



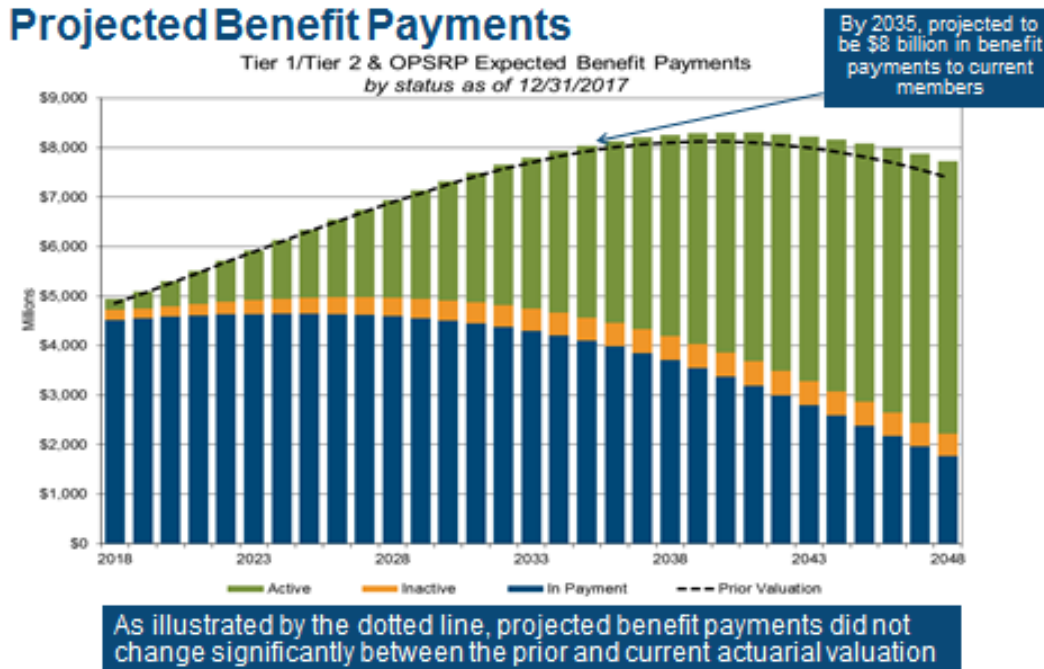
March 7, 2019

TO: Members Capital Construction Subcommittee  
FROM: Kevin Olineck, Director  
SUBJECT: Responses to Committee Discussion – February 22, 2019

A variety of questions were raised during the February 22, 2019 meeting. The following responds to discussion around projected benefit payments – shown by Tier, and an example of stochastic modeling.

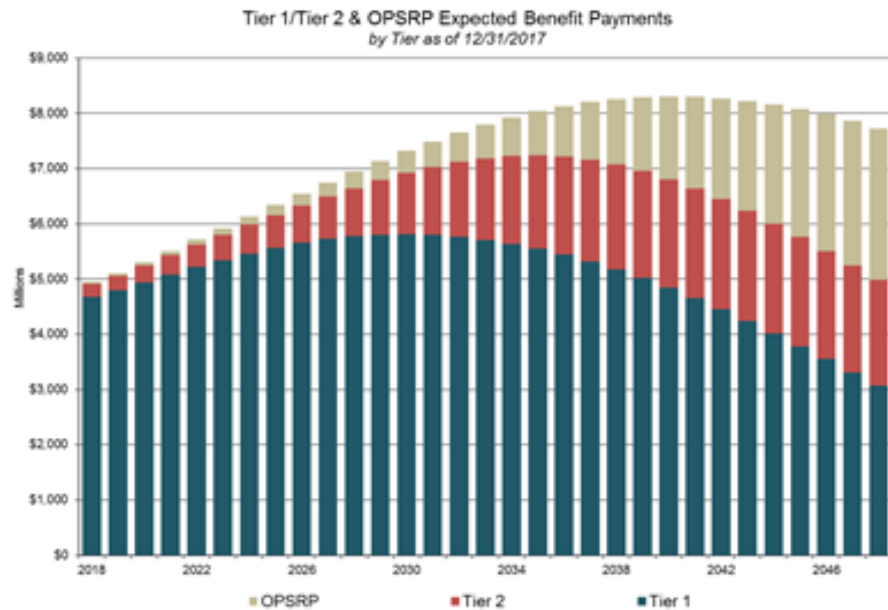
### PROJECTED BENEFIT PAYMENTS

The charts below show projected pension benefit payments, as of the December 31, 2017 valuation in two ways. First, by status of the member as of 12/13/17 – receiving payment, inactive and soon-to-retire, or active soon-to-retire. Second, by Tier membership.



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## Projected Benefit Payments by Tier



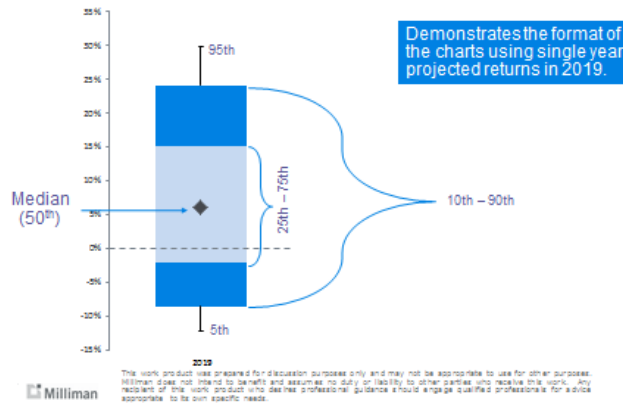
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## STOCHASTIC MODELING

At the December 7, 2018 PERS Board meeting, Milliman presented their annual financial modeling results. What follows is an excerpt from their presentation to illustrate stochastic modeling. The model results are likelihood ranges instead of a single amount and the range distribution is based on a stochastic simulation using 10,000 trials. The model incorporates published returns through October 2018.

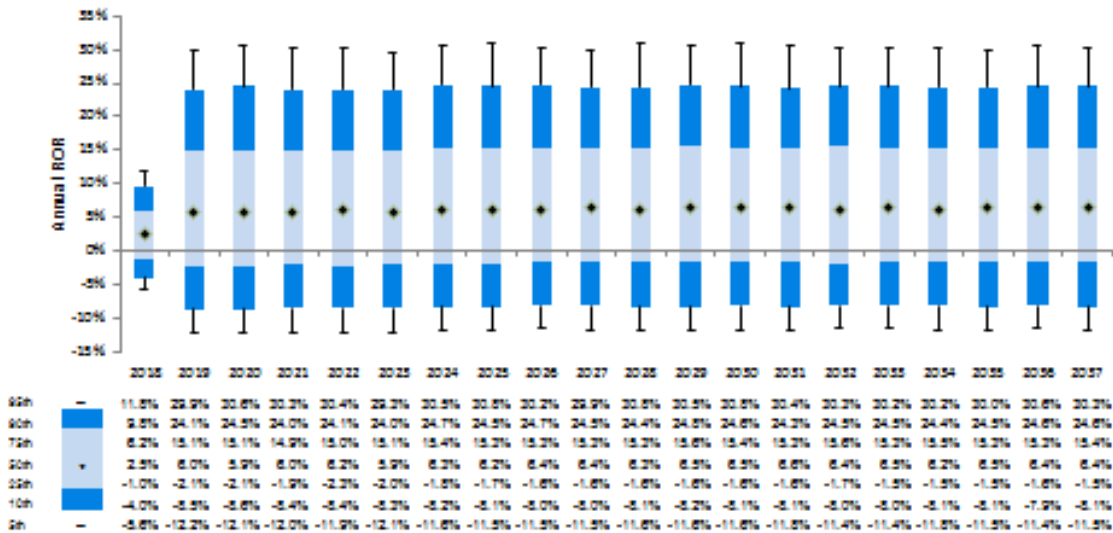
Scenarios were developed by the Milliman national capital market specialists, and used the current OPERF target asset allocation policy; for these scenarios, the median annualized average geometric 20-year return is 6.65%. Dots in the charts represent median (50<sup>th</sup> percentile) outcomes, but results from the 5<sup>th</sup> to 95<sup>th</sup> percentiles are displayed. The chart format is demonstrated below.

**PERS Fund Rate of Return**  
 Projected 2019 Investment Returns



**PERS Fund Rate of Return**  
 Single Calendar Year Investment Returns

Our capital market outlook model projects lower median returns in the first five years following 2018 due to current low yields on fixed income. Higher median returns are projected in the latter portion of the modeling period.



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