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Actuarial Experience Study

City of Portland Fire & Police Disability & Retirement Fund (FPDR)

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September 22, 2020

Agenda

- Introduction
- Economic assumptions
- Demographic assumptions
- Future COLA assumption

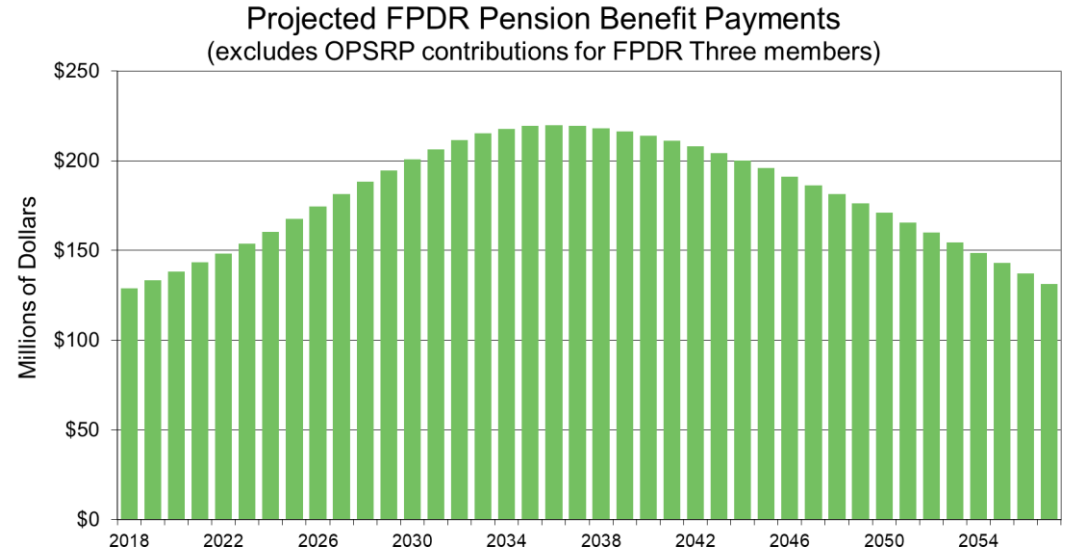
Introduction

Actuarial Valuation and Assumptions

- Biennial actuarial valuations provide financial statement reporting information for both FPDR and the City of Portland
- An actuarial valuation is a very long-term calculation
- Given the long-term nature of the modeling, assumptions play a key role in the calculation

Assumptions used both to:

- Project future benefit payments
- Convert those payments to a present value



Introduction

Actuarial Valuation and Assumptions

- Assumptions in our last FPDR valuation (2018) based on:
  - Study of FPDR experience conducted prior to the 2014 valuation
    - Determined most demographic assumptions, including rates of retirement, disability, and salary growth
  - Oregon PERS Police & Fire assumptions for mortality
    - Due to a much larger number of members, Oregon PERS public safety experience is more credible than FPDR-only experience
- Best practice to refresh experience studies every five to ten years to reflect current trends
  - Accordingly, we have prepared a new study to recommend assumptions for the June 30, 2020 valuation

Introduction
Experience Study

- The new study analyzed experience from recent periods
  - Most demographic assumptions use data from July 2014 to June 2019
  - Salary increases reflect July 2015 to June 2019 data
- Assumptions can be broadly divided into two categories:
  - Economic assumptions
  - Demographic assumptions
- Full detail of methodology and recommended assumptions in Appendix

Economic Assumptions

Assumptions to Be Reviewed

	6/30/2018 Valuation "Current" Assumptions
Inflation	2.75%
Real Wage Growth	1.00%
Payroll Growth (sum of above)	3.75%
Discount Rate	Current municipal bond index, per GASB: 6/30/2018: 3.87% 6/30/2019: 3.50%

Economic Assumptions
Inflation

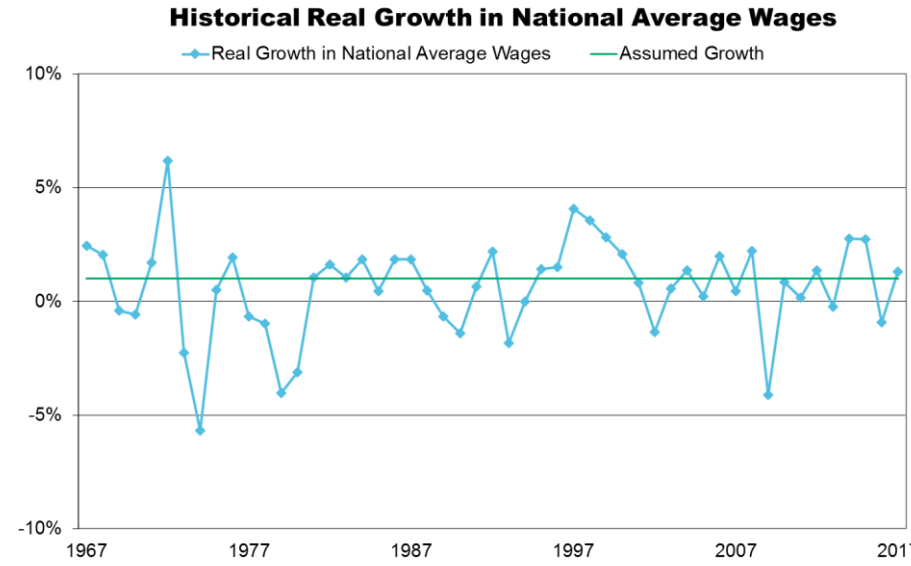
- The inflation assumption affects other assumptions
- Inflation can vary significantly over time
- One estimate of future inflation can be derived from yields of Treasury securities and Treasury Inflation Protected Securities (TIPS)
- Social Security's current "intermediate cost" 30-year average inflation assumption is **2.40%**
- In our opinion, the current assumption of **2.75%** should be reduced to **2.25%**

Period Ending 12/31/2019	Average Inflation
10 years	1.76%
20 years	2.14%
30 years	2.41%
40 years	3.09%

	As of 12/31/19		As of 6/30/20	
	10 Year	30 Year	10 Year	30 Year
Treasury Yield	1.92%	2.39%	0.66%	1.41%
TIPS Yield	0.15%	0.58%	(0.68%)	(0.15%)
"Breakeven" Inflation	**1.77%**	**1.81%**	**1.34%**	**1.46%**

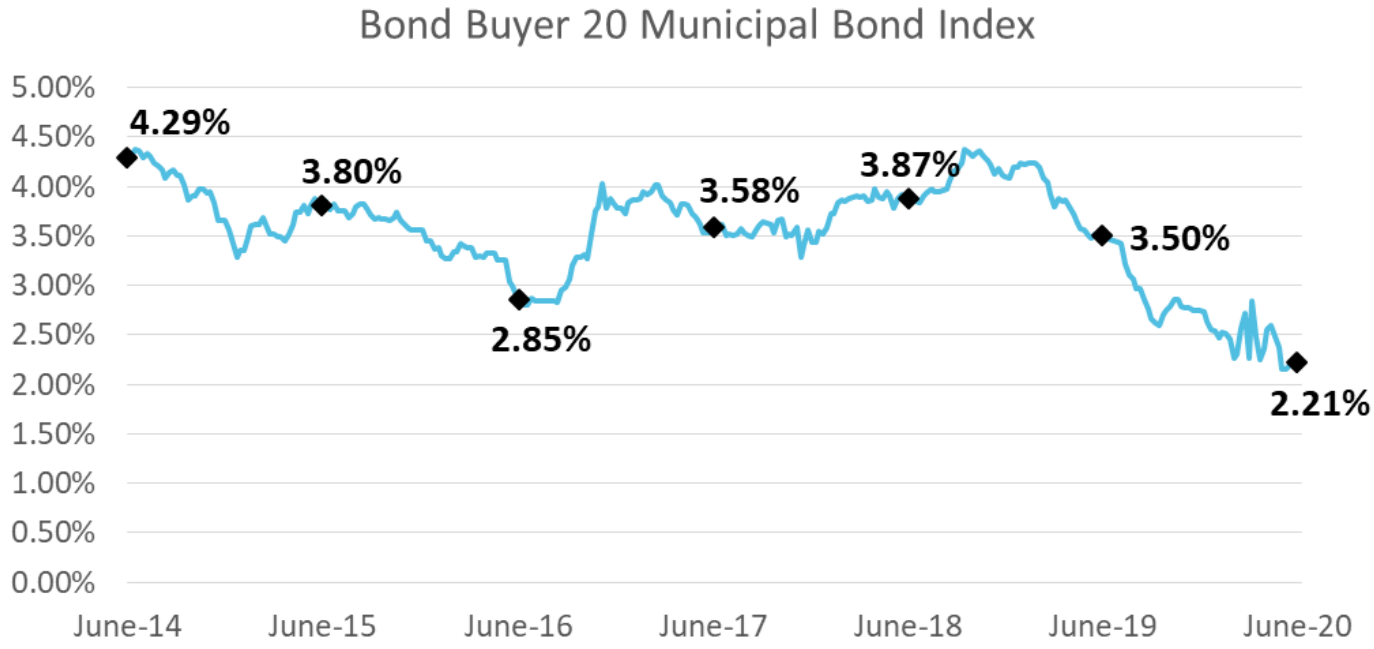
Economic Assumptions
Real Wage Growth

- An individual member's assumed annual salary increase is composed of:
  - Inflation
  - Real wage growth
  - Individual merit/longevity component
- Real wage growth represents the increase in wages in excess of inflation for the entire group due to improvements in productivity and competitive market pressures
- Social Security's long-term "intermediate cost" real wage growth assumption is 1.1%
- In our opinion, the current assumption of **1.0%** is reasonable



Period ending 12/31/2018	Average Real Wage Growth
10 Years	0.59%
20 Years	0.92%
30 Years	0.82%
40 Years	0.65%

Economic Assumptions
Discount Rate



- Discount rate
  - Based on Bond Buyer Index shown above
  - 6/30/2020 rate of 2.21% is significantly lower than the previous valuation date of 6/30/2018

Assumptions to Be Reviewed

	6/30/2018 Valuation "Current" Assumptions	6/30/2020 Valuation Recommended Assumptions
Inflation	2.75%	2.25%
Real Wage Growth	1.00%	1.00%
Payroll Growth (sum of above)	3.75%	3.25%
Discount Rate	Current municipal bond index, per GASB: 6/30/2018: 3.87% 6/30/2019: 3.50%	Current municipal bond index, per GASB: 6/30/2020: 2.21%

Demographic Assumptions

Demographic Assumptions

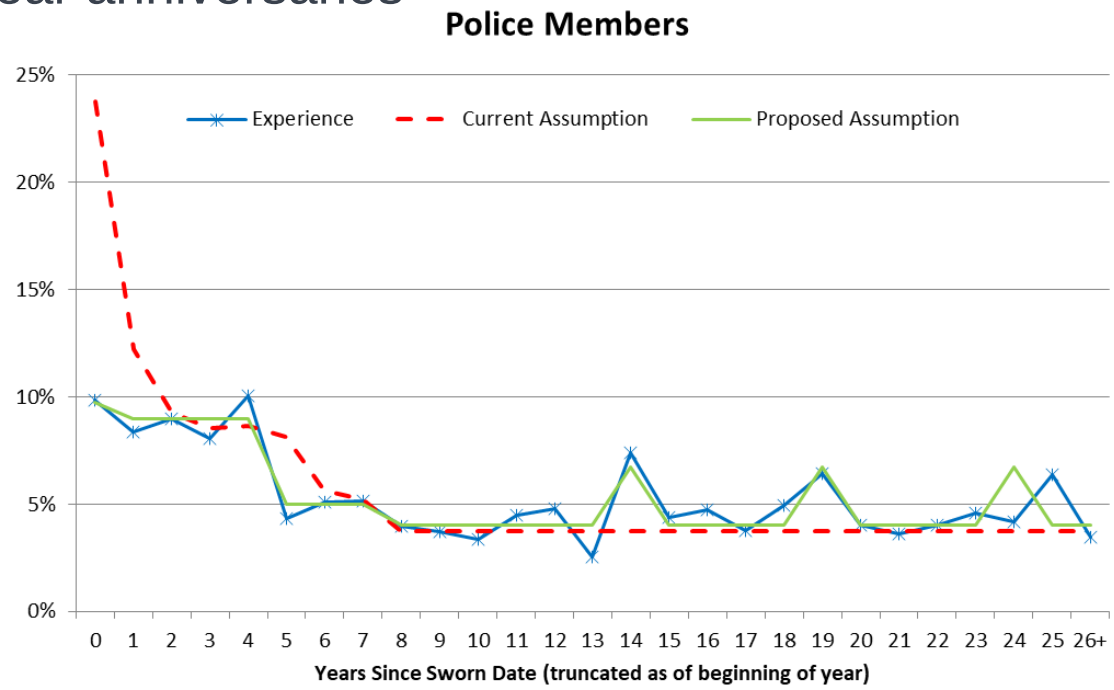
Individual member salary increase assumption

- Reflects combined effects of general wage growth and inflation assumptions, plus an additional component for increase due to merit or longevity
  - Individuals earn promotions and step/grade increases
- Our analysis reviewed 2015-2019 member experience
  - Included partial adjustment for the 3% increases to top-step pay under the PPA contract in 2017 through 2019
    - Fully reflecting such significant increases centered in the study period would likely overstate the expected forward-looking annual increase
- Resulting assumption varies by service, reflecting career patterns

Demographic Assumptions

Individual member salary increase assumption

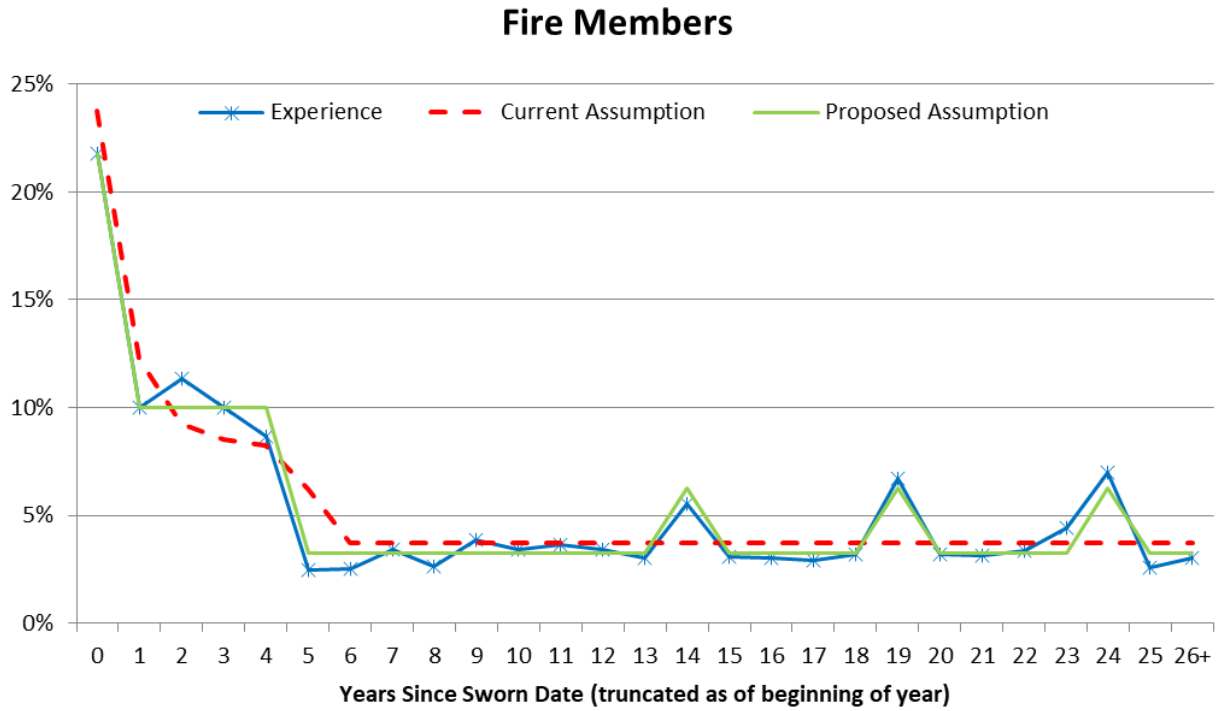
- Recent Police experience (with partial recognition of recent top-step PPA increases) was lower than assumed in early years, due to elimination of "entry rate" pay level
- Proposed assumption explicitly reflects longevity-related increases at 15/20/25 year anniversaries



Demographic Assumptions

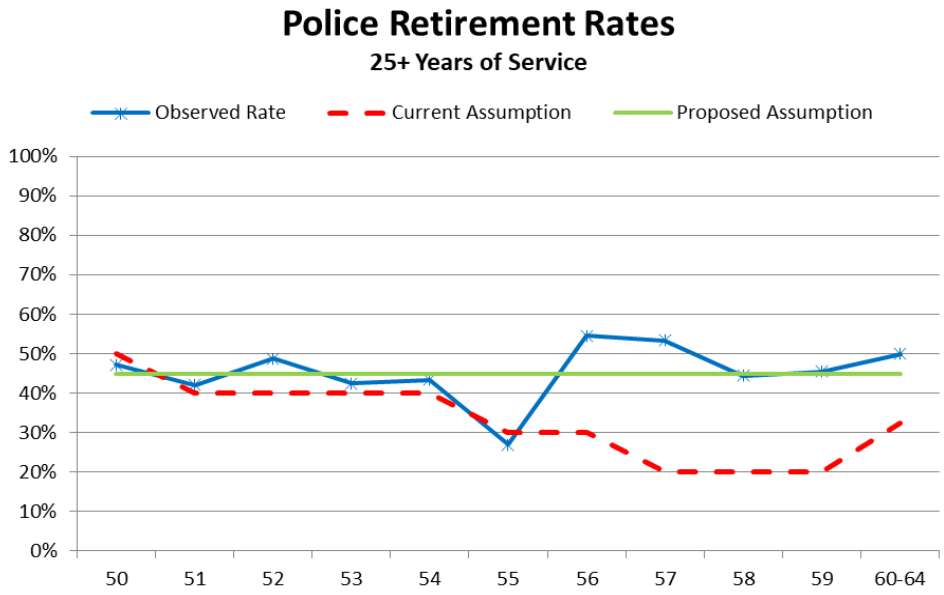
Individual member salary increase assumption

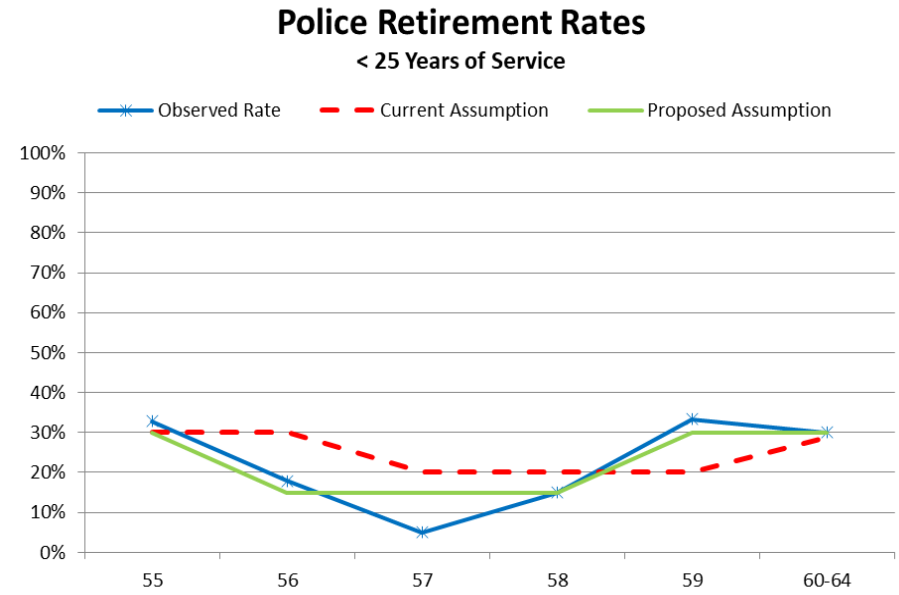
- Fire experience generally mirrored assumption, but proposed updates will more closely reflect recent observed experience
- Proposed assumption explicitly reflects longevity-related increases at 15/20/25 year anniversaries



Demographic Assumptions
Retirement Rates

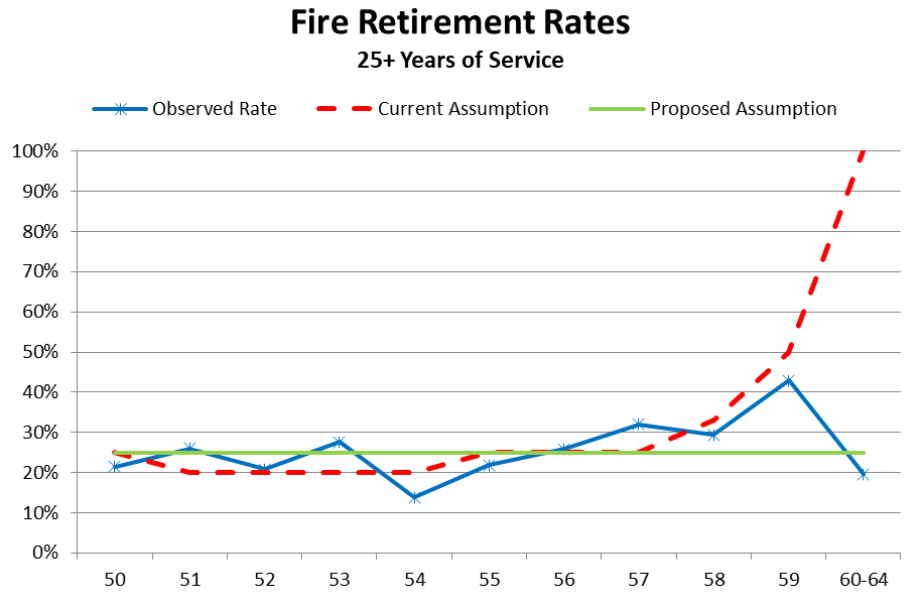
- Current assumed rates are separated by Bureau and based on age only
- We recommend adjusting the assumption format to use age-based rates prior to 25 years of service and a higher flat rate for 25+ years

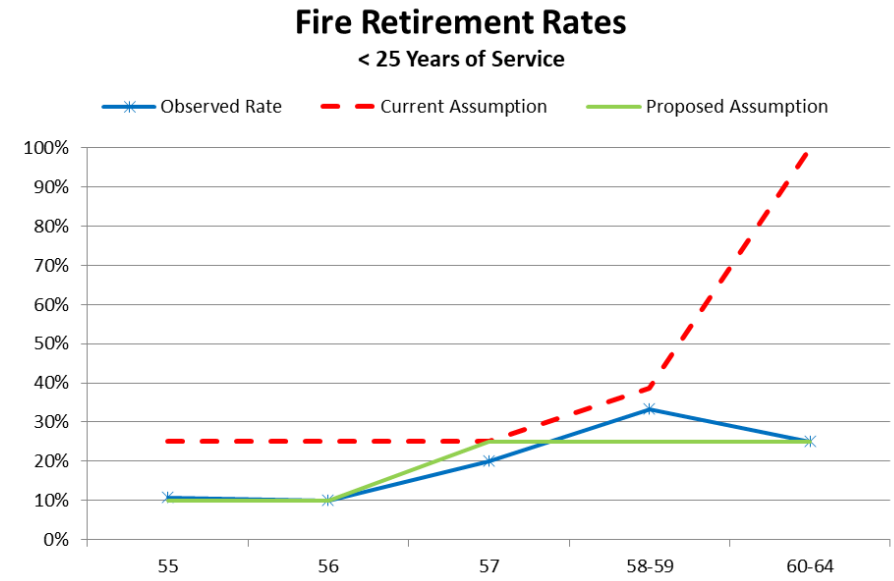




Demographic Assumptions
Retirement Rates

- We also recommend extending retirement rates for Fire to age 65 (matching those for Police)





Demographic Assumptions
Retirement Elections

Assumption	Current Assumption	Observed Experience	Proposed Assumption
Benefit form elected (% of final pay)	2.8% of pay: 80% 2.6% of pay: 20%	2.8% of pay: 80% Below 2.8%: 20%	No change
Percent married	80%	69%	70%
Spousal age difference	+/- 3 years	+/- 2.5 years	+/- 3 years
Out-of-state retirees	20%	29%	30%
27 Pay Period Adjustment	65% retire with 27 pay periods (2.5% load to system average)	65% retired with 27 pay periods	No change

Demographic Assumptions
Withdrawal

- Rates of pre-retirement withdrawal are very low after a member's initial two years of service
  - Experience during study period suggests separating the Police & Fire assumptions, as shown

Service	Current Assumption	Police		Fire	
		Observed Experience	Proposed Assumption	Observed Experience	Proposed Assumption
0 years	15%	14%	15%	7%	10%
1 year	5%	10%	7.5%	0%	1%
2+ years	0.50%	1.27%	1.25%	0.30%	0.25%

Demographic Assumptions
Annual Incidence of Long-term Disability

- Second study for disability since 2006 reforms
  - Previous study showed significantly fewer members initiating long-term disability than expected under pre-reform assumption
  - Current study continued this trend
- We recommend lowering the assumed rate of disabilities by using 70% of the currently-adopted standard table
  - Sample rates shown below

Age	Current Assumption	Proposed Assumption
30	0.06%	0.04%
40	0.16%	0.11%
50	0.45%	0.31%
Expected over study period	11.6	8.1

6 FPDR members initiated long-term disability over study period

Demographic Assumptions
Mortality

- Mortality differs by:
  - Gender
  - Member vs. spouse
  - Healthy vs. disabled
  - Active vs. retired

Future life expectancy: Male Retiree (age in 2020)		
Retiree Age	Prior Assumption	New Assumption
55	31.6	30.7
65	22.4	21.1
75	14.1	12.8

- In recent years, we have linked FPDR mortality assumption to current Oregon PERS assumption
  - Because death rates at most ages are low, large amounts of data required for statistically credible experience
  - PERS study has significantly more mortality experience than FPDR
- Most recent PERS study reduced life expectancy for Police & Fire

Demographic Assumptions
Mortality

- Current PERS assumption reflects new “PUB-2010” tables published by Society of Actuaries in January 2019
  - First modern standard mortality tables based exclusively upon public employee data, including tables specifically for public safety
  - Previous assumption was based on a blend of “white collar” and “blue collar” experience from private plan experience
- Recommend continuing to link FPDR mortality assumption to the most recent PERS Police & Fire mortality assumption
  - Reflects PUB-2010 sex-distinct public safety mortality tables for members
  - Details in the appendix

Demographic Assumptions Reviewed

Assumption	Current	Recommended
Total salary increase	7-year select and ultimate; separate Police & Fire assumptions	Revise rates; modify Police entry structure; explicitly reflect long-service increases
Retirement rates	Age-based, with separate rates for Police versus Fire	Separate rates for <25 years of service vs. 25+
Retirement elections	Detailed in prior slides	Changes to % married and assumption for % out-of-state
Withdrawal	2-year “select and ultimate” structure	Separate rates for Police vs. Fire
Disability	Age-based rates from standard disability table	Adjust to use 70% of rates from standard disability table
Mortality	Police & Fire assumptions from 2016 PERS study	Police & Fire assumptions from 2018 PERS study

Effect on 2018 Actuarial Valuation Results

3.87% discount rate	6/30/2018 Valuation - Current Assumptions		6/30/2018 Valuation - Proposed Assumptions	
PV of Projected Benefits	$3.90 billion		$3.84 billion	
Accrued Liability				
Active	$1.15 billion		$1.15 billion	
Inactive	$2.17 billion		$2.12 billion	
Total	$3.32 billion		$3.27 billion	
PV of Future Normal Cost	$580 million		$570 million	
Normal Cost	$64 million		$64 million	

- Does not illustrate effects of:
  - Update to new GASB discount rate
  - Any potential change to FPDR Two COLA assumption

Future COLA Assumption

Future COLA Assumption

- Our June 30, 2018 valuation and related levy-adequacy modeling assumed FPDR Two retiree COLA increases followed a "Modified PERS" approach
  - CPI-U changes up to 2.00% for service prior to October 8, 2013, and 1.25% for service after October 8, 2013
- This reflected Board direction after discussion, including illustration of how results would change if a full 2% COLA was assumed each year
- **Note: The assumption used for the valuation <u>does not</u> determine the actual COLA adopted by the Board**
  - The Board retains full discretion to adopt each year's assumption, within the Charter parameters

Future COLA Assumption

- The actual FPDR Two COLA amounts for the last two years have not followed the "Modified PERS" approach which was assumed in the prior valuation
  - 2019 COLA: full 2%
  - 2020 COLA: blend of 2% and 1.75%, based on service before and after October 8, 2013
- To illustrate the sensitivity of the COLA assumption, the table below compares June 30, 2018 results under two alternatives

($ in millions)	6/30/2018 Valuation	6/30/2018 Valuation
COLA Method	Modified PERS	Full 2% per year
Present Value of Benefits	$3,900	$4,000

- The 2019 and 2020 COLA decisions would have added approximately $1 million to the "Modified PERS" results above, if they had been reflected at June 30, 2018

Future COLA Assumption

- The June 30, 2020 valuation and levy adequacy modeling will require an assumption for future COLA amounts
- We will continue to reflect the “Modified PERS” approach unless the Board provides us an alternative direction

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Appendix

Certification

This presentation discusses actuarial methods and assumptions for use in the valuation of the Fire & Police Disability & Retirement Fund ("FPDR" or "the Fund") sponsored by the City of Portland. For the most recent complete actuarial valuation results, including cautions regarding the limitations of use of valuation calculations, please refer to our formal Actuarial Valuation Report as of June 30, 2018 ("the Valuation Report") published on January 15, 2019. The Valuation Report, including all supporting information regarding data, assumptions, methods, and provisions, is incorporated by reference into this presentation. The statements of reliance and limitations on the use of this material is reflected in the actuarial report and still apply to this presentation..

In preparing this presentation, we relied, without audit, on information (some oral and some in writing) supplied by the Fund and City of Portland staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

Milliman's work product was prepared exclusively for FPDR and the City of Portland for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning FPDR's operations, and uses FPDR's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. The signing actuaries are independent of the plan sponsors. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, 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. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Appendix
Total Salary Increase

	Current Assumption	
Years of Service	Police*	Fire
0	23.75%	23.75%
1	12.25%	12.25%
2	9.25%	9.25%
3	8.55%	8.55%
4	8.65%	8.25%
5	8.15%	6.25%
6	5.65%	3.75%
7	5.25%	3.75%
8 +	3.75%	3.75%

*Blend of assumptions for non-PPA, PPA Officers, and PPA Sergeants, Criminalists, and Detectives

	Proposed Assumption	
Years of Service*	Police	Fire
0	9.75%	21.75%
1	9.00%	10.00%
2	9.00%	10.00%
3	9.00%	10.00%
4	9.00%	10.00%
5	5.00%	3.25%
6	5.00%	3.25%
7	5.00%	3.25%
8 +	4.00%	3.25%
Additional increase at 14, 19, 24	2.75%	3.00%

*Truncated as of beginning of year

Appendix
Retirement Rates - Current

	Fire	Police
Age	Current Assumption	Current Assumption
50	25%	50%
51	20%	40%
52	20%	40%
53	20%	40%
54	20%	40%
55	25%	30%
56	25%	30%
57	25%	20%
58	33%	20%
59	50%	20%
60	100%	20%
61	100%	20%
62	100%	45%
63	100%	45%
64	100%	45%
65+	100%	100%

Appendix
Retirement Rates - Proposed

	Fire		Police	
Age	< 25 years of service	25+ years of service	< 25 years of service	25+ years of service
50		25%		45%
51		25%		45%
52		25%		45%
53		25%		45%
54		25%		45%
55	10%	25%	30%	45%
56	10%	25%	15%	45%
57	25%	25%	15%	45%
58	25%	25%	15%	45%
59	25%	25%	30%	45%
60	25%	25%	30%	45%
61	25%	25%	30%	45%
62	25%	25%	30%	45%
63	25%	25%	30%	45%
64	25%	25%	30%	45%
65+	100%	100%	100%	100%

Appendix
Disability Rates

- Current disability incidence assumption is 1985 Disability Study Class 1 Rates
- Propose using 70% of the 1985 Disability Study Class 1 Rates

Age	1985 Disability Study Class 1 – Sample Rates
30	0.06%
35	0.10%
40	0.16%
45	0.26%
50	0.45%
55	0.85%

Age	70% of 1985 Disability Study Class 1 – Sample Rates
30	0.04%
35	0.07%
40	0.11%
45	0.18%
50	0.31%
55	0.59%

Demographic Assumptions
Disability-related assumptions

- Ancillary assumption used in our valuation of disability benefits are shown below:

	Current Assumption	Proposed Assumption
Service-related disability	90% of disabilities assumed service-related	No change
Post-disability employment	One third of members on long term disability are assumed capable of substantial gainful activity	No change
Earnings for post-disability gainful employment	Assumed to be 9% of pre-disability pay	Assumed to be 20% of pre-disability pay

Appendix
Mortality

- Current mortality tables shown below:

Age	Current Assumption
Male Retiree	RP-2014 Healthy Annuitant Male, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, set back 12 months
Female Retiree	RP-2014 Healthy Annuitant Female, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, no set back
Male Beneficiary	RP-2014 Healthy Annuitant Male, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, set back 12 months
Female Beneficiary	RP-2014 Healthy Annuitant Female, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, no set back
Male Active	RP-2014 Healthy Employee Male, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, set back 12 months
Female Active	RP-2014 Healthy Employee Female, Generational projection with unisex Social Security data scale, Blended 50% Blue Collar, 50% White Collar, no set back
Disabled Males	RP-2014 Disabled Annuitant Male, Generational projection with unisex Social Security data scale, no collar adjustment, no set back
Disabled Females	RP-2014 Disabled Annuitant Female, Generational projection with unisex Social Security data scale, no collar adjustment, no set back

Appendix
Mortality

- Proposed mortality tables shown below:

Age	Proposed Assumption
Male Retiree	Pub-2010 Healthy Public Safety Retiree Male, Generational projection with unisex Social Security data scale, no set back
Female Retiree	Pub-2010 Healthy Public Safety Retiree Female, Generational projection with unisex Social Security data scale, set back 12 months
Male Beneficiary	Pub-2010 Healthy General Employees Retiree Male, Generational projection with unisex Social Security data scale, set back 12 months
Female Beneficiary	Pub-2010 Healthy General Employees Retiree Female, Generational projection with unisex Social Security data scale, no set back
Male Active	Pub-2010 Healthy Public Safety Employee Male, Generational projection with unisex Social Security data scale, no set back
Female Active	Pub-2010 Healthy Public Safety Employee Female, Generational projection with unisex Social Security data scale, set back 12 months
Disabled Males	Pub-2010 Disabled Retiree Male, Generational projection with unisex Social Security data scale, Blended 50% Public Safety / 50% Non-Safety, no set back
Disabled Females	Pub-2010 Disabled Retiree Female, Generational projection with unisex Social Security data scale, Blended 50% Public Safety / 50% Non-Safety, no set back