November 23, 2014

TO: Honorable Council Members

FROM: Joey Greive, CFA, CFP

RE: Recent actuarial questions and answers related to 2014-386

Please see the following Questions and Answers which have been posed during the October and November Council deliberations on 2014-386. The purpose of this memo is update you as to where we are with each. New questions have also been posed since we last met. Those are incorporated into this document as well. Please let us know if you have additional questions or if you would like the below clarified by the actuary.

1. **Was an increased contribution to 10% per employee used in the charts provided by Milliman?** (Several Council Members)

   11/17 Response: Yes. Our June 4, 2014 letter on page 4 indicated that for purposes of our analysis, we assumed that the employee contribution rate would increase to 10% effective October 1, 2014 which was the effective date of the agreement at that time. The three month delay in the proposed effective date would defer the increase in the employee contribution rate to 8% until January 1, 2015 and to 10% until the next budget year beginning on October 1, 2015 for current employees unless pay restorations occur sooner. This delay would reduce the expected amount of employee contributions by approximately $2.8 million for a year. In turn, this increases the expected City Contribution over the 35-year projection period by approximately $3.1 million in total. The $3.1 million slightly reduces the projected savings of $1.8 billion that our June 4, 2014 analysis estimated. From a benefits perspective, the delay would only impact employees hired between October 1, 2014 and December 31, 2014. The City has advised us that it is not aware of any major hiring plans during this three month period (October 1, 2014 to December 31, 2014). If there are no new hires prior to RRA implementation the impact on the liabilities is nil. For purposes of this analysis we have not yet adjusted our projections to reflect any potential delay in individual salary increases and hence the lowering of potential future retirement benefits, which affect both the Baseline and the proposed RRA.

2. **How does the removal of the pay increases for personnel from the budget process impact the Milliman review?** (Several Council Members)

   11/17 Response: The response below assumes that while “across the board” pay raises will be 0% for FY 2015, employees will still be eligible for step, merit, etc. types of raises.

   Our understanding of the proposed RRA is that the contribution rate for current employees will not increase to 10% until Police Officers and Fire Members each receive a 2% pay raise. Hence, the elimination of the “across the board” pay raise means the current employee contribution rate will increase to 8% upon the effective date but will not increase to 10% during FY 2015 due to the lack of pay raises included in the FY 2015 City budget. The deferring of the increased employee contribution rate means the City contribution would increase. The three month delay in the proposed effective date would defer the increase in the employee contribution rate to 8% until January 1, 2015 and to

10% until the next budget year beginning on October 1, 2015 for current employees, assuming pay raises are not granted during the current fiscal year. This would reduce the expected amount of employee contribution by approximately $2.8 million. In turn, this increases the expected City Contribution over the 35-year projection period by approximately $3.1 million in total. The $3.1 million slightly reduces the projected savings of $1.8 billion that our June 4, 2014 analysis estimated. From a benefits perspective, the delay would only impact employees hired between October 1, 2014 and December 31, 2014. The City has advised us that it is not aware of any major hiring plans during this three month period (October 1, 2014 to December 31, 2014). If there are no new hires prior to RRA implementation the impact on the liabilities is nil. For purposes of this analysis we have not yet adjusted our projections to reflect any potential delay in individual salary increases and hence the lowering of potential future retirement benefits.

3. **What is the impact if the RRA is modified so that the three percent annual COLA increase is delayed for three years on future accruals for current employees?** (Anderson)

   11/17 Response: In general, the value of future accruals for current participants would be reduced by 7% to 8% of the value of their future accruals. The impact on any individual future retiree will vary by the split of this benefits between what is already accrued (no COLA delay) and what has not yet been accrued. This would have the impact on three hypothetical future retirees as follows:

Hypothetical Retiree
Portion of Benefit Accrued as of RRA Adoption Date
Assuming 3% Annual Post-Retirement Adjustment

	100%	50%	0%
Initial Benefit	$55,000	$55,000	$55,000
Benefit After 10 years	$73,915	$71,794	$69,672
Benefit After 20 years	$99,336	$96,485	$93,630

4. **What is the impact if the RRA is modified so the rate of return on DROP accounts is fixed at 5.4% per annum?** (Anderson)

   11/17 Response: The proposed RRA lowers the interest accrual on future DROP participants from 8.40% to the actual return earned by the Trust Fund with a floor of 5% and a Max of 10%. We note that the 2013 valuation report prepared by Pension Board consultants, Inc. shows the current DROP accounts to be approximately equal to $247 million as of October 1, 2013. If we assume the future rate of return (ROR) on Trust Fund assets equals the valuation assumption of 7%, and that the amount of DROP accounts remain at $247 million for the next 20 years, a very rough guestimate is the interest credited on future DROP accounts at 5.4% rather than 7.0% over the next 20 years will be about $80 million less. If the interest credited to DROP accounts is less, then more investment earnings would be used to reduce the UAL.

5. **What is the impact of delaying the effective date of the proposed RRA to January 1, 2015?** (Several Council Members)

   11/17 Response: The three month delay in the proposed effective date would defer the increase in the employee contribution rate to 8% until January 1, 2015 and to 10% until the next budget year beginning on October 1, 2015 for current employees assuming no pay raises are granted during the current fiscal year. This would reduce the expected amount of employee contribution by approximately $2.8 million. In turn, this increases the expected City Contribution over the 35-year projection period by approximately $3.1 million in total. The $3.1 million slightly reduces the projected savings of $1.8 billion that our June 4, 2014 analysis estimated. From a benefits perspective, the delay would only impact employees hired between October 1, 2014 and December 31, 2014. The City has advised us that it is not aware of any major hiring plans during this three month period (October 1, 2014 to December 31, 2014). If there are no new hires prior to RRA implementation the impact on the liabilities is nil. For purposes of this analysis we have not yet adjusted our projections to reflect any potential delay in individual salary increases and hence the lowering of potential future retirement benefits.

6. **How were the Chapter Funds applied for the proposed RRA?** (Several Council Members)

   11/17 Response: For the RRA the City has estimated the initial amount of Chapter 175/185 funds to be used by the City is $8 million. We have assumed this amount will remain constant from year to year producing a total of $56 million over the seven years (FY 2015-FY 2021). We have modeled the use of the funds for the seven years as follows:

   $5 million to fund the base benefits of the Plan for each of the seven years and
   $3 million as an additional UAL payment for the next seven years.

7. **List and discuss mortality tables used in Valuation Reports we have in our files.** (Schellenberg)

   11/17 Response: Post-Retirement Healthy Mortality assumptions below used in Valuations of Police and Fire Pension Fund. All the Valuation Reports were prepared by Pension Boards Consultants, Inc.:

October 1, 1998 Report	1983 Group Annuity Mortality Tables
April 1, 2000 Report	Same as 1998 Report
October 1, 2001 Report	Same as 1998 Report
October 1, 2003 Report	Same as 1998 Report
October 1, 2006 Report	Same as 1998 Report
October 1, 2008 Report	1994 Group Annuity Mortality Tables
October 1, 2011 Report	The RP-2000 Combined Healthy Mortality Table, separate by sex, Projection Scale AA to valuation date of 2011.
October 1, 2012 Report	The RP-2000 Combined Healthy Mortality Table, separate by sex, Projection Scale AA to

	valuation date of 2012.
October 1, 2013 Report	The RP-2000 Combined Healthy Mortality Table, separate by sex, Projection Scale AA to valuation date of 2013.

Discussion: As background, in general, proposed assumptions are developed by analyzing historical member census data using actuarial and statistical techniques, while also being contemplative of potential future experience for various reasons.

Mortality rates are used to project the length of time benefits will be paid to current and future retirees and beneficiaries. The selection of a mortality assumption affects plan liabilities because the estimated value of retiree benefits depends on how long the benefit payments are expected to continue. There are generally clear differences in the mortality rates among non-disabled and disabled retired members.

As a result, each group is normally reviewed separately. For purposes of this letter, we have only set-forth the mortality assumption for non-disabled retired members. The Experience Study Report grouped together and analyzed the experience of Retirees, Drops, Survivors and Terminated Vesteds

The 2011 Experience Study Report performed by Pension Board Consultants, Inc. notes the current assumption at the time of the study was the 1994 Group Annuity Mortality Table. [1)]

[1)]Used in October 1, 2008 valuation.

The Experience Study Report notes that the Actuarial Experience was 249 deaths among retirees (including Drops), beneficiaries, and vested terminated employees compared with 176.3 expected during the five-year study period.

The report recommended changing the assumption to the RP 2000 Combined Healthy Mortality Table projected by Scale AA to valuation date.[2)]

[2)]Proposed for use in October 1, 2011 Valuation, and subsequently adopted by the Board.

8. **Project an average new retiree benefit with a 1.5% COLA and a 3% COLA for the life expectancy of the average new retiree. Also sum up the total benefit payments paid under each assumption.** (Boyer) (See chart on next page).

Jacksonville Police and Fire Pension Fund		
Sample Retirement Benefit Projection Comparing 3% Annual Post-Retirement Adjustment to 1.5% Annual Post-Retirement Adjustment with a Three Year Delay Based on 2013 Actuarial Valuation Male Mortality Table (the RP 2000 Combined Healthy Mortality Table projected by Scale AA to valuation date of 2013)		
Age	3% Annual Post- Retirement Adjustment	1.5% Annual Post- Retirement Adjustment
55	$ 55,000	$ 55,000
56	$ 56,650	$ 55,000
57	$ 58,350	$ 55,000
58	$ 60,100	$ 55,825
59	$ 61,903	$ 56,662
60	$ 63,760	$ 57,512
61	$ 65,673	$ 58,375
62	$ 67,643	$ 59,251
63	$ 69,672	$ 60,139
64	$ 71,763	$ 61,041
65	$ 73,915	$ 61,957
66	$ 76,133	$ 62,886
67	$ 78,417	$ 63,830
68	$ 80,769	$ 64,787
69	$ 83,192	$ 65,759
70	$ 85,688	$ 66,745
71	$ 88,259	$ 67,747
72	$ 90,907	$ 68,763
73	$ 93,634	$ 69,794
74	$ 96,443	$ 70,841
75	$ 99,336	$ 71,904
76	$ 102,316	$ 72,982
77	$ 105,386	$ 74,077
78	$ 108,547	$ 75,188
79	$ 111,804	$ 76,316
80	$ 115,158	$ 77,461
81	$ 118,613	$ 78,623
82	$ 122,171	$ 79,802
83	$ 125,836	$ 80,999
Total	$2,487,037	$1,924,267

9. **Discuss the difference between salaries and hence employee contributions increasing 2% versus contributing the 2% directly to the fund.** (Crescimbeni)

   11/23 update: We are working with the actuary to provide an answer to Council. The actuary will seek to meet with CM Crescimbeni while in town on 11/24 and 11/25 to clarify and complete this response.

Follow-up requested by CM Crescimbeni at 11/18 Finance Committee meeting: He understands that option 1 is more costly than option 2, and now would like to see this quantified.

11/17 Response: Below are some differences between: 1) Individual salaries increasing by 2% resulting in employee contributions increasing by 2% and 2) instead the City contributing the 2% directly to the Police and Fire Pension Fund as an employer contribution.

Under (1), employee salaries are resulting in higher projected retirement benefits. The additional employee contributions may be refunded back to the employee if not vested. Other pay related benefits such as Sick Pay, Holiday Pay, Group Life Insurance, etc. would also increase. Furthermore, future pay raises would be higher in absolute dollars resulting in higher retirement benefits and other non-pension related benefits. Thus from a cost perspective (1) is more costly than option (2).

Please note that the connection of employee pension contributions to pay restorations was a recommendation of the Retirement Reform Task Force.

However, as a result of pursuing option (2), is possible that in future bargaining the Police and/or Fire representatives will successfully argue that their salaries are 2% lower than their competitors, and hence the City would agree to the 2% pay raise or increases in other benefit programs.

10. Derive Savings of RRA vs Base over 30 years rather than 35. (Clark)

Response: While the chart below summarizes our answer, further calculation is required when comparing this to any prior 30 year estimates because assumptions have changed, and actual experience (demographic and investment) has varied from that assumed during the interim.

Scenario	Total Dollars ($ billions) over the next 35 years[1 2]	Total Dollars ($ billions) over the next 30 years[1 2]
Baseline with Frozen 175/185 Chapter Funds	$6.69	$6.19
Proposed RRA	$4.78[3]	$4.56[3]
Estimated Savings	$1.90[3]	$1.63[3]

1. Total dollars exclude expected employee contributions, State Chapter Funds allocation (i.e. premium-tax refunds) and expected court fines and penalties. State laws make the City responsible for funding the difference between the actuarially determined contribution and these amounts.

2. Excludes all additional sources of funds used to accelerate the funding of the Unfunded Actuarial Liability.

3. A one-time total transfer of $61 million is made from the EBA and the CBSA to the Pension Fund; $40 million as an additional UAL payment in FY 2015, and $21 million as an additional UAL payment FY 2016. The City contributes $19 million in FY 2016 and eight more payments of $40 million beginning in FY 2017 and continuing and including FY 2024.

Clark follow-on: To accurately compare the 2013 and 2014 agreements a rerun of the 2013 agreement with the new assumptions would be necessary. We estimate this will take approximately four weeks to complete.*

Note:

In addition based on discussions with the City, in response to recent discussions surrounding chapter funds and PEW, we have updated our Base projections to reflect a slightly lower amount of Chapter 175/185 funds available to reduce the ARC in the baseline scenario as follows:

> The June 4, 2014 baseline projections assumed the City's ARC would be reduced by 4.58% of pay attributable to expected Court Fines and Penalties plus half of the Chapter 175/185 funds.
>
> The revised projections assume the City's ARC is reduced by 0.58% of pay attributable to expected Court Fines and Penalties plus approximately $5.236 million per annum starting in FY 2014-2015. The $5.236 million is the estimate of the Chapter Funds expected to be paid as shown in the 2013 valuation report of the Police and Fire Plan prepared by Pension Board Consultants, Inc. and represents approximately 4% of 2013 Valuation payroll. As shown in the chart below this assumption change, increases the cost of the status quo baseline projection, which in turn increases the savings estimate of the 2014 RRA by $79 million dollars.

Scenario	Total Dollars ($ billions) over the next 35 years[1]
Base	$6.614
Revised Base	$6.693
Change from Base	$0.079

[1] Total dollars exclude expected employee contributions, State Chapter Funds allocation (i.e. premium-tax refunds) and expected court fines and penalties. State laws make the City responsible for funding the difference between the actuarially determined contribution and these amounts.

11. How many PFPF members, including those in the DROP and surviving spouses, are currently receiving pension benefits and what is the total amount paid annually to these beneficiaries? (Lumb)

11/23 Response: Please see pages 14 and 15 of the PFPF 10/1/13 valuation for a breakdown of those in the various retirement categories and the average payments.

12. Under the revised DROP account are employees allowed to leave their money in those accounts or if they will be required to take the lump sum option? (Lumb)

11/23 Response: My understanding in discussion with OGC is that if you are currently in DROP, there is no change. Current active employees who are not yet in DROP will still be allowed to leave their money in but at the reduced rate. For new employees, DROP is entirely abolished. Please consult OGC for further clarification if needed on this.

13. If we borrowed the $120 million what would be the approximate terms of the note and how much would the ARC change? Also how much less would we be getting from JEA? (Love)

11/23 Response: Please see the attached draft financial analysis of the funding plan. The figures shown are approximated and may change as we refine our analysis. We have estimated a 10 year taxable financing of the City's $120 million to result in a $14.7 million annual payment based upon a rate of 3.5%. When combined with the upfront cash from JEA, the immediate application of the $61mm in PFPF reserves, and the ongoing addition chapter funds allocated per the agreement, the City's annual PFPF expenditures under the status quo versus the proposed funding approach are projected as follows for the next 10 years:

Pension Costs by Year: Draft pending final actuarial analysis					
					Annual
	Status Quo PFPF ARC		Pension Costs with Funding Plan		**Savings Over Status Quo**
FY 15	153		153		
FY 16	162		157.0		**5.0**
FY 17	167		156.4		**10.6**
FY 18	172		156.3		**15.7**
FY 19	177		154.5		**22.5**
FY 20	184		153.0		**31**
FY 21	191		164.6		**26.4**
FY 22	199		168.3		**30.7**
FY 23	207		177.1		**29.9**
FY 24	215		181		**34**
FY 25	224		185.7		**38.3**
Cumulative	**2051**		**1806.9**		**244.1**

The attached EXHIBIT A shows further detail behind the proposed funding solution, in draft form, as well as the year by year estimate of what the JEA contribution would be under the proposed agreement using a conservative growth assumption of 1%, per the 2014 U.S. Energy Information Administration report provided to us.

14. Please explain the details of the proposed refinancing that is expected to generate $120 million that could potentially be used for unfunded liability. (Yarborough)

11/23 Response: The City currently pays an interest rate of 7% on the amount owed to the Police and Fire Pension Fund ($1.65 billion). In the proposed solution, the City would refinance $120 million of that total debt at approximately 3.5% and pay off that same amount of the Unfunded Liability now, as opposed to later. This would result in overall lower costs as it is similar to refinancing a home mortgage with a rate of 7% into a less costly loan of 3.5%. The proposal also includes $120 million from JEA, which will be used in the same manner (paying down the 7% mortgage). These two amounts will also be combined with immediate application of the $61 million in PFPF reserve balances to pay down the debt. The result of this package is an immediate debt pay-down of approximately $300 million, which lowers the City's overall costs and fully funds the commitment to the PFPF as required in 2014-386.

Additional Questions Raised by City Council Members requiring further modeling as of 11/21/2014

15. Rerun RRA with COLAs on future accruals delayed three years. (Anderson)

11/23 update: Draft response awaiting lead actuary review. Response anticipated in the near future.

11/17 Response: We estimate this will take approximately two to three weeks to complete.*

16. Rerun Base and RRA using new Society of Actuaries (SOA) mortality tables (RP 2014) with its Mortality Improvement Scale (MP-2014) for future mortality improvements. (Gulliford)

11/23 update: Draft response approaching lead actuary review stage. Response anticipated in the near future.

11/17 Response: We estimate this will take approximately three weeks to complete.* We note that using the new Society of Actuaries tables with full generational projections will increase the City's estimated ARC for both the Base projection and the proposed RRA projection, thereby partially offsetting the impact on the projected savings of the 2014 RRA.

Discussion: Although the SOA's analysis acknowledged statistically significant structural differences in the underlying mortality rates produced for public and private plans, and therefore eliminating from the final RP-2014 report the data from "three extremely large public plans", the SOA still states that "it would not necessarily be inappropriate or inconsistent for actuaries to consider…the RP-2014 tables as suitable mortality benchmarks for specific public plan."

Public pension plans are not required to adopt these new tables. However, as these plans' actuaries review the mortality assumption they currently use, they may find that information presented in the new tables may influence the plans' assumptions as RP-2014 and MP-2014 become widely accepted. If the plans' mortality assumptions are reviewed on a regular basis, the timing of the new review is not likely to be affected.

17. Rerun RRA and Base assuming aggregate payroll growth averages at 1.5% per annum. (Boyer)

11/23 update: Actuarial modeling in progress to add quantification and charts/graphs as requested subsequent to the initial responses shown below.

11/17 Response: We estimate this will take approximately three weeks to complete.* We note that lowering the actual salary experience of active participants will modify the City's estimated ARC for both the Base projection and the proposed RRA projection, thereby partially offsetting the impact on the projected savings of the 2014 RRA.

10/21 Responses:
There are two salary or payroll assumptions used in the projections. 3.25% per annum is the assumed aggregate payroll growth per annum, while 4.00% is the individual annual

increase in each employee's salary. If individual salaries grow at an annual rate of less than 4.00%, their projected benefits at retirement would be lower and hence plan costs would be lower. The lower costs would affect both the current plan and the RRA. We have not done any projections assuming lower annual pay raises, but savings would be reduced as overall costs would be reduced. It may be easier to think about the two salaries or payroll growth assumptions in terms of an escalator:

- Individual salary raises represent individuals going up the escalator. The total impact of individual salary raises is less than the aggregated payroll assumption as the higher paid individual retiree (steps off the top of the escalator) and is replaced with an individual getting on the bottom of the escalator.
- The aggregate payroll growth assumption represents the entire escalator being raised.

a. What would the total plan cost difference be to the city over the analysis period if lower payroll growth were to play out?

Answer:
Our response assumes that this question is regarding aggregate payroll. This assumption is utilized in developing the amortization or how the unfunded liability is paid off overtime. If in any one year, aggregate payroll increases less than 3.25% per annum, fewer contributions would flow into the plan and a higher UAL would result in the following year. If payroll is continually growing less than the assumption, the amortization payment would need to be modified such that the UAL would be paid off over the intended time period. This modification would lead to higher contributions sooner, but overall lower contributions during the amortization period. Similar to a mortgage, if you pay off your house early you pay less interest and less payments, but the monthly payment made is higher.

b. When looking at salary growth, which elements are not included? Is it the total payroll level of the plan or does it factor out "step-raises".

Answer:
Aggregate payroll is total "pension" payroll while the individual assumption reflects inflation, merit , step, etc.

18. Rerun RRA with the current employee contribution rate going to 8% on 1/1/2015, but not to 10% until 10/1/2016 or 10/1/2018. (Boyer)

11/23 update: Actuarial modeling in progress

11/17 Response: We estimate this will take approximately three weeks to complete.*

19. **What is the impact on the Total Dollars ($ billions) over the next 30 years if the $40 million dollars per year is reduced to either $10 million, $20 million or $30 million and in what year does the Fund attain a funded percentage of at least 80%. (Please note that under these scenarios the additional annual transfer of $10 million, $20 million or $30 million continues to FY 2024).** (Anderson)

    11/23 update: Response: We estimate this will take approximately two to three weeks to complete.

20. **What is the impact on the Total Dollars ($ billions) over the next 30 years if the $40 million dollars per year is completely eliminated. In addition, the one-time total transfer of $61 million from the Enhanced Benefit Account (EBA) and the City Budget Stabilization Account (CBSA) to the Pension Fund; $40 million as an additional UAL payment in FY 2015, and $21 million as an additional UAL in FY 2016 would also be eliminated.** (Clark/Boyer/Lumb/Anderson)

    11/23 update: Response: We estimate this will take approximately two to three weeks to complete.

***Means actual computer driven projections must be modified and rerun.**

Actuarial disclaimers:

Except as otherwise indicated in this e-mail, the explanatory notes contained in the Milliman letter dated June 4, 2014 regarding "Update to Projections Regarding Jacksonville Police and Fire Pension Fund to include proposed 2014 Retirement Reform Agreement" including statement of reliance and limitations on use to continue to apply.

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