City of San Jose Federated City Employees' Retirement System

Audit of June 30, 2021 Pension Actuarial Valuation

January 12, 2022

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January 12, 2022

Board of Administration
City of San Jose Federated City Employees' Retirement System
1737 North 1st Street, Suite 600
San Jose, CA 95112

Re: Audit of June 30, 2021 Pension Actuarial Valuation

Dear Members of the Board:

We are pleased to present the results of our audit of the June 30, 2021 Pension Actuarial Valuation for the City of San Jose Federated City Employees' Retirement System ("System"). The purpose of this audit was to verify the calculations completed by Cheiron and to offer comments on the methodology and the results of their actuarial valuation.

This review was conducted by Paul Angelo, a Fellow of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA, and Andy Yeung, an Associate of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA. This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

The assistance of Cheiron and the System is gratefully acknowledged. We appreciate the opportunity to be of service to the Board of Administration, and we are available to answer any questions you may have on this report.

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 opinion herein.

Sincerely,

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

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

ST/mv

cc: William Hallmark
Steven Hastings
Jacqueline King

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Executive Summary

This report has been prepared by Segal to present an audit of the June 30, 2021 Pension Actuarial Valuation performed by Cheiron for the System. As described in the System's contract for actuarial audit services, the scope of our audit is to perform a full replication of the June 30, 2021 actuarial funding valuations for the Tier 1 and Tier 2 pension plans that were included in the System's June 30, 2021 Pension Actuarial Valuation Report.

Summary of Results and Recommendations

This audit report includes an independent reproduction of the detailed valuation results that appear in the June 30, 2021 valuation report prepared by Cheiron. This audit was based on actuarial reports, employee data and supplemental information provided by both the System and Cheiron.

We have performed this actuarial audit of the System 's June 30, 2021 Pension Actuarial Valuation to provide assurance to the System 's Board of Administration that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices. ***Our audit confirms that the results of the actuarial calculations as of June 30, 2021 are reasonable, and that those calculations are based on generally accepted actuarial principles and practices.***

The following is a high-level summary of the results from our audit of the June 30, 2021 Pension Actuarial Valuation:

- The valuation results were prepared using the non-economic (demographic) actuarial assumptions approved by the Board based on the experience study as of June 30, 2019. Those non-economic assumptions were used in the June 30, 2019 valuation and have been carried over unchanged for the June 30, 2021 valuation, except for updating the assumed rate of mortality improvement from MP-2019 to MP-2021[1]. A review of those non-economic assumptions is not included in our contract for actuarial services and is therefore beyond the scope of this assignment.
- The economic (6.625% investment return, 2.25% price inflation and 3.00% wage inflation) actuarial assumptions previously used in the June 30, 2020 valuation were subsequently reviewed by the System and all of these assumptions were unchanged as part of the June 30, 2021 valuation. We have performed a high level review of those assumptions for reasonableness. We concluded that Cheiron has recommended a set of economic assumptions that are reasonable for use in the June 30, 2021 valuation for the System. We note that the investment return and the price inflation assumptions appear to have been developed independently, which did not allow us to assess whether the investment return

[1] According to the information provided by the Society of Actuaries (SOA), MP-2021 projection scale is based on historical mortality information through 2019 that does not reflect the COVID-19 pandemic and due to the uncertainty about the near-term and long-term effects of COVID-19, no adjustments to scale MP-2021 have been made for the pandemic. However, a tool has been provided by the SOA to allow practitioners to adjust the projection scale for COVID-19.

assumption and the other economic assumptions are consistent with regard to inflation expectations[1]. Our review of the economic assumptions is included in Section III of this report.

- We understand that the Board has followed a practice of reviewing the economic assumptions (in particular, the investment return assumption) before each annual valuation. While the annual review of economic assumptions should allow the System to incorporate the most up-to-date capital market information in calculating the liabilities, that practice of performing an annual review is becoming less common practice among similar systems particularly when selecting long term economic assumptions (such as the investment return assumption).

  When continuing with the current practice, we recommend to the Board that they consider their deliberation of those economic assumptions for the upcoming valuation before (or just immediately after) the date of the valuation. Based on our prior experience working with other investment consulting firms, we understand that the long-term capital market assumptions provided by those firms are updated only periodically during the year, and that by starting the review of those economic assumptions earlier (e.g., earlier than the discussion that started in October 2021 as was the case during the review of the assumptions for the June 30, 2021 valuation), it should allow the Board more time to review, deliberate and adopt or modify the investment return and other economic assumptions recommended by Cheiron.

- The demographic data used in the 2021 valuation by Cheiron was primarily that supplied by the System, and included only minimal changes made by Cheiron.

  Cheiron reported 9 fewer actives than included in the System's data, and filled in missing salaries for 27 active records. The data question responses contained the basis for some, but not all of these changes. While we could not confirm the basis behind each of the changes, we have concluded that Cheiron's valuation data in whole are reasonable for use in the June 30, 2021 valuation for the System.

  Segal would recommend that the System request Cheiron provide a copy of the final membership data file used in the valuation so that any differences could be reviewed and confirmed by the System to be accurate and reasonable before the next valuation.

- In performing the actuarial valuation, there was a need to take the salary earned during 2020/2021 to project it forward to estimate the amount that would be earned during 2021/2022 and thereafter in their valuations for the System and the Police and Fire Plan (Plan). While we are satisfied with the explanation provided by Cheiron for the two methods based on two different starting salaries used in their valuations for the System and the Plan, we note that it is not common for the same actuary to use two methods to project salaries for different employee groups who worked for the same employer. Note that we provided this comment in our prior audit of the June 30, 2016 valuation; the two methods applied are now more similar to each other than they were in the June 30, 2016 valuation.

- Upon discussion with the System, we identified a number of items where Cheiron's interpretation of the plan provisions differs from the System's practice. Specifically, Cheiron valued the continuation of Tier 1 member contributions past 30 years of service credit, and valued different Tier 2 pre-retirement death benefits. When we raised these issues with Cheiron, they recommended that they be incorporated in future valuations rather than revising

[1] As discussed in Section III, Cheiron's PowerPoint recommending the investment return assumption did not include the specific price inflation assumptions that were used in developing the range of expected returns on the System's portfolio using 10-year and 20-year returns from Meketa and Horizon. It is our understanding from collecting information from these sources that they have used different inflation assumptions over the two different time horizons.

the June 30, 2021 valuation.

In order to study the impact of the cessation of Tier 1 member contributions, we looked at members with 30 years of eligibility service (instead of members with 30 years of benefit service) and assumed that all such suspended employee contributions would be paid by the employer. Under those two assumptions, we estimated there would be an increase of 0.24% in the Tier 1 employer contribution rate, a decrease of 0.24% in the average Tier 1 employee contribution rate. (The impact would be less if benefit service should be used and some of those suspended contributions would be paid by the members with less than 30 years of service.)

We estimate the impact of the Tier 2 pre-retirement death benefits to be about a $5.4 million decrease in the total present value of future benefits and a decrease of 0.14% in the Tier 2 employer contribution rate, and a decrease of 0.14% in the Tier 2 employee contribution rate.

The combined impact would be a net change of 0.00% in the total average employer contribution rate and a decrease of 0.18% in the total average employee contribution rate. Cheiron should be asked to confirm the implementation of these changes in their next valuation.

- Market value of assets has been maintained by the System for each of the two tiers. We have reviewed and agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.
- Segal's total (Tier 1 and Tier 2) present value of future benefits is about 100% of Cheiron's total present value of future benefits. This key result is the basis for all other liabilities and cost calculations in the valuation.
- Segal's total City contribution rate is 56.67% of payroll, compared to Cheiron's total City contribution rate is 56.46% of payroll. This means the total City contribution rate calculated by Segal is about 100% of that calculated by Cheiron. The difference between 56.67% and 56.46% can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present value of future benefit between the past actuarial accrued liability and the future normal costs.
- Segal's total employee contribution rate is about 7.59% of payroll, compared to Cheiron's total employee contribution rate is 7.92% of payroll. This means the total member rate calculated by Segal is about 96% of that calculated by Cheiron. Most of this difference (0.18%) is due to Cheiron valuing Tier 1 member contributions past 30 years of service credit and valuing different Tier 2 pre-retirement death benefits. The remainder of the difference can generally be explained by differences in procedures and methods used by Segal and Cheiron.
- A list of all action items we would recommend as part of the June 30, 2022 valuation is provided in Exhibit D. (Note that in preparing the list, we have included several items that are only addressed in Sections II and III of this report.)

Detailed Findings

Our detailed findings and recommendations are summarized as follows:

- As indicated in Section III of this report, we found the economic assumptions reviewed as part of the June 30, 2021 valuation and used by Cheiron to be reasonable and in accordance with generally accepted actuarial standards and principles, with the sole exception that we were unable to assess the consistency of the economic assumptions with respect to expected price inflation.
- Segal's *total present value of future benefits* as of June 30, 2021 is 100% of Cheiron's present value.
- A comparison of Segal's present value of future benefits (PVB) to Cheiron's present values by Tier and in total indicates that the total liabilities of each plan are reasonable as shown in the following table.

Plan	Ratio of Segal's PVB to Cheiron's PVB
Tier 1	100%
Tier 2	97%
Total Tiers 1 and 2 combined	100%

  Our valuation software is generally set up to assume a beginning of year timing when members are expected to leave the plan because of withdrawal, termination, death and retirement. In order to more closely match with the results prepared by Cheiron to assume a middle of year timing for the above events, we have made an adjustment to our results and the method we used could potentially result in somewhat smaller liabilities especially when applied to members in Tier 2 who currently have lower service. Cheiron valuing different Tier 2 pre-retirement death benefits also contributes somewhat to the difference between Segal's and Cheiron's Tier 2 present value of benefits.
- Segal's *total actuarial accrued liability* as of June 30, 2021 is 100% of Cheiron's liability.

For this audit, our first focus was on matching the core numbers on which the Tiers' ultimate costs depend: the present values of future benefits. The results of this analysis were shown in the previous table. We also focused on more detailed analyses of (i) the proper implementation of the demographic assumptions as determined by the 2019 experience study as well as the economic assumptions reviewed and approved as part of the 2021 valuation, (ii) the breakdown of the total normal cost contribution rate into the portions paid by the City and by the members, and (iii) the determination of the UAAL contribution rate paid by the City and by the members. Those detailed analyses produced the following findings and recommendations:

- Segal's *total City contribution rate* is 56.67% of payroll and Cheiron's total City contribution rate is 56.46% of payroll. Cheiron valued the continuation of Tier 1 member contributions past 30 years of service credit, which understated the Tier 1 employer contribution rate by 0.24% of payroll. Also, Cheiron valued different Tier 2 pre-retirement death benefits, which overstated the Tier 2 employer contribution rate by 0.14% of payroll. Overall, the net impact is 0.00% in the total employer contribution rate. The total City contribution rate calculated by Segal is about 100% of that calculated by Cheiron. The difference between 56.67% and 56.46% can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present value of future benefit between the past actuarial accrued liability and the future normal costs.

- Segal's *total employee contribution rate* is about 7.59% of payroll and Cheiron's total employee contribution rate is 7.92% of payroll. The total member rate calculated by Segal is about 96% of that calculated by Cheiron. Most of this difference (0.18%) is due to Cheiron valuing Tier 1 member contributions past 30 years of service credit and valuing different Tier 2 pre-retirement death benefits. The remainder of the difference can generally be explained by differences in procedures and methods used by Segal and Cheiron.

  In the table on the next page we show the ratios of the normal cost rate, the UAAL contribution rate, and the total rate for the City and the members for Tier 1 and Tier 2 separately, and in total. Rates that have not been included in Cheiron's valuation report are shown as "not applicable (N/A)".

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Net City Normal Cost Rate	102%	97%	100%
City UAAL Rate ($ Amount for Tier 1)	101%	54%[1]	100%
Total City Rate	N/A	95%	100%

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Member Normal Cost Rate	97%	97%	N/A
Member UAAL Rate (Reclassification Rate for Tier 1)	100%	54%[1]	N/A
Total Member Rate	97%	95%	96%

- For funding purposes, market value of assets has been maintained by the System on a Tier by Tier basis and we agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.
- In determining the UAAL contribution rate, Cheiron uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each of the UAAL layers. The total of those amortization payments is then converted to a percent by using the expected payroll for the fiscal year that begins one year after the date of the current valuation. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.
- Overall, we have verified that Cheiron's calculations of the normal cost, UAAL and the total City contribution rate as a percentage of payroll are reasonable. Similarly, we have verified that Cheiron's calculations of the normal cost, UAAL and the total member contribution rate as a percentage of payroll are reasonable.

[1] The Tier 2 UAAL dollar contribution amount is small compared to the total Tier 2 contribution amount. Differences between Cheiron's calculation and Segal's calculation are primarily due to differences in procedures and methods used by Segal and Cheiron and is therefore not considered material.

Purpose and Scope of the Actuarial Audit

Purpose of the Audit

Segal has performed an actuarial audit of Cheiron's June 30, 2021 Pension Actuarial Valuation to provide assurance to the System's Board of Administration that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices.

Scope of the Audit

The scope of the audit, as described in the System's Actuarial Audit Services Agreement with Segal, includes the following:

- Evaluation of the available data for the performance of such valuation, the degree to which such data is sufficient to support the conclusions of the valuation, and the use and appropriateness of any assumptions made regarding such data.
- Comparison of the major benefits summarized in Appendix C of Cheiron's June 30, 2021 valuation report against those that are included in the online Summary of Plan Description. For some benefits, we have also consulted with the relevant provisions in the City Ordinance to confirm our understanding. We concluded that all the major benefits have been properly included by Cheiron in their valuation, with the exception that Cheiron valued the continuation of Tier 1 member contributions past 30 years of service credit, and valued different Tier 2 pre-retirement death benefits.
- Completion of a parallel valuation as of June 30, 2021 using the assumptions, methodologies and funding methods used by the System's consulting actuary in their performance of the June 30, 2021 valuation.
- Evaluation of the parallel valuation results for the two Tiers that were included in the June 30, 2021 Actuarial Valuation Report and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and/or adjustments with the System's consulting actuary.

Results of the Valuation Audit

Several steps are involved in conducting an actuarial audit of a pension benefits program. Outlined below are the primary steps we took to comply with the scope of the audit services. Following each step is a description of our observations.

Step 1: Compare the demographics of the 2021 data provided by the System with the valuation data used by Cheiron for the June 30, 2021 actuarial valuation

Results

EXHIBIT-A provides a comparison, by membership type (i.e., Tiers 1 and 2), of the number of participants, their average ages, average salaries (active members), average service (active members) and average benefits (pensioners). This exhibit indicates that Cheiron had only made a few adjustments, estimations or corrections to the data received from the System. In general, the data received was "valuation ready" with the exception of adjustments to exclude 9 active records and fill in missing salaries for 27 active records.

Observations

1. We asked for and received the final membership data file used by Cheiron in their valuation. Segal noticed that Cheiron reported 9 fewer actives than included in the System's data, and filled in missing salaries for 27 active records. The data question responses contained the basis for some, but not all of these changes. While we could not confirm the basis behind each of the changes, we have concluded that Cheiron's valuation data in whole are reasonable for use in the June 30, 2021 valuation for the System. We recommend that the System request Cheiron provide a copy of the final membership data file used in the valuation so that any differences could be reviewed and confirmed by the System to be accurate and reasonable before the next valuation.
2. The payments awarded to ex-spouses under the combined account option (records indicated in the beneficiary data file with a code of "Q" for Qualified Domestic Relations Order or "QDRO") have been combined by Cheiron with the payments awarded to the corresponding members into a single record. No combining was necessary with respect to the annuity and pension portions of the benefit reported on the member record as the System has already included the ex-spouse's portions of those benefits in the member's record. Only the COLA portion of the benefit that has been paid to the ex-spouse would need to be added and combined with the COLA portion of the benefit for the retiree. We are only noting this detail for documentation purposes as the method used by Cheiron is consistent with how the data should be handled based on our discussion with the System.

Step 2: Develop a valuation program based on the relevant provisions of the System as summarized in the Summary Plan Descriptions, using the actuarial methods and assumptions outlined in the most recent valuation report, and further defined by Cheiron

Observations

1. Cheiron's valuation report does not state precisely how the reciprocity and the percent of refund of contribution assumptions are applied in combination in their valuation program. Segal recommends to Cheiron that they document how these assumptions are applied when they prepare their future valuation reports.

   Based on our discussion with Cheiron, all actives who have less than 5 years of service when they terminate employment are assumed to get a refund of contributions (100% refund of contributions). The reciprocity and percent of refund assumptions are only applied in combination to actives that have more than 5 years of service. For actives that have more than 5 years of service, the reciprocity assumption is applied after the percent of refund assumption is applied.

   For example, for a Tier 1 active member age 30 with 5 years of service, the total termination rate is 8.75%, the percent of refund assumption is 25.00%, and 30% of terminating employees are assumed to subsequently work for a reciprocal employer. Cheiron applies the assumptions in the following order:

   - 2.1875% (8.75% * 25%) will get a refund of contributions,
   - 1.9688% (8.75% * (100% - 25%) * 30%) will work for a reciprocal employer, and
   - 4.5937% (8.75% * (100% - 25%) * 70%) will get a deferred vested benefit without working for a reciprocal employer.

2. In performing the actuarial valuation, there was a need to take the salary earned during 2020/2021 to project it forward to estimate the amount that would be earned during 2021/2022 and thereafter in their valuations for the System and the Police and Fire Plan (Plan). While we are satisfied with the explanation provided by Cheiron for the two methods based on two different starting salaries used in their valuations for the System and the Plan, we note that it is not common for the same actuary to use two methods to project salaries for different employee groups who worked for the same employer. Note that we provided this comment in our prior audit of the June 30, 2016 valuation; the two methods applied are now more similar to each other than they were in the June 30, 2016 valuation.

3. In June 2021, the City Council approved an ordinance which discontinues pension contributions for active Tier 1 Federated members after 30 years of service. We confirmed with Cheiron that this ordinance is not reflected in their June 30, 2021 valuation report. Our valuation program reflects that pension contributions for active Tier 1 members cease after 30 years of service.

4. Cheiron valued the following Tier 2 pre-retirement death benefits, according to page 68 of their valuation report:

> *<u>Less than five Years of Service, or No Qualified Survivor</u>*
>
> *Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus one month of salary for each year of service, up to a maximum of six years.*
>
> *<u>Five or more Years of Service</u>*
>
> *2.5% of Final Compensation for each year of credited service, subject to a maximum of 70% of Final Compensation. Benefit is subject to a minimum of 40% of Final Compensation if member dies while an active employee. The benefit is payable until the spouse or registered domestic partner marries or establishes a domestic partnership. If the member was age 55 with 20 years of service at death, the benefit is payable for the lifetime of the member's spouse or registered domestic partner.*

We have confirmed with the System that the following Tier 2 pre-retirement death benefits should be valued instead:

> *<u>Not Eligible for Retirement</u>*
>
> *Lump sum benefit equal to the accumulated refund of all employee contributions with interest*
>
> *<u>Eligible for Retirement with No Qualified Survivor</u>*
>
> *Lump sum benefit equal to the accumulated refund of all employee contributions with interest, plus one month of salary for each year of service, up to a maximum of six years.*
>
> *<u>Eligible for Retirement with Qualified Survivor</u>*
>
> *2.0% of Final Compensation for each year of credited service, subject to a maximum of 70% of Final Compensation. Benefit is subject to a minimum of 40% of Final Compensation if member dies while an active employee. The benefit is payable until the spouse or registered domestic partner marries or establishes a domestic partnership. If the member was age 55 with 20 years of service at death, the benefit is payable for the lifetime of the member's spouse or registered domestic partner.*

Our valuation program reflects the Tier 2 pre-retirement death benefits that the System actually pays out in practice.

Step 3: Run the valuation program with specific individuals (test lives) to illustrate particular benefit provisions and compare results to Cheiron's results

Results

EXHIBIT-B provides a comparison of Segal's and Cheiron's test life results for (i) the present value of future benefits, (ii) the present value of future normal costs, and (iii) the actuarial accrued liability.

- *Present Value of Future Benefits:* This measure represents the current value of the member's projected benefits, recognizing the time value of money (*i.e.,* the investment return assumption), the salary increase assumption and the probabilities of retirement, death, disability and turnover. This value is the cornerstone for the entire valuation as it represents the amount expected to be needed to provide all future expected benefit payouts for current members, based on the valuation assumptions.

  The ratio of Segal's results to Cheiron's results, on a *total present value of future benefits basis,* range from 100% to 101% for the Tier 1 active test lives. The ratio of Segal's results to Cheiron's results is about 100% for the retired test lives and Tier 1 terminated vested test lives. The ratio of Segal's results to Cheiron's results range from 97% to 104% for the Tier 2 terminated vested test lives. With the exception of one deferred reciprocal member, where we included a minimum liability equal to the members' account balance, the ratio of Segal's results to Cheiron's results range from 96% to 98% for the Tier 2 active and terminated vested test lives. Cheiron valuing different Tier 2 pre-retirement death benefits contributes somewhat to the difference between Segal's and Cheiron's Tier 2 present value of benefits.

  We believe our results are within an acceptable range of Cheiron's results to provide assurance that the significant plan liabilities are properly valued.

- *Present Value of Future Normal Costs and Actuarial Accrued Liability:* The funding method adopted by the System, the Entry Age Actuarial Cost Method, separates the present value of future benefits for active members into two components, the actuarial accrued liability and the present value of future normal costs. Simply stated, the Entry Age Actuarial Cost Method determines a level cost as a percentage of pay for each year of service, called the normal cost. For active members, the actuarial accrued liability is the accumulated value of past normal costs (less any expected benefits, and assuming all actuarial assumptions were exactly realized), while the present value of future normal costs represents the current value of future normal costs required to fully fund the member's projected benefits before the member is expected to retire.

  The method used to separate the present value of projected benefits into its two components can differ somewhat from valuation system to valuation system, even though the underlying funding method used in the systems is the same.

  For the active test lives, the ratios of Segal's results to Cheiron's is about 102% (range from 97% to 106%) for the present value of future normal costs and about 99% (range from 94% to 101%) for the actuarial accrued liability [See page 20A].

Observations

1. Segal's valuation software is generally set up to assume a beginning of year (July 1) timing when members are expected leave the plan because of withdrawal, termination, death and retirement. The Cheiron system, in contrast, assumes decrements occur in the middle of the year (January 1). Either methodology is acceptable, with each actuarial firm establishing its own approach for the assumed timing of decrements. As part of this audit for the System, in order to more closely match with the results prepared by Cheiron to assume a middle of year timing for the above events, we have made an adjustment to our results and the method we used could potentially result in somewhat smaller liabilities especially when applied to members in Tier 2 who currently have lower service.

2. The actuarial assumptions recommended by the 2019 experience study together with mortality improvement scale MP-2021 used in the June 30, 2021 valuation and the 6.625% investment return assumption approved by the Board for the June 30, 2021 valuation were used to value the test lives.
3. As stated above, Segal set a minimum liability in our valuation for each member to be at least equal to the member's account balance. Cheiron assumed that all current inactive vested and reciprocal members receive a monthly deferred retirement benefit without comparing the value of that benefit to the account balance. However, for future terminated vested or reciprocal decrements for current Tier 2 actives, Cheiron expects the member to take a refund if it exceeds the actuarial present value of their deferred benefit payment. We would recommend that Cheiron apply assumptions for current and future terminated vested and reciprocal members to either receive a deferred benefit or a refund of contributions consistently. We believe this should not affect the overall results materially.
4. As noted earlier, Cheiron valued pension contributions for Tier 1 Federated members after 30 years of service. This does not affect the present value of future benefits materially.
5. As noted earlier, Cheiron valued different Tier 2 pre-retirement death benefits than what the System actually pays out. If Segal valued the same Tier 2 pre-retirement death benefits as Cheiron, the ratio of Segal's results to Cheiron's results would range from 98% to 101% for the Tier 2 active and terminated vested test lives (with the exception of one deferred reciprocal member, where we included a minimum liability equal to the members' account balance.)
6. Upon reviewing Cheiron's initial test lives, we noted that Cheiron did not value the $500 post-retirement death benefit for Tier 1 terminated vested members. In response to our inquiry, Cheiron revised their valuation results and provided revised test lives. Cheiron stated that the programming changes increased the actuarial liability by 0.07% or about $3.1 million.

Step 4: Run the valuation program with all participant data, compile results, and compare to Cheiron's results

Results

EXHIBIT-C provides a comparison, by Tier, of Segal's results and Cheiron's results for (i) the present value of future benefits, (ii) the present value of future normal costs, (iii) the UAAL, (iv) the total normal cost and UAAL contribution rates, (v) the City normal cost and UAAL contribution rates and (vi) the member normal cost and UAAL contribution rates.

- The ratios of Segal's results to Cheiron's results, on a *total present value of future benefits basis,* range from 97% to 102% for active members. For the terminated vested and the retirees combined, the ratio is 100%. In total, our present value of future benefits is 100% of Cheiron's present value as shown in the column labeled "TOTAL" on page 21-A.
- The present value of future normal costs is allocated between member contributions and the City contributions. For Tier 1, members contribute 3/11 of the normal cost rate (including administrative expenses, but excluding the cost for reciprocal benefits) and the City pays the

remainder of the total contribution rate, including the UAAL payments. Tier 1 members who were rehired into Tier 2 and then returned to Tier 1 under Measure F also pay half of the increased cost attributable to their Tier 2 service. For Tier 2, the members and the City each pays half of the total contribution rate including both normal cost and UAAL payments.

- The actuarial accrued liability depends in part on the valuation system's methodology for separating the present value of projected benefits into its two components – the actuarial accrued liability and the present value of future normal costs. The UAAL is then simply the difference between the actuarial accrued liability and the actuarial value of assets. Therefore, differences in the actuarial accrued liabilities due to the variations in the valuation systems impact the UAAL, and the related City and member normal cost contribution rates.
- Segal's *total City contribution rate* is 56.67% of payroll and Cheiron's total City contribution rate is 56.46% of payroll. The total City contribution rate calculated by Segal is about 100% of that calculated by Cheiron. The difference between 56.67% and 56.46% can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present value of future benefit between the past actuarial accrued liability and the future normal costs.
- Segal's *total employee contribution rate* is about 7.59% of payroll and Cheiron's total employee contribution rate is 7.92% of payroll. The total member rate calculated by Segal is about 96% of that calculated by Cheiron. Most of this difference (0.18%) is due to Cheiron valuing Tier 1 member contributions past 30 years of service credit and valuing different Tier 2 pre-retirement death benefits. The remainder of the difference can generally be explained by differences in procedures and methods used by Segal and Cheiron.
- In the table below we show the ratios of the normal cost rate, the UAAL contribution rate, and the total rate for the City and the members for Tier 1 and Tier 2 separately, and in total. Rates that have not been included in Cheiron's valuation report are shown as "not applicable (N/A)".

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Net City Normal Cost Rate	102%	97%	100%
City UAAL Rate ($ Amount for Tier 1)	101%	54%[1]	101%
Total City Rate	N/A	95%	100%

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Member Normal Cost Rate	97%	97%	N/A
Member UAAL Rate (Reclassification Rate for Tier 1)	100%	54%[1]	N/A
Total Member Rate	97%	95%	96%

- For funding purposes, market value of assets has been maintained by the System on a Tier by Tier basis and we agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.

[1] The Tier 2 UAAL dollar contribution amount is small compared to the total Tier 2 contribution amount. Differences between Cheiron's calculation and Segal's calculation are primarily due to differences in procedures and methods used by Segal and Cheiron and is therefore not considered material.

- In determining the UAAL contribution rate, Cheiron uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each of the UAAL layers. The total of those amortization payments is then converted to a percent by using the expected payroll for the fiscal year that begins one year after the date of the current valuation. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.
- Overall, we have verified that Cheiron's calculations of the normal cost, UAAL and the total City contribution rate as a percentage of payroll are reasonable. Similarly, we have verified that Cheiron's calculations of the normal cost, UAAL and the total member contribution rate as a percentage of payroll are reasonable.

Step 5: Evaluate the valuation results and methodology as presented in the Cheiron actuarial valuation report

Observations

1. As we have not been provided with a draft of Cheiron's actuarial valuation report (as originally anticipated in our contract for audit services), we reviewed Cheiron's final actuarial report in detail after it had already been presented to the Board. Most of our comments (already discussed in the previous steps) based on that final report are relatively minor and deal primarily with providing additional disclosures for documentation purposes.

Review of Economic Assumptions

The economic assumptions reviewed by Cheiron during the 2021 actuarial valuation are the investment rate of return, price inflation and wage growth (price inflation and real wage increases). Actuarial Standard of Practice No. 27 (ASOP 27) provides the actuary guidance in developing these assumptions. Among these guidelines is the need for consistency among the economic assumptions selected by the actuary.

Results

Cheiron has recommended a set of economic assumptions that are reasonable for use in the June 30, 2021 valuation for the System. This is the case even though the investment return and the price inflation assumptions appear to have been developed independently, with the result that we were unable to assess whether the investment return assumption and the other economic assumptions are consistent with regard to inflation expectations.

We understand that the Board has followed a practice of reviewing the economic assumptions (in particular, the investment return assumption) before each annual valuation. While the annual review of economic assumptions should allow the System to incorporate the most up-to-date capital market information in calculating the liabilities, that practice of performing an annual review is becoming a less common practice particularly when selecting long term economic assumptions (such as the investment return assumption).

When continuing with the current practice, we recommend to the Board that they consider their deliberation of those economic assumptions for the upcoming valuation before (or just immediately after) the date of the valuation. Based on our prior experience working with other investment consulting firms, we understand that the long-term capital market assumptions provided by those firms are updated only periodically during the year, and that by starting the review of those economic assumptions earlier (e.g., earlier than the discussion that started in October 2021 as was the case during the review of the assumptions for the June 30, 2021 valuation), it should allow the Board more time to review, deliberate and adopt or modify the investment return and other economic assumptions recommended by Cheiron.

Details of Review

In order to demonstrate the interconnection and the consistency among the investment return, price inflation and wage inflation assumptions, Segal utilized a “building block” approach in developing and documenting our review of these three assumptions. Under this approach, the investment rate of return assumption is the combination of the price inflation component and the real rate of return component (used by the investment consultants), less an expense component. Similarly, the wage growth assumption is the combination of the price inflation component and the real wage increase component. (It should be noted that the salary increase assumption is developed using the wage growth assumption and the merit increase assumption.) In our experience, this is generally the preferred approach for documenting and developing these assumptions.

Inflation Assumption for Use in Projecting Benefit Obligations

The first “building block” to consider is the price inflation component assumption. This assumption underlies all other economic assumptions, including both the investment return and the projection of benefit liabilities (i.e., salary increase for actives and COLAs for retirees in Tier 2). In their analysis, as part of the 2021 economic assumptions review, Cheiron cited the inflation expectations from the Federal Reserve Survey of Professional Economic Forecasters, the inflation expectations from Horizon’s survey of investment consultants, the inflation assumptions used by plans in the Public Plan Database, and the inflation assumptions used by different California public retirement plans in their valuations.

There was a disparity between the 50th percentile assumptions of 2.44% from the economic forecasters and 2.75% from the California public retirement plan valuations. While we would find the 2.25% assumption used by Cheiron to be within the reasonable range for this assumption, it is important to acknowledge the relatively shorter time horizons used by the economic forecasters and the relatively longer time period used by the California public retirement plans in their valuations could have support different inflation assumptions. For example, the benefits for some members currently in their 30’s and 40’s will not commence until they retire at 60’s and 70’s and then be paid for 20 to 30 years after their retirement. Due to the difference in the time horizon, for Segal’s California public retirement system clients (that have recently reviewed these assumptions) we have been recommending an inflation assumption of 2.50% to those clients in 2021.

Administrative and Investment Expenses Paid from the System and the Deduction of some of those Expenses in Development of Investment Return Assumption

Administrative Expenses

In their 2019 experience study, Cheiron analyzed the administrative expenses as an expense per member for each plan year since 2014. The administrative expense per member (including actives, retirees, and inactive members) had ranged from a low of $401 to a high of $523.

Rather than to offset the administrative expenses with actual investment income, which would lower the investment return assumption, Cheiron included an additional contribution in their valuation to defray those expenses. That assumption was set at $500 per member for FYE 2020, and is currently $530 per member for FYE 2022 (increasing annually by the 3.00% wage increase assumption), to allocate expenses between Tier 1 and Tier 2 in proportion to headcount of members (including actives, retirees and inactive members). The projected administrative expenses for the fiscal year are divided by projected payroll for that fiscal year to arrive at a total administrative expense rate, with separate rates for each tier. Tier 1 members pay 3/11ths of the administrative expenses expected for Tier 1, and Tier 2 members pay half of the administrative expenses expected for Tier 2.

Note that using headcount of all members to determine administrative expenses in dollars will lead to increases in administrative expenses as a percentage of payroll for Tier 1 because Tier

1 is a closed group with projected compensation expected to decrease in future years faster than the total member headcount. For example, the total administrative expense rate for Tier 1 was 2.68% of payroll in the June 30, 2020 valuation vs. 2.82% of payroll in the June 30, 2021 valuation. The aggregate administrative expense was 1.47% of payroll in the June 30, 2020 valuation vs. 1.48% of payroll in the June 30, 2021 valuation.

We agree with Cheiron that the collection of $530 per member (assumed to increase with wage inflation) to defray administrative expenses may be subject to increase in future valuations and that the investment return assumption does not have to be adjusted to anticipate the payment of such expenses.

Investment Expenses

The actual amount of investment expenses paid out of the pension plan during fiscal year 2021 was $8.3 million. (Of that amount, about 90% was paid out as investment managers fees and the remaining 10% was paid out for investment consulting, custodian banking, and other expenses.)

Because Cheiron made no provision to collect those investment expenses as an additional contribution rate, these investment expenses came out of investment return. Because Cheiron did not make an explicit reduction for these, there was an implicit 0.00% investment expense assumption used by Cheiron in their development of the investment return assumption. While we have not audited the capital market assumptions, it has been our experience working with the investment consultants retained by our California public retirement system clients that their capital market assumptions are generally gross of (i.e. not reduced for) investment expenses.

It should be noted that individual actuarial firms use different models with different criteria and parameters to develop the investment return assumption, and the model used by Segal is different from that used by Cheiron. Segal would generally subtract some portion of the investment expenses (average investment expenses were about 40 basis points or bps for the last four years) from the indexed (or passively managed) returns in developing the investment return assumption, which would lower the expected investment return assumption[1]. Furthermore, in the case of the System, it appears based on information provided in the comparison of asset performance section of the Fiscal Year 2021 ACFR that the average market return net of manager fees was lower than the policy benchmark by about 50 bps during a 10-year period. While this may be a coincidence (40 bps versus 50 bps), this observation could be used to support some reduction in the investment return assumption for payment of those expenses.

We also note that about 10% of the total investment expense paid in Fiscal Year 2021 was for investment consulting, custodian banking, and other expenses that either were not directly in

[1] Our practice may be considered by some to be more conservative than that required under the Actuarial Standard of Practice (ASOP) No. 27, which states in part in Section 3.8.3.d, “Investment Manager Performance -- Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). The actuary should not assume that superior or inferior returns will be achieved, **net of investment expenses**, from an active investment management strategy compared to a passive investment management strategy unless the actuary believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period.” (emphasis added). We believe this means that assuming only enough superior return to cover related investment expenses would not require the relevant supporting data referenced in ASOP No. 27.

pursuit of “alpha” returns or were expenses that had not been netted out of the capital market assumptions. For all these reasons, we recommend that Cheiron review their methodology in conjunction with the ASOP 27 to consider making some provisions for payment of future investment expenses when they review the investment return assumption before the June 30, 2022 valuation.

Development of Investment Rate of Return Assumption

For the investment rate of return assumption, the Board chose to maintain the current assumption of 6.625% used in the June 30, 2020 valuation for the June 30, 2021 valuation. Cheiron derived the 6.625% investment return assumption by applying the System’s target asset allocation in a stochastic model developed using the capital market assumptions provided by Meketa, the System’s investment consultants, and by Horizon in preparing their investment return assumption recommended for the June 30, 2021 valuation. While the reductions from 6.875% for the June 30, 2016 valuation (applicable at the time of our last audit) to 6.75% for the June 30, 2018 valuation and then to 6.625% for the June 30, 2020 and 2021 valuations were consistent with the trend in the industry to adopt more conservative investment return assumptions, we would nonetheless recommend to Cheiron that they include a more detailed writeup of their analysis behind their recommendation in a more formal report. This should supplement the high level analysis provided in their Power Point presentation made to the Board at the October 2021 meeting.

We have the following observations with respect to the development of the 6.625% investment return assumption that Cheiron provided in their June 30, 2021 economic assumptions review.

- To estimate the expected return from each category class, Cheiron used the capital market assumptions from both Meketa and Horizon[1] as opposed to just using assumptions from Meketa. We agree that the current approach is preferable as it allows for more market information to be used and does not suffer from the undesired outcome (and possibly significant variability) of having the expected investment returns dependent on which investment consultant is employed by a retirement plan.
- As noted above, Cheiron used the capital market assumptions by asset class provided by Meketa and Horizon to develop the distribution of expected returns on the System’s portfolio that was the basis for their recommended investment return assumption. However Cheiron did not include the capital market assumptions for inflation from either Meketa or Horizon in their PowerPoint presentation[2]. This means we were unable to determine whether the inflation assumptions used to develop the expected return were consistent with the inflation assumption of 2.25% that was used in developing the salary increase and COLA assumptions.
- As an independent check, Segal has applied the model that we use for other California public retirement systems to review the adopted 6.625% investment return assumption. While, especially when first applied, our model does not necessarily produce an absolute investment return recommendation, it is very useful for comparing the level of risk inherent in the

[1] According to Cheiron, the Horizon survey includes expected returns from 39 consultants over a 10-year horizon and 24 consultants over a 20-year horizon.

[2] While we were not provided with the specific price inflation assumptions that were used in developing range of expected returns on the System’s portfolio using 10-year and 20-year returns from Meketa and Horizon, it is our understanding from collecting information from these sources that they have used different inflation assumptions over the two different time horizons.

investment return assumptions adopted by a given retirement system at different points in time or with other retirement systems that have previously been analyzed using that model.

Based on the application of our model, we believe that the level of risk implicit in the 6.625% investment return assumption, along with a 2.25% price inflation assumption, is somewhat lower than the comparable risk measure used by other California public retirement systems that have been analyzed using that model. The main reason is that for those other California public retirement systems, we have used a higher inflation assumption (2.50% in 2021) in developing their investment return assumption.

- Another test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide. We note that an investment return assumption of 6.625% is in the low range for this assumption among the California public sector retirement systems. The most common range, with a few exceptions, is from 6.75% to 7.25%. Again, part of the reason is that a number of those other California public retirement system are using a higher inflation assumption.

Taking into account the above discussion and based on our own independent analysis, we believe that the 6.625% investment return assumption that has been recommended by Cheiron to the Board is reasonable. However, we believe that they should consider making adjustment in their model to address the issues related to investment expenses and inflation as discussed above, including an explicit disclosure of the inflation component of the capital market assumptions used to develop their expected returns.

Wage Increase Assumption

In developing the wage inflation assumption, Cheiron compared the actual wage inflation with actual price inflation for state and local governments over the past 5, 10, and 20 years and took the difference to determine the real wage growth. Under that approach, there was a wide range of results they observed for real wage growth (ranged from 0.86% to 1.44% for state government and 0.58% to 1.50% for local government).

This information, together with the 3.0% general across the board wage increases negotiated for the next three years as well as the median wage inflation in their survey of California systems of 3.25% were all considered in coming up with their 3.00% wage increase assumption using a “building block” approach.

Even though we find the 0.75% they used as the real wage growth assumption that they added to the 2.25% inflation assumption to determine the final 3.00% wage increase assumption to be within the reasonable range for this assumption, we would nonetheless recommend to Cheiron that they include a more detailed writeup of their analysis behind their recommendation in a more formal report.

Exhibit – A
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Active Member Data

	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number [1]	1,414	1,413	2,370	2,362	3,784	3,775
Average Age	51.2	51.2	39.0	39.0	43.5	43.5
Average Eligibility Service	18.2	18.2	3.7	3.7	9.1	9.1
Average Benefit Service	17.6	17.6	3.6	3.6	8.8	8.8
TOTAL						
Earnable compensation rate as of 6/30/2021 [2]	$5,626,699	$5,623,445	$7,455,719	$7,492,378	$13,082,418	$13,115,823
Expected salary for 7/1/2021-6/30/2022 [2], [3]	$151,934,438	$152,079,775	$205,076,805	$206,981,542	$357,011,243	$359,061,317
AVERAGE						
Earnable compensation rate as of 6/30/2021 [2]	$3,979	$3,980	$3,146	$3,172	$3,457	$3,474
Expected salary for 7/1/2021-6/30/2022 [2], [3]	$107,450	$107,629	$86,530	$87,630	$94,348	$95,116
% DIFFERENCE						
Number [1]		-0.1%		-0.3%		-0.2%
Average Age		0.0%		0.0%		0.0%
Average Eligibility Service		0.0%		0.0%		0.0%
Average Benefit Service		0.0%		0.0%		0.0%
TOTAL						
Earnable compensation rate as of 6/30/2021 [2]		-0.1%		0.5%		0.3%
Expected salary for 7/1/2021-6/30/2022 [2], [3]		0.1%		0.9%		0.6%
AVERAGE						
Earnable compensation rate as of 6/30/2021 [2]		0.0%		0.8%		0.5%
Expected salary for 7/1/2021-6/30/2022 [2], [3]		0.2%		1.3%		0.8%

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

(1) 9 actives provided by the System were not valued as actives by Cheiron. Of those 9 actives, 2 were valued as inactive (1 terminated vested, 1 non-vested terminated) by Cheiron based on data question responses. Segal could not readily identify why the other 7 actives were omitted.

(2) 30 actives did not have a compensation rate in the data provided by the System. 3 of these 30 actives were not valued as actives by Cheiron. In the final Cheiron data file provided to Segal, the compensation rate was filled in for 18 of the remaining 27 actives, and expected salaries for 2021/2022 were assigned values for the remaining 27 actives.

(3) The expected salary for 2021/2022 has been calculated using a method consistent with that used by Cheiron and it is as follows:

***Step One** - For Tier 1 full-time employees, an annualized salary was calculated by multiplying Compensation Rate 2 Earnable times 365/14. For all other actives, an annualized salary was set to equal Compensation Rate 2 Earnable times 80 divided by Compensation Hours 2 times 365/14.*

***Step Two** – Expected Salary for 2021/2022 was calculated by increasing the annualized salary with one year of wage inflation and one-half year of merit.*

The differences in the expected salary between the System and Cheiron can be explained by item (2) above.

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Retired & Disabled Member Data

	Service Disability		Non-Service Disability	
	System	**Cheiron**	**System**	**Cheiron**
Number	116	116	68	68
Average Age	67.9	67.9	67.7	67.7
Total Annual Benefit[1]	$4,647,674	$4,652,678	$2,381,872	$2,384,753
Average Annual Benefit	$40,066	$40,109	$35,028	$35,070
% DIFFERENCE				
Number		0.0%		0.0%
Average Age		0.0%		0.0%
Total Annual Benefit[1]		0.1%		0.1%
Average Annual Benefit		0.1%		0.1%

	Retired		Total Retired and Disabled	
	System	**Cheiron**	**System**	**Cheiron**
Number	3,784	3,783	3,968	3,967
Average Age	70.0	70.0	69.9	69.9
Total Annual Benefit[1]	$208,032,786	$208,044,740	$215,062,332	$215,082,171
Average Annual Benefit	$54,977	$54,995	$54,199	$54,218
% DIFFERENCE				
Number		0.0%		0.0%
Average Age		0.0%		0.0%
Total Annual Benefit[1]		0.0%		0.0%
Average Annual Benefit		0.0%		0.0%

[1] The annual benefit amount includes the COLA benefit for any corresponding QDRO record from the beneficiary file and is calculated as: Pension Amount + Annuity Amount + COLA Adjustment + QDRO COLA Adjustment. The benefit is limited by IRC Section 415(b).

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Beneficiaries

	Beneficiaries	
	System	**Cheiron**
Number	544[1]	544
Average Age	75.2	75.2
Total Annual Benefit	$16,947,356	$16,960,351
Average Annual Benefit	$31,153	$31,177
% DIFFERENCE		
Number		0.0%
Average Age		0.0%
Total Annual Benefit		0.1%
Average Annual Benefit		0.1%

[1] Does not include 120 records indicated in the beneficiary file with the indicator of "Q" for Qualified Domestic Relations Order or "QDRO". The benefit is limited by IRC Section 415(b).

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Inactive Member Data

Terminated Vested/Reciprocal	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number	867	868	266	266	1,133	1,134
Average Age	48.7	48.7	39.8	39.8	46.6	46.6
Total Annual Benefit[(1)]	$16,404,680	$16,499,509	$1,305,200	$1,305,200	$17,709,880	$17,804,708
Average Annual Benefit	$18,921	$19,009	$4,907	$4,907	$15,631	$15,701
Total Contribution Balance with Interest	$61,201,707	$61,294,521	$4,928,870	$4,928,775	$66,130,577	$66,223,296
Average Contribution Balance with Interest	$70,590	$70,616	$18,530	$18,529	$58,368	$58,398
% DIFFERENCE						
Number		0.1%		0.0%		0.1%
Average Age		0.0%		0.0%		0.0%
Total Annual Benefit[(1)]		0.6%		0.0%		0.5%
Average Annual Benefit		0.5%		0.0%		0.4%
Total Contribution Balance with Interest[(1)]		0.2%		0.0%		0.1%
Average Contribution Balance with Interest[(1)]		0.0%		0.0%		0.1%

(1) 13 terminated vested/reciprocal members have missing benefit amounts in the data provided by the System. All 13 members have benefit amounts in Cheiron's data.

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Inactive Member Data (continued)

Non-Vested Terminated	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number[1]	66	66	462	463	528	529
Average Age	46.8	46.8	38.1	38.1	39.2	39.2
Total Contribution Balance with Interest	$935,510	$935,510	$3,747,821	$3,747,900	$4,683,331	$4,683,410
Average Contribution Balance with Interest	$14,174	$14,174	$8,112	$8,095	$8,870	$8,853
% DIFFERENCE						
Number		0.0%		0.2%		0.2%
Average Age		0.0%		0.0%		0.0%
Total Contribution Balance with Interest[1]		0.0%		0.0%		0.0%
Average Contribution Balance with Interest[1]		0.0%		-0.2%		-0.2%

[1] 14 terminated records with contribution balance less than or equal to $0 in the data provided by the System were excluded.

Exhibit – A (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Analysis of Participant Data

Inactive Member Data (continued)

Total Inactives	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number[1]	933	934	728	729	1,661	1,663
Average Age	48.6	48.6	38.8	38.8	44.3	44.3
Total Contribution Balance with Interest	$62,137,217	$62,230,031	$8,676,691	$8,676,675	$70,813,908	$70,906,706
Average Contribution Balance with Interest	$66,599	$66,627	$11,919	$11,902	$42,633	$42,638
% DIFFERENCE						
Number		0.1%		0.1%		0.1%
Average Age		0.0%		0.0%		0.0%
Total Contribution Balance with Interest[1]		0.1%		0.0%		0.1%
Average Contribution Balance with Interest[1]		0.0%		-0.1%		0.0%

(1) 14 terminated records with contribution balance less than or equal to $0 in the data provided by the System were excluded.

Exhibit – B

City of San Jose Federated City Employees' Retirement System

June 30, 2021 Valuation

Test Life Comparison

ACTIVES	Testlife #1		Testlife#2		Testlife #3		Testlife #4		Testlife #5	
	Tier 1		Tier 1		Tier 1		Tier 2[(1)]		Tier 2[(1)]	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	**$281,595**	**$284,228**	**$738,956**	**$748,168**	**$639,465**	**$641,183**	**$302,549**	**$294,973**	**$144,707**	**$138,942**
PV - Future Normal Costs	$169,388	$173,737	$67,217	$70,036	$124,974	$132,597	$148,881	$150,327	$89,800	$86,911
Actuarial Accrued Liability	$112,207	$110,490	$671,739	$678,132	$514,490	$508,585	$153,668	$144,646	$54,907	$52,031
RATIO OF SEGAL/CHEIRON										
Total PVB		**101%**		**101%**		**100%**		**97%**		**96%**
PV - Future Normal Costs		103%		104%		106%		101%		97%
Actuarial Accrued Liability		98%		101%		99%		94%		95%

ACTIVES	Testlives #1-5	
	Tier 1 & Tier 2	
	Cheiron	Segal
Total PVB	**$2,107,272**	**$2,107,493**
PV - Future Normal Costs	$600,260	$613,608
Actuarial Accrued Liability	$1,507,012	$1,493,885
RATIO OF SEGAL/CHEIRON		
Total PVB		**100%**
PV - Future Normal Costs		102%
Actuarial Accrued Liability		99%

[(1)] Our valuation software is generally set up to assume a beginning of year timing when members are expected leave the plan because of withdrawal, termination, death and retirement. In order to more closely match with the results prepared by Cheiron to assume a middle of year timing for the above events, we have made an adjustment to our results and the method we used could potentially result in somewhat smaller liabilities especially when applied to members in Tier 2 who currently have lower service. Cheiron valuing different Tier 2 pre-retirement death benefits also contributes somewhat to the difference between Segal's and Cheiron's Tier 2 present value of benefits. If we value the same Tier-2 pre-retirement death benefits as Cheiron, the ratio of Segal to Cheiron's PVB would be 98% for Testlife #4 and 98% for Testlife #5.

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Exhibit – B (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Test Life Comparison

INACTIVES	Testlife #6		Testlife #7		Testlife #8		Testlife #9		Testlife #10	
	Beneficiary Tier 1		Beneficiary Tier 1		Beneficiary Tier 1		Non-Service Disability Tier 1		Non-Service Disability Tier 1	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	$705,692	$705,692	$10,779	$10,776	$1,001,368	$1,001,368	$534,678	$534,678	$351,924	$351,925
RATIO OF SEGAL/CHEIRON		100%		100%		100%		100%		100%

INACTIVES	Testlife #11		Testlife #12		Testlife #13		Testlife #14		Testlife #15	
	Retired Tier 1		Retired Tier 1		Retired Tier 1		Retired Tier 1		Service Disability Tier 1	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	$2,137,114	$2,137,114	$292,956	$292,956	$857,368	$857,368	$1,317,574	$1,317,574	$379,507	$379,508
RATIO OF SEGAL/CHEIRON		100%		100%		100%		100%		100%

Exhibit – B (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2016 Valuation
Test Life Comparison

INACTIVES	Testlife #16		Testlife #17		Testlife #18		Testlife #19		Testlife #20	
	Terminated Reciprocal Tier 1[1]		Terminated Vested Tier 1[1]		Terminated Vested Tier 1[1]		Terminated Reciprocal Tier 1[1]		Retired Tier 2	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	$11,680	$11,681	$173,139	$172,410	$72,859	$72,860	$11,835	$11,905	$7,099	$7,099
RATIO OF SEGAL/CHEIRON		100%		100%		100%		101%		100%

[1] Upon reviewing Cheiron's initial test lives, we noted that Cheiron did not value the $500 post-retirement death benefit for Tier 1 terminated vested members. In response, to our inquiry, Cheiron revised their valuation results and provided revised test lives. Cheiron stated that the programming changes increased the actuarial liability by 0.07% or about $3.1 million.

INACTIVES	Testlife #21		Testlife #22		Testlife #23		Testlives #6-23	
	Terminated Reciprocal Tier 2		Terminated Reciprocal Tier 2		Terminated Reciprocal Tier 2		Total Inactives	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	$30,650	$29,778	$31,089	$30,570	$5,874	$6,101	$7,933,186	$7,931,364
RATIO OF SEGAL/CHEIRON		97%[2]		98%[2]		104%[3]		100%

[2] Cheiron valued different Tier 2 pre-retirement death benefits than what the System actually values. If Segal valued the same Tier 2 pre-retirement death benefits as Cheiron, the ratio of Segal's results to Cheiron's results for Testlives #21 and #22 would be 101% and 100%, respectively.

[3] Segal set a minimum liability in our valuation for each member to be at least equal to the member's account balance. Cheiron assumed that all current inactive vested and reciprocal members receive a monthly deferred retirement benefit without comparing the value of that benefit to the account balance. However, for future Tier 2 terminated vested and reciprocal members, Cheiron expects the member to take a refund if it exceeds the actuarial present value of their deferred benefit payment. We would recommend that Cheiron set assumptions for current and future terminated vested and reciprocal members consistently. We believe this difference should not a material impact on the overall results.

Exhibit – C

City of San Jose Federated City Employees' Retirement System

June 30, 2021 Valuation

Comparison of Results

(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Tier 1		Tier 2[(1)]		Total	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Actives	$1,194,074	$1,212,357	$410,394	$396,729	$1,604,468	$1,609,086
Retirees	$3,186,559	$3,186,567	$2,045	$2,048	$3,188,604	$3,188,615
Inactive Vesteds	$242,788	$243,136	$12,576	$12,617	$255,364	$255,753
Total PVB	**$4,623,421**	**$4,642,060**	**$425,015**	**$411,394**	**$5,048,436**	**$5,053,454**
RATIO OF SEGAL/CHEIRON						
Actives		102%		97%		100%
Retirees		100%		100%		100%
Inactive Vesteds		100%		100%		100%
Total PVB		**100%**		**97%**		**100%**

(1) Our valuation software is generally set up to assume a beginning of year timing when members are expected leave the plan because of withdrawal, termination, death and retirement. In order to more closely match with the results prepared by Cheiron to assume a middle of year timing for the above events, we have made an adjustment to our results and the method we used could potentially result in somewhat smaller liabilities especially when applied to members in Tier 2 who currently have lower service. Cheiron valuing different Tier 2 pre-retirement death benefits also contributes somewhat to the difference between Segal's and Cheiron's Tier 2 present value of benefits.

Exhibit – C (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Comparison of Results

	Tier 1		Tier 2		Total	
CONTRIBUTION RATES	**Cheiron**	**Segal**	**Cheiron**	**Segal**	**Cheiron[3]**	**Segal**
1. Normal Cost Rate (incl. admin. exp.)	27.70%	27.78%	15.70%	15.22%		
2a. Member Normal Cost Rate (before adjustment for 30-year stop) [1]	7.41%	7.42%	7.85%	7.61%		
2b. Member Normal Cost Rate (after adjustment for 30-year stop) [1]	7.41%	7.18%	7.85%	7.61%		
3. Net City Normal Cost Rate (1. – 2b.)	20.29%	20.60%	7.85%	7.61%	12.31%	12.28%
4. Total UAAL Rate			0.56%	0.30%		
5. Member Average Reclassification Rate/UAAL Rate	0.13%	0.13%	0.28%	0.15%		
6. City UAAL Rate (Payment for Tier 1)	$162,602	$163,823	0.28%	0.15%	44.15%	44.39%
7. Total Member Rate (2b. + 5.) [2]	7.54%	7.31%	8.13%	7.76%	7.92%	7.59%
8. Total City Rate (3. + 6.)	N/A	N/A	8.13%	7.76%	56.46%	56.67%
				RATIO OF SEGAL/CHEIRON		
1. Normal Cost Rate (incl. admin. exp.)		100%		97%		
2a. Member Normal Cost Rate (before adjustment for 30-year stop) [1]		100%		97%		
2b. Member Normal Cost Rate (after adjustment for 30-year stop) [1]		97%		97%		
3. Net City Normal Cost Rate (1. – 2b.)		102%		97%		100%
4. Total UAAL Rate				54% [4]		
5. Member Average Reclassification Rate/UAAL Rate		100%		54% [4]		
6. City UAAL Rate (Payment for Tier 1)		101%		54% [4]		101%
7. Total Member Rate (2b. + 5.) [2]		97%		95%		96%
8. Total City Rate (3. + 6.)		N/A		95%		100%

Exhibit – C (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Comparison of Results

(1) Cheiron valued the continuation of Tier 1 member contributions past 30 years of service credit. As a result the Tier 1 City Normal Cost rate is understated by about 0.24% of payroll.

(2) If Segal valued the continuation of Tier 1 members contributions past 30 years of service credit, the total Tier 1 member rate would equal 7.55% and the ratio of Segal to Cheiron's value would equal 100%.

(3) While we were able to locate and opine on Cheiron's calculations for the net City Normal Cost rate of 12.31% as provided on page 40 of their report, we were not able to locate Cheiron's total Normal Cost rate and total Member Normal Cost rate. As such, in the table above we only show the ratios of the Normal Cost rate and Member Normal Cost rate for Tier 1 and Tier 2 separately, and not in the total.

(4) The Tier 2 UAAL dollar contribution amount is small compared to the total Tier 2 contribution amount. Differences between Cheiron's calculation and Segal's calculation are primarily due to differences in procedures and methods used by Segal and Cheiron and therefore not a concern.

Exhibit – C (continued)
City of San Jose Federated City Employees' Retirement System
June 30, 2021 Valuation
Comparison of Results

UNFUNDED ACTUARIAL ACCRUED LIABILITY	Tier 1		Tier 2		Total	
	Cheiron	Segal	Cheiron	Segal	Segal	Cheiron
Present Value of Future Benefits	$4,623,421	$4,642,060	$425,015	$411,394	$5,048,436	$5,053,454
PV Future NC Contributions	212,013	214,692	273,442	264,902	485,455	479,594
Actuarial Accrued Liability	**4,411,408**	**4,427,368**	**151,573**	**146,492**	**4,562,981**	**4,573,860**
Current Assets at Actuarial Value	2,370,202	2,370,202	142,892	142,892	2,513,094	2,513,094
UAAL	2,041,206	2,057,166	8,681	3,600	2,049,887	2,060,766
Total UAAL Rate			0.56%	0.30%		
RATIO OF SEGAL/CHEIRON						
Present Value of Future Benefits		100%		97%		100%
PV Future NC Contributions		101%		97%		99%
Actuarial Accrued Liability		100%		97%		100%
Current Assets at Actuarial Value		100%		100%		100%
UAAL		101%		41%		101%
Total UAAL Rate				54%		

Exhibit – D

City of San Jose Federated City Employees' Retirement System

Recommended Action Items Before June 30, 2022 Valuation

- In developing the economic assumptions for the 2022 valuation, Cheiron should consider providing additional documentation on their recommended investment return and wage inflation assumptions. Cheiron should consider some provisions for payment of future investment expenses when they review the investment return assumption.
- The Board might want to consider their deliberation of the economic assumptions before (or just immediately) after the date of the valuation.
- Cheiron should discontinue pension contributions for active Tier 1 Federated members after 30 years of service.
- Cheiron should value the Tier 2 pre-retirement death benefits that the System actually pays out in practice.
- Cheiron should clarify the application of the reciprocity and percent of refund of contribution assumptions in the 2022 valuation.
- Cheiron should apply assumptions for current and future terminated vested and reciprocal members to either receive a deferred benefit or a refund of contributions consistently.