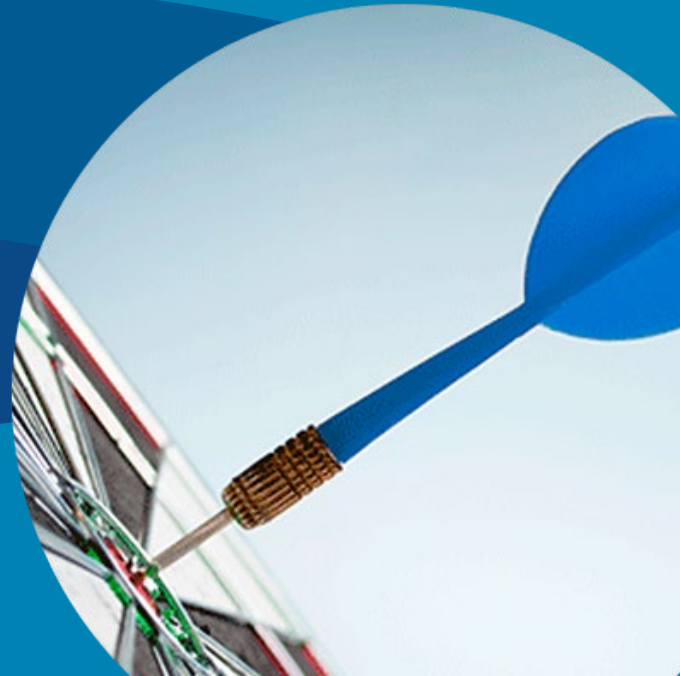




# Wisconsin Retirement System

39th Annual Actuarial Valuation as of  
December 31, 2019 and Gain/Loss  
Analysis

June 2020

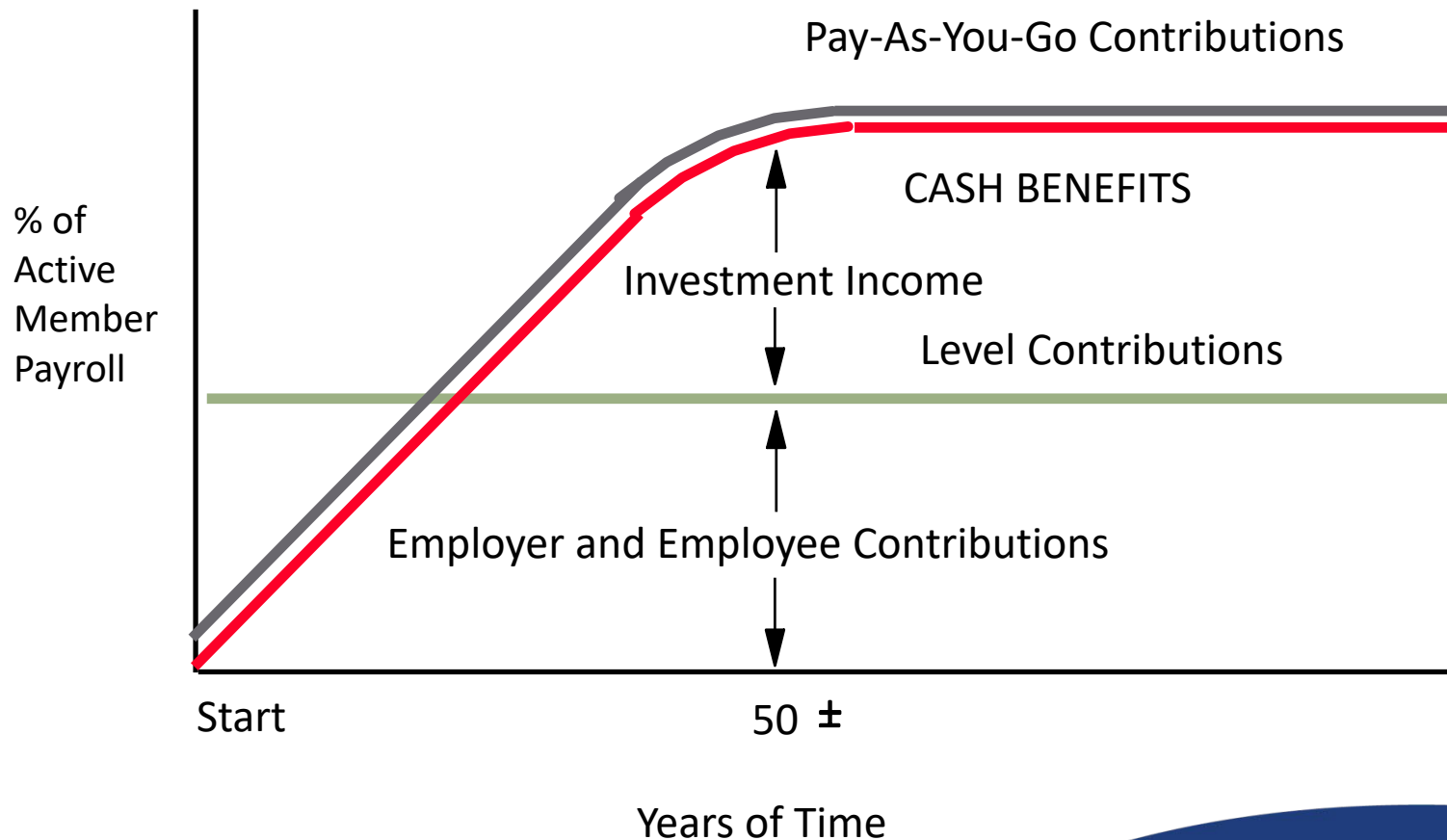


# Funding Objectives

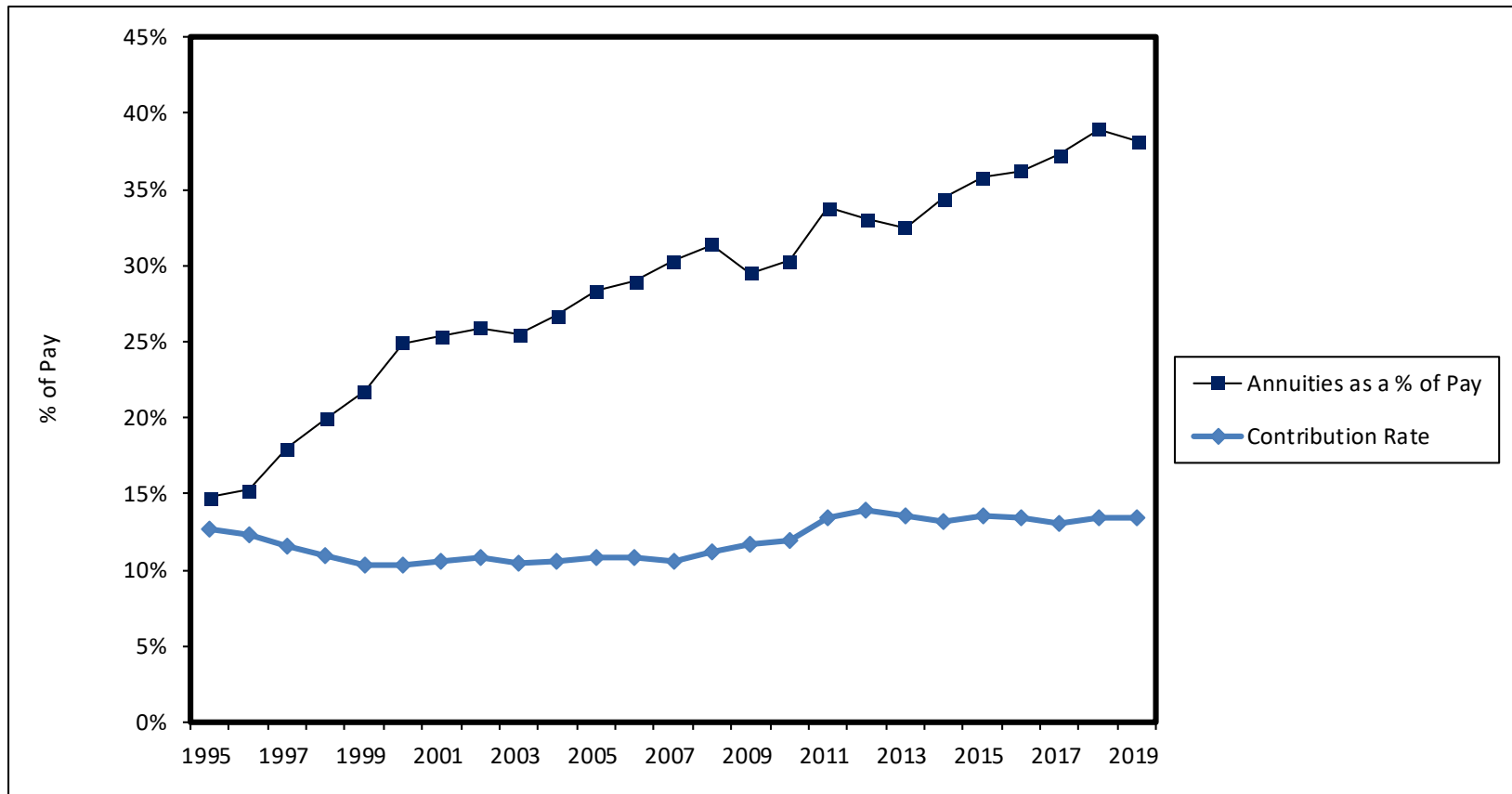
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- Intergenerational equity with respect to plan costs
- Stable or increasing ratio of assets to liabilities
- Stable pattern of contribution rates

# 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	235,645	\$12,926.3	\$54,855	45.3	11.2	\$59,406
Executive Group & Elected Officials	1,302	112.3	86,269	55.3	13.8	108,499
Protective Occupation with Social Security	19,528	1,314.4	67,310	39.8	12.1	69,228
Protective Occupation without Social Security	2,759	230.7	83,619	40.9	14.0	87,765
<b>Total Active Participants</b>	<b>259,234</b>	<b>\$14,583.7</b>	<b>\$56,257</b>	<b>44.9</b>	<b>11.3</b>	<b>\$60,694</b>
Prior Year	256,933	\$14,041.3	\$54,650	45.0	11.4	\$59,186

# All Participants

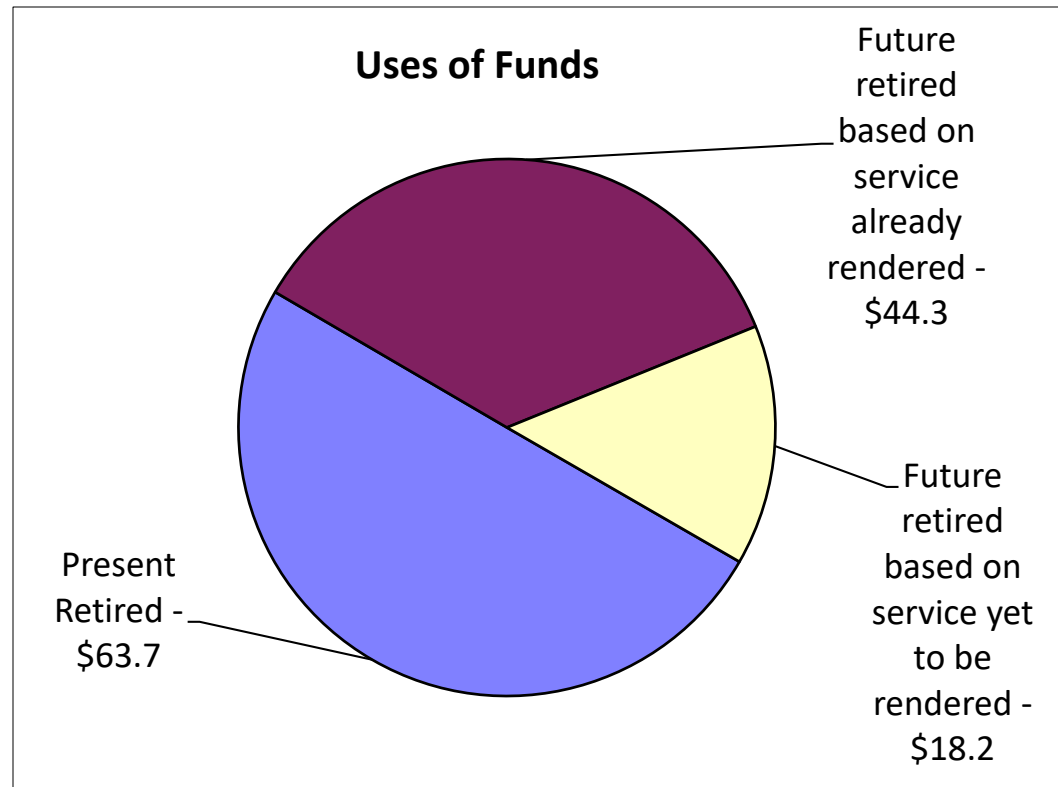
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Valuation Group	Number	Average Annual Earnings/Benefits*
Actives	259,234	\$56,257
Inactives	169,471	\$16,861
Retirees & Beneficiaries	216,944	\$25,645
<b>Total Participants</b>	<b>645,649</b>	

\* For inactives, average money purchase balance.

# \$126.2 Billion\* of Benefit Promises to Present Active and Retired Members

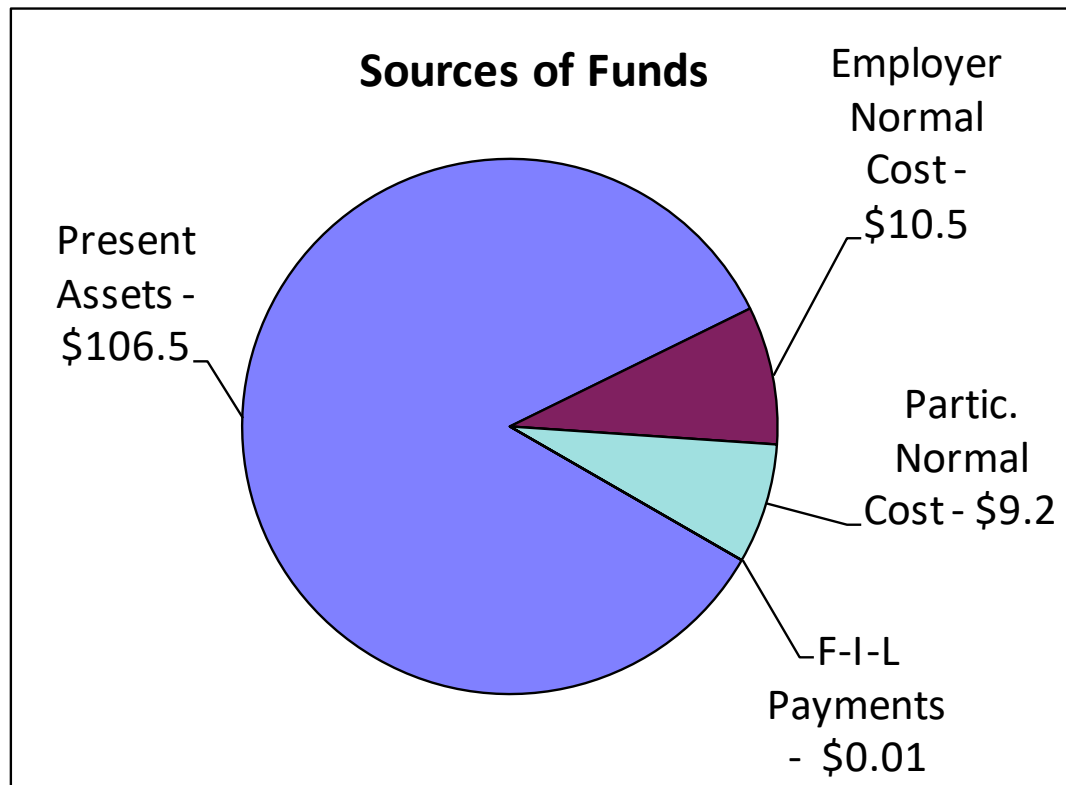
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\* Present value of future benefits; all divisions combined.

# Sources of Funds for Financing \$126.2 Billion of Benefit Promises

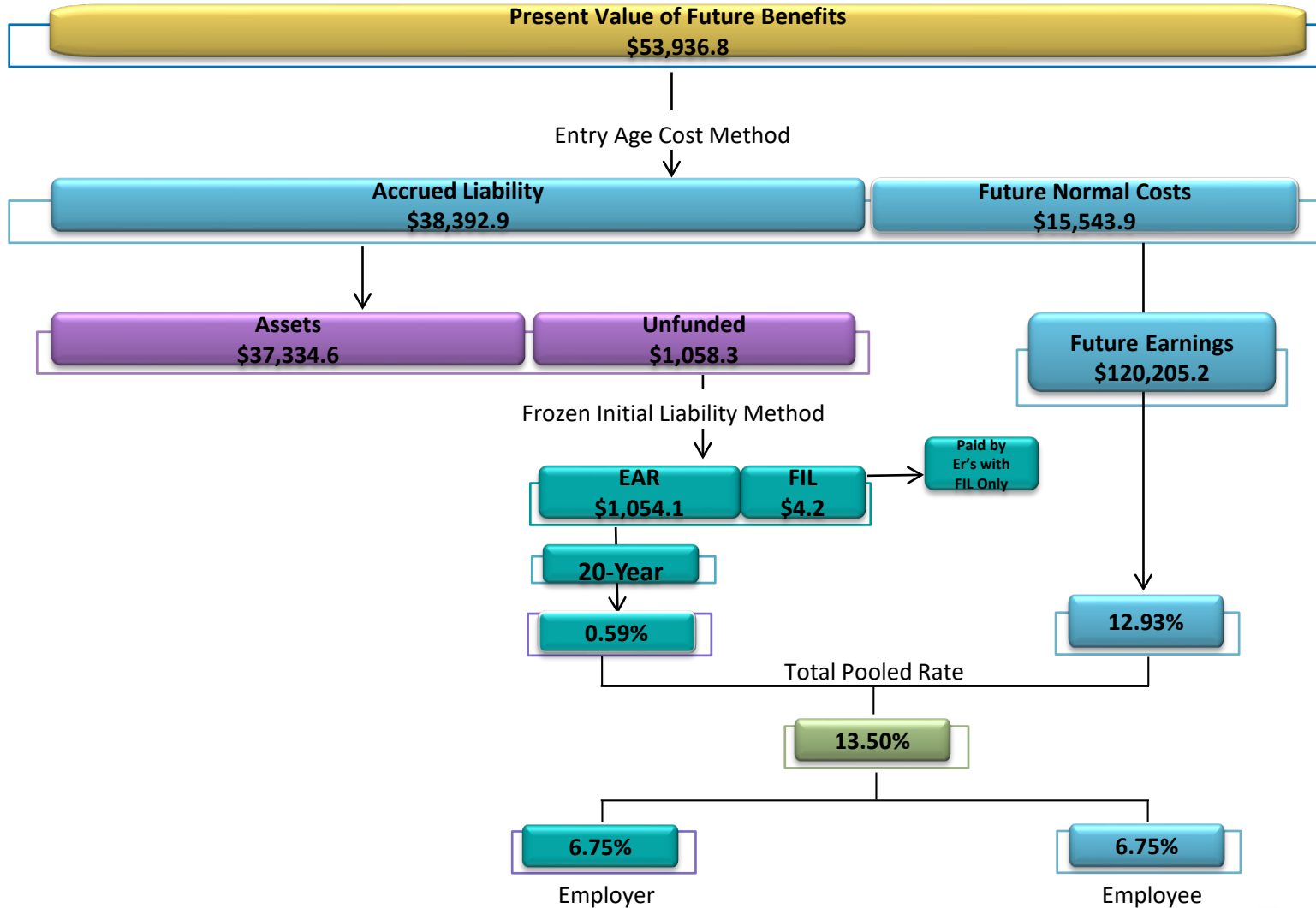
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# Actuarial Valuation Process

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



# Summary of December 31, 2019 Valuation Results

	General, Executive & Elected Officials		Protective Occupation				Average 2021
			With Soc. Sec.		Without Soc. Sec.		
	2021	2020	2021	2020	2021	2020	
Employer Normal Cost	6.75%	6.75%	11.75%	11.65%	16.35%	16.25%	7.45%
Participant Normal Cost	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%
<b>Total Normal Cost</b>	<b>13.5%</b>	<b>13.5%</b>	<b>18.5%</b>	<b>18.4%</b>	<b>23.1%</b>	<b>23.0%</b>	<b>14.2%</b>
<b>Estimated Total NC (\$ millions)*</b>	<b>\$1,867.4</b>	<b>\$1,797.9</b>	<b>\$258.0</b>	<b>\$246.6</b>	<b>\$56.5</b>	<b>\$54.9</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>
1999	10.30%	14.30%	11.40%	15.50%
2004	10.63%	11.37%	13.19%	14.41%
2009	11.72%	13.35%	14.74%	17.26%
2014	13.20%	15.60%	16.00%	20.00%
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%

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 = 328% - 434% (with - without Soc. Security)
    - General & Executive/Elected = 286%
  - Liability/Payroll ratios<sup>1</sup>
    - Protective = 359% - 463% (with - without Soc. Security)
    - General & Executive/Elected = 294%

<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%	18.40%	23.00%
Effect of Benefit Change	0.00%	0.00%	0.00%
Effect of Assumption Change	0.00%	0.00%	0.00%
Effect of Asset Performance	(0.06)%	(0.18)%	(0.27)%
Effect of Salary Experience	0.02%	0.14%	0.06%
Effect of Money Purchase Benefit	0.00%	0.00%	0.00%
Demographic and Other Experience	0.04%	0.14%	0.31%
2021 Normal Cost Rate	13.50%	18.50%	23.10%

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>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Actual Investment Return	\$ 17,765				
Assumed Investment Return	6,744				
Gain/(Loss) to be phased-in	11,021				
Phased-in recognition					
• Current year	\$ 2,204	?	?	?	?
• First prior year	(2,049)	\$ 2,204	?	?	?
• Second prior year	1,461	(2,049)	\$ 2,204	?	?
• Third prior year	120	1,461	(2,049)	\$ 2,204	?
• Fourth prior year	<u>(1,344)</u>	<u>120</u>	<u>1,461</u>	<u>(2,049)</u>	<u>\$ 2,204</u>
Total recognized gain (loss)	\$ 392	\$ 1,736	\$ 1,616	\$ 155	\$ 2,204



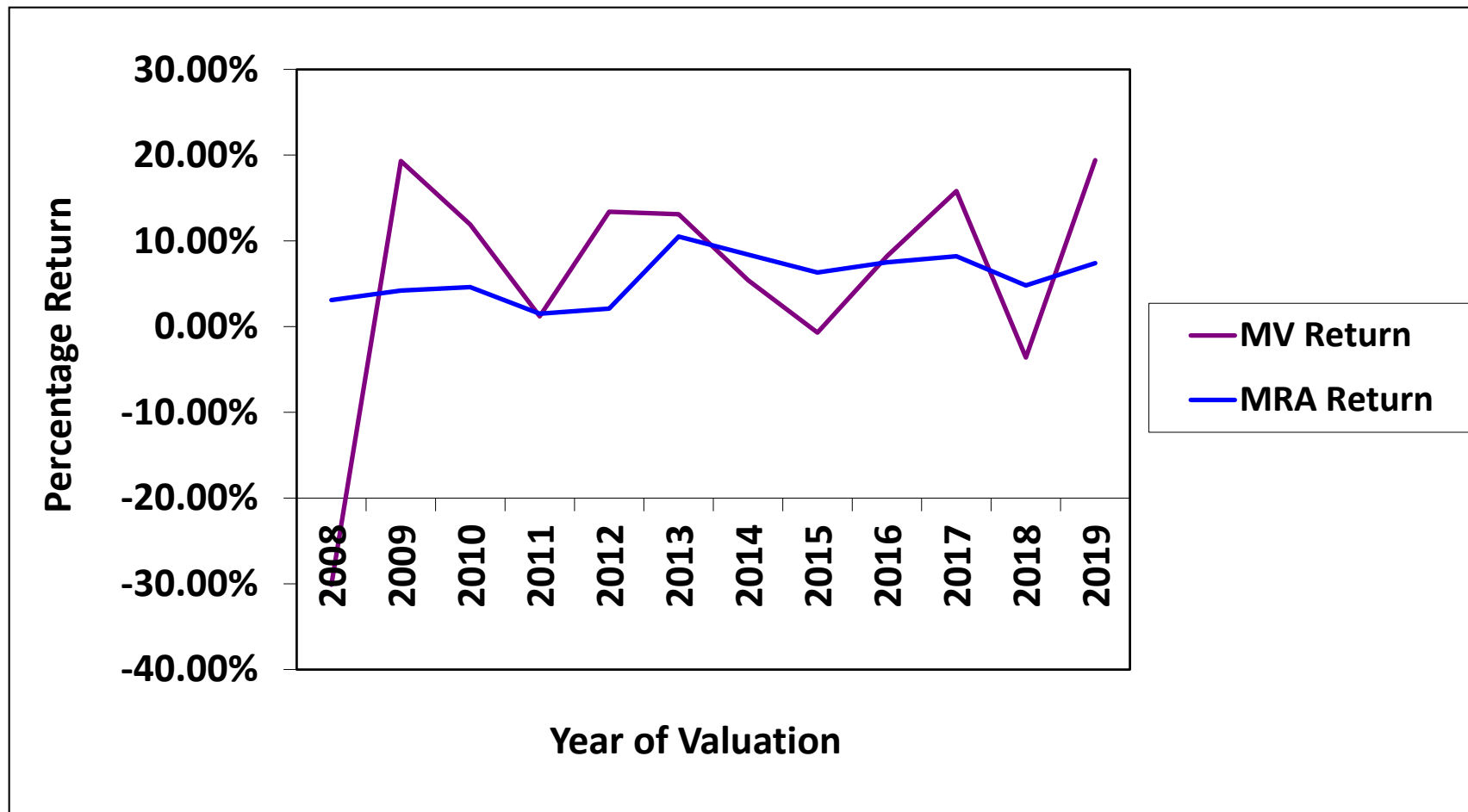
# Reconciliation of Market Recognition Account (MRA)

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	<u>\$ Millions</u>
MRA at Beginning of Year	\$ 98,081.7
Non-Investment Cash Flow	(3,481.2)
Assumed Return (at 7.0%)	6,743.9
Phase-in of Gains/(losses)	392.2
MRA at End of Year	\$101,736.6
MRA Rate of Return	7.40%
Market Value Rate of Return	19.40%

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

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



# WRS Funded Status

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	<b>Frozen Initial</b>	<b>Entry Age</b>
2016	100.0%	99.0%
2017	100.0%	99.5%
2018	100.0%	98.6%
2019	100.0%	98.6%

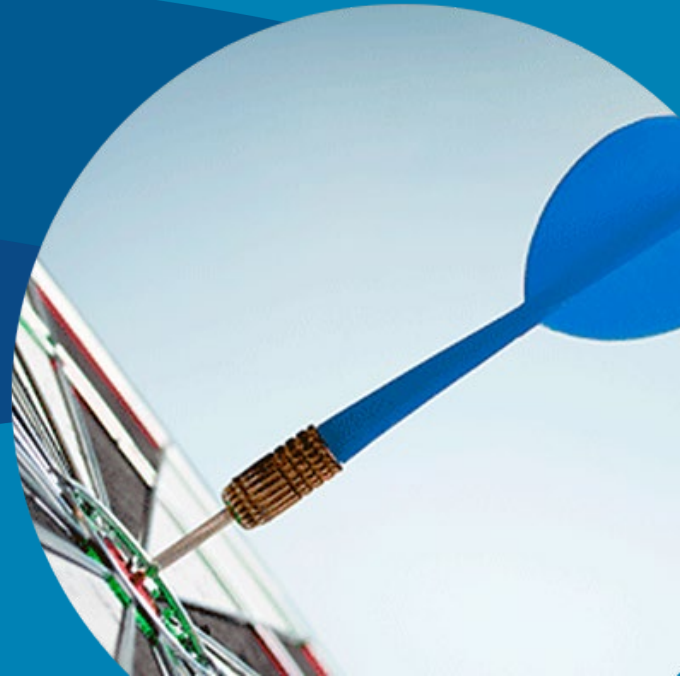
# Concluding Remarks

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- There are \$5.7 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



# 2019 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

---

$$C + I = B + E$$

**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**

---

$$C + I = B + E$$

**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 2019

---

	<u>Actual</u>	<u>Expected</u>
<b>Beginning Census</b>	256,933	
(-) Normal Retirement	4,267	4,577
(-) Early Retirement	3,490	4,209
(-) Death	109	240
(-) Disability Retirement		
- Total Approved	282	193
- Less Pending	87	
- Net New	195	
(-) Other Separations	14,553	13,463
(-) Transfers Out	2,041	
(+) Transfers In	2,041	
(+) New Entrants	24,915	
<b>Ending Census</b>	259,234	

# Population Development During 2019

---

**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. The net result was a small loss.

# Components of Total Gain/(Loss)

---

	<b>Gain/(Loss) in Millions</b>	
	<b>2018</b>	<b>2019</b>
Economic Risk Areas	\$(379)	\$95
Decrement Risk Areas	(57)	(61)
Other Activity	<u>(89)</u>	<u>(122)</u>
Total Gain/(Loss)	\$(525)	\$(89)

# Investment Earnings in 2019 (Active Participants)

---

\$ Millions

A. Average balance on Participant and Employer Accumulation Reserves	\$40,008
B. Expected earnings: 7.0%	2,800
C. Earnings credited to Participant and Employer Accumulation Reserves	3,636
D. Gain (loss) from earnings: C - B	\$ 836



# Investment Earnings in 2019

## (Active Participants)

---

- \$836 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 2019 (Active Participants)

---

	<u>\$ Millions</u>
Gross Gain/(Loss) for the Year (for Actives)	\$836
Less Estimated Gain/(Loss) due to Money Purchase	35
Less Estimated Gain/(Loss) due to Variable Excess	<u>641</u>
Net Core Fund Asset Gain/(Loss)	\$160

# Comparative Schedule of Experience Gains/Losses by Decrement

---

## Divisions Combined (Millions)

	<u>2018</u>	<u>2019</u>
Normal Retirement	\$(14.5)	\$(25.1)
Early Retirement	(18.3)	(13.3)
Disability Retirement	(7.7)	(5.5)
Death with Benefit	(2.9)	(3.7)
Other Separations	(13.8)	(13.5)
	<u>          </u>	<u>          </u>
Total	\$(57.2)	\$(61.1)
As % of Liabilities	-0.15%	-0.14%

# 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	\$(34.4)	(0.1)%
Protective w/Soc. Sec.	(26.6)	(0.6)%
Protective w/o Soc. Sec.	(4.5)	(0.4)%
	<b>\$(65.5)</b>	<b>(0.2)%</b>

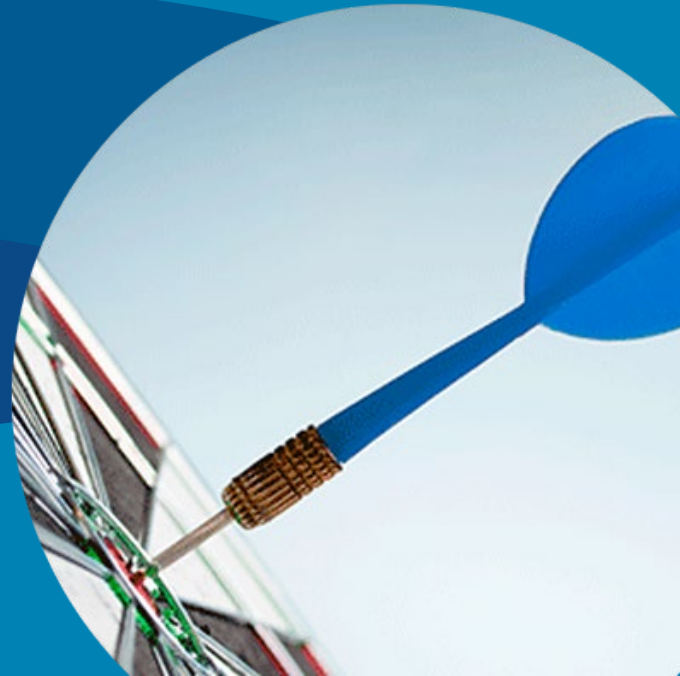
# Concluding Remarks

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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 second in a regular 3-year experience cycle
- This study, together with the 2018 and 2020 results, will form the basis for the next experience study – to be performed after the December 31, 2020 valuation cycle



# Current Events



# COVID Implications for the WRS

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- GRS-ETF Study
- Where We Stand Today
- Potential Impact from Mortality
- Impact of Economic Volatility on Future Funding Results

# COVID Implications for the WRS

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- GRS-ETF Study
- Deterministic projections will investigate various areas of interest
- Stochastic projections will model impact on retiree dividends
- Commentary re: Pros/cons, consequences of implementing changes



# Where We Stand Today

---

- We obviously do not yet know the full scope of the impact of the COVID-19 pandemic
  - On asset markets
    - Markets are still a roller coaster
    - Major US equity indexes lost 30-35% of their value from February 14 through March 23
    - Recovered almost one-third by the end of March
    - Recovered almost two-thirds by the end of April
    - Flat through May 21
    - What will the next month/quarter/year hold?

# Where We Stand Today

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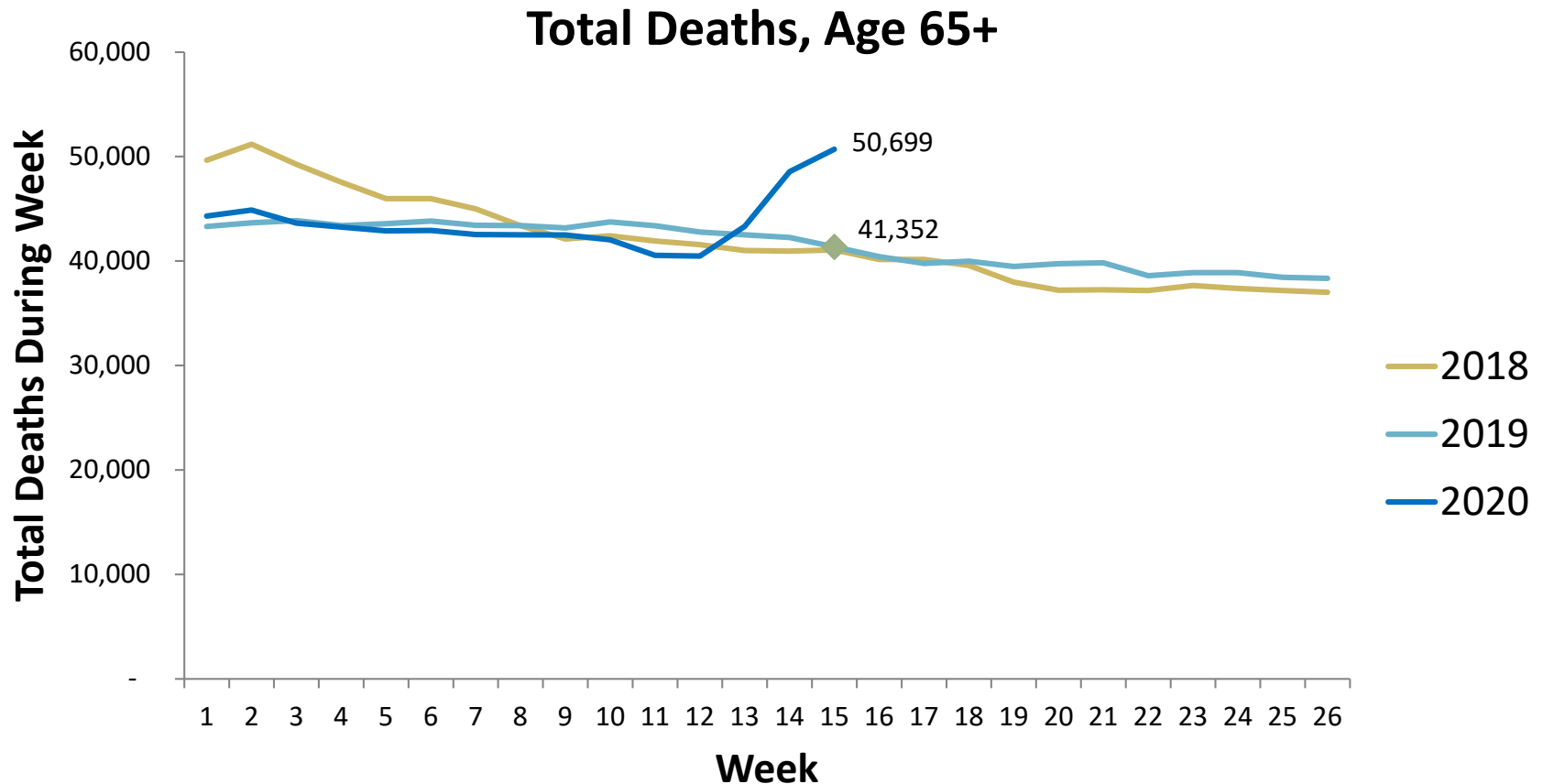
- We obviously do not yet know the full scope of the impact of the COVID-19 pandemic
  - On the Wisconsin Retirement System
    - Primarily focused on
      - Continuity of administrative functions
      - Monitoring asset allocation and liquidity needs
    - Investment earnings and contribution dollars are the concern
    - Actuarial metrics of your plan changes more slowly than most -- given the sharing of asset losses among actives, retirees and employers

# Demographics: Mortality

---

- What will the ultimate impact of COVID-19 be on Wisconsin mortality?
  - How much delay is in the real-time statistics being published?
  - What long-term trends will emerge going forward on plan mortality?
  - Consider two extremes

# National Mortality Data through Week Ending April 11<sup>th</sup>



<https://gis.cdc.gov/grasp/fluview/mortality.html>



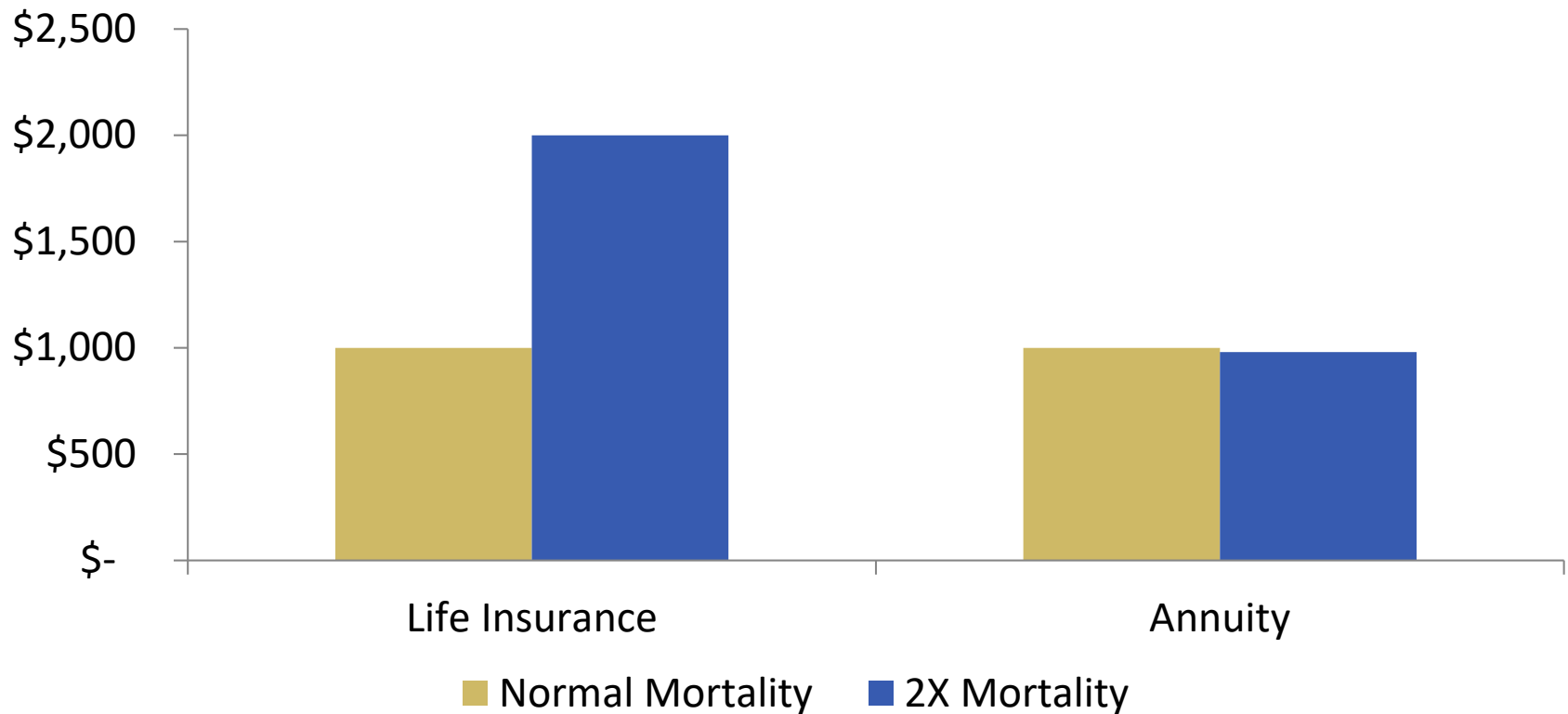
# Demographics: Mortality

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- Possibility #1: COVID-19 is a one-time “shock” event on plan mortality but longer-term trends are not expected to change
  - Large portion of people being significantly impacted were advanced in age with preexisting conditions
  - Will not have a major impact on WRS
    - Presumably followed by reduced mortality for the next year or two
    - Opposite of the impact this could have on life insurance

# Life Insurance vs Annuity

## Impact of 2X Normal Mortality over a Year on Annual Outflows



# Demographics: Mortality

---

- Possibility #2: Current pandemic signals overall change in future mortality trends
  - COVID-19 (or another virus) will continue to impact society for years to come
  - This true change in long-term trend will have a more lasting impact on plan health
    - Not just due to shorter life expectancy
    - Could impact retirement patterns, incidence of disability, investment returns, etc.

# COVID Impact on Funded Status and Asset Accumulation

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- Impact could vary widely depending on the plan's starting point and length of the downturn
- In general, the impact will be driven by:
  - Investment Performance
  - Net Cash Flow
  - Actual Contributions versus Policy



# Trust the Process

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- WRS survived Great Recession
  - But with first ever Dividend decreases
  - But with changes to benefit multipliers
  - Codified Funding Policy
- Wherever this pandemic leads, now is the time to trust the funding policy

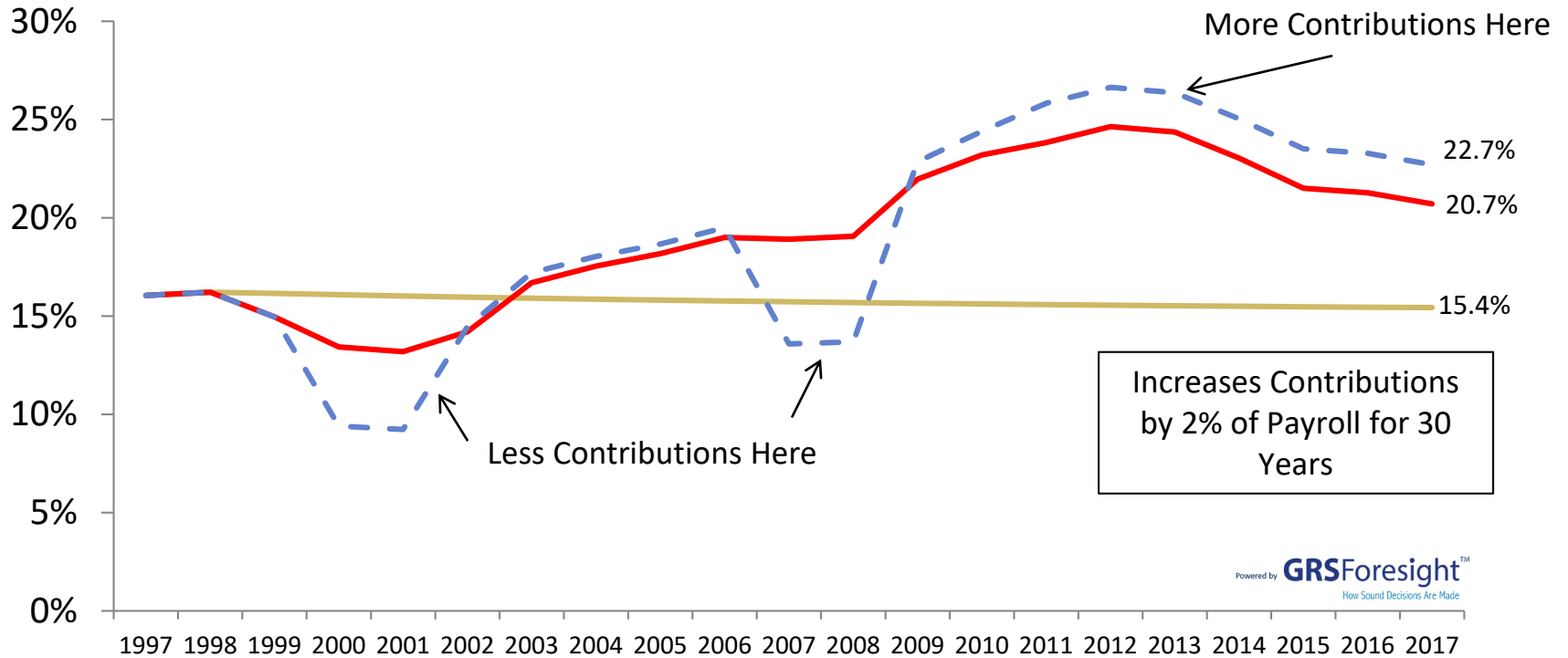
# COVID-19 Contribution Reductions?

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- Our clients are very interested to understand how the plan's funded status in the future will be impacted by :
  - Contribution holidays
  - Contribution reductions
  - Re-amortizations
  - Headcount reductions
- This is not the first time. During the 2002/2003 recession and the 2008 financial crisis, several plan sponsors reduced contributions
- These occurrences dig a hole that is hard to emerge from

# Funding Impact

## Contribution Rate



- 7% Per Year (Expected)
- 7% Average Compound, Actual Pattern
- - 7% Average Compound, Actual Pattern and Contribution Holiday



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How Sound Decisions Are Made

# Dealing With Discretionary Contribution Reductions

---

- Resist, Resist, Resist
  - Cost is not  $(1+I)^N$ , it is much more than that
  - Selling an illiquid asset, will have a MUCH higher cost than that
- Is there another source of funding?
- Get a scheduled, itemized, amortization schedule to make it up as soon as possible

# In Closing

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- Focus on administrative issues and investment management
- Trust the Process
- Advocate to keep the revenue stream as normal as possible
- The cost of missing contributions during a recession is much more than missing interest

# Disclaimers

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- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- Readers are cautioned to examine original source materials and to consult with subject matter experts before making decisions related to the subject matter of this presentation.
- This presentation expresses the views of the authors and does not necessarily express the views of Gabriel, Roeder, Smith & Company.

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- QUESTIONS?

# Disclaimers

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- 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.”
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