



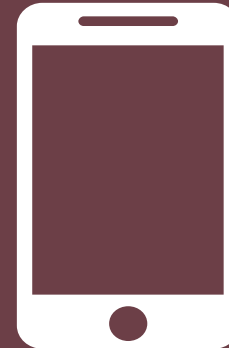
## Sign-In For Public Guests:

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## Meeting Materials

- Available at [etf.wi.gov](http://etf.wi.gov)



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Microphones  
and/or Cell Phone  
(Using #6)**



# Welcome to the Joint Meeting of the Employee Trust Funds, Teachers Retirement and Wisconsin Retirement Boards

June 17, 2021



# Announcements

Item 1 – No Memo



# Consideration of Open Minutes of March 25, 2021



Item 2 - Memo Only



# Wisconsin Retirement System 40<sup>th</sup> Annual Valuation of Active Lives and Gain/Loss Analysis – December 31, 2020

Item 3A – Joint Meeting of Retirement Boards

Gabriel Roeder Smith & Company  
Brian Murphy, Senior Consultant  
Jim Anderson, Senior Consultant  
Rich Koch, Senior Consultant

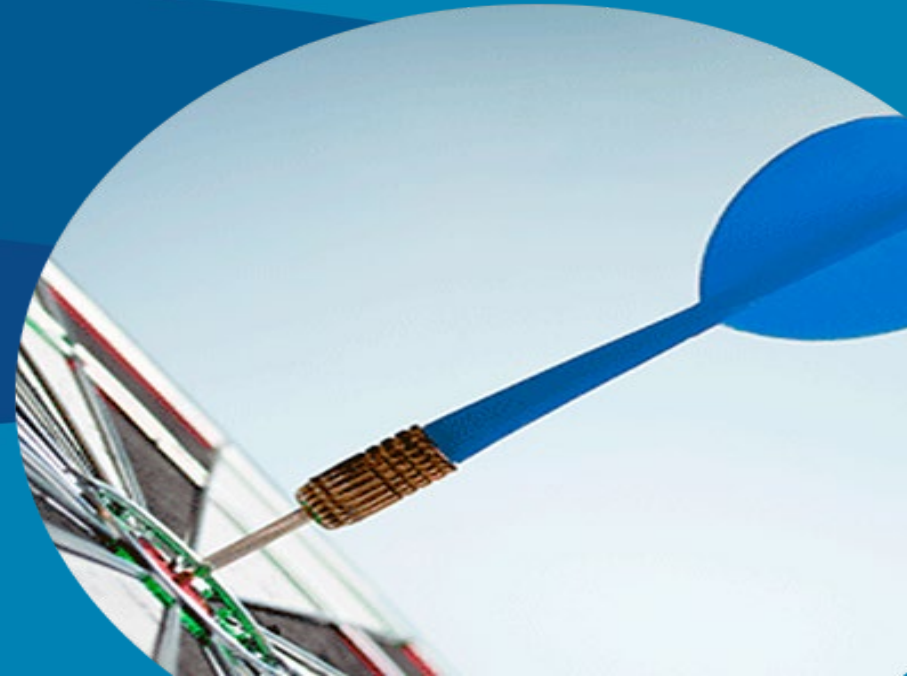




# Wisconsin Retirement System

40th Annual Actuarial Valuation as of  
December 31, 2020 and Gain/Loss  
Analysis

June 2021

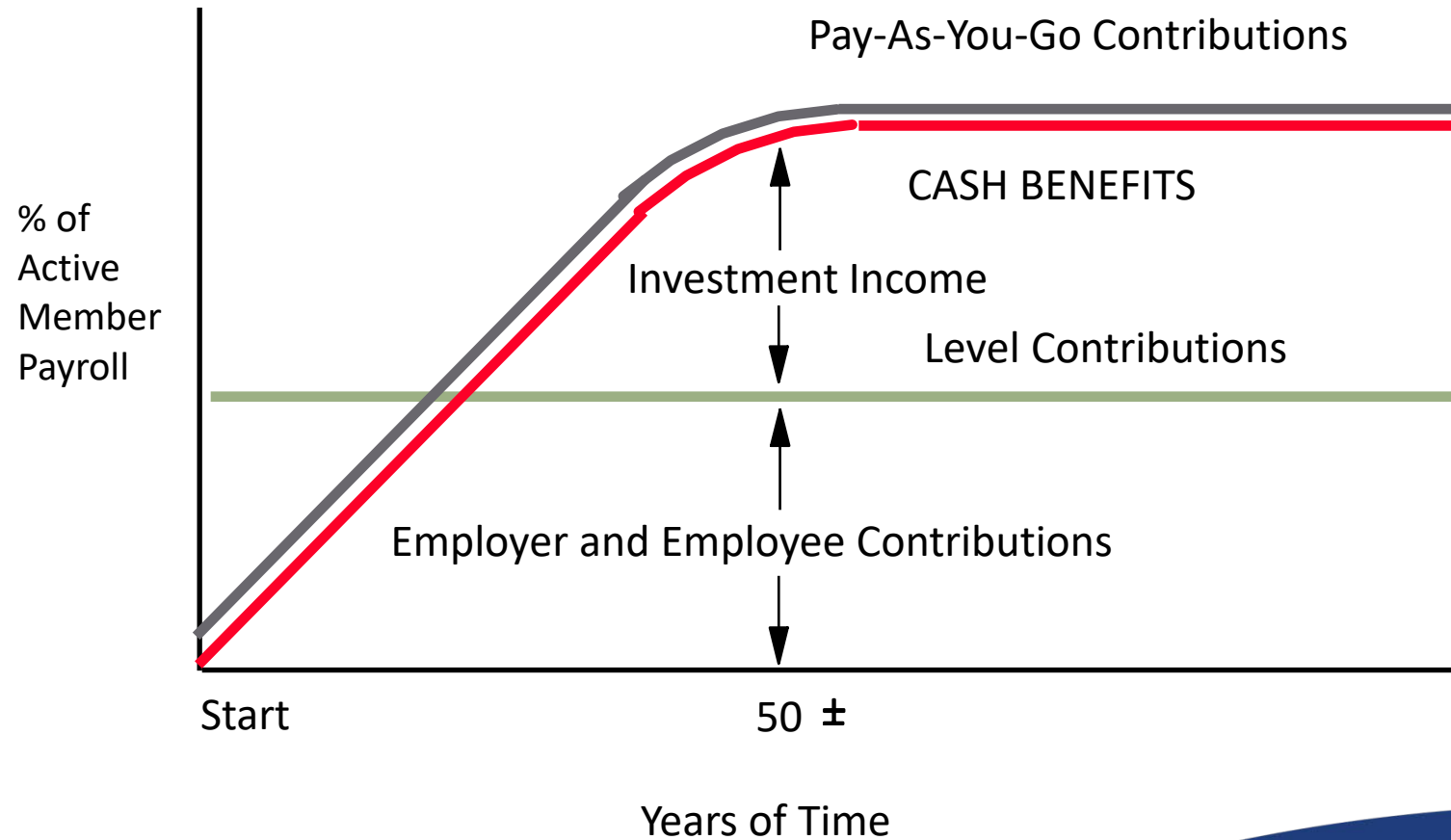


# Funding Objectives

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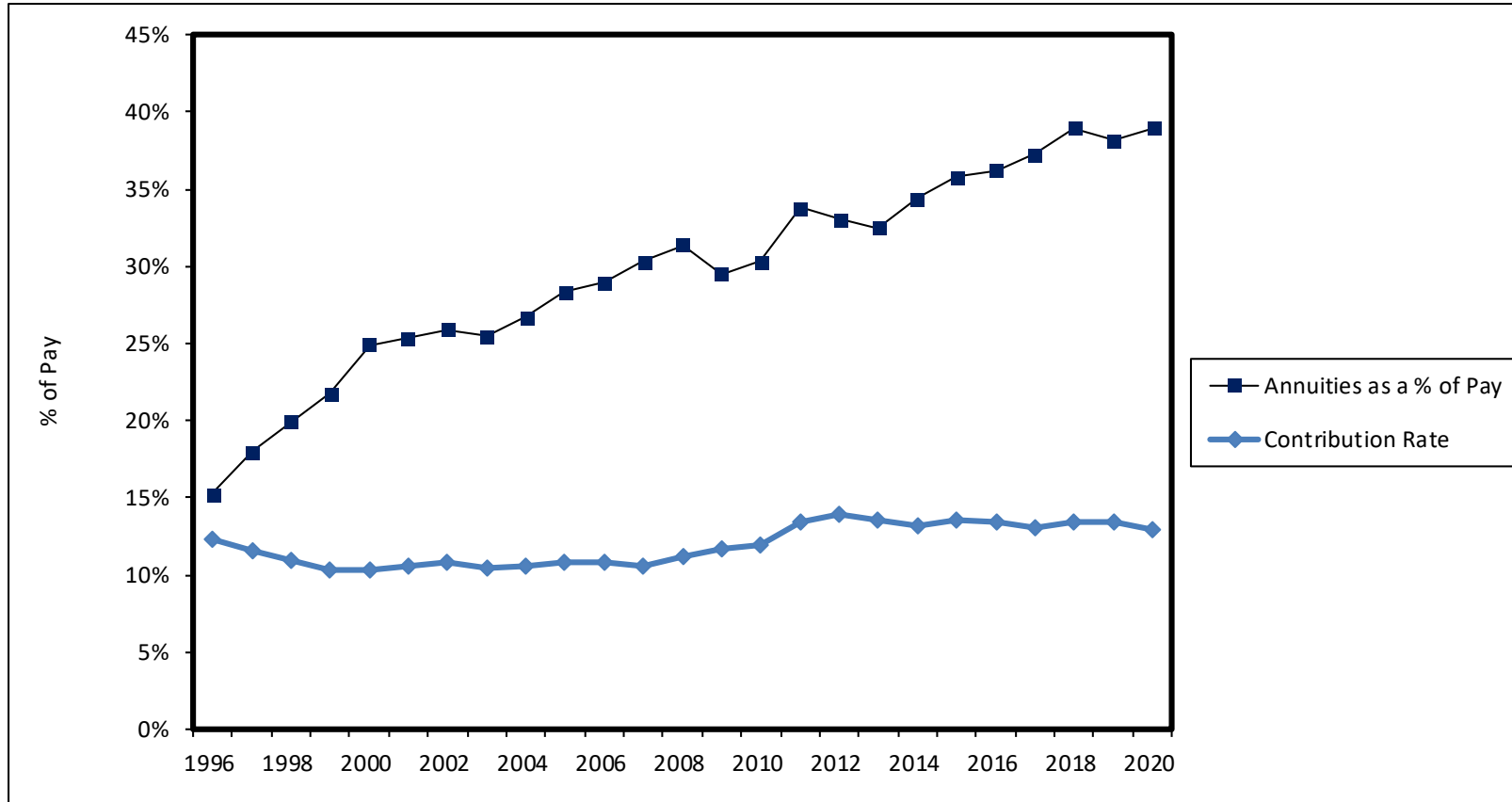
- Intergenerational equity with respect to plan costs
- Stable or increasing ratio of assets to liabilities
- Stable pattern of contribution rates

# Financing Diagram





# Annuities as a % of Payroll and WRS Average Total Contribution Rate\*



Annuities are expected to continue to increase as a percent of payroll for several more decades.

\*Average total rate shown is for General Participants.

# Active Participants

Valuation Group	Number	Annual Earnings (\$Millions)	Group Averages			
			Earnings	Age	Years of Service	Contribs.
General	234,628	\$13,294.7	\$56,663	45.2	11.1	\$63,450
Executive Group & Elected Officials	1,280	116.3	90,894	55.4	14.1	118,510
Protective Occupation with Social Security	19,676	1,414.6	71,893	39.7	12.0	73,676
Protective Occupation without Social Security	2,754	240.0	87,136	40.7	13.9	93,611
<b>Total Active Participants</b>	<b>258,338</b>	<b>\$15,065.6</b>	<b>\$58,317</b>	<b>44.8</b>	<b>11.2</b>	<b>\$64,823</b>
Prior Year	259,234	\$14,583.7	\$56,257	44.9	11.3	\$60,694



# All Participants

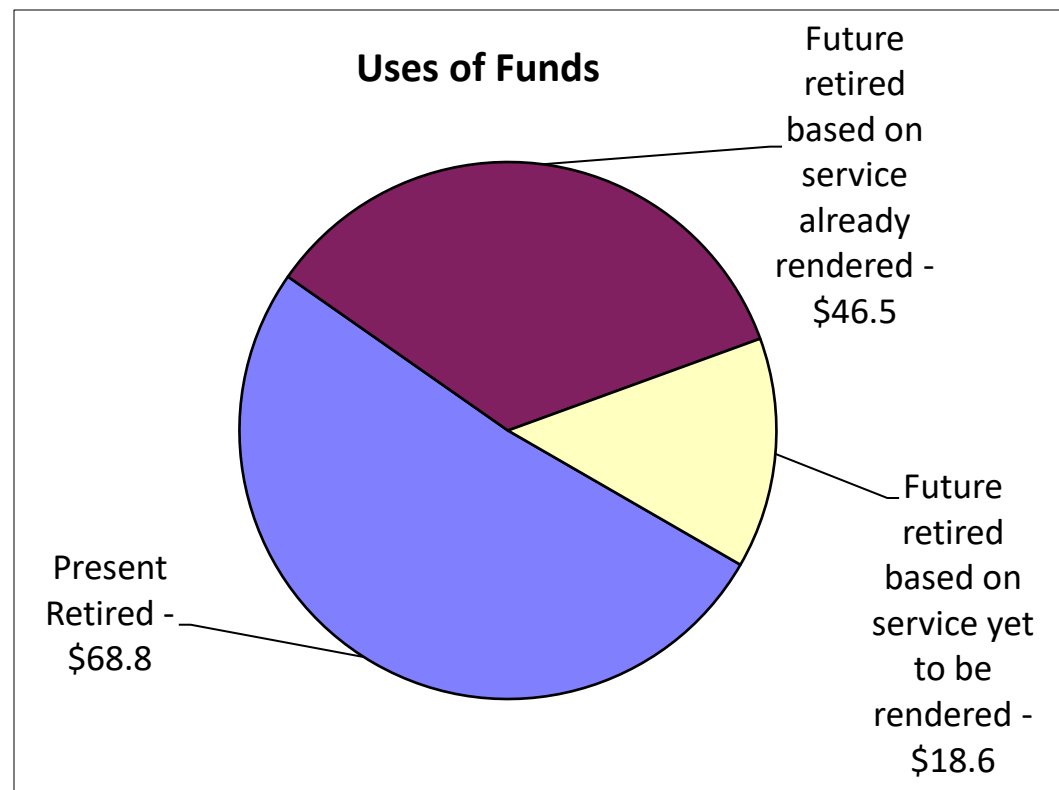
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Valuation Group	Number	Average Annual Earnings/Benefits*
Actives	258,338	\$58,317
Inactives	169,166	\$18,228
Retirees & Beneficiaries	222,723	\$26,369
<b>Total Participants</b>	<b>650,227</b>	

*\* For inactives, average money purchase balance.*



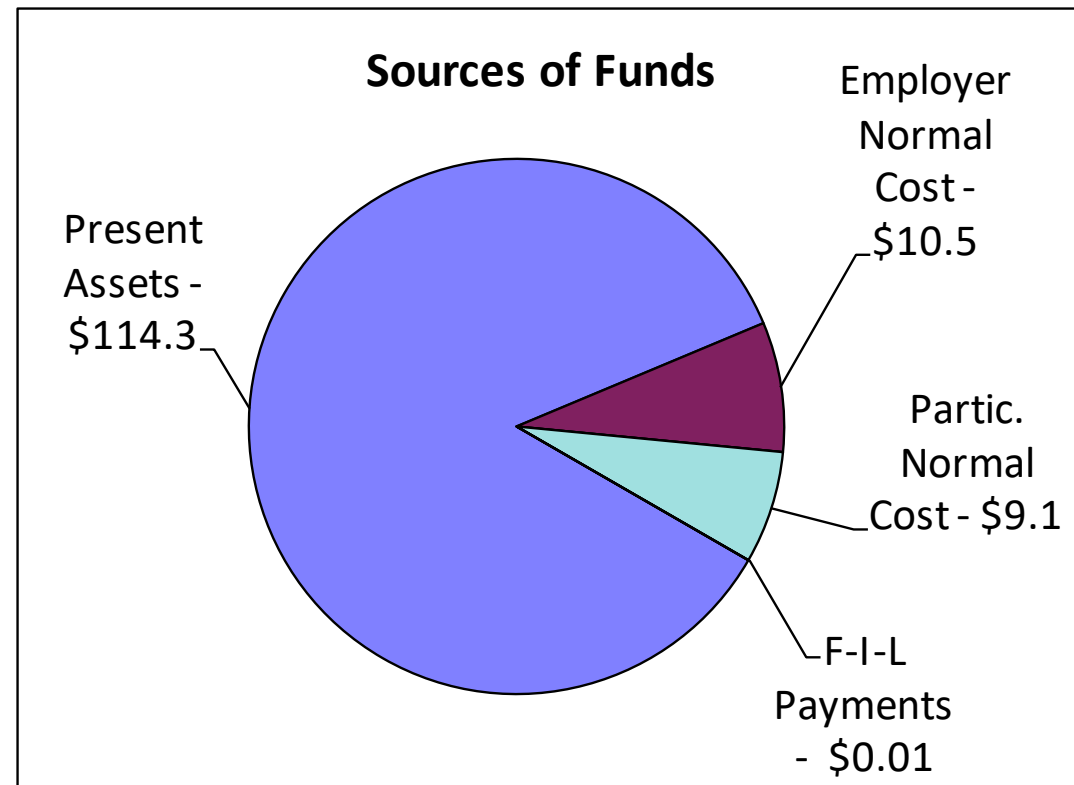
# \$133.9 Billion\* of Benefit Promises to Present Active and Retired Members



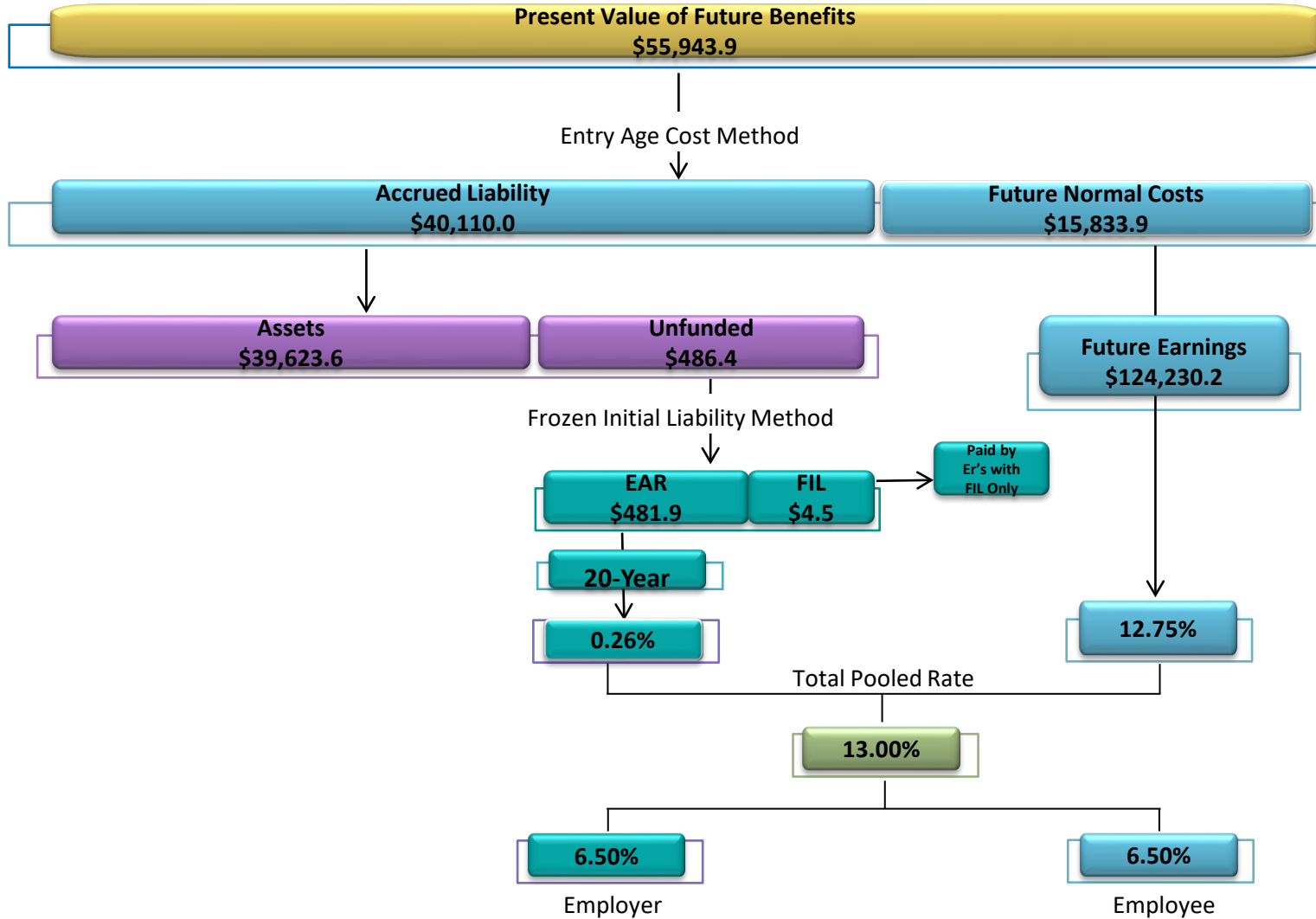
\* Present value of future benefits; all divisions combined.



# Sources of Funds for Financing \$133.9 Billion of Benefit Promises



## Actuarial Valuation Process Illustration for General/Elected Group (\$ Millions)



# Summary of December 31, 2020 Valuation Results

	General, Executive & Elected Officials		Protective Occupation				Average 2022
			With Soc. Sec.		Without Soc. Sec.		
	2022	2021	2022	2021	2022	2021	
Employer Normal Cost	6.50%	6.75%	12.00%	11.75%	16.40%	16.35%	7.20%
Participant Normal Cost	6.50%	6.75%	6.50%	6.75%	6.50%	6.75%	6.50%
<b>Total Normal Cost</b>	<b>13.0%</b>	<b>13.5%</b>	<b>18.5%</b>	<b>18.5%</b>	<b>22.9%</b>	<b>23.1%</b>	<b>13.7%</b>
<b>Estimated Total NC (\$ millions)*</b>	<b>\$1,849.6</b>	<b>\$1,867.4</b>	<b>\$277.6</b>	<b>\$258.0</b>	<b>\$58.3</b>	<b>\$56.5</b>	

\* Based on payroll projected from valuation date to fiscal year using the payroll growth assumption.

# Comparative Statement of Total Average Contribution Rates

<b>Valuation 12/31</b>	<b>General</b>	<b>Executive &amp; Elected</b>	<b>Protective with Soc. Sec.</b>	<b>Protective without Soc. Sec.</b>
2000	10.30%	12.70%	11.80%	14.90%
2005	10.81%	11.56%	13.38%	14.56%
2010	11.90%	14.10%	14.90%	17.50%
2015	13.67%	13.67%	17.50%	21.80%
2016	13.43%	13.43%	17.43%	21.65%
2017	13.12%	13.12%	17.10%	21.59%
2018	13.54%	13.54%	18.41%	23.02%
2019	13.53%	13.53%	18.51%	23.11%
2020	13.01%	13.01%	18.52%	23.86%

Executive and Elected employee and employer rates for CY 2016 and beyond are made in accordance with the combined General/Exec & Elected results.





# Protective Contribution Rate Levels

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- Higher contribution rates compared to General Employees
  - Higher benefit multipliers
    - Protective = 2% or 2.5% (with or without Soc. Security)
    - General & Executive/Elected = 1.6%
  - Earlier Normal Retirement Eligibility
    - Protective at Age 54 or Age 53 with 25 years of service
    - General & Executive/Elected at Age 65/62 or Age 57 with 30 years of service

# Protective Contribution Rate Levels

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- More volatile contribution rates compared to General Employees
  - Asset/Payroll ratios<sup>1</sup>
    - Protective = 324% - 439% (with - without Soc. Security)
    - General & Executive/Elected = 295%
  - Liability/Payroll ratios<sup>1</sup>
    - Protective = 356% - 464% (with - without Soc. Security)
    - General & Executive/Elected = 299%

<sup>1</sup> From active lives valuation

# Reasons for Contribution Changes

	<b>General, Executive &amp; Elected</b>	<b>Protective with Soc. Sec.</b>	<b>Protective without Soc. Sec.</b>
2020 Normal Cost Rate	13.50%	18.50%	23.10%
Effect of Benefit Change	0.00%	0.00%	0.00%
Effect of Assumption Change	0.00%	0.00%	0.00%
Effect of Asset Performance	(0.52)%	(0.70)%	(1.03)%
Effect of Salary Experience	0.13%	0.72%	0.61%
Effect of Money Purchase Benefit	(0.15)%	(0.05)%	(0.01)%
Demographic and Other Experience	0.04%	0.03%	0.23%
2021 Normal Cost Rate	13.00%	18.50%	22.90%

The effect of Asset Performance is different for each group because the ratio of assets to payroll is different for each group.



# Impact of Asset Gains/Losses

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- Asset gains and losses above or below the assumed rate of return are smoothed in over the current year and four future years
- Four years after a valuation date, all asset gains or losses known at valuation date are fully recognized
- Statutory smoothing method in WRS is referred to as the Market Recognition Account (MRA)

# Operation of Market Recognition Account (MRA) - \$ Millions

	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Actual Investment Return	\$ 15,868				
Assumed Investment Return	7,000				
Gain/(Loss) to be phased-in	8,868				
Phased-in recognition					
• Current year	\$ 1,774	?	?	?	?
• First prior year	2,204	\$ 1,774	?	?	?
• Second prior year	(2,049)	2,204	\$ 1,774	?	?
• Third prior year	1,461	(2,049)	2,204	\$ 1,774	?
• Fourth prior year	120	1,461	(2,049)	2,204	\$ 1,774
Total recognized gain (loss)	\$ 3,510	\$ 3,390	\$ 1,929	\$ 3,978	\$ 1,774

# Reconciliation of Market Recognition Account (MRA)

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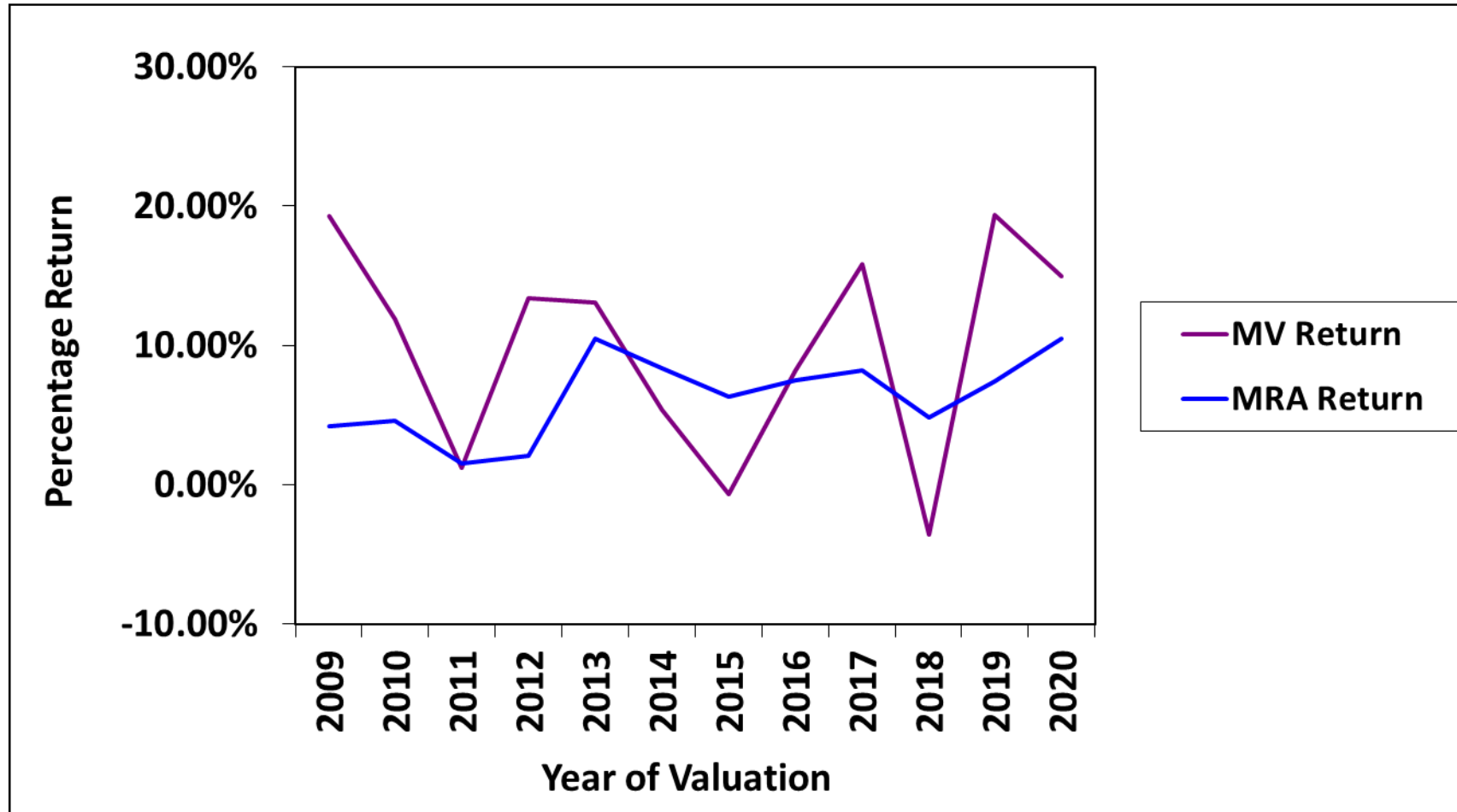
	<u>\$ Millions</u>
MRA at Beginning of Year	\$ 101,741.9
Non-Investment Cash Flow	(3,484.9)
Assumed Return (at 7.0%)	7,000.0
Phase-in of Gains/(losses)	3,509.8
MRA at End of Year	\$108,766.8
MRA Rate of Return	10.50%
Market Value Rate of Return	15.00%

Assets in MRA include non WRS programs such as Sick Leave, Duty Disability, etc.

Market value rate of return shown as calculated by GRS and may differ from returns calculated by SWIB and/or ETF.



# Market Value Return vs. Market Recognition (Actuarial) Return



# WRS Funded Status

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	<b>Frozen Initial</b>	<b>Entry Age</b>
2017	100.0%	99.5%
2018	100.0%	98.6%
2019	100.0%	98.6%
2020	100.0%	99.1%



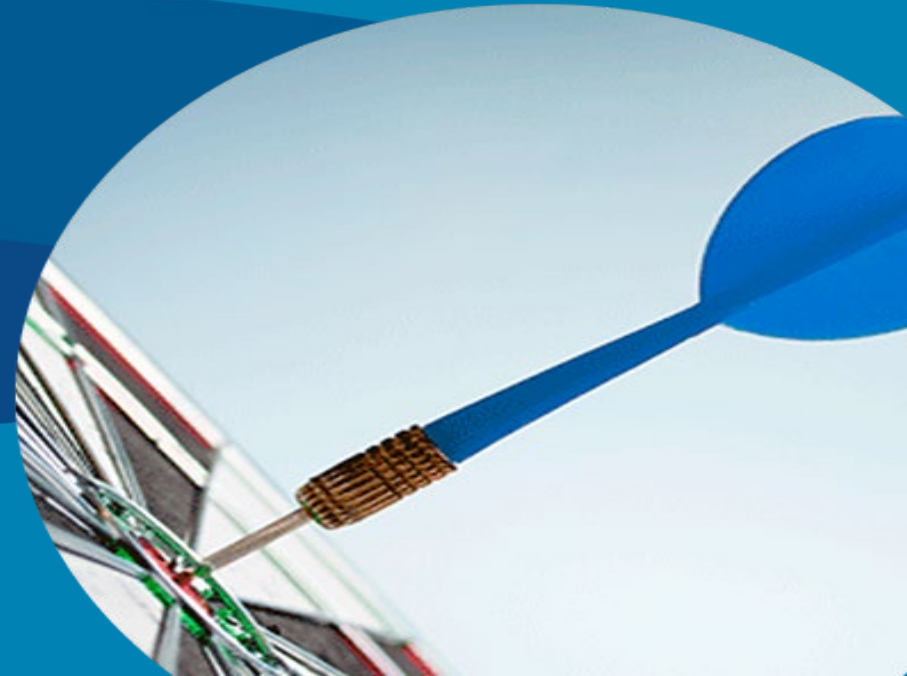
# Concluding Remarks

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- There are \$11.1 billion of unrecognized gains in the MRA
- Due to the cost sharing nature of WRS, asset gains have been traditionally shared by:
  - Employees (through increased money purchase benefits and decreases in contributions)
  - Employers (through decreases in contributions)
  - Retirees (through increased dividends)



# Gain/Loss Analysis



# 2020 Gain/Loss Analysis

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A Gain/Loss Analysis measures differences between actual and assumed experience in each Risk Area.

# WRS Assumption Risk Areas

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## Primary Risks

### Demographic

Normal retirement

Early retirement

Death-in-service

Disability

Other separations

### Economic

Salary increases

Investment return

# Why Have a Gain/Loss Analysis?

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- To gain an understanding of reasons for contribution rate changes
- It is a year-by-year measure of the operation of assumptions
- To determine when assumption changes are needed
- To understand the nature of risk

# The Nature of Defined Benefit Plan Risk

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## Investment Risk

- The risk that actual returns will differ from assumed returns.

## Asset/Liability Mismatch

- The potential that changes in assets are not offset by changes in liabilities. Because of the way assets are invested in most public plans this is almost synonymous with investment risk.

## Contribution Risk

- The risk that actual contributions will differ from expected contributions. This could occur, for example, if the plan's funding policy is not followed, or if there are changes in the covered population.

# Retirement Sustainability Equation

## - Asset/Liability Mismatch

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$$C + I = B + E$$

**B** depends on

- ▶ Plan Provisions – at retirement, member receives x% of Final Average Pay times years of service
- ▶ Participant Experience – tenure, pay increases, etc.

**Most Systems do not have asset changes offset by liability changes**

# Retirement Sustainability Equation

- Smaller Asset/Liability Mismatch in WRS

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$$C + I = B + E$$

**B** depends on plan provisions, which incorporates **I** Experience

- ▶ Money Purchase DC benefit (changes with I results)
- ▶ Annual post-retirement adjustments to the monthly annuity benefit are based solely on investment returns
  - ▶ Dividends can increase or decrease



# The Nature of Defined Benefit Plan Risk

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## Salary and Payroll Risk

- Individual pays and/or total covered payroll may not grow at the assumed rate. If covered payroll grows more slowly than assumed, or shrinks, actual contributions may fall short of expected contributions.

## Longevity Risk

- Members may live for more or fewer years than expected, affecting the amount of pension income they will receive from the plan.

## Other Demographic Risks

- Members may terminate, retire, or become disabled at rates other than expected, affecting both contribution rates and funded status.

# Population Development During 2020

	<u>Actual</u>	<u>Expected</u>
<b>Beginning Census</b>	259,234	
(-) Normal Retirement	4,468	4,630
(-) Early Retirement	3,683	4,168
(-) Death	119	244
(-) Disability Retirement		
- Total Approved	295	118
- Less Pending	87	
- Net New	208	
(-) Other Separations	14,137	13,891
(-) Transfers Out	1,970	
(+) Transfers In	1,970	
(+) New Entrants	21,719	
<b>Ending Census</b>	258,338	



# Population Development During 2020

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**Normal Retirements:** Varied by group and gender. Overall, slightly lower than expected, but net result on liabilities is a small loss.

**Early Retirements:** Lower than expected, overall producing a small loss.

**Deaths:** Among active participants were lower than expected. The net result for the past year was a small loss.

**Disabilities:** Greater than expected, producing a loss.

**Other Separations:** Varied by group, gender and service. Overall, slightly higher than expected. The net result was a loss.

# Components of Total Gain/(Loss)

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	<b>Gain/(Loss) in Millions</b>	
	<b>2019</b>	<b>2020</b>
Economic Risk Areas	\$95	\$760
Decrement Risk Areas	(61)	(109)
Other Activity	<u>(122)</u>	<u>(149)</u>
Total Gain/(Loss)	\$ (89)	\$502



# Investment Earnings in 2020 (Active Participants)

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	<u>\$ Millions</u>
A. Average balance on Participant and Employer Accumulation Reserves	\$41,630
B. Expected earnings: 7.0%	2,914
C. Earnings credited to Participant and Employer Accumulation Reserves	4,113
D. Gain (loss) from earnings: C - B	\$ 1,199



# Investment Earnings in 2020

## (Active Participants)

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- \$1,746 million is the total recognized asset gain for the year for active participants
- However, part of the total gain/loss is allocated to Variable Excess accounts
- Some of the gain flows through to members via the operation of Money Purchase minimum benefits
- Must net these out to determine remaining core fund gain or loss
- Remaining portion affects contribution rates



# Investment Earnings in 2020 (Active Participants)

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	<u>\$ Millions</u>
Gross Gain/(Loss) for the Year (for Actives)	\$1,746
Less Estimated Gain/(Loss) due to Money Purchase	260
Less Estimated Gain/(Loss) due to Variable Excess	<u>287</u>
Net Core Fund Asset Gain/(Loss)	\$1,199



# Comparative Schedule of Experience Gains/Losses by Decrement

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## Divisions Combined (Millions)

	<u>2019</u>	<u>2020</u>
Normal Retirement	\$ (25.1)	\$ (33.5)
Early Retirement	(13.3)	(22.7)
Disability Retirement	(5.5)	(10.5)
Death with Benefit	(3.7)	(1.7)
Other Separations	(13.5)	(40.4)
	<hr/>	<hr/>
Total	\$ (61.1)	\$ (108.8)
As % of Liabilities	-0.14%	-0.24%





# Salary Related Gain/Loss

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- Pay increases were overall higher than expected, resulting in a loss

	<b>Gain/Loss</b>	<b>% of Group</b>
	<b>\$ Millions</b>	<b>Liabilities</b>
General, Executive & Elected	\$(267.3)	(0.7)%
Protective w/Soc. Sec.	(150.5)	(3.3)%
Protective w/o Soc. Sec.	(21.3)	(2.0)%
	<b>\$(439.1)</b>	<b>(1.0)%</b>

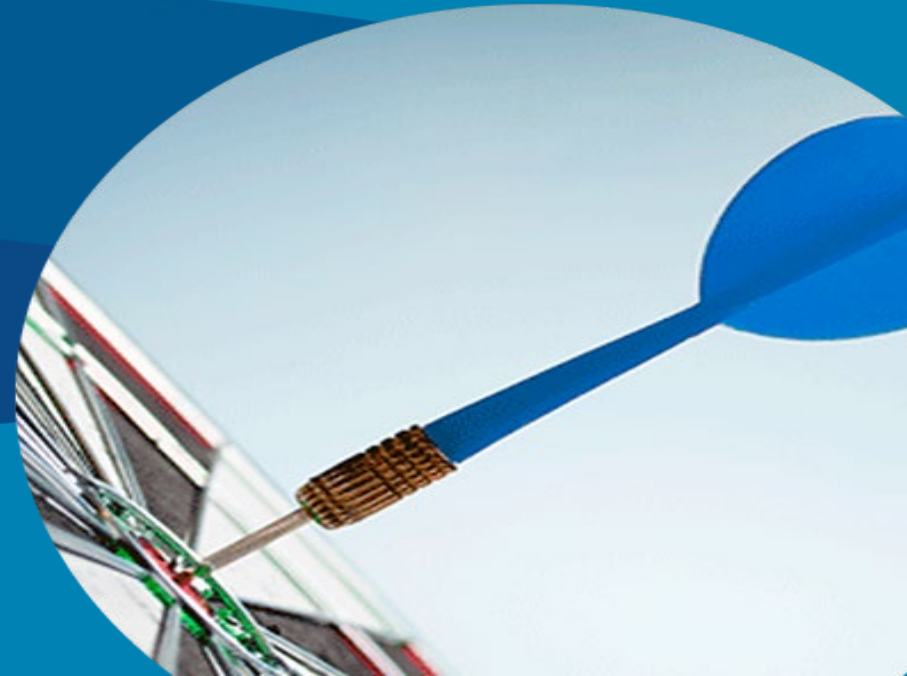
# Concluding Remarks

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- Recognition of remaining prior asset gains and losses are expected over the next few years
- This Gain/Loss Analysis is the third in a regular 3-year experience cycle
- This study, together with the 2018 and 2019 results, will form the basis for the next experience study – to be performed after the December 31, 2020 valuation cycle



# Current Events



# 2018-2020 WRS Experience Study

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- A summary of, and expansion on, the annual Gain/Loss analysis
  - Performed to refine assumptions every 3 years
  - Board selection and approval required
- Delivery at December 2021 Board meeting

# 2018-2020 WRS Experience Study

## The Concept of Present Value

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1

Actuarial calculations almost always begin with the calculation of a present value (“PV”)

2

PV (\$ payable in the future) = the amount of money that, if we had it today, would accumulate to the amount that will be payable considering:

- Investment Return
- Probability that money will be paid

3

The calculation of the present value depends upon assumptions

# 2018-2020 WRS Experience Study

## Present Value Assumptions

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### Investment Return

- Relates to Economic Assumptions



### Probability that Money will be Paid

- Relates to Demographic Assumptions, Mortality, Turnover, etc.

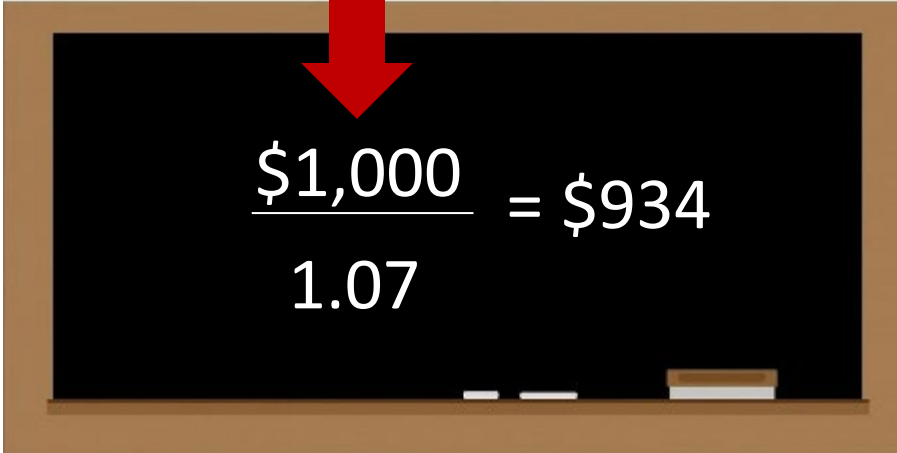
# 2018-2020 WRS Experience Study

## Present Value Examples

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The present value of \$1,000 payable 1 year from now to a bank at 7% interest is \$934.

The present value of \$1,000 payable 1 year from now to a person who is 99 years old today, provided that the person is alive 1 year from now, is probably less than \$500.



A chalkboard with a brown frame and a black surface. A red arrow points from the top text box down to the chalkboard. On the chalkboard, the equation  $\frac{\$1,000}{1.07} = \$934$  is written in white chalk. There are some faint white marks on the chalkboard surface, including a small white eraser and some white lines.

$$\frac{\$1,000}{1.07} = \$934$$

But if the 99 year old lives the entire year, you will owe the whole \$1,000.

# Selection of Assumptions

## What Are They?

### Economic

- Investment Return
- Payroll Growth Rate
- Promotional/Step Pay Increases
- Population Growth Rate (Usually, a constant population size is assumed)

### Demographic

- Retirement Rates
- Disability
- Turnover
- Mortality

## Who Selects Them?

### Economic

- Board
- Actuary
- Other Advisors

### Demographic

- Mostly Actuary
- Board Approves



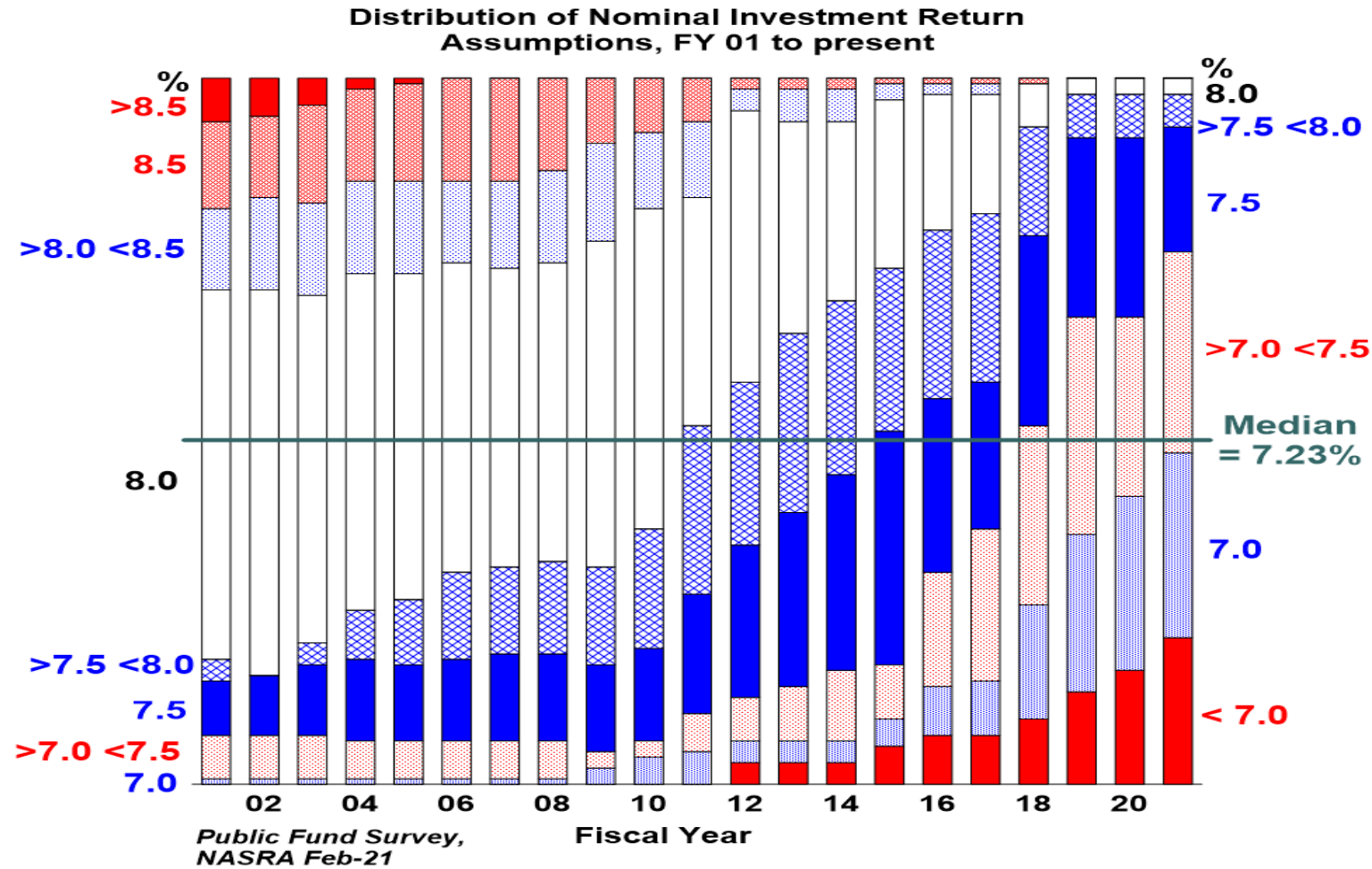


# Changes in Major Assumptions

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Effect on Liabilities and Contributions		
Assumption	Action	Usual Effect
Interest Rate	Decrease	Increase
Wage Inflation	Increase	Increase
Spread	Increase	Decrease
Population Growth	Increase	Decrease
Retirement	Retire Younger	Increase
Turnover	More Quits	Decrease
Mortality	Live Longer	Increase

# Public Pension Investment Return Assumptions: N= 130 Large Public Pension Plans, 2001-2020



# 2018-2020 WRS Experience Study

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- Previous study (2015-2017) highlights
  - A LOT of discussion about mortality
  - Approval of new demographic assumptions
  - Approval of 20 bp drop in Wage Inflation and Assumed Investment return
  - Impact on contribution rates
    - 60 bp increase for Protectives
    - no measurable change for General

# 2018-2020 WRS Experience Study

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- Forthcoming study 2018-2020 expectations
  - A LOT of discussion about mortality, investigation of new PUB-2010 and MP-2021 tables
  - Investigation and approval of new demographic assumptions
  - Investigation and approval of new economic assumptions

- 
- QUESTIONS?

# Disclaimers

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- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- Brian Murphy, Mark Buis and James Anderson are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.
- This is one of multiple documents comprising the actuarial report. Additional information regarding actuarial assumptions and methods, and important additional disclosures are provided in the full report entitled “Thirty-Ninth Annual Actuarial Valuation and Gain Loss Analysis.”
- If you need additional information to make an informed decision about the contents of this presentation or the contents of the full report, or if anything appears to be missing or incomplete, please contact us before making use of the information.

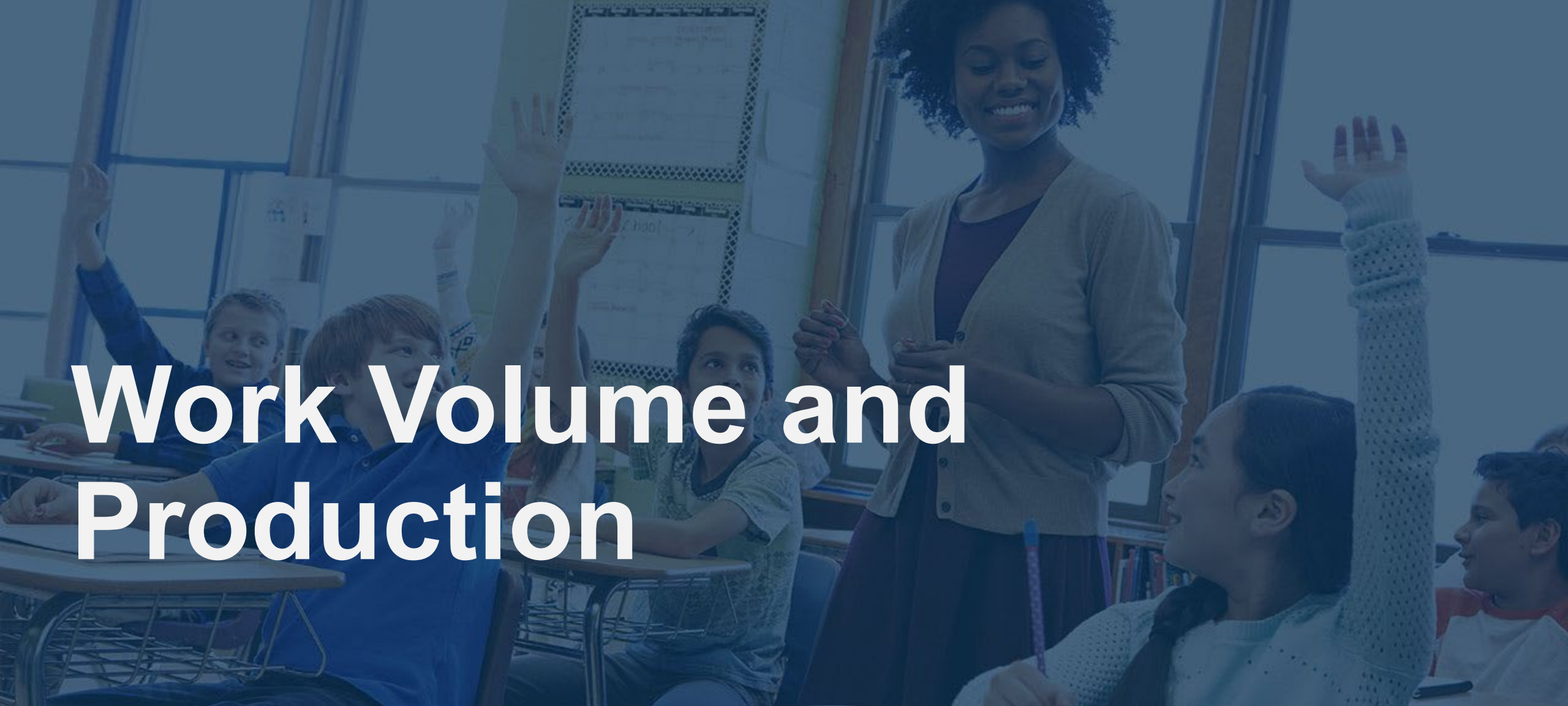
# Retirement and Customer Service Update

Item 4A – Joint Meeting of Retirement Boards

Anne Boudreau, Deputy Administrator

Division of Retirement Services

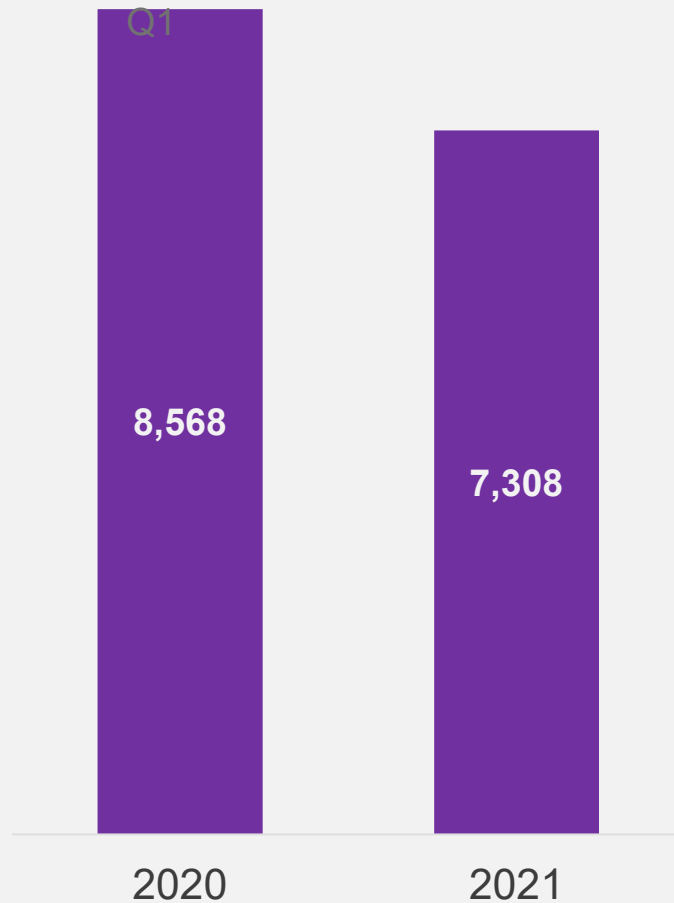




# Work Volume and Production



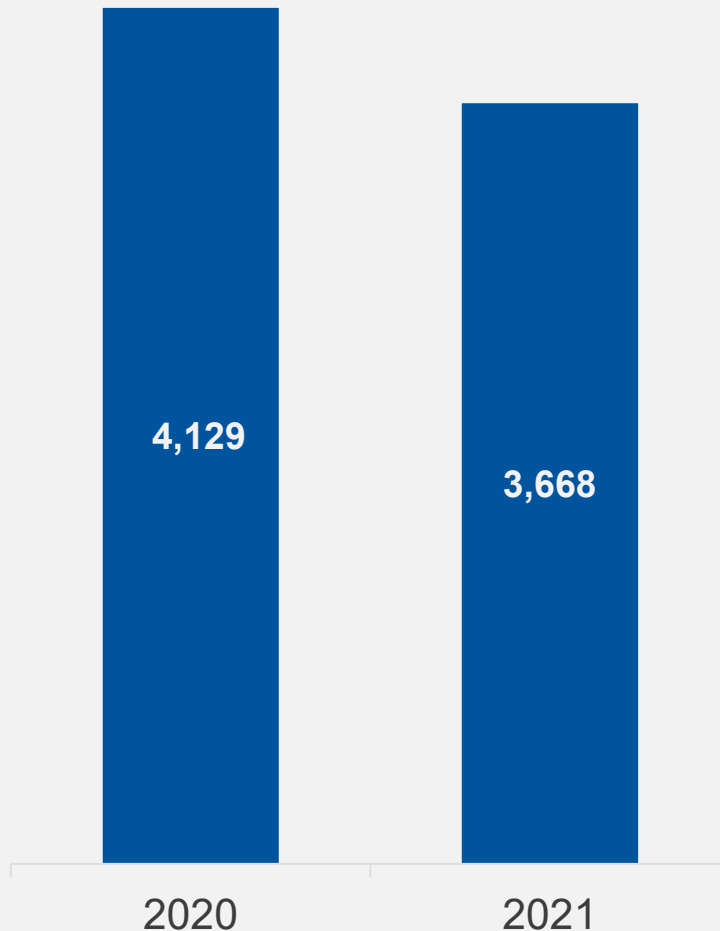
# Retirement Trends



**Retirement  
Estimates**

**↓ 14.7%**

# Retirement Trends



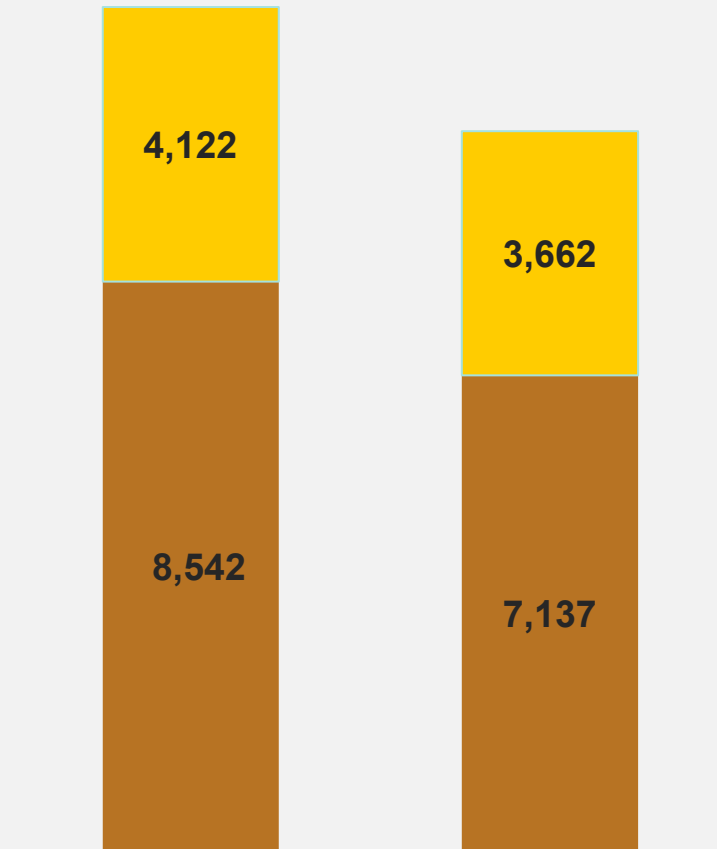
**Retirement Applications**



**11.2%**

# Retirement Trends

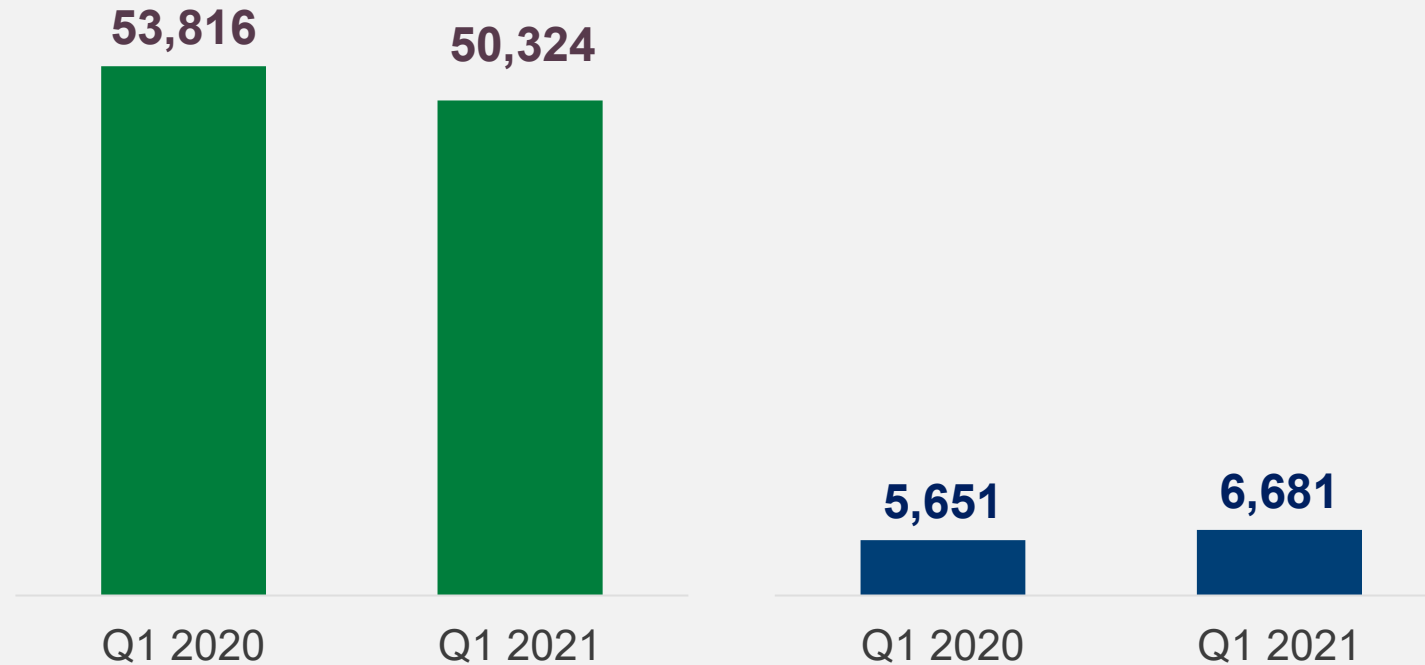
■ Estimates    ■ Applications



**Adjusted Totals**

**↓ 14.7%**

# Member Contacts to ETF



**Calls**

↓ 6.5%



**Email**

↑ 18.2%



# ETF Projects and Accomplishments

# Process Improvement: Employer Onboarding



Plain Language and  
Checklist



Short Educational  
Video



Better Customer  
Satisfaction

# Process Improvement: Annual Reconciliation



New  
Virtual Process



More Accurate  
Employer Reports



Strong Case  
Management



**Questions?**



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# Thank you

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ETF E-mail Updates



608-266-3285  
1-877-533-5020

# State Budget and Legislative Update

## Item 4B – Joint Meeting of Retirement Boards

Tarna Hunter, Director of Strategic Engagement and  
Government Relations

Office of the Secretary



# Written Reports Only

Items 4C – 4H - Memo Only



# Future Items for Discussion

Item 5 – No Memo



# Adjournment

Item 6 – No Memo



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# Thank you

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