



Experience Study & Investment Update

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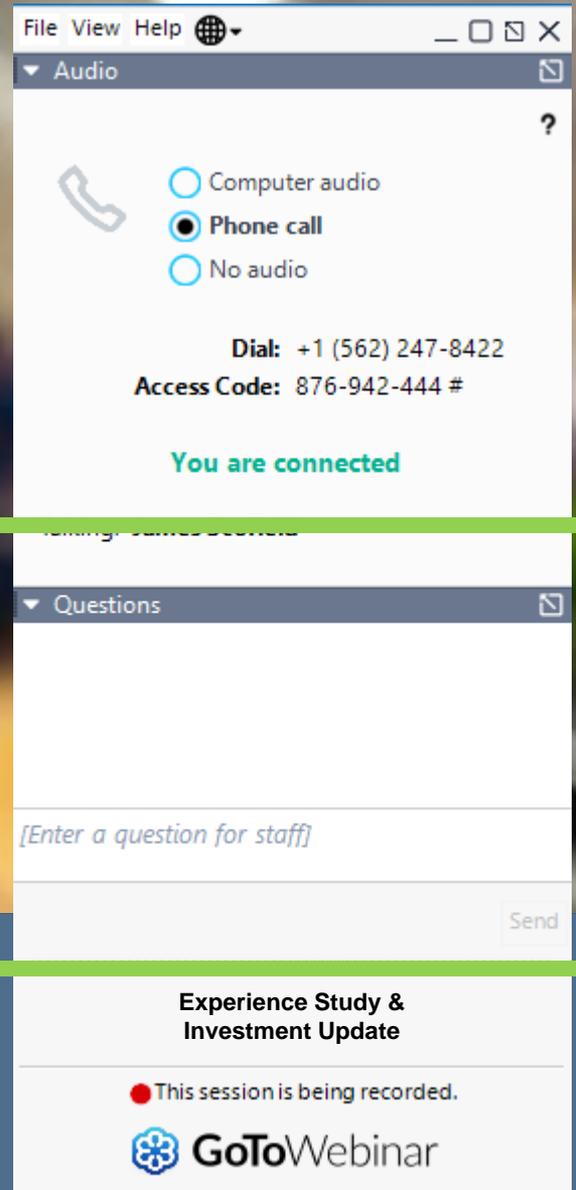


Agenda

- Introduction and Background
- Actuarial Assumptions & Experience Study Updates
- MERS Portfolio Management and Performance
- Management Strategies and Actions



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Experience Study & Investment Update

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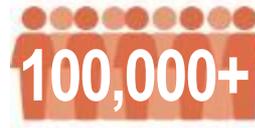
About MERS of Michigan

Our mission is to partner with those who serve Michigan communities to provide retirement benefits and related services to support a secure retirement

BY THE NUMBERS



of Michigan's pension plans participate with MERS



participants



in combined total assets

Data as of 3/31/2020

About You

What is your role at your local unit of government?

Background

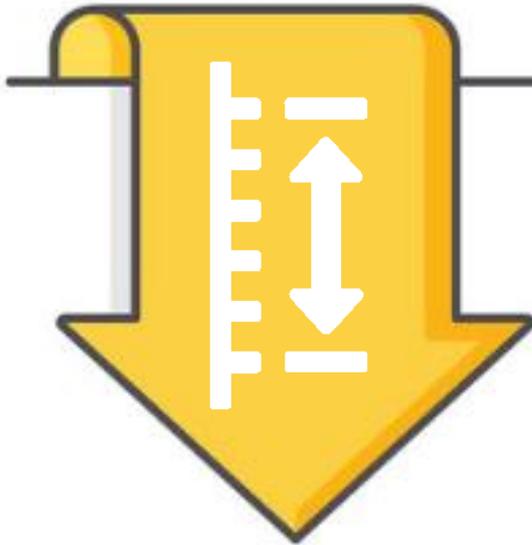
- Benefits are determined at the local level
- As the Plan Fiduciary, MERS role is to ensure that each municipality's plan assets are adequate to provide for the benefits that are expected to be paid
- Our independent, elected board governs MERS with fiscal best practices which promote responsible funding



Responsible Funding Practices

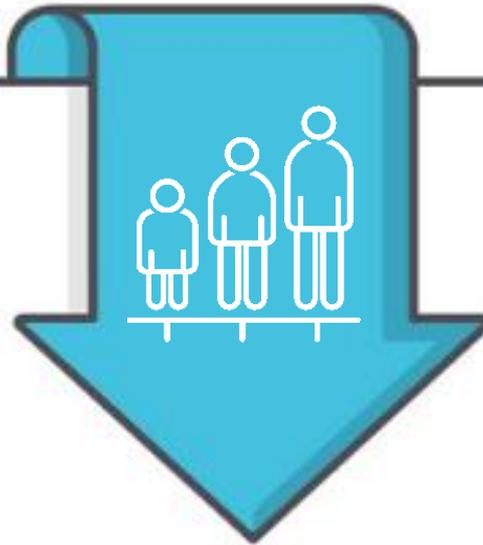
- Required contributions are calculated by an independent accredited actuary using assumptions about future events
- Your required contributions, along with other plan information, is provided to you each year in your Annual Actuarial Valuation
- An actuarial audit is performed regularly
- Assumptions fall into two categories — **economic and demographic**
- As part of our fiduciary responsibility and fiscal best practices, we perform an **Experience Study** every five years to compare actual experience of the plan with the assumptions to determine if changes are needed

Funding Policy Goals & Priorities



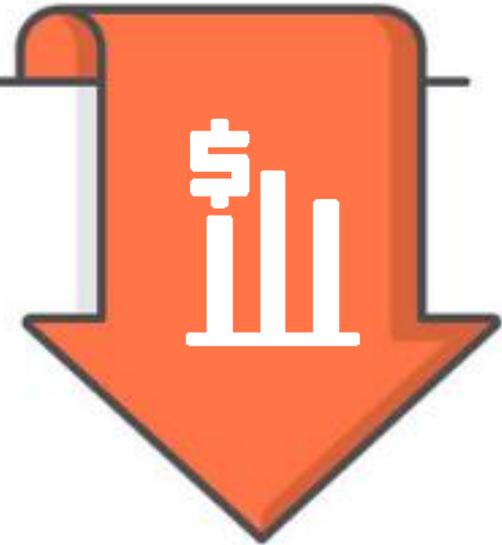
1

Adequacy



2

Intergenerational
Equity

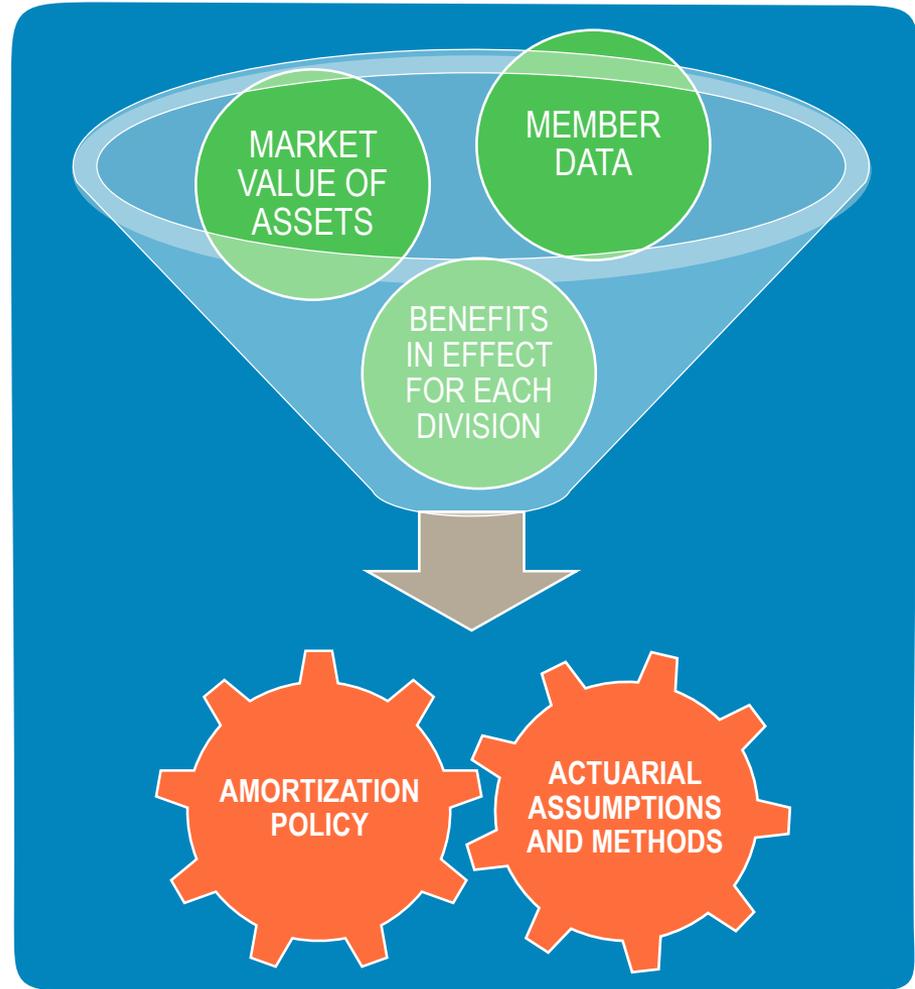


3

Contribution
Stability

Calculating the Total Annual Contribution

Total Annual Contribution =



Timeline

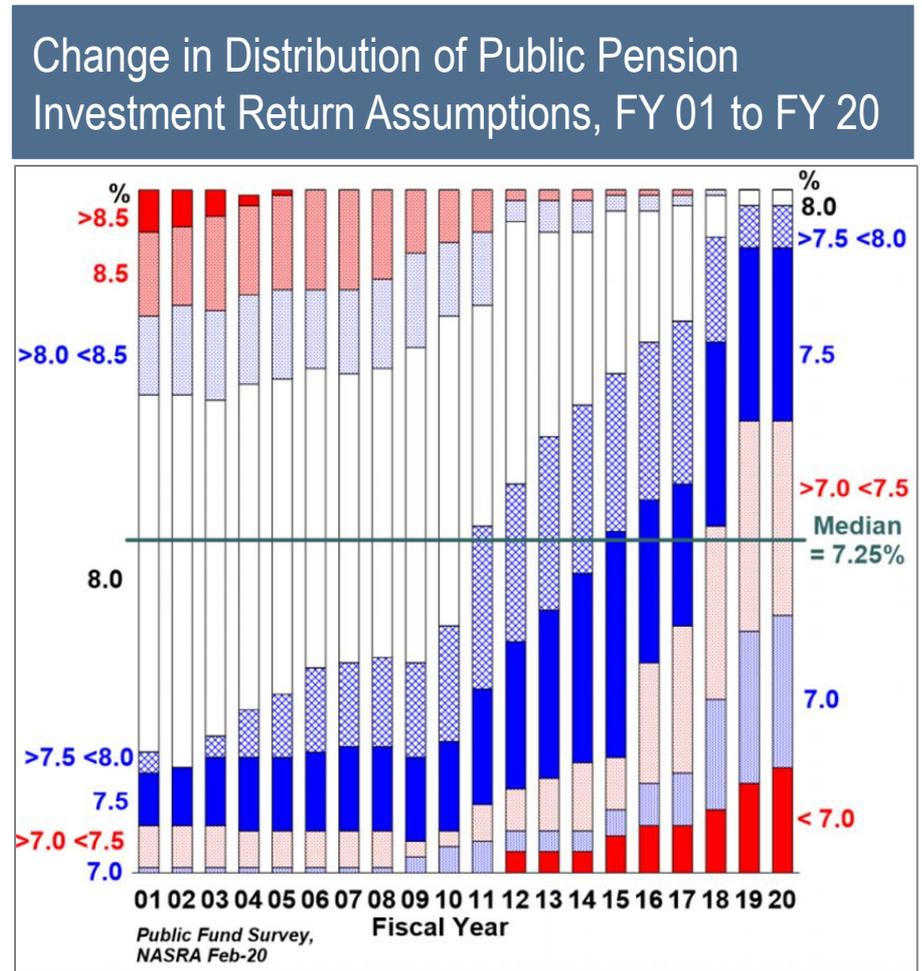
- We understand that giving you advance notice of changes is important
- The economic assumption review was performed first to provide more advance notice
- **Economic assumption** changes were adopted in 2019 and impact FY 2021 contributions
- **Demographic assumption** changes were adopted in 2020 and impact FY 2022 contributions



Actuarial Assumptions & Experience Study Updates

Economic Assumptions

- Plans are reviewing economic assumptions more frequently so plans can make incremental changes on an ongoing basis
- NASRA study of public pension plan investment return assumptions
 - Median rate: 7.25%
 - Lowest rate: 5.25%
 - Highest rate: 8.0%



Investment Rate Review Process

- In mid-2018, GRS conducted an independent analysis of the investment rate assumption
- Use an industry standard tool to review capital market assumptions from independent investment consultants
- Adapted assumptions to MERS' asset allocation policy
- Look at 10, 20 and 30 year forecasts

MERS Economic Assumptions

- In 2019, the MERS Retirement Board adjusted key economic assumptions

Investment rate of return assumption was lowered from 7.75% to 7.35%

Wage inflation assumption was lowered from 3.75% to 3.00%

- These assumption changes were effective with the 2019 valuation and **will impact FY 2021** contributions



Demographic Assumptions

Key Demographic Assumptions

- Early 2020, the MERS Retirement Board approved changes to demographic assumptions
- Key changes were made to:



Mortality

- Estimate of how long each individual is expected to live and consequently how long each individual is expected to receive a pension
- Life expectancies have generally increased over time
- Society of Actuaries issued Pub-2010 mortality table in 2019
 - Separate assumptions for males and females
 - Table was then adapted to MERS' experience on a liability-weighted basis

Mortality Improvement

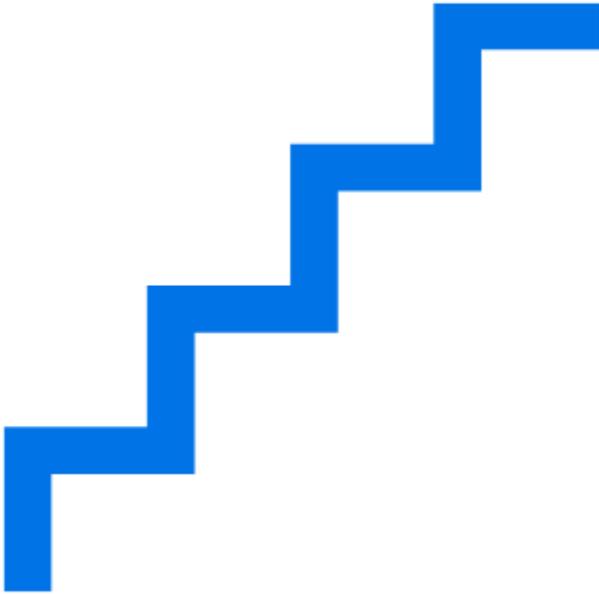
This assumption recognizes that mortality rates continue to improve over time

Life Expectancies of the U.S. Population

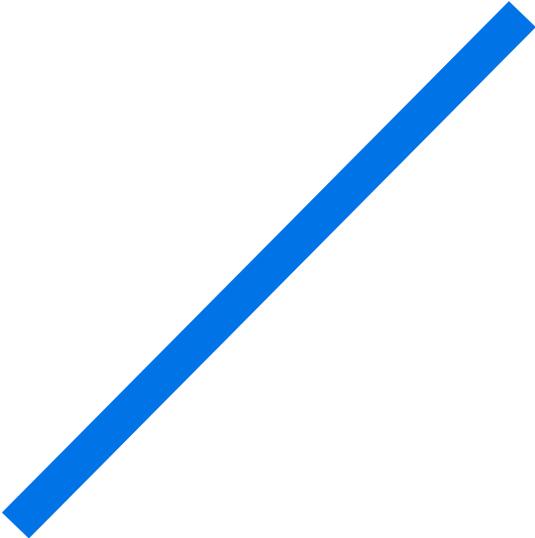
| Year |  From Birth |  From Birth |  Age 65 |  Age 65 |
|----------------------------|---|---|---|---|
| 1935 | 59.4 | 63.3 | 76.9 | 78.2 |
| 2010 | 75.4 | 80.0 | 81.6 | 84.2 |
| 2050 Projection | 79.5 | 83.6 | 83.9 | 86.4 |

Source: Social Security Administration, Actuarial Study Number 120

Mortality Improvement Types



Static



Fully Generational

Retirement Rates

- Overall, actual retirement experience was similar to the assumed experience
- There is strong evidence that Public Safety Retirement rates differ from those of other employees

| | Exposures | Actual | Expected | A/E |
|---------------|-----------|---------|----------|------|
| Public Safety | 1,290.2 | 454.9 | 383.2 | 119% |
| All Others | 5,450.3 | 1,340.9 | 1,411.3 | 95% |

- A higher incidence of retirements versus the current assumption suggests Public Safety need to be separately rated

Withdrawal Rates

- Overall, actual withdrawal experience was similar to the assumed experience
- There is strong evidence that Public Safety Withdrawal rates differ from those of other employees

| | Exposures | Actual | Expected | A/E |
|---------------|-----------|--------|----------|------|
| Public Safety | 4,879.1 | 114.2 | 162.4 | 70% |
| All Others | 7,633.7 | 343.4 | 290.9 | 118% |

- A lower incidence of withdrawals versus the current assumption suggests Public Safety need to be separately rated

Summary of Demographic Impacts

Summary of changes:

Mortality

- Likely to increase cost for divisions with more females and possibly decrease cost for divisions with more males

Mortality Improvement

- Likely to increase cost for most divisions
- Younger active workforces may see the highest increases
- A few retiree-only divisions with older populations may see a decrease

Retirement and Withdrawal Experience

- Generally, an increase for public safety divisions and possibly a decrease for other employee divisions

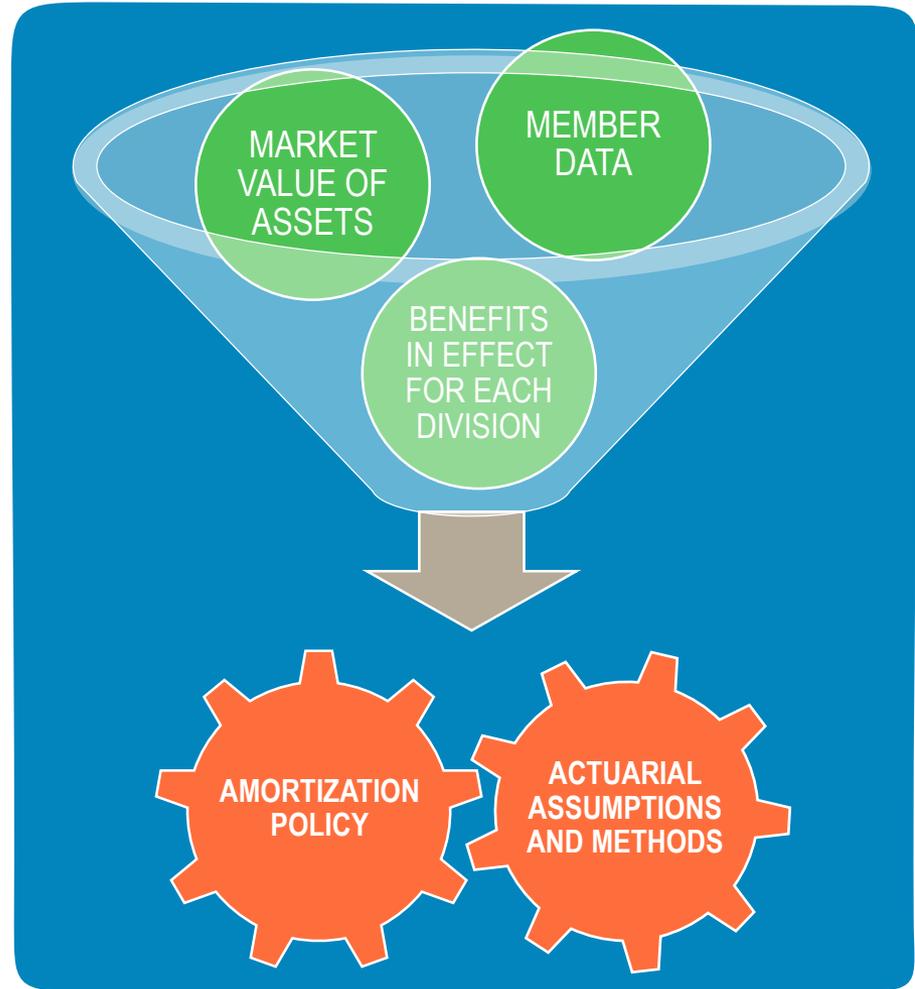
- Changes will be effective with the 2020 valuation and will impact FY 2022 contributions
- The 2019 Annual Actuarial Valuation reports have a “what-if” scenario showing projected costs under the new demographic assumptions for reference



MERS Portfolio Management and Performance

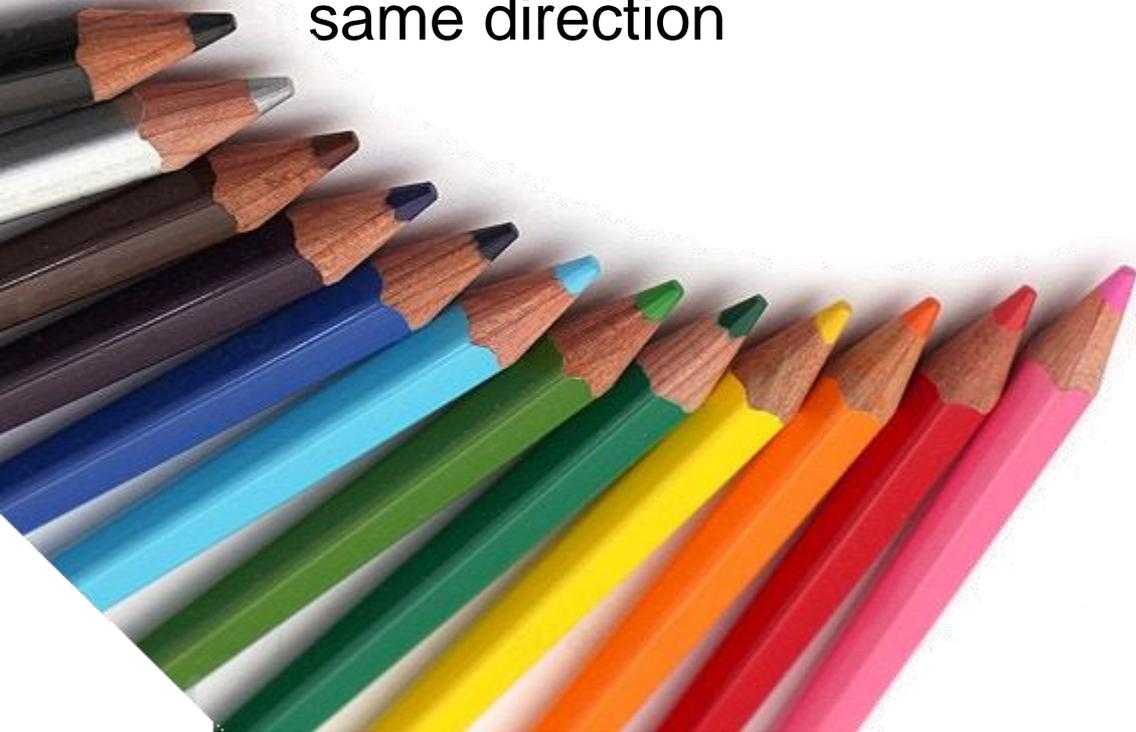
Calculating the Total Annual Contribution

Total Annual Contribution =



Pension Plan Portfolio

- Mature pension plans must balance the need to pay pension benefits while continuing to grow
- Diversification reduces exposure to volatility through a variety of investments that are unlikely to all move in same direction



Market Environment

- The last two months have seen unprecedented volatility (upside and downside)
 - Dramatic risk off then dramatic risk on
- Unprecedented economic decline
 - Materially worse than 2008/2009
- Unprecedented policy response
 - Both in the US and abroad
- How long to flatten the curve and reopen the economy?
 - What does a return to “normal” look like?
- What is the shape of the recovery?
 - L-shaped, U-shaped, or V-shaped

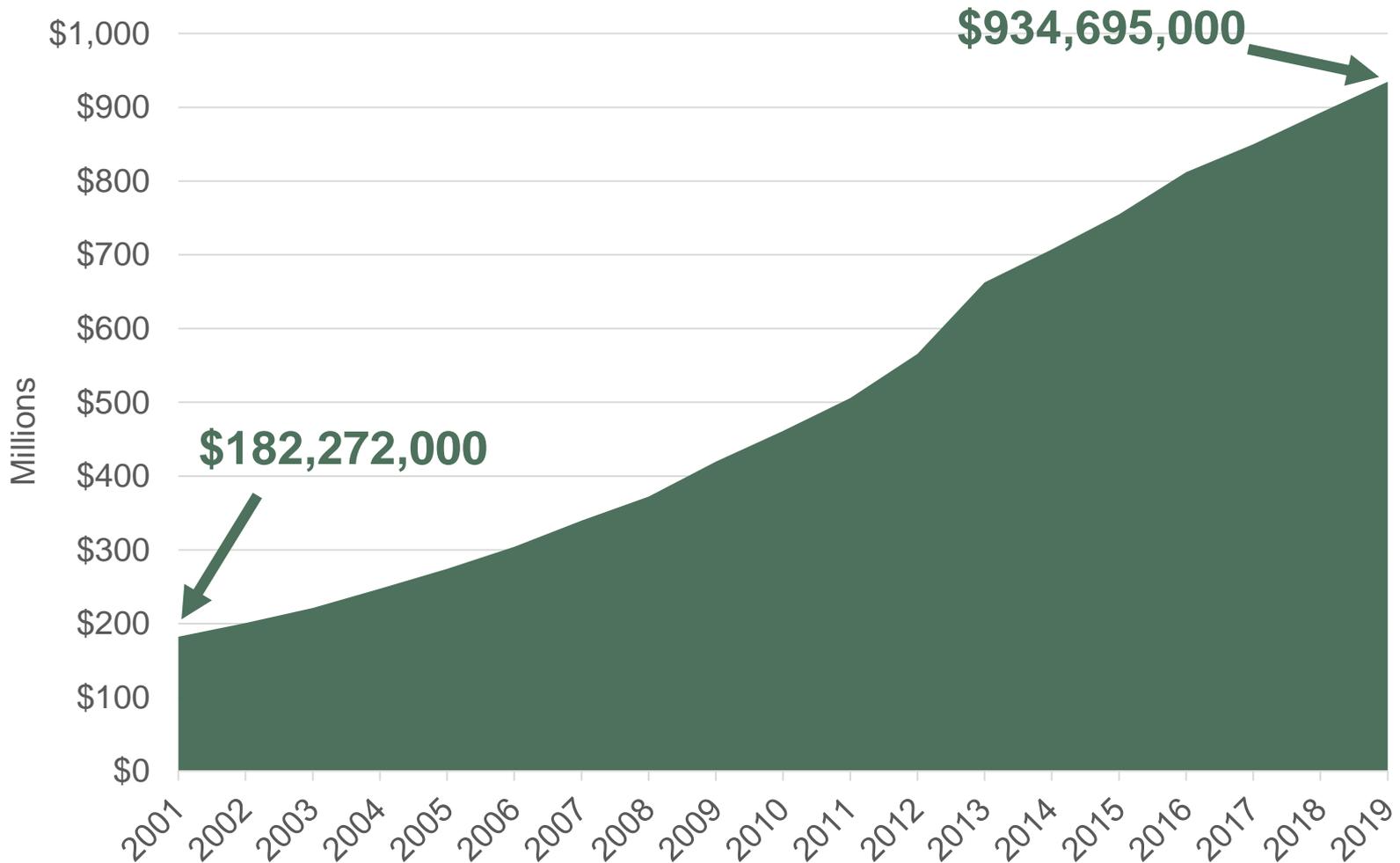
Market Rebounds



Liquidity Considerations

- In a stressed market environment, characterized by rapidly falling prices, widening spreads and declining liquidity, some assets become very difficult to sell
- It's important to proactively manage liquidity **before** **and during** a crisis to ensure the following:
 1. **Monthly pension obligations are paid**
 2. Don't forget #1
 3. Contractual private market capital calls are met
 4. Adequate liquidity to rebalance the portfolio and take advantage of market opportunities

MERS Pension Payments



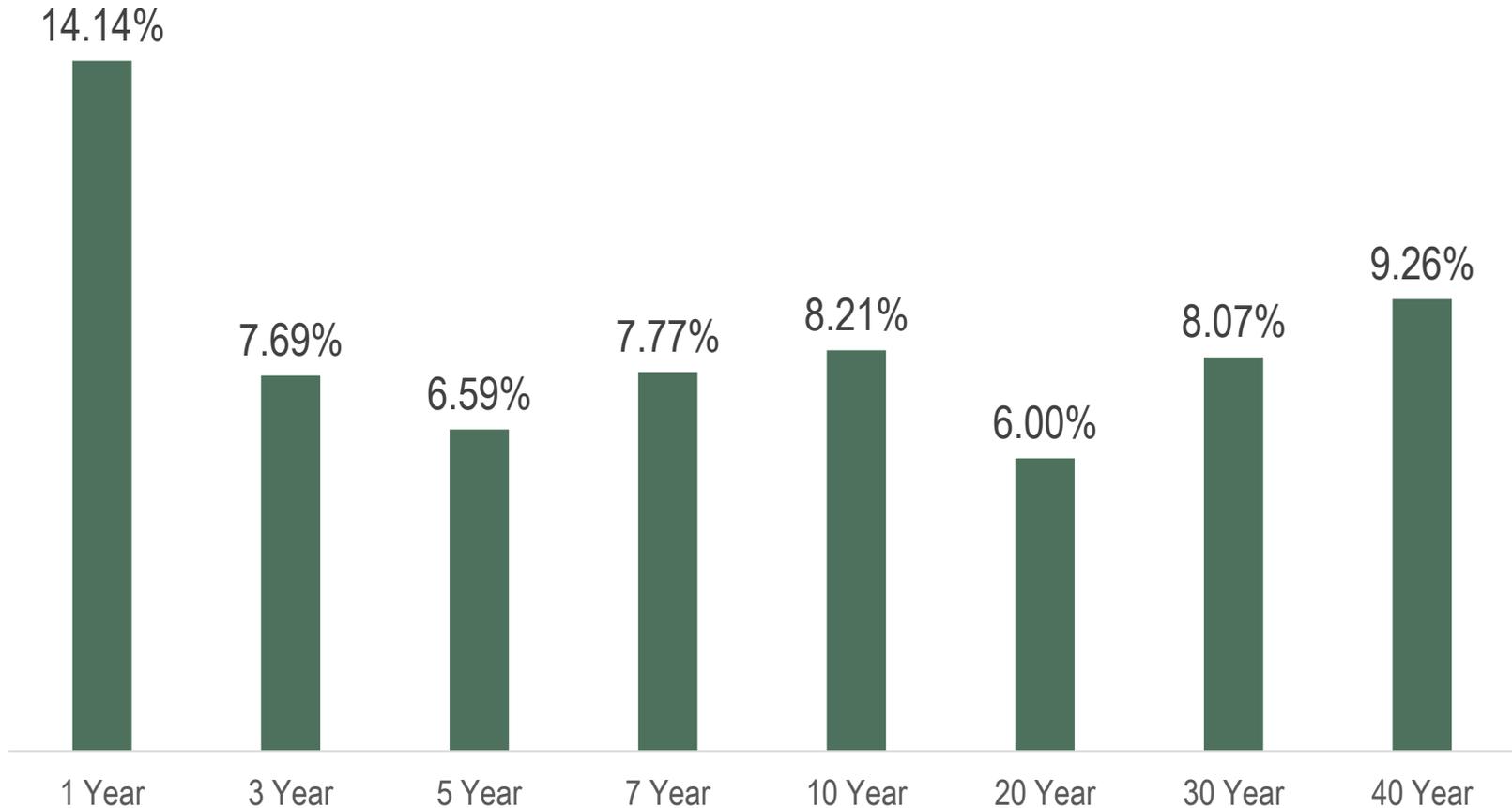
Portfolio Diversification

Table of Investment Returns Including MERS Defined Benefit with Asset Classes (2000-2019)

| 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| Real Estate 13.84% | U.S. Fixed Income 8.43% | Gbl ex-U.S. Fixed 22.37% | Emerging Market Equity 55.82% | Real Estate 37.96% | Emerging Market Equity 34.00% | Real Estate 42.12% | Emerging Market Equity 39.38% | U.S. Fixed Income 5.24% | Emerging Market Equity 78.51% | Small Cap Equity 26.85% | U.S. Fixed Income 7.84% | Real Estate 27.73% | Small Cap Equity 38.82% | Real Estate 15.02% | Large Cap Equity 1.38% | Small Cap Equity 21.31% | Emerging Market Equity 37.28% | Cash Equivalent 1.87% | Large Cap Equity 31.49% |
| U.S. Fixed Income 11.63% | High Yield 5.28% | U.S. Fixed Income 10.26% | Small Cap Equity 47.25% | Emerging Market Equity 25.55% | Real Estate 15.35% | Emerging Market Equity 32.17% | Dev ex-U.S. Equity 12.44% | Gbl ex-U.S. Fixed 4.39% | High Yield 58.21% | Real Estate 19.63% | High Yield 4.98% | Emerging Market Equity 18.23% | Large Cap Equity 32.39% | Large Cap Equity 13.69% | U.S. Fixed Income 0.55% | High Yield 17.13% | Dev ex-U.S. Equity 24.21% | U.S. Fixed Income 0.01% | Small Cap Equity 25.52% |
| Cash Equivalent 6.18% | Cash Equivalent 4.42% | Real Estate 2.82% | Real Estate 40.69% | Dev ex-U.S. Equity 20.38% | Dev ex-U.S. Equity 14.47% | Dev ex-U.S. Equity 25.71% | Gbl ex-U.S. Fixed 11.03% | Cash Equivalent 2.06% | Real Estate 37.13% | Emerging Market Equity 18.88% | Gbl ex-U.S. Fixed 4.36% | Dev ex-U.S. Equity 16.41% | Dev ex-U.S. Equity 21.02% | MERS Defined Benefit 6.68% | Cash Equivalent 0.05% | Large Cap Equity 11.96% | Large Cap Equity 21.83% | High Yield -2.08% | Dev ex-U.S. Equity 22.49% |
| MERS Defined Benefit -2.76% | Small Cap Equity 2.49% | Cash Equivalent 1.78% | Dev ex-U.S. Equity 39.42% | Small Cap Equity 18.33% | MERS Defined Benefit 6.78% | Small Cap Equity 18.37% | MERS Defined Benefit 8.58% | MERS Defined Benefit -24.79% | Dev ex-U.S. Equity 33.67% | High Yield 15.12% | MERS Defined Benefit 2.30% | Small Cap Equity 16.35% | MERS Defined Benefit 15.00% | U.S. Fixed Income 5.97% | Real Estate -0.79% | Emerging Market Equity 11.19% | Small Cap Equity 14.65% | Gbl ex-U.S. Fixed -2.15% | Real Estate 21.91% |
| Small Cap Equity -3.02% | MERS Defined Benefit -1.01% | High Yield -1.37% | High Yield 28.97% | MERS Defined Benefit 14.90% | Large Cap Equity 4.91% | Large Cap Equity 15.73% | U.S. Fixed Income 6.97% | High Yield -26.16% | Small Cap Equity 27.17% | Large Cap Equity 15.06% | Large Cap Equity 2.11% | Large Cap Equity 16.00% | High Yield 7.44% | Small Cap Equity 4.89% | MERS Defined Benefit -0.85% | MERS Defined Benefit 11.10% | MERS Defined Benefit 13.40% | MERS Defined Benefit -3.51% | Emerging Market Equity 18.44% |
| Gbl ex-U.S. Fixed -3.91% | Emerging Market Equity -2.61% | Emerging Market Equity -6.16% | Large Cap Equity 28.68% | Gbl ex-U.S. Fixed 12.54% | Small Cap Equity 4.55% | MERS Defined Benefit 13.61% | Large Cap Equity 5.49% | Small Cap Equity -33.79% | Large Cap Equity 26.47% | MERS Defined Benefit 14.43% | Cash Equivalent 0.10% | High Yield 15.81% | Real Estate 3.67% | High Yield 2.45% | Dev ex-U.S. Equity -3.04% | Real Estate 4.06% | Gbl ex-U.S. Fixed 10.51% | Large Cap Equity -4.38% | High Yield 14.32% |
| High Yield -5.86% | Gbl ex-U.S. Fixed -3.75% | MERS Defined Benefit -8.34% | MERS Defined Benefit 24.72% | High Yield 11.13% | Cash Equivalent 3.07% | High Yield 11.85% | Cash Equivalent 5.00% | Large Cap Equity -37.00% | MERS Defined Benefit 17.31% | Dev ex-U.S. Equity 8.95% | Small Cap Equity -4.18% | MERS Defined Benefit 11.39% | Cash Equivalent 0.07% | Cash Equivalent 0.03% | Small Cap Equity -4.41% | Dev ex-U.S. Equity 2.75% | Real Estate 10.36% | Real Estate -5.63% | MERS Defined Benefit 14.14% |
| Large Cap Equity -9.11% | Real Estate -3.81% | Dev ex-U.S. Equity -15.80% | Gbl ex-U.S. Fixed 19.36% | Large Cap Equity 10.88% | High Yield 2.74% | Gbl ex-U.S. Fixed 8.16% | High Yield 1.87% | Dev ex-U.S. Equity -43.56% | Gbl ex-U.S. Fixed 7.53% | U.S. Fixed Income 6.54% | Real Estate -6.46% | U.S. Fixed Income 4.21% | U.S. Fixed Income -2.02% | Emerging Market Equity -2.19% | High Yield -4.47% | U.S. Fixed Income 2.65% | High Yield 7.50% | Small Cap Equity -11.01% | U.S. Fixed Income 8.72% |
| Dev ex-U.S. Equity -13.37% | Large Cap Equity -11.89% | Small Cap Equity -20.48% | U.S. Fixed Income 4.10% | U.S. Fixed Income 4.34% | U.S. Fixed Income 2.43% | Cash Equivalent 4.85% | Small Cap Equity -1.57% | Real Estate -48.21% | U.S. Fixed Income 5.93% | Gbl ex-U.S. Fixed 4.95% | Dev ex-U.S. Equity -12.21% | Gbl ex-U.S. Fixed 4.09% | Emerging Market Equity -2.60% | Gbl ex-U.S. Fixed -3.09% | Gbl ex-U.S. Fixed -6.02% | Gbl ex-U.S. Fixed 1.49% | U.S. Fixed Income 3.54% | Dev ex-U.S. Equity -14.09% | Gbl ex-U.S. Fixed 5.09% |
| | Dev ex-U.S. Equity -21.40% | Large Cap Equity -22.10% | Cash Equivalent 1.15% | Cash Equivalent 1.33% | Gbl ex-U.S. Fixed -8.65% | U.S. Fixed Income 4.33% | Real Estate -7.33% | Emerging Market Equity -53.33% | Cash Equivalent 0.21% | Cash Equivalent 0.13% | Emerging Market Equity -18.42% | Cash Equivalent 0.11% | Gbl ex-U.S. Fixed -3.08% | Dev ex-U.S. Equity -4.32% | Emerging Market Equity -14.92% | Cash Equivalent 0.33% | Cash Equivalent 0.86% | Emerging Market Equity -14.57% | Cash Equivalent 2.28% |

MERS Long-Term Investment Returns

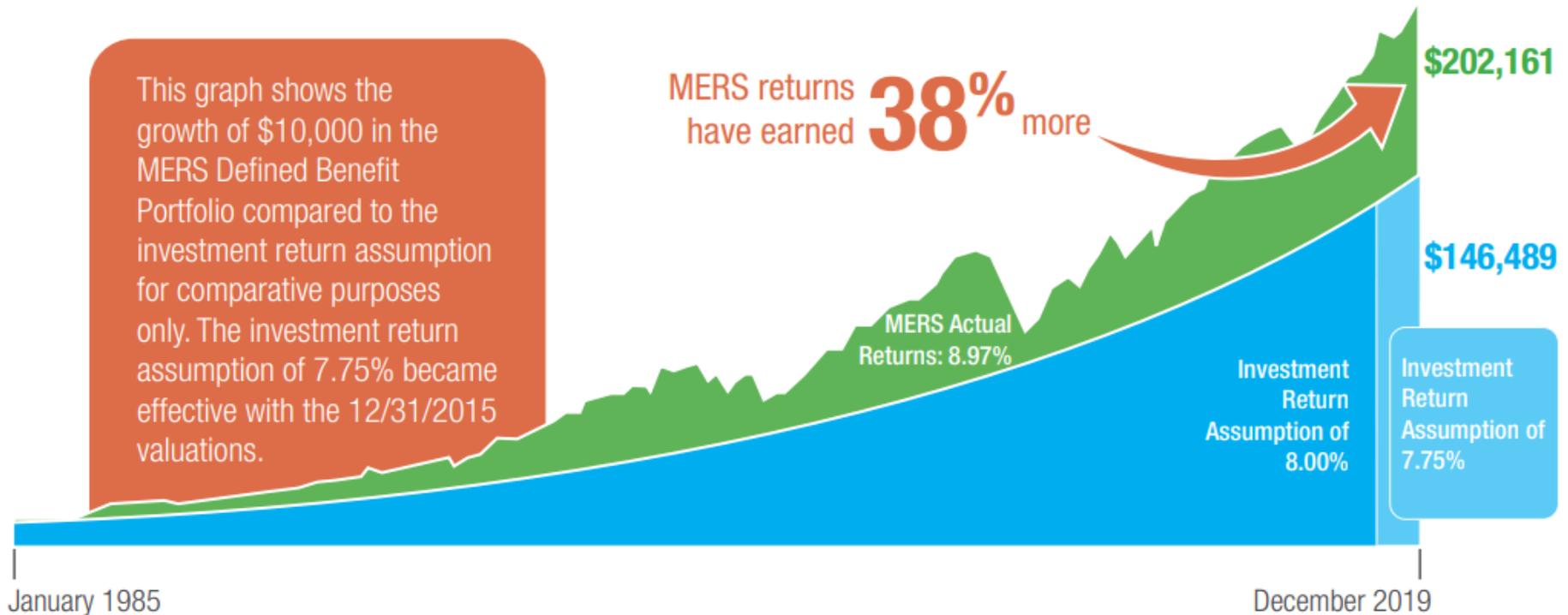
As of December 31, 2019



All rates are shown as gross of fees

Long-Term Investment Returns

Actual returns have outperformed the actuarial assumption



Market Value vs. Actuarial Value

- Each Annual Actuarial Valuation explains the difference between market and actuarial value of assets
- Actuarial value of assets, used to determine both your funded ratio and your required employer contribution, is based on a smoothed value of assets
- Asset smoothing is a tool to reduce contribution volatility, however, when the smoothed actuarial rate is less than the assumed actuarial rate, gradual increases in contributions will occur

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Investments

A Prudent, Long-Term Strategy — And a Proven Track Record of Success

The MERS **Investments team** is dedicated to providing our member municipalities with excellent returns at affordable costs, while protecting the pensions and assets of our many members.

Year-by-Year Returns **MERS Long-Term Investments**

Click to view pdf

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MERS consistently outperforms its benchmarks and market averages, with a prudent, long-term approach designed to provide downside protection and upside market participation.

Our investment goals

- Provide a completely diversified fund utilizing various management and style strategies that will provide downside market protection with upside market participation
- Generate reasonable growth and income while minimizing market volatility
- Integrate and develop industry best practices
- Hire, develop, and retain top-tier investment professionals who are aligned with MERS core values

Our Philosophy

Investing in today's financial markets is becoming increasingly complex as result of the rapid exchange of information, increased volatility and global interconnectedness. Thus, it is important to identify core beliefs to simplify the decision-making process. Following is a list of our unwavering investment beliefs:

- Capital preservation is paramount — avoiding losses is more important than achieving gains
- Markets are inefficient — they are driven by human emotion which can be overcome by taking a contrarian, long-term perspective
- Keep it simple — if you do not understand it, do not invest in it
- Volatility is not a true measure of risk, permanent impairment of capital or shortfall is risk
- Diversification is critical because the future is unknown
- Mean reversion drives everything — most investments go through cycles, and cycles imply reversion
- The focus should be on risk-adjusted returns — returns cannot be evaluated without considering the risk taken to achieve those returns

We believe that constantly reminding ourselves of and framing our discussions around these central tenets will help achieve the stated investment goals and increase the probability of long-term investing success.

Retirement Strategies

Learn about [MERS Retirement Strategies](#).

Investment Menus

- [DC Plan](#)
- [Hybrid Plan](#)
- [HCSP](#)
- [RHFV](#)
- [457](#)
- [IRA](#)
- [ISP](#)

Investments Team

[Meet the team](#)

Resources

- [CIO Reports](#)
- [Investment Policy Statement \(DB\)](#)
- [Investment Policy Statement \(PDA & Institutional\)](#)
- [Brief: Excessive Fund Choice Undermines Performance](#)

Investment Committee

- [Scheduled meeting notice](#)



Management Strategies & Actions

Forecasting Tools

Scenarios and Projections

- Contributions are calculated based upon assumptions about future events which may or may not materialize.
- Each report provides projections based on different assumption scenarios to assist with planning, including a scenario to assist with estimating the impact of the demographic assumption changes.
- MERS strongly encourages employers to contribute more than the minimum required contributions

Impact Relief

- To help employers with the impact of the Experience Study there are two options available

No Phase-In (Default):

- Contributions will reflect the full impact of the demographic assumption changes

Phase-In (Optional):

- For those that need more time, there is an option to phase in the demographic assumption changes over **four years**

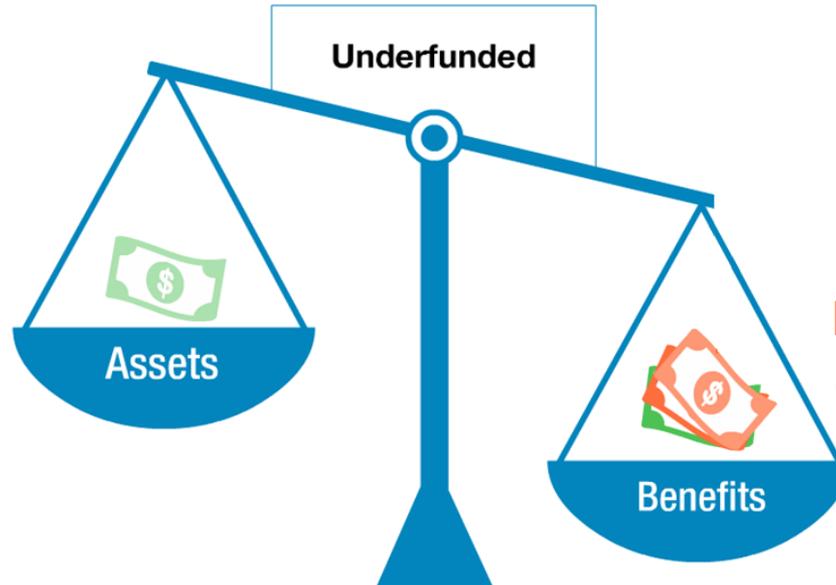
- Annual Actuarial Valuation show you both options

Managing Unfunded Liability

- Unfunded liability is the difference between a plan's estimated pension benefits and assets that have been set aside to pay for them
- There are two ways a municipality can close its unfunded liability gap

Funding Strategies

- Increase assets

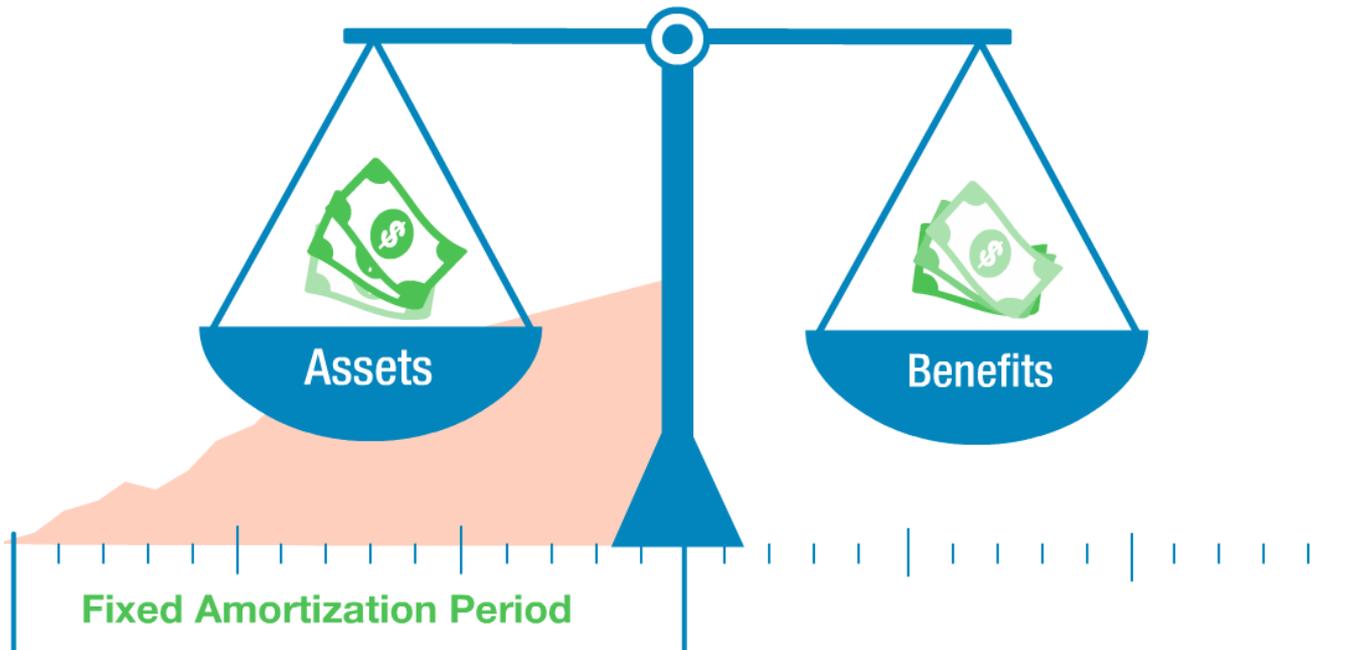


Plan Design Strategies

- Reduce or eliminate liability moving forward

Paying Down the UAL

- Unfunded liability is paid off over a fixed period of time known as the amortization period



- Local units may request an analysis to determine if an amortization extension is possible
- Extending the amortization period defers costs into the future, resulting in higher long-term costs

Funding Strategies

Since 2016

Cost sharing

- 2/3 of MERS plans have employee contributions
- May not have a large impact to UAL for retiree heavy divisions

626



Voluntary contributions

- Like any invested account, the power of compounding rewards pre-funding
- Employers can dictate how additional voluntary contributions are applied:
 - Applying assets to pay down UAL by establishing a Surplus Division
 - Reducing future contributions by applying the assets directly to a specific division

2,039



Bonding

- Municipalities may bond for all or a portion of their unfunded accrued liabilities — pension or OPEB
- No guarantee that future unfunded liabilities may not occur

12



Plan Design Strategies

Lower DB Plan Provisions for New Hires

Higher Retirement Age for New Hires

Hybrid Plan

Defined Contribution

Bridged Multiplier for Existing Employees

Bridged COLA for Existing Employees

Plan Freeze

Contacting Your Regional Manager



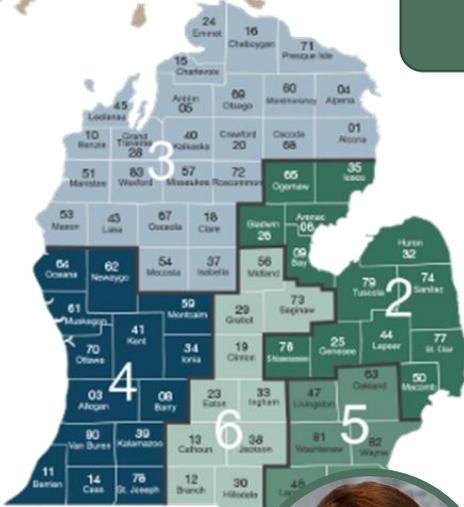
Region 1
Terra Langham



Region 2
Matt Taylor



Region 3
Tony Radjenovich



Region 5
Sue Feinberg



Region 4
Mike Overley



Region 6
Marne Daggett

MERS Resources

- Review valuation projections & alternative scenarios
- Explore videos and FAQs
- Meet with MERS representative

Communication

- Communicate with key stakeholders
- MERS is here to partner with you

Plan Design Review

- Review plan designs
- Consider your budget goal for both your current and proposed retirement plans



Short-Term Options

- Consider if impact relief options or an amortization extension is needed

Funding Strategies

- Review strategies to increase assets such as cost sharing, voluntary contributions or bonding



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