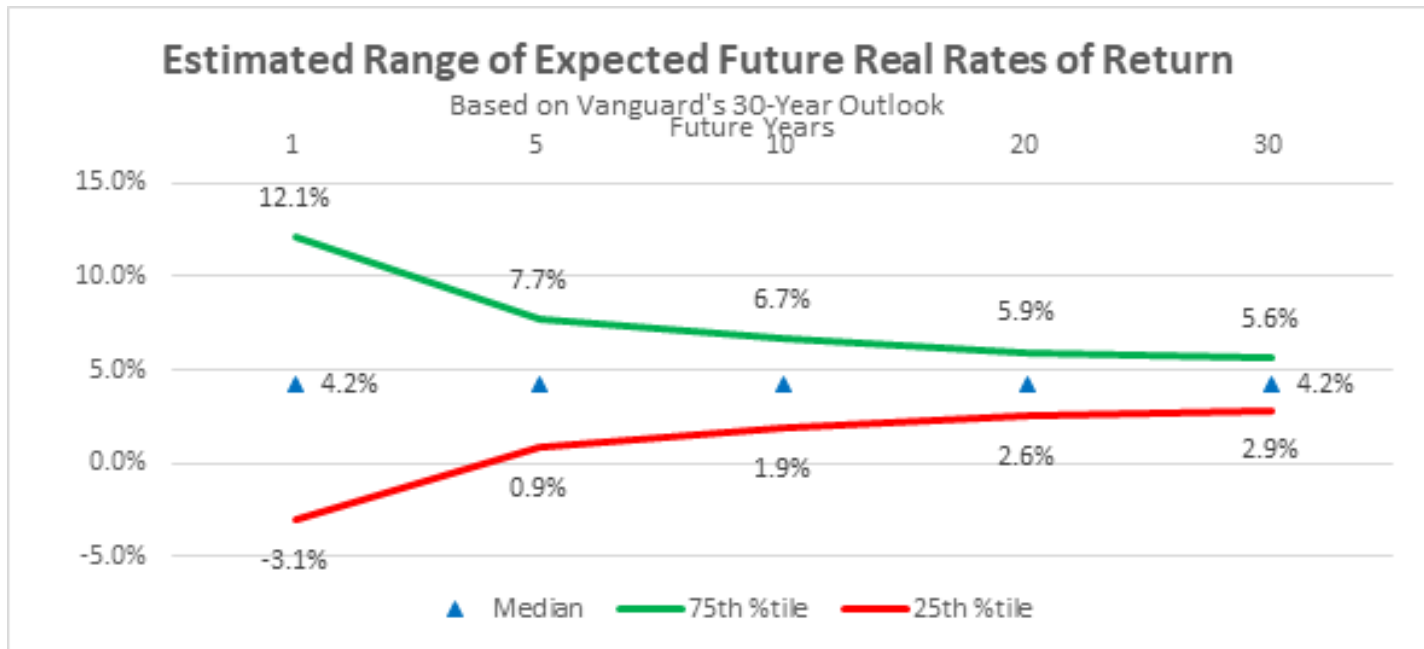


While the current assumption of 2.60% is reasonable under actuarial standards, a small adjustment lower to 2.50% also is reasonable given the data. Whether recent inflation is transitory or longer term is a key question at this point in time.

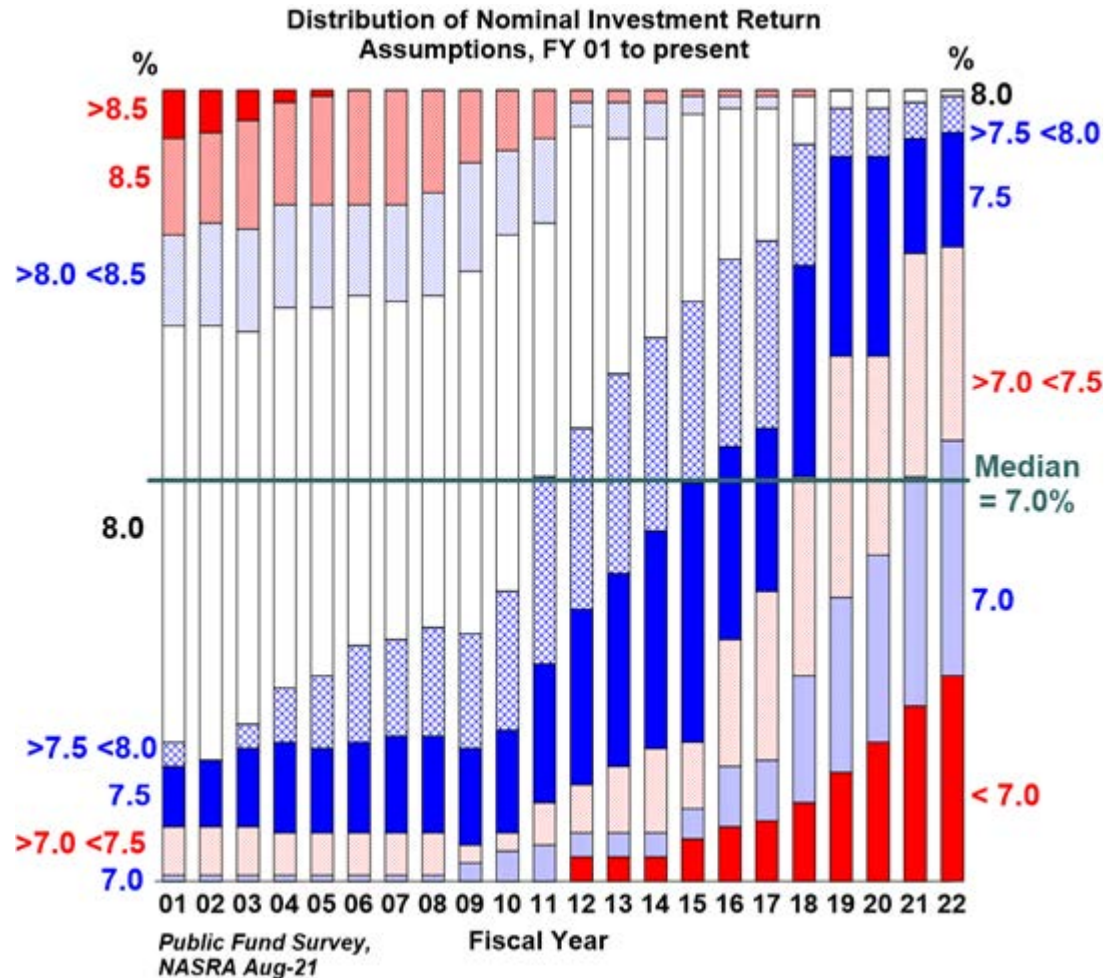
Vanguard's Real Return Expectations



	10-Year	30-Year
2021	2.43%	4.20%
2017	4.25%	5.30%
Change	(1.82%)	(1.10%)



Peer System Comparison (Investment Return Assumption)



Median return was 8.0% from 2001 through 2011 but has since declined to 7.0%.



Recommended Economic Assumptions

	Current	Recommended
Consumer Price Inflation	2.60%	2.50%
General Wage Increase	3.50%	3.40%
Real Wage Inflation*	0.90%	0.90%
Investment Return	6.90%	6.75%**
Cost of Living Adjustment	2.60%	2.50%
Covered Payroll Increase	3.50%	3.00%

* General Wage Increase less Price Inflation

** Further incremental reduction down to 6.50% recommended, if possible.

Recommended Changes to Demographic Assumptions



- **Mortality:** change to more recent table, based solely on public plan data, *Pub-2010 General Employees Median Mortality Table*. Future mortality improvements using MP-2020 Scale (aligns with auditor's preferred mortality table).
- **Retirement:** minor adjustments to better fit actual experience.
- **Termination of employment:** minor adjustments to termination rates for males and females both. Value greater of refund or monthly benefit for vested members who terminate.
- **Merit Salary Scale:** higher increases for shorter durations and lower increases for durations over 10 years.

Impact on Retirement Plan: District Actuarial Contribution Amount



Note: the cost impact of each assumption change is based on the 1/1/21 valuation and is dependent on the order in which the changes are considered. The current amortization policy is used for the assumption base (20-year periods).

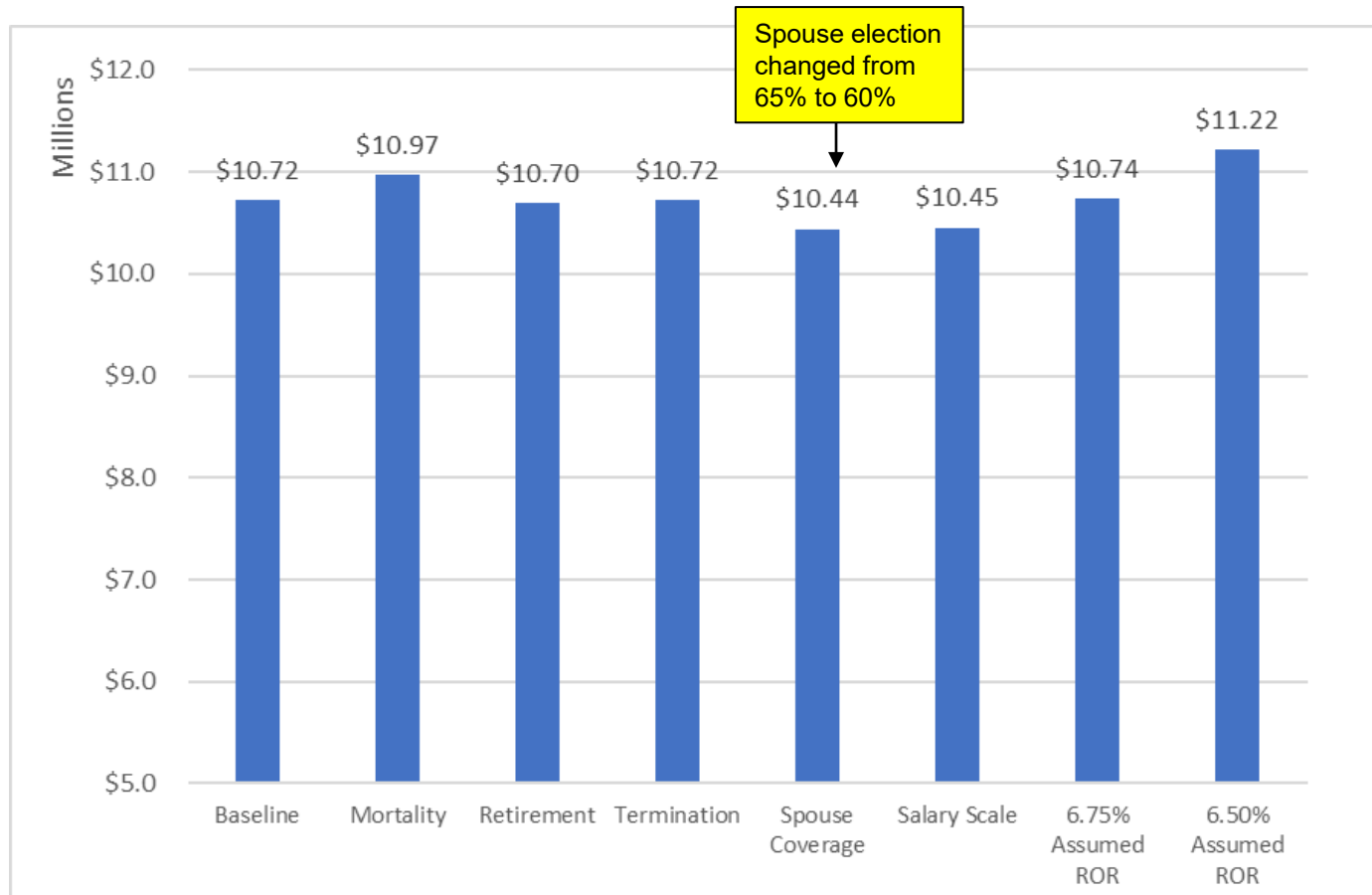
Retirement Plan Cost Impact

(based on 1/1/21 valuation)



	Current Assumptions	Proposed Assumptions With 6.75%	Proposed Assumptions With 6.50%
Actuarial Liability	\$501,663,185	\$507,494,394	\$522,916,646
Actuarial Value of Assets	<u>471,538,185</u>	<u>471,538,185</u>	<u>471,538,185</u>
Unfunded Actuarial Liability	\$30,124,483	\$35,955,692	\$51,377,944
Funded Ratio	94.00%	92.92%	90.17%
Normal Cost Rate	19.14%	19.18%	20.38%
Administrative Expenses	0.14%	0.14%	0.14%
UAL Payment	<u>2.63%</u>	<u>3.34%</u>	<u>4.83%</u>
Actuarial Contribution Rate	21.91%	22.66%	25.35%
Employee Contribution Rate	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>(8.00%)</u>
District Contribution Rate	13.91%	14.66%	17.35%
District Contribution	\$9,481,333	\$9,974,624	\$11,804,892

Impact on OPEB Plan: Actuarial Required Contribution Amount



Note: the cost impact of each assumption change is based on the 1/1/21 OPEB valuation and is dependent on the order in which the changes are considered. The current amortization policy is used for the assumption base (20-year periods).

OPEB Plan Cost Impact

(based on 1/1/21 valuation)



	Current Assumptions	Proposed Assumptions With 6.75%	Proposed Assumptions with 6.50%
Actuarial Liability	\$138,656,984	\$140,710,484	\$145,523,426
Market Value of Assets	<u>60,309,558</u>	<u>60,309,558</u>	<u>60,309,558</u>
Unfunded Actuarial Liability	\$78,347,426	\$80,400,926	\$85,213,868
Funded Ratio	43.50%	42.86%	41.44%
Normal Cost Rate	\$ 3,116,578	\$ 3,020,609	\$ 3,211,052
UAL Payment	<u>7,607,001</u>	<u>7,715,783</u>	<u>8,010,985</u>
Actuarial Contribution Rate	\$10,723,579	\$10,736,392	\$11,222,037



Cavanaugh Macdonald
CONSULTING, LLC

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**The Retirement Plan
For Employees of Metropolitan Utilities District**

**Four Year Experience Study
For Period Ending December 31, 2020**

Submitted: October 25, 2021





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Cavanaugh Macdonald

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October 25, 2021

Insurance and Pensions Committee
Retirement Plan for Employees of
The Metropolitan Utilities District
1623 Harney Street
Omaha, NE 68102

Dear Committee Members:

It is a pleasure to submit this report of our investigation of the experience of the Retirement Plan for Employees of the Metropolitan Utilities District (MUD or District) for the study period of January 1, 2017 through December 31, 2020.

The purpose of this report is to communicate the results of our review of the actuarial methods and the economic and demographic assumptions. If adopted, the new assumptions and methods would be used in the actuarial valuation, prepared as of January 1, 2022. Our recommendations represent changes from the prior assumptions that are designed to better anticipate the emerging experience of the Plan. Actual future experience, however, may still differ from these assumptions.

In preparing this report, we relied without audit on information supplied by the Plan Administrator for the annual actuarial valuation. If any data or other information is inaccurate or incomplete, our analysis and recommendations may be impacted and a revised report may need to be issued.

We hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

We further certify that, in our opinion, the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27, (Selection of Economic Assumptions for Measuring Pension Obligations) and No. 35, (Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations). At the time this study was prepared, the world is still recovering from a pandemic. We have considered available information, but do not believe that there is yet sufficient data to influence the recommended assumptions which are intended to be long term estimates. We will continue to monitor the situation and advise the Retirement Committee in the future of any adjustments that we believe would be appropriate.

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Board of Trustees
October 25, 2021
Page 2

In order to prepare the results in this study we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We look forward to our discussions and the opportunity to respond to your questions and comments.

We, Patrice A. Beckham and Bryan K. Hoge, are members of the American Academy of Actuaries, Enrolled Actuaries and Fellows of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

A handwritten signature in blue ink that reads 'Patrice Beckham' in a cursive script.

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal & Consulting Actuary

A handwritten signature in blue ink that reads 'Bryan Hoge' in a cursive script.

Bryan K. Hoge, FSA, EA, FCA, MAAA
Consulting Actuary



SECTION 1 – INTRODUCTION

The purpose of an actuarial valuation is to provide a timely best estimate of the ultimate costs of a retirement system. Actuarial valuations for the Retirement Plan for Employees of the Metropolitan Utilities District (MUD) are prepared annually to measure the financial condition of the Plan and to determine the recommended contribution by the District. The valuation requires the use of certain assumptions with respect to the occurrence of future events, such as rates of death, disability, termination of employment, retirement, and salary changes to estimate the obligations of the System.

The basic purpose of an experience study is to determine whether the actuarial assumptions currently in use have accurately anticipated actual emerging experience. This information, along with the judgement of the Retirement Committee, its advisors, and the actuary, is used to evaluate the appropriateness of continued use of the current actuarial assumptions. When analyzing experience and assumptions, it is important to realize that actual experience is reported short term while assumptions are intended to be long term estimates of experience. Therefore, no single experience study period is given full credibility in setting actuarial assumptions. If significant differences exist between what is expected from our assumptions and actual experience and we believe it is a long-term trend, our strategy is usually to recommend a change in assumptions that would produce results somewhere between the actual and expected experience.

Our Philosophy

Similar to an actuarial valuation, the calculation of actual and expected experience is a fairly mechanical process, and differences between actuaries in this area are generally minor. However, the setting of assumptions differs, as it is more art than science. In this report, we have recommended changes to certain assumptions. To explain our thought process, we offer a brief summary of our philosophy:

- **Don't Overreact:** When we see significant changes in experience, we generally do not adjust our rates to reflect the entire difference. We will typically recommend rates somewhere between the old rates and the new experience. If the experience during the next study period shows the same result, we will probably recognize the trend at that point in time or at least move further in the direction of the observed experience. On the other hand, if experience returns closer to its prior level, we will not have overreacted, possibly causing volatility in the actuarial contribution rates.
- **Credibility:** Generally, there is insufficient data for any one single study period to be assigned full credibility in setting assumptions. Actual experience is analyzed to determine whether it is likely a long-term trend or an anomaly. If we determine the experience is credible, we move part way to the observed experience but not all the way.
- **Anticipate Trends:** If there is an identified trend that is expected to continue, we believe that this should be recognized. An example is the retiree mortality assumption. It is an established trend that people are living longer. Therefore, we believe the best estimate of liabilities in the valuation should reflect some expected increase in life expectancy.
- **Simplify:** In general, we attempt to identify which factors are significant and eliminate or ignore the ones that do not materially improve the accuracy of the liability projections.



SECTION 1 – INTRODUCTION

At the request of the Retirement Committee, Cavanaugh Macdonald Consulting, LLC performed a study of the experience of the Retirement Plan for Employees of the Metropolitan Utilities District for the period January 1, 2017 through December 31, 2020. This report presents the results and recommendations of our study which, if approved, will be implemented in the January 1, 2022 actuarial valuation of the Plan.

These assumptions have been developed in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the Actuarial Standards Board of the American Academy of Actuaries.

SCOPE OF THIS REPORT

The actuarial valuation utilizes various actuarial methods and two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its impact on the System. Demographic assumptions are based on the emergence of the specific experience of the Systems' members.

All of the major actuarial assumptions that will be used in the January 1, 2022 actuarial valuation have been reviewed in this Study. The remainder of this report is divided as follows:

SECTION 2	EXECUTIVE SUMMARY
SECTION 3	ACTUARIAL METHODS
SECTION 4	ECONOMIC ASSUMPTIONS
SECTION 5	DEMOGRAPHIC ASSUMPTIONS
SECTION 6	MORTALITY
SECTION 7	RETIREMENT
SECTION 8	TERMINATION OF EMPLOYMENT
SECTION 9	OTHER ASSUMPTIONS



SECTION 2 – EXECUTIVE SUMMARY

A brief summary of the results of our findings and recommendations is shown below:

Actuarial Methods

We are recommending that all of the current actuarial methods be retained. This includes the actuarial cost method, the asset smoothing method, and the Unfunded Actuarial Liability amortization method.

Economic Assumptions

The following set of economic assumptions is recommended:

- Investment Return: 6.75% annual return, net of investment expenses (decrease from 6.90%). Continued decrease to 6.50% over the next four years.
- Price Inflation: 2.50% (decrease from 2.60%)
- Cost of Living Adjustment: 2.50% (decrease from 2.60%)
- General Wage Growth: 3.40% (decrease from 3.50%)
- Covered Payroll Increase: 3.00% (decrease from 3.50%)
- Salary Merit Scale: Minor adjustment at most durations

Demographic Assumptions

After thoughtful consideration, we are recommending the following changes to the current demographic assumptions:

- Modify the current mortality assumption by moving to the most recently published standard table for public pension plan valuations, the Pub-2010 General Employees Median Mortality Table, with future mortality improvements using the MP-2020 Projection Scale.
- Modify the early and normal retirement assumptions to partially reflect the observed experience in this study.
- Modify the termination of employment rates for both males and females to better reflect the observed patterns in the data. In general, rates increased for males and decreased for females.

Financial Impact

The estimated financial impact of the proposed changes, based on results of the January 1, 2021 actuarial valuation, is summarized on the following page. The actual impact, which will be reflected in the January 1, 2022 actuarial valuation, may vary from the numbers shown on the exhibit on the following page.



SECTION 2 – EXECUTIVE SUMMARY

Estimate of Financial Impact of Assumption Changes
Retirement Plan
Based on January 1, 2021 Valuation

	Current Assumptions	Proposed Assumptions*	Change
1. Present Value of Future Benefits	\$625,772,998	\$632,267,676	\$ 6,494,678
2. Present Value Future Normal Costs	<u>124,109,813</u>	<u>124,773,282</u>	<u>663,469</u>
3. Actuarial Liability (1) – (2)	\$501,663,185	\$507,494,394	\$ 5,831,209
4. Actuarial Value of Assets	<u>471,538,185</u>	<u>471,538,185</u>	<u>0</u>
5. Unfunded Actuarial Liability (UAL) (3) – (4)	\$ 30,124,483	\$ 35,955,692	\$ 5,831,209
6. Funded Ratio (4) / (3)	94.00%	92.92%	(1.08%)
7. Normal Cost Rate	19.14%	19.18%	0.04%
8. Administrative Expenses	0.14%	0.14%	0.00%
9. UAL Payment	<u>2.63%</u>	<u>3.34%</u>	<u>0.71%</u>
10. Actuarial Contribution Rate (7) + (8) + (9)	21.91%	22.66%	0.75%
11. Employee Contribution Rate	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>0.00%</u>
12. District Contribution Rate (10) + (11)	13.91%	14.66%	0.75%
13. District Contribution	\$ 9,481,333	\$ 9,974,624	\$ 493,291

* Reflects all proposed assumption changes and investment return of 6.75%.



SECTION 2 – EXECUTIVE SUMMARY

Estimate of Financial Impact of Assumption Changes
Retirement Plan
Based on January 1, 2021 Valuation

	Current Assumptions	Proposed Assumptions at 6.50%*	Change
1. Present Value of Future Benefits	\$625,772,998	\$658,526,493	\$ 32,753,495
2. Present Value Future Normal Costs	<u>124,109,813</u>	<u>135,609,847</u>	<u>11,500,034</u>
3. Actuarial Liability (1) – (2)	\$501,663,185	\$522,916,646	\$ 21,253,461
4. Actuarial Value of Assets	<u>471,538,185</u>	<u>471,538,185</u>	<u>0</u>
5. Unfunded Actuarial Liability (UAL) (3) – (4)	\$ 30,124,483	\$ 51,377,944	\$ 21,253,461
6. Funded Ratio (4) / (3)	94.00%	90.17%	(3.83%)
7. Normal Cost Rate	19.14%	20.38%	1.24%
8. Administrative Expenses	0.14%	0.14%	0.00%
9. UAL Payment	<u>2.63%</u>	<u>4.83%</u>	<u>2.20%</u>
10. Actuarial Contribution Rate (7) + (8) + (9)	21.91%	25.35%	3.44%
11. Employee Contribution Rate	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>0.00%</u>
12. District Contribution Rate (10) + (11)	13.91%	17.35%	3.44%
13. District Contribution	\$ 9,481,333	\$ 11,804,892	\$ 2,323,559

* Reflects all proposed assumption changes and investment return of 6.50%.



**Estimate of Financial Impact of Assumption Changes
OPEB Plan
Based on January 1, 2021 Valuation**

	Current Assumptions	Proposed Assumptions*	Change
1. Present Value of Future Benefits	\$162,745,780	\$164,526,927	\$ 1,781,147
2. Present Value Future Normal Costs	<u>24,088,796</u>	<u>23,816,433</u>	<u>(272,353)</u>
3. Actuarial Liability (1) – (2)	\$138,656,984	\$140,710,484	\$ 2,053,500
4. Market Value of Assets	<u>60,309,558</u>	<u>60,309,558</u>	<u>0</u>
5. Unfunded Actuarial Liability (UAL) (3) – (4)	\$ 78,347,426	\$ 80,400,926	\$ 2,053,500
6. Funded Ratio (4) / (3)	43.50%	42.86%	(0.64%)
7. Normal Cost Rate	\$ 3,116,578	\$ 3,020,609	\$ (95,969)
8. UAL Payment	<u>7,607,001</u>	<u>7,715,783</u>	<u>108,782</u>
9. Actuarial Contribution Rate (7) + (8)	\$10,723,579	\$10,736,392	\$ 12,813

* Reflects all proposed assumption changes and investment return of 6.75%.



**Estimate of Financial Impact of Assumption Changes
OPEB Plan
Based on January 1, 2021 Valuation**

	Current Assumptions	Proposed Assumptions at 6.50%*	Change
1. Present Value of Future Benefits	\$162,745,780	\$172,323,715	\$ 9,577,935
2. Present Value Future Normal Costs	<u>24,088,796</u>	<u>26,800,289</u>	<u>2,711,493</u>
3. Actuarial Liability (1) – (2)	\$138,656,984	\$145,523,426	\$ 6,866,442
4. Market Value of Assets	<u>60,309,558</u>	<u>60,309,558</u>	<u>0</u>
5. Unfunded Actuarial Liability (UAL) (3) – (4)	\$ 78,347,426	\$ 85,213,868	\$ 6,866,442
6. Funded Ratio (4) / (3)	43.50%	41.44%	(2.06%)
7. Normal Cost Rate	\$ 3,116,578	\$ 3,211,052	\$ 94,474
8. UAL Payment	<u>7,607,001</u>	<u>8,010,985</u>	<u>403,984</u>
9. Actuarial Contribution Rate (7) + (8)	\$10,723,579	\$11,222,037	\$ 498,458

* Reflects all proposed assumption changes and investment return of 6.50%.



SECTION 3 – ACTUARIAL METHODS

ACTUARIAL COST METHOD

The systematic financing of a pension plan requires that contributions be made in an orderly fashion while a member is actively employed, so that the accumulation of these contributions, together with investment earnings should be sufficient to provide promised benefits and cover administration expenses. The actuarial valuation is the process used to determine when money should be contributed; i.e., as part of the budgeting process.

The actuarial valuation will not impact the amount of benefits paid or the timing of those payments and, therefore, it does not impact the actual cost of the System. In the long run, actuaries cannot change the costs of a pension plan, regardless of the funding method used or the assumptions selected. However, the choice of actuarial methods and assumptions will influence the allocation of costs to different time periods and, therefore, the contribution pattern.

The valuation or determination of the present value of all future benefits to be paid by the System reflects the assumptions that best seem to describe anticipated future experience. The choice of a funding method does not impact the determination of the present value of future benefits. The funding method determines only the incidence or allocation of cost. In other words, the purpose of the funding method is to allocate the present value of future benefits determination into annual costs. In order to do this allocation, it is necessary for the funding method to “break down” the present value of future benefits into two components: (1) that which is attributable to the past (2) and that which is attributable to the future. The excess of that portion attributable to the past over the plan assets is then amortized over a period of years. Actuarial terminology calls the part attributable to the past the “past service liability” or the “actuarial liability”. The portion of the present value of future benefits allocated to the future is commonly known as the “present value of future normal costs”, with the specific piece of it allocated to the current year being called the “normal cost”. The difference between the plan assets and actuarial accrued liability is called the “unfunded actuarial liability”.

Two key points should be noted. First, there is no single “correct” funding method. Second, the allocation of the present value of future benefits, and hence cost, to the past for amortization and to the future for annual normal cost payments is not necessarily in a one-to-one relationship with service credits earned in the past and future service credits to be earned.

There are various actuarial cost methods, each of which has different characteristics, advantages and disadvantages. Currently, the Entry-Age Normal method is used in the annual actuarial valuation. The rationale of the Entry Age Normal (EAN) funding method is that the cost of each member’s benefit is determined to be a level percentage of salary from date of hire to the end of the member’s employment. This level percentage multiplied by the member’s annual salary is referred to as the normal cost and is that portion of the total cost of the employee’s benefit which is allocated to the current year. The portion of the present value of future benefits allocated to the future is determined by multiplying this percentage times the present value of the member’s assumed earnings for all future years including the current year. The entry age normal actuarial accrued liability is then developed by subtracting from the present value of future benefits that portion of costs allocated to the future. To determine the unfunded actuarial liability, the value of plan assets is subtracted from the entry age normal actuarial accrued liability. The current year’s cost to amortize the unfunded actuarial liability is developed by applying an amortization factor.



SECTION 3 – ACTUARIAL METHODS

It is to be expected that future events will not occur exactly as predicted by the actuarial assumptions in each year. Actuarial gains/losses from actual versus expected experience under this actuarial cost method can be directly calculated and are reflected as a decrease/increase in the unfunded actuarial liability. Consequently, the actuarial gain/loss results in a decrease/increase in the amortization payment and therefore, the contribution rate.

The Entry Age Normal cost method is the most common cost method used by public plans because it develops a normal cost rate that tends to be stable and less volatile. It also is the required cost method under calculations required by the Governmental Accounting Standards Board Statements 67 and 68, which are used for financial reporting. **We recommend the Entry Age Normal actuarial cost method be retained.**

ACTUARIAL VALUE OF ASSETS

In preparing an actuarial valuation, the actuary must assign a value to the assets of the trust fund. An adjusted market value, called the “actuarial value of assets”, is often used by applying an asset smoothing method (also called an asset valuation method). This reduces the effect of short-term volatility while still tracking the overall movement of the market value of assets. This practice is commonly used by governmental pension plans because most plan sponsors would rather have annual costs remain relatively level, as a percentage of payroll or actual dollars, than have a cost pattern that is extremely volatile.

The actuary does not have complete freedom in assigning this value. The basic principles regarding the calculation of a smoothed asset value, as prescribed by the Actuarial Standards Board, are found in Actuarial Standard of Practice No. 44 (ASOP 44), *Selection and Use of Asset Valuation Methods for Pension Valuations*.

ASOP 44 provides that the asset valuation method should bear a reasonable relationship to the market value. Furthermore, the asset valuation method should be likely to satisfy both of the following:

- Produce values within a reasonable range around market value, AND
- Recognize differences from market value in a reasonable amount of time.

In lieu of both of the above, the standard will be met if either of the following requirements is satisfied:

- There is a sufficiently narrow range around the market value, OR
- The method recognizes differences from market value in a sufficiently short period.

These rules or principles prevent the asset valuation methodology from being used to manipulate annual funding patterns. No matter what asset valuation method is used, it is important to note that, like a cost method or actuarial assumptions, **the asset valuation method does not affect the true cost of the plan; it only impacts the incidence of contributions.**

MUD’s Current Method

The MUD Retirement Plan values assets, for actuarial valuation purposes, based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. This philosophy is consistent with the long-term nature of a retirement system. Under this method, the actuarial value of the



SECTION 3 – ACTUARIAL METHODS

assets is the expected value of assets plus 25% of the difference between the actual market value and the expected value, where the expected value is last year's actuarial value of assets and subsequent cash flows into and out of the fund accumulated at the assumed rate of return. This is mathematically equivalent to using a weighted average of 75% of the expected asset value and 25% of actual market value.

The current asset valuation method also includes what is known as a “corridor”, which provides that once the initial calculation of the actuarial value of assets is made it is compared to a corridor around the market value (80% of market value to 120% of market value). If the initial actuarial value lies outside this corridor, the final actuarial value of assets is set equal to the corresponding corridor value. For example, if the initial calculation of the actuarial value of assets is 132% of market value, the actuarial value is set equal to 120% of market value. We believe the corridor is necessary to ensure actuarial standards are met.

An asset valuation method is used to “smooth out” the volatility that occurs in the market value of assets. We believe the current method is reasonable and provides adequate smoothing while the corridor ensures the asset valuation method meets actuarial standards. **We recommend the current asset valuation method be retained.**

AMORTIZATION OF UAL

As described earlier, actuarial liabilities are the portion of the actuarial present value of future benefits that are not included in future normal costs. Thus, it represents the liability that, in theory, should have been funded through normal costs for past years of service. Unfunded actuarial liabilities (UAL) exist when the actuarial liability exceeds the actuarial value of plan assets. These deficiencies can result from:

- (i) plan improvements that have not been completely paid for,
- (ii) experience that is less favorable than expected,
- (iii) assumption changes that increase liabilities, or
- (iv) contributions that are less than the actuarial contribution rate.

There are a variety of different methods that can be used to amortize the UAL. Each method results in a different payment stream and, therefore, has cost implications. For each methodology, there are three characteristics:

- The period over which the UAL is amortized,
- The rate at which the amortization payment increases, and
- The number of components of UAL (separate amortization bases).

Amortization Period: The amortization period can be either “closed” or “open”. If it is a closed amortization period, the number of year remaining in the amortization period decreases by one each year. Alternatively, if the amortization period is an open or rolling period, the amortization period does not decline but remains the same number each year. This approach essentially “refinances” the System’s debt (UAL) every year, pushing off the payment of the UAL to future years.

While the funded ratio may increase over time under the open amortization period, the System is not expected to reach a funded ratio of 100%. The open amortization policy is especially of concern when the amortization period is very long (i.e. 25 or 30 years) due to the negative amortization that occurs with the level percent of pay financing method (UAL payment is less than the interest on the UAL so the dollar amount of the UAL continually increases). Open amortization periods were once fairly common, but are rarely used now in pension funding given most industry experts do not embrace the methodology.



SECTION 3 – ACTUARIAL METHODS

Amortization Payment: The level dollar amortization method is similar to the method in which a homeowner pays off a mortgage. The liability, once calculated, is financed by a constant fixed dollar amount, based on the amortization period until the liability is extinguished. This results in the liability steadily decreasing while the payments, though remaining level in dollar terms, in all probability decrease as a percentage of payroll. (Even if a plan sponsor’s population is not growing, inflationary salary increases will usually be sufficient to increase the aggregate covered payroll).

The rationale behind the level percentage of payroll amortization method is that the Plan is funded with payroll-based contribution rates. Since normal costs are calculated to be a constant percentage of pay, the unfunded actuarial liability should be paid off in the same manner. When this method of amortizing the unfunded actuarial liability is adopted, the initial amortization payments are lower than they would be under a level dollar amortization payment method, but the dollar amount of the payment increases at a fixed rate each year so that ultimately the annual payment far exceeds the level dollar payment. The expectation is that total payroll will increase at the same rate so the amortization payments will remain constant, as a percentage of payroll. In the initial years, the level percentage of payroll amortization payment is often less than the interest accruing on the unfunded actuarial liability meaning that even if there are no experience losses, the dollar amount of the unfunded actuarial liability will grow (called negative amortization). The growth in the dollar amount of UAL is dependent on the investment return assumption, payroll growth assumption and the amortization period, but it is usually more of an issue if the plan is paying off the unfunded actuarial liability over a longer period, such as 25 or 30 years.

Amortization Bases: The UAL can either be amortized as one single amount or as components or “layers”, each with a separate amortization base, payment and period. If the UAL is amortized as one amount, the UAL is recalculated each year in the valuation and experience gains/losses or other changes in the UAL are folded into the single UAL amortization base. The amortization payment is then the total UAL divided by an amortization factor for the applicable amortization period.

If separate amortization bases are maintained, the UAL is composed of multiple amortization bases, each with its own payment schedule and remaining amortization period. In each valuation, the unexpected change in the UAL is established as a new amortization base over the appropriate amortization period beginning on that valuation date. The total system UAL is simply the sum of all of the outstanding amortization bases on the valuation date and the total UAL payment is the sum of all of the amortization payments on the existing amortization bases. This approach provides transparency in that the legacy UAL is paid off over a fixed period of time and the remaining components of the UAL are clearly identified in each subsequent valuation. Adjustments to the UAL in future years due to assumption changes, benefit changes and actuarial experience are also separately identified. One downside of this approach is that it can create some discontinuities in contribution rates when UAL layers/components are fully paid off. If this occurs, it likely would be far in the future, with adequate time to address any adjustments needed.

Current MUD Unfunded Actuarial Liability Amortization Method: The current amortization method used by MUD includes an initial amortization base (established in 2014) with payments over a closed 30-year period, determined as a level percentage of payroll. A new amortization base is created each year that includes the unanticipated change in the UAL for the year. The new bases are amortized over a closed 20-year period, also determined as a level percentage of payroll. A new amortization base will also be created when actuarial assumptions are changed or the benefit structure is modified. An appropriate period can be determined, after discussion with the actuary, for these events. If the system has a total UAL of \$0 or less



SECTION 3 – ACTUARIAL METHODS

(i.e., there is an actuarial surplus), all of the amortization bases are eliminated, and the net surplus is amortized over 30 years. **We recommend the current amortization policy be retained.**

District Funding Policy: The District has contributed the budgeted contribution amount for the year if it is greater than the actuarial contribution amount, determined in the valuation. This approach strengthens the Plan's funding because the additional contributions above the actuarial contribution decrease the unfunded actuarial liability. It also results in a more stable contribution pattern. We suggest the District continue the practice of paying the higher of the actuarial contribution and the budgeted contribution (based on last year's results projected forward one year).



SECTION 4 – ECONOMIC ASSUMPTIONS

ECONOMIC ASSUMPTIONS

The economic assumptions used in the MUD valuation include price inflation, cost-of-living adjustment, long-term investment return, general wage inflation (the across-the-board portion of salary increases), payroll growth, and salary increase for individual members. Unlike demographic assumptions, economic assumptions do not lend themselves to analysis based heavily upon internal historical patterns, because both salary increases and investment returns are influenced more by external forces which are difficult to accurately predict over the long term. The investment return and salary increase assumptions are generally selected on the basis of expectations in an inflation-free environment and then increased by the long-term expectation for price inflation, called the “building block” approach.

Sources of data considered in the analysis and selection of the economic assumptions included:

- Historical observations of price and wage inflation statistics and investment returns (12/31/20).
- The 2021 Social Security Trustees Report (August 2021).
- Future expectations of MUD’s investment consultant, Vanguard (March 2021)
- Expectations of other investment consultants (August 2021 Horizon Actuarial Survey).
- U. S. Department of the Treasury bond rates (12/31/20).
- Forecasts from various sources including the Congressional Budget Office, Federal Reserve Bank and the Survey of Professional Forecasters June 2021).
- Assumptions used by other large public retirement systems, based on the Public Fund Survey, published by the National Association of State Retirement Administrators (August 2021).

In evaluating the forecasts, we considered the timing on the published information and the potential impact COVID-19 might have had on the forward-looking measurements.

ACTUARIAL STANDARD OF PRACTICE NUMBER 27

Actuarial Standards of Practice are issued by the Actuarial Standards Board to provide guidance to actuaries with respect to certain aspects of performing actuarial work. Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides actuaries with guidance regarding the selection of economic assumptions for measuring pension obligations. Because no one knows what the future holds, an actuary must use professional judgement to estimate possible future economic outcomes, based on a mixture of past experience, future expectations, and professional judgement.

Our analysis of the expected rate of return, as well as all other economic assumptions, was performed following the guidance in ASOP 27.

Due to the application of ASOP 27, it may be informative for others to be aware of the basic content of ASOP 27. The standard applies to the selection of economic assumptions to measure obligations under any defined benefit pension plan that is not a social insurance program (e.g., Social Security).

With respect to relevant data, the standard recommends the actuary review appropriate recent and long-term historical economic data but advises the actuary not to give undue weight to recent experience. Furthermore, it advises the actuary to consider that some historical economic data may not be appropriate for use in developing assumptions for future periods due to changes in the underlying environment. In addition, with respect to any particular valuation, each economic assumption should be consistent with all other economic assumptions over the measurement period.



SECTION 4 – ECONOMIC ASSUMPTIONS

ASOP 27 recognizes that economic data and analyses are available from a variety of sources, including representatives of the plan sponsor, investment advisors, economists, and other professionals. The actuary is permitted to incorporate the views of experts, but the selection or advice must reflect the actuary's professional judgement.

Recognizing that there is no correct answer, the standard calls for the actuary to select a “reasonable” economic assumption. For this purpose, an assumption is deemed reasonable if it has the following characteristics:

- a. it is appropriate for the purpose of the measurement.
- b. it reflects the actuary's professional judgement.
- c. it takes into account historical and current economic data that is relevant as of the measurement date.
- d. it reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
- e. it has no significant bias (i.e., it is neither significantly optimistic nor pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included.

The standard goes on to discuss a “range of reasonable assumptions” which in part states “the actuary should also recognize that different actuaries will apply different professional judgement and may choose different reasonable assumptions. As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice.”

The remaining section of this report will address the relevant types of economic assumptions used in the actuarial valuation to determine the liabilities of the MUD Plan. In our opinion, the economic assumptions recommended in this report have been developed in accordance with ASOP No. 27.

The recent experience, and still developing impact of COVID-19, is likely to influence both demographic experience and economic forecasts, at least in the short term. However, there is insufficient data available at this point to influence our recommendations for long-term assumptions. We will continue to monitor the developments related to COVID-19 and the impact on pension plans over the next few years and keep the Board advised of any changes we believe should be made.

The following table summarizes the economic assumptions:



SECTION 4 – ECONOMIC ASSUMPTIONS

	Current Assumptions	Recommended Assumptions
Price Inflation	2.60%	2.50%
Real Rate of Return	4.30%	4.25%
Investment Return	6.90%	6.75%*
Productivity	0.90%	0.90%
General Wage Growth	3.50%	3.40%
Payroll Growth	3.50%	3.00%
Cost of Living Adjustments	2.60%	2.50%

*Recommend continued decrease to 6.50% before next experience study is performed in 2025.

Price Inflation

Use in the Valuation: Price inflation is typically measured by the annual increase in the Consumer Price Index (CPI). This assumption underlies most of the other economic assumptions, either directly or indirectly. The current assumption for price inflation is 2.60% per year.

Future price inflation is used directly in developing the actuarial assumption for cost-of-living increases since they are based on the change in the Consumer Price Index (CPI). Inflation is used indirectly in the development of the assumptions for investment return and general wage increase, which also impacts individual salary increases and payroll growth. Under ASOP 27, the price inflation assumption must be consistent among all economic assumptions.

Past Experience: Although economic activities, in general, and inflation in particular, do not lend themselves to prediction solely on the basis of historical analysis, historical patterns and long-term trends are factors to be considered in developing the inflation assumption. The Consumer Price Index, US City Average, All Urban Consumers, CPI-U, has been used as the basis for reviewing historical levels of price inflation.



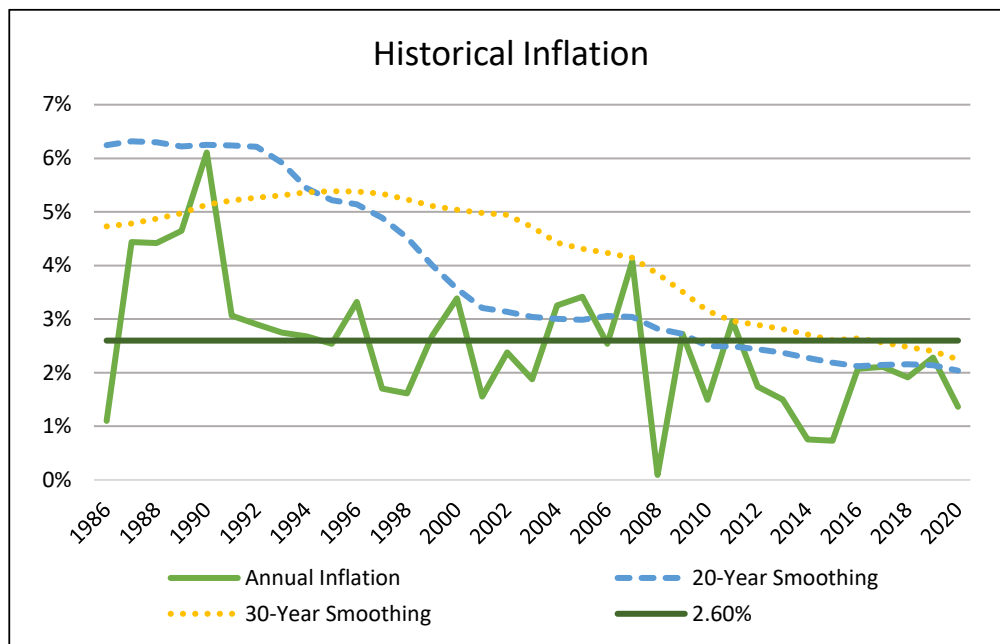
SECTION 4 – ECONOMIC ASSUMPTIONS

The following table provides historical annualized rates of the CPI-U over periods ending December 31, 2020.

Periods Ending December 2020	Annualized Rate of Inflation
Last 10 Years	1.74%
Last 20 Years	2.04%
Last 30 Years	2.25%
Last 40 Years	2.80%
Last 50 Years	3.18%

Inflation has been relatively low over the more recent periods, including about 2.25% over the last 30 years and 2.00% over the last 20 years.

The following graph illustrates the historical annual change in price inflation, measured as of December 31, as well as the 20-year and 30-year rolling averages.





SECTION 4 – ECONOMIC ASSUMPTIONS

Historical averages are heavily dependent on the period selected. For example, the period of high inflation from 1973 to 1981 has a significant impact on the averages over periods which include these years. Over more recent periods (last 20 to 30 years) measured from December 31, 2020, the average annual rate of increase in the CPI-U has been lower than the current assumption. However, inflation has spiked lately with an annual increase over 5% from July 2020 to July 2021. Whether the higher inflation experienced more recently is transitory or longer term remains to be seen.

Forecasts of Inflation

For our purposes, the assumed inflation rate, and all economic assumptions, should be a forward-looking expectation of future experience. There are several sources to consider that offer expectations for future price inflation although many of these focus on a shorter timeframe than is applicable for pension funding. These sources are discussed below.

Investment Consultants

Based on Vanguard’s March 31, 2021 capital market assumptions, both the ten-year and 30-year price inflation assumption is 1.9%.

Using the 2021 Horizon Survey (published in August 2021), the range of inflation assumptions for the short term (10 years) was 2.0% to 2.8% with a median of 2.0% for the 39 consultants included in the survey. For the 24 consultants providing an inflation assumption for a longer period (20-30 years), the median assumption was 2.2% with a range of 1.8% to 2.9%. Note that the 25th to 75th percentile range for long term inflation was fairly tight at 2.0% to 2.3%. These inflation expectations are consistent with Vanguard’s inflation assumption.

Bond Market Expectations

Additional information to consider in formulating this assumption is obtained from measuring the spread between the nominal yield on treasury securities (bonds) and the inflation indexed yield on TIPS of the same maturity. This is referred to as the “breakeven rate of inflation” and represents the bond market’s expectation of inflation over the period to maturity. As of December 31, 2020, the difference for 30-year bonds implied inflation of 2.02% for the next thirty years. Over the last few years, the bond market has been anticipating inflation of around 2.0% or less over 30 years, in line with the target inflation rate stated by the Federal Reserve. However, market prices for treasuries and TIPS can change rapidly to reflect recent macroeconomic events as we observed in the months when the COVID-19 pandemic was spreading in the United States and in the months since the US economy has started to recover. As of June 30, 2021, the implied inflation for the next thirty years is closer to 2.3%, higher than what was seen on December 31, 2020, but as we noted before, these outlooks can change rapidly.

Congressional Budget Office

The report of the Congressional Budget Office, “*The Budget and Economic Outlook: 2021 to 2031*”, reflects CBO’s expectations of average annual price inflation of 2.4% for the CPI-U over the next ten years.

Survey of Professional Forecasters

The Philadelphia Federal Reserve Bank conducts a quarterly survey of the Society of Professional Forecasters. Their forecast in the third quarter of 2021 was for inflation over the next ten years to average 2.44%.



SECTION 4 – ECONOMIC ASSUMPTIONS

Social Security Administration

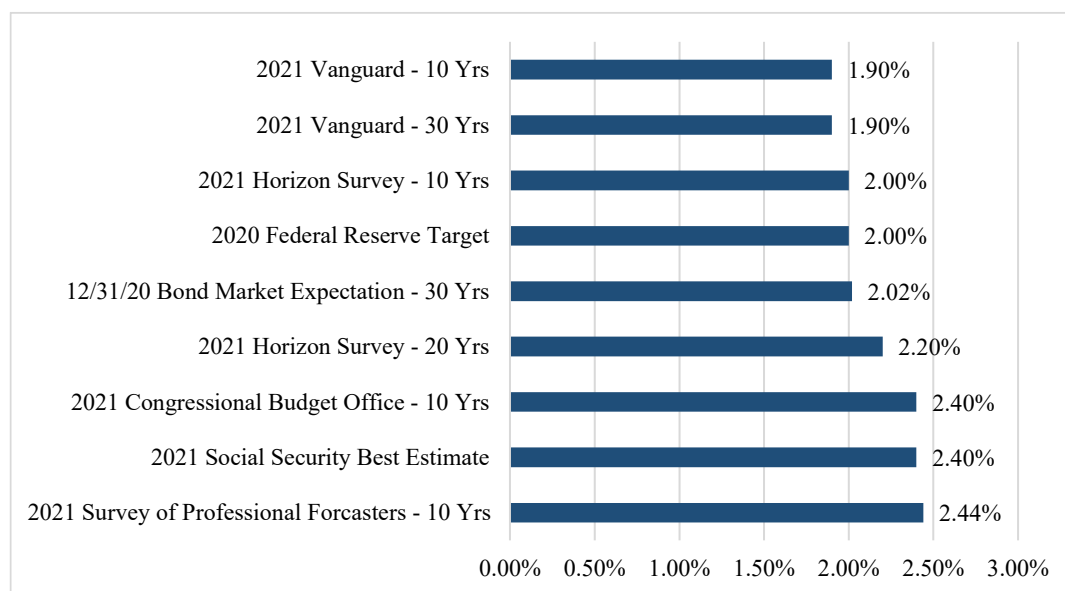
Although many economists forecast lower inflation than the assumption used by most retirement plans, they are generally looking at a shorter time horizon than is appropriate for a pension valuation. To consider a longer, similar time frame, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the most recent report (August 2021), the projected ultimate average annual increase in the CPI over the next 75 years was estimated to be 2.40%, under the intermediate (best estimate) cost assumption. The range of inflation assumptions used in the Social Security 75-year modeling, which includes low, intermediate and high-cost scenarios was 1.80% to 3.00%.

Peer System Comparison

While we do not recommend the selection of any assumption based on what other systems use, it does provide another set of relevant information to consider. The National Association of State Retirement Administrators (NASRA) Public Fund Survey collects information on the assumptions used by over 130 large retirement systems. The average inflation assumption in the most recent Public Fund Survey was 2.65% which compares to 3.75% back in the 2001 Survey. Note, however, that the most common assumption is 2.50%. It should be noted that there is a lag in this data as there is with any survey. Data for Systems that have recently conducted an experience study and made a change to this assumption is not captured in the survey data. Note we are not using this data directly to set the inflation assumption. The real value of this data is it clearly illustrates the marked decline in the inflation assumption over the past two decades.

Comparison of Inflation Expectations

The following graph summarizes the current levels of expected inflation from various sources. Note that the timeframe of different reports varies.





SECTION 4 – ECONOMIC ASSUMPTIONS

Based on the various forecasts for inflation, we believe the current assumption of 2.60% is still reasonable but on the high end of the reasonable range. We want to be cautious about reducing this assumption because inflation has been much higher lately and this assumption also influences the assumed cost of living adjustment increase. Our recommendation is to modestly lower the price inflation assumption, moving from 2.60% to 2.50%.

Consumer Price Inflation	
Current Assumption	2.60%
Recommended Assumption	2.50%

COST OF LIVING ADJUSTMENT (COLA)

The MUD Plan provides for a cost-of-living adjustment (COLA) based on actual inflation, measured by the change in the CPI-W. The retirees’ benefits are adjusted semi-annually, but the increase cannot exceed 3.0% in a calendar year. The current COLA assumption is 2.60%, the same as the price inflation assumption. It is important to remember that the inflation assumption represents the expected average rate of inflation, recognizing that variability exists. This variation means that there will likely be some years when the COLA granted will be less than 2.6% and some when the COLA granted will be more than 2.6%, but no more than 3.0%. Based on our analysis, ***we recommend that the COLA assumption be reduced from 2.60% to 2.50%***. Note that setting this assumption equal to the price inflation assumption provides a small margin of conservatism for adverse deviation.

INVESTMENT RETURN ASSUMPTIONS

Retirement Plan Assumption

Use In The Valuation: The investment return assumption is one of the primary determinants in the allocation of the expected cost of the System’s benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. Generally, the investment return assumption should represent the long-term rate of return on the plan assets, considering the asset allocation policy, expected long term real rates of return on the specific asset classes, the underlying inflation rate, and investment expenses.

The current investment return assumption is 6.90% per year, net of all investment-related expenses. This rate of return is referred to as the nominal rate of return and is composed of two components. The first component is price inflation (previously discussed). Any excess return over price inflation is referred to as the real rate of return. The real rate of return, based on the current set of assumptions, is 4.30% (6.90% nominal return less 2.60% inflation).

Because the economy is constantly changing, assumptions about what may occur in the near term are volatile. Asset managers and investment consultants usually focus on this near-term horizon so as to make prudent choices regarding how to invest the trust funds, i.e., asset allocation. For actuarial calculations, we typically consider very long periods of time as some current employees will be receiving benefit payments



SECTION 4 – ECONOMIC ASSUMPTIONS

more than 70 years from now. It is important to remember that the retirement plan is investing assets on behalf of the member during both his working career employee and while he is receiving benefit payments. Often more than one-half of the investment income earned on assets accumulated to pay benefits is received after the employee retires. In addition, in an open plan like MUD, the stream of benefit payments is continually increasing as new hires replace current members who leave covered employment due to death, termination of employment, and retirement. This difference in time horizon between investment consultants and actuaries is frequently a source of debate and confusion when setting economic assumptions.

The Actuarial Standards Board Statement Number 27 (ASOP 27) provides guidance to actuaries on the selection of economic assumptions used for measuring pension obligations. The current edition of ASOP 27 calls for the actuary to select a “reasonable” assumption. It goes on to say an assumption is “reasonable” if it has no significant bias (i.e. it is neither significantly optimistic nor pessimistic). The standard also describes a “Range of Reasonable Assumptions”. In part, this definition states, “the actuary should also recognize that different actuaries will apply different professional judgement and may choose different, reasonable assumptions”. As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice.

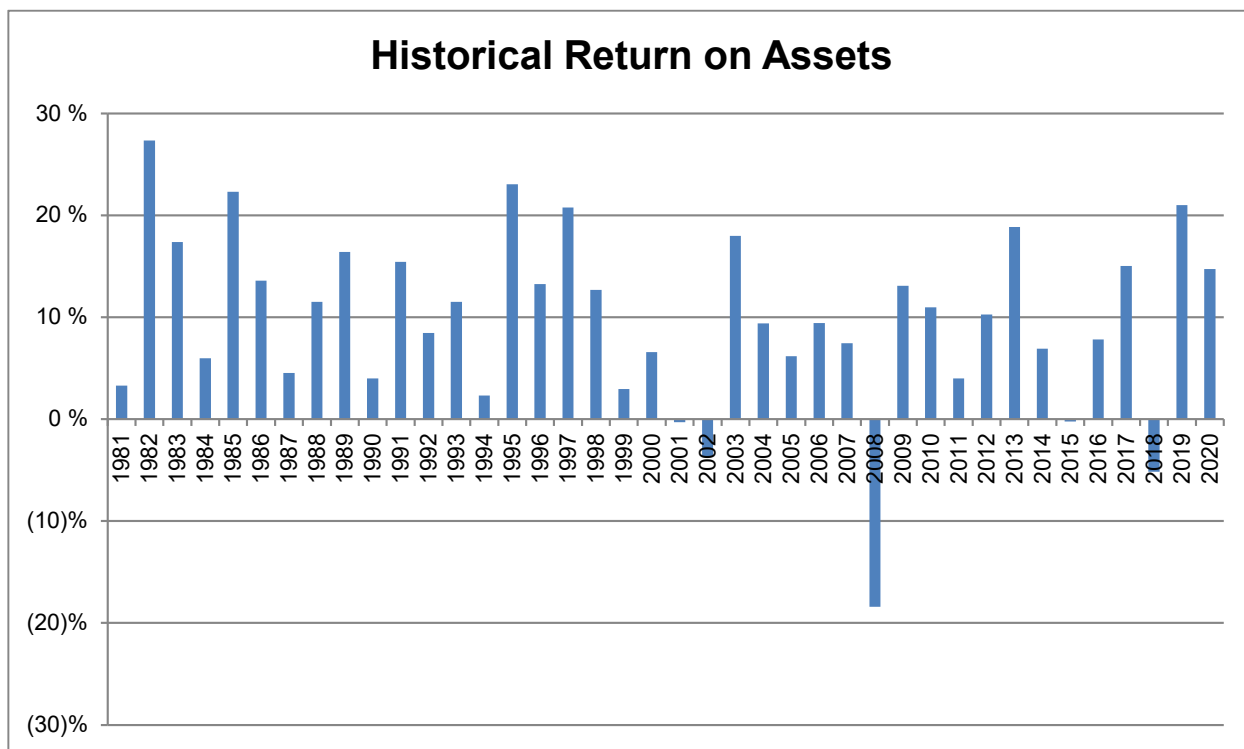
In general, we have observed a marked reduction in the capital market assumptions by both actuarial firms and investment consultants over the last decade. The impact of this trend on public pension funds is evident in the Public Fund Survey (published by the National Association of State Retirement Administrators). The median investment return assumption, which was 8.0% from 2001 to 2011, is now 7.0%. However, it is worth noting that asset allocations can vary significantly among systems in the Survey. More discussion on the NASRA Public Fund Survey results can be found later in this section of the report.

Historical Perspective: One of the inherent problems with analyzing historical data is that the results can look significantly different depending on the time frame used, given that year-to-year results vary widely. Even though history provides a valuable perspective for setting this assumption, the economy of the past is not necessarily the economy of the future. In addition, asset allocations may have changed over the period so returns may not be directly comparable.

The System’s actual investment return on the market value of assets is shown in the following graph:



SECTION 4 – ECONOMIC ASSUMPTIONS

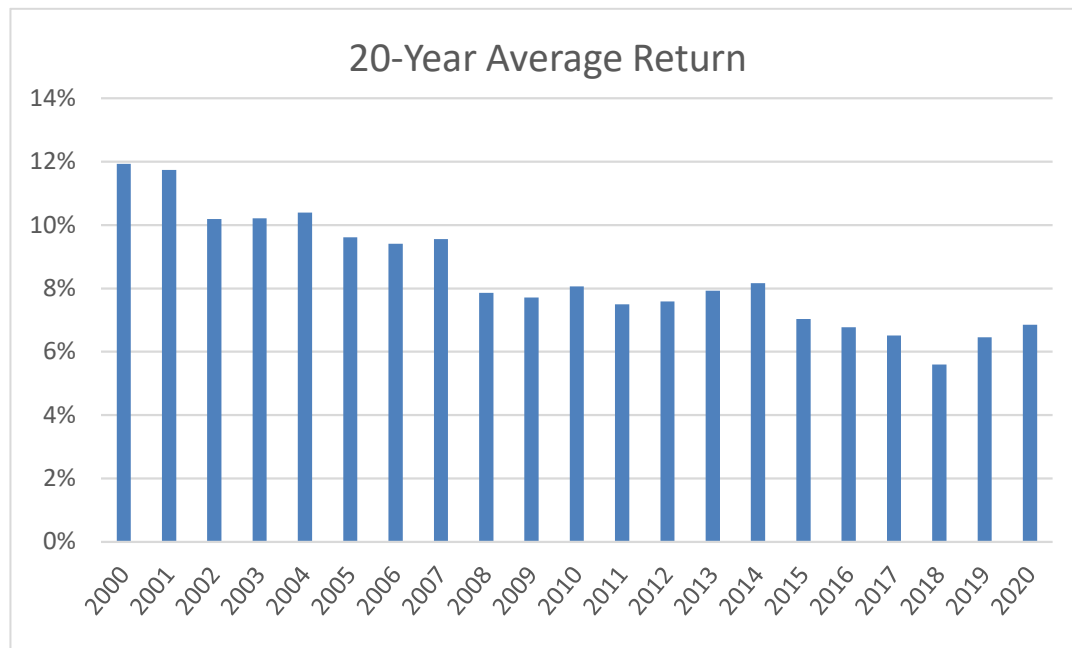


The compound return has varied significantly when viewed over different time periods. For example, the rate of return over the ten-year period ending December 31, 2020 was 9.0%, the rate of return over the twenty-year period ending December 31, 2020 was 6.9% and the rate of return over the thirty-year period ending December 31, 2020 was 8.4%. However, historical investment performance is a poor indicator of what to expect in the future. Past performance is heavily impacted by past inflation rates as well as the interest rate environment.

While the Plan has met or exceeded the current investment return assumption in the past, the long-term trend of lower returns over time is clear in the following graph that shows the historical 20-year average geometric returns over time:



SECTION 4 – ECONOMIC ASSUMPTIONS



Forward Looking Analysis

We believe the most appropriate analysis to consider in setting the investment return assumption is to model the expected returns, given the system’s target asset allocation and forward-looking capital market assumptions. However, we are trained as actuaries and not as investment professionals. As such, we rely heavily on professional investment consultants, such as Vanguard, to provide investment expertise including capital market assumptions.

In performing our analysis, we use the building block approach so the real rate of return of the portfolio is modeled, based on the target asset allocation, and then the expected return is added to the price inflation assumption. Therefore, our analysis focuses on the *real rate of return* while the analysis of the investment consultants more typically focuses on the nominal return in their asset allocation consulting. MUD’s current target asset allocation, along with their investment consultant’s (Vanguard) long-term (30 year) capital market assumptions, are shown in the following table:

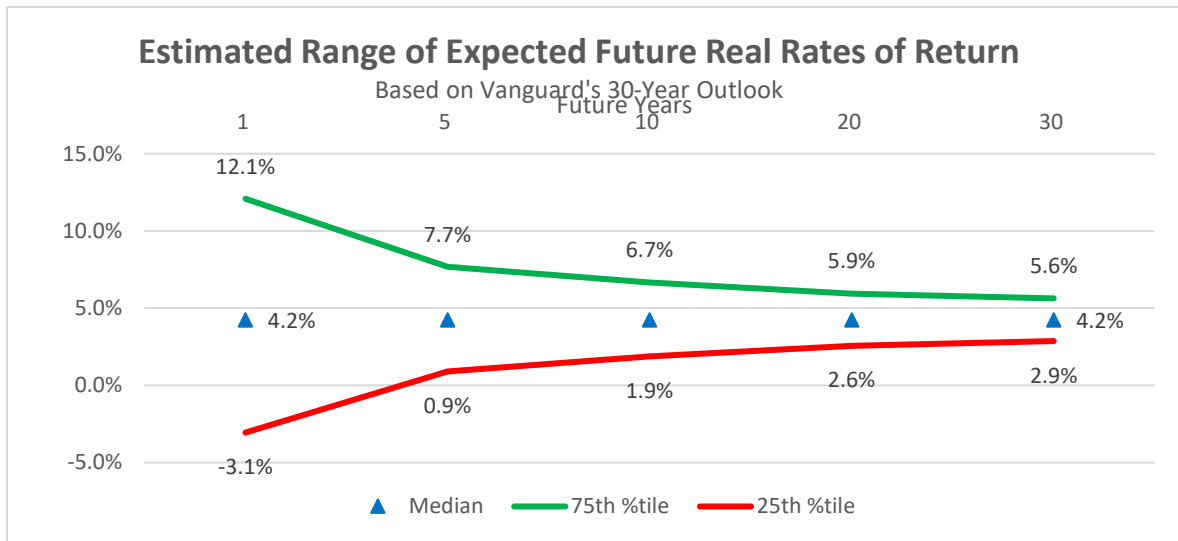
Asset Category	Asset Allocation	Expected Rate of Return*	Standard Deviation
U.S. Equities	36%	7.18%	17.8%
Non-US Equities	24%	10.12%	19.6%
U.S. Aggregate Bonds	15%	3.43%	5.0%
Non-US Bonds	3%	2.90%	4.5%
U. S. Intermediate Term Credit	11%	3.82%	4.9%
U.S. Short Term Credit	3%	3.65%	3.0%
U.S. Reits	8%	7.38%	20.40%
Total	100%		

* Arithmetic return



SECTION 4 – ECONOMIC ASSUMPTIONS

Using the target asset allocation shown in the table, we modeled the expected returns over various time periods. The following graph shows the expected range of real returns over a 30-year time horizon using Vanguard’s long-term capital market assumptions. In any one year, there is a high standard deviation or measurement of volatility as illustrated by the range of results, i.e. 50% of the results are expected to be between -3.1% and 12.1%. By expanding the time horizon to 30 years, the average (mean) return of 4.2% does not change, but the volatility declines significantly so 50% of the results fall in a range of 2.6% to 5.9%.



The range of results is much lower than in the last experience study when there was a 50% chance the returns would be between 4.2% and 6.4%.

A similar analysis, using Vanguard’s 10-year capital market assumptions, produced an expected real return of 2.43% compared to the 30-year expected real return of 4.2%. We consistently observe this type of significant difference in the short-term and long-term perspective of the capital market assumptions for most investment consultants. As mentioned earlier, the Horizon Actuarial Survey compiles the data on capital market assumptions from many different investment consultants and provides medians and the range of results. Based on the median assumptions in the Horizon Survey, the expected real rate of return of the MUD portfolio, using the short-term assumptions, was 3.03% and 3.86% using the long-term assumptions.

The median expected returns in this experience study are significantly lower than the expected returns resulting from capital market assumptions in 2017 when the last experience study was performed. The results areas summarized in the following table:

	10-Year Return	30-Year Return
Vanguard - 2021	2.43%	4.20%
Vanguard - 2017	4.25%	5.30%
Decrease	1.82%	1.10%
Horizon - 2021	3.03%	3.86%
Horizon - 2017	4.33%	5.20%
Decrease	1.30%	1.34%

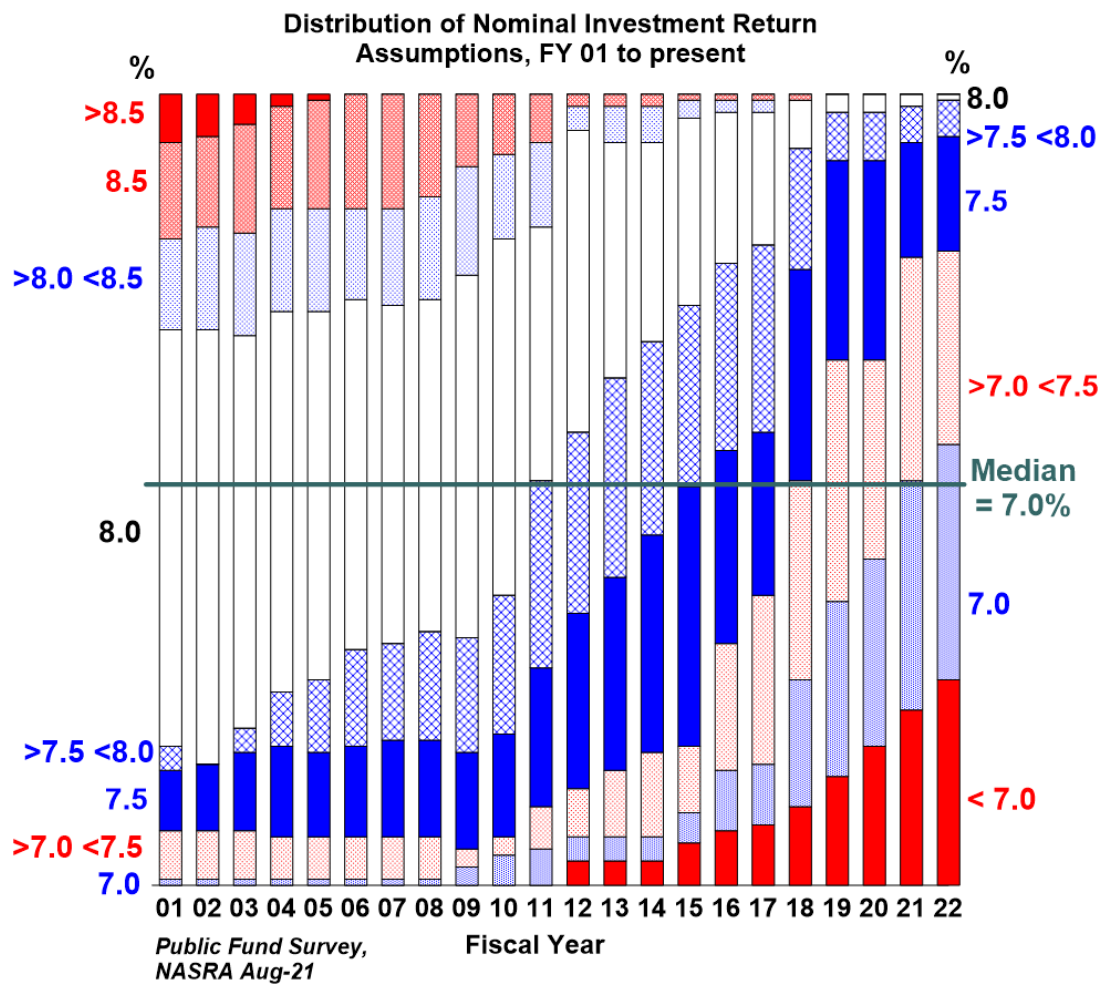


SECTION 4 – ECONOMIC ASSUMPTIONS

Industry Trends

Public retirement systems have historically compared their investment performance to their peer group. While we believe there is some merit in assessing the movement in the assumed rate of return for other systems, this is not an appropriate basis for setting this assumption in our opinion. For example, different plans have different plan dynamics which will impact their choice of the assumed investment return. This peer group information merely provides another set of relevant data to consider, as long as we recognize that asset allocation varies from system to system.

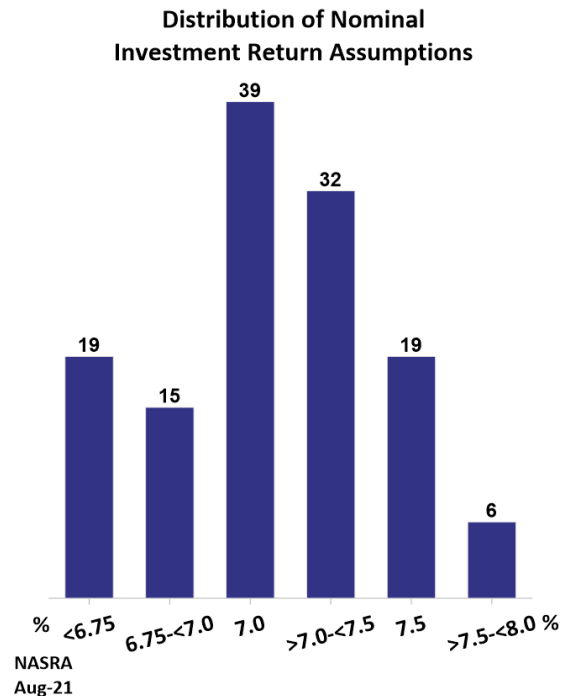
The following graph shows the change in the distribution of the investment return assumption from fiscal year 2001 through August, 2021 for the 130+ large public retirement systems included in the NASRA Public Fund Survey. As it indicates, the investment return assumptions used by public plans have decreased dramatically over the last fifteen years, likely impacted by the decrease in the underlying inflation assumption. It is worth noting that the median investment return assumption first dropped from 8.00% to 7.75% in fiscal year 2012 and has now declined to 7.00% in 2021. We continue to see additional decreases in the assumed rate of return for systems in the Public Fund Survey, many of which are reducing the assumption for the second or third time.





SECTION 4 – ECONOMIC ASSUMPTIONS

As the following graph illustrates, there are 34 of the 130 plans (26%) using an assumption below 7.0%. The distribution of current investment return assumptions is shown below:



Administrative Expense Assumption

All investment-related expenses are paid from returns on the plan assets, but an explicit expense assumption is necessary for any fees that are paid from plan assets that are considered an administrative expense. The expense assumption is added to the normal cost in calculating the actuarial contribution each year. The current expense assumption uses the actual administrative expenses in the prior year as an estimate for the current year. On that basis, the expense component of the contribution rate in the January 1, 2021 valuation was 0.14% of covered payroll. This is a commonly used approach and **we recommend the current assumption be retained.**

Summary and Recommendation

It is important to reemphasize that the assumptions used by most investment consultants are intended to assist the Board with determining asset allocations. As a result, they tend to be more short-term in nature and reflective of the current market conditions than the investment return assumption developed by the actuary for funding the benefits and measuring liabilities. Although this has always been the case, the significant difference that currently exists in expected returns over the short term versus the long-term creates a greater challenge in setting the investment return assumption. For example, Vanguard's 30-year assumptions produce an expected nominal return of 6.12% compared to their 10-year expected return of 4.37%. If only the real rate of return is considered, the difference is still significant: 4.22% over 30 years compared to 2.24% for the 10-year return. A similar outlook is evident for the 24 consultants included in the 2021 Horizon Survey who provided both short-term (10 years) and long-term (20 years) assumptions.



SECTION 4 – ECONOMIC ASSUMPTIONS

Recommendation:

Because investment earnings account for the majority of revenue for most public plans, the choice of an investment return assumption has a major impact on a system's financing and actuarial funded status. An investment return assumption that is too low will overstate liabilities and costs, causing current members/ratepayers to be overcharged and future members/ratepayers to be undercharged. An investment return assumption that is too high will understate liabilities and undercharge current members/ratepayers at the expense of future members/ratepayers. An assumption that is significantly wrong in either direction will cause a misallocation of resources and inequitable distribution of costs among generations of members/ratepayers. Because of this, setting the investment return assumption requires a balancing act with an attempt to not be overly conservative nor aggressive, although some margin for adverse deviation is acceptable under actuarial standards.

Actuarial standards require us to maintain a long-term perspective in setting all assumptions, including the investment return assumption. Therefore, we believe we must be careful not to let recent experience or short-term expectations impact our judgement regarding an appropriate investment return assumption over the long term. However, given the material difference in expectations in the short and long term, along with the fact that benefit payments are somewhat higher than contributions (negative cash flow), we cannot ignore the impact of lower returns in the short term on the funding of the Plan.

Since experience studies are performed only every four years, with a focus on the long-term, and investment consultants modify their capital market assumptions at least once a year, we do not believe basing the investment return assumption solely on the most recent estimate from one investment consultant or even a survey of several investment consultants is reasonable. Such action could create significant and frequent fluctuations in the system's funded ratio and the corresponding actuarial contribution rate, creating unnecessary challenges in funding the system. Our goal is to choose an assumption that will be reasonable over the long-term with infrequent adjustments. We expect to change this only when there are compelling changes to investment policy, changes in the underlying inflation assumption, or evidence of a change in the long-term trends in the capital markets.

Vanguard's 2021 long-term capital market assumptions result in a real return of 4.22% and their short-term capital market assumptions produce a real return of 2.24% (nominal returns of 6.72% and 4.74% if the price inflation assumption is included). MUD's current real rate of return assumption is 4.30%, but we cannot ignore the dramatic difference in the short-term returns. Therefore, we believe it is appropriate to lower the investment return assumption. **We recommend the investment return assumption be decreased from 6.90% to 6.75% in the January 1, 2022 valuation and then continue to decline incrementally over the next four years. Ideally, the assumption would ultimately reach 6.50% before the next experience study is performed. However, there can be some flexibility in the implementation plan to allow the Plan to react to market experience, the Plan's funded status, and the volatility in contributions.**



SECTION 4 – ECONOMIC ASSUMPTIONS

The components of the nominal return are shown in the table below:

	Current Assumption	Proposed Assumption	
		Initial	Ultimate
Real return	4.40%	4.25%	4.00%
Price inflation	2.60%	2.50%	2.50%
Nominal return	6.90%	6.75%	6.50%

OTHER POST-EMPLOYMENT BENEFITS (OPEB) INVESTMENT RETURN ASSUMPTION

The previous discussion regarding the development of the investment return assumption for the Retirement Plan is also applicable to the investment return assumption for the OPEB valuation. However, the OPEB Plan has a different asset allocation and, therefore, a different expected return and standard deviation. This leads to a different distribution of potential outcomes. Rather than repeat the full analysis shown earlier for the Retirement Plan, a summary of the findings is included here.

The asset allocation for the OPEB Plan is as follows:

Asset Category	Asset Allocation	Expected Rate of Return*	Standard Deviation
U.S. Equities	40%	7.18%	17.8%
Non-US Equities	27%	10.12%	19.6%
U.S. Aggregate Bonds	11%	3.43%	5.0%
Non-US Bonds	3%	2.90%	4.5%
U. S. Intermediate Term Credit	9%	3.82%	4.9%
U.S. Short Term Credit	2%	3.65%	3.0%
U.S. Reits	8%	7.38%	20.40%
Total	100%		

* Arithmetic return

Based on the target asset allocation shown in the table above, the expected real returns are slightly higher than those for the Retirement Plan: 2.61% using the 10-year assumptions and 4.40% using the 30-year assumptions. These expected returns are 0.14% higher than the Retirement Plan returns for 10 years and 0.18% higher for the 30-year period.

The current real return assumption is 4.30% (6.90% less 2.60%). However, knowing the expected returns in the short term are nearly 1.80% lower than the long-term assumptions, this needs to be reflected in the expected accumulation of assets over time. **Therefore, we believe it is reasonable to lower the investment return assumption for the OPEB Plan to 6.75%, with an inflation assumption of 2.50%. Given the outlook for the short term, it seems prudent to also move towards an investment return assumption of 6.50% before the next experience study is performed in 2025.**



SECTION 4 – ECONOMIC ASSUMPTIONS

SALARY INCREASES

Estimates of future salaries are based on assumptions for two types of increases:

1. Increases in each individual’s salary due to promotion or longevity (often called merit scale), and
2. Increases in the general wage level of the membership, which are directly related to price and wage inflation.

General Wage Inflation

The general wage inflation assumption is used to model real wage growth over time in the general economy, i.e. “across the board” rate of salary increases or how much the pay scales will change year to year. The general wage inflation assumption is composed of the price inflation assumption and an assumption for the real rate of wage increases/real wage growth. The excess of wage growth over price inflation is also called productivity growth.

Given the current price inflation assumption of 2.60%, the current general wage inflation assumption of 3.50% implies an assumed real wage increase/real wage growth assumption of 0.90%.

Historical Perspective: Wage statistics can be found in the Social Security System database on the National Average Wage data. This information goes back to 1955 and is the most comprehensive database available.

The excess of wage growth over price inflation represents the real wage growth rate. The following table shows the compounded wage growth over various periods, along with the comparable price inflation rate for the same period. The differences represent the real wage growth rate. Note that there is a delay in the date the national average wage for the prior year is released so the most recent data is for 2019.

Years	Period	General Wage Inflation	CPI Increase	Real Wage Inflation
2009-2019	10	2.9%	1.8%	1.1%
1999-2019	20	2.9%	2.1%	0.8%
1989-2019	30	3.4%	2.4%	1.0%
1979-2019	40	4.0%	3.1%	1.1%
1969-2019	50	4.5%	3.9%	0.6%
1959-2019	60	4.5%	3.7%	0.8%

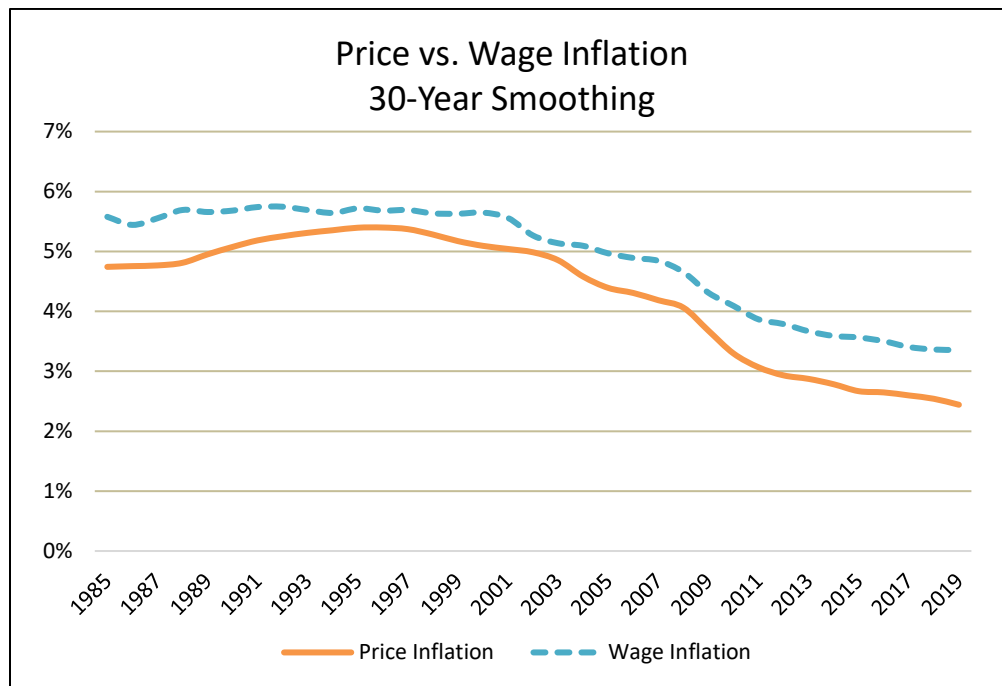
Because the National Average Wage is based on all wage earners in the country who are covered by Social Security, it can be influenced by the mix of jobs (full-time vs. part-time, manufacturing vs. service, etc.) as well as by changes in some segments of the workforce that are not seen in all segments (e.g. regional changes or growth in computer technology). Furthermore, if compensation is shifted between wages and benefits, the wage index would not accurately reflect increases in total compensation. MUD’s membership is composed exclusively of governmental employees working in Nebraska, whose wages and benefits are



SECTION 4 – ECONOMIC ASSUMPTIONS

somewhat linked as a result of the state and local economy, funding allocations, and governing policies. Because the competition for workers can, in the long term, extend across industries and geography, the broad national earnings growth will have some impact on MUD members. In the shorter term, however, the wage inflation of MUD employees and the nation may be less directly correlated.

The difference between wage and price inflation over rolling 30-year periods is shown in the following graph:



Over the last 30 years, the real wage increase, as measured by the increase in the National Average Wage Index, has been about 1.0% per year on average.

Forecasts of Future Wages: The wage index used for the historical analysis is projected forward by the Office of the Chief Actuary of the Social Security Administration in their 75-year projections. In the August 2021 Trustees Report, the annual increase in the National Average Wage Index under the intermediate cost assumption (best estimate) was 3.8%, 1.2% higher than the Social Security Administration’s intermediate inflation assumption of 2.4% per year. The range of the assumed real wage growth in the 2021 Trustees report was 0.5% to 1.8% per year.

MUD Actual Experience: The average salary, which accounts for the change in the active membership each year, increased 3.14% per year over the last 11 years. This is a reasonable estimate of the actual general wage increase experienced by MUD over this timeframe. Actual price inflation over the same period was around 2.1% which results in about a 1.0% increase in wages due to productivity.



SECTION 4 – ECONOMIC ASSUMPTIONS

Analysis: Over the last 10, 20 and 30 years, the actual experience on a national basis has been close to the current assumption. However, this is based on Social Security data which uses the average wages of all US workers. As mentioned earlier, the median real wage increase has been significantly lower. The increase in the average salary over the last 11 years compared to actual price inflation indicates wages increased about 1.0% more than pure price inflation. We recommend retaining the current assumption of 0.90% for real wage increases. When combined with the price inflation assumption of 2.50%, it creates a general wage inflation assumption of 3.40%.

Merit Salary Increase Assumption

As noted above, future salary increases are the result of two components. However, actual salary experience is typically reported in total, rather than by components, so the experience study reviewed total salary increases for the study period. The overall salary increase in each year of the study period is shown in the table below:

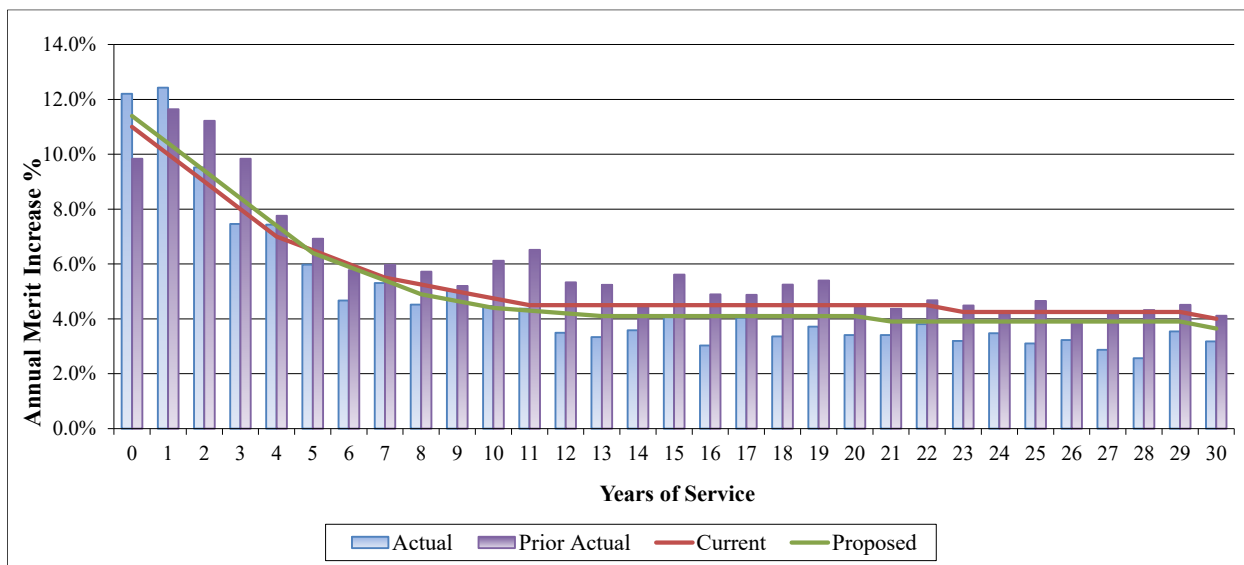
Total Salary Increases			
Year	Actual	Expected	Difference
2017	5.52%	5.39%	0.13%
2018	3.96%	5.41%	(1.45%)
2019	5.40%	5.44%	(0.04%)
2020	4.75%	5.54%	(0.79%)
2017-2020	4.91%	5.45%	(0.54%)
2013-2016	5.85%	5.25%	0.60%

Four years is a relatively short period to analyze individual salary increases. Variations that occur in one year can have a dramatic impact on the overall results. The current assumption was unchanged in the last experience study so we can aggregate the results for the current and prior study for additional data and enhanced credibility. As the last two rows in the table above show, actual increases were about 0.60% higher than expected in the prior study and 0.54% lower than expected in the current study. Over the entire 8 years, the current assumption has been a relatively good estimate of actual salary increases for individual members.

The following graph shows the observed increases for all years (the bars) compared to the current assumption (the red line). As can be seen, the shape of the assumption and the actual salary increases exhibit a similar pattern. In addition, as the table above shows, the actual salary increases granted in the last three years have been close to the current assumption, particularly when the difference in actual and expected price inflation is considered. We believe this supports the continued use of the total salary scale assumption with some modest adjustments. The recommendation is to lower the general wage increase from 3.50% to 3.40% as a result of lowering the price inflation assumption. That decline will flow through directly to the individual salary increase assumption, lowering it by 0.10%. Reviewing the data for the last two studies, we believe some minor tweaks to the merit salary increase assumption are appropriate. Please see the proposed assumption (green line) in the following graph:



SECTION 4 – ECONOMIC ASSUMPTIONS



The overall salary increase expected using the proposed assumption is 5.25%, down from 5.45% under the current assumption. Fifty percent (or 0.10%) of the reduction is due to the decrease in the price inflation assumption and the other fifty percent reflects the overall impact of the changes to the merit salary increase assumption.

PAYROLL GROWTH ASSUMPTION

Amortization payments on the unfunded actuarial liability are currently determined as a level percent of payroll. Therefore, the valuation requires an assumption regarding future annual increases in covered payroll. The wage growth assumption is typically used for this purpose. The current payroll growth assumption is 3.50%, the same as the current wage growth assumption.

Actual covered payroll for the MUD Plan increased an average of 2.65% per year over the last 11 years, largely due to a decrease in the number of active members. The number of active members in the January 1, 2021 valuation was 808 compared to 851 in the 2010 valuation. Despite the fact the number of active members has declined in the past, we do not have any knowledge that a similar decline is expected in the future. Therefore, we propose continuing the current assumption that no future growth or decline in the number of active members will occur. With no assumed growth in membership, future salary growth due only to general wage increases is generally anticipated. We believe it would be prudent to set the payroll growth assumption slightly lower than the general wage inflation assumption given the past experience. **Therefore, we recommend the payroll growth assumption be set at 3.00%.** Given that the District contributes a dollar amount of contribution rather than applying a contribution rate to actual payroll, this change means the dollar amounts of contributions to pay off the UAL will be slightly higher initially and lower in the latter part of the amortization period which will pay down the UAL more quickly.



SECTION 5 – DEMOGRAPHIC ASSUMPTIONS

DEMOGRAPHIC ASSUMPTIONS

Actuarial Standard of Practice (ASOP) No. 35 provides guidance to actuaries regarding the selection of demographic and other non-economic assumptions for measuring pension obligations.

ASOP 35 General Considerations and Application

Each individual demographic assumption should satisfy the criteria of ASOP 35. In selecting demographic assumptions the actuary should also consider: the internal consistency between the assumptions, materiality, cost effectiveness, and the combined effect of all assumptions. At each measurement date, the actuary should consider whether the selected assumptions continue to be reasonable, but the actuary is not required to do a complete assumption study at each measurement date. In our opinion, the demographic assumptions recommended in this report have been developed in accordance with ASOP 35.

Overview of Analysis

The purpose of a study of demographic experience is to compare what actually happened to the individual members of the System during the study period (calendar years 2017 through 2020) with what was expected to happen, based on the actuarial assumptions. A single four-year period is a relatively short observation period, particularly given the size of the group. Therefore, we have considered the results of the prior Experience Study when deemed appropriate.

Studies of demographic experience generally involve three steps:

- First, the number of members changing membership status, called decrements, during the study is tabulated by age, duration, gender, group, and membership class (active, retired, etc.).
- Next, the number of members expected to change status is calculated by multiplying certain membership statistics, called exposure, by the expected rates of decrement.
- Finally, the number of actual decrements is compared with the number of expected decrements. The comparison is called the actual to expected ratio (A/E Ratio), and is expressed as a percentage.

In general, if the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, sex, or duration deviates significantly from the expected pattern, new assumptions are considered. Recommended revisions are normally not an exact representation of the experience during the observation period. Judgement is required to anticipate future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience.



SECTION 5 – DEMOGRAPHIC ASSUMPTIONS

It takes a fair amount of data to provide experience study results that are fully credible for demographic assumptions. Because the membership or certain subsets of the membership are relatively small, some assumptions have been selected based more on our professional judgement of reasonable future outcomes than actual experience.

ASOP 35 states that the actuary should use professional judgement to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgement. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Pursuant to ASOP 35 the actuary should follow the following steps in selecting the demographic assumptions:

1. Identify the types of assumptions. Types of demographic assumptions include but are not limited to retirement, mortality, termination of employment, disability, election of optional forms of payment, administrative expenses, family composition, and treatment of missing or incomplete data. The actuary should consider the purpose and nature of the measurement, the materiality of each assumption, and the characteristics of the covered group in determining which types of assumptions should be incorporated into the actuarial model.
2. Consider the relevant assumption universe. The relevant assumption universe includes experience studies or published tables based on the experience of other representative populations, the experience of the plan sponsor, the effects of plan design, and general trends.
3. Consider the assumption format. The assumption format includes whether assumptions are based on parameters such as gender, age or service. The actuary should consider the impact the format may have on the results, the availability of relevant information, the potential to model anticipated plan experience, and the size of the covered population.
4. Select the specific assumptions. In selecting an assumption the actuary should consider the potential impact of future plan design as well as the factors listed above.
5. Evaluate the reasonableness of the selected assumption. The assumption should be expected to appropriately model the contingency being measured. The assumption should not be anticipated to produce significant cumulative actuarial gains or losses over the measurement period.



SECTION 6 – MORTALITY

MORTALITY

One of the most important demographic assumptions in the valuation is mortality because it projects the duration of retirement benefit payments. If members live longer than expected, the true cost of future benefit obligations will be understated.

Rates of mortality declined throughout the 20th century and have continued to decline, which means that, in general, people are living longer. Consequently, we anticipate that mortality tables will need to be updated periodically even if we are anticipating some increase in longevity. Because of potential differences in mortality, we break down our study by gender (males and females) and by status (healthy retirees, disabled retirees, and active members).

Because of the substantial amount of data required to construct a mortality table, actuaries usually rely on standard tables published by the Society of Actuaries. Actuaries then use various adjustments to these standard, published mortality tables in order to better match the observed mortality rates of a specific group:

- (1) Age adjustments
- (2) Benefit Size (Above or Below Median)
- (3) Scaling of rates

The first of these adjustments is an age adjustment that can be either a “setback” or a “set forward”. A one-year age set forward treats all members as if they were one year older than they truly are when applying the rates in the mortality table. So, a one year set forward would treat a 61 year old retiree as if he will exhibit the mortality of a 62 year old in the standard mortality table.

The second adjustment is based on the average benefit size. We know there is a correlation between the size of benefits and the longevity of the group, i.e., those with higher benefit amounts tend to live longer. Selecting a table using the benefit level of the group is expected to better anticipate the longevity of the underlying population.

A third adjustment, which requires a significant amount of data, that can be used to adjust the mortality rates in a standard table to better fit actual experience is to “scale” a mortality table by multiplying the probabilities of death by factors less than one (to reflect better mortality) or factors greater than one (to reflect poorer mortality). Scaling factors can be applied to an entire table or a portion of the table. Of course, if needed, actuaries may use two or even all three of these methods to develop an appropriate table to model the mortality of the specific plan population.

The issue of future mortality improvement is one that the actuarial profession has become increasingly focused on studying and monitoring. This has resulted in changes to the relevant Actuarial Standard of Practice, ASOP 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This ASOP requires the pension actuary to make and disclose a specific recommendation with respect to future improvements in mortality after the valuation date, although it does not require that an actuary assume there will be future improvements. There have been significant improvements in longevity in the past, although there are different opinions about future expectations, and thus there is a subjective component in the estimation of future mortality improvement.



SECTION 6 – MORTALITY

There are two widely-used ways to reflect future improvements in mortality:

- (1) Static table with “margin”
- (2) Generational mortality

The first approach to reflecting mortality improvements is through the use of a static mortality table with “margin.” Under this approach, the Actual to Expected Ratio is intentionally targeted to be over 100% so that mortality can improve without creating actuarial losses. This approach is mandated by the Internal Revenue Service for determining minimum funding amounts for corporate pension plans as mortality improvements are projected seven years for retirees and 15 years for actives. While there is no formal guideline for the amount of margin required (how far above 100% is appropriate for the Actual to Expected Ratio), we typically prefer to have a margin of around 10% at the core retirement ages. The goal is still for the general shape of the curve to be a reasonable fit to the observed experience. Depending on the magnitude and duration of mortality improvement, the margin would decrease and eventually may become insufficient. When that occurs, the assumption would need to be updated.

Another approach, referred to as generational mortality (currently used in the MUD Plan valuations), directly anticipates future improvements in mortality by using a different set of mortality rates based on each year of birth, with the rates for later years of birth assuming lower mortality than the rates for earlier years of birth. The varying mortality rates by year of birth create a series of mortality tables that contain “built-in” mortality improvements, e.g., a member who turns age 65 in 2035 has a longer life expectancy than a member who turns age 65 in 2020. When using generational mortality, the Actual to Expected Ratios for the observed experience are set near 100% as future mortality improvements will be taken into account directly in the actuarial valuation process. The generational approach is our preferred method for recognizing future mortality improvements in the valuation process because it is more direct and results in longer life expectancy for members who are younger, consistent with what we believe is more likely to occur. This is the method currently used in the MUD valuation and we recommend it continue to be used.

The table below shows the life expectancy at age 65 under generational mortality, an indication of how long a new retiree would be expected to receive monthly payments, at various points in time.

Year	Life Expectancy at Age 65	
	Males	Females
2021	20.4	24.0
2031	21.1	24.7
2041	21.9	25.3
2051	22.7	26.0



SECTION 6 – MORTALITY

Healthy Retirees: The current mortality table used in the MUD valuation to anticipate the duration of benefit payments to members in-pay status is the RP-2014 Healthy Annuitant Male Mortality Table with no age adjustment and the RP-2014 Healthy Annuitant Female Mortality Table with a one-year age set forward. Future mortality improvements are anticipated using Scale MP-2016.

In examining the results of the Experience Study, if the A/E Ratio is greater than 100%, the assumptions have predicted fewer deaths than actually occurred (indicating longer lifetimes than expected) and with an A/E Ratio less than 100%, the assumptions have predicted more deaths than have actually occurred (shorter lifetimes than expected).

We also analyzed experience on a benefit-weighted basis where the exposures and deaths are multiplied by the monthly retirement benefit amount. This helps to reflect any differences that arise from better mortality experience among those with larger benefits. Because a valuation is designed to measure the amount and timing of future benefit payments (liability) rather than simply the number of retirees leaving pay status, this benefit-weighted approach is an important factor in developing a mortality assumption to value plan obligations. In addition, the mortality rates in the mortality tables are developed using the benefit-weighted approach so we want to be consistent in the application of the table to our data.

Because the size of the MUD Retirement Plan retiree population is relatively small and mortality trends tend to change slowly, we aggregated the data in the prior study period with the current study period for our analysis. This increases the amount of data and, therefore, the credibility of the results/findings, however, there is still so little data, it is difficult to assign credibility to our findings. The aggregate observed experience for healthy (not disabled) male and female retirees, from ages 60 to 90, during the study period is shown in the following chart.

All Healthy Retirees					
	Exposure	Observations		A/E Ratio	A/E Ratio
		Actual	Expected	Current (Count)	Current (Weighted)
Males	2,640	107	90	119%	117%
Females	830	20	17	118%	90%
Total	3,470	127	107	119%	N/A

The Actual to Expected Ratios on a benefit-weighted basis were materially different from the Actual to Expected Ratios on a count basis for females, confirming that members with higher benefits have better mortality. Please note that we are not saying that larger benefits lead to better mortality, but simply that there is a correlation between the two.

Because we are using generational mortality, the Actual to Expected Ratios should be near 100% as future mortality improvements will be taken into account directly in the actuarial valuation process. Actual deaths during the study period were higher than the number expected for males (107 actual and 90 expected for an A/E ratio of 119%) on a count basis. The experience was consistent on a benefit-weighted basis (117%). For females, there were three more deaths than expected during a four-year period which is a small number despite an A/E ratio of 118%. On a benefit-weighted basis, the A/E ratio was 90%. It is worth noting that the size of the female group is much smaller than the males so even less credibility can be assigned to their actual experience.



SECTION 6 – MORTALITY

We further analyzed the male mortality experience by breaking the results down into two groups: ages 55 to 65 and ages 66 to 95. There are very few deaths at the very young ages so the current assumption overstates the number of deaths from ages 55 to 65, but notice the difference is only two people over four years. The actual experience for ages 66 to 90 is shown in the table below and it indicates the number of deaths was higher than expected on both a count and liability weighted basis.

Healthy Male Retirees					
	Exposure	Observations		A/E Ratio	A/E Ratio
		Actual	Expected	Count	Weighted
Ages 55 to 65	679	4	6	67%	48%
Ages 66 and up	2,123	116	96	121%	121%
Total	2,802	120	102	118%	N/A

Given the A/E ratio for males, a change to the mortality assumption would appear to be reasonable at this time, particularly given there is a new mortality table based solely on public plan data. However, we believe there is not enough credible data to vary dramatically from the base tables. The Pub-2010 family of mortality tables was published by the Society of Actuaries (SOA) in 2019. They represent the only standard mortality tables based solely on public pension plan data. We have found this family of tables to be a reasonably good fit for most public plans, particularly given the fact that different tables are developed for different types of jobs (Teachers, General Employees and Public Safety). There are also table variations for above median, below median and median benefit sizes. MUD's experience over the past two studies has shown mortality to be in line with the below median set of tables. However, the size of their benefits are more in line with the high end of the median table or even in the above median range. Therefore, instead of using only one of these observations we took both into account.

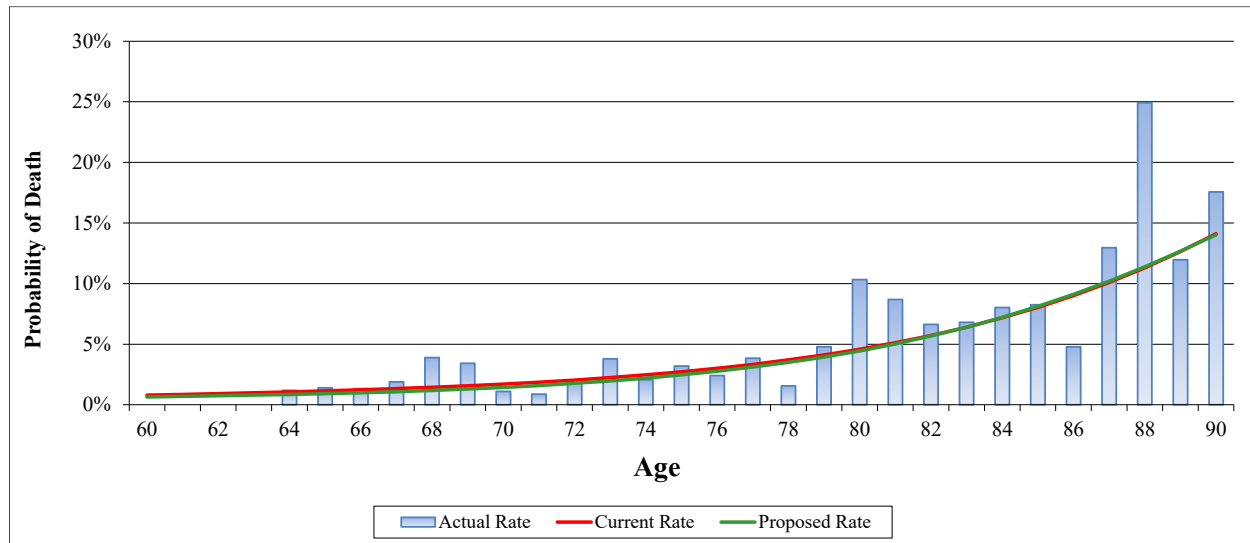
For males, we found the General Employees Median Mortality Table projected to the midpoint of the study with Scale MP-2020, provided a reasonable fit to the observed data. The A/E ratio was 125%, however, we recognize the MUD retiree dataset is extremely small and, therefore, the credibility of the data/findings is limited, so the base table without adjustments seems appropriate. If the selection of the mortality assumption was made with only looking at the data observed and A/E ratios, we likely would have selected the General Employees Below Median Male Mortality Table. Given all of this information, we believe we should be cautious about changing the mortality assumption and not over-adjust in either direction. **Therefore, we recommend moving to the Pub-2010 General Employees Median Mortality Table for males.**

There is insufficient data upon which to base our analysis for females. Therefore, we recommend using the same mortality table as is used for males, but with rates for females. **Therefore, we recommend moving to the Pub-2010 General Employees Median Mortality Table for females. For both males and females, future mortality improvements will be modeled using MP-2020.**



SECTION 6 – MORTALITY

The comparison of the current and proposed assumption for males, ages 60 to 90, is shown in the following graph. The proposed assumption results in an A/E ratio of 125% on a benefit-weighted basis for ages 60 to 90 (see graph below).



Disabled Retirees: Typically, the mortality of disabled retirees is higher than that of healthy retirees. The current assumption is the RP-2014 Disabled Life Mortality Table with generational improvements using MP-2016. There is far too little data to perform any reliable analysis so our recommendation is based on professional judgement. We prefer to use a table for disabled members that is in the family of the Pub-2010 Tables. **Therefore, we recommend the Pub-2010 Non-Safety Median Disabled Mortality Table. Future mortality improvements will be modeled using MP-2020.**

Beneficiaries: The mortality of beneficiaries generally applies to the survivors of members who have elected a joint and survivor option. There is insufficient data to analyze and rely on those results to set an assumption. **Therefore, we recommend using the Pub-2010 General Employees Median Contingent Annuitant Mortality Table, and MP-2020 for future mortality improvements, to value beneficiaries in the valuation.**

Active Members: This assumption predicts eligibility for death benefits for active employees prior to retirement, rather than the expected lifetime for pension payments. In smaller groups, the mortality rates for active members are often set based on the same assumption as is used for healthy retirees. Given the low probability of death while active, the results cannot be credible on their own without much larger numbers of employees than are in the MUD active group. We prefer to keep the mortality assumption for active and retired members on a consistent basis. **Therefore, we recommend the active member mortality assumption be the Pub-2010 General Employees Median Mortality Table, and the MP-2020 projection scale to reflect future mortality improvements.**



SECTION 7– SERVICE RETIREMENT

SERVICE RETIREMENT

Service retirement measures the change in status from active membership directly to retirement. This assumption does not include the retirement patterns of members who terminated from active membership years prior to their retirement (terminated vested members). A separate assumption addresses that situation.

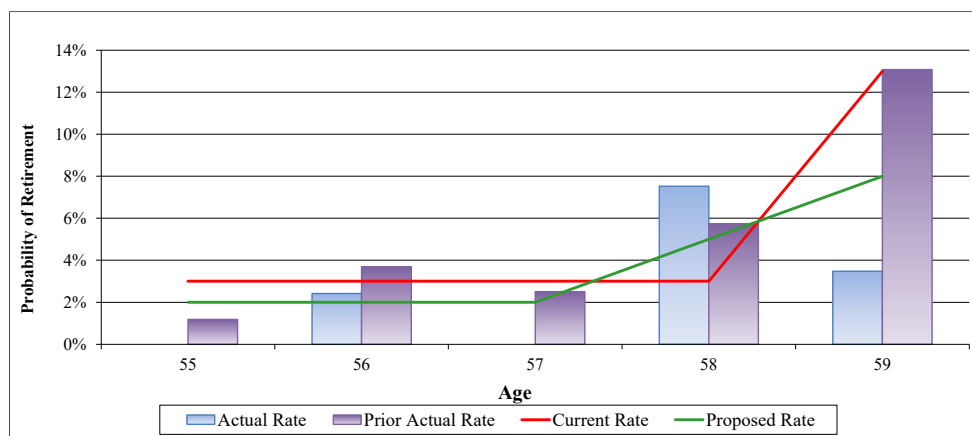
Members can retire with unreduced benefits at age 60 with 5 years of service (referred to as “normal retirement”). Early retirement (with reduced benefits) is available at age 55 with 5 years of service. Different assumptions are used for under the early and normal retirement provisions so each is studied separately.

Actual experience during the study period is shown below.

2017 to 2020 Retirement Experience					
Retirement Type	Exposure	Observations		A/E Ratio	A/E Ratio
		Actual	Expected	(Count)	(Weighted)
Early	642	15	31	48%	54%
Normal	519	121	164	74%	93%
Total	1,161	136	195	70%	87%

The overall A/E ratio for the current study period on a count basis was 70%, indicating a lower number of retirements than expected during the study period for both early and normal retirement. In the prior study, there were more retirements than expected under the early retirement provisions (A/E ratio of 111%) and fewer retirements than expected under the normal retirement provisions (A/E ratio of 76%). There was a similar trend in the experience study before that so this is the first time there were fewer early retirements than expected. The fit of the early retirement assumption is reasonably good at ages 55 to 57, but adjustments are needed at ages 58 and 59. However, we do not want to over-adjust so we are moving part of the way toward the observed experience. **We recommend the early retirement rate at age 58 be increased and the age 59 rate be decreased as shown in the graph below.** The revised A/E ratio using the recommended assumption is 63% on a count basis and 71% on a liability-weighted basis.

Early Retirement

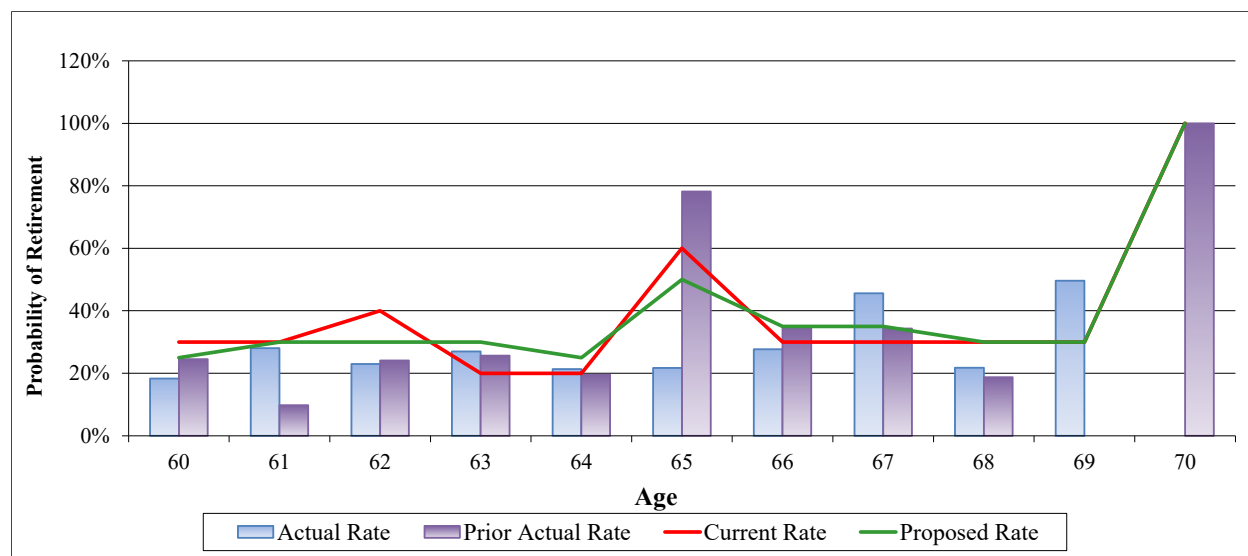




SECTION 7– SERVICE RETIREMENT

The A/E ratio, on a liability-weighted basis, for normal retirement is close to 100%, but the retirement rate at age 65 is much higher than the actual experience. Given the difference in the actual experience and current assumption at age 65 and the fit at some of the other ages, we believe some adjustment to the assumption is appropriate. **Therefore, we are recommending the changes shown in the graph below.** Based on the recommended assumption, the A/E ratio is 77% on a count basis. However, on a liability-weighted basis it is 98% and the overall fit of the assumption to the actual experience has improved.

Normal (Unreduced) Retirement



Inactive Vested Members

Currently, inactive vested members who leave their contributions in the Plan are assumed to retire at age 58. The data is very limited so detailed analysis was not performed. Based on our professional judgement, the assumption is reasonable. **We recommend the current assumption be retained.**



SECTION 8– TERMINATION OF EMPLOYMENT (WITHDRAWAL)

TERMINATION OF EMPLOYMENT (WITHDRAWAL)

This section of the report summarizes the results of our study of terminations of employment for reasons other than retirement. Rates of termination can vary by both age, years of service, and gender. In general, rates of termination tend to be highest at younger ages and in the early years of employment.

The number of terminations includes all members who were reported as active in one valuation and not active nor retired in the following valuation data. Some of these members subsequently receive refunds of contributions, some return to active membership, and some leave their contributions with the Plan until retirement and receive a monthly benefit.

The current assumption is a service based assumption where the probability of termination decreases as the employee earns additional years of service. The current assumption reflects some probability of termination through 20 years of service for males and 25 years of service for females.

The following table summarizes the terminations that occurred for durations 1 through 20 during the study period:

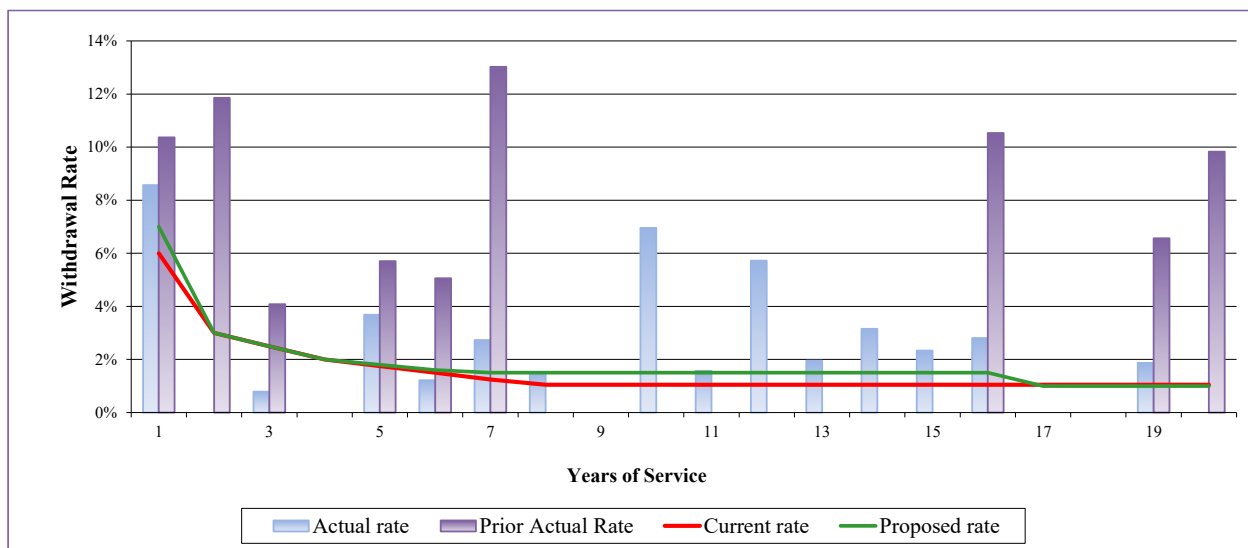
	Exposure	2017 to 2020 Termination Experience			
		Observations		A/E Ratio	A/E Ratio
		Actual	Expected	Count	Weighted
Male	1,289	26	24	109%	158%
Female	449	14	16	86%	48%
Total	1,738	40	40	100%	N/A

Since termination of employment often involves a decision by the employee to voluntary leave covered employment, the actual experience can be heavily influenced by the economic conditions during the study period. During the current study period, there were no significant events that should have skewed the actual termination of employment experience.

Males: The A/E ratio is above 100% on a count analysis but is considerably higher than 100% when considering the liability-weighted results. We assign more credibility to the liability-weighted results so we are recommending some adjustments to the current assumption, as shown in the following graphs.

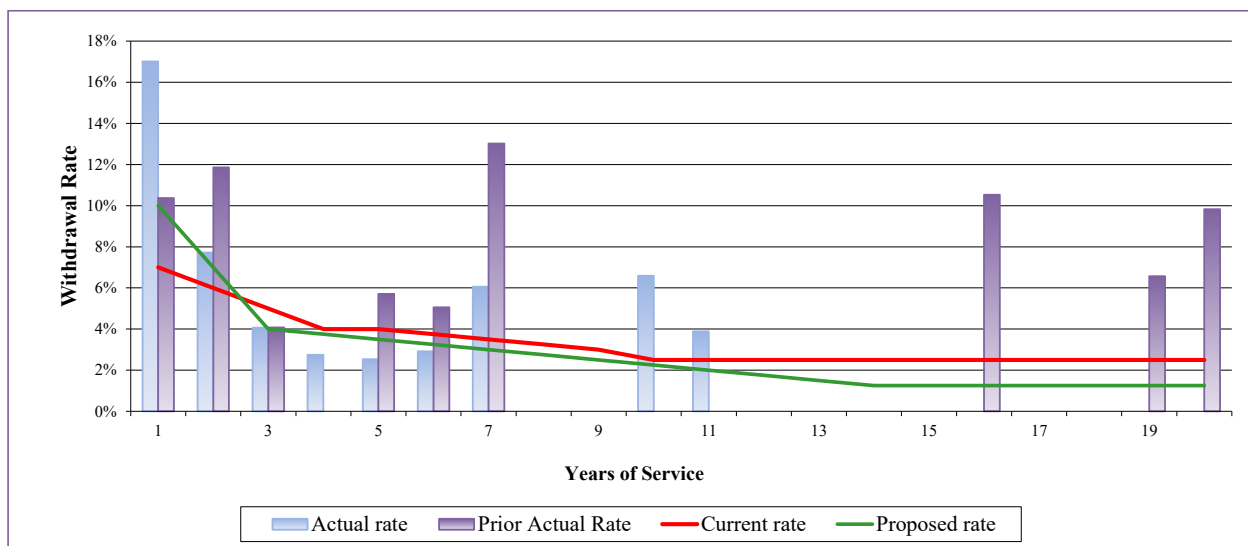


SECTION 8— TERMINATION OF EMPLOYMENT (WITHDRAWAL)



Given the small dataset, we are moving part of the way toward the actual experience in order to avoid over-correcting in this study. Using the recommended assumption, the A/E ratio for males for durations 1 through 20 is 96% on a count basis and 135% on a liability-weighted basis.

Females: There is far less data for females than for males. As a result, we expect to observe more volatility in the termination rates over the range of service, as exhibited by high rates at some ages and 0% rates at others. This volatility occurred in both the current study and the prior study, as shown below.



We recommend that the termination rates be adjusted as shown in the graph above to better fit the actual observed experience. The A/E ratio, using the proposed assumption, is 98% on a count basis and 68% on a liability-weighted basis. Note the termination rates are set to 0% at durations 21 through 25 in the proposed assumption which is a change from the current assumption.



SECTION 8– TERMINATION OF EMPLOYMENT (WITHDRAWAL)

Withdrawal of Employee Contributions by Vested Terminating Members

Some vested employees who terminated employment elect to take a refund of their employee contribution balance, thereby forfeiting the right to receive a monthly benefit at retirement. Currently an assumption is used to anticipate this event for current active members who are expected to terminate employment after becoming vested. The current assumption is 40% of those who terminate with less than 20 years of service will elect a refund of their employee contribution balance.

The number of vested members who terminate employment is relatively small, but we reviewed the data during the study period to evaluate the reasonableness of the current assumption. There were 23 terminations of vested members with less than 20 years of service. Four (4) elected to take a refund and forfeit their deferred monthly benefit, about 17%. While we could reduce the assumption to a lower percentage from the current 40%, we believe that in most cases, a terminated vested member will make the decision that is the most beneficial to them. **Therefore, we recommend assuming a terminating vested member will elect a refund of employee contributions if the value is greater than the present value of the deferred monthly benefit.**



SECTION 9 – OTHER ASSUMPTIONS

OTHER ASSUMPTIONS

RETIREMENT PLAN

LOAD ON JOINT AND CONTINGENT ANNUITANT FORM OF PAYMENT

When a member elects to retire under a joint and contingent annuitant form of payment, the monthly benefit amount is reduced to reflect the longer expected payment period. However, if the contingent annuitant predeceases the retiree, the benefit amount “pops up” to the amount the retiree would be receiving if the joint and contingent annuitant form of payment had not been elected. In the valuation process, active liabilities are increased by 0.50% to estimate the higher liability associated with the pop up feature for those receiving benefit as a joint and contingent annuitant form.

Based on the experience during the study period, the current load of 0.50% of active liability is a reasonable load and **we recommend it be retained.**

ANNUITY FACTORS FOR OPTIONAL FORMS OF PAYMENT

The Plan permits a retiring employee to elect to receive his benefit under a different form of payment, i.e., a joint and contingent survivor annuity. Under this option, the benefit amount is reduced, but all or a specified portion is continued to a designated contingent annuitant after the employee’s death. The Plan provides that the benefit payable under the joint and contingent annuity option shall be an “actuarially equivalent amount”. This means that the two benefit payment streams have the same present value under a given set of actuarial assumptions.

The assumptions that impact the definition of actuarially equivalent include the interest rate (same as investment return assumption), mortality assumption and the COLA assumption. Any change to any of these three assumptions will impact the factors used to calculate the optional forms of benefit. While it is not required that the administrative factors automatically be updated with a change in one or more of these assumptions, the impact should be studied so a determination can be made as to whether to change/update the joint and contingent annuity factors used for benefit calculations.

In the current experience study, recommendations were made to change all three of these assumptions. Therefore, we recommend the actuarial equivalent factors be updated to reflect the recommended assumptions, assuming the Retirement Committee adopts the recommended assumption changes. However, the mortality assumption used in the valuation is generational which means that the life expectancy at any given age changes in each future year. To avoid the complexity of creating new factors every year, we recommend a static mortality table be used for the optional form factors as is currently done. The following is the set of assumptions we recommend be used to create the joint and contingent annuity factors that will be used effective January 1, 2022. Note a later implementation date is also acceptable if there are administrative concerns with a January 1, 2022 date.



SECTION 9 – OTHER ASSUMPTIONS

Interest rate: 6.75%

Mortality: Pub 2010 Median Mortality Table, projected to 2037 using Scale MP-2020

COLA: 2.50%

Member Gender: Blended 90%Male/10% Female

Joint Annuitant: Blended 10% Male/90% Female

MARRIAGE ASSUMPTION (RETIREMENT AND OPEB VALUATION)

The current assumption is that 90% of all employees are married with the male spouse three years older. This is a standard assumption, used for this purpose, and we believe it provides reasonable estimate. **We recommend the current assumption be retained.**

OPEB PLAN ONLY ASSUMPTIONS

OPEB ELECTION RATES

Health benefits after retirement are voluntary and retiring employees may elect or waive coverage. Over the last five years, 163 retirees were eligible to participate in the retiree medical plan. Of that group, 10 waived coverage (about 6%) and 153 elected to participate. Of the 153, 90 retirees covered their spouse in addition to themselves.

Based on this information and our professional judgement, we recommend the participation rate continue to be 95% (current assumption) and the spousal coverage assumption be lowered from 65% to 60%.



APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

Interest Rate: (revised 2020) 6.90% per annum, compounded annually.

Payroll Growth: (revised 2018) 3.50% per year.

Inflation: (revised 2018) 2.60% per year.

Mortality Rates: (revised 2018)

Active RP-2014 Adjusted to 2006 Total Dataset Mortality Table with Female Rates Set Forward One Year – Generational with Projected Improvements under Scale MP-2016

Retired RP-2014 Adjusted to 2006 Total Dataset Mortality Table with Female Rates Set Forward One Year – Generational with Projected Improvements under Scale MP-2016

On Long-Term Disability RP-2014 Adjusted to 2006 Disabled Retiree Mortality Table with Female Rates Set Forward One Year – Generational with Improvements under Scale MP-2016

Withdrawal Rates: (revised 2018)

<u>Years of Service</u>	<u>Annual Rate</u>	
	<u>Male</u>	<u>Female</u>
1	10.00%	8.00%
5	2.00%	4.00%
10	1.05%	3.00%
15	1.05%	2.50%
20	1.05%	2.50%
25	0.00%	1.50%
30	0.00%	0.00%

Retirement Rates: (revised 2018)

<u>Age</u>	<u>Annual Rate</u>
55 to 58	3%
59	13%
60	30%
61	30%
62	40%
63	20%
64	20%
65	60%
66 to 69	30%
70	100%

Retirement benefits are assumed to commence at age 58 for vested terminated members and age 62 for disabled members.



APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

Salary Scale: (revised 2018)

Salaries of the employees are assumed to increase according to the following schedule:

<u>Years of Service</u>	<u>Annual Percentage Increase</u>
1	11.00%
5	7.00%
10	5.00%
15	4.50%
20	4.50%
25	4.25%
30	4.25%
35	4.00%

Note: Includes salary inflation at 3.50%

Spouse’s Benefit: (revised 2015)

It is assumed that 90% of employees are married, with wives three years younger than husbands.

Probability of Refund:

<u>Service</u>	<u>Refund</u>
5	40%
10	40
15	40
20	0

Cost of Living Adjustment: (revised 2018)

Retirement benefits are assumed to increase at 2.60% per year.

Administrative Expense: (implemented 2015)

Component of contribution rate, based on the prior year’s actual administrative expenses.

Decrement Timing

Middle of year

Other:

Active liabilities for withdrawal and retirement benefits are loaded 0.50% for those members expected to elect a Joint and Contingent Annuitant form of payment that has a pop-up feature.

The lump sum death benefit (a return of contributions with interest) for vested terminated members is assumed to equal three times the annual benefit amount.

The salary amounts used as an input for valuation purposes represent pensionable compensation for the 12-month period immediately preceding the valuation date. These amounts are calculated by using the employees’ contribution amounts for the 12-month period immediately preceding the valuation date, as provided to us by the client.



APPENDIX B – PROPOSED ACTUARIAL ASSUMPTIONS

Interest Rate: (revised 2021) 6.75% per annum, compounded annually.

Payroll Growth: (revised 2021) 3.00% per year.

Inflation: (revised 2021) 2.50% per year.

Mortality Rates: (revised 2021)

Active Pub-2010 General Members (Median) Employee Mortality Table projected generationally using the MP-2020 Scale

Retired Pub-2010 General Members (Median) Retiree Mortality Table projected generationally using the MP-2020 Scale

Beneficiary Pub-2010 General Members (Median) Contingent Survivor Mortality Table projected generationally using the MP-2020 Scale

On Long Term Disability Pub-2010 Non-Safety Disabled Retiree Mortality Table projected generationally using the MP-2020 Scale

Withdrawal Rates: (revised 2021)

<u>Years of Service</u>	<u>Annual Rate</u>	
	<u>Male</u>	<u>Female</u>
1	7.00%	10.00%
5	1.80%	3.50%
10	1.50%	2.25%
15	1.50%	1.25%
20	1.00%	1.25%
25	0.00%	0.00%

Retirement Rates: (revised 2021)

<u>Age</u>	<u>Annual Rate</u>
55 to 57	2%
58	5%
59	8%
60	25%
61 to 63	30%
64	25%
65	50%
66 to 67	35%
68 to 69	30%
70	100%

Retirement benefits are assumed to commence at age 58 for vested terminated members and age 62 for disabled members.



APPENDIX B – PROPOSED ACTUARIAL ASSUMPTIONS

Salary Scale: (revised 2021)

Salaries of the employees are assumed to increase according to the following schedule:

<u>Years of Service</u>	<u>Annual Percentage Increase</u>
1	10.40%
5	6.40%
10	4.40%
15	4.10%
20	4.10%
25	3.90%
30	3.65%
35	3.65%

Note: Includes salary inflation at 3.40%

Spouse’s Benefit: (revised 2015)

It is assumed that 90% of employees are married, with wives three years younger than husbands.

Form of Payment:

Members who terminated vested are assumed to take a refund of contributions if it is more valuable than their deferred benefit.

Cost of Living Adjustment: (revised 2021)

Retirement benefits are assumed to increase at 2.50% per year

Administrative Expense:
(implemented 2015)

Component of contribution rate, based on the prior year’s actual administrative expenses.

Decrement Timing

Middle of year

Other:

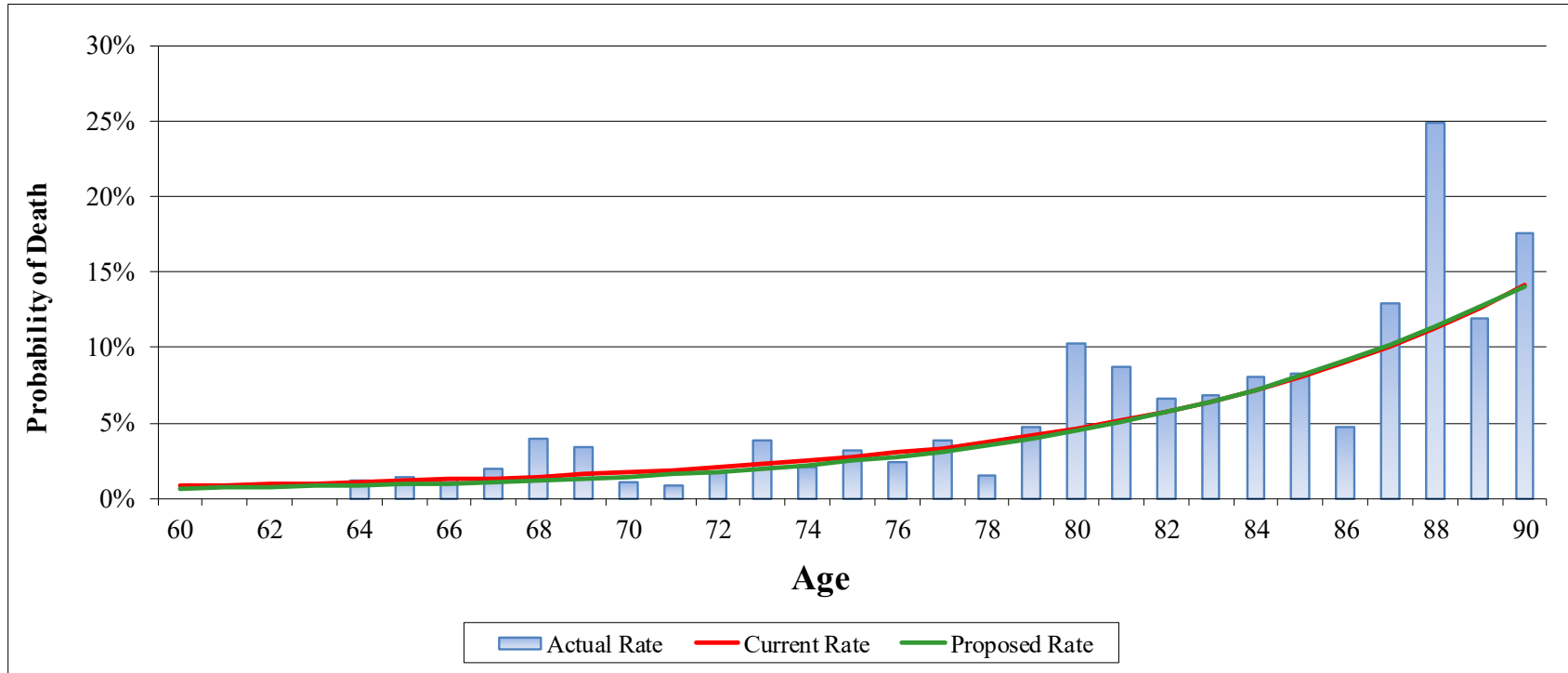
Active liabilities for withdrawal and retirement benefits are loaded 0.50% for those members expected to elect a Joint and Contingent Annuitant form of payment that has a pop-up feature.

The lump sum death benefit (a return of contributions with interest) for vested terminated members is assumed to equal three times the annual benefit amount.

The salary amounts used as an input for valuation purposes represent pensionable compensation for the 12-month period immediately preceding the valuation date. These amounts are calculated by using the employees’ contribution amounts for the 12-month period immediately preceding the valuation date, as provided to us by the client.



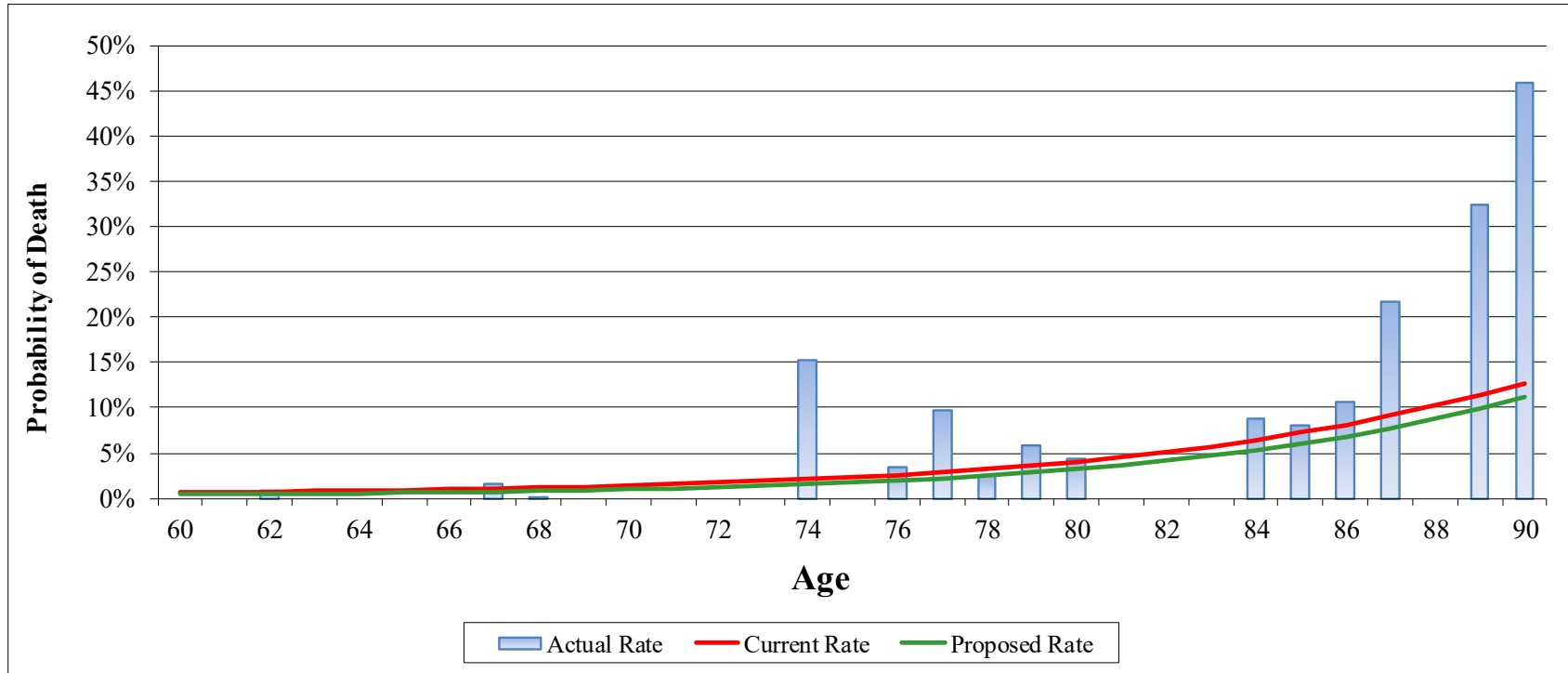
EXHIBIT C-1
Retiree Mortality - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	280,957	239,169	224,924
Actual/Expected		117%	125%



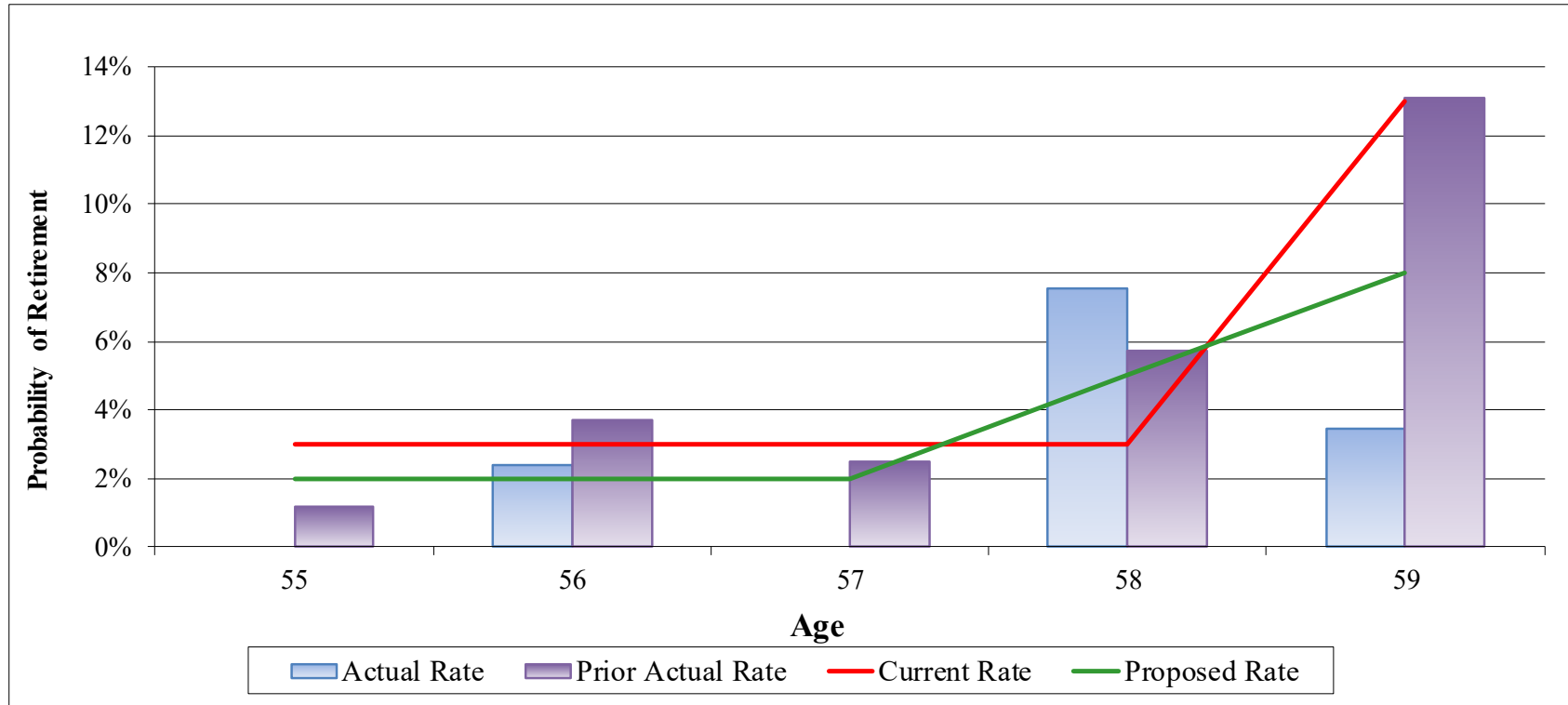
EXHIBIT C-2
Retiree Mortality - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	28,327	31,536	23,189
Actual/Expected		90%	122%



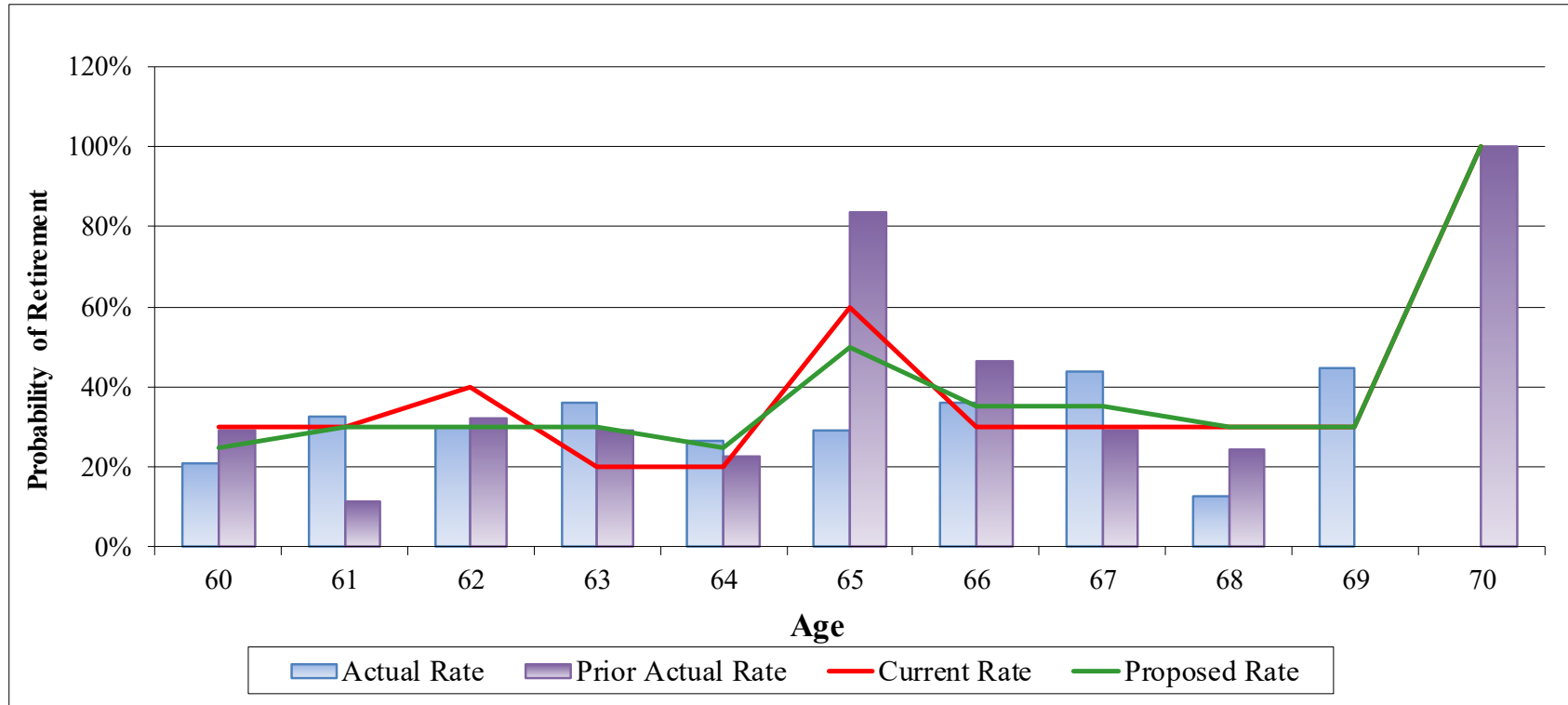
EXHIBIT C-3
Early Retirement



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	33	60	46
Actual/Expected		54%	71%



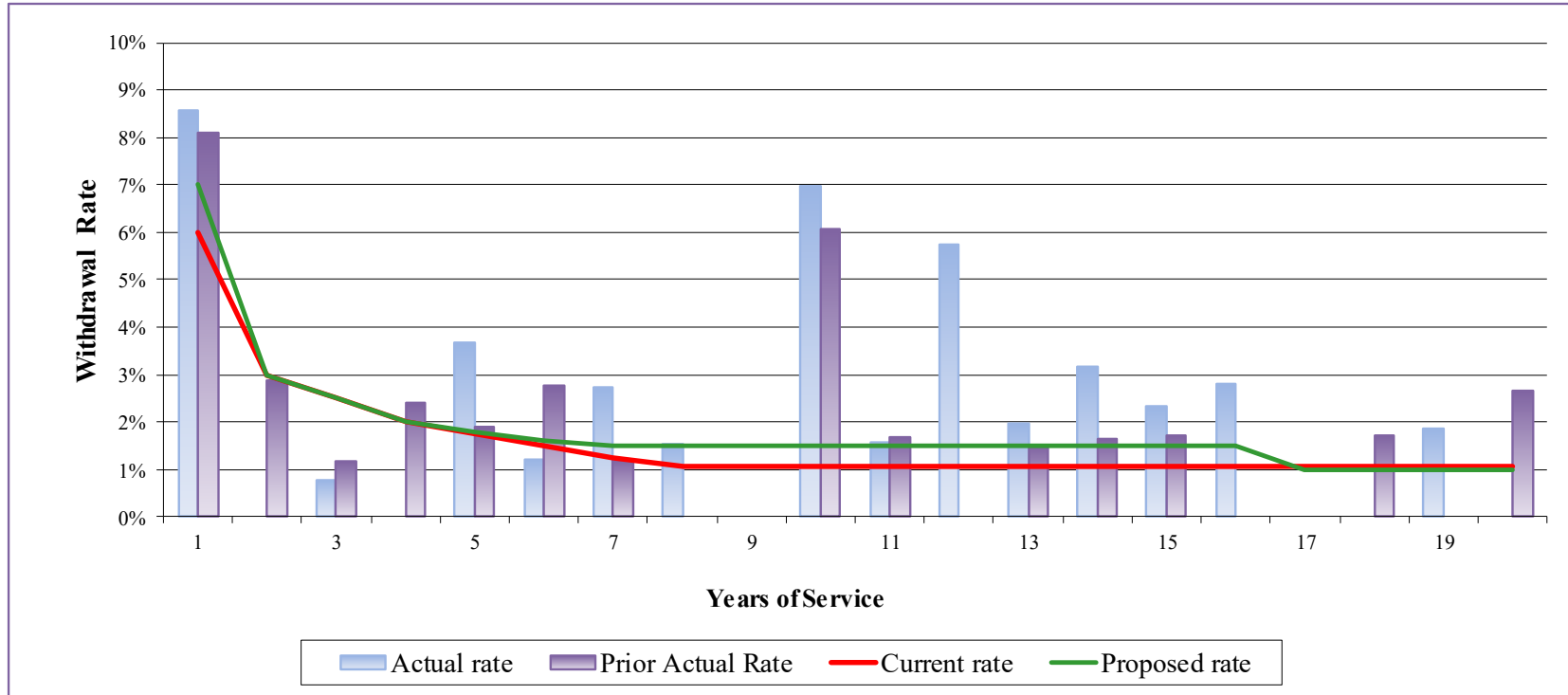
EXHIBIT C-4
Unreduced Retirement



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	308	331	314
Actual/Expected		93%	98%



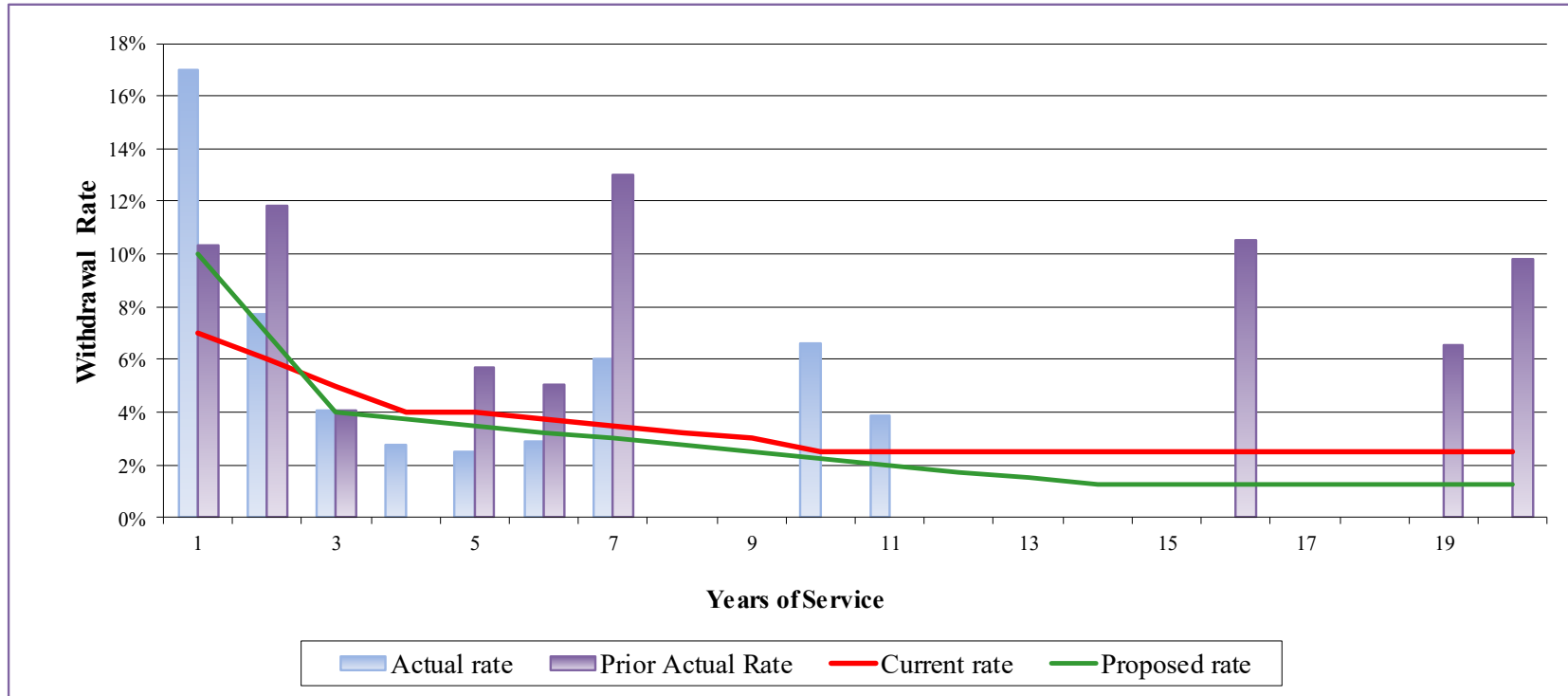
EXHIBIT C-5
Termination of Employment – Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	18	11	13
Actual/Expected		158%	135%



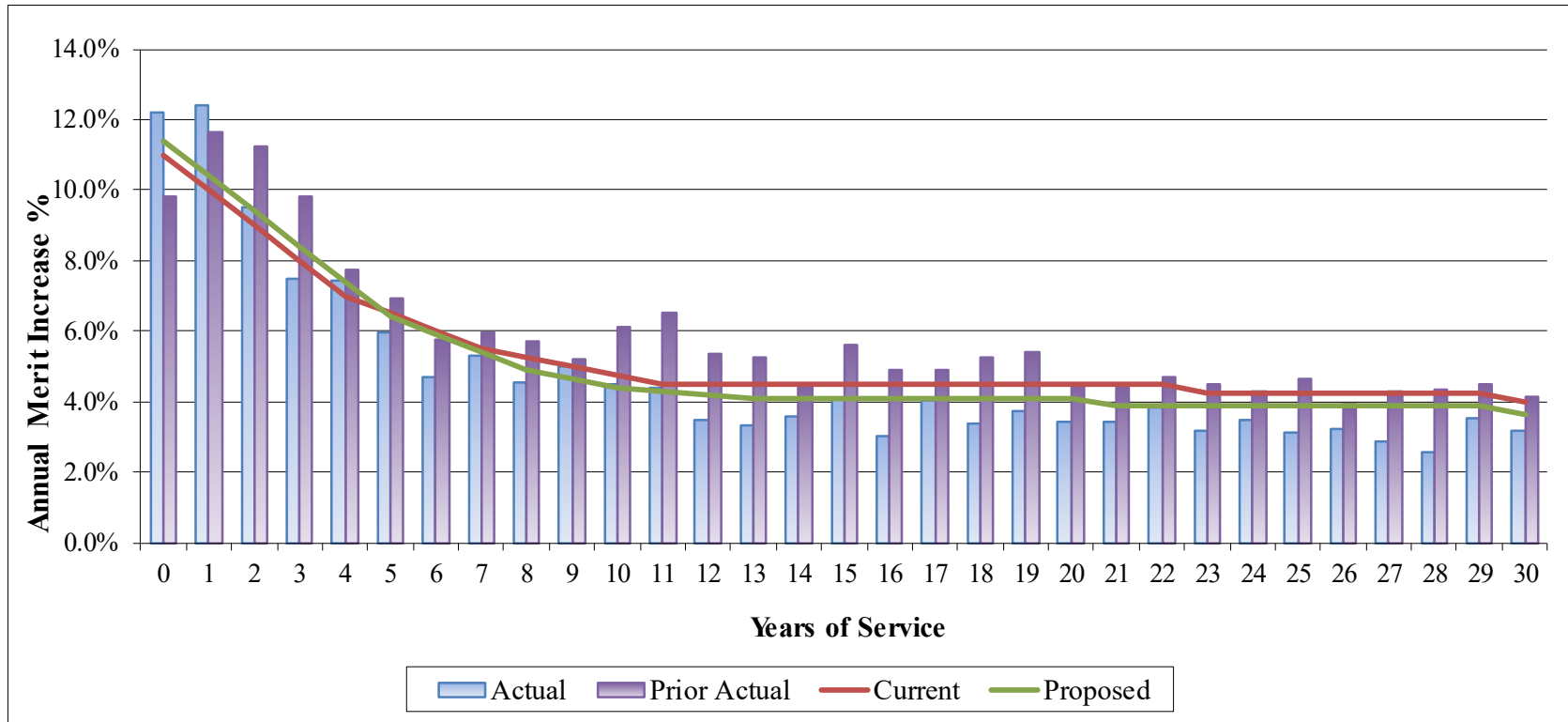
EXHIBIT C-6
Termination of Employment - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	4	8	6
Actual/Expected		48%	68%



EXHIBIT C-7
Total Salary Scale



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Average Increase	4.91%	5.45%	5.25%
Actual/Expected		90%	94%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-1
Retiree Mortality - Males

<u>Age</u>	<u>Exposure</u>	<u>Actual Deaths</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	170,452	–	0.000%	1,360.0	0.798%	1,093.8	0.642%
61	272,294	–	0.000%	2,331.1	0.856%	1,880.7	0.691%
62	314,409	–	0.000%	2,890.8	0.919%	2,335.2	0.743%
63	360,041	–	0.000%	3,558.9	0.988%	2,866.4	0.796%
64	371,880	4,441	1.194%	3,957.8	1.064%	3,178.0	0.855%
65	370,400	5,197	1.403%	4,245.9	1.146%	3,408.9	0.920%
66	361,266	4,797	1.328%	4,469.3	1.237%	3,597.5	0.996%
67	355,459	6,748	1.898%	4,750.3	1.336%	3,850.3	1.083%
68	331,233	12,912	3.898%	4,792.5	1.447%	3,923.4	1.184%
69	297,453	10,170	3.419%	4,674.3	1.571%	3,872.5	1.302%
70	299,338	3,337	1.115%	5,122.8	1.711%	4,301.9	1.437%
71	290,213	2,540	0.875%	5,420.8	1.868%	4,617.6	1.591%
72	296,775	5,284	1.780%	6,069.5	2.045%	5,250.8	1.769%
73	276,513	10,495	3.796%	6,208.7	2.245%	5,449.5	1.971%
74	277,410	5,718	2.061%	6,854.1	2.471%	6,110.3	2.203%
75	295,508	9,473	3.206%	8,053.8	2.725%	7,291.8	2.468%
76	281,892	6,827	2.422%	8,493.6	3.013%	7,805.1	2.769%
77	301,744	11,605	3.846%	10,068.4	3.337%	9,390.9	3.112%
78	276,956	4,322	1.560%	10,261.7	3.705%	9,700.7	3.503%
79	277,297	13,247	4.777%	11,422.6	4.119%	10,942.1	3.946%
80	271,026	27,977	10.323%	12,439.0	4.590%	12,062.3	4.451%
81	222,895	19,380	8.694%	11,414.4	5.121%	11,197.4	5.024%
82	190,706	12,659	6.638%	10,915.2	5.724%	10,821.7	5.675%
83	181,367	12,335	6.801%	11,611.1	6.402%	11,614.1	6.404%
84	181,556	14,566	8.023%	13,023.2	7.173%	13,108.1	7.220%
85	157,442	13,003	8.259%	12,652.6	8.036%	12,794.0	8.126%
86	134,981	6,449	4.778%	12,156.6	9.006%	12,312.1	9.121%
87	125,636	16,283	12.960%	12,680.0	10.093%	12,821.9	10.206%
88	90,703	22,596	24.912%	10,249.0	11.299%	10,329.7	11.389%
89	68,881	8,246	11.971%	8,704.5	12.637%	8,724.3	12.666%
90	58,930	10,352	17.567%	8,317.0	14.113%	8,271.1	14.036%
	7,762,657	280,957	3.619%	239,169.5	3.081%	224,924.0	2.898%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-2
Retiree Mortality - Females

<u>Age</u>	<u>Exposure</u>	<u>Actual Deaths</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	70,772	–	0.000%	438.7	0.620%	285.3	0.403%
61	112,563	–	0.000%	755.7	0.671%	484.9	0.431%
62	122,124	1,128	0.923%	886.2	0.726%	564.4	0.462%
63	146,842	–	0.000%	1,151.7	0.784%	733.1	0.499%
64	152,559	–	0.000%	1,293.7	0.848%	824.2	0.540%
65	140,180	–	0.000%	1,288.4	0.919%	825.3	0.589%
66	153,985	–	0.000%	1,536.9	0.998%	991.9	0.644%
67	131,052	2,166	1.653%	1,424.7	1.087%	927.8	0.708%
68	98,734	196	0.199%	1,171.7	1.187%	773.2	0.783%
69	89,949	–	0.000%	1,168.5	1.299%	783.1	0.871%
70	76,606	–	0.000%	1,091.7	1.425%	744.0	0.971%
71	56,697	–	0.000%	888.6	1.567%	616.7	1.088%
72	42,848	–	0.000%	739.6	1.726%	523.5	1.222%
73	45,844	–	0.000%	873.4	1.905%	630.1	1.375%
74	45,226	6,865	15.180%	952.6	2.106%	700.5	1.549%
75	35,276	–	0.000%	823.2	2.333%	616.0	1.746%
76	42,014	1,466	3.489%	1,088.9	2.592%	826.9	1.968%
77	40,418	3,962	9.802%	1,165.6	2.884%	897.6	2.221%
78	32,269	834	2.585%	1,038.2	3.217%	808.9	2.507%
79	31,180	1,795	5.757%	1,121.7	3.597%	882.8	2.831%
80	30,861	1,340	4.341%	1,244.2	4.032%	988.2	3.202%
81	27,495	–	0.000%	1,244.2	4.525%	996.7	3.625%
82	26,150	–	0.000%	1,330.0	5.086%	1,074.1	4.107%
83	24,729	–	0.000%	1,415.5	5.724%	1,151.7	4.657%
84	19,396	1,721	8.872%	1,249.1	6.440%	1,025.3	5.286%
85	14,297	1,158	8.098%	1,036.1	7.247%	858.3	6.003%
86	11,041	1,167	10.569%	899.5	8.147%	753.0	6.820%
87	7,949	1,735	21.830%	726.8	9.143%	615.4	7.742%
88	5,563	–	0.000%	569.8	10.242%	488.1	8.774%
89	5,917	1,923	32.505%	678.1	11.460%	586.5	9.911%
90	1,900	872	45.873%	242.6	12.770%	211.8	11.147%
	1,842,437	28,327	1.537%	31,535.6	1.712%	23,189.3	1.259%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-3
Early Retirement

<u>Age</u>	<u>Exposure</u>	<u>Actual Retirements</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
55	246	–	0.000%	7.4	3.000%	4.9	2.000%
56	226	5	2.416%	6.8	3.000%	4.5	2.000%
57	238	–	0.000%	7.1	3.000%	4.8	2.000%
58	248	19	7.524%	7.4	3.000%	12.4	5.000%
59	243	8	3.473%	31.5	13.000%	19.4	8.000%
	1,200	33	2.712%	60.3	5.022%	46.0	3.833%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-4
Unreduced Retirement

<u>Age</u>	<u>Exposure</u>	<u>Actual Retirements</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	285	60	21.150%	85.6	30.000%	71.3	25.000%
61	260	85	32.585%	78.0	30.000%	78.0	30.000%
62	192	57	29.873%	76.9	40.000%	57.7	30.000%
63	136	49	35.892%	27.2	20.000%	40.8	30.000%
64	72	19	26.551%	14.4	20.000%	18.0	25.000%
65	37	11	29.001%	22.3	60.000%	18.6	50.000%
66	35	13	36.166%	10.6	30.000%	12.4	35.000%
67	22	10	43.987%	6.6	30.000%	7.7	35.000%
68	9	1	12.769%	2.6	30.000%	2.6	30.000%
69	7	3	44.701%	2.0	30.000%	2.0	30.000%
70	5	–	0.000%	4.8	100.000%	4.8	100.000%
	1,060	308	29.032%	331.1	31.222%	313.9	29.608%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-5
Termination of Employment – Males

<u>Duration</u>	<u>Exposure</u>	<u>Actual Terminations</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
1	6	1	8.572%	0.4	6.000%	0.4	7.000%
2	11	–	0.000%	0.3	3.000%	0.3	3.000%
3	21	0	0.790%	0.5	2.500%	0.5	2.500%
4	26	–	0.000%	0.5	2.000%	0.5	2.000%
5	34	1	3.681%	0.6	1.750%	0.6	1.800%
6	33	0	1.219%	0.5	1.500%	0.5	1.600%
7	25	1	2.730%	0.3	1.250%	0.4	1.500%
8	29	0	1.526%	0.3	1.050%	0.4	1.500%
9	38	–	0.000%	0.4	1.050%	0.6	1.500%
10	52	4	6.957%	0.5	1.050%	0.8	1.500%
11	60	1	1.574%	0.6	1.050%	0.9	1.500%
12	58	3	5.726%	0.6	1.050%	0.9	1.500%
13	47	1	1.956%	0.5	1.050%	0.7	1.500%
14	37	1	3.156%	0.4	1.050%	0.6	1.500%
15	52	1	2.336%	0.5	1.050%	0.8	1.500%
16	59	2	2.809%	0.6	1.050%	0.9	1.500%
17	84	–	0.000%	0.9	1.050%	0.8	1.000%
18	92	–	0.000%	1.0	1.050%	0.9	1.000%
19	84	2	1.869%	0.9	1.050%	0.8	1.000%
20	82	–	0.000%	0.9	1.050%	0.8	1.000%
	930	18	1.920%	11.3	1.212%	13.2	1.422%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-6
Termination of Employment - Females

<u>Duration</u>	<u>Exposure</u>	<u>Actual Terminations</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
1	2	0	17.018%	0.1	7.000%	0.2	10.000%
2	4	0	7.724%	0.2	6.000%	0.3	7.000%
3	7	0	4.068%	0.4	5.000%	0.3	4.000%
4	8	0	2.752%	0.3	4.000%	0.3	3.750%
5	11	0	2.535%	0.4	4.000%	0.4	3.500%
6	12	0	2.914%	0.4	3.750%	0.4	3.250%
7	10	1	6.059%	0.3	3.500%	0.3	3.000%
8	9	–	0.000%	0.3	3.250%	0.2	2.750%
9	13	–	0.000%	0.4	3.000%	0.3	2.500%
10	13	1	6.590%	0.3	2.500%	0.3	2.250%
11	19	1	3.888%	0.5	2.500%	0.4	2.000%
12	26	–	0.000%	0.6	2.500%	0.5	1.750%
13	21	–	0.000%	0.5	2.500%	0.3	1.500%
14	23	–	0.000%	0.6	2.500%	0.3	1.250%
15	18	–	0.000%	0.5	2.500%	0.2	1.250%
16	13	–	0.000%	0.3	2.500%	0.2	1.250%
17	18	–	0.000%	0.5	2.500%	0.2	1.250%
18	18	–	0.000%	0.5	2.500%	0.2	1.250%
19	17	–	0.000%	0.4	2.500%	0.2	1.250%
20	17	–	0.000%	0.4	2.500%	0.2	1.250%
	280	4	1.381%	8.1	2.877%	5.7	2.023%



APPENDIX D – LIABILITY WEIGHTED DATA SUMMARY TABLES

EXHIBIT D-7
Total Salary Scale

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Current Expected (Millions)	Current Rate	Proposed Expected (Millions)	Proposed Rate
0	4.2	4.7	12.20%	4.7	11.00%	4.7	11.40%
1	7.0	7.9	12.42%	7.7	10.00%	7.7	10.40%
2	7.4	8.1	9.53%	8.0	9.00%	8.0	9.40%
3	9.2	9.9	7.46%	10.0	8.00%	10.0	8.40%
4	9.9	10.7	7.44%	10.6	7.00%	10.7	7.40%
5	10.5	11.1	5.98%	11.1	6.50%	11.1	6.40%
6	9.6	10.0	4.67%	10.1	6.00%	10.1	5.90%
7	6.7	7.0	5.31%	7.1	5.50%	7.1	5.40%
8	6.6	6.9	4.52%	7.0	5.25%	6.9	4.90%
9	7.5	7.9	5.02%	7.9	5.00%	7.9	4.65%
10	7.7	8.1	4.47%	8.1	4.75%	8.1	4.40%
11	8.8	9.1	4.37%	9.2	4.50%	9.1	4.30%
12	8.7	9.0	3.49%	9.1	4.50%	9.1	4.20%
13	7.4	7.7	3.34%	7.8	4.50%	7.8	4.10%
14	6.1	6.3	3.59%	6.4	4.50%	6.4	4.10%
15	7.2	7.4	4.09%	7.5	4.50%	7.4	4.10%
16	6.9	7.1	3.03%	7.2	4.50%	7.2	4.10%
17	8.4	8.8	4.04%	8.8	4.50%	8.8	4.10%
18	8.7	9.0	3.36%	9.1	4.50%	9.1	4.10%
19	7.2	7.5	3.72%	7.5	4.50%	7.5	4.10%
20	7.4	7.7	3.41%	7.7	4.50%	7.7	4.10%
21	6.2	6.4	3.41%	6.4	4.50%	6.4	3.90%
22	6.2	6.4	3.81%	6.4	4.50%	6.4	3.90%
23	5.6	5.8	3.19%	5.9	4.25%	5.9	3.90%
24	5.0	5.2	3.48%	5.2	4.25%	5.2	3.90%
25	4.9	5.0	3.10%	5.1	4.25%	5.1	3.90%
26	4.4	4.5	3.23%	4.6	4.25%	4.6	3.90%
27	4.4	4.5	2.87%	4.5	4.25%	4.5	3.90%
28	3.5	3.6	2.56%	3.6	4.25%	3.6	3.90%
29	3.5	3.6	3.54%	3.6	4.25%	3.6	3.90%
30	3.2	3.3	3.18%	3.3	4.00%	3.3	3.65%
	209.8	220.1	4.91%	221.3	5.45%	220.8	5.25%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-1
Retiree Mortality - Males

<u>Age</u>	<u>Exposure</u>	<u>Actual Deaths</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	57	–	0.000%	0.5	0.798%	0.4	0.642%
61	83	–	0.000%	0.7	0.856%	0.6	0.691%
62	99	–	0.000%	0.9	0.919%	0.7	0.743%
63	110	–	0.000%	1.1	0.988%	0.9	0.796%
64	117	2	1.709%	1.2	1.064%	1.0	0.855%
65	118	2	1.695%	1.4	1.146%	1.1	0.920%
66	114	2	1.754%	1.4	1.237%	1.1	0.996%
67	108	2	1.852%	1.4	1.336%	1.2	1.083%
68	96	2	2.083%	1.4	1.447%	1.1	1.184%
69	89	3	3.371%	1.4	1.571%	1.2	1.302%
70	92	1	1.087%	1.6	1.711%	1.3	1.437%
71	95	1	1.053%	1.8	1.868%	1.5	1.591%
72	95	2	2.105%	1.9	2.045%	1.7	1.769%
73	92	4	4.348%	2.1	2.245%	1.8	1.971%
74	96	2	2.083%	2.4	2.471%	2.1	2.203%
75	105	2	1.905%	2.9	2.725%	2.6	2.468%
76	102	3	2.941%	3.1	3.013%	2.8	2.769%
77	108	5	4.630%	3.6	3.337%	3.4	3.112%
78	99	2	2.020%	3.7	3.705%	3.5	3.503%
79	98	5	5.102%	4.0	4.119%	3.9	3.946%
80	97	11	11.340%	4.5	4.590%	4.3	4.451%
81	81	7	8.642%	4.1	5.121%	4.1	5.024%
82	68	6	8.824%	3.9	5.724%	3.9	5.675%
83	67	4	5.970%	4.3	6.402%	4.3	6.404%
84	67	5	7.463%	4.8	7.173%	4.8	7.220%
85	61	6	9.836%	4.9	8.036%	5.0	8.126%
86	57	3	5.263%	5.1	9.006%	5.2	9.121%
87	54	6	11.111%	5.5	10.093%	5.5	10.206%
88	46	9	19.565%	5.2	11.299%	5.2	11.389%
89	37	5	13.514%	4.7	12.637%	4.7	12.666%
90	32	5	15.625%	4.5	14.113%	4.5	14.036%
	2,640	107	4.053%	89.8	3.403%	85.2	3.229%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-2
Retiree Mortality - Females

<u>Age</u>	<u>Exposure</u>	<u>Actual Deaths</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	32	–	0.000%	0.2	0.620%	0.1	0.403%
61	48	–	0.000%	0.3	0.671%	0.2	0.431%
62	50	1	2.000%	0.4	0.726%	0.2	0.462%
63	58	–	0.000%	0.5	0.784%	0.3	0.499%
64	61	–	0.000%	0.5	0.848%	0.3	0.540%
65	56	–	0.000%	0.5	0.919%	0.3	0.589%
66	63	–	0.000%	0.6	0.998%	0.4	0.644%
67	55	2	3.636%	0.6	1.087%	0.4	0.708%
68	45	1	2.222%	0.5	1.187%	0.4	0.783%
69	41	–	0.000%	0.5	1.299%	0.4	0.871%
70	36	–	0.000%	0.5	1.425%	0.3	0.971%
71	29	–	0.000%	0.5	1.567%	0.3	1.088%
72	21	–	0.000%	0.4	1.726%	0.3	1.222%
73	22	–	0.000%	0.4	1.905%	0.3	1.375%
74	21	3	14.286%	0.4	2.106%	0.3	1.549%
75	16	–	0.000%	0.4	2.333%	0.3	1.746%
76	18	1	5.556%	0.5	2.592%	0.4	1.968%
77	17	1	5.882%	0.5	2.884%	0.4	2.221%
78	16	1	6.250%	0.5	3.217%	0.4	2.507%
79	14	1	7.143%	0.5	3.597%	0.4	2.831%
80	15	1	6.667%	0.6	4.032%	0.5	3.202%
81	13	–	0.000%	0.6	4.525%	0.5	3.625%
82	15	–	0.000%	0.8	5.086%	0.6	4.107%
83	15	–	0.000%	0.9	5.724%	0.7	4.657%
84	13	1	7.692%	0.8	6.440%	0.7	5.286%
85	12	1	8.333%	0.9	7.247%	0.7	6.003%
86	9	1	11.111%	0.7	8.147%	0.6	6.820%
87	6	1	16.667%	0.5	9.143%	0.5	7.742%
88	4	–	0.000%	0.4	10.242%	0.4	8.774%
89	5	1	20.000%	0.6	11.460%	0.5	9.911%
90	4	3	75.000%	0.5	12.770%	0.4	11.147%
	830	20	2.410%	16.5	1.988%	12.4	1.497%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-3
Early Retirement

<u>Age</u>	<u>Exposure</u>	<u>Actual Retirements</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
55	143	–	0.000%	4.3	3.000%	2.9	2.000%
56	127	3	2.362%	3.8	3.000%	2.5	2.000%
57	127	–	0.000%	3.8	3.000%	2.5	2.000%
58	127	8	6.299%	3.8	3.000%	6.4	5.000%
59	118	4	3.390%	15.3	13.000%	9.4	8.000%
	642	15	2.336%	31.1	4.838%	23.7	3.696%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-4
Unreduced Retirement

<u>Age</u>	<u>Exposure</u>	<u>Actual Retirements</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
60	123	20	16.260%	36.9	30.000%	30.8	25.000%
61	116	29	25.000%	34.8	30.000%	34.8	30.000%
62	93	22	23.656%	37.2	40.000%	27.9	30.000%
63	70	20	28.571%	14.0	20.000%	21.0	30.000%
64	44	11	25.000%	8.8	20.000%	11.0	25.000%
65	27	6	22.222%	16.2	60.000%	13.5	50.000%
66	21	5	23.810%	6.3	30.000%	7.4	35.000%
67	13	5	38.462%	3.9	30.000%	4.6	35.000%
68	5	1	20.000%	1.5	30.000%	1.5	30.000%
69	4	2	50.000%	1.2	30.000%	1.2	30.000%
70	3	–	0.000%	3.0	100.000%	3.0	100.000%
	519	121	23.314%	163.8	31.561%	156.6	30.164%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-5
Termination of Employment – Males

<u>Duration</u>	<u>Exposure</u>	<u>Actual Terminations</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
1	105	7	6.667%	6.3	6.000%	7.4	7.000%
2	88	–	0.000%	2.6	3.000%	2.6	3.000%
3	102	1	0.980%	2.6	2.500%	2.6	2.500%
4	91	–	0.000%	1.8	2.000%	1.8	2.000%
5	91	3	3.297%	1.6	1.750%	1.6	1.800%
6	70	1	1.429%	1.1	1.500%	1.1	1.600%
7	43	1	2.326%	0.5	1.250%	0.6	1.500%
8	49	1	2.041%	0.5	1.050%	0.7	1.500%
9	54	–	0.000%	0.6	1.050%	0.8	1.500%
10	65	3	4.615%	0.7	1.050%	1.0	1.500%
11	67	1	1.493%	0.7	1.050%	1.0	1.500%
12	59	3	5.085%	0.6	1.050%	0.9	1.500%
13	44	1	2.273%	0.5	1.050%	0.7	1.500%
14	34	1	2.941%	0.4	1.050%	0.5	1.500%
15	47	1	2.128%	0.5	1.050%	0.7	1.500%
16	50	1	2.000%	0.5	1.050%	0.8	1.500%
17	65	–	0.000%	0.7	1.050%	0.7	1.000%
18	64	–	0.000%	0.7	1.050%	0.6	1.000%
19	54	1	1.852%	0.6	1.050%	0.5	1.000%
20	47	–	0.000%	0.5	1.050%	0.5	1.000%
	1,289	26	2.017%	23.8	1.849%	27.1	2.102%



APPENDIX E – COUNT WEIGHTED DATA SUMMARY TABLES

EXHIBIT E-6
Termination of Employment - Females

<u>Duration</u>	<u>Exposure</u>	<u>Actual Terminations</u>	<u>Actual Rate</u>	<u>Current Expected</u>	<u>Current Rate</u>	<u>Proposed Expected</u>	<u>Proposed Rate</u>
1	24	3	12.500%	1.7	7.000%	2.4	10.000%
2	32	3	9.375%	1.9	6.000%	2.2	7.000%
3	41	2	4.878%	2.1	5.000%	1.6	4.000%
4	33	1	3.030%	1.3	4.000%	1.2	3.750%
5	35	1	2.857%	1.4	4.000%	1.2	3.500%
6	31	1	3.226%	1.2	3.750%	1.0	3.250%
7	21	1	4.762%	0.7	3.500%	0.6	3.000%
8	16	–	0.000%	0.5	3.250%	0.4	2.750%
9	19	–	0.000%	0.6	3.000%	0.5	2.500%
10	17	1	5.882%	0.4	2.500%	0.4	2.250%
11	24	1	4.167%	0.6	2.500%	0.5	2.000%
12	30	–	0.000%	0.8	2.500%	0.5	1.750%
13	24	–	0.000%	0.6	2.500%	0.4	1.500%
14	22	–	0.000%	0.6	2.500%	0.3	1.250%
15	17	–	0.000%	0.4	2.500%	0.2	1.250%
16	11	–	0.000%	0.3	2.500%	0.1	1.250%
17	15	–	0.000%	0.4	2.500%	0.2	1.250%
18	14	–	0.000%	0.4	2.500%	0.2	1.250%
19	12	–	0.000%	0.3	2.500%	0.2	1.250%
20	11	–	0.000%	0.3	2.500%	0.1	1.250%
	449	14	3.118%	16.3	3.626%	14.3	3.189%

METROPOLITAN UTILITIES DISTRICT
Inter-Departmental Communication

October 26, 2021

Subject: Co-Fiduciary for the 457b Defined Contribution Plan

To: Insurance and Pensions Committee
CC: All Board Members; President Doyle, Senior Vice Presidents
Ausdemore, Langel, Lobsiger, Schaffart and all Vice Presidents

From: Mark Mendenhall, Senior Vice President, General Counsel

The District offers employees a 457(b) defined contribution retirement plan ("Plan") administered via Voya Financial. A 457(b) plan is a type of tax advantaged retirement plan for state and local government employees as well as employees of certain non-profit organizations.

The District's Personnel Policy Manual, Section 10, summarizes the Plan as a voluntary, supplemental savings plan to assist employees in retirement planning. The Plan allows employees to defer an amount from the employee's wages and invest that amount in various investment options offered from Voya Financial.

The District established an Investment Policy Statement ("Statement"). The Statement provides that the Plan may offer a variety of investment options that represents multiple asset classes. The Statement further requires an internal committee comprised of the Senior Vice President - Chief Financial Officer, Senior Vice President – General Counsel, and Vice President – Human Resources, to review the investment options and their performance.

That committee has met previously with Advanced Capital Group ("ACG") when Voya Financial modified the Plan's investment options in 2019. ACG provided guidance in the form of recommendations to offer various investment options. ACG was previously familiar with Voya Financial, and through that process in 2019, established familiarity with the Plan. At that time, the committee discussed engaging a third party to act as a fiduciary for the Plan. ACG expressed interest in performing that role. Management is now recommending authorization to enter into a services agreement with ACG.

ACG is a registered investment advisor that will act as a fiduciary that will offer independent recommendations as to appropriate investment options to be offered by the District's 457(b) Plan. ACG may also develop custom asset allocation model portfolios based on generally accepted investment theories and make recommendations to the Plan's committee. Fees for this service will be paid out of funds currently paid to Voya Financial resulting in no annual incremental cost to either the Plan participants or the District.

Based on ACG's familiarity with the Plan, Voya and its position as a registered investment advisor capable of providing investment recommendation and advice, Management is recommending the Board authorize the President to enter into a services agreement with ACG for a period not to exceed three (3) years.



Mark Mendenhall
Senior Vice President, General Counsel

Approved:



Mark A. Doyle
President

2022 BUDGET WORKING DRAFT

Personnel
Capital Projects

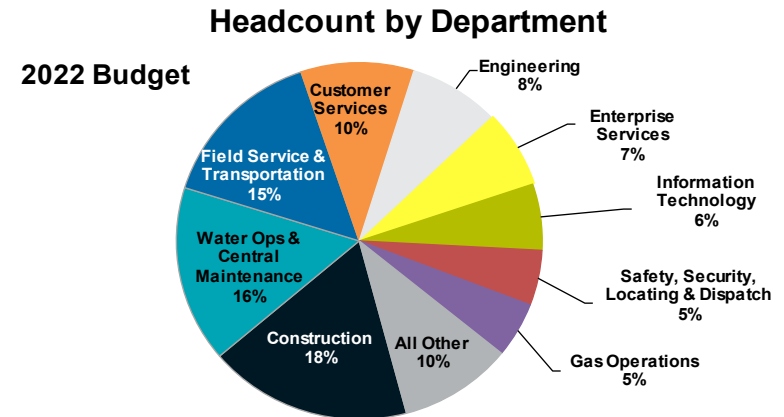
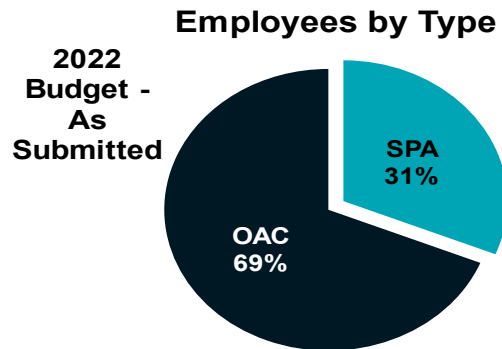
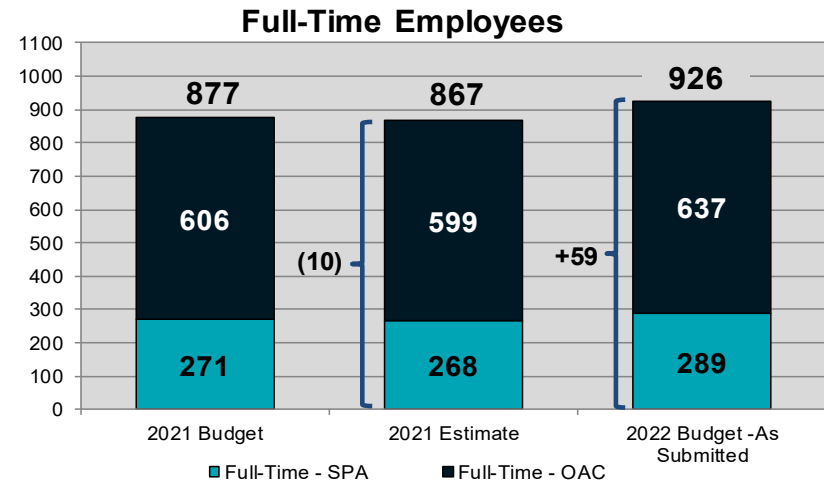
November 2021



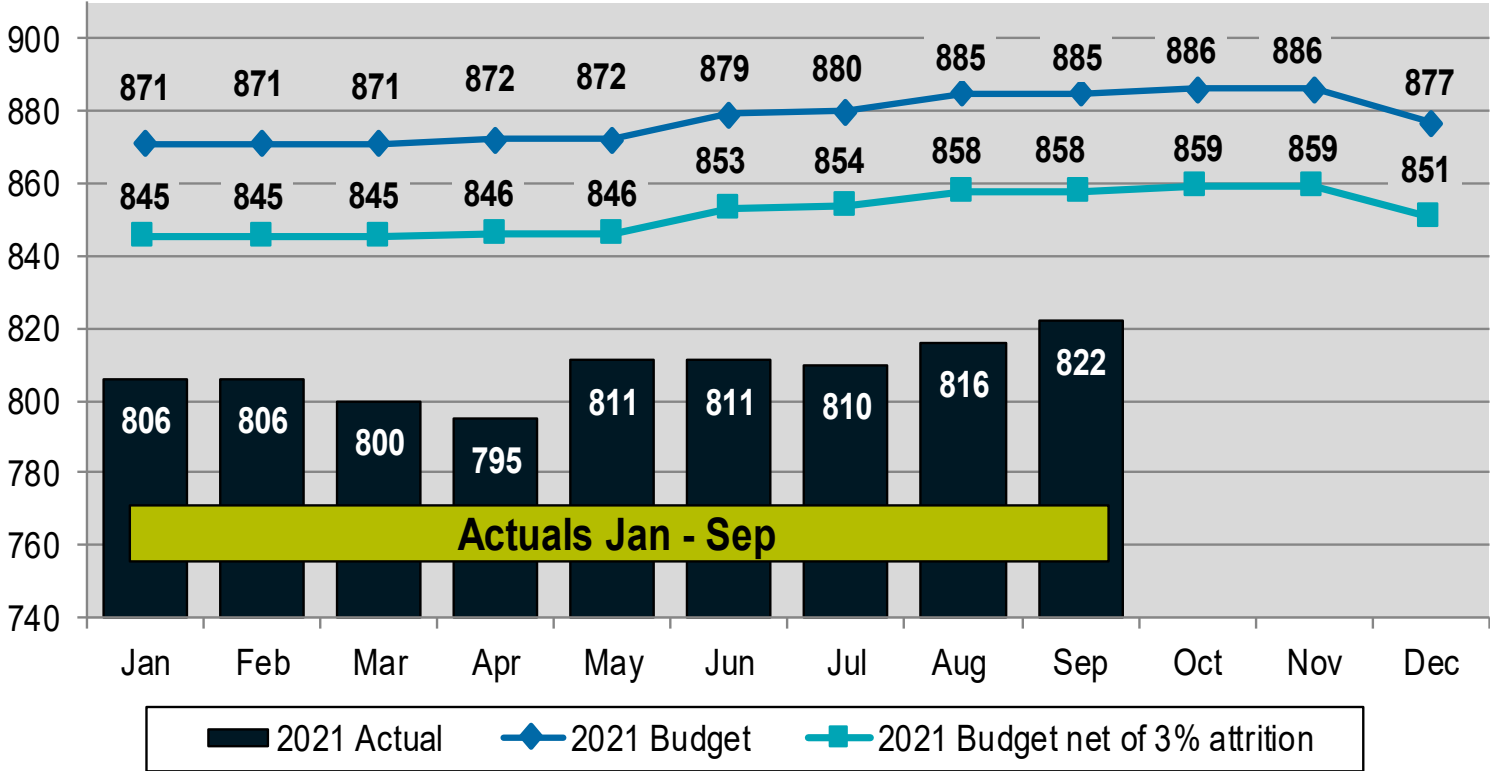
PERSONNEL

2022 Personnel Budget (Water & Gas Combined)

	As of December 31		
	2021 Budget	2021 Estimate	2022 Budget - As Submitted
Full-Time - SPA	271	268	289
Full-Time - OAC	606	599	637
Total Full-Time	877	867	926
Part-Time	3	4	5
Total Employees	880	871	931



Full-Time Employees Monthly Trend





Travel & Memberships Summary

Travel & Memberships Summary

2022 Budget

<u>TRAVEL</u>	<u>2021 Budget</u>	<u>2022 Budget</u>	<u>Increase (Decrease)</u>
TOTAL AS SUBMITTED	\$ 309,150	\$ 297,350	\$ (11,800)
Budget Adjustment	\$ (96,800)	\$ (85,000)	\$ 11,800
TOTAL TRAVEL	\$ 212,350	\$ 212,350	\$ -

	<u>2021 Budget</u>	<u>2022 Budget</u>	<u>Increase (Decrease)</u>
<u>MEMBERSHIPS - Funded by MUD</u>			
Individual Memberships	\$ 50,972	\$ 42,420	\$ (8,552)
Company-wide Memberships	\$ 147,250	\$ 151,565	\$ 4,315
TOTAL MEMBERSHIPS - Funded by MUD	\$ 198,222	\$ 193,985	\$ (4,237)

MEMBERSHIPS - Funded by NNG Marketing Incentive Fund

TOTAL MEMBERSHIPS - Funded by NNG	\$ 207,228	\$ 221,180	\$ 13,952
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Capital Expenditures Water Department

Water Department Plant Additions and Replacements

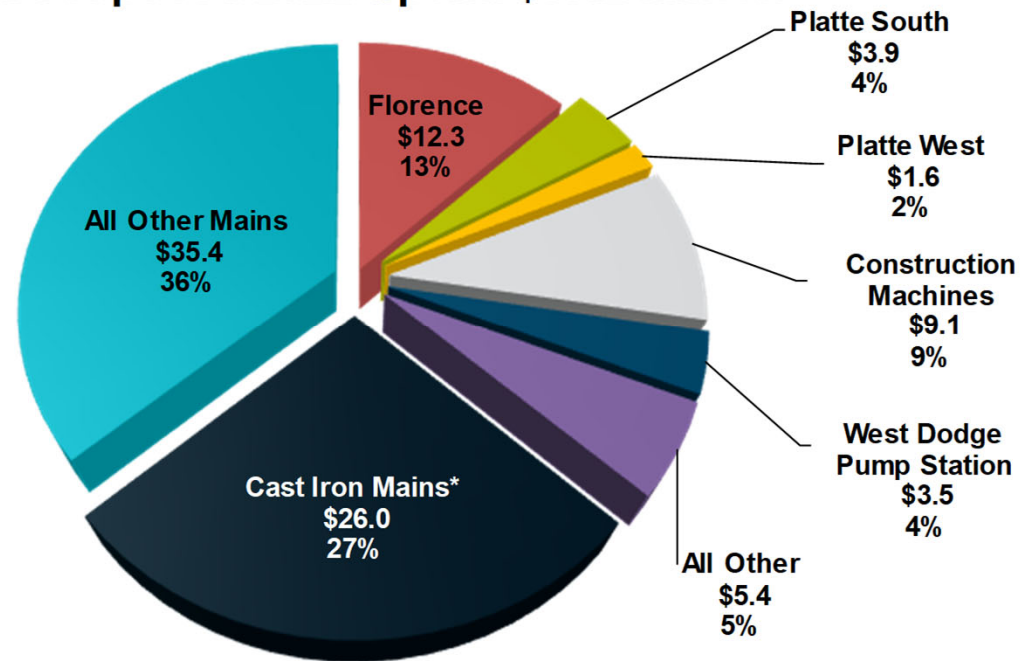
(\$ in Millions)

LINE NO	DESCRIPTION	2021 BUDGET	2021 ACT/EST	2022 BUDGET	VARIANCES	
					2021 ACT/EST VS. 2021 BUDGET	2022 BUDGET VS. 2021 BUDGET
<u>Mains</u>						
1	Water Construction Mains (WCM)	\$ 4.4	\$ 2.5	\$ 5.8	\$ (1.9)	1.4
2	Water Cast Iron Main Replacement (WCI)	18.9	21.4	25.2	2.5	6.3
3	Water Construction Relocation Mains (WCR)	3.4	6.2	4.3	2.8	0.9
4	* Water Construction Contract Mains (WCC)	12.5	13.4	13.3	0.9	0.8
5	* Water Construction Developer Mains (WCD)	0.5	2.0	0.5	1.5	-
6	* Water Construction Pioneer Main (WCP)	10.8	8.5	11.5	(2.3)	0.7
7	Water Main District (WMD)	-	0.3	-	0.3	-
	Total Mains	50.5	54.3	60.6	3.8	10.1
<u>Other Distribution System Property</u>						
8	Replacement of Obsolete/Broken Hydrants	0.3	0.3	0.3	-	-
9	Replacement of Obsolete/Broken Valves	0.5	0.4	0.4	(0.1)	(0.1)
	Total Other Distribution System Property	0.8	0.7	0.7	(0.1)	(0.1)
<u>Buildings, Land and Equipment</u>						
10	Buildings, Land and Equipment Platte West	0.3	0.1	1.6	(0.2)	1.3
11	Buildings, Land and Equipment Florence	11.0	6.3	12.3	(4.7)	1.3
12	Buildings, Land and Equipment Platte South	2.1	2.1	3.9	-	1.8
13	Buildings, Land and Equipment - Other	8.5	1.4	5.8	(7.1)	(2.7)
14	Repumps	0.7	0.4	0.8	(0.3)	0.1
15	Construction Machines	4.9	2.7	9.1	(2.2)	4.2
16	Furniture, Equipment and Miscellaneous	1.3	0.8	1.7	(0.5)	0.4
	Total Building, Land and Equipment	28.8	13.8	35.2	(15.0)	6.4
17	<u>WIR Infrastructure Abandonments</u>	0.6	0.6	0.8	-	0.2
18	<u>Salvage Credits on Construction Machines</u>	(0.6)	(0.1)	(0.1)	0.5	0.5
	Total Plant Additions and Replacements	\$ 80.1	\$ 69.3	\$ 97.2	\$ (10.8)	\$ 17.1
	Funds received on Reimbursable Projects above	\$ 17.7	\$ 20.4	\$ 20.2	\$ 2.7	\$ 2.5

* Components of certain main types are paid for by customers/developers.

Water Department Plant Additions and Replacements by Type

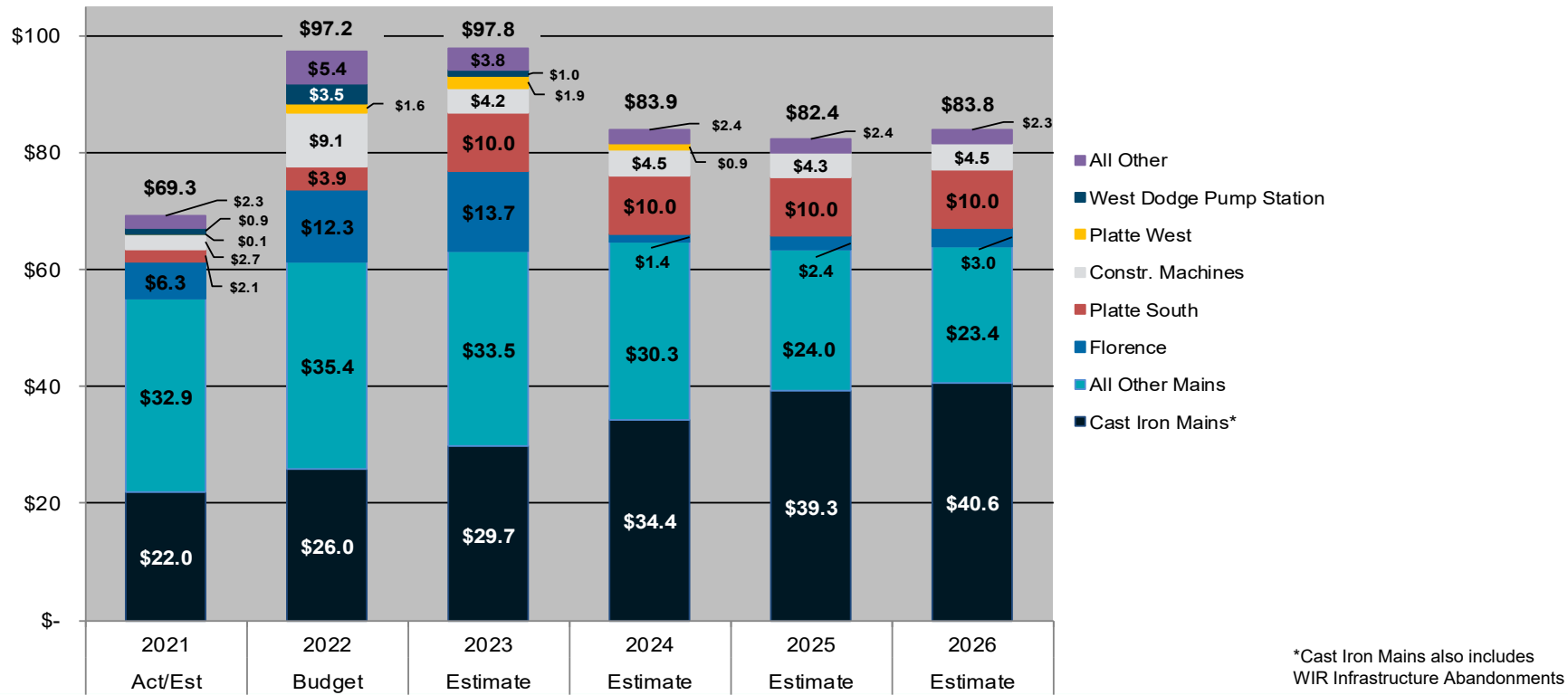
Total Proposed 2022 Spend \$97.2 Million



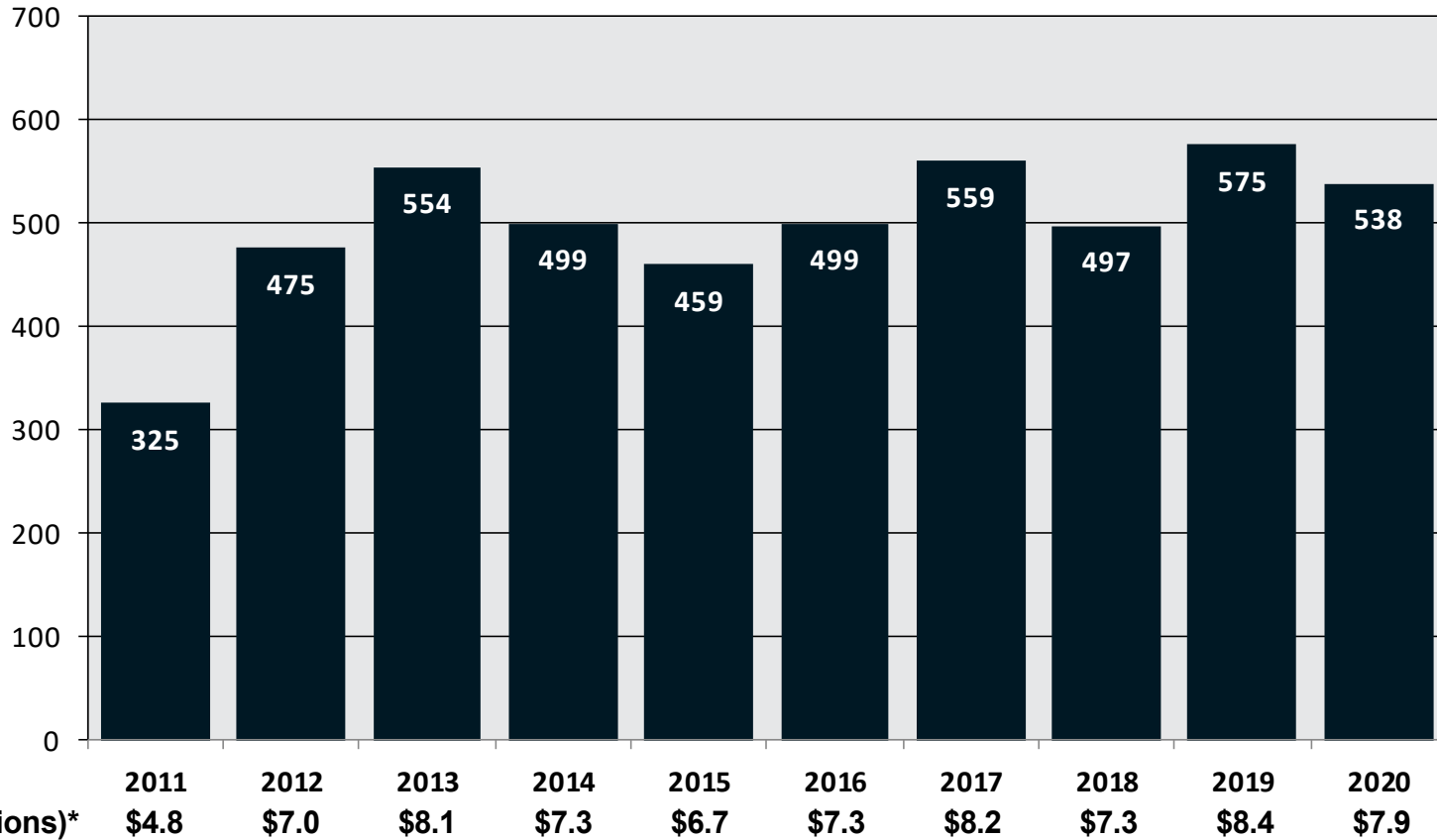
*Cast Iron Mains also includes
WIR Infrastructure Abandonments

Water Department Five Year Projection of Plant Additions and Replacements

(\$ in Millions)



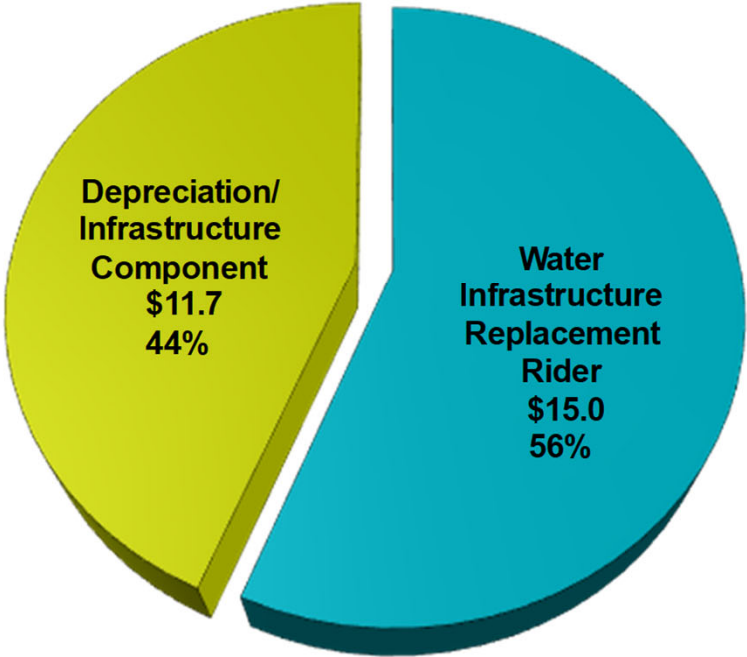
Historical Water Main Breaks



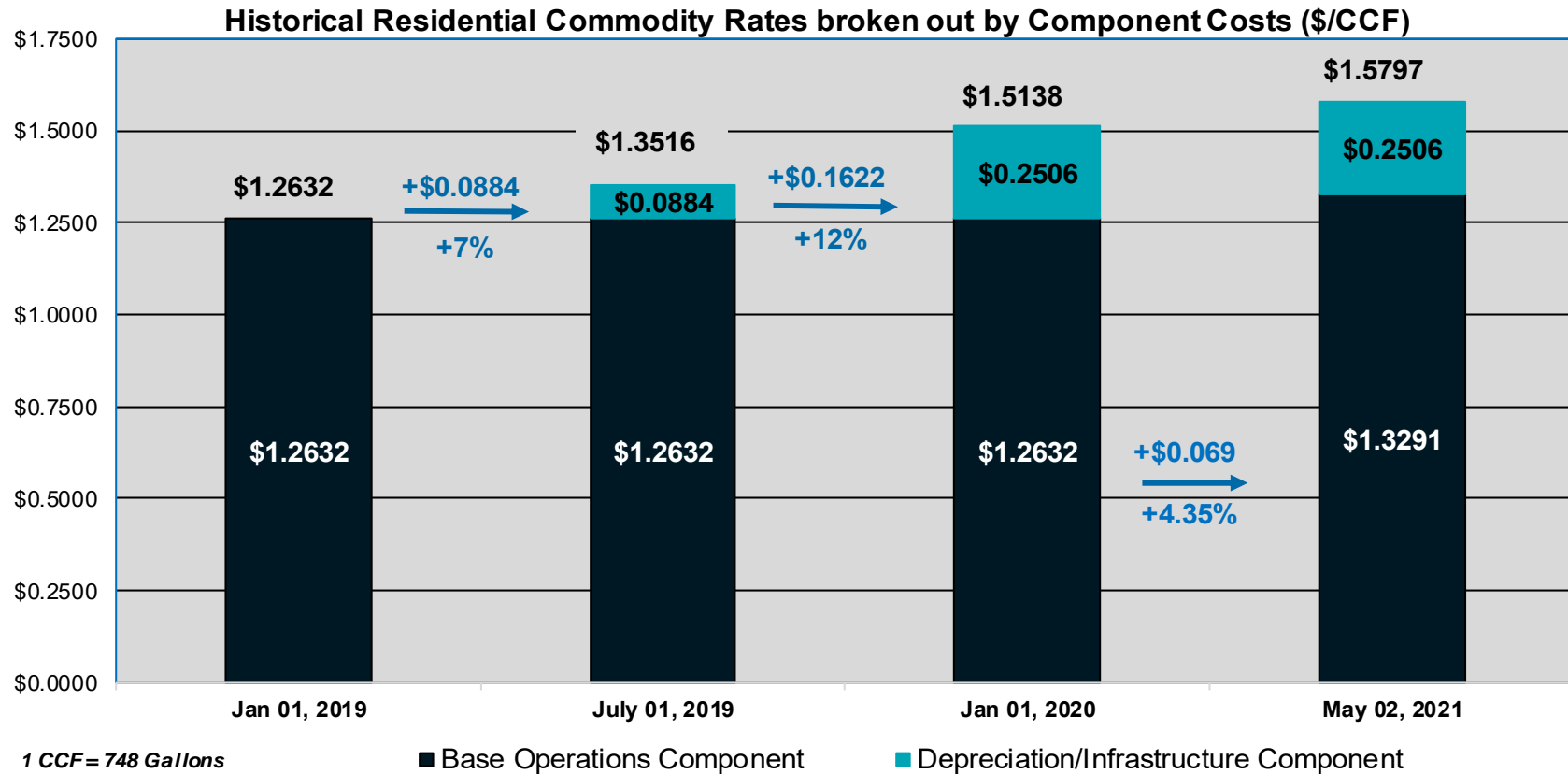
* Approximate cost of main breaks based on 2020 average cost per break of \$14,670

How do we pay for Water Infrastructure Replacement?

Total Budgeted 2021 Revenue \$26.7 Million



Residential Commodity Rate Components and History



What happens if we don't increase the Depreciation/Infrastructure commodity rate or the Water Infrastructure fixed rate?

(in Millions)

Infrastructure Related "Cash Balance" at December 31, 2020

\$34.5

	Miles	Cost per Mile *	(A) Extended Cost **	Water Infrastructure Revenue			(B) - (A) Deficit	Cash Balance @ December 31
				Infrastructure "Rider" - Fixed ***	Depreciation/ Infrastructure Commodity ***	(B) Total Infrastructure Revenue		
2021	16.0	\$1.7	\$ 28.0	\$15.0	\$11.7	\$26.7	(\$1.3)	\$33.2
2022	18.0	\$2.0	\$ 35.7	\$15.2	\$11.7	\$26.9	(\$8.8)	\$24.4
2023	20.0	\$2.0	\$ 40.8	\$15.3	\$11.8	\$27.1	(\$13.8)	\$10.7
2024	22.5	\$2.1	\$ 47.3	\$15.4	\$11.9	\$27.3	(\$20.1)	(\$9.4)
2025	25.0	\$2.2	\$ 54.1	\$15.5	\$11.9	\$27.4	(\$26.7)	(\$36.1)
2026	25.0	\$2.2	\$ 55.8	\$15.6	\$12.0	\$27.6	(\$28.1)	(\$64.2)
2027	27.0	\$2.3	\$ 60.9	\$15.7	\$12.1	\$27.7	(\$33.1)	(\$97.3)
2028	28.0	\$2.3	\$ 64.7	\$15.7	\$12.1	\$27.8	(\$36.9)	(\$134.2)
2029	29.0	\$2.4	\$ 68.7	\$15.8	\$12.2	\$28.0	(\$40.7)	(\$175.0)
2030	30.0	\$2.5	\$ 74.7	\$15.9	\$12.2	\$28.1	(\$46.6)	(\$221.6)

* 2021 - 2026 cost information taken from 2022 Budget "As Submitted"; 2027 and beyond inflated at 2.5% per year

** Extended cost does not reflect costs associated with the Infrastructure Integrity group; it reflects only construction cost associated with main replacement

*** Assumes no rate increases, but does reflect impact of .8% growth in customers each year

Water Infrastructure Funding Strategy

- A replacement rate of 1% of the water mains in our system would result in an annual replacement rate of 30.7 miles based on 3,068.1 miles of water mains in our system at December 31, 2020 (1% translates into an assumed 100 year life of a main).
- 30 miles of annual main replacement is not a one-time "initiative"; it is better described as required annual maintenance that must be funded by a rate structure that pays for this each year.
- The compounding impact of annual rate increases approximating the rate of inflation or greater, coupled with the impact of growth in customer count, is necessary to fund a ramp-up in miles of water mains to be replaced and to meet other business needs.
- Since the Fixed components (WIR and Service Charge) of the 2021 budgeted full year water bill for the average residential customer comprise 53% of the total, a 5.5% - 6% commodity increase results in an annual increase of approximately 2.75% - 3%.

Water Department

Plant Addition and Replacements Funding Sources – “Colors of Money”

(\$ in Millions)

LINE NO	DESCRIPTION	2021 BUDGET	2021 ACT/EST	2022 BUDGET	FUNDING SOURCES			"Colors of Money":
					Primary	Secondary	Tertiary	
<u>Mains</u>								
1	Water Construction Mains (WCM)	\$ 4.4	\$ 2.5	\$ 5.8				Costs recovered via Impact Fees; various categories of main expenditures analyzed to determine fee (assessed based on meter size for new water service connections). Funded by "Water Infrastructure Replacement" charge and "Infrastructure" commodity component of rates.
2	Water Cast Iron Main Replacement (WCI)	18.9	21.4	25.2				
3	Water Construction Relocation Mains (WCR)	3.4	6.2	4.3				
4	Water Construction Contract Mains (WCC)	12.5	13.4	13.3 **				
5	Water Construction Developer Mains (WCD)	0.5	2.0	0.5 **				
6	Water Construction Pioneer Main (WCP)	10.8	8.5	11.5 **				
7	Water Main District (WMD)		0.3					
	Total Mains	50.5	54.3	60.6				
<u>Other Distribution System Property</u>								
8	Replacement of Obsolete/Broken Hydrants	0.3	0.3	0.3				Funded by Service/Commodity rates.
9	Replacement of Obsolete/Broken Valves	0.5	0.4	0.4				
	Total Other Distribution System Property	0.8	0.7	0.7				
<u>Buildings, Land and Equipment</u>								
10	Buildings, Land and Equipment - Platte West	0.3	0.1	1.6				Funded by customers/developers - costs are not incurred unless requested by a customer/ developer; MUD sometimes serves as Pioneer main "developer", in which case, costs are recovered over time as connections occur to the Pioneer main.
11	Buildings, Land and Equipment - Florence	11.0	6.3	12.3 *				
12	Buildings, Land and Equipment - Platte South	2.1	2.1	3.9 *				
13	Buildings, Land and Equipment - Other	8.5	1.4	5.8 *				
14	Repumps	0.7	0.4	0.8				
15	Construction Machines	4.9	2.7	9.1				
16	Furniture, Equipment and Miscellaneous	1.3	0.8	1.7				Funded via bond issuances; debt principal and interest payments funded by Service/Commodity rates.
	Total Buildings, Land and Equipment	28.8	13.8	35.2				
17	WIR Infrastructure Abandonments	0.6	0.6	0.8				* Bond issuance will result in incremental bond carrying costs (principal and interest payments) to be funded by Service/Commodity rates ** Components of certain main types are paid for by customers/developers.
18	Salvage Credits on Construction Machines/Transfers	(0.6)	(0.1)	(0.1)				
Total Plant Additions and Replacements		\$ 80.1	\$ 69.3	\$ 97.2				
	Reimbursable Projects Included Above **	\$ 17.7	\$ 20.4	\$ 20.2				



Capital Expenditures Gas Department

Gas Department Plant Additions and Replacements

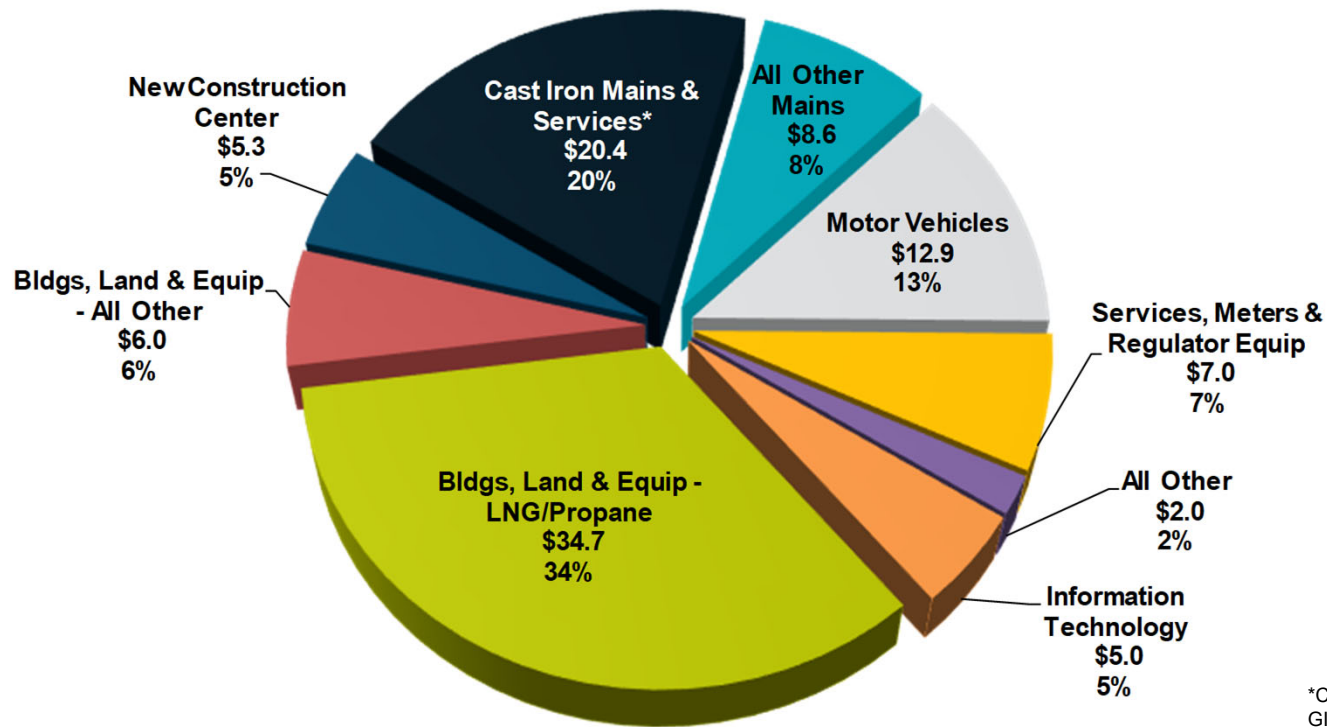
(\$ in Millions)

LINE NO	DESCRIPTION	2021 BUDGET	2021 ACT/EST	2022 BUDGET	VARIANCES	
					2021 ACT/EST VS. 2021 BUDGET	2022 BUDGET VS. 2021 BUDGET
<u>Mains</u>						
1	Gas Construction Mains (GCM)	\$ 1.4	\$ 1.0	\$ 1.2	\$ (0.4)	\$ (0.2)
2	Gas Cast Iron Main Replacement (GCI)	10.5	10.6	10.5	0.1	-
3	Gas Construction Relocation Mains (GCR)	2.8	2.9	3.0	0.1	0.2
4	Gas Revenue Mains (GRM)	2.9	2.4	4.4	(0.5)	1.5
	Total Mains	17.6	16.9	19.1	(0.6)	1.5
5	Replacement of Small Gas Valves	0.1	0.1	0.1	-	0.0
<u>Other Distribution System Property</u>						
6	Metering Equipment	1.8	1.7	1.8	(0.1)	-
7	New Services	2.8	3.1	3.0	0.3	0.2
8	Leaking Service Replacement	2.1	1.9	2.0	(0.2)	(0.1)
9	GIR Service Replacements (MUD)	4.7	4.3	4.3	(0.4)	(0.4)
10	GIR Service Replacements (Contracted)	3.8	3.8	3.9	(0.0)	0.1
11	Regulator Stations Infrastructure	0.1	0.1	-	-	(0.1)
12	Regulator Stations & Equipment	0.3	0.3	0.2	-	(0.1)
	Total Other Distribution System Property	15.6	15.2	15.2	(0.4)	(0.4)
<u>Buildings, Land and Equipment</u>						
13	* Buildings, Land and Equipment - LNG/Propane	22.8	5.6	34.7	(17.2)	11.9
14	Buildings, Land and Equipment - All Other	9.7	4.7	11.3	(5.0)	1.6
15	Information Technology	3.3	1.4	5.0	(1.9)	1.7
16	Motor Vehicles	8.3	5.2	12.9	(3.1)	4.6
17	Furniture, Equipment and Miscellaneous	0.8	1.1	1.6	0.3	0.8
	Total Buildings, Land and Equipment	44.9	18.0	65.5	(26.9)	20.6
<u>Major System Retirements</u>						
18	Service Piping Abandonments	0.5	0.4	0.4	(0.1)	(0.1)
19	GIR Infrastructure Abandonments	1.7	1.7	1.7	-	-
20	Salvage Credits on Motor Vehicles	(0.7)	(0.1)	(0.1)	0.6	0.6
	Total Plant Additions and Replacements	\$ 79.7	\$ 52.2	\$ 101.9	\$ (27.4)	\$ 22.2
	Gas Cost Adjustment recovered in Projects above *	\$ 22.8	\$ 5.9	\$ 34.7	\$ (16.9)	\$ 11.9

* The cost of certain projects is recovered via the Gas Cost Adjustment component of rates.

Gas Department Plant Additions and Replacements by Type

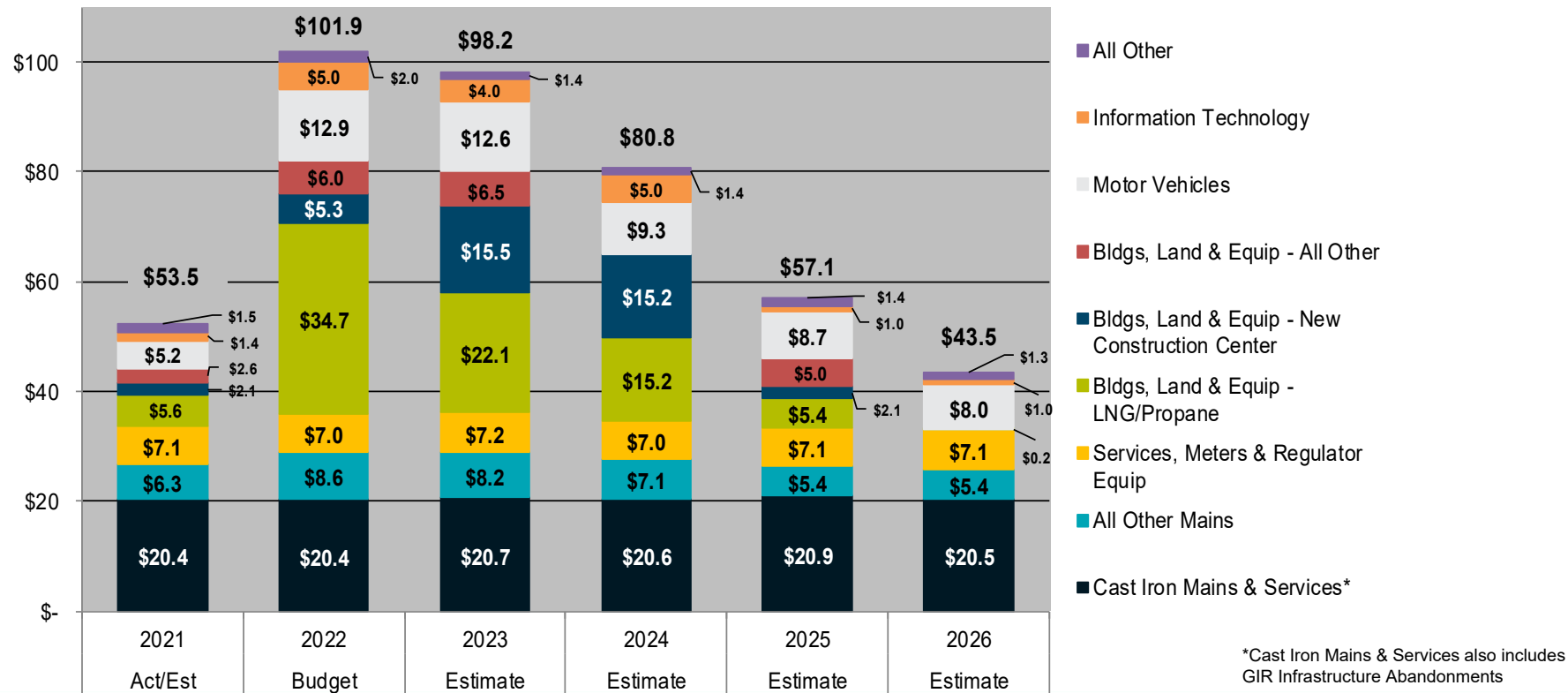
Total Proposed 2022 Spend \$101.9 Million



*Cast Iron Mains & Services also includes GIR Infrastructure Abandonments

Gas Department Five Year Projection of Plant Additions and Replacements

(\$ in Millions)



Gas Department

Plant Addition and Replacements Funding Sources – “Colors of Money”

(\$ in Millions)

LINE NO	DESCRIPTION	2021 BUDGET	2021 ACT/EST	2022 BUDGET	FUNDING SOURCES			"Colors of Money":
					Primary	Secondary	Tertiary	
<u>Mains</u>								
1	Gas Construction Mains (GCM)	\$ 1.4	\$ 1.0	\$ 1.2				
2	Gas Cast Iron Main Replacement (GCI)	10.5	10.6	10.5				Funded by Service/Commodity rates.
3	Gas Construction Relocation Mains (GCR)	2.8	2.9	3.0				
4	Gas Revenue Mains (GRM)	2.9	2.4	4.4				
	Total Mains	17.6	16.9	19.1				
5	<u>Replacement of Small Gas Valves</u>	0.1	0.1	0.1				 Funded by "Gas Infrastructure Replacement" charge.
<u>Other Distribution System Property</u>								
6	Metering Equipment	1.8	1.7	1.8				
7	New Services	2.8	3.1	3.0				
8	Leaking Service Replacement	2.1	1.9	2.0				
9	GIR Service Replacements (MUD)	4.7	4.3	4.3				Funded by addition to firm rates (Gas Cost Adjustment) related to operational "peaking" expenditures at LNG and propane caverns. Not charged to interruptible customers.
10	GIR Service Replacements (Contracted)	3.8	3.8	3.9				
11	Regulator Stations Infrastructure	0.1	0.1	-				
12	Regulator Stations & Equipment	0.3	0.3	0.2				
	Total Other Distribution System Property	15.6	15.2	15.2				
<u>Buildings, Land and Equipment</u>								
13	* Buildings, Land and Equipment - LNG/Propane	22.8	5.6	34.7				 Funded via bond issuances; debt principal and interest payments funded by Service/Commodity rates.
14	Buildings, Land and Equipment - All Other	9.7	4.7	11.3				
15	Information Technology	3.3	1.4	5.0				
16	Motor Vehicles	8.3	5.2	12.9				
17	Furniture, Equipment and Miscellaneous	0.8	1.1	1.6				
	Total Buildings, Land and Equipment	44.9	18.0	65.5				
<u>Major System Retirements</u>								
18	Service Piping Abandonments	0.5	0.4	0.4				
19	GIR Infrastructure Abandonments	1.7	1.7	1.7				
20	Salvage Credits on Motor Vehicles	(0.7)	(0.1)	(0.1)				
	Total Plant Additions and Replacements	\$ 79.7	\$ 52.2	\$ 101.9				
	GCA Recoverable Projects Included Above *	\$ 22.8	\$ 5.9	\$ 34.7				* The cost of certain projects is recovered via the Gas Cost Adjustment component of rates.



Thank You