



**City of Atlanta General Employees'  
Pension Fund**

# Review of Demographic Actuarial Experience

**For the Period July 1, 2014 to June 30, 2019**

April 20, 2022

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# | Agenda

**Overview of Assumptions being Studied**

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**Experience Gains and Losses in Study Period**

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# Overview: Purpose of an Experience Study

## ***Why Conduct an Experience Study?***

- Review funding and asset methods
- Review recent experience and trends; compare against current actuarial assumptions and methods
- Develop information to establish recommended assumptions and methods for use in future valuations
- Avoid unnecessary contribution and accounting volatility
- Mitigate chances of inadequate funding
- Meet current industry standards
- Fiduciary responsibilities



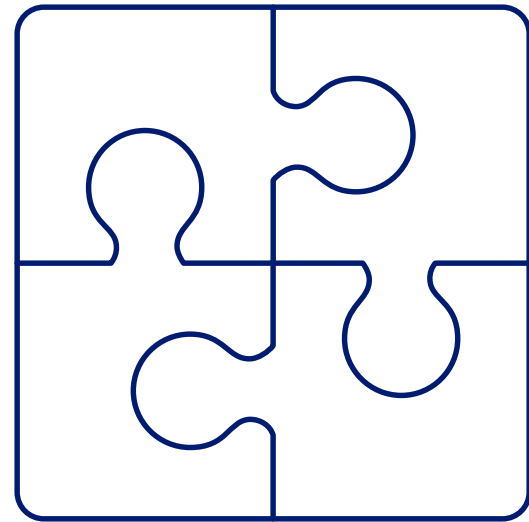
# Overview: Purpose of an Experience Study

- An experience study provides the basis for developing recommended assumptions to be used in the annual actuarial valuation:
  - Performed on a periodic basis
  - Last full experience study was conducted in 2017 for the five-year period ended June 30, 2016 with new assumptions implemented for the July 1, 2017 valuation
  - Partial study for actuarial methods and economic and mortality assumptions was conducted for the five-year period ended June 30, 2019 with new assumptions implemented for the July 1, 2020 valuation.
  - Current study for the remaining demographic assumptions is based on the five-year period July 1, 2014 through June 30, 2019.
- Actuarial Standards of Practice Statements 27 and 35 provide guidance on best practices for performing assumption-setting analysis.
  - Each assumption should be the actuary's best estimate.
- Segal's role is to make appropriate "best estimate" recommendations to the Investment Board for each assumption.
- Any assumptions that are adopted as a result of this study will first be implemented with the July 1, 2021 valuation.

**The assumptions are the Investment Board's assumptions, and the Investment Board can adopt all, none or some of the recommendations of the actuary.**

# Overview: How Demographic Assumptions Are Set

- Review past experience
- Compare past experience (“actual”) with assumptions (“expected”)
- Determine trends – make judgments about future
- Keep in mind
  - No “right” answer – best estimate
  - Assumptions are long-term



# Overview of Assumptions being Studied



## Demographic

- Withdrawal
- Disability
- Retirement
- Percent Married/Spouse Age
- Percent electing refund on employee contributions
- Unused sick leave
- Accumulated vacation pay

*The mortality rates and improvement scales, economic assumptions and actuarial methods were reviewed under the prior study (covering the same period) and are excluded from this review.*

# Changes In Recent Years

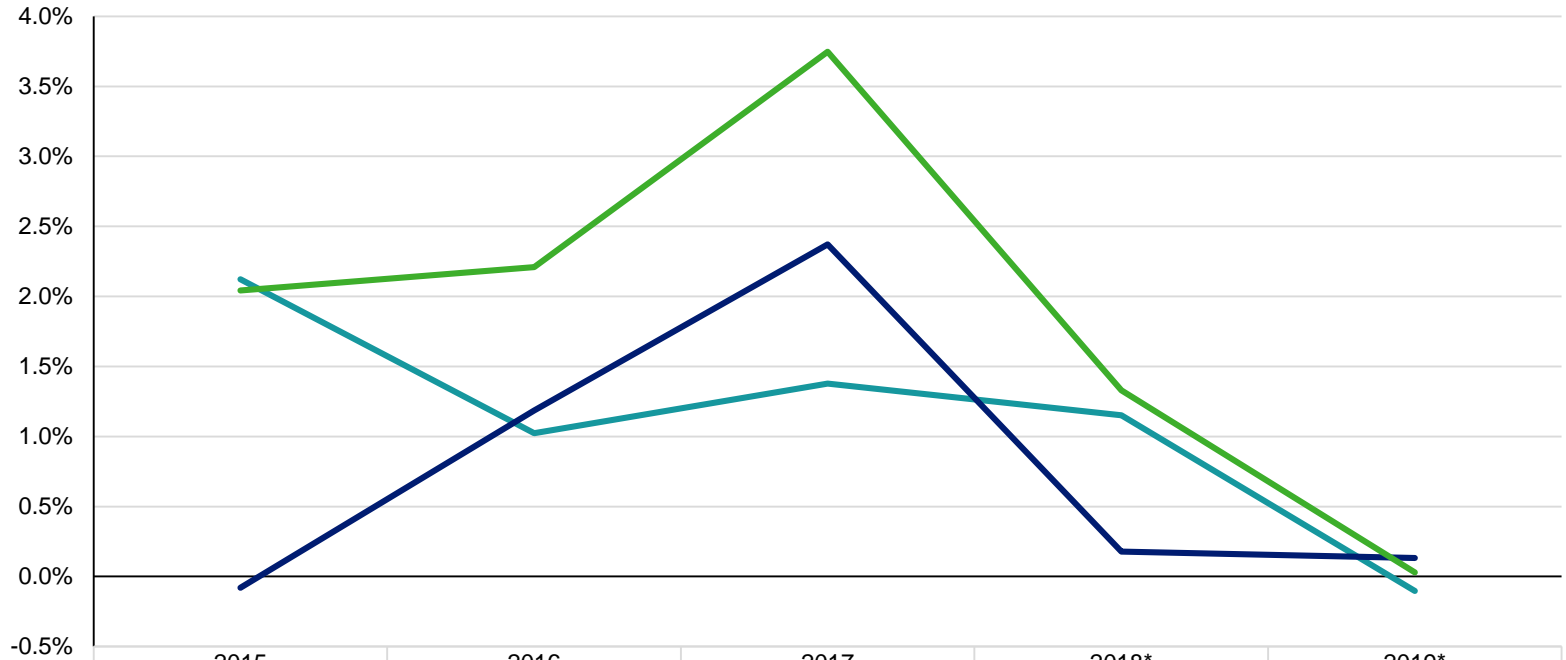
## ***Changes With Last Experience Study***

- The last experience study covering the demographic assumptions under review was for the period July 1, 2011 to June 30, 2016 and was dated June 7, 2017. Changes were approved by the Board in August 2017 and implemented in the July 1, 2017 valuation.

<b>Valuation</b>	<b>Assumption Changes</b>
July 1, 2017	<p>Decreased retirement rates for participants ages 53 to 64 with 30 or more years of service; no change if less than 30 years of service</p> <p>Decreased sex-distinct ordinary disability rates to 80% of prior rates; maintained occupational disability assumption of 10% of ordinary disability rates</p> <p>Decreased service-based turnover rates for participants with less than 2 years of service</p> <p>Increased percentage of terminated employees electing refund of employee contributions for pre-2011 plan participants from 50% to 75%; maintained 100% assumption for 2011 plan participants</p>

# Experience Gains and Losses in Study Period

Gain/(Loss) Experience as a Percentage of Actuarial Accrued Liability (AAL)  
for Years Ending June 30, 2015 to June 30, 2019



	2015	2016	2017	2018*	2019*
Investment	2.12%	1.02%	1.38%	1.15%	-0.10%
Non-Investment	-0.08%	1.18%	2.37%	0.18%	0.13%
Total	2.04%	2.21%	3.75%	1.33%	0.03%

\*Only 2018 and 2019 results reflect experience from assumptions updated with the 2017 experience study.



# Summary of Findings

- As part of this study, we reviewed our prior programming, City ordinances, Summary Plan Descriptions, and Strategic Benefits Advisors understanding on how benefits are administered. As a result, we made programming changes to retirement eligibility, disability benefits, pre-retirement death benefits, and application of accumulated vacation pay. These changes decreased the Actuarial Accrued Liability by less than 0.1%, the Employer Normal Cost by 2.7%, and the Recommended Contribution by 0.5%.
- On an amount-weighted basis, withdrawal experience was significantly lower than expected (roughly 45%). However, given recent withdrawal trends in the broader economy in the last 2-3 years, our proposed assumptions move partway towards actual experience.
- Disability experience for both males and females was roughly 60% of expected. Additionally, since the incidence of disability is low and the difference in benefits for ordinary disability vs. occupational disability is phasing out, we propose no longer tracking these categories separately.
- Retirement experience for participants with under 30 years of service was less than assumed, with the actual number of retirements 13% lower than expected. The main decreases were at ages 62 to 66. For participants with 30 or more years of service, overall, there were 29% more retirements than expected among participants ages 50 to 60.
- Based on improved data quality, for plans other than the 2011 plan, we can assume individual active marital status based on the employee contribution rate in the data. Previously, a 75% assumption had been used. We have also updated spousal age differences to reflect that female participants have male spouses closer in age.

# Summary of Findings

- Participants not in the 2011 plan are less likely to elect a refund of their employee contributions than had been assumed.
- Loads for unused sick leave pay and service were introduced, and the load for accumulated vacation pay was increased. These assumptions were informed by an analysis of 2021 retirements prepared earlier this year by Strategic Benefits Advisors. That assistance is gratefully acknowledged.
- The impact of the proposed assumption changes (other than the married assumption) is estimated assuming the changes were adopted with the July 1, 2020 valuation. Any assumption changes adopted by the Board will be reflected for the first time with the July 1, 2021 valuation.
- Using 2020 valuation results, the total combined impact (including programming adjustments) is:
  - Actuarial Accrued Liability increases 0.5% from \$1.965 billion to \$1.974 billion
  - Employer Normal Cost increases 30.9% from \$5.9 million to \$7.8 million
  - Total Recommended Contribution increases 5.0% from \$51.8 million to \$54.3 million
  - Total Recommended Contribution as a percentage of projected payroll increases from 25.12% to 26.38%, an increase of 1.26% of projected payroll
- The impact of the proposed changes is shown assuming changes were adopted with the July 1, 2020 valuation but any assumptions adopted by the Investment Board will be reflected for the first time in the July 1, 2021 valuation.

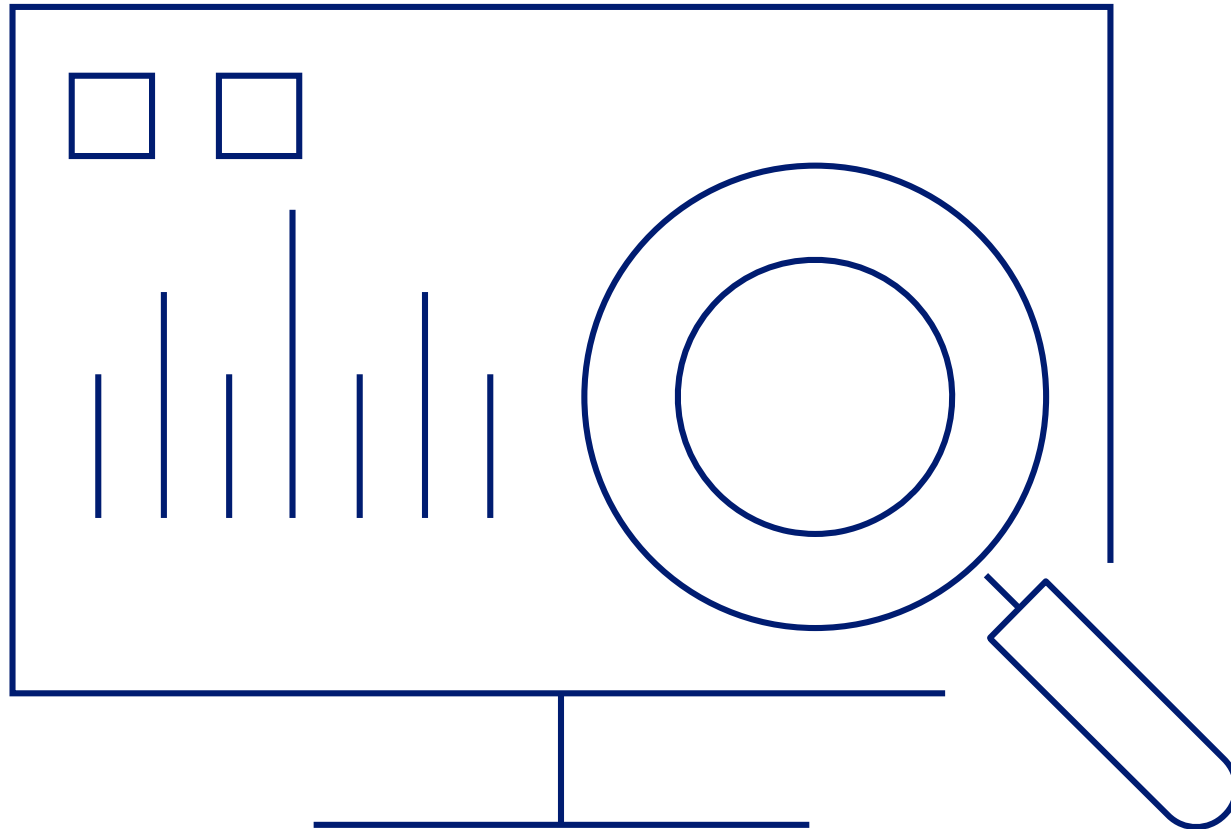
# Summary of Proposed Assumption Changes

Assumption	Current Assumption	Proposed Assumption
Withdrawal	Headcount-weighted, service-based rates; see current rates listed on slide 18	Amount-weighted, service-based rates; see proposed rates listed on slide 18
Ordinary Disability	Sex-distinct, age-based rates grading upward from 0.00% to 0.95% for males and from 0.00% to 0.66% for females	Sex-distinct, age-based rates grading upward from 0.00% to 0.68% for males and from 0.00% to 0.47% for females
Occupational Disability	10% of Ordinary disability rates	Remove distinction between Ordinary and Occupational
Retirement	Separate age-based rates for participants with Less than 30 Years and 30 or More Years of Service at Retirement; see current rates listed on slide 27	Maintained current rate structure but modified individual rates to more closely match the observed experience; see proposed rates listed on slide 27
Percent Married	<b>Hired prior to September 1, 2011:</b> 75% <b>Hired after August 31, 2011:</b> Assume all participants are not married	<b>Hired prior to September 1, 2011:</b> Assumption based on active participant contribution rate provided with valuation data <b>Hired after August 31, 2011:</b> Assume all participants are not married
Spousal Age Difference	<b>Male Participants:</b> Three years older than female spouses <b>Female Participants:</b> Three years younger than male spouses	<b>Male Participants:</b> Three years older than female spouses <b>Female Participants:</b> Two years younger than male spouses
Pre-retirement Survivor Annuity Death Benefit for Participants Hired after August 31, 2011	75% are eligible for pre-retirement survivor death benefits (with value not less than refund of employee contributions)	No change

# Summary of Proposed Assumption Changes

Assumption	Current Assumption	Proposed Assumption
Refunds of Employee Contributions for Terminated Vested Participants	<p><b>Hired before September 1, 2011:</b> 75% elect a refund of their employee contributions</p> <p><b>Hired after August 31, 2011:</b> 100% elect a refund of their employee contributions</p>	<p><b>Hired before September 1, 2011:</b> 60% elect a refund of their employee contributions</p> <p><b>Hired after August 31, 2011:</b> 100% elect a refund of their employee contributions</p>
Vacation Pay	<p><b>Hired prior to September 1, 2011:</b> Retirement benefits are increased by 4.00%</p> <p><b>Hired after August 31, 2011:</b> No adjustment</p>	<p><b>Hired prior to September 1, 2011:</b> Retirement benefits are increased by 4.50%</p> <p><b>Hired after August 31, 2011:</b> Retirement benefits are increased by 1.50%</p>
Sick Leave Pay	None	<p><b>Hired prior to September 1, 2011:</b> Retirement benefits are increased by 0.50%</p> <p><b>Hired after August 31, 2011:</b> No adjustment</p>
Additional Accumulated Unused Sick Leave Service at Retirement	None	<p><b>Hired prior to September 1, 2011:</b> Additional 0.25 years of service included in total service (prior to application of maximum caps) for calculation in retirement benefits</p> <p><b>Hired after August 31, 2011:</b> No adjustment</p>

# Impact of Proposed Assumption Changes



# Impact of Proposed Assumption Changes

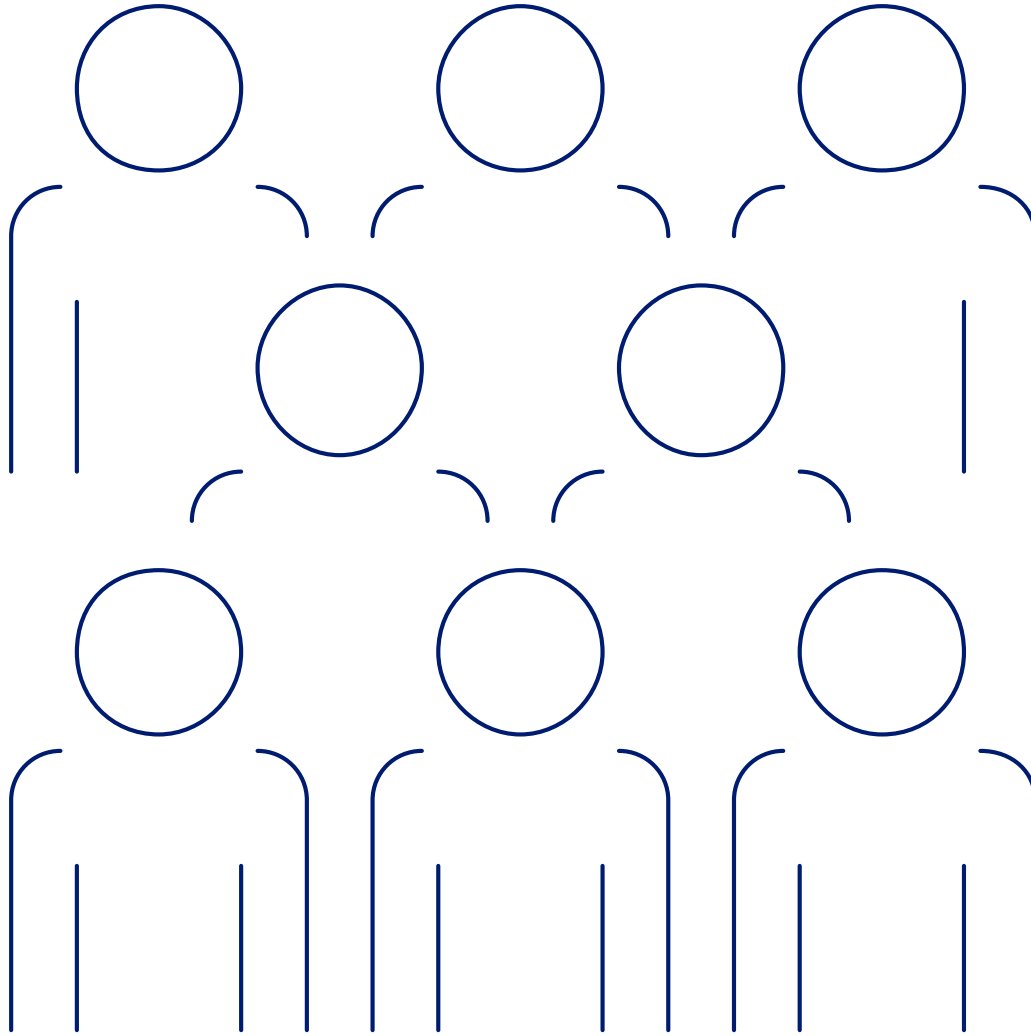
The following chart provides the estimated impact of the proposed assumption changes, based on the July 1, 2020 valuation results; changes will be implemented with the July 1, 2021 valuation.

Description	(A) July 1, 2020 Valuation Results	(B) July 1, 2020 Results with Program Refinements	(C) July 1, 2020 Results with Refinements and Recommended Retirement Changes	(D) July 1, 2020 Results with Program Refinements and Recommended Turnover Changes	(E) July 1, 2020 Results with Program Refinements and Recommended Turnover and Vacation/Sick Leave Load Changes	(F) July 1, 2020 Results with Program Refinements and All Recommended Assumption Changes*
1 Actuarial Accrued Liability (AAL)	\$1,965,224,862	\$1,964,270,275	\$1,967,744,971	\$1,965,212,181	\$1,974,065,523	\$1,974,156,768
2 Actuarial Value of Assets (AVA)	<u>1,336,954,199</u>	<u>1,336,954,199</u>	<u>1,336,954,199</u>	<u>1,336,954,199</u>	<u>1,336,954,199</u>	<u>1,336,954,199</u>
3 Unfunded Actuarial Accrued Liability (UAAL) [(1) - (2)]	628,270,663	627,316,076	630,790,772	628,257,982	637,111,324	637,202,569
4 Employer Normal Cost	5,924,133	5,762,529	5,857,960	7,365,305	7,688,639	7,756,527
5 Payment on UAAL	42,647,784	42,582,986	42,818,852	42,646,923	43,247,899	43,254,093
6 <b>Total Recommended Contribution adjusted for Timing [(4) + (5) + Interest]</b>	<b>\$51,750,478</b>	<b>\$51,509,260</b>	<b>\$51,862,237</b>	<b>\$53,285,043</b>	<b>\$54,269,840</b>	<b>\$54,348,770</b>
7 Recommended Contribution as a % of Projected Payroll	25.12%	25.00%	25.18%	25.87%	26.34%	26.38%
8 Projected Payroll	\$206,005,099	\$206,005,099	\$206,005,099	\$206,005,099	\$206,005,099	\$206,005,099
9 Funded Ratio – AVA Basis	68.03%	68.06%	67.94%	68.03%	67.73%	67.72%
10 Funded Ratio – MVA Basis**	67.06%	67.09%	66.97%	67.06%	66.76%	66.75%

\*Does not reflect proposed percent married assumption

\*\*Based on market value of assets of \$1,317,795,000 as of July 1, 2020

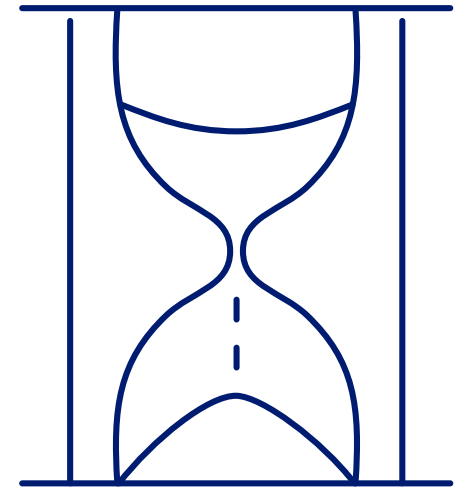
# Demographic Assumptions



# Withdrawal Assumption

## ***Current Assumption***

- Service-based with rates decreasing with longer service
- Headcount-weighted rates range from 18.00% for new hires down to 2.5% for participants with 14 or more years of service.
- Rates do not apply upon later of early retirement eligibility and age 55.





# Withdrawal Assumption

## *Findings*

- Experience was reviewed on both a headcount-weighted and amount-weighted basis. The amount-weighted experience produced lower rates than expected at all service levels, with a greater percentage difference at low service levels.
- Under the amount-weighted basis, exposures are based on every \$1,000 of annual benefit amount rather than on headcount. Essentially, this weights higher-service and higher-paid participants more heavily than lower-service and lower-paid participants to more closely approximate the impact on liabilities.
- Amount-weighted experience also resulted in a smoother pattern with less volatility.
- However, given recent withdrawal trends in the broader economy in the last 2-3 years, our proposed assumptions move partway towards actual amount-weighted experience
- No major differences between males and females
- Refer to the table on the next slide for details on exposures and experience.

**Withdrawal: Amount-Weighted Experience  
for the Period July 1, 2014 through June 30, 2019  
All Participants**

<b>Service</b>	<b>Exposures (in thousands)</b>	<b>Actual (in thousands)</b>	<b>Actual Rate</b>	<b>Proposed Rate</b>
0-1	\$342.23	\$17.59	5.14%	11.00%
1-2	875.48	60.69	6.93%	10.50%
2-3	1,248.22	78.50	6.29%	10.00%
3-4	1,413.29	65.27	4.62%	9.00%
4-5	1,643.31	57.50	3.50%	7.00%
5-6	1,675.88	48.32	2.88%	6.50%
6-7	2,255.09	45.25	2.01%	6.00%
7-8	3,851.14	155.83	4.05%	5.50%
8-9	4,695.05	88.69	1.89%	5.00%
9-10	2,958.87	57.32	1.94%	4.50%
10-11	293.49	3.60	1.23%	4.00%
11-12	212.50	4.09	1.93%	3.50%
12-13	135.78	0.00	0.00%	3.00%
13-14	96.95	0.00	0.00%	2.50%
14-15	92.78	0.00	0.00%	2.00%
15+	441.29	0.00	0.00%	1.50%
<b>Total</b>	<b>\$22,231.31</b>	<b>\$682.66</b>	<b>3.07%</b>	<b>6.09%</b>

# Withdrawal Assumption

## Recommendations

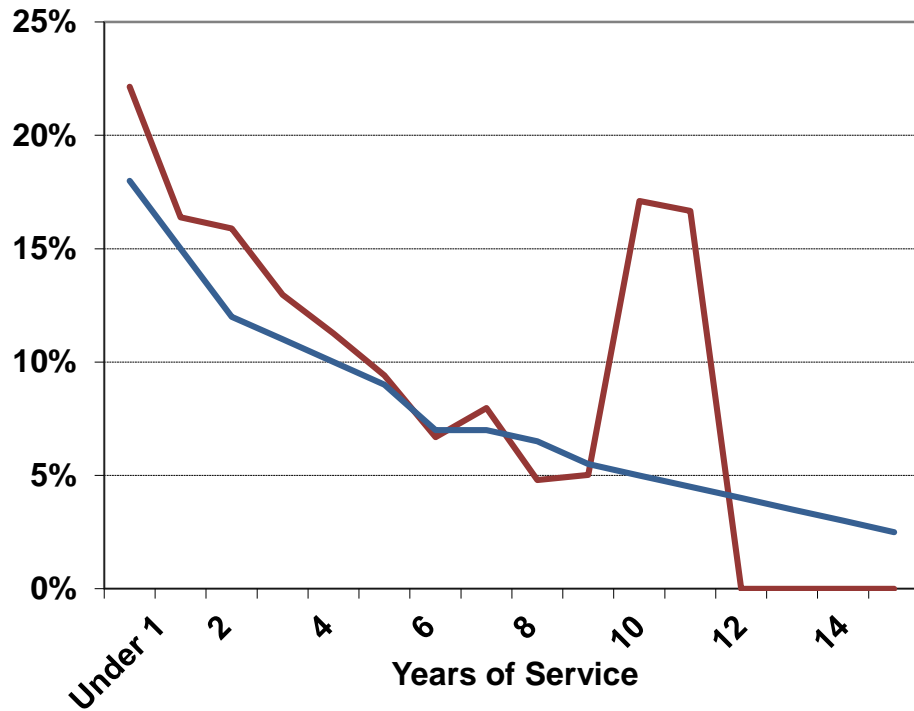
- Maintain service-based table with same rates for males and females
- Change from headcount-weighted to amount-weighted rates
- Decrease the rates for all years of service
- The following graphs show actual and expected rates on both on a headcount-weighted (HCW) and an amount-weighted (AW) basis and the proposed rates on an AW basis.

Years of Service	Current Rates (Headcount-weighted)	Proposed Rates (Amount-weighted)
0	18.00%	11.00%
1	15.00%	10.50%
2	12.00%	10.00%
3	11.00%	9.00%
4	10.00%	7.00%
5	9.00%	6.50%
6	7.00%	6.00%
7	7.00%	5.50%
8	6.50%	5.00%
9	5.50%	4.50%
10	5.00%	4.00%
11	4.50%	3.50%
12	4.00%	3.00%
13	3.50%	2.50%
14	3.00%	2.00%
15+	2.50%	1.50%

# Withdrawal Assumption – Graphs of Actual, Expected, and Proposed Assumptions

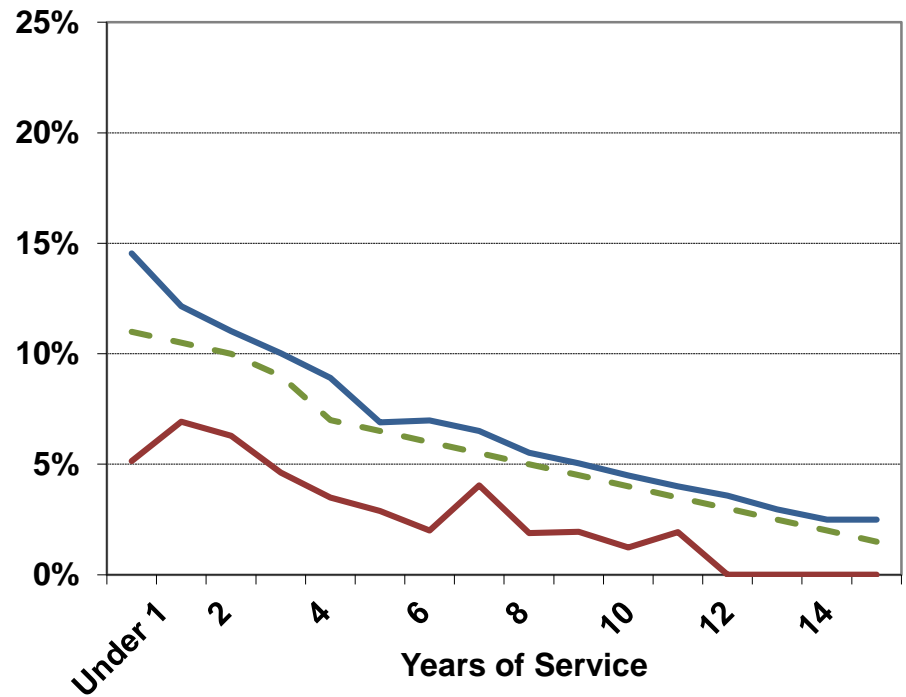
## Headcount-Weighted

Actual Expected



## Amount-Weighted

Actual Expected Proposed



# Disability Assumption

## *Current Assumptions*

- Current rates are age-based.
- Rates are gender specific.
- Headcount-weighted rates range from 0% under age 35 to 0.95% by age 60 for males and 0.66% at age 60 for females.
- Occupational disability rates are 10% of the ordinary disability rates.

## *Findings*

- Actual disability incidence is lower than expected for both males and females.
- The following table summarizes the disability experience.

<b>Group</b>	<b>Exposures</b>	<b>Actual</b>	<b>Expected</b>	<b>% of Expected</b>
Total	17,520	27	50	54%
Males	9,569	17	31	55%
Females	7,951	10	19	53%

# Disability Assumption

## Recommendations

- Maintain distinct rates for males and females.
- Maintain age-based patterns.
- Set proposed rates equal to approximately 70% of current rates.
- Remove distinction for occupational disability.

Age	Current Rates for Males	Proposed Rates for Males	Current Rates for Females	Proposed Rates for Females
Less than 35	0.00%	0.00%	0.00%	0.00%
35	0.09%	0.07%	0.09%	0.07%
40	0.14%	0.10%	0.13%	0.10%
45	0.22%	0.15%	0.20%	0.15%
50	0.37%	0.26%	0.32%	0.23%
55	0.64%	0.45%	0.54%	0.38%
60	0.95%	0.68%	0.66%	0.47%

# Retirement Assumption

## *Current Assumptions*

- Age-based, unisex rates
- Headcount-weighted
- Unreduced early retirement at any age with 30 years of service
- Separate sets of assumed rates for those with and without 30 or more years of service at retirement
- New plan provisions for participants hired after August 31, 2011 may impact future retirement patterns
  - Participants hired after August 31, 2011 had not reached retirement eligibility during the experience period for this study
  - Future studies will evaluate whether separate rates are needed for these participants

# Retirement Assumption

## *Findings*

- The data was analyzed on a headcount-weighted and an amount-weighted basis. The case for an amount-weighted approach was not as strong as for turnover with less difference between the headcount-weighted and amount-weighted results. Additional factors impact retirement including general health, other sources of income, the overall economic environment, and personal choice. As a result, the proposed assumptions were based on the headcount-weighted results.
- Ignoring participants under age 50 and over age 70, actual rates for participants with less than 30 years of service were less than expected
  - About 87% of expected
- Ignoring participants under age 50 and over age 70, actual rates for participants with 30 or more years of service were more than expected
  - About 128% of expected
- The tables on the next 2 slides show the expected and actual retirements during the study period, split by those with and without 30 or more years of service.



# Retirement Assumption

## Retirement: Headcount-Weighted Employees with Less than 30 Years of Service at Retirement for the Period July 1, 2014 through June 30, 2019

Age	Exposures	Actual	Actual Rate	Proposed Rate	Age	Exposures	Actual	Actual Rate	Proposed Rate
<50	13	13	100.00%	0.00%	60	304	51	16.78%	20.00%
50	349	6	1.72%	2.00%	61	235	37	15.74%	15.00%
51	384	6	1.56%	2.00%	62	198	24	12.12%	10.00%
52	400	7	1.75%	2.00%	63	171	9	5.26%	10.00%
53	383	13	3.39%	3.00%	64	151	16	10.60%	10.00%
54	383	11	2.87%	3.00%	65	131	28	21.37%	20.00%
55	345	24	6.96%	5.00%	66	90	17	18.89%	20.00%
56	322	13	4.04%	6.00%	67	63	13	20.63%	20.00%
57	321	14	4.36%	6.00%	68	48	7	14.58%	15.00%
58	312	18	5.77%	7.00%	69	32	2	6.25%	25.00%
59	300	31	10.33%	7.00%	70+	118	21	17.80%	100.00%
					<b>Total*</b>	<b>4,922</b>	<b>347</b>	<b>7.05%</b>	<b>7.40%</b>

\*Total excludes ages less than 50 and ages 70 or more.

# Retirement Assumption

## Retirement: Headcount-Weighted Employees with 30 or More Years of Service at Retirement for the Period July 1, 2014 through June 30, 2019

Age	Exposures	Actual	Actual Rate	Proposed Rate	Age	Exposures	Actual	Actual Rate	Proposed Rate
<50	3	0	0.00%	0.00%	60	33	12	36.36%	35.00%
50	5	3	60.00%	60.00%	61	32	12	37.50%	35.00%
51	11	6	54.55%	60.00%	62	28	5	17.86%	20.00%
52	27	18	66.67%	60.00%	63	25	6	24.00%	20.00%
53	27	15	55.56%	60.00%	64	27	1	3.70%	20.00%
54	37	16	43.24%	45.00%	65	24	7	29.17%	20.00%
55	44	21	47.73%	45.00%	66	21	5	23.81%	20.00%
56	39	17	43.59%	45.00%	67	12	1	8.33%	20.00%
57	45	20	44.44%	45.00%	68	11	0	0.00%	20.00%
58	45	19	42.22%	40.00%	69	9	1	11.11%	20.00%
59	37	14	37.84%	40.00%	70+	42	6	14.29%	100.00%
					<b>Total*</b>	<b>539</b>	<b>199</b>	<b>36.92%</b>	<b>37.70%</b>

\*Total excludes ages less than 50 and ages 70 or more.

# Retirement Assumption

## *Recommendations*

- Maintain age-based table with same rates for males and females
- Maintain headcount-weighted rates
- Participants with less than 30 years of service:
  - Minor adjustment to rates at ages 62 to 67 to more closely match the observed experience
- Participants with 30 or more years of service:
  - Increase rates at earlier ages (50 to 61) to reflect earlier retirement once participants reach 30 years of service. Slight reduction to rates for ages 65 and over
- Changes in current and proposed assumed retirement rates are shown on slide 27.
- A graph depicting current actual, assumed and proposed rates for the Plan in total during the study period is shown on slide 28.

# Retirement Assumption

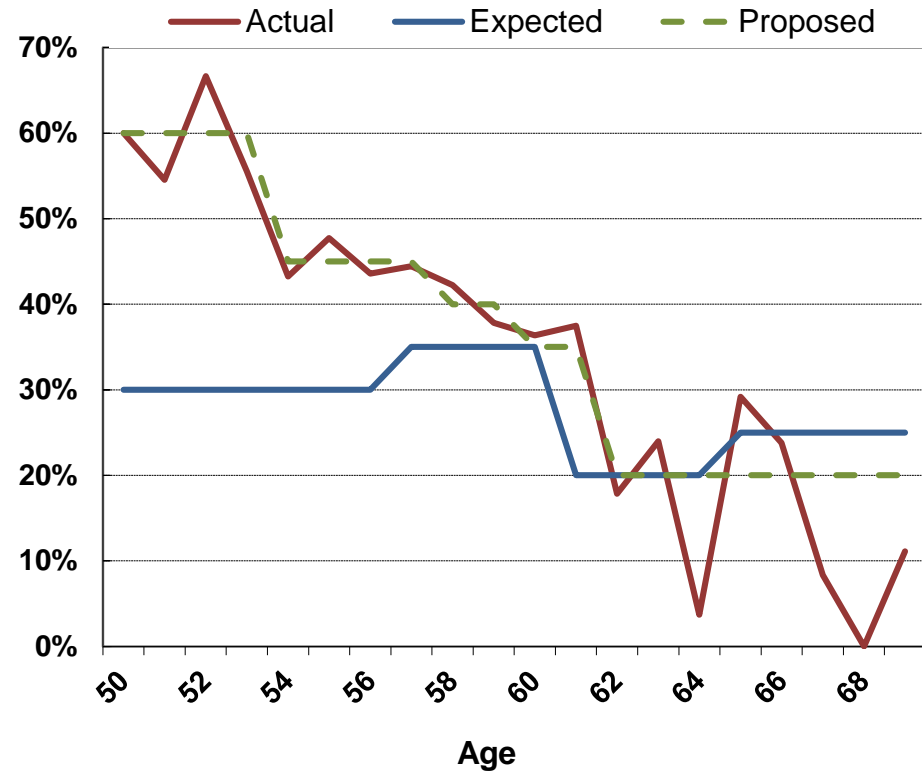
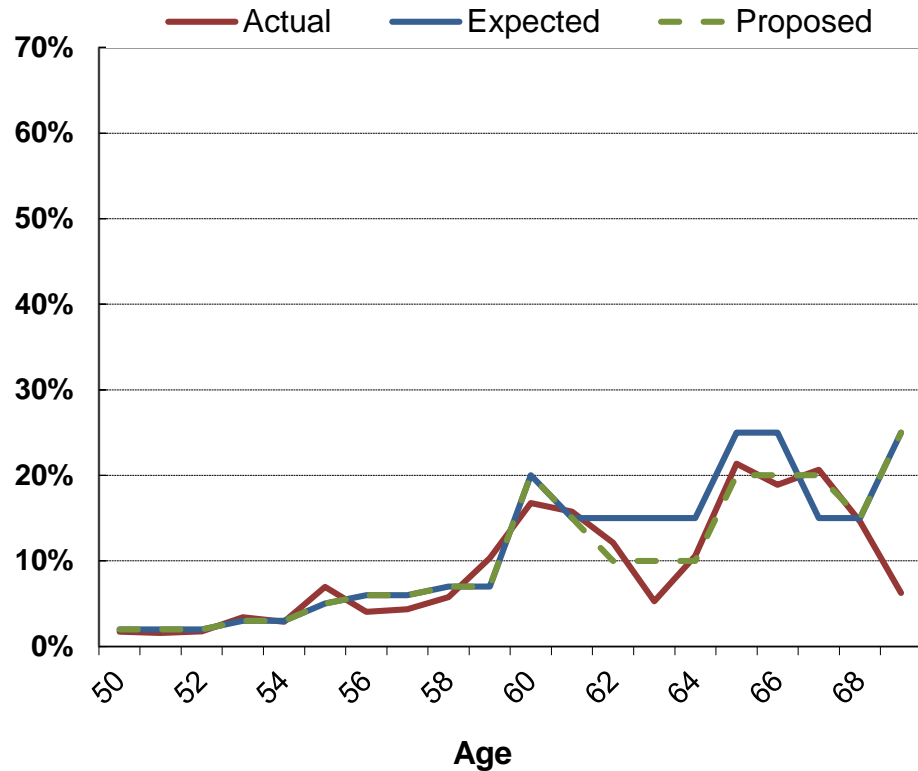
The chart below shows the current and proposed retirement rates:

Age	Less than 30 Years of Service		Age	30 or More Years of Service	
	Current Rate	Proposed Rate		Current Rate	Proposed Rate
50 – 52	2%	2%	50 – 53	30%	60%
53 – 54	3%	3%	54 – 56	30%	45%
55	5%	5%	57	35%	45%
56 – 57	6%	6%	58 – 59	35%	40%
58 – 59	7%	7%	60	35%	35%
60	20%	20%	61	20%	35%
61	15%	15%	62 – 64	20%	20%
62 – 64	15%	10%	65	25%	20%
65 – 66	25%	20%	66	25%	20%
67	15%	20%	67	25%	20%
68	15%	15%	68	25%	20%
69	25%	25%	69	25%	20%
70	100%	100%	70	100%	100%

# Retirement Assumption – Graphs of Actual, Expected, and Proposed Assumptions

Less Than 30 Years of Service

30 or More Years of Service



# Spousal Assumptions

## **Current Assumption**

- 75% of participants hired before September 1, 2011 are assumed to have a spouse upon retirement or death from active status
- Males are assumed to be three years older than their female spouses

## **Findings**

- Improved data quality will allow us to directly base this assumption on individual employee contribution rates for participants other than those in the 2011 plan for future valuations.
- The beneficiaries of male participants were about three years younger, while the beneficiaries of female participants were about two years older.

## **Recommendations**

- Hired prior to September 1, 2011: Base assumption on active participant contribution rate provided in valuation data. Assume 75% of terminated vested participants are married if contribution rate prior to termination not available.
- Hired after August 31, 2011: Assume all participants are not married.
- Modify the spousal age assumption for female participants to assume male spouse are two years older.
- No change for spousal age assumption for male participants.



# Refund of Employee Contributions Assumption

## **Current Assumption**

- 75% of participants hired before September 1, 2011 are assumed to elect a refund of their employee contributions.
- 100% of participants hired after August 31, 2011 are assumed to elect a refund of their employee contributions.

## **Findings**

- 62% of participants hired before September 1, 2011 took a refund of their employee contributions.
- 97% of participants hired after August 31, 2011 took a refund of their employee contributions.

## **Recommendations**

- Hired before September 1, 2011:  
Decrease percentage of terminated employees assumed to elect refunds of their contribution balances from 75% to 60%.
- Hired after August 31, 2011:  
Maintain the 100% assumption for participants.



# Unused Sick Leave Assumption

## ***Current Assumption***

- No adjustments are made to retirement benefits with regard to sick leave pay
- No adjustment for unused sick leave service at retirement

## ***Findings***

- Analysis prepared by Strategic Benefits Advisors
- Warrants adjustments to benefits

## ***Recommendations***

- **Hired prior to September 1, 2011:**
  - Sick Leave Pay: Introduce load of 0.50% to retirement benefits
  - Unused sick leave service at retirement: Introduce assumption to add an additional 0.25 years of service to total service (prior to application of maximum caps) for calculation in retirement benefits
- **Hired after August 31, 2011:** No adjustment for sick leave pay or unused sick leave service is reflected in calculation of retirement benefits



# Accumulated Vacation Pay Assumption

## ***Current Assumption***

- Hired prior to September 1, 2011: Retirement benefits are increased by 4.00%
- Hired *after August 31, 2011*: No adjustment

## ***Findings***

- Analysis prepared by Strategic Benefits Advisors
- Warrants adjustments to benefits

## ***Recommendations***

- Hired prior to September 1, 2011: Increase load from 4.00% to 4.50%
- Hired *after August 31, 2011*: Introduce load of 1.50% to retirement benefits

# Actuarial Certification


The actuarial experience review of demographic assumptions other than mortality for the City of Atlanta General Employees' Pension Fund and the resulting cost estimates were performed under the supervision of Jeanette R. Cooper, FSA, FCA, MAAA, EA, with the assistance of Ben Kirkland and Jody Martin.

The study was based on data provided by the System for the July 1, 2014 through July 1, 2019 valuations. Our analysis was conducted in accordance with generally accepted actuarial principles as prescribed by the Actuarial Standards Board (ASB) and the American Academy of Actuaries. Additionally, the development of all assumptions contained herein is in accordance with ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*). Ms. Cooper is experienced with performing experience studies for large public-sector pension plans and is qualified to render the opinions contained in this presentation.

Assumptions for loads on accumulated vacation pay and unused sick leave were informed by an analysis of retirements in 2021 prepared by Strategic Benefits Advisors.

Segal valuation results are based on proprietary modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Certified by:



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Jeanette R. Cooper, FSA, FCA, MAAA, EA  
Vice President and Consulting Actuary

# Thank You!

**Jeanette R. Cooper, FSA, FCA, MAAA, EA**

Vice President and Actuary

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