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VIA EMAIL and USPS

June 6, 2017

Mr. Robert Theller, Esq.
Retirement Administrator
City of Fresno Retirement Systems
2828 Fresno Street, Suite 201
Fresno, CA 93721-1327

**Re: City of Fresno Retirement Systems
Review of Cost Neutrality for Deferred Retirement Option Plan (DROP)**

Dear Rob:

As requested by your office, we have reviewed the cost neutrality of the DROP based on data, assumptions, and methods from the most recent actuarial valuation as of June 30, 2016. For current active members who have not elected DROP as of June 30, 2016, we performed an analysis of projected experience (i.e., what we anticipate the costs to be for current active members expected to elect DROP in the future). For members who have already elected DROP (including all members regardless of whether they have retired from the DROP as of June 30, 2016), we have compared, in the aggregate, the actual and the theoretical amounts (i.e., what the amount would be if accumulated at the assumed interest rates) in their DROP accounts.

In preparing this report, we have followed the practice of our 2014 and 2011 cost neutrality studies (as well as the Systems' prior actuary's study in 2005) in including the analysis of the Employees Plan and the Fire and Police Tier 1 and Tier 2 Plan in a single report. This is because with the exception of the actual results that differ by Plan, the issues and discussions that follow apply equally to both the Employees and the Fire and Police Plans.

This letter provides the results as well as the methodology used in this study.

Summary of Conclusions

Cost Neutrality of DROP for Active Members

In answering the question of whether the DROP is cost neutral, we have continued the methodology used in our last cost neutrality study dated January 22, 2014. Under that method, the DROP was deemed cost neutral if the present value of benefits payable to the active members under the current Plans with the DROP provisions was within 2% of what the present value of benefits payable under the Plans would be without the DROP provisions.

In our opinion, that method is a reasonable basis to evaluate the cost neutrality of the DROP provisions. Based on that method, we conclude in this study that, with respect to the current active members only as reported in the June 30, 2016 valuation, the DROP is cost neutral for the Employees Plan and the Fire and Police Plan because the increase in the value of benefits under the DROP does not exceed 2%.

Accumulated Amounts in the DROP Accounts for DROP Participants

For members who had elected DROP (including all members regardless of whether they had retired from the DROP as of June 30, 2016), we have compared, in the aggregate, the actual and the theoretical amounts (i.e., what the amount would be if accumulated at the assumed investment return used in the actuarial valuations) in their DROP accounts. While in the 2014 study the total actual balance for each Plan was **less** than the theoretical balance over the three-year period ending June 30, 2013, the total actual balance for each Plan is **more** than the theoretical balance over the current three-year period ending June 30, 2016. We believe the significant market recovery experienced by the Plans in the years immediately preceding that period have a significant impact on that result. Therefore, we have also chosen to consider the same results over the **six-year period** ending June 30, 2016. Based on the observation that the total actual balance is **less** than the theoretical balance in those accounts over that extended period, we conclude in this study that the DROP has not increased the cost of the plans with respect to the interest credited to the DROP accounts.

Background

In 2011 and 2014, we reviewed the cost neutrality of the DROP and concluded that the change in the present value of benefits for the then current active employees under the Plans with the DROP provisions came within 2% of the present value of benefits for the Plans without the DROP provisions (except the Fire and Police Plan showed a **reduction** in the value of benefits under the DROP that exceeded 2%).

In 2005, the Systems' prior actuary reviewed the cost neutrality of the DROP and concluded that the change in the present value of benefits for the then current active employees under the Plans with the DROP provisions came within 2% of the present value of benefits for the Plans without the DROP provisions.

The present value of benefits for the Plans with the DROP provisions were calculated based on the same actuarial assumptions¹ used by the Boards in the regular valuations to set the contribution rate requirements for the City and the active members. Those assumptions were set based on actual experience observed for the members who signed up for the DROP. However, in determining what the present value of benefits would be for the Plans without the DROP provisions, additional hypothetical assumptions had to be made as to the age the active employees would have retired from the Plans and the levels of benefit that would have been earned in the absence of the DROP. The hypothetical aspect of the retirement age assumptions without the DROP provisions is discussed in more detail later in this report.

In addition to the above analysis for the active members, for those members who had ever enrolled in the DROP, we compared the interest actually credited to those members' DROP accounts (using a contingent rate calculated based on the Plans' actual average rate of return from investments over the last five years) since the date of the last cost neutrality study to the theoretical investment return assumption assumed by the Boards for the actuarial valuations during that same period.

The methods used in this study for current active employees and for members with DROP accounts are the same as those described above for the 2014 study. Of note is that neither the earlier nor the current studies included a comparison of (1) the actual DROP account balance plus the value of the retirement benefit earned by each DROP electing member at his/her date of retirement with (2) the value of the benefit he/she would have earned based on his/her actual age, service and final average compensation at retirement in the absence of the DROP. As mentioned in our prior study, we can expand the scope of our study to provide a separate analysis of that comparison for those members if requested to do so by the Boards.

Consistent with the prior actuarial study of the DROP, our review is limited to the analysis of the cost of providing pension benefits with and without the DROP. We have not analyzed any possible impact of the DROP program on any other non-pension benefits or costs, such as the retaining of experienced employees relative to the training of new employees, or the relative cost or savings of providing health benefit to a member as an active employee (while participating in the DROP) relative to providing such benefits to a member as a retiree (in the absence of the DROP) should the City offer such benefits outside of the Retirement Plans.

Method Used for Measuring Cost Neutrality

A particular actuarial measure has to be chosen by the Retirement Boards as the basis for measuring the cost neutrality of the DROP program. A DROP program may provide an incentive for a member to remain in service longer for the City, depending on when a member signs up for the DROP and how long the member stays in the DROP. These decisions made by the member may change the total present value of benefits paid by the Plans, as well as the allocation of that present value of benefits between service already rendered by the member (i.e., actuarial accrued liability) and future service (i.e., future normal cost).

¹ These assumptions include: the ages active employees were anticipated to sign up for the DROP, the probability of signing up for the DROP at each of those ages, the number of years the active employee was expected to stay in the DROP before retirement from the City, etc.

The method used in the last study was to compare the present value of the total pension Plan benefit with the DROP (including the DROP account) to the present value of the pension benefit without the DROP. As employees are only required to make member contributions into the Plans before electing DROP², the two present values have to be adjusted to reflect the appropriate projected member contributions. In that earlier study, the DROP was deemed cost neutral if the difference between the two net present values was within 2%. We believe that this net present value measurement used in the prior study is still reasonable and we have continued to apply that method in this study.

This study is also similar to prior studies in that it determines the actual impact of the DROP on the total present value of pension benefits for all current active members who have not signed up for the DROP. This study examines the impact of the DROP based on complete valuation results for the entire active plan membership as of a valuation date, in this case June 30, 2016.

Note that these valuations address the prospective cost impact of the DROP on current active members, excluding members currently in the DROP. This means we have not included any retrospective analysis of the value of benefits for members who have already signed up for the DROP or have retired after participating in the DROP.³ However, the experience of such members is included in our analysis of the actual interest credited to the DROP accounts versus the theoretical interest that would have been credited using the expected investment return assumption adopted by the Board for use by the Plans between 2013 and 2016.

The analysis provided in the rest of this report includes discussion of the net present value method, including the assumptions used in applying that method, and the results associated with measuring the net present value of the Plans with the DROP and without the DROP.

Method and Assumptions Used to Measure the Net Present Value With the DROP

In our July 1, 2012 to June 30, 2015 triennial experience studies for the Employees and the Fire and Police Plans, we provided our recommended actuarial assumptions for used in the pension valuations. Included in our recommendations were the time periods active employees were anticipated to sign up for the DROP once they become eligible for the program, the probability of signing up for the DROP at each of those time periods, and the number of years the active employee was expected to stay in the DROP before retirement from the City. Those assumptions were then utilized in the June 30, 2016 valuations.

The results from the June 30, 2016 valuations will serve as a baseline for the DROP cost neutrality analysis.

² The Plans were amended so that any new active members entering DROP after around February 2011 would be required to continue making member contributions into the Plans. However, we have not taken that amendment into account since those member contributions would be deposited into the member's DROP account and therefore not available to defray the City's net present value of pension benefits as described above.

³ That analysis would include for each actual DROP participant, a comparison of the sum of the value of the DROP account plus the present value of benefits payable after retirement from the DROP with the present value of benefits calculated based on age, service and final average salary that would have been earned through the date of retirement from the City had the DROP participant never signed up for the DROP.

Method and Assumptions Used to Measure the Net Present Value Without the DROP

In order to determine what the net present value of pension benefits would have been without the DROP, we would have to know when the members would have retired if the DROP were not in effect. This is because, everything else being equal, if members would have retired earlier, then the cost of the Plans without the DROP would have been calculated using the age, service and final average compensation at such earlier date.

The cost of a pension plan can be higher or lower at an earlier retirement age depending on whether the benefit accrual factor used for each year of service stays unchanged or decreases at the earlier retirement age. Other factors that influence the change in cost include: the anticipated decrease in final average compensation at the earlier retirement age, the additional post-retirement COLA paid upon such earlier retirement, etc.

In the case for the Fire and Police Tier 1, there is no reduction in the benefit accrual factor at an earlier retirement age because a member in that tier can retire on or after age 50 with a benefit of 2.75% of final average compensation for each of the first 20 years of service plus 2.00% per year of service thereafter.

For the Fire and Police Tier 2, a member retiring at 50 receives a benefit of 2.00% per year of service and that benefit accrual factor rises to 2.70% per year of service at retirement age 55. A similar observation can be made of the Employees Plan but in the case of the Employees Plan, the benefit accrual factor is not even maximized for retirement at age 65 as the factor is increased for retirement after age 65.

When doing the “with and without the DROP” comparison, it is this higher or lower “without the DROP” plan present value that we compare to the present value of the plan benefits with the DROP structure. Therefore, the question of “how much earlier would members have retired if it were not for the DROP” is crucial in determining whether the DROP is cost neutral.

In practice, it is impossible to really know when members would have retired without the DROP as the program has been in existence since 1998. This means that the question of whether the DROP is cost neutral will depend on a somewhat subjective assessment or estimate of when members would have retired without the DROP.

As in prior studies, in this study we have determined the net present value of benefits without the DROP by assuming that the DROP caused delays in retirement of two years. We did this by taking the current June 30, 2016 valuation results and shortening the length of DROP participation assumption by two years. In other words, if the DROP were not in effect, we assumed that members who were originally expected to elect DROP and remain in DROP for the assumed duration (6 years for members of the Employee Plan and 7 years for members of the Fire and Police Plan) would retire two years earlier than the originally assumed DROP exit date. The results prepared under this assumption are referred to as the Scenario 1 results.

Given that the DROP has been in existence since 1998, one could consider that the DROP may no longer have much influence in delaying a member’s decision to retire from the Plans because the

member may consider the DROP as part of his/her long-term retirement planning. We have also determined the net present value of benefits without the DROP if we assume that members who were originally expected to elect DROP would continue to work until the originally assumed DROP exit date. The results prepared under this assumption are referred to as the Scenario 2 results.

As we discussed above, while it is impossible to really know when members would have retired without the DROP because of the underlying plan designs we believe it reasonable to expect that the DROP would still have some impact on influencing the retirement behavior of some members. Therefore, we have labeled the results under Scenario 2 as being made available for reference only.

Cost Neutrality Results

We can now compare the June 30, 2016 net present value of pension benefits with the DROP (as determined in the June 30, 2016 valuation) to the net present value without the DROP, under the alternative estimates of retirement behavior without the DROP just described.

BASELINE - With the DROP
\$ in Thousands

	Fire and Police Tier 1	Fire and Police Tier 2	Fire and Police Total	Employees
1. Present Value of Pension Benefits for Active Members	\$5,373	\$603,008	\$608,381	\$381,034
2. Present Value of Member Contributions up to Date of DROP	\$9	\$65,442	\$65,451	\$54,268
3. Net Present Value of Benefits	\$5,364	\$537,566	\$542,930	\$326,766

**SCENARIO 1 – For Use in Determining DROP
 Cost Neutrality Without the DROP, Assuming
 Retirements Occur Two Years Earlier than
 Originally Assumed DROP Exit
 \$ in Thousands**

	Fire and Police Tier 1	Fire and Police Tier 2	Fire and Police Total	Employees
1. Present Value of Pension Benefits for Active Members	\$5,107	\$606,774	\$611,881	\$388,775
2. Present Value of Member Contributions up to Date of DROP	\$113	\$76,595	\$76,708	\$62,459
3. Net Present Value of Benefits	\$4,994	\$530,179	\$535,173	\$326,316

**SCENARIO 2 – For Reference Purposes Only
 Without the DROP, Assuming Retirements
 Occur on Originally Assumed DROP Exit
 \$ in Thousands**

	Fire and Police Tier 1	Fire and Police Tier 2	Fire and Police Total	Employees
1. Present Value of Pension Benefits for Active Members	\$4,979	\$590,410	\$595,389	\$391,741
2. Present Value of Member Contributions up to Date of DROP	\$142	\$78,883	\$79,025	\$66,013
3. Net Present Value of Benefits	\$4,837	\$511,527	\$516,364	\$325,728

The following are points of note about the results:

- The net present value of benefits under the Baseline for Fire and Police Tier 1 is about \$0.4 million or 7.4% higher than the net present value of benefits under Scenario 1 with respect to the active members included in the June 30, 2016 valuation that had not signed up for the DROP. However, because Tier 1 is such a small portion of the total liability, the cost increase for the Fire & Police Plan in total is only about \$7.8 million or 1.4% of the present value of benefits for active members under the Scenario 1 retirement assumptions.
- The net present value of benefits under the Baseline for the Employees Plan is roughly the same as the present value of benefits under Scenario 1. There is a slight cost increase of about 0.1% of the net present value of benefits for the Employees Plan.

- We conclude in this study that, with respect to the current active members only as reported in the June 30, 2016 valuation, the DROP is cost neutral for the Employees Plan and the Fire and Police Plan since the increase in the value of benefits under the DROP does not exceed 2%.
- As previously stated, whether the DROP produces additional costs or savings to the Plans is generally related to the benefit accrual factor under the service retirement benefit formula. The trend towards lower net present value of benefits upon later assumed age at retirement for Fire and Police Tiers 1 and 2 can be observed by comparing the results under Scenarios 1 and 2.

For members in the Employees Plan, there is no material difference in net present value of benefits between the assumed age at retirement without the DROP provided in Scenario 1 and Scenario 2.

- In our last study, for Fire & Police Tier 2 we determined that the impact of the DROP was a **cost reduction** of roughly 8%. This determination was in part due to our assumption used in the 2014 study that most members electing the DROP would do so at or around age 50 and retire about seven years later on average. Without the DROP, our assumption in the 2014 study was that most of these members would have retired at or around age 55, when the benefit accrual factor is at its highest. In effect, in addition to inducing members to retire a few years later than they otherwise would have, our assumption used in the 2014 study based on experience available at the time suggested that the DROP also encouraged these members to begin “receiving” a benefit earlier via DROP deposits at a lower accrual factor, thereby reducing the costs of the plan.

However, based on the experience available at the time of our most recent analysis of actuarial experience, we observed that most Tier 2 members who elected the DROP did so closer to age 55, when the accrual factor is at its highest. Reflecting this experience in our assumptions, we now determine that the impact of the DROP is a **slight cost increase** of about 1.4%.

This change illustrates the sensitivity of the cost of the DROP to retirement patterns, though we note that current patterns and our resulting assumptions represent a relatively optimized retirement strategy for members. In particular, for the roughly 60% of Tier 2 members who are expected to retire after age 55 (the point at which the benefit accrual factor stops increasing), we expect that slightly more than 70% of them will have elected to enter the DROP at an earlier age, effectively maximizing their expected benefit payments. This is significantly higher than our prior assumption that slightly less than 20% of the roughly 30% of members expected to retire after age 55 would have elected the DROP.⁴

⁴ Note that we **do not** set an explicit assumption for the percentage of Tier 2 members expected to retire after age 55, nor for the percentage of those post-55 retirees who will have elected to enter the DROP at an earlier age. Rather, these assumptions are implicit in our age-based DROP election and non-DROP retirement rate assumptions.

Interest Crediting to DROP Accounts

The Systems provided us with historical data for DROP balances, DROP deposits and withdrawals, and actual interest credited to the DROP accounts for the three-year period since the date of the last cost neutrality study (July 1, 2013) to June 30, 2016. We understand that the actual interest credited to the DROP accounts is based on a five-year trailing average of actual investment returns, net of investment expenses.

In the tables below, we have compared the ending balance of the DROP accounts as of June 30, 2016 to the theoretical ending balances assuming the interest credited were to be based on the investment return assumption of 7.50% assumed by the Boards for the actuarial valuations during that same period⁵, consistent with the method used in our last study.

In addition to the assumed investment return rate, we have also included two alternative calculations based on the actual market value rate of return and the smoothed actuarial value rate of return that was used in the actuarial valuation to establish the City and the active member contribution rates in the historical actuarial valuations from July 1, 2013 to June 30, 2016.

**Fire and Police DROP Account Ending Balance
 \$ in Thousands**

As of June 30	Actual (5-Year Trailing Average Market Return)	Investment Return Assumption of 7.50%*	Actual Market Value Rate of Return*	Actual Actuarial Value Rate of Return*
2013	\$110,829			
2014	\$115,802	\$115,736	\$126,240	\$118,335
2015	\$123,505	\$120,946	\$126,508	\$125,770
2016	\$130,484	\$125,966	\$123,163	\$130,854

**Employees DROP Account Ending Balance
 \$ in Thousands**

As of June 30	Actual (5-Year Trailing Average Market Return)	Investment Return Assumption of 7.50%*	Actual Market Value Rate of Return*	Actual Actuarial Value Rate of Return*
2013	\$73,140			
2014	\$81,027	\$81,256	\$88,406	\$83,012
2015	\$93,331	\$91,095	\$94,623	\$94,459
2016	\$105,406	\$101,202	\$98,203	\$104,587

* Assuming DROP deposits and withdrawals are, on average, made at the middle of the year.

The following are points of note about the results:

⁵ Note that the investment return assumption for the June 30, 2016 valuations was reduced to 7.25%.

- Our analysis shows that the actual ending balances of the DROP accounts as of June 30, 2016 are about 3%-4% **higher** than the ending balances if we instead apply the assumed investment return assumption of 7.50% over that **three-year** period.

This is in contrast to the last study, where the actual ending balances of the DROP accounts during the prior **three-year** period ending June 30, 2013 were about 4-6% **lower** than the ending balances if we instead apply the investment return assumption of 8.00% over that period. As noted in that study, this is because the Plans experienced significant market recovery during that **prior three-year** period, and the five-year trailing average net return used to credit the DROP accounts only partially reflected that experience.

- In this study, the previously unreflected portion of that market recovery served to increase the interest credited to the DROP accounts, thereby bringing the ending balances above what would have been expected based on the assumed investment return.

If instead we compare the actual ending balances to those that would have been expected based on the assumed investment returns over the **six-year** period ending June 30, 2016 (effectively combining the favorable and unfavorable impact of the market recovery on the results in the prior and current study, respectively), the actual ending balances are about 1% **lower**.

**Fire and Police DROP Account Ending Balance
 \$ in Thousands**

As of June 30	Actual (5-Year Trailing Average Market Return)	Investment Return Assumption ^{1,2}	Actual Market Value Rate of Return ²	Actual Actuarial Value Rate of Return ²
2010	\$99,704			
2011	\$103,184	\$105,074	\$120,669	\$100,043
2012	\$106,889	\$109,531	\$116,207	\$97,198
2013	\$110,829	\$115,464	\$128,634	\$102,211
2014	\$115,802	\$120,718	\$147,093	\$108,866
2015	\$123,505	\$126,302	\$147,965	\$115,425
2016	\$130,484	\$131,723	\$144,717	\$119,759

¹ 8.0% for years ending June 30, 2011-2013. 7.5% for years ending June 30, 2014-2016.

² Assuming DROP deposits and withdrawals are, on average, made at the middle of the year.

**Employees DROP Account Ending Balance
\$ in Thousands**

As of June 30	Actual (5-Year Trailing Average Market Return)	Investment Return Assumption ^{1,2}	Actual Market Value Rate of Return ²	Actual Actuarial Value Rate of Return ²
2010	\$57,178			
2011	\$61,642	\$63,265	\$72,461	\$60,231
2012	\$67,524	\$69,867	\$73,510	\$62,163
2013	\$73,140	\$77,345	\$85,157	\$69,057
2014	\$81,027	\$85,776	\$102,479	\$78,526
2015	\$93,331	\$95,954	\$109,103	\$89,558
2016	\$105,406	\$106,425	\$112,746	\$99,331

¹ 8.0% for years ending June 30, 2011-2013. 7.5% for years ending June 30, 2014-2016.

² Assuming DROP deposits and withdrawals are, on average, made at the middle of the year.

Considering this, we conclude that the DROP is cost neutral with respect to the interest credited to the DROP accounts, relative to the assumed investment return assumption.

- The balance calculated using the same actual smoothed actuarial value rates of return that Segal uses for the actuarial valuation is slightly different than that calculated using the five-year trailing average of actual investment returns developed by the Systems. Even though these numbers are both based on five years of actual returns, we believe that difference can probably be explained by the differences in the methods used in calculating the two returns. We are available to further review that difference if requested to do so by the Systems.

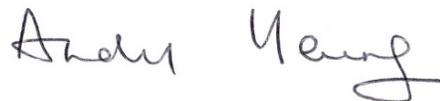
We are Members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial option herein.

We look forward to discussing this report with you.

Sincerely,



Paul Angelo, FSA, EA, FCA, MAAA
Senior Vice President and Actuary



Andy Yeung, ASA, MAAA, FCA, EA
Vice President and Actuary

MYM/bbf