## Merced County Employees' Retirement Association (MercedCERA)

> Actuarial Experience Study for July 1, 2019 through June 30, 2022









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Inflation Rate Price inflation; building block for other assumptions

Current Assumption 2.50%



Discount Rate Assumed annual return on investments (net of investment expenses)

Current Assumption 6.75%



Wage Growth Base (across-the-board) pay increases

Current Assumption 2.75%



**COLA Rates** Annual growth in postretirement COLAs. Affected by banking / cap (3%)

Current Assumption 2.40% (Tier 1 only)

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### Traditional Building Block Approach





The median expectation of inflation forecasts below is between 2.50% to 2.80%. The range of 10-year inflation expectations by economic forecasters is extraordinarily wide with a median of 2.8%. The median price inflation assumption is 2.75% for California systems, and the 1937 Act Systems used only two inflation assumptions in the 2021 valuations, 2.50% and 2.75%.

### Inflation Forecasts



Min to 25th 25th to 50th 50th to 75th 75th to Max

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### **Inflation Metrics**

June 2019 June 2020 June 2021 June 2022 Oct 2022





### **Inflation Metrics**

June 2019 June 2020 June 2021 June 2022 Oct 2022



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The current assumed COLA growth rates are lower than the inflation assumption, due to the low inflationary environment prior to 2020. However, the extraordinary 2022 inflation will result in actual COLAs equal to the caps in addition to material increases in the COLA banks. We have performed stochastic testing of the COLA growth rate, with initial inflation levels around 5.0% inflation, ultimate inflation at 2.50%, and reflecting higher COLA banks. We propose the following increases to the COLA growth assumptions based on these simulations, most notably, increases to the rate for the current Tier 1 retirees with the 3.0% COLA cap from 2.40% to 2.65%.

### Summary of Retiree COLA Growth Rate Assumptions

Group	Estimated 2023 COLA Bank	Current	Proposed
3% COLA Cap - Current Tier 1 Retirees	3.0% to 4.5%	2.40%	2.65%
3% COLA Cap - Actives and Inactives, not in pay status	0.00%	2.40%	2.40%



	Expected Nominal Returns (Dec 2021)
	Time Horizon 🔵 10 Year 🔵 20-30 Year
9.0%	
8.8% -	
8.6% -	
8.4% -	
8.2% -	
8.0% -	
7.8% -	
7.6% -	
7.4% -	
7.2% -	
7.0% -	
6.8% -	Average Nominal Return 6.6%
6.6% -	
6.4% -	
6.2% -	
6.0%	Meketa (Dec. 2021) Horizon (Dec. 2021)



However, some consultants - including Meketa - have published updated capital market assumptions in the 2nd half of 2022 based on current market conditions and these assumptions are substantially higher than those from the beginning of the year. Horizon has also published their updated survey for 2022. The average expected nominal return for the MercedCERA asset allocation with the updated assumptions is almost 7.5%. However, the current assumption of 6.75% still represents a reasonable assumption, and we would caution against *increasing* the discount rate, since we generally recommend against overreacting to significant short-term changes in the data.





Salary increases are made of three components: base inflation, plus "real" wage growth (for productivity or other reasons), plus increases in individual pay due to merit, promotion, and longevity. Inflation and real wage growth are considered economic assumptions, while the merit salary increases are considered a demographic assumption. As noted earlier, we are not recommending any change to the inflation assumption (2.50%), and we believe the current 0.25% assumption for real wage growth is still reasonable. Although it is lower than the assumption used by the Social Security Administration in their projections, we reviewed the experience for Merced and found that the members have experienced *negative* real wage growth since 2013.

#### Base (CPI) Inflation Real Wage Growth Herit/Longevity



Wage Growth



#### General -







#### General -



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#### Avg Merit (2014-2022) Current Proposed



#### General -

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Service



For Safety members, the experience also showed lower merit increases earlier in the members' careers, but a higher ultimate merit rate after 10 years of service. We recommend minor changes in the assumption for Safety members accordingly. We note that a slightly higher ultimate rate for Safety members than General members is consistent with what we have seen at other CERL systems.

#### Safety

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Our analyses shown for retirement, disability and termination experience include data for June 30, 2013 through June 30, 2022. However, we also reviewed the proposed assumptions against the June 30, 2013 - June 30, 2019 data (from the previous two experience studies) in order to exclude any impacts COVID may have had on participant behavior from 2020 to 2022. We found that the proposed assumptions were still reasonable for the previous periods.

### Retirement / Disability / Termination Rates





For the *rates of decrement* - i.e., the rates of retirement, termination, disability and death - we use a similar approach. First, we calculate the average percentage of active members leaving service for each cause over the past nine years. Here we show the retirement experience for **General Legacy** (i.e., non-PEPRA) members with 20-29 years of service. We note that the experience below age 55 is limited to the Tier 1 retirees, as General members of Tiers 2 and 3 are not eligible to retiree below age with less than 30 years of service.

### General Legacy Retirement Rates (20-29 Years of Service)

Actual Rate Current Assumption Proposed Assumption Confidence Interval









### General Legacy Retirement Rates (20-29 Years of Service)

Actual Rate Current Assumption Proposed Assumption Confidence Interval





We then add in a confidence interval, a statistical measure that indicates a range we expect the true value to lie within, based on the *credibility* of the data. Hovering over the values below will reveal additional information, including the actual and expected number of members retiring, as well as several statistical measures including the Actual/Expected ratio (for the overall group) and the R-squared (a statistical measure related to the amount of variance explained by the assumption).

### General Legacy Retirement Rates (20-29 Years of Service)

Actual Rate Current Assumption Proposed Assumption Confidence Interval





We may propose a modification to the assumption, typically if the actual rate falls outside the interval or if there is a significant trend indicating experience has been different than the assumption (applying professional judgement as necessary). For this group, we are proposing modest increases to the rates below age 65.

### General Legacy Retirement Rates (20-29 Years of Service)

Actual Rate Current Assumption Proposed Assumption Confidence Interval







As part of this study, we are proposing separate rates for General Legacy members with less than 20 years of service, as the retirement rates for these individuals have been lower than those with 20-29 years of service at the same age. We are also proposing modest adjustments to the retirement rates for those with 30+ years of service.

### **General Retirement Rates (Legacy Members)**

All 10 - 19 Years of Service 20 - 29 Years of Service 30+ Years of Service

Actual Rate Current Assumption Proposed Assumption Confidence Interval



Age

Age

Age

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For the first time, we now have enough experience to begin analyzing the rates separately for the PEPRA membership, at least for the General employees. Although we don't have enough experience yet to discern reasonable confidence intervals, the limited experience we do have indicates that the PEPRA retirement rates are likely to be lower than the current assumptions, which is reasonable given the maximum benefit multipliers don't apply until the members reach age 67.

### **General PEPRA Retirement Rates**

Actual Rate Current Assumption Proposed Assumption (5-19) Proposed Assumption (20+)



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We have proposed reduced retirement rates - beginning at age 52, the minimum retirement age - for PEPRA members with less than 20 years of service. We considered applying the retirement rates that CalPERS currently uses to project retirement rates for their PEPRA employees with the same benefit formula. However, we found that this would result in a drastic increase in the average retirement age of almost four years for the Merced PEPRA members (vs. the use of the non-PEPRA assumptions), which is considerably more than the increase in the average retirement age for the calPERS members with similar formulas (about two years).

### **General PEPRA Retirement Rates**

Actual Rate Current Assumption Proposed Assumption (5-19) Proposed Assumption (20+)





We also proposed slightly higher rates for those with at least 20 years of service, in line with our observation that members with more service are consistently more likely to retire. The new assumptions increase the average expected age at retirement by about two years, consistent with the relative difference anticipated by CalPERS. We note that the age at which the PEPRA members retire has less of an impact on Plan cost than it does for the Legacy tiers, because of the lack of a significant early retirement subsidy under the PEPRA benefit formula.

### **General PEPRA Retirement Rates**

Actual Rate Current Assumption Proposed Assumption (5-19) Proposed Assumption (20+)



For the Safety members, we propose minor adjustments. We considered extending the ultimate retirement age (i.e., the age at which all members are assumed to have retired) beyond age 60, but there are only six Safety members currently working past age 60 (less than 2% of the population), so we concluded no change was necessary. We also considered proposing separate rates for the PEPRA members, but there was very little experience and the average expected retirement age under the proposed assumptions is already 54, so we concluded separate rates were not warranted at this time. We will continue to monitor the emerging experience for the Safety PEPRA members.

### Safety Retirement Rates (All Members)

All <20 Years of Service 20+ Years of Service

Actual Rate Current Assumption Proposed Assumption Confidence Interval



For disability, we take a different approach. We look to a set of standard disability tables, specifically those developed by CalPERS. The current assumptions are based on the 2017 CalPERS Experience Study State Miscellaneous tables for General (a 30/70 blend of the male/female tables) and the Public Agency Police tables for Safety (50% of the Industrial rates plus 50% of the Non-Industrial rates). We are recommending using updated disability tables from the more recent experience study CalPERS completed in 2021. We note that confidence intervals are not shown below for the age bands where there is too little data to support producing one.

### **Total Disability Rates**

(Service plus Non-Service)



Actual Rate Current Assumption Proposed Assumption Confidence Interval





The updates to the General members were minor: only the female rates changed as part of the CalPERS experience study. We continue to recommend the use of a 30/70 blend of the male and female State Miscellaneous tables, as the fit for both genders is better when comparing to a blended unisex table than using sex-distinct tables. We also continue to recommend assuming 50% of the General disabilities are duty-related, as this has been reasonably close to the experience over the past 9 years (57% have been duty-related).

### **Total Disability Rates**

(Service plus Non-Service)



Actual Rate Current Assumption Proposed Assumption Confidence Interval





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For Safety members, we propose the use of a new set of tables: the Public Agency County Peace Officers rates, using the Industrial rates for duty-related disabilities and the Non-Industrial rates for non-duty disabilities. Although the number of disabilities predicted by the new assumptions is slightly further from the actual number over the past nine years than under the current assumptions, the data is very limited (only 25 disabilities over 9 years), and the updated assumptions don't include a large spike in disabilities for retirement-eligible members, which has been consistent with Merced experience.

### **Total Disability Rates**

(Service plus Non-Service)



Actual Rate Current Assumption Proposed Assumption Confidence Interval





When reviewing the rates of termination (i.e., when a member leaves for reasons other than retirement, death or disability) we show the experience at each level service, since termination rates tend to have stronger correlation with service than age. The current termination assumptions for the General members are gender-based. However, a review of the experience over the past nine years shows that the patterns have been very similar for males and females, therefore are proposing moving to unisex rates, which are slightly higher than the current assumptions.

### **Termination Rates (General)**

All General General (Male) General (Female)

Actual Rate Current Assumption Proposed Assumption Confidence Interval

#### General





We note that the proposed assumptions represent a reasonable set of assumptions compared to the male and female experience when considered separately. We also reviewed the proposed assumptions compared to the experience excluding the past two years (i.e., the pre-COVID data, and found them to be reasonable.

### **Termination Rates (General)**

All General General (Male) General (Female)

Actual Rate Current Assumption Proposed Assumption Confidence Interval





### **Termination Rates (Safety)**

Actual Rate Current Assumption Proposed Assumption Confidence Interval



We also review the *types* of terminations. Terminating members have the option of receiving a refund of contributions or leaving them on deposit, in which case they are entitled to receive a deferred benefit (based on their final salary with another system if they establish reciprocity). Below we show the analysis for the likelihood of each type of termination and the experience for the General members at various service levels. The current assumptions predict that the more service a member has, the less likely they are to withdraw their contributions, which has been consistent with experience. We are not proposing any changes for the General members.

### **Termination Type (General)**



#### Withdrawal Deferred Benefit





93%

Actual



For the Safety members, the percentage of members with less than ten years of service withdrawing their contributions has exceeded the assumptions, therefore we have proposed modest increases to the withdrawal rates.

### **Termination Type (Safety)**

All	0-4 YOS	5-9 YOS	10+ YOS

#### Withdrawal Deferred Benefit









For mortality, we take a somewhat different approach. First, we weight mortality experience by benefit amount, not headcount, since members with larger benefits are expected to live longer. Also, MercedCERA does not have enough data to generate its own mortality tables - even if we combine the data over a longer period - so we look to a set of standard tables. For the prior Experience Study we recommended mortality rates based on the CalPERS rates for the General members and based on the Society of Actuaries Public Sector Safety (below-median) rates for Merced Safety members.

### **Healthy Mortality Rates**

Healthy Male General Retiree	Healthy Female General Retiree	Healthy Male Safety Retiree	Healthy Female Safety Retiree
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For this analysis, we excluded the data from the past two years, because of the elevated mortality levels due to COVID. The current assumptions did a reasonable job of predicting experience, but we have recommended updating the General mortality rates to the latest CalPERS assumptions, with a 5% load (the same load we currently use for the Safety members) to account for the fact that the Merced members have exhibited slightly higher mortality rates than the average CalPERS member. We are not recommending any changes to the Safety base rates.

### **Healthy Mortality Rates**

Healthy Male General Retiree	Healthy Female General Retiree	Healthy Male Safety Retiree	Healthy Female Safety Retiree
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#### Actual Rate Current Rate Proposed Rate Confidence Interval





The table below summarizes the current and proposed standard tables to use for each group's base mortality rates (i.e., the rates used to project current mortality rates). Note that we have not proposed any adjustments to the standard tables other than for the Healthy Retirees and Beneficiaries, as these are the only groups with sufficiently credible data to develop an appropriate adjustment factor.

### Summary of Base Mortality Assumptions

Group	Current	Proposed
General Healthy Retiree and Beneficiaries	CalPERS 2017 Healthy Retiree	CalPERS 2021 Healthy Retiree, Adjusted by 1.05
Safety Healthy Retiree and Beneficiaries	Safety Pub2010 (Below Median, Benefit Weighted), Adjusted by 1.05	Safety Pub2010 (Below Median, Benefit Weighted), Adjusted by 1.05
General Disabled (current disabled)	CalPERS Disability 2017, Industrial for duty-related, Non- Industrial for non-duty related	CalPERS Disability 2021, Industrial for duty-related, Non-Industrial for non-duty related
Safety Disabled (current disabled)	CalPERS Disability 2017, Industrial for duty-related, Non- Industrial for non-duty related	CalPERS Disability 2021, Industrial for duty-related, Non-Industrial for non-duty related
General Disabled (future disabled)	CalPERS Disability 2017, 50/50 Industrial/Non-Industrial	CalPERS Disability 2021, 50/50 Industrial/Non-Industrial
Safety Disabled (future disabled)	CalPERS Industrial Disability 2017	CalPERS Industrial Disability 2021
General Active Employee	CalPERS 2017 Employee Non-Industrial	CalPERS 2021 Employee Non-Industrial
Safety Active Employee	Safety Pub2010 Employee (Below Median, Benefit Weighted) plus CalPERS 2017 Industrial Death	Safety Pub2010 Employee (Below Median, Benefit Weighted) plus CalPERS 2021 Industrial Death



We also need to select a table to project future *improvements* in mortality - since most experts believe that over the long-term we should expect increasing lifespans. Here is an example of how the remaining lifetime for a General female retiree age 60 may be expected to change based on what year they reach that age, under the current base mortality and mortality improvement assumptions.

### Expected Remaining Lifetime (General Female Age 60)



Current mortality based on CaIPERS 2017 Healthy Retiree and Generationally Projected using Scale MP-2019



The Society of Actuaries generally releases a new update to their mortality improvement assumptions for pension plans each year. Recently, the recommended tables have reflected *slowing* in mortality improvements, even prior to COVID. CalPERS has adopted an approach of using 80% of the improvement assumptions released in 2020 (known as Scale MP-2020), which we also recommend for MercedCERA. Below we show the expected remaining lifetime at various ages for the current retirees based on these assumptions.

### **Expected Remaining Lifetime**











### **Expected Remaining Lifetime**





Male, Old Assumptions Male, New Assumptions – Female, Old Assumptions – Female, New Assumptions





### **Expected Remaining Lifetime**





Male, Old Assumptions 📕 Male, New Assumptions 📙 Female, Old Assumptions 📕 Female, New Assumptions





The impact was slightly larger for the Safety members, since the only change for them was to use the less conservative future improvement assumptions, with no change to the current base rates. This reduced the expected lifetime for a 65 year old male by a little more than 0.5 years.

### **Expected Remaining Lifetime**





Male, Old Assumptions 📕 Male, New Assumptions 📒 Female, Old Assumptions 📕 Female, New Assumptions





As part of the experience study, we reviewed the other miscellaneous actuarial assumptions used in the valuation as described below and made recommendations where necessary.



### Reciprocity

Percentage of deferred members assumed to establish reciprocity. Recommend increase in reciprocity rates for Safety members with at least 5 years of service from 67% to 75% (based on review of retirements from deferred status over past 9 years). General assumption (50% for members with at least five years of service) still reasonable.



### **Family Composition**

Recommend reducing marriage assumption from 85% to 80% for Safety members, as only 78% of Safety retirees in the past 6 years have been married. No changes to General assumption (75% for males, 55% for females; almost identical to actual rates in the past 6 years).

Continue to assume males 3 years older than their spouses and females 2 years younger than their spouses.



### Commencement Age for Deferred Members

Recommend to increase age at retirement for Safety members with reciprocity from 52 to 55 and reduce age at retirement for Safety non-reciprocal terminated vested members from age 51 to 50.



### Administrative Expenses

Increase assumption from \$2.55M to \$2.80M for FYE 2023, expected to increase in future years with wage inflation.

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The slides which follow show the effect of the assumption changes on the *total* actuarial cost of the Plan, made up of the impact on the overall **Normal Cost**, plus the change in the **Unfunded Actuarial Liability** (UAL) payment. The employer is responsible for any changes in the UAL payment, but changes in the Normal Cost rate will affect both employer and member contributions. The Actuarial Valuation Report will show the overall impact of the assumption changes on the member and employer rates.





The overall changes in the mortality assumptions - in particular the slower rates of expected future improvements - reduces the total contribution rate in the current year by 0.2% of pay, with a slightly larger impact for Safety and very little change for General.

### Total 2022 Contribution Rate Change by Source

Mortality 🛽 Retirement (Active and Inactive) 📄 Term/Refunds/Recip 🔳 Disability 📓 Merit Scale 📕 COLA Growth 📗 Admin Expenses





Mortality 🛽 Retirement (Active and Inactive) 📄 Term/Refunds/Recip 🔳 Disability 📕 Merit Scale 📕 COLA Growth 📒 Admin Expenses





Lower termination rates reduced the overall cost for the General members and the Plan overall, but the combined changes in the termination rates, withdrawal rates, and reciprocity assumptions increased the cost slightly for Safety.

### Total 2022 Contribution Rate Change by Source

Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses





🛢 Mortality 🛢 Retirement (Active and Inactive) 📒 Term/Refunds/Recip 📳 Disability 📗 Merit Scale 📕 COLA Growth 📗 Admin Expenses





Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses





Mortality Retirement (Active and Inactive) Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses





Mortality Retirement (Active and Inactive) 📄 Term/Refunds/Recip Disability Merit Scale COLA Growth Admin Expenses





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The previous slides only showed the impact of assumption changes for the current valuation, where 1/3 of the change in the UAL payment is realized based on MercedCERA funding policy. Here we show the cost impact on both the 2022 valuation and the ultimate impact after three years. The impact of all proposed assumption changes on the ultimate cost of the plan is very minimal: only 0.3% of pay, compared the current combined employer plus employee cost of over 50% of pay. The impact on the funded ratio is a reduction of about 0.5% (from 70.0% to 69.5%).

### **Total Contribution Impact**





### **Total Contribution Impact**







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### Certification

The purpose of this report is to present the preliminary results of the MercedCERA Actuarial Experience Study covering the period from June 30, 2019 through June 30, 2022. This report is for the use of Merced in selecting assumptions to be used in actuarial valuations beginning June 30, 2022.

In preparing our presentation, we relied on information (some oral and some written) supplied by MercedCERA. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Cheiron utilizes ProVal actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.

To the best of our knowledge, this presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This presentation was prepared for the MercedCERA Retirement Board for the purposes described herein. Other users of this presentation are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

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