VIDEOCONFERENCE MEETING

STATE OF CALIFORNIA

PUBLIC EMPLOYEES' RETIREMENT SYSTEM

BOARD OF ADMINISTRATION

INVESTMENT COMMITTEE

OPEN SESSION

ZOOM PLATFORM

MONDAY, SEPTEMBER 13, 2021

9:50 A.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
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## APPEARANCES

COMMITTEE MEMBERS:

Theresa Taylor, Chairperson

David Miller, Vice Chairperson

Margaret Brown

Rob Feckner

Henry Jones

Fiona Ma, represented by Frank Ruffino

Lisa Middleton

Stacie Olivares

Eraina Ortega

Ramon Rubalcava

Shawnda Westly

Betty Yee, represented by Lynn Paquin and Karen Greene-Ross

STAFF:

Marcie Frost, Chief Executive Officer

Dan Bienvenue, Interim Chief Investment Officer

Matt Jacobs, General Counsel

Scott Terando Chief Actuary

Sarah Corr, Managing Investment Director

Kelly Fox, Chief, Stakeholder Relations

Sterling Gunn, Managing Investment Director

Pam Hopper, Committee Secretary

APPEARANCES CONTINUED

STAFF:

Jean Hsu, Managing Investment Director

Arnie Phillips, Interim Deputy Chief Investment Officer

Lauren Rosborough Watt, Investment Director

Greg Ruiz, Managing Investment Director

ALSO PRESENT:

John Bottorff, ClearnEarth4Kids.org

William Cunningham, Creative Investment Research

Carlos Davidson

Catherine Downs, City of Santa Ana

Steve Foresti, Wilshire Consulting

Alyssa Giachino, Private Equity Stakeholder Project

Dillon Gibbons, California Special Districts Association

Suzanne Hume, CleanEarth4Kids.org

J.J. Jelincic

Sarah Lamin, City of Hayward

Gwen Larmeb, Fossil Free California

Jeanette MacMillan, Fossil Free California

Steve McCourt, Meketa

Todd Parton, City of Beaumont

Jonny Pena, League of California Cities

Sydney, CleanEarth4Kids.org

APPEARANCES CONTINUED

ALSO PRESENT:

Chris Tavarez, City of Hanford

Sheila Thorne, Fossil Free California

Tom Toth, Wilshire Consulting

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PROCEEDINGS

CHAIRPERSON TAYLOR: I am now calling the Investment Committee open session to order.

Ms. Hopper, can you call roll.

COMMITTEE SECRETARY HOPPER: Theresa Taylor?

CHAIRPERSON TAYLOR: Here.

COMMITTEE SECRETARY HOPPER: Margaret Brown?

COMMITTEE MEMBER BROWN: Morning.

COMMITTEE SECRETARY HOPPER: Rob Feckner?

COMMITTEE MEMBER FECKNER: Good morning.

COMMITTEE SECRETARY HOPPER: Henry Jones?

COMMITTEE MEMBER JONES: Here.

COMMITTEE SECRETARY HOPPER: Frank Ruffino for Fiona Ma?

ACTING COMMITTEE MEMBER RUFFINO: Present.

COMMITTEE SECRETARY HOPPER: Lisa Middleton?

COMMITTEE MEMBER MIDDLETON: Present.

COMMITTEE SECRETARY HOPPER: David Miller?

VICE CHAIRPERSON MILLER: Here.

COMMITTEE SECRETARY HOPPER: Stacie Olivares?

COMMITTEE MEMBER OLIVARES: Here.

COMMITTEE SECRETARY HOPPER: Eraina Ortega?

COMMITTEE MEMBER ORTEGA: Here.

COMMITTEE SECRETARY HOPPER: Ramon Rubalcava?

COMMITTEE MEMBER RUBALCAVA: Present.

COMMITTEE SECRETARY HOPPER: Shawnda Westly?

COMMITTEE MEMBER WESTLY: Present.

COMMITTEE SECRETARY HOPPER: Lynn Paquin for Betty Yee?

ACTING COMMITTEE MEMBER PAQUIN: Here.

COMMITTEE SECRETARY HOPPER: Madam Chair, all is in attendance.

CHAIRPERSON TAYLOR: All right. Great. Thank you, Pam.

We'll now recess into closed session for items 1 through 7 from the closed session agenda. So at this time, the Board members will exit this open session meeting and connect to the closed session. To the members of the public watching on livestream, the open session Investment Committee meeting will reconvene following the closed session, so I'll see you guys on the other side.

(Off record: 9:51 a.m.)

(Thereupon the meeting recessed
into closed session.)

(Thereupon the meeting reconvened
open session.)

(On record: 1:30 p.m.)

CHAIRPERSON TAYLOR: We're back in open session of the Investment Committee. And we're just going to move right along into the agenda.

So we are on Agenda Item number 2, approval of the September 13th, 2021 Investment Committee timed agenda. I need a motion.

VICE CHAIRPERSON MILLER: Move approval.

CHAIRPERSON TAYLOR: Moved by Mr. Miller.

COMMITTEE MEMBER FECKNER: Second.

CHAIRPERSON TAYLOR: I heard a second.

COMMITTEE MEMBER FECKNER: Second.

CHAIRPERSON TAYLOR: Oh, second by Mr. Feckner.

Ms. Hopper, can you take the roll for that.

COMMITTEE SECRETARY HOPPER: Margaret Brown?

Rob Feckner?

COMMITTEE MEMBER FECKNER: Aye.

COMMITTEE SECRETARY HOPPER: Henry Jones?

COMMITTEE MEMBER JONES: Aye.

COMMITTEE SECRETARY HOPPER: Frank Ruffino for Fiona Ma?

ACTING COMMITTEE MEMBER RUFFINO: Aye.

COMMITTEE SECRETARY HOPPER: Lisa Middleton?

COMMITTEE MEMBER MIDDLETON: Aye.

COMMITTEE SECRETARY HOPPER: David Miller?

VICE CHAIRPERSON MILLER: Aye.

COMMITTEE SECRETARY HOPPER: Stacie Olivares?

COMMITTEE MEMBER OLIVARES: Aye.

COMMITTEE SECRETARY HOPPER: Eraina Ortega?

COMMITTEE MEMBER ORTEGA: Aye.
COMMITTEE SECRETARY HOPPER: Ramon Rubalcava?
COMMITTEE MEMBER RUBALCAVA: Aye.
COMMITTEE SECRETARY HOPPER: Shawnda Westly?
COMMITTEE MEMBER WESTLY: Aye.
COMMITTEE SECRETARY HOPPER: Lynn Paquin for Betty Yee?
ACTING COMMITTEE MEMBER PAQUIN: Aye.
COMMITTEE SECRETARY HOPPER: One last time, Margaret Brown?
Margaret Brown?
CHAIRPERSON TAYLOR: There she is.
COMMITTEE SECRETARY HOPPER: I see here. I don't hear her though.
COMMITTEE MEMBER BROWN: (Thumbs up.)
CHAIRPERSON TAYLOR: She say aye with her finger.
COMMITTEE SECRETARY HOPPER: Okay. I have Margaret Brown as an aye.
CHAIRPERSON TAYLOR: Okay.
And Madam Chair, I have all ayes, motion being made by David Miller, seconded by Rob Feckner for Agenda Item 2.
CHAIRPERSON TAYLOR: All right. Great. So Agenda Item 2 passes. I'm not sure, Eraina, if you know that you're really dark. I don't think -- I don't know if

people can see you or not.

COMMITTEE MEMBER ORTEGA: I noticed that just now and was trying to figure out what happened. So I'm working on that. Thank you.

CHAIRPERSON TAYLOR: Okay. Great. So let's move on to Agenda Item 3, Executive Report, and Mr. Bienvenue.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes. Thank you, Madam Chair. Good afternoon, everybody. Let's see here. Normally, I would discuss our portfolio's performance and positioning as part of this report, but I think we know that we've got a -- first of all, we have semi-annual trust level reviews today, so we'll be able to take that topic up in detail there and we also have a very full agenda today, so I'll keep these very brief with just a quick overview of this report today.

We'll lead off with the consent items and then move on to two action items for the Committee's consideration. The first is the Total Fund and Affiliate Policy that relates to putting in place a limit around actionable tracking error. And the content of this item is consistent with Chair direction in June.

The second item represents a continuation of our asset liability management work presenting capital market assumptions for adoption by the Board. Now, note that these capital market assumptions are consistent with what you saw in July and that these are not the adoption of a policy portfolio and a discount rate. They're the assumptions we'll use as we present potential portfolios for the Committee's consideration in November.

After these two action items, we'll move on to the information items that are on our agenda. The first continues our ALM work together, where Sterling Gunn and Christine Reese will lead our discussion and preview of the various candidate portfolios with the idea this item we'll be needing for the Investment Committee to get more feedback on preferences for the portfolio, as we make trade-offs between returns that we're trying to generate and the multi-faceted risk that we found.

And then next we move on to our annual trust level review and annual program review items, first presented by management, the second by your consultants, where we'll dig into the portfolio and the business model for the Board's oversight. So that's what we have before us today. And with that, I'll turn it back to you, Madam Chair to take any questions or to take us through the agenda.

CHAIRPERSON TAYLOR: Thank you. I have a question from Ms. Brown.

COMMITTEE MEMBER BROWN: Thank you. Can everybody hear me now?

(Heads nod.)

COMMITTEE MEMBER BROWN: Excellent. Okay. Sorry about that. Having a little technical difficulties today.

Mr. Bienvenue, I have been getting a lot of calls and emails about our investments in China. And I'm hoping that, at some point in time, you'll be giving an update, or if not, if you'd be willing to touch on that now. There's two concerns whether or not our investments are going towards the Chinese Military Complex, and then the other one is just with the Chinese government sort of taking over -- taking over companies or limiting companies. And I'm just wondering how those moves by the Chinese government are impacting our investments in China.

Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah. So let me -- let me take those in order and if we want to go deeper, we certainly can bring back an agenda item on this, if desired. But let me -- let me start with, first of all, there are a list of companies that are on a -- you know, there's a certain set of companies that are on the, what is called, the OFAC list, which is a list of entities that U.S. businesses aren't to do business with. That list was expanded under the Trump administration and has since been further expanded under the Biden administration.

As those companies have gone on those lists, those are to come out of our benchmark and therefore out of our portfolio. So I can assure you that there is nothing that is sort of inconsistent with all of those directives in the portfolios.

As far as the, you know, balancing the sort of risk and returns in China, it is a great question and one that your -- you know, that the Investment staff frankly debates fairly consistently. You know, China is the, you know, second largest economy in the world. It's the largest contributor to global economic growth in the world. It's got the largest, you know, population in the world. I mean, it's a major economic engine. And frankly, you know, relative to that economic engine, it is underrepresented in our portfolio and in the capital markets.

However, there are risks that come with that. I mean, you certain saw recently where the Chinese government came out and said that, you know, Chinese education companies could no longer be for profit. They had to be not-for-profit companies. And, of course, we immediately looked into potential exposure there in the private equity portfolio. Unfortunately, the exposure was very, very limited.

But it is a challenging balance that we're looking at and certainly something that we're -- that we're spending some -- you know, quite a bit of time on trying to -- trying to navigate, you know, generating the returns that we need. And certainly as I say, China is an engine of economic growth and potential returns, while also balancing the risks.

COMMITTEE MEMBER BROWN: Oh. Thank you, Dan. I appreciate the fact that we don't have any investments on the OFAC list. Of course, that's not the information that's out there publicly and I appreciate that.

And then I would like to see, hopefully Ms. Taylor will agree, our Chair, that we could get a more in-depth presentation on what we hold -- what we hold in China, if that's public if, and then what's going on with the returns, and what basically the staff sees as maybe the next -- the Chinese government is going to mess with and therefore harm our returns.

Do we know how much money we've -- have we lost any money as a result of the changes in the government strategy over there with respect to investments?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Well, I will say that right after some of the -- you know, sort of Chinese government intervention. You know, the Chinese equity markets did draw down a little bit. So in both public markets space and then private for evaluation space, I would say that there's been some drawdown. We do have assets, you know, invested also in the real assets side. You know, of course, on all the private market valuations, you know, as we know is as much art as science. But it's challenging to, you know, sort of answer that question. But I would say that in the short term, there had been some drawdown in the -- in the public equity returns in China. But I would say that if you measure over a longer horizon, the returns have actually been very strong. So it really kind of depends on the -- on the horizon you use.

COMMITTEE MEMBER BROWN: Well, I appreciate the information and I would look forward to maybe getting some more in-depth information, if possible.

CHAIRPERSON TAYLOR: So I can -- I can agree that this is something that is of concern. I don't want you -- because November is a big meeting too, so I don't want you guys to be killing yourselves trying to get us that information. But if you could give us like kind of a basic outline of where our investments are and kind of risks and returns type of thing.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes, be happy to. Why don't -- why don't -- why don't we look at, you know, kind of what makes most sense to be most responsive and we'll bring something back. And then if that doesn't hit the mark, we can -- we can come back again.

CHAIRPERSON TAYLOR: Okay. That sounds great.

COMMITTEE MEMBER BROWN: Thank you. Thank you, Ms. Taylor.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And we'll take that as Committee direction.

CHAIRPERSON TAYLOR: Thank you.

Hold on a second.

So we're moving on to our action consent items. And that's approval of the June 14th Investment Committee open session meeting minutes. I need a motion.

VICE CHAIRPERSON MILLER: Move approval.

CHAIRPERSON TAYLOR: Moved by Mr. Miller.

COMMITTEE MEMBER BROWN: Second.

CHAIRPERSON TAYLOR: Second by Ms. Brown.

Ms. Hopper, can you call the roll for the vote?

COMMITTEE SECRETARY HOPPER: Margaret Brown?

COMMITTEE MEMBER BROWN: Aye.

COMMITTEE SECRETARY HOPPER: Rob Feckner?

COMMITTEE MEMBER FECKNER: Aye.

COMMITTEE SECRETARY HOPPER: Henry Jones?

COMMITTEE MEMBER JONES: Aye.

COMMITTEE SECRETARY HOPPER: Frank Ruffino for Fiona Ma?

ACTING COMMITTEE MEMBER RUFFINO: Aye.
COMMITTEE SECRETARY HOPPER: Lisa Middleton?
COMMITTEE MEMBER MIDDLETON: Aye.
COMMITTEE SECRETARY HOPPER: Lisa Middleton?
COMMITTEE MEMBER MIDDLETON: Aye.
COMMITTEE SECRETARY HOPPER: Thank you.
David Miller?
VICE CHAIRPERSON MILLER: Aye.
COMMITTEE SECRETARY HOPPER: Stacie Olivares?
COMMITTEE MEMBER OLIVARES: Aye.
COMMITTEE SECRETARY HOPPER: Eraina Ortega?
COMMITTEE MEMBER ORTEGA: Aye.
COMMITTEE SECRETARY HOPPER: Ramon Rubalcava?
COMMITTEE MEMBER RUBALCAVA: Aye.
COMMITTEE SECRETARY HOPPER: Shawnda Westly?
COMMITTEE MEMBER WESTLY: Aye.
COMMITTEE SECRETARY HOPPER: Lynn Paquin for Betty Yee?
ACTING COMMITTEE MEMBER PAQUIN: Aye.
COMMITTEE SECRETARY HOPPER: Madam Chair, I have a motion being made by David Miller, seconded by Margaret Brown, all ayes, for Agenda Item 4A approval of the June 14, 2021 Investment Committee open session meeting minutes.
CHAIRPERSON TAYLOR: Great. Thank you.

We will move on to Agenda Item 5, information consent items. I have not received any requests to pull anything off.

So that moves us on to Item 6, action item, Policy and Delegation, Total Fund and Affiliate Fund Policy updates.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. Thank you, Madam Chair. Let's see, can we please bring Christine Gogan forward as a presenter to join Arnie and me here, as well as Ali Kazemi from Wilshire to answer questions as appropriate.

And then while they're coming up, can I also please ask that we bring Amy Deming forward. And I'd like to take a moment to introduce Amy as our new Investment Director of the Investment Controls and Operational Risk Group, also known as ICOR. Amy joins us from Allianz Global Investors. She spent the last 15 years with progressively increased responsibility in various capacities, including being the Global Head of Investment Advisory Compliance, Deputy Chief Compliance Officer, and head of U.S. Investment Compliance. So Amy brings extensive experience, not only in the areas of controls of the clients, but also in leading and fostering a diverse equitable and inclusive business environment. And we're really happy to have her on board.

I also want to take a moment to thank Christine Gogan for her leadership as the Interim ID of ICOR over the last nine months and to thank her as she continues in helping Amy transition into the role and into CalPERS. Christine's commitment and the, you know, knowledge in this has really been invaluable. And she, as well as the whole ICOR team, have done an exceptional job during this transition. So I really just wanted to take a moment to thank Christine and introduce you to Amy. If we were in the auditorium, I would ask Amy to stand up and maybe you should just wave and say hello and that way you can all meet Amy and you'll certainly see more of her in the future.

So with that, why don't we move on to this first action item on today's agenda. As I mentioned, this is a second reading following Chair direction on proposed updated language around the tracking error and total fund and affiliate fund investment policies. So I will turn it over to Arnie to take us through the item.

Arnie, over to you.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Yes. Thank you, Dan and welcome to Amy and also thank you to Christine for all the help she has done handling ICOR in the interim there.

So as Dan mentioned, this was a Chair-directed item in June. Just as a quick timeline update, we did initially bring this topic back at the November 2020 Investment Committee. Then we brought the information item in June of this year. And then Chair directed to bring it today in action form.

So with that, I'll just give a high level summary of the proposed changes. Staff is proposing that actionable tracking error replace total tracking error in the Total Fund Policy. Actionable tracking error reflects the impact of active strategies across the public markets. It eliminates the noise that naturally results from investing in private assets where the nature of the benchmarks adds tracking Error simply through the deployment of assets.

Staff believes that actionable tracking error improves transparency on true shifts in strategy initiated by staff, thus contributing to better governance and accountability for investment decisions.

The proposal also includes a couple updates to the affiliate fund section and the currency management section to make them consistent with the PERF's proposed move to actionable tracking error.

We've also included for your reference the deck that staff presented in June, which is Attachment 3. During the June discussion, there was a request for peer data. This data is included in the deck, Attachment 4. And just to kind of summarize that deck, we worked with Wilshire. And I guess the way I would characterize it is there isn't really a single answer on how other entities handle tracking error. It is handled pretty much differently everywhere. But the one common denominator we saw out of more plans than less was they tend to focus also on the public assets. And I don't -- I wouldn't say ignore, but they don't count the private assets in the tracking error calculation typically.

And then finally, the deck also includes Wilshire's opinion letter supporting the change to actionable tracking error. That's Attachment 5. And with that background, I'm happy to answer any questions you may have.

CHAIRPERSON TAYLOR: So I am not seeing any questions on the tracking error. I think having brought it back several times, I think you have satisfied the Board. So this is an action item and I need a motion to move forward.

VICE CHAIRPERSON MILLER: I move for approval of the recommended policy changes.

COMMITTEE MEMBER JONES: Second.

CHAIRPERSON TAYLOR: Moved by Mr. Miller, seconded by Mr. Jones. Ms. Hopper, can you go ahead and call the roll for the vote?

COMMITTEE SECRETARY HOPPER: Margaret Brown?

COMMITTEE MEMBER BROWN: No.

COMMITTEE SECRETARY HOPPER: Rob Feckner?

COMMITTEE MEMBER FECKNER: Aye.

COMMITTEE SECRETARY HOPPER: Henry Jones?

COMMITTEE MEMBER JONES: Aye.

COMMITTEE SECRETARY HOPPER: Frank Ruffino for Fiona Ma?

ACTING COMMITTEE MEMBER RUFFINO: Aye.

COMMITTEE SECRETARY HOPPER: Lisa Middleton?

COMMITTEE MEMBER MIDDLETON: Aye.

COMMITTEE SECRETARY HOPPER: David Miller?

VICE CHAIRPERSON MILLER: Aye.

COMMITTEE SECRETARY HOPPER: Stacie Olivares?

COMMITTEE MEMBER OLIVARES: Aye.

COMMITTEE SECRETARY HOPPER: Eraina Ortega?

COMMITTEE MEMBER ORTEGA: Aye.

COMMITTEE SECRETARY HOPPER: Ramon Rubalcava?

COMMITTEE MEMBER RUBALCAVA: Aye.

COMMITTEE SECRETARY HOPPER: Shawnda Westly?

COMMITTEE MEMBER WESTLY: Aye.

COMMITTEE SECRETARY HOPPER: Lynn Paquin for Betty Yee?

ACTING COMMITTEE MEMBER PAQUIN: Aye.

COMMITTEE SECRETARY HOPPER: Madam Chair, I have a motion being made by David Miller, seconded by Henry Jones. I have 10 ayes and one no made by Margaret Brown for Agenda Item 6A, Total Fund and Affiliate Fund Policy Updates.

CHAIRPERSON TAYLOR: Thank you. Agenda Item 6A passes.

We will move on to Agenda Item, Action Item, 7 Total fund, A, Asset Liability Management Adoption of the Capital Market Assumptions.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. Thank you, Madam Chair. And thank you to Arnie, and to Christine and Amy for joining us. And Ali as well, thank you.

Let's see, can we please now bring Sterling Gunn and Christine Reese forward as presenters, along with our Chief Actuary, Scott Terando. And if we can also please bring Tom Toth and Steve Foresti from Wilshire forward so they can answer questions an appro -- as appropriate.

And then once that's done, we can also move Christine Gogan and Amy Deming back to the attendees queue. I know -- I know you're juggling a lot though David, so I'll let you do these one at a time. And we can start with Sterling, Christine, Scott Terando, Tom Toth, and Steve Foresti forward.

So as I mentioned in my opening comments, this item continues our cyclical asset liability management work. Here, we're presenting capital market assumptions for the Committee's consideration and adoption. Note that these are the same CMAs you saw in July as mentioned, and note that this is action on the capital market assumptions, the policy portfolios -- or potential portfolios for adoption will come back in November after the candidate portfolio information item that follows this item.

So with that, I will turn it over to Sterling to lead us through the item. Sterling, over to you.

(Thereupon a slide presentation.)

MANAGING INVESTMENT DIRECTOR GUNN: All right. Thank you, Dan. Good after, everyone. So the purpose of this session, as Dan mentioned, is to have the Board consider adopting the baseline scenario capital market assumptions that we will use for the 2021 asset liability management process.

In July, we had presented the 10- and 20-year survey results for the recent capital market assumptions. And the capital markets presented today are based on the March 2021 capital market assumptions survey. Note though that today we are presenting the five- and 20-year return projections rather than the 10 and 20. And that links to the sort of multi-portfolio strategy that we're proposing later on.

All right. So the survey results reveal the diverse views on returns, and so we need to be mindful of false precision. And the one thing that is almost certain is that actual returns will differ from these projections. So as a result, we developed downside and upside scenarios to better understand the sensitivity in portfolios to variations and return assumptions. These two scenarios were developed solely to test portfolio sensitivity to assumptions and have no direct influence on policy decisions, such as discount rates or policy asset allocation.

So as a result, we're not asking for approval of the downside and upside scenarios. We've included them in the appendix solely as a point of reference. We have also included a summary of the inflation and GDP assumptions related to the three scenarios. And we includes these assumptions as a point of reference.

And I should also point out the Actuarial and Investment offices used independent processes to estimate baseline inflation rates. And the results here that we present are toes developed by the Investment Office. And these results of these two processes actually only differ by about five basis point, which given the uncertainty of these kind of projections is well within an acceptable range. And this small difference does not influence the results of our analysis.

The recommendation itself is the following: to adopt the baseline projected five- and 20-year returns, which are on page three of the presentation materials; to adopt the projected 20-year projected volatilities on page three of the presentation materials; and to adopt the asset class 20-year correlations, which are on page four of the presentation materials.

At this point, I would be happy to answer questions.

CHAIRPERSON TAYLOR: I'm kind of waiting. I would imagine I would have questions, but I am not having questions on this particular things. So if there are no questions -- let me look one more time. Last chance.

Okay. I need a motion to move this forward.

VICE CHAIRPERSON MILLER: I will move to approval of the recommendations.

CHAIRPERSON TAYLOR: Okay. Moved by Mr. Miller.

COMMITTEE MEMBER FECKNER: Second.

CHAIRPERSON TAYLOR: Seconded by Mr. Feckner.

Ms. Hopper, can you call the roll to take the vote?

COMMITTEE SECRETARY HOPPER: Margaret Brown?

COMMITTEE MEMBER BROWN: No.

COMMITTEE SECRETARY HOPPER: Rob Feckner?

COMMITTEE MEMBER FECKNER: Aye.

COMMITTEE SECRETARY HOPPER: Henry Jones?

COMMITTEE MEMBER JONES: Aye.

COMMITTEE SECRETARY HOPPER: Frank Ruffino for Fiona Ma?

ACTING COMMITTEE MEMBER RUFFINO: Aye.

COMMITTEE SECRETARY HOPPER: Lisa Middleton?

COMMITTEE MEMBER MIDDLETON: Aye.

COMMITTEE SECRETARY HOPPER: David Miller?

VICE CHAIRPERSON MILLER: Aye.

COMMITTEE SECRETARY HOPPER: Stacie Olivares?

COMMITTEE MEMBER OLIVARES: Aye.

COMMITTEE SECRETARY HOPPER: Eraina Ortega?

COMMITTEE MEMBER ORTEGA: Aye.

COMMITTEE SECRETARY HOPPER: Ramon Rubalcava?

COMMITTEE MEMBER RUBALCAVA: Aye.

COMMITTEE SECRETARY HOPPER: Shawnda Westly?

COMMITTEE MEMBER WESTLY: Aye.

COMMITTEE SECRETARY HOPPER: Lynn Paquin for Betty Yee?

ACTING COMMITTEE MEMBER PAQUIN: Aye.

COMMITTEE SECRETARY HOPPER: Madam Chair, I have a motion being made by David Miller, seconded by Rob

Feckner. I have 10 ayes, one no made by Margaret Brown for Agenda Item 7A, Asset Liability Management, Adoption of Capital Market Assumptions.

And you are on mute, Ms. --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: You are on mute.

CHAIRPERSON TAYLOR: Got it.

Agenda Item 7a passes.

So we will move on to Agenda Item 8a, which is an information item, Asset Liability Management Discussing -- Discussion of the Candidate Portfolios.

Oh, I'm sorry. Hold on. I do see a question. It did pop up. Ms. Brown.

COMMITTEE MEMBER BROWN: Thank you. I am so sorry. I'm having internet -- all the words are cutting out and I can't get my Diligent notes up.

So this is why it's so important to keep paper notes as well as electronic notes. So can I just get Sterling or the consultant to explain again why we are doing projected returns for five years and 20 years as opposed to the normal thing that we do, which is one through 10 and then 11 through 20, or are you going explain that now?

MANAGING INVESTMENT DIRECTOR GUNN: I'm going to speak to that now, and --

COMMITTEE MEMBER BROWN: Thank you.

MANAGING INVESTMENT DIRECTOR GUNN: -- hopefully give a reasonable explanation. And the intent here is to try to identify where the market could be quite different between the near term and long term. And so if we think that -- like the current market very high valuations in fixed income, high valuations in equities. And at some point, you know, we think the market might return to a more normal state. We don't know exactly when. But five years might be a more reasonable horizon for when that inflection point may occur than 10 years.

So historically, there might have been a 10 year projection for returns and it still would have been a blend of medium -- you know, short-, medium-, long-term rates. So the intent here really was to try to identify is there a potential inflection point and can we take any guidance then from that -- the difference between the near term and the long term when we discuss how to a construct portfolio.

CHAIRPERSON TAYLOR: Does that help Margaret?

COMMITTEE MEMBER BROWN: So what -- but what is the effect of doing this? What is the effect it -- right.

MANAGING INVESTMENT DIRECTOR GUNN: So the effect is we can try to develop a two-step portfolio for the near term and a portfolio for the long term, with the belief that that is -- will give us a better outcome than if we just had a single portfolio for the entire period.

So if we think about the near term in the CMAs, where we see, you know, lower returns and higher risks, particularly we see very low returns in fixed income. So that may mean that a portfolio in the near term may tilt away from fixed income, whereas in the longer term in a more normal market, fixed income returns may return to more normal kind of levels, which face a more -- a more balanced portfolio may be more appropriate. So it really is trying to take advantage of additional information.

If we simply use 10 years --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And maybe I'll --

MANAGING INVESTMENT DIRECTOR GUNN: Oh. I was just going to say, before you do, Dan, that the 10 years is an average. And we basically throw out information about what we might think could be happening in the near term.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And I --

MANAGING INVESTMENT DIRECTOR GUNN: So we're trying to take advantage of that information.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes. The only thing that I would add is that right now we believe that with central bank intervention globally, interest rates are artificially a little low, and therefore, bond valuations are a little high. And therefore those diversifying assets that are part of the asset allocation in the short term, they're just not as diversified.

So the short answer to your question, Ms. Brown, is that by having this sort of bifurcated, you know, shorter term and long term, you know, five-year and 20-year, what that allows us to do is support a higher assumed rate of return, and therefore a higher discount rate for any given level of risk. So if we -- you know, if we -- if we support a -- this higher discount rate for -- if we -- if we target minimizing downside risk, we can support a higher rate of return for each level of risk.

COMMITTEE MEMBER BROWN: Okay. So let me ask Wilshire what other -- what other pensions are doing this when they do their ALM? And maybe -- and then the question is why hasn't CalPERS done this before this time around? That's for you, Mr. Toth.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Tom.

MR. TOTH: I think Steve came off mute, but I'm not hearing him, if he had opening comments and I can comment on as well.

CHAIRPERSON TAYLOR: Steve, can you talk?

Apparently not. We're not hearing Steve. So go ahead, Tom.

MR. TOTH: Okay. So we talked a little bit about other pension systems that are utilizing, call them, multi-period optimization. And it's not part -- it is not common by and large here in the U.S. Although we have seen some overseas pension systems doing it. I think the -- you know, why is CalPERS doing it is a fair question. And it really comes down to I think the recognition that we are in a challenging environment to start. And I don't want to call -- aberration is probably too strong a word, but as Dan pointed out with Central Bank intervention in the interest rate markets rates being abnormally low, and then stacking on risk premiums above that, this is taking that into account when we start doing optimization work for the portfolios.

And by doing it in two -- I'll call it two steps, short term and long term, and recognizing the difference in environments, it allows you to put together a more optimal portfolio for the full period -- the full 20-year period than you were if you were just to try to take an average for the -- for the total period. So I think it's a -- it's a useful lens for looking at opportunities in the market, given what we're seeing particularly in fixed income ex -- for fixed income expectations.

CHAIRPERSON TAYLOR: You're still muted.

COMMITTEE MEMBER BROWN: Thank you. So where else are they using this? You said internationally? So, I mean, I'm looking for a highly respected international fund that's using this. I mean, I hate to invent the wheel. I'd like to copy it from somebody else.

MR. TOTH: And, Mr. Gunn, please chime in. I know you're very familiar with some of the Canadian pension systems, but CPPIB was one example utilized earlier.

CHAIRPERSON TAYLOR: Sterling, did you want to add to that?

MANAGING INVESTMENT DIRECTOR GUNN: Yes. I think -- so the actual mechanics will vary, but most funds are looking at sort of a medium-term, short-term, and long-term and asking what can be done better than just holding a long-term portfolio. So I do know some of the -- some of the Canadian funds are asking these kind of questions and trying to -- do they use the same mathematical model we do? Perhaps, perhaps not. But they are trying to answer the same kind of questions and manage a portfolio in a way that's appropriate.

COMMITTEE MEMBER BROWN: Thank you for that. I just -- I just -- the reason for my no vote is I just feel really uncomfortable. I don't really understand it all just yet, so -- but I appreciate the explanation.

Thank you.

CHAIRPERSON TAYLOR: Okay. I also have a question from Ms. Middleton.

COMMITTEE MEMBER MIDDLETON: Thank you, Madam Chair. And Dan, Sterling, we are making some important changes here. And I understand this to make it possible for us to project going forward what I referred to in closed session as a projection of a lower increase in employer contributions that are going to be required. I think it's going to be very important for us in the next few weeks to get out a very clear message to the community as to exactly what we've done and why it is going to be beneficial.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Thank you, Ms. Middleton. And we agree with you that -- and that is exactly right, that the -- one of the reasons, you know, that in this ALM cycle we are certainly looking at ways we can support a higher discount rate to -- you know, we want to make sure that's a prudent discount rate, right, so it doesn't overly stress potential contribution volatility, but it's that balance. And you'll see this in the -- in the candidate portfolio's item that follows this trying to support a discount right that's high enough to manage contribution level, while also not being so high as to -- as to unduly burden contribution volatility. This change is one of the things that we -- that we certainly think that we can use to add to this and agree we need to get this socialized within the stakeholder community.

MR. FORESTI: Hey, Dan, can you -- I think I have my audio working. Can you hear me?

CHAIRPERSON TAYLOR: Yes.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: We can, Steve.

MR. FORESTI: Great. Apologies. I was just having some issues I guess with the -- with the audio. Maybe just to add some context to some of the comments that were previously made. And without I guess at the risk of putting Sterling and staff kind of on their heels just a little bit, I think this issue of a two period versus a one period, perhaps the Committee could get more comfort is when you move to November and actual candidate portfolios are put in front of you. In addition to having at a particular targeted level of return, let's say 6.8 for example, not just what the short-term and long-term portfolios look like in this two-period optimization context, but a direct comparison of what a portfolio over the single long period would look like, so then you have side-by-side comparisons of what the return, risk, drawdown, trade-offs are. That might be something -- I think that will contextualize a lot of the comments that they've heard around what the trade-offs are.

But in a nutshell, this is purely a recognition that we're in a unique environment where returns over the short term are very different from expectations over a longer term period. And that very well may resolve itself over some number of years. It could be five. It could be 10. It could be 15.

But by doing what I'm suggesting, you also put yourself in a position where on the two-year review cycle, you've got a threshold to look at how far apart those next five year versus the -- you know, the six through 20 are with the portfolio you have. And as that gap narrows, that starts to become some information to help in terms of, you know, any sort of issue on when to -- when and if to move from one portfolio to the next.

So I would -- I would offer that up as potential, A, area to give you comfort on what the trade-offs are, and B, a way to monitor as you keep an eye on the portfolio going forward how those discrepancies between the near term and the longer term work themselves out.

COMMITTEE MEMBER MIDDLETON: Steve, thank you. That's really helpful. And all of us understand that we're tying to get the risk level correct and balanced in order to make sure that we have something that we can reliably predict moving forward. But I would be remiss if I did not say something that I know all of you and all of my colleagues know. The cost to employers today has reached crisis levels. So thank you.

MANAGING INVESTMENT DIRECTOR GUNN: Thank you for that.

CHAIRPERSON TAYLOR: So thank you, Ms. Middleton. And, yes, think that's why it's important that we look and maybe beyond the forefront for doing something like this, if that's what need be. Again, it sounds like we're not completely on the forefront, but if it helps us be more accurate, which is very hard when you're making predictions like this. In our scenarios, I think it's important that we do so. And I think also to understand the previous vote was on capital market assumptions with upside economic, and long term, and volatility. So it wasn't really about this two tiered thing right at the moment.

I mean, it kind of us it, but it's not. So these are -- these are mainly our capital market assumptions based on the several organizational input that we had.

Next is Mr. Jones.

COMMITTEE MEMBER JONES: Thank you, Madam Chair.

Yes. You know, I support, you know, moving forward to see what the impact would be on this addition -- this new approach, but I do have an additional maybe two questions.

I want to be clear on making sure that I'm understanding the previous process that we will use the one, and 10, and 11, and 30, weren't those two averaged out. We didn't use just the 20-year assumption. Didn't we use a 1-10 and 11-20 and came up with an average before. I need to get a clear answer on that first.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes, Mr. Jones. In the most recent cycle, and Scott can certainly speak to this. I see Scott on there.

COMMITTEE MEMBER JONES: Okay.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: The most recent cycle be used, years 1 through 10 and then we use years 11 actually through 60.

COMMITTEE MEMBER JONES: Through 60, right.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: But we use those to then determine one portfolio --

COMMITTEE MEMBER JONES: And that --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

-- as opposed to taking advantage of a potential change in allocation within that period.

COMMITTEE MEMBER JONES: Okay. So you're --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And that change in allocation would come back to this -- to this --

COMMITTEE MEMBER JONES: I see.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: I'm sorry.

COMMITTEE MEMBER JONES: So you're saying that in this approach, you will use one portfolio from one to five and different portfolio for six to 20?

MANAGING INVESTMENT DIRECTOR GUNN: That is correct.

COMMITTEE MEMBER JONES: Okay.

MANAGING INVESTMENT DIRECTOR GUNN: -- or until such time as we think we've met that inflection point and we think the market's are changing. So it may not be five years.

COMMITTEE MEMBER JONES: So when we adopt our portfolio, we'll be. It would be combined in one boat to -- with those two components in it, is that correct?

MANAGING INVESTMENT DIRECTOR GUNN: Yeah. So we would -- so, yes, we're basically saying we approve this approach. So the portfolio weights would be whichever candidate portfolio weights in the near term, combined with that process to review and reconsider both the CMAs, and if we have the appropriate portfolio in the future.

COMMITTEE MEMBER JONES: Okay. And so then our independent consultant, Wilshire, said that they will continue to use their one and 10, and 11 and 30 or 60, whatever it is. So how do we evaluate then if our consultants are going to be publishing data on one hand and we're going to be going down a path using data on another hand, because Wilshire is -- I thought I heard them say that they will not change their methodology.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah. Maybe I'll jump in there. Wilshire's methodology is -- and, you know, our survey of CMA providers covers, you know, the gamut of potential providers, some use two and 10, some use two and 20, some use 10 and 30. They are all over the place. What we have landed on is just basically using a five and then a -- and then a years six through 20, but we don't think any of those are significantly different, because really at the end of the day as you get out past those -- that sort of three and five years, we think that it's very difficult to forecast, Mr. Jones.

So really -- I mean, it's always difficult to forecast, but especially as you get out further. And so really any of those would land you at the same place. I think as Sterling described, what this will allow us to do is adopt an asset allocation for this short-term period, where we think that markets are overly expensive, especially in the fixed income area, knowing that we can come back to this Board for another allocation that will update that once markets sort of normalize. And what that allows us to do is to support a higher discount rate over the entire 20-year period.

COMMITTEE MEMBER JONES: And you know the other thought here too is that we've often advocated that we're in the long-term business where we're projecting out 40, 50, and 60 years. And now it seems that we're going completely opposite to that as we -- we often say that don't count on one or two years, but now this, in essence, is saying count on one or two years.

MANAGING INVESTMENT DIRECTOR GUNN: Well, I think we're still acting like long-term investors. And if I were to go back to the -- thank you for the question by the way, because it gives me a chance to speak to this.

Before we would approve a portfolio based on say 20- or 30-year returns. Now, that portfolio does have, you know, performance in the near term. And it does have performance in the long term. And even -- nothing stops us from changing as we've done in the past after two or four years changing that portfolio.

So the question I think around long term is really about, you know, can we see a path. You know, we could just choose a single portfolio for 30 years. That would give a path on a projection basis. But knowing that again after three or four years of that one portfolio, we could probably change.

So all we're really highlighting here is we can perhaps address that path right now considering a near term, which comes with the -- and we can compare that I guess. But really, it's still long term until we have both pieces. And we're showing there is a path that involves two portfolios rather than just a single portfolio.

COMMITTEE MEMBER JONES: Okay. I'm -- okay. I continue to look at it and see what we learn from it.

MANAGING INVESTMENT DIRECTOR GUNN: Yeah. I think just the last point here would be one reason for the scenarios is we're talking an awful lot about projections here.

COMMITTEE MEMBER JONES: Yeah, I know.

MANAGING INVESTMENT DIRECTOR GUNN: And so we've also tried to explore, you know, if the world doesn't unfold the way the projections suggest, what might performance look like. So we have some of that near the end of here as well.

COMMITTEE MEMBER JONES: Yeah, but I mean even with our old method, I mean it was projections, so that's not new.

MANAGING INVESTMENT DIRECTOR GUNN: Right. Yeah. We just -- you know, that's where I'm being prepared. We can have an idea of what might happen.

MR. TOTH: And --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Mr. Jones. Sorry, go ahead Tom.

MR. TOTH: Sorry. Real quick, Dan.

Mr. Jones, maybe to give you some further context when you're looking at the assumptions, which are approved and Wilshire's, we were part of the process, but we were not the only part of the process, so that's why there's some differences in the numbers, but we certainly looked at the reasonableness and most importantly the process for generating them. So that's number one.

And then number two, when we're looking at the results, some of which you'll see in the candidate portfolio presentation, it's actually interesting how close the expected returns for the near and the long term are using these capital market assumptions, compared to Wilshire's -- and I was going to make this comment earlier, but I'll -- I'll make it here. The expectations for the one to 10 year, 10-year horizon portfolio and the 30-year, they actually lineup very, very well.

The modeling here is the near term at 5.2

percent. You'll see in our presentation, we would model that using our proprietary assumptions at 5.1 percent, quite close. And over the long term in the candidate portfolio, it's at 6.6 percent. And we would model that at 6.5 percent. So the relative difference between the near term and the long term are actually quite close, which gives us some further comfort in the CMAs.

COMMITTEE MEMBER JONES: And, you know, and I read your opinion letter, and it does say be aware of the strengths, and I've heard all the strengths, but it also says be aware of the weaknesses. But I haven't heard the weaknesses.

MR. TOTH: Steve.

COMMITTEE MEMBER JONES: So what are the weaknesses?

MR. TOTH: Steve, do you want to touch on that?

MR. FORESTI: Yeah, Mr. Jones, having been the one who wrote that letter, I'll be happy to touch on that a bit. You know, one of the issues -- and I'll leave the positives aside, because as you noted, we've kind of commented on some of those. One of the issues is the potential for some internal inconsistency in the assumptions, and to try to stay out of the weeds just to, you know, draw attention to two particular assumptions within this suite. Public equity, there's a cap-weighted and there's a factor-weighted.

And if you look, for example, at the, you know, 20-year numbers -- well, let's start with just cap-weighted. 6.8 is the assumption for global equity over both the five and the 20-year period. And then if you compare that cap-weighted equity return to the expectation for the factor-weighted, you see a drop-off in return, right. So from 6.8 -- gosh, I don't have the numbers in front of me. I wish they were on the screen here, but I think it's down to 6.1 for market-weighted. And then they drop-off a little lower when you look at five years.

So the point I'm raising is without visibility into all the different survey respondents, I'll just throw a hypothetical out there, let's say the 6.8 was from all 11 respondents providing a number over the 20-year period, but only five respondents provided a factor-weighted number. And by simply taking the results of those surveys with a different group of people -- another way to -- it could be that you just happened to -- the survey respondents who happened tro provide responses for factor-weighted were the ones that were the lowest five, let's say, of the 11 that gave you another number.

So without having that look through and understanding it, you know, one interpretation could have been, well, all those five actually had the same assumption for cap- and factor-weighted. Without seeing all that granularity, you don't know if necessarily there was this gap in perception or it was just a different group of people responding.

Now staff has that detail. They're aware of those potential issues. You have a series of constraints that would be part of an optimization process. It would also protect a bit against these sorts of things. But it was really that potential, and it's not a certain, but a potential inconsistency in just outsourcing to a median from a survey. And then not, you know, fully understanding that.

But again, you know, in our conversations with staff is we feel comfortable that they, you know, recognize the process, they have visibility into these numbers, and can -- and modify. So I'm not painting a picture that oh, my gosh, this potential internal inconsistency is a red flag. We're just flagging it because it does lead to that potential if you just completely ignore the issue of similarity of those who responded to different parts of the survey.

COMMITTEE MEMBER JONES: Because how many firms have the cap-weighted and the factor-weighted component of the global equity? Is that just a few agencies that you can compare to anyway, is that correct?

MANAGING INVESTMENT DIRECTOR GUNN: So we need --

MR. FORESTI: Yeah. I mean to take an extreme case, let's say only respondent provided a factor-weighted and 11 provided a cap-weighted. The net result is where that one respondent shook out. And they -- that one respondent might have had the same cap- and factor-weighted. So there's no real additional information from that.

Again, totally extreme case, but that's what we are raising just in this survey type of process, the potential for those sorts of inconsistencies.

COMMITTEE MEMBER JONES: Okay. As I said, I'll continue to hope for the best outcome. We'll evaluate it going forward.

MR. FORESTI: Now, Mr. Jones, maybe to address or alleviate some of your concerns, those issues aside, we did compare the results against our standard assumptions. And as Tom mentioned, you know, they lineup pretty well. Precisely, no, of course, but if you compare us to probably any of the other 10 respondents we'll be a little off on an asset class or another. So, you know, with those things noted, we did then still look at a comparison of the survey results to our assumptions. And while it's not a one-to-one match, nothing was -- it was a glaring issue to us.

And that includes we don't maintain five-year assumptions. But in terms of direction and what we'd expect, if we took our 10 years and we said, well, what's baked into this, there is not doubt, for example, in fixed income, that if we put a five-year assumption together, it would be lower than our 10-year assumption. So that's very consistent with what we saw in the survey results.

So just to throw that out there, you know, to push back a little bit about -- about this potential inconsistency of a survey process, the end result to us seems reasonable and appropriate for use in the asset allocation process.

COMMITTEE MEMBER JONES: Okay. Thank you.

CHAIRPERSON TAYLOR: Okay. Thank you, everyone.

Next question, Ms. Paquin.

ACTING COMMITTEE MEMBER PAQUIN: Thank you, Madam Chair. And I appreciate the questions that you had, Mr. Jones, because we shared many of the same questions and comments. And also appreciated Mr. Foresti's recommendation or suggestion that we come back in November. Presumably, by the end of today, we'll have narrowed down some of the portfolio candidates presented. And I think it would be great to be able to see a single period optimization along with multi-periods.

And I think that just seeing it side-by-side will help to kind of answer a lot of these questions that I had at least.

Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah, Ms. Paquin, thank you for the comments. And I certainly made a note of that we will -- I want to, you know, check in with Steve when we get a -- you know, get finished with this, but we'll want to make sure that we both understand the suggestion and then try to make it as clear as possible, because I agree I think it's a -- it was a good suggestion by Wilshire.

CHAIRPERSON TAYLOR: Okay. Thank you.

Mr. Miller.

VICE CHAIRPERSON MILLER: Yeah. Thank you very much. Yeah, I'm also really looking forward to seeing that type of presentation kind of the side-by-side, but I'm also pretty favorably disposed toward this approach. I don't -- I don't see it as incompatible with the way we have, you know, historically been doing our capital market assumptions, our ALM processes. It's different time horizons to kind of overlay onto those processes.

But I think that when I think about long-term projections, I don't really just think about, you know, it's a 30-year projection, as much as it's a 30-year projection that also recognizes, you know, that things are not linear, that there's predictable variation and changes in variation. There's short, long, medium term kind of cycles of business cycles, and market behaviors, and numbers. That that all goes into making those kind of projections. A lot of sophisticated and sometimes non-intuitive thinking by people making those projections that goes into them that's all reflected in a long-term projection, but having a shorter or medium horizon allows you to really build on what you know is going on. And especially when we really pretty strongly anticipate a change in the relatively near -- a big change in the environment in the relatively near term based on the rather unusual current circumstances, as Dan and others have talked about.

So I look forward to seeing it. And I think it's a -- it's an improvement, and particularly in the context of I'm much more sensitive to the potential for downside impacts. And so consciously choosing to look at that shorter time horizon in a systematic way to try to optimize where we go and to try to provide the best opportunity to get the best outcomes for, you know, the system, and for our employers, and -- it just seems like a wise way to go.

That's it for me. Thank you.

CHAIRPERSON TAYLOR: Thank you, Mr. Miller.

And I want to agree with Mr. Miller on this, but also just remind everybody what Ms. Middleton is saying, which is we have to be very aware of what our contribution rates are going to be for our employers moving forward, that can -- and part of this I believe, if I'm correct, Mr. Gunn, is to make sure that we maintain either even or lower contribution rates, so -- given our unusual circumstance right now with capital market assumptions, is that correct?

MANAGING INVESTMENT DIRECTOR GUNN: It -- mostly, yes. We are trying to make sure that we have a portfolio strategy that does better than just having a single portfolio. So that target return, near term may still be a little bit below the discount rate, and longer may be a little bit above it, but it's still a better outcome than if we just had the single portfolio where the near-term returns would be even lower.

CHAIRPERSON TAYLOR: And part of those assumptions that you guys are talking about, in terms of the difference of the environment, is the interest rates that are being kept low. And I just read, and I cannot remember where right now, but that the Fed is looking at starting to ease off on the quantitative easing from the pandemic, which will allow them to increase interest rates later. That gives us that opportunity to do that check, right? And that's what we -- you guys are really kind of referring to.

MANAGING INVESTMENT DIRECTOR GUNN: That's correct is this --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And maybe I'll --

MANAGING INVESTMENT DIRECTOR GUNN: Okay. Go ahead, Dan.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: I'm sorry, Sterling. I was going to -- I was going to say, yes, obviously, you know, the Fed is balancing a lot of things. But yes, they are talking about starting to taper asset purchases. Now, when they're talking about tapering, they're not saying that they're going to reduce the balance sheet and they're not saying that they're going to raise interest rates. What they're saying is that they're just going to slow their pace of purchases of, you know, fixed income instruments.

And you've seen that starting of some tapering happened in Europe. You've seen it in New Zealand I believe it is. You've seen, you know, elsewhere in the globe, that there's this sort of gradual removal of some of that stimulus.

Now to Sterling's previous point, we don't know if that's going to happen over two years, three years, five years. That's contingent on a lot of what happens with inflation, whether it's transitory or whether it's more sustained, but we do think that markets will normalize over time. And we do think that for that reason to have a portfolio that's designed for this very short term, while markets are somewhat abnormal, and then have a separate portfolio that -- again, we would come to that -- with that portfolio for approval by this Board. This isn't like a -- like a, you know, pick two allocation. This is pick an approach that would be a short-term portfolio and then a way that allows us to keep the discount rate high enough with a tolerable level of risk, so that that way we can support an appropriate level of contributions to Ms. Middleton's point.

And, you know, we -- obviously, we know that contribution -- the contribution volatility is the issue. This would be a path through what we believe is a set of markets that are somewhat abnormally priced due to global central bank intervention in the short term, but then allowing us to get to a longer term that again balances that risk both short and long term.

And I guess one other comment I did want to make. Ms. Middleton, you talked about stakeholder engagement. Certainly, we are -- we are doing stakeholder engagement.

I think Marcie is speaking at the League of Cities I believe it's next week. But we will continue to do that, because we definitely do need to make sure that we are -- that we are out there with our stakeholders.

CHAIRPERSON TAYLOR: Great. Thank you very much. It looks like that's the end of the questions. So I think we can move on to the information items, total fund, asset liability management discussion of the candidate portfolios.

MANAGING INVESTMENT DIRECTOR GUNN: All right.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. Sorry. Thank you, Ms. Taylor. Just really quickly, yes, to your point, we're moving on to the candidate portfolios. Just really quickly before I turn it over to Sterling. I really want to make sure that we have a good healthy discussion regarding preferences. You know, a lot of what we're talking about here is preferences. These aren't things that are, you know, a right answer and a wrong answer. These are balancing the risks that we're willing to take, risks around, you know, contributions, risks around the kinds of assets, risks around complexity.

So really want to have a -- really want to get the Board's feedback on this balancing of risks as we go through this process, so that when we come back in

November with potential candidate portfolios, and then also potential sort of single period versus multi-period choices. So that will allow us to really weigh those risks and give the Board the -- you know, the sort of menu of options that is preferred.

So with that, why don't I turn it over to Sterling to take us through the item.

(Thereupon a slide presentation.)

MANAGING INVESTMENT DIRECTOR GUNN: All right. Thank you, Dan. We've covered a fair -- a fair amount of this item. So let me see what I can do to not cover all the ground here, but this is an item that actually both Scott and I are presenting. So I'll be walking through the portfolio part and then Scott will be addressing the implications for the plans in terms of contribution risk and funding risk.

Now, so we've talked before about our objectives and so on. So I would -- I just want to start with, first of all, the asset classes that we actually considered for con -- inclusion in the portfolio, just so we're all clear on them, so market cap-weighted global equities. And they're there of course to participate in global growth and over the long term to harvest the equity risk premium. It also has a lot of liquidity, so, you know, if we were concerned about liquidity, this is a liquid asset.

The non-market cap-weighted global equities also considered. And it also is exposed to economic growth. Although, we do think there is a lower drawdown risk than the market cap-weighted themselves, but it -- there's limited capacity in the market. And so we have constrained this asset class to be no more than 15 percent of the portfolio.

Private equity, again, more economic growth, but also opportunities to potentially be involved in innovations that may not be available in the public markets. So over time companies are staying private longer, so the opportunities there may be different. Also projected to be one of the highest returning asset classes, so that's also attractive. And it does offer some modest diversification relative to public equities, particularly over short-term horizons.

But again, because of the structure and the time horizon of the asset class, we do have an asset cap allocation at 13 percent. And I would mention that we can -- you know, in November perhaps we can talk in detail about implementation, how we might get from where we are to getting to a 13 percent. I would also note though we make no assumption about increasing it past that point, after the -- whereas, you know, a successful plan, obviously we could consider going well past 13 percent in the future.

Real assets, they provide income, long-term inflation protection. Also diversification relative to equity, but again challenging to scale, so we've capped the allocations at 15 percent. Treasuries are there for very liquid. They provide income and they're very, very scalable. And they're also good diversifiers relative to equity.

We also have other fixed income, investment grade corporates, mortgaged-backed securities, emerging markets, sovereign bonds, high yield, and so on. Each of these asset classes create exposures to different parts, the fixed income market, different parts of capital structure, and to different geographies. Different geographies, of course, may lead us into some conversations about ESG type things, but we believe the returns are worth it, and that those kind of things can be managed.

Let's see where are we here. Private debt, it's part of the opportunistic strategy, and again has potential for high returns relative to other fixed income, good risk-to-return characteristics, and diversifies relative to equity.

Now, in addition to those asset classes, we are also considering the benefits of leverage. And we'll illustrate an example later on. And there's two ways to view leverage. The first way, which is quite common, is to simply use leverage to buy more of the same thing. So, for example, we could use leverage to buy more public equities. That increases the potential return of the portfolio and also increases the risk of the portfolio. And there are actually circumstances where you would have to do that. So if the -- if the desired target return was over and above the public equity returns, for example, then we might have to lever the portfolio to get up to the return level that we look -- are looking for. We'll have an example of that in Portfolio B.

Excuse me.

An alter use of leverage is just improving portfolio diversification. In modern portfolio, your action does support the use of leverage when constructing higher return portfolios. But rather than getting into the technicalities of it, we illustrate the benefit of leverage by comparing Portfolios C and D, you know, the same target return with and without leverage. And we'll see the benefits of diversification in those examples.

Now, there are extreme circumstances when -- just like any other asset class, when leveraged can increase losses. And those circumstances include really severe market dislocations where correlations do quickly rise and you do lose the benefits of diversification. That's a tactical issue, but that's not a long-term issue. And again, we're looking at a strategic allocation strategic use of leverage over an extended period of time.

Now, CalPERS uses leverage today and we account for that leverage in two ways. The first way is the Board approves leverage embed in our asset class benchmarks. So an example, the real assets benchmark has embedded leverage. And that's actually monitored and we monitor the difference between that level and what we actually have in real estate.

Another form is just the inherent leverage in our public equity benchmarks. We just take that as granted. What's important about these forms of leverage is management has no discretion over them. They are part of the benchmark. The second form is the Board has given management some discretion to use leverage with an aggregate limit of 20 percent over the embedded benchmark leverage amount. And we're currently using I think around four percent of so of that limit. And we use that to add value.

Now, the proposed leverage allocations are -- as I said, are strategic in nature and are intended to improve the portfolio diversification. So it would be embedded leverage and would be included as part of the strategic asset allocation benchmark, so it would be of the first type.

Now, we've talked quite bit about the CMAs and the near term versus long term, and how that influenced the -- our approach to designing the portfolio strategy. So I'd -- rather than speak to the CMAs, I will just mention the fact that we had to choose a point in time for our analysis, so we chose the five years. However, the near term and long term, as we've mentioned, that transition, that inflection point may happen at some point other than five years. So the current asset liability process is actually well positioned to help the Board both monitor and manage that transition over time. And the fact is we don't have to be limited to two-year reviews and four-year reviews. As an ongoing process, we could do this.

So let me talk just briefly then about how we actually approached the portfolio construction. Obviously, we started with a target return and with the intent of minimizing extreme drawdown risk. And then we did use an optimizer as a starting point to understand what's going on. And we tried to design a near-, long-term portfolios to help us manage the differences in the near-term and long-term CMAs.

I should point out the two portfolios are designed as a pair. We don't design them independently.

They are designed as a pair to minimize risk over the 20-year period, while still achieving the target return.

And although I don't have the materials here, we have looked at, if we had done the single-period portfolio for example, and other choices, and we will find that this actually does have a lower average risk over the 20 years than does the single period -- the single portfolio strategy. I'll return to that in a few minutes.

We also impose constraints on the asset allocations. And these reflect the practical considerations such as scalability and maintaining the market capabilities. I've already talked about the scalability with the various asset classes. We -- the point about the operational aspects of this. Minimum allocations to support liquidity, but also to maintain long-term operational capabilities. It would not make sense to say get out of an asset class for a couple of years and then have to come back into it.

So we've looked at the consequences of having a -- preserving a minimum threshold for asset classes. And it has no long-term material impact on the portfolio results.

And we've also performed several tests to make sure we understand the sensitivity of these outcomes to the choices that we're making. And I'll just go through these fairly quickly. We did the scenario analysis. We've talked about the scenarios, baseline, upside and downside. And we've -- later on, I'll return to a chart that compares the results for the scenario analysis. We've looked at the sensitivity portfolio diversification to the choice of the asset classes, if we'd had a limited number of asset classes rather than the number -- a higher number. So basically analyzing the benefits of diversification by building portfolios with different asset classes.

So we started off with just three, public equities, treasuries, and liquidity. We have an example of that. That's Portfolio B. We'll discuss that in a little bit of detail in a moment. Having started with the three, we then sequentially added fixed income spread asset classes and redid the analysis, then included private equity and redid the analysis, then private debt, and then finally leverage. And at each point, we redid the analysis to make sure we understood the benefits of actually including additional asset classes and how that would improve diversification.

No surprising, the first few add a lot of benefit and over time the marginal improvement diminishes, but it still improves. We also did look at simply portfolios without any private asset classes. So those are an example of the kind of tests we've done in the background. We've done a liquidity analysis and all the candidate portfolios pass our liquidity test, which include stress tests.

We also use, and this is relevant to the conversation we were having earlier, different portfolio strategies. So we've used a multi-period portfolio strategy using two portfolios for the near and long term. We did look at single portfolio solutions. And for any given target turn return, we did find they have a higher average risk than the multi-period solutions do over the full period.

We also developed near- and long-term portfolios independently, so if we insisted that the near-term portfolio achieved the discount rate and the long-term portfolio achieved the discount rate. When we do that, again the overall average risk over the period is higher, but also we found in the near term to achieve a discount rate you have to take significantly more risk over that period of time, and again, that's because of the state of the market that we're in.

We did a correlation sensitivity, because that's -- people have been wondering about that. We have a positive correlation. We've tested for a negative correlation, which actually is more beneficial. And we did look at ramping up the private asset allocations. We know those allocations can't happen overnight, so we asked, okay, over, you know, several years, if we had to ramp up, how does that affect the overall long-term implications for the portfolio? And it does not have a material effect on the overall portfolio performance. And we shared that with the actuarial team and they seemed comfortable with that.

So if there are no questions about that material, I just want to talk about some of the pros and cons of some of the decisions that we'll likely need to make in November.

CHAIRPERSON TAYLOR: I don't see any questions, Mr. Gunn, so go ahead.

MANAGING INVESTMENT DIRECTOR GUNN: All right. Thank you. So this is slide 5, pros and cons of key decisions. Most of these are pretty straightforward. Most members here have been through this exercise before. One of the most important decisions is choice of discount rate. It has consequences for costs and risks. And the higher discount rate, we expect should lower costs. But that choice of a higher discount rate does require a higher projected return, which in turn requires higher portfolio risk. And that higher portfolio risk leads to both higher contribution volatility and funding ratio risk. And Scott will discuss some examples of that contribution and funding ratio risk and how it changes depending on the choice of portfolio.

Now, I mentioned earlier use of near-term and long-term portfolio avoids excessive risk taking in the near term. And we also would like something a slightly lower and riskier projected returns in the near term balanced by the higher returns but less risky projected returns in the long run. We'll see some examples of that.

And we do have five sample candidate portfolios, all of which increase our allocations to private equity, ream assets, and private debt. And these asset classes have an important role in building well-diversified portfolios and meeting our projected return targets. Achieving these allocations, as mentioned and as mentioned elsewhere, may require policy changes needed to facilitate market competitiveness.

In addition, private equity tends to scale by both increasing the size of investments and by adding new managers and companies to the portfolio. And that differs from public equities, where scale is achieved by investing more in the same companies.

And that's a distinction that may have implications when we think about, you know, physical risk human capital, and financial risks. Let me illustrate that. By increasing our public equity allocation, it increases existing risks. So the S&P, for example, if we were to invest in the S&P and then increase that allocation, we would simply be increasing our exposure to the existing S&P carbon footprint. We wouldn't be getting expose to anything new. It's just becoming larger.

In contrast, increasing our allocation to private equity is likely to expose us to new managers and companies, and potentially introducing new risks, not just making existing risks larger. Now we believe these risks can and will be managed by our private equity underwriting and projected returns will justify the risks.

So at this point, I'm happy to proceed to talking about the candidate -- sample candidate portfolios.

So if we go to page six, please.

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MANAGING INVESTMENT DIRECTOR GUNN: So each of the portfolios has a page similar to this. And the key features of the portfolio are summarized. So on the top left is a summary of projected returns, drawdown risk, and volatility. Bottom left is a summary of pros and cons. In the middle is a bar chart with two the columns that represent the asset allocation for the near term and the long term. And the top right is a bar chart of portfolio drawdown risk and volatilities.

And I must say for the most part, the pros and cons tend to read very, very similarly. As you take more risk, they all take more private assets then you get similar exposure -- or potential exposures to ESG. So this current -- is the current portfolio. It has a single portfolio allocation for the near and long term. So the two bar charts are the same.

Now, if we look to the table at the top left, first of all, the title tells us that adopting the current portfolio would lead to a discount rate of six and a quarter percent, based on a 20-year projected return of 6.2 percent. That difference between the projected returns discount rate doesn't materially affect anything. And Scott can speak to the reason for the slight difference in his section.

Now, the table has three rows, one row for the full 20-year period, one row for the near term, and one row for the long term. And there are three columns for the projected return, projected drawdown risk, and the projected volatility.

So if we turn our attention to the projected return column at the left, we see the current portfolio projected return is 6.2 percent. In the near term, its projected return is 5.2 percent, which is about one percent below the projected 20-year return, which effectively would be one percent below the discount rate in the near term. And in the long term, the projected return is about 6.6, about 40 basis points higher than the projected return. Now, if we look at the drawdown risk column, we can see the projected drawdown risks over 20 years, the near term and the long term are similar. Near term is a little bit higher, but really they're similar. And this is the consequence of this being a simple -- a single asset allocation, where it tends to try to smooth out risk but not the returns.

And as we'll see in the coming example in Portfolio A, we can -- we think we can improve upon that. So this basically highlights the challenge of using a single portfolio over the full period to try to achieve our returns. Now, the advantage of this portfolio is it preserves the status quo. We don't have to make any policy changes. There's no additional complexity. The portfolio stays as it is. However, its adoption would have projected lower returns and would increase contributions

Can we go to page seven, please?

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MANAGING INVESTMENT DIRECTOR GUNN: So this is the first of our sort of sample candidate portfolios that has this two-step allocation for the near and long term.

And what we see is this portfolio strategy delivers better returns for less risk. So if we look at the projected 20-year return, it's 6.4 percent with a drawdown risk over 20 years of 18.7 percent. This projected return is 20 basis points better than the current portfolio that has a projected risk that's about four percent lower than the current portfolio over the 20-year period.

In the near term, Portfolio A has a projected return of about 5.7 percent, which is 70 bps below the target, with a drawdown risk over the near term projected to be about 22.6 percent. There's a lot of false precision here, but I'm just reeling off the numbers, because that's just to distinguish from one to the next.

So we can see the long term on the other hand is -- projected return is 6.7, drawdown risk though in the long term is quite a bit lower at 17.7 percent. And at first blush, these results can appear disappointing. They are better, however, than if we had used the single portfolio strategy as we did in the past. I don't have those numbers here on the page, but in our work, we found that single-portfolio strategy had a projected near return of around 5.3 percent as opposed to 5.7, and had drawdown risk over the near term of around 23.6 percent, which is quite a bit better than the -- higher than the 22.6.

Also compared to the current portfolio, Candidate

A allocation is more diversified with allocations to a broad range of fixed income asset classes.

(Coughing.)

MANAGING INVESTMENT DIRECTOR GUNN: Excuse me.

All this talking is dry work.

Now, the next three sample candidates all have the same projected return, 6.8 percent. I use them to illustrate the value of diversifying across asset classes and the use of leverage to enhance diversification.

Can we go to slide eight, please.

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MANAGING INVESTMENT DIRECTOR GUNN: So Portfolio B is a very low complexity portfolio constructed solely of public equities, treasuries, and leverage. And based on the current CMAs, this low complexity strategy can meet the target of 6.8 percent, but only by using leverage. Now, beyond the simplicity of the asset allocation, the most notable feature of this portfolio is its very high level of drawdown risk, which is about twice as high as drawdown risk for the current portfolio and for Portfolio A.

Both the near- and long-term portfolios are dominated by public equity exposures. Projected returns and drawdown risks are similar in both the near and the long term, in great part, because there aren't too many options. Portfolio B illustrates the trade-off between diversification, or the lack thereof, and low complexity.

All right. Let's go to the slide nine, please.

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MANAGING INVESTMENT DIRECTOR GUNN: Portfolio C helps us understand the benefits of diversification. Keep in mind, drawdown risk of 37 percent in a really simple portfolio. So Portfolio C still targets 6.8 percent projected over the 20 years. And now it however is better diversified than Portfolio B, including many of the asset classes that I discussed earlier, but not leverage. It has a projected drawdown risk of 22.9 percent over the 20 years. And that's comparable to that of the current portfolio.

It also has projected returns of 6.2 percent in the near term, almost one percent better than the current portfolio. Portfolio C, however, has higher drawdown risk in the near term, almost three percent higher than the current portfolio drawdown, which is only 23.6 percent.

And portfolio projected returns are seven percent over the longer term, 40 basis points better that the current portfolio. And its drawdown risk over that longer term period is 22 percent, which is comparable to the current portfolio.

So that portfolio demonstrates the value of diversification. It also gives an indication of the trade-offs between near and long term.

Go to slide 10, please.

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MANAGING INVESTMENT DIRECTOR GUNN: The only difference now is the inclusion of five percent leverage. Again, target 6.8 percent, and the drawdown risk over 20 years is about one percent better than that of the previous portfolio. That modest improvement in risk is due to the use of leverage. So this is the illustration I talked about earlier.

In the near term, Portfolio D has the projected returns of 6.4 percent. Again, better -- one percent better than the current. It has drawdown risk of about 27.2 over the near term over, which is higher, three and a half percent higher than the current portfolio.

It also has projected returns over the longer run, seven percent and modest lower risk of around 20.8 percent, which is lower than the current portfolio.

So here is an example of -- to get the higher returns in the near term, you'd have to take some additional risk, as we have in the other portfolios. That's made up for in the longer term.

So if we go to slide 11.

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MANAGING INVESTMENT DIRECTOR GUNN: We'll will use this example to illustrate two things. First of all, a target return of seven percent. Twenty basis points higher than the previous three portfolios. And rather than going through all the numbers here, I think I'll just focus on the higher drawdown risk. So the drawdown risk here in the near term is 28.2 percent, which is four and a half percent higher than the current portfolio. In the long run, it's about 20.8 percent, which is a little bit lower than the current portfolio. Over the 20 years, the drawdown risk is 24 and a half percent.

So what do we see here? Well, if we were to look back at Portfolio A and D, going from A to D, we increased returns from 6.4 to 6.8 percent. So that's 40 basis points. And the risk increased by about 3.4 percent. So that was a gain of roughly 12 basis points for every unit of risk.

When we move from Portfolio D to this most recent portfolio, we gained 20 basis points, but increased risk by 2.4. So we only gained eight basis points per unit of drawdown risk. I just want to -- this highlights the diminishing increase in returns as we increase risk, which I think is an important thing to keep in mind as we go up the risk curve.

So I think at this point, if there are no questions on I guess a lot of numbers here, I'll hand it over to Scott who can talk about and illustrate the implications of the portfolio choice for a couple of example plans.

CHAIRPERSON TAYLOR: Okay. I'm not seeing any questions, but I would like to kind of bring up the high risk -- higher risk.

VICE CHAIRPERSON MILLER: You've got Henry waving his hand.

CHAIRPERSON TAYLOR: Well, Henry, I don't see you here. Okay. Go ahead, Henry.

COMMITTEE MEMBER JONES: Yeah. I'm trying to find the chat box. And so I -- I didn't want gto move on, but --

CHAIRPERSON TAYLOR: Look at the top, Henry, and undo your gallery -- or full screen and it will gill you the chat box.

COMMITTEE MEMBER JONES: Yeah. No, I see it now. It was just that I -- it was going to it before you -- I wanted to catch you before you moved on, so thank you.

CHAIRPERSON TAYLOR: Okay.

COMMITTEE MEMBER JONES: Yeah. And this is -- I think is the chart that really go to my question, Sterling and then we -- on E here, and we're looking at the 20-year near term and long term, right? And all I was saying is that what if that was still 30, the near term would be one to 10, the long term would be 11 to 30 to 60. That's what I was trying to get to, what would make -- you know, what would these numbers do? What would be the difference?

MANAGING INVESTMENT DIRECTOR GUNN: I think it depends very much on what we assume. And I think what we talked about earlier, there's a lot of uncertainty the farther we go out.

COMMITTEE MEMBER JONES: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: So if we assume, for example, returns -- and I'll -- an exaggeration just to illustrate. In the years 20 through 60 were 30 percent returns --

COMMITTEE MEMBER JONES: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: -- then we could, of course, lower the discount rate. But there's so much uncertainty, I don't think we could really see anything convincing about if it would make a difference to what we were talking about here. The uncertainty is large enough. We saw this in the July CMAs. You know, we had the boxes plotted around the median values.

COMMITTEE MEMBER JONES: Uh-huh.

MANAGING INVESTMENT DIRECTOR GUNN: And they were quite wide. They were plus or minus two, plus or minus three percent for most of the asset classes.

COMMITTEE MEMBER JONES: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: So think we've picked a point. You know, the median point we talked about that with Steven and Tom earlier. And we've -- I don't think we can -- you know, we could make strong assumptions to really materially change anything here.

COMMITTEE MEMBER JONES: Okay.

CHAIRPERSON TAYLOR: So is the simple answer -- what you're saying is the shorter term is easier to predict.

MANAGING INVESTMENT DIRECTOR GUNN: I think there's more going on in the shorter term that there's more information.

CHAIRPERSON TAYLOR: Okay.

MANAGING INVESTMENT DIRECTOR GUNN: We're -- I'm trying to avoid using the word "predict" though. My apologies, but certainly in terms of understanding the range of outcomes, I think it's probably a little -- we believe we understand more about the near term than we do the very, very long term in some ways.

CHAIRPERSON TAYLOR: Okay. So hold on a second, guys, Lisa and Ramon, I did have a question. So the higher risk return with leverage, which is Portfolio D, what -- why is that different from highest risk return with five percent leve -- oh, I see. Never mind. It's got a higher rate of return, seven percent versus 6.8 percent.

And then the other thing I wanted to ask about was the private asset deployment requires policy changes, if we decided to use this leverage to diversify our portfolio. What does that mean?

MANAGING INVESTMENT DIRECTOR GUNN: So the -- well, actually, my apologies if I linked the two together. The leverages we're using is to improve diversification in the portfolio. The policy changes are if we want to get from 8 to 13, what might we do to improve our competitiveness in the marketplace in order to perhaps do large deals, perhaps be able to close deals more quickly.

CHAIRPERSON TAYLOR: So without coming to the Board?

MANAGING INVESTMENT DIRECTOR GUNN: Greg, I'm sure, could speak to this in detail. Yeah.

CHAIRPERSON TAYLOR: So basically without coming to the Board. Okay. I think I get what you're saying.

Okay. Ms. Middleton.

COMMITTEE MEMBER MIDDLETON: Thank you.

Sterling, thank you. This is really good. Just a couple of quick questions. This is coming to us as an information item and we're not being asked to make a decision on any of these candidate portfolios today, is that correct?

MANAGING INVESTMENT DIRECTOR GUNN: That is correct. These are samples.

COMMITTEE MEMBER MIDDLETON: Okay. So -- and it will be November when we will be actually making those decisions or do you see that timeline being extended beyond November?

MANAGING INVESTMENT DIRECTOR GUNN: At the moment, planning on November.

COMMITTEE MEMBER MIDDLETON: Okay. You've given us essentially six options, but I gather you could create any number of options depending on how you put these portfolios together.

MANAGING INVESTMENT DIRECTOR GUNN: Yes. That's probably true, yes. We tried to keep it straight -- well, I was going to say relatively straightforward, so --

COMMITTEE MEMBER MIDDLETON: Even six challenges some of us in terms of what we may be looking at. And in all seriousness, as we come forward to November, do you think it would be appropriate to try to narrow the options that are before us?

MANAGING INVESTMENT DIRECTOR GUNN: We could. I mean, part of the reason why we're is to get the Board's guidance on the range of outcomes that are actually acceptable.

COMMITTEE MEMBER MIDDLETON: Okay.

MANAGING INVESTMENT DIRECTOR GUNN: I think today was important to show a fairly diverse range. So we have the current portfolio.

COMMITTEE MEMBER MIDDLETON: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: We have a portfolio at 6.4 and portfolios at 6.8 and 7. And I think when you see the results from the -- that Scott will soon discuss about what this -- the implications for contribution rates and for funding ratio risk, that may provide, I guess, further input for the guidance that we'll get back from you.

COMMITTEE MEMBER MIDDLETON: All right. As we look at the portfolios that have been identified by some of the leading public pension funds across North America, could you tell us where each one of these -- do they tend to be towards some of the higher risk portfolios that you are projecting for us or some of the candidate portfolios that are lower risk?

MANAGING INVESTMENT DIRECTOR GUNN: Frankly, it's all over the map and I think it's actually very bespoke. I think it depends on the circumstances of the particular fund.

COMMITTEE MEMBER MIDDLETON: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: I think the important question is getting the returns for the level of risk. So for us, once we sort of agree on other level of risk or target return, making sure we've got a portfolio we have confidence in, I think that's our job here.

COMMITTEE MEMBER MIDDLETON: So one of the incredibly difficult jobs that we have is trying to assess what's an appropriate level of risk --

MANAGING INVESTMENT DIRECTOR GUNN: Correct.

COMMITTEE MEMBER MIDDLETON: -- for the -- for CalPERS to take on. So what guidance would you give us in terms of making that judgment as to what's an appropriate level of risk?

MANAGING INVESTMENT DIRECTOR GUNN: Right. To give you a good answer, I would -- I'll give the framework. The framework would be what can we afford to make risk go away? My insights though are limited in terms of the stakeholder's ability to pay to make risk go away. And that's the contributions. So if we're at a threshold for contributions are challenging, then it may be difficult to bring the discount rate down. If others -- you know, if we were very flesh, we might think otherwise.

COMMITTEE MEMBER MIDDLETON: Does Mr. Foresti or Mr. Toth want to comment on the -- that question of how should we be assessing the risk that's acceptable?

MR. TOTH: Maybe I can start. And Steve, feel free to chime in. I think Mr. Gunn really hit the nail on the head. What we think of as decision factors for clients are what are the impact on funded status on contribution volatility, and the ability of the plan to navigate challenging market environments, i.e. significant drawdowns and continue to meet your commitments to your -- to your participants.

So those are the things to focus on when you think about how much risk can we add in the portfolio. But I think it's helpful to bookend them with two simple examples. You can have a very safe portfolio with very low risk, but that is not going to generate nearly the returns you need to satisfy your commitments over multiple decades.

And then conversely, you can take on a lot of risk, maybe concentrating wholly in equity risk assets, for example, but that is unlikely to satisfy the ability of the portfolio to manage through significant drawdowns, given that you do have those fixed benefit payments.

So it really comes down to a balancing act when making those decisions. And so I realize that's not a -- I'll say a recipe for picking one portfolio, but those are the things that we think are most important to consider.

COMMITTEE MEMBER MIDDLETON: Is it accurate to say that you believe that CalPERS is in a position where taking on more risk is something that we can and should do?

MR. TOTH: I think so. And I'll give you some -- a rationale for that. One is the work that's been done over the last number of years around liquidity management and the ability to navigate challenging environments with a very robust holistic picture of what the portfolio -- the liquidity of the portfolio can generate in order to satisfy your obligations.

So I think that's one of the ways that the portfolio management process has been improved going forward. And then frankly, we are fortunate that last year was a very strong year in the market. So frankly, there are just more assets available than if we'd been having this discussion, you know, 18 months ago or so.

So there -- the management of risk is going to be the primary determinant of the ability of the portfolio to navigate those environments. And I think the portfolio management process is in a better position to do that now than it might have been, you know, five plus years ago.

COMMITTEE MEMBER MIDDLETON: All right. Thank you. And just a final comment. All of this is really difficult work when the context it's taking place in is that employer contribution costs are at a level that we do see pushback within the public on what is being asked and that goes to the sustainability of the system that we have here. With that, I'll turn it over to my colleagues.

Thank you.

CHAIRPERSON TAYLOR: Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Ms. Middleton, I'm sorry. I just -- if I -- I'm sorry, Ms. Taylor, if I could just comment really quickly. Ms. Middleton, I think you really hit the nail on the head. And these are exactly the risks that we're trying to balance. First of all, your comment previously about this being very difficult. It is difficult. I mean, this decision, you know, will dominate the, you know, risk and return profile of the portfolio on a go-forward basis and figuring out how to navigate this.

And again, it's balance. There isn't a low -- you know, the ideal scenario would be able to pick a portfolio that delivers returns with no risk and, you know, no need for policy changes or any of those things, no added complexity, right? That's not what the off -- what the markets are offering right now. What the markets are offering is, you know, lower returns and lower returns per unit of risk. We've been talking about that.

Now, that said, I do think that what we have here is trying to help tease out those -- you know, those trade-offs, those balances. And you spoke to this earlier in terms of like narrowing the number that we come back with. I think what you'll see in these portfolios is that, number one, what you see is there is a lower risk. You know, that 6.4 percent portfolio there is a, you know, kind of where we are right now. The Risk Mitigation Policy would land us at 6.8, a 6.8 portfolio. And then a really kind of higher risk portfolio, that seven percent.

And you'll see -- Scott is going to cover some of the actuarial things. And Sterling alluded to these. But what you'll see is, given the sort of risk metrics, you know, the drawdown metrics of that portfolio, what is that -- what do those mean in terms of contributions, but more importantly contribution volatility and potentially -- and upside contribution volatility, and then also, what does that mean in terms of drawdown and likelihood of hitting say a, you know, 50 percent funded target. So you'll see that here in the next -- in the upcoming slides.

So that's really one of the risks that we're trying to get a sense for one. One of the preferences that we're trying to get a sense for is would we be lower risk than where the Risk Mitigation Policy would land us? Would we be kind of like where the Risk Mitigation Policy would land us or would we want to go back to that more sort of seven percent knowing that that comes with significantly greater funding risk and contribution risk.

The next one is that risk -- that desire for private assets. And that's what you see in that difference between Portfolio B and Portfolio C. We know that those private assets come with greater complexity. They come with probably -- in order to get to those higher levels of private assets, they're going to come with some need for policy changes and the like. They are very attractive. Those private asset are very attractive in terms of diversification, in terms of returns, and returns per unit of risk, but these are the cons of them is that they come with those other things.

But getting a sense of would we rather have a really simple all public asset portfolio that comes with all of that drawdown risk or do we want those private assets knowing that they come with some of these other things, again, that complexity and the like.

And then the final thing that I think we're really trying to -- trying to, you know, get a sense of in this feedback - and again Ms. Middleton, your point - this is really getting a sense of preferences that we can come back in November with preferably a narrower set of choices, with that narrower set of choices being really responsive to where do -- where does the in aggregate land on these topics? But then that last one would be, do we think that we should have leverage strategically to the portfolio.

Now, we think that the right answer would probably, if we want to add leverage, it would be to add it modestly - you know, markets, we've been talking about this - given central bank intervention. Markets we think are richly priced in some of those diversifying assets. So we wouldn't add a lot, but would -- do we think it makes sense to potentially add it to the toolkit? Maybe so, because when you look at the returns and then the drawdown, the risk profile is slightly better for the portfolios that had leverage. But then again that leverage adds complexity and we know that it -- you know, there are some that will raise concerns with leverage.

And so these -- if I had to narrow it to three really important things that we need to get feedback from the Board on, it's, number one, would we rather land at a slightly lower return than what we currently -- than where the Risk Mitigation Policy would land us, about the same or higher; number two, what's our appetite for these private assets and knowing that the pros and cons that come with the private assets, and then; number 3, what's our appetite for adding leverage to the strategic asset allocation knowing that that too comes with some complexity and the like.

So those are really what we're trying to get feedback from the Board on, so that in November we can come back in a responsive way with, all right, then we would consider these, you know, three, or four, or whatever choices, so we really give the Board the choices that you need to make. Because to your point, Ms. Middleton, I -- you know, I can't underscore it enough, it's a balancing act and it's a difficult balance.

COMMITTEE MEMBER MIDDLETON: Thank you. Appreciate that.

CHAIRPERSON TAYLOR: Thank you, Dan. And I will -- as we go through the questions, we'll see what everybody's appetite is out of those six, where they want to go, hopefully. If not, we'll have to have a little nod of heads or something.

Mr. Rubalcava.

COMMITTEE MEMBER RUBALCAVA: Thank you, Ms. Taylor -- Chair Tailor. Yes. Thank you for the presentation. I really found it very interesting and also very informative, because I think the charts help clarify for me a lot that has been said earlier -- in the earlier presentations. For example, on other candidates, the projected return is lower in the near term, and so you can see that. But then again so is the drawdown risk is also higher in the short term, which speaks to why we need to be able to come back and do that -- the relook, even though we're long-term horizon, so I appreciate that.

And also to speak to some of the questions that were raised, I think I'm real sensitive to that we have taken that action, this Board has, to mitigate risk and be ready and manage liquidity, particularly the lessons learned from 08/09. And so that gives me a lot of confidence and I appreciate how staff has taken a forward-looking view of what can we do. Maybe we're -- maybe we leading or maybe we're in the forefront, but I think that's okay. I think that's very commendable.

Chairman -- Chair Taylor asked the question -- one question I was going to ask, which was about what are the policy changes required? So I think that was addressed. But one question I did have is, it was sort have -- if you could elaborate, how does leverage improve diverse -- diversification, because that's one thing that kept coming out? How do -- how does leverage improve that? How was -- how can we use leverage to improve diversification?

MANAGING INVESTMENT DIRECTOR GUNN: So just qualitatively -- excuse me -- the way it comes about is if we had a lot of equity, we could take a dollar's worth of equity out of the portfolio, so returns drop a little bit, but maybe add five dollars worth of bonds to make up that lost return. So now the returns are back to the level we thought they would be. But now we've got a more diversified portfolio. And it just so happens that because we've replaced that one dollar's worth of equity with five dollar's worth of bonds to get the returns we want, the diversification between bonds and equities works if our favor.

But to get the bonds, we have to use some leverage. So that's sort of the mechanism behind this. And it does sort of depend on when you are in terms of the risk return framework. We happen to be in a fairly, you know, high-return, high-risk part of the world, and so the -- this works here. If we were looking at lower returns, we may not need to do those things.

COMMITTEE MEMBER RUBALCAVA: Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Mr. Rubalcava, I think I could say it another way as sort of an individual investor. If you were going to buy a house, one way to buy that house would be to sell down your 401(k), and your 457, and maybe take a loan against your pension, and then put all your assets into this house, but then you'd be fully all into that house. The other way would be to take out a mortgage and buy the house, but keep your 401(k), and your 457, and your pension.

Now, frankly doing all of those things will actually put you in a higher levered position, right, because you actually borrowed money to buy the house, but you're also in a more diversified position in terms of your personal life. That's kind of how it would work with our portfolio, now granted on a much smaller scale. But that's how it would work with ours is that rather than saying pile, you know, a hundred percent equity there to you to the terms that we're trying to achieve, it would allow us to borrow some money in buying some diversifying assets that gives us a portfolio that's a bit more balanced.

COMMITTEE MEMBER RUBALCAVA: Thank you. That was very helpful. Also, another question I had, Trustee Middleton already asked it, which was about my concern about the impact of the employer contribution. But I think related to that, and I think Scott will probably speak to it, is what will the impact be on the member rate, particularly the PEPRA, because I know the normal cost will be impacted, more so perhaps than the assets will go down, the funding level, and which will impact more the employer positively than it would PEPRA members. So I'm looking forward to the presentation from Scott. Thank you very much.

MANAGING INVESTMENT DIRECTOR GUNN: Thank you for your question.

CHAIRPERSON TAYLOR: Thank you.

Ms. Paquin.

ACTING COMMITTEE MEMBER PAQUIN: Thank you. Appreciate the various portfolio candidates that you put forward today. And I'm just curious -- just kind of looking at Candidates C and D, the difference between adding the five percent leverage. So if the Board chose Candidate D and added five percent leverage, at this point, what -- how would the Board be able to track all the various forms of leverage that the portfolio has. And going back to one of the comments that Mr. Gunn made where, you know, a policy allows up to 20 percent leverage throughout the different benchmarks. We're currently at four percent. But does that mean that we could end up in a situation where the fund has 25 percent leverage or basically the five percent here and additional leverage spread throughout the asset classes?

MANAGING INVESTMENT DIRECTOR GUNN: So earlier, if that's what I said, I misspoke. We have leverage embedded in the benchmarks, and then the 20 percent is over and above that, what's in the benchmarks, so --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Ms. Paquin. Sorry. In terms -- in terms of tracking it, right now, twice a year, we bring back the -- a leverage report. And in that leverage report -- I think it's twice year. In that leverage report, you will see the sort of the decomposition of the leverage that's in the portfolio. Something really important to -- and Sterling just alluded to it, and really something important to disentangle is that there's kind of two types of a -- there's a lot of different types of leverage, which a way to think about it is sort of leverage relative to the benchmark -- the policy benchmark and then overall leverage.

What we currently have is a 20 percent policy limit that is leveraged relative to the benchmark. And the reason we do that is that you could argue that there's leverage in the public equity asset classes, right, which almost every stock in the portfolio probably has bonds also issued, which means that there's leverage there. Certainly, some of the private equity -- you know, most of the private equity portfolio has leverage there. So there's leverage across our portfolio. Even the real assets benchmark is specifically leveraged.

So the 20 percent currently applies to leverage relative to the benchmark. What this would be would be to add an additional five percent of strategic asset allo -- of strategic leverage that's actually in the benchmark.

ACTING COMMITTEE MEMBER PAQUIN: Okay.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And as I say, we will bring that report -- this will be added to that report, such that the Board can see on an ongoing basis what the leverage is in the portfolio.

ACTING COMMITTEE MEMBER PAQUIN: Okay. That's helpful. And then I was also curious, did you consider modeling a discount rate of six and a half percent. I see the one that's 6.375 percent, but I'm not sure if there's a six and a half percent in there too.

MANAGING INVESTMENT DIRECTOR GUNN: We haven't yet. I guess as part of the guidance, if we were asked to, we can go back and do that.

ACTING COMMITTEE MEMBER PAQUIN: Okay. Thank you. I think from our office point of view, I mean, as far as winnowing down the portfolios, we'd be comfortable in November seeing Candidates C and D, and then a six and a half percent portfolio.

And I had one more question too. I know a while back we were looking at the Risk Mitigation Policy, there was a calculation done trying to estimate how long it would take for the discount rate to be moved down to six and a half percent to something actual through the RMS policy. And curious if that's something that we could take a look at in November as well?

MANAGING INVESTMENT DIRECTOR GUNN: I'm going to leave that answer to Scott who would probably have to perform that calculation, so...

ACTING COMMITTEE MEMBER PAQUIN: Okay. All right. Thank you.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Ms. Paquin, the leverage report you're looking for is actually including in today's deck. It's in agenda Item 8B, so we can highlight that when we -- when we get to that too to show you what it looks like.

ACTING COMMITTEE MEMBER PAQUIN: Great. Thank you.

CHAIRPERSON TAYLOR: Okay. Thank you very much. Next question is from Ms. Olivares.

COMMITTEE MEMBER OLIVARES: Thank you, Madam Chair. I really appreciate all the work that went into this report. And I think the models are helpful for understanding what's being proposed here, but I would still like to see actual case studies of the -- so some type of back-tested performance, where we've actually seen this play out. And I say that just because there's so many assumptions that go into these models. And ultimately, we need to make our decisions on what's actually happened as well. So we need both.

I also wanted to recommend what I think is a good primer for understanding this, and it's by the CFA

Institute, and it's called, "The Stochastic Programming Approach to Asset, Liability, and Wealth Management". And it talks about the asset, liability management in the context of pensions, annuities with insurance companies, endowments, and hedge funds. And so as CalPERS starts to consider different approaches to risk management and investing, I think it's helpful to look at the intersectionality of these different approaches.

MANAGING INVESTMENT DIRECTOR GUNN: Thank you. That's a good suggestion. That is the kind of work that had been done at CPPIB --

COMMITTEE MEMBER OLIVARES: Um-hmm.

MANAGING INVESTMENT DIRECTOR GUNN: -- using that kind of a methodology. So what we're doing is similar but not the same.

COMMITTEE MEMBER OLIVARES: Similar, right. I think the Board might find the reading helpful in terms of understanding how it applies in different industries and how we can look at case studies there.

MANAGING INVESTMENT DIRECTOR GUNN: Okay.

COMMITTEE MEMBER OLIVARES: Thanks. That's all I have.

CHAIRPERSON TAYLOR: Thank you, Ms. Olivares.

Ms. Brown.

COMMITTEE MEMBER BROWN: Thank you. Thank you, Ms. Olivares. I wrote that down. I'll be trying to find that shortly.

I had a question, Mr. Gunn. I'm looking at the Candidate Portfolio C, just as an example. And I wanted to know what is the difference between -- in the -- in the assumptions for real assets, which you currently have at 15 percent in both the near term and long term, and then the private debt at five percent, near term and long term? What's -- I want to know what is the -- what's the return, because, you know, I've heard some different things about private debt. I know that before we've talked about private debt as being very lucrative in returning -- getting us great returns, depending upon who we're loaning to. But then I've also heard other things like that the private debt we were going to fund -- do something with subscription lines, which is -- which is pen -- which is nothing, very little money. And so I'm just trying to figure out what's involved in that five percent, that light orange-colored bar, what's that return versus the real assets?

MANAGING INVESTMENT DIRECTOR GUNN: Right. So I'm just looking at the CMA assumptions that we'd shared. And private debt in the near term is about 6.8 percent and in the long term 5.9 percent.

COMMITTEE MEMBER BROWN: Okay.

MANAGING INVESTMENT DIRECTOR GUNN: And the volatility is 9.9 percent.

COMMITTEE MEMBER BROWN: Okay. And then the real assets?

MANAGING INVESTMENT DIRECTOR GUNN: Real assets, 5.3 in the near term and 5.5 in the long term with a volatility of 12.2 percent. I would also mention though that one thing that makes these assets attractive is the relatively low correlation. So they have good return-to-risk ratios, both the asset classes you just asked about, and they are good diversifiers relative to public equities. And public equities due dominate the risk in our portfolio. That's -- we're participating in a lot of growth exposure.

So that's one reason for the popping up here. Good risk-to-return ratios. They're good diversifiers. The reason for the allocations is we really have limited them. And Dan mentioned it earlier about optimizers are very greedy creatures. And so we've limited these allocations to what we think are actually practical.

COMMITTEE MEMBER BROWN: And those -- and those capital market assumptions, I would assume that that's net of all costs and fees, right --

MANAGING INVESTMENT DIRECTOR GUNN: Yes, it is.

COMMITTEE MEMBER BROWN: -- when we look -- when we look at those?

Okay. And then in no -- in no scenario that I currently see that we have private equity less than 13 percent. And my concern that we want to go up from eight percent to 13 percent is that we keep missing the benchmark. We're below the benchmark, year in and year out. I think one year maybe we just barely beat it and that's when the benchmark was like 4.3 percent, which I still don't believe was a real benchmark by the way.

And so even though private equity gives us the highest return, it still has a lot of risk and we're not getting any alpha. We're not beating the benchmark. And I'm just trying to figure out why we continue to want to increase our allocation to private equity when we miss -- keep missing the benchmark.

MANAGING INVESTMENT DIRECTOR GUNN: And I guess, you know, as a long-term investor, you know, Greg has indicated he believes that going forward our strategy can address the question you've just raised. I don't know if I should get into the details here, but Greg can certainly do that.

And so we've actually tempered our enthusiasm here. So we've capped the allocation at a level which we think is actually practical in terms of the near term and haven't let the allocation grow past that over the following, you know, 10, 15 years. There are a number of institutions globally have who have much larger allocations and are actually larger than we are in terms of AUM. So it's possible, changes in policy, of course, and the level of resources we might want to commit, to get beyond that 13 percent. So I think it's -- the 13 percent for private equity, 15 percent for the real assets are near term maybe a slight stretch, but practical, and certainly though I think are worth being into.

COMMITTEE MEMBER BROWN: All right. Thank you.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Ms. Brown, one other thought to keep in mind on the real assets versus the private debt is our real assets portfolio is largely equity focused, so equity positions versus the debt -- private debt being on the debt side. So the real assets portfolio will provide. So hopefully some inflation protection that, you know, wouldn't be handled quite as well as private debt, so -- but the key difference being -- one being kind of equity focused, the other being debt focused.

CHAIRPERSON TAYLOR: Okay. I think that's everybody's questions on this. We're not done though, right? We're moving on to Mr. Terando.

MANAGING INVESTMENT DIRECTOR GUNN: Yes.

CHAIRPERSON TAYLOR: All right.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes, Madam Chair. We'll move on to Scott at this point. So, Scott, over to you.

CHIEF ACTUARY TERANDO: Thanks, Dan. Good afternoon, Madam Chair, members of the Board. I'm Scott Terando, CalPERS Chief Actuary.

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CHIEF ACTUARY TERANDO: So continuing on with the presentation. What we looked at -- the Actuarial Office looked at is how can we present, you know, both the contribution levels and the, you know, impact on funded status in a convenient way and where we could capture, you know, all the portfolios in one particular graph.

So what we have here is we have a chart. We picked a sample employer here, State miscellaneous plan. We do have in the appendix other employers, safety plans, miscellaneous plans from public agencies, schools plans, as well as some other State plans. So just for purposes of this presentation, we picked the State miscellaneous plan.

So let me kind of step through here and look -- explain what we're looking at. On the bottom axis, the X axis, we have the probability of the funded ratio dropping below 50 percent. On the left-hand side, we have the distribution of employer contributions as a percent of pay. And it goes obviously from zero to over a hundred and fifty percent. The reason that axis are so big are some of the other plans that we sampled have much larger contributions and we wanted to keep the stick -- the scale consistent among all the graphs.

So what we did is we looked at 5,000 scenarios of a 30-year term period for each of the portfolios. And then we -- what we have here is we have the graph of those results. So, you know, let's take the current portfolio as an example. It's the teal-colored portfolio. As you can see here what that bar represents is it represents the range of distributions of the contributions over all those asset scenario returns that we sampled.

The dark bar itself represents between the 25th and 75th percentile. And then, you know, the -- that portion above and below, you know, with that little, what we call, whisker portion, is the 5th, and the 95th percentile, the dot that is the mean contribution level. So this, you know, allows you to kind of compare all of the portfolios that were presented earlier and the impact that they have both in terms contribution range and probability of falling below 50 percent.

As we can sere here, you know, we have this cluster, you know, just around 18 percent, 19 percent in terms of the portfolios where there's an 18 percent chance that the plan would drop below 50 percent over the next 30 years. On the far left, you have Portfolio A that's right around 10 percent level. And you can see way far out at well over 40 percent is Portfolio B. So that gives you -- you know, it gives you a feel for kind of like the risk level of the chance of a portfolio falling below 50 percent. And you can also kind of look at where the mean contributions fall. If you look at the current portfolio, you can see the mean contribution level is higher than pretty much almost all the other portfolios. Even the Portfolio A with the lowest discount rate, we anticipate -- actually, the current portfolio has the lowest discount rate and you can see that's why it translates into the highest mean contribution level.

So, you know, this kind of goes to, you know, some of the questions of -- you know, I think Ms. Middleton asked how do we assess the risk and how do we visualize it compared from one portfolio to another? You know, this is kind of one way of looking at -- you can look at how tall the bar is. You know, the longer the bar is, there's more volatility in contribution levels, and where does it fall in terms of funded ratio and dropping below 50 percent.

Next slide, please.

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CHIEF ACTUARY TERANDO: So in slide 13, what we have here is -- again, we're working with the State miscellaneous plan. And we looked at the projected contribution levels over the next several years at the various portfolios. What you'll see here is the -- you see a center line, the dashed black line, that's, you know, the base percent right now, the base expected contribution level. That's at the current seven percent discount rate, based on the last valuations we did, and the expected returns of seven percent.

You can see the two lines below the 6.75 and the six and three-eighths line -- or the 6.75 and the seven percent line, excuse me, where the contribution levels are expected to drop over the next several years. Obviously, at the seven percent and the high return, it produces lower expected contributions.

In terms of the other two portfolios, the 6.25 and the six and three-eighths portfolio, you see that you have an initial jump in the first year and then the rates trend downward. The reason you have that -- you see the rates go up and then trend downward is, you know, we have a five-years ramp-up on the investment gain side. And so those -- the gains ramped up over five years, so you see rates kind of coming down and smoothing out over the first five years.

In terms of the other ones, the 6.75, the risk mitigation pretty much offsets -- it does offset the increase in accrued liability, so you don't really see an increase in rate and any -- at least in this example for the State miscellaneous plan, the additional gain on the investment side is enough to offset any increase in the normal cost as well.

And then going to slide 14.

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CHIEF ACTUARY TERANDO: Slide 14 is similar to what we have on slide 12, except in this example, we looked at a very low funded miscellaneous plan. As you can see, a low funded status has a -- you know, I'd say a relatively large impact on the risk to the -- to the particular plan and dropping below 50 percent. If you remember back on slide 12, most of the portfolios were around 20 percent. The very aggressive one was a little bit above 40 percent and a very conservative one was slightly around 10. And you can see with a lower funded status plan, you can see not only does the probability drop below 50 percent, pretty much almost double or increased by one and a half percent for most of the portfolios.

If you look at the size of the bar, you can see that range of contributions increases substantially. So something to keep in mind as we work through this ALM process, that, you know, we don't have just one particular plan or one particular group. We have thousands of plans. Their funded status and their contribution levels are in various positions. And this is presented so you get a sense of, you know, the impact that one plan may feel is not going be the same as another plan.

Now, before I turn it back over to Sterling who's going to run through several impacts -- market scenario impacts on these portfolios, I guess we'll open it up for questions on -- if you have any questions about these graphs. I do know -- I think Mr. Rubalcava asked about PEPRA increases. We'll get into that and those details a lot more during our experience study during the FAC on tomorrow. We'll run through a lot of the details on that information. But what we've -- I think what we've -- we're seeing is once you've combined the proposed demographic changes, as well as potential decreases in the discount rate, we would expect many, if not all, of the public agency plans to possibly have PEPRA increases for the PEPRA members. It's just a combination of the demographic changes as well as the changes due to the discount rate. Those will carry forward into the normal cost. And those impacts can't be -- those type of those -- the impact on the normal costs aren't offset by any of the investment gains. And so any of those impacts will carry forward and carry through. And we anticipate most of the PEPRA members having to face a increase in contributions.

CHAIRPERSON TAYLOR: Okay. Thank you, Mr. Terando. That was actually very helpful and very clear. So we do expect some PEPRA increases. We'll go over that in FAC tomorrow. The lower funded miscellaneous plan baseline that you're talking about here are -- is that like Portfolio A and --

CHIEF ACTUARY TERANDO: Well, for -- no. When I say a lower miscellaneous funded plan, if you looked at the -- when we looked at the State and -- the State miscellaneous plans, you know, I think after the investment gain, we were closer to the upper 70s or 80 percent funded. This plan, example here, is closer to 65 percent funded. So we just --

CHAIRPERSON TAYLOR: So that miscellaneous like safety plans and safety --

CHIEF ACTUARY TERANDO: Yeah. This is a public agency miscellaneous plan. We also looked at a lower funded safety plan. It's in the appendix. We looked at a number of plans. We tried to look at a lower funded and higher funded and, you know, just average funded plans just so the Board can get a sense of how these portfolios interact. And the impact that they can have on the contributions. It's just kind of to give you guys more information. And so you can -- you can see how, you know, funded status carries through in terms of the probability of risk and probability of increased contributions. They're all interrelated. And, you know, this was just one way of presenting it.

We also look at -- you know, we looked at -- in the appendix, there's also a chart where we picked one portfolio and then had like nine or different -- nine different plans on it, same type of graph, so you can see how the different plans react to one particular portfolio.

CHAIRPERSON TAYLOR: Okay. Yeah, I see -- I actually see that.

Okay. Mr. Rubalcava.

COMMITTEE MEMBER RUBALCAVA: Thank you. Just a quick question here. Thank you, Scott, for your response. I just want to clarify a statement you made. You said that there would be PEPRA increases and you explained why. And one comment you made is that it will not be offset by investment gains. So I think what you're trying to say just to be clear is that investment gains would be a mitigating factor for the employer impact on the contribution rates, is that what you're trying to say also?

CHIEF ACTUARY TERANDO: Yeah. Yeah, that's correct.

COMMITTEE MEMBER RUBALCAVA: Thank you. I just want to clarify that.

CHIEF ACTUARY TERANDO: Yeah. The employer, for the most part -- I mean, there are some extensions, but the employers for the most part pay the unemployment liability. So any investment gains or losses translate into the employer contribution rate.

COMMITTEE MEMBER RUBALCAVA: Thank you.

CHAIRPERSON TAYLOR: That looks like all my questions. So I think we can move forward.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. Thank you, Madam Chair. At this point, we move back to Sterling to try to close out the presentation. And what you'll see on these next slides frankly being responsive to some of the requests to kind of what our portfolio would look like in various (inaudible) environments and then, you know, sort of potential environments. So this is kind of multiple scenarios. So Sterling, I'll turn it back over to you.

MANAGING INVESTMENT DIRECTOR GUNN: All right. Thank you, Dan. So if we could go to slide 15, please.

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MANAGING INVESTMENT DIRECTOR GUNN: So this is a historical stress test. It's what would happen to the portfolios if they had run through the GFC in 2008 and '09. The panel on the left simply focuses our attention on a narrower time frame. The panel on the right includes both the GFC and the following period that we've experienced for the last, you know, almost 15 years.

So and the only -- if you look at the plot, the only real differentiated between portfolios frankly is the degree of equity or growth exposure in the portfolio. So it's not really a surprise there. So that Portfolio B for example, that really low complexity portfolio that was like 110 percent equities, we see that's the blue line, which plummets during the GFC and loses almost 50 percent of its value before recovering. And then if we look in the right-hand side, we do see that portfolio has had, you know, exceptional returns since then, but also has offered a very, very bumpy ride while doing so, a very volatile ride.

So just pointing that out, because this is not to recommend Portfolio B by any means. This is history and we are in a very different period of time now than we were certainly 11, 12, 13 years ago. This really was in great part -- one, it's a stress test. If we to replace the GFC, what might these portfolios look like? That was an incredibly rare event. And I think the one thing we probably know is the next time we have an event like this, it will be for different reasons probably.

The counterpoint - I won't go through all the details here - are the current portfolio and Portfolio A -- excuse me again -- both of which are the lower return portfolios, but also lower risk. And so you can see that that's reflected by the sort of amber colored lines on the left-hand side. And they'd still lose about a third of their value during the GFC. And you also see on the right-hand side, they still quite well. You know, over the last 10 or 12 years, if you'd replayed history, they would have done quite well.

Beyond that, I don't think there's too many takeaways from this. If we go to slide 16, the next two slides are really more hypotheticals --

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MANAGING INVESTMENT DIRECTOR GUNN: -- which is kind of the domain we're living in now. We just have to start asking not about so much what history would have done to us and start thinking about might happen to us. So this is just a mild test of if we had an equity downturn of 20 percent, what might happen. And the key takeaway here -- so let me explain the chart.

We have these pairs of columns, each representing from left the current portfolio, Portfolio A. Going left to right, we have all the portfolios. The columns represent the near term and the long-term portfolios that we discussed earlier. And so what we're seeing is what happens to those portfolios during an equity drawdown of 20 percent.

The current portfolio, the response is the same. It's the same, because it's the same portfolio near term and long term.

Now, if we look at Portfolio A, we see the near term drawdown risk is a little bit higher in this experience than the long term. If you remember from Portfolio A, we have more equities in the near-term portfolio than we do the long term. And that's the reason for that difference in response.

I should also point out not only are equities contributing to the losses here, but also private equity, and to a lesser extent the real assets, because they do have an equity-like component as well.

And you see that pattern repeated with all the other portfolios, that tend to have more equities in the near term than in the long term, and therefore an equity shock is -- certainly, it leads to slightly larger losses in the near term than in the long term.

If I go to slide 17, please.

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MANAGING INVESTMENT DIRECTOR GUNN: So here, it's an interest rate shock. If interest rates were to go up one percent, what would happen? And two things are happening here and I should point out that these kind of tests are model dependent. We're using a vendor's model, which assumes a negative correlation, so that will explain some of the features we see here. So on the one hand with the one percent interest rate shock, we do see the fixed income assets losing value, so the gray, yellow, and blue bars below the horizontal axis. But we also see equities, and real assets, and private assets increasing. And that has to do with this negative correlation that's currently embedded in the model.

So I mentioned earlier about getting into the business of thinking of what-if, what might happen in the future. So one thing we will have to work on is what if we have positive correlations? So these are the kind of things we will look at. But this is what we have at the moment with the vendor model we have today.

I'll go to slide 8 please, if there's no questions about either one of those slides.

--o0o--

MANAGING INVESTMENT DIRECTOR GUNN: This slide is deserving of some explanation. Hopefully, I can make this clear. Let's choose Candidate Portfolio A, which is in the second row. So we have five pieces of information here. We have its performance in the base case scenario, which is 6.4 percent. We have its performance in the downside scenario, which is six percent. And then if we skip over one column, we get to upside, and we see its performance in the upside scenario is seven percent.

So that looks quite disappointing that this portfolio in the downside scenario would underperform by 40 basis points. Upside scenario, of course, you know, we'd be quite happy to gain an extra 60 basis points.

So the third and fifth columns help us understand comparison to a viable alternative. So if we go to the downside optimal portfolio column, what is this column about. Well, we started with Candidate A, Portfolio A, and we looked at its risk. How much risk was involved in that portfolio? Now, in the downside scenario, it's not optimal, right? It was designed for the base case.

So if we go to the downside, there's a different portfolio that will be optimal for that level of risk. So we calculated that portfolio and we asked for that same amount of risk what would the returns be? It so happens the returns are basically the same to within a rounding error. So what does this tell us?

It tells us that our portfolio, Portfolio A, in the downside scenario does quite well compared to the actually optimal portfolio, six percent and six percent. Both those results might be disappointing, but it tells us for the amount of risk that we've committed to, we couldn't have done any better.

Upside optimal portfolio is the flip side. Our candidate, we go to the upside scenario. We design a portfolio that is optimal for the upside and we ask again what would it return be given the same amount of risk? And again, we see to within a rounding error, it's close, seven percent and seven percent.

So all of this should give us some comfort, in that the portfolio that we're choosing, hard to beat it, give the level of risk that we're running. On the other hand, if we find out, as we do our continual revisions, that we are in the downside scenario. It tells us, if we want to get back to 6.4 percent, we would have to take additional risk. So that's the message here is one. For a given unit of risk, this is a good portfolio even in the downside or the upside scenarios. But it also tells us in those other scenarios, we may have to adjust the portfolio, if we believe the level of return is less than satisfactory.

So hopefully I've done a reasonable job of explaining this here. It's to give us comfort. The portfolio for the given level of risk is reasonable in the downside and upside scenarios. We wouldn't have to make huge adjustments.

I'll stop there.

And if there are no --

CHAIRPERSON TAYLOR: I'm not --

MANAGING INVESTMENT DIRECTOR GUNN: Okay. Sorry.

CHAIRPERSON TAYLOR: -- getting any questions, Sterling.

MANAGING INVESTMENT DIRECTOR GUNN: All right. So I guess, you know, at this point, Dan actually offered a pretty good summary of all the work that we've done here about the key decisions, about, one, the level risk, two, the role of private assets, and three, the use of leverage, all of which, you know, we can explore further, when we go forward to November.

And I guess our key ask right now is guidance about what else you would like from us to go forward to get to November and help us get to a good place?

CHAIRPERSON TAYLOR: So again, it was the level of risk, what are the three?

MANAGING INVESTMENT DIRECTOR GUNN: The level of risk, the role of private assets, where all these sort of newer candidate portfolios do have larger allocations to the private assets, and the role of leverage as a means of divert -- improving portfolio diversification and lowering the level of drawdown risk.

CHAIRPERSON TAYLOR: Okay. How does everyone feel about that? We're going to have to move on to questions from the public after this, but do we have an appetite? I heard a request for C and D and then a -- from Ms. Paquin from Betty Yee's office, and then adding a 6.5 percent. Do I have any -- these put in the -- if you want to talk, if you want to ask questions, because we want to give some guidance here.

Ms. Ortega.

COMMITTEE MEMBER ORTEGA: Thank you, Chair Taylor. I would concur with Ms. Paquin's request for the things that she had asked to see. And I would also ask if there is any further analysis the staff could bring us on the issue of the time it takes to get to the higher targets on the private assets, both the real estate and the private equity. If there's any information that can be provided to us about what that time frame might contribute to not achieving the targets -- the comes that are assumed.

MANAGING INVESTMENT DIRECTOR GUNN: And so we do have that information about the ramp-up and how it affects long-term returns. We do have that.

COMMITTEE MEMBER ORTEGA: That would be great. Thank you.

MANAGING INVESTMENT DIRECTOR GUNN: And I think, if I -- so ask for the single portfolio solution as well.

CHAIRPERSON TAYLOR: And then the 6.5, Ms. Paquin, do you want that -- you want that the dual path, right, the dual path?

COMMITTEE MEMBER PAQUIN: Yes.

CHAIRPERSON TAYLOR: And then you also -- do you want it with leverage or without, or what, or both?

ACTING COMMITTEE MEMBER PAQUIN: Whatever the staff feels appropriate. I mean, I think it was helpful in C and D to see it with and without leverage, because it doesn't look like there's that much of a difference in the returns or the risk.

CHAIRPERSON TAYLOR: Okay. Then I say that if we add the 6.5 percent, we do it with and without leverage.

I have a comment from Mr. Miller then Ms. Middleton.

VICE CHAIRPERSON MILLER: Yeah. You know, I'm -- I don't mind the complexity of seeing more than two or three options, particularly the options that when there are multiple options that outperform what we're doing now overall, but -- and I'm certainly very much in favor of seeing options that give our team the most tools. I want to see the options. I think we need the private equity. I think we need the private debt. I think in the longer run, my expectation is that we will be doing more than 13 percent, but right now that's a reasonable target in terms of our expectation to be able to ramp-up capability capacity. But I think, you know, cycles down the road, we're probably going to be increasing those. So having that -- those in here, having that in is important to me.

And for all types of use of leverage that we use that we should have those tools for our staff. And one of the things that I think is a little hard for me sometimes to have a good handle on is it's pretty easy to see the differences between, you know, the big differences in the risk numbers from one to another. But when they're very close to each other, like D and E, what's the real practical impact of those kind of differences in risk or volatility?

Some of the -- some of those numbers are pretty close from one to another and so -- and just addressing that either with discussion or quantitative, you know, demonstrations or examples would be helpful to me. So I don't just process those raw numbers into what would the impact be for an employer or -- so that's my thoughts.

CHAIRPERSON TAYLOR: Some of it sounds like it's going to come to us in FAC.

VICE CHAIRPERSON MILLER: Yeah. Yeah. I think so. But overall, I'm really impressed with the work that's been done and it's been very helpful and -- yeah, I'm just looking forward to, you know, November.

CHAIRPERSON TAYLOR: Okay. Ms. Middleton. Thank you, Mr. Miller.

COMMITTEE MEMBER MIDDLETON: Thank you and my thanks to all of the comments made so far by my colleagues. I agree each one of them. And I really appreciate Mr. Ortega raising the question of how do we get to a higher level of public equity, when we know that has been a struggle at times.

I'd also like to see Candidate Portfolio B included in the mix for consideration. And I say that not to say I'm triggering towards any one of the options. I'd like to have multiple choices.

What I will say is the status quo is not adequate. It's not acceptable and we are going to have to take on additional risk in order to get the returns that need -- we need. Let's do it in a prudent way and with our eyes wide open, but we are going to need to take on additional risk.

CHAIRPERSON TAYLOR: Thank you, Ms. Middleton. I appreciate that.

So I'm going to add Candidate Portfolio B.

And, Mr. Jones, please.

COMMITTEE MEMBER JONES: Yeah. Thank you, Chair

Taylor. Yeah, I would like to see the same candidate portfolios that have already been mentioned. I think that should give us enough to analyze and to get information on to hopefully move forward. But also, I would like to know if it's possible -- and I'm not talking about a black swan event, but are there some events that we can anticipate that would have differing effect on these portfolio candidates. For example, what if the pandemic -- these different variants continue in the -- and I assume you've already factored in some market downturn going forward from the pandemic, but what if it's a long-term downturn? Has that been considered in these factors in these numbers yet? And so -- and I don't know what else, but I'm just thinking of what else could -- you know, the fires. What if they just -- I mean, they're just out of control now. I mean, that's having a devastating effect on the economy. What if it continues beyond some, you know, prescribed period of time? Is it just going to disrupt the whole economic -- the economy as we see it today and which one of these portfolios would have the greatest negative effect?

And I don't know if that's possible, but it's just a thought, because they're unknowns, and that's what we're dealing with when we're looking into the future are unknowns. And I know the black swan is the one that you can't predict, but I'm just thinking are there any other events that you can think of that you believe would have a negative effect on these portfolios?

CHAIRPERSON TAYLOR: Is that something -- is that too much, Mr. Gunn? Is that -- I mean, we did -- you did the 20 percent downturn. You did the Great Financial Crisis, so kind of a black swan-ish GFC with the candidate portfolios we're talking about, I guess.

MANAGING INVESTMENT DIRECTOR GUNN: Yeah. I mean, we can -- we can make up, you know, scenarios, I guess. It's -- you know, as Mr. Jones said, it's the nature of black swans, we really don't know what they are. But rather what we can try to do is build a diversified portfolio. And again, that sort of comes back to the leverage. It helps us build a more diversified portfolio, which means we are less exposed to a single factor, which today we're dominated by growth. And over time, if we were to adopt leverage and become comfortable with it, then strategically we might be able to grow into a more diversified portfolio through the proper use of leverage.

COMMITTEE MEMBER JONES: And you may have already, as you talked about the diversification, is taken into consideration some of those things. And so you may have already done that. I just want to be sure that's not something that is obvious in the future that we have not factored in. I thought I would ask that.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Mr. Jones, just really quickly, the way the methodology works when we talk about the drawdown is we actually take the statistics associated with all of these potential portfolios. By statistics, I mean, you know, what are the -- what are the returns of each asset class, what are the ability that -- how those assets move with each other. And then basically we load that into a -- it's called a Monte Carlo simulation. It basically runs 5,000 different potential portfolio paths, so 5,000 different ways it could go. And then what that drawdown calculation is looking at is what is the sort of peak to trough in the worst 10 percent of those 5,000 paths.

So I will say that that's tort of implicitly in the methodology so far. We will take away thinking about are there any, you know -- and Sterling walked through those -- these other scenarios. But we'll think about if there are any others that maybe --

COMMITTEE MEMBER JONES: And as I said, you may have already included, because as you said that, what is it, 10 percent drawdown, you don't know what caused it, but you just knew it drew down, so --

MANAGING INVESTMENT DIRECTOR GUNN: That's right.

COMMITTEE MEMBER JONES: -- maybe it's already there. I was just trying to get a sense, but maybe it's already there.

MANAGING INVESTMENT DIRECTOR GUNN: It's -- yeah, as Dan, said, 5,000 simulations of all different kinds of outcomes, each representing a different cause.

COMMITTEE MEMBER JONES: Okay.

CHAIRPERSON TAYLOR: Is that program really called the Monte Carlo program, just asking?

MANAGING INVESTMENT DIRECTOR GUNN: The method is called Monte Carlo, yes.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: It's called Monte Carlo simulation.

CHAIRPERSON TAYLOR: Wow. Okay. So I think that's the end of our questions. We do have public comment. I think we have seven of them. So -- woops, sorry. If you want to go ahead and start those. I don't know if that's Cheree that's doing it or Mr. Fox.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, this is Kelly Fox. And I'll be working the call-in studio. Our first caller is Catherine Downs from the City of Santa Ana.

MS. DOWNS: Good afternoon Investment Committee members. Thank you for listening to public comments. My name is Catherine Downs and I'm the Finance Director for the City of Santa Ana in Orange County. I'm glad the committee is requesting to see Candidate Portfolio C return for a November decision-making. Candidate Portfolio C is a good compromise to strengthen the system without a significant further decrease to the discount rate, yet minimize the impact to risk.

Santa Ana has both miscellaneous and safety plans, and we really issued pension obligation bonds for approximately 75 percent of our current estimated unfunded liability in an attempt to avoid the estimated 41 percent increase in our contributions over the next six years.

Santa Ana has a dense population with per capita income of less than $21,000 a year or half the per capita income for all of Orange County. With a tax base of only $880 per resident, the city struggles to provide basic necessary services. Violent crime rates are 30 percent above the national average and the city is park poor with only one acre for every 1,000 residents.

Santa Ana's revenues have increased by an average of only 2.1 percent per year since the 2008 recession. Prior to issuing the POBs, our required contribution was going to increase 14 percent next year. With increases like that, our job to provide service to a population that struggles with basic human needs is much harder. I understand CalPERS must take measures to protect the health of the system, including an adjustment to the investment strategy, but I cannot support a significant further decrease of the 6.8 percent discount rate nor do I support an amplification of gains and losses from additional leveraging.

Again, I support Candidate Portfolio C as the best compromise. Thank you for your time today.

CHAIRPERSON TAYLOR: Thank you.

Mr. Fox, next caller.

STAKEHOLDER RELATIONS CHIEF FOX: Yes, Madam Chair. The next caller is Sarah Lamin from the City of Hayward.

MS. LAMIN: Board mem -- good afternoon, Board members. Thank you for the opportunity to speak. And I really appreciate the comments today and the thoughtfulness that staff has been working through these processes and the Board's consideration.

As you know, and as many of you have mentioned, we have -- we have an ongoing funding problem. And once again, what we're looking at is additional employer contributions. I appreciate that this is now a much bigger part of the conversation than it used to be and we still have to get to the bigger -- the expense side of the equation.

And so I will repeat my ask that as this process moves forward, that you also think about what is the next process to convene the stakeholders, so that we can deal with the expense side. Because regardless of the scenario, we're not going to be at the funded status we all need and want to have happen. And we're done talking about how we got here. What we need to talk about is where do we go from here?

And to that end, I cannot support anything that increases employer contribution rates. For the City of Hayward, that would be an additional expense of eight to nine million dollars every year, which is funding we simply don't have. And the PEPRA employees don't have additional funds to be able to contribute either. And it's not fair to balance our budgets either on them or on the taxpayers. We've all had enough. So I encourage you to continue your careful consideration and to not lose track of the next conversation we have to have about controlling our expenses. Thank you.

CHAIRPERSON TAYLOR: Thank you.

Mr. Fox.

STAKEHOLDER RELATIONS CHIEF FOX: Yes. Chair, the next caller is Todd Parton from the City of Beaumont.

MR. PARTON: Hello. Thank you. And I, too, appreciate the efforts that the Board is taking to safeguard the portfolio. We're all going to be beneficiaries of this work. So again, it's much appreciated.

The concern we have really is with regard to the assumptions that are going into the discount rate. If you look at the 30-year -- 31-year history of the fund value, the overall value in 1999 was $45.4 billion. Reported for '21, the pension fund is worth 469 billion. So that represents about a 7.8 percent compound annual interest rate in terms of increase year to year.

So when we're looking at a significant discount to the discount rate, it's having a monumental effect. And it calls into question how that really comports to what's really happening out there in the market and what the actual returns are. To put it into perspective, our 2020 audit, fiscal year-end of June 2020, really looked at a unfunded liability for the city of $18.2 million. A one percent drop to 6.15 percent increased that unfunded liability by 59 percent. It takes us to $28.9 million. And some of the portfolios that we're looking at are taking us dangerously close to that number. Obviously, it's not fiscally sustainable.

Our general fund has been growing at about a two percent rate. We're projecting that out with our assumptions. If you look at some of the scenarios being presented here, we're looking at a potential six percent or more increase per year to our employer contribution.

And when you're a fast growing city like Beaumont is, one of the fastest in the state, we are struggling to keep up with the growth of services, public safety, the whole suite of services that are needed desperately within the community.

So we really are concerned about, again, the model that's going into play, the effects that that's having on the projected discount rates and the investment targets. And we would request that additional consideration be given to what that appropriate rate -- appropriate target ought to be.

Would also respectfully request that more attention be given to reaching out and having some dialogue out into the communities. Appreciate the presentation at the upcoming conference. It is COVID. There will probably be some limited attendance at that event, so we really, really would appreciate some additional effort to reach back out to the rest of us in the field.

Thank you.

CHAIRPERSON TAYLOR: Thank you very much.

Next caller, Mr. Fox.

STAKEHOLDER RELATIONS CHIEF FOX: Yes, Madam Chair. The next caller Chris Tavarez from the City of Hanford.

MR. TAVAREZ: Hello. Good afternoon. My name is Chris Tavarez. I'm the Finance Director calling on behalf of the City of Hanford in Kings County. Very much appreciate the discussion on this item. There's a lot to consider here. Like many cities and other agencies in the state, Hanford has very limited financial resources to confront increasing costs. A discount rate change will lead to a direct impact to many agencies' ability to keep up with ever-increasing demands on services.

What this means to Hanford, amongst many other cities in the state, is that the City struggles to increase public safety and parks resources. This could get out of hand. This change may decrease or at least further delay additional resources that are vital to maintain, or increasing in essential services and quality of life for our residents and businesses. For example, annually, police officers or firefighter positions may not be funded or development of parks would be severely limited. This would be a big hit to providing services to our residents.

In addition, in light of the high fiscal year 20-21 investment return, a portfolio selection and potential reduction to the current discount rate should be considered carefully as to minimize member contributions as much as possible to limit impact to agency services throughout the state.

Thank you very much for your time.

CHAIRPERSON TAYLOR: Thank you, sir.

Next caller.

STAKEHOLDER RELATIONS CHIEF FOX: Yes, Madam Chair, the next caller is Mr. Dillon Gibbons from the California Special Districts Association.

MR. GIBBONS: Dillon Gibbons. Hello Chair and members of the Committee. Dillon Gibbons, Senior Legislative Representative with the California Special Districts Association. Our association members strive to take a fiscally prudent approach to their CalPERS' liabilities, in order to minimize financial liabilities in the future and to keep current CalPERS rates as low as possible.

However, the low rates are not the driving factor in their approach to fiscal responsibility. The overall health and sustainability of the system is a more important criteria. So while we don't have a position on a particular candidate portfolio, we do believe that several of the options presented provide a path for responsible investments that don't increase costs on employers or employees, while minimizing additional risks to the fund. And we would like to thank CalPERS staff for all their efforts to put these varied options together.

And before I wrap up, I just want to thank the Board and CalPERS staff for the significant communication that has been provided during this ALM process and thank Ms. Middleton in particular for her comments about not maintaining the status quo. Thank you very much for the opportunity to speak with you today.

CHAIRPERSON TAYLOR: Thank you.

Mr. Fox, next caller.

STAKEHOLDER RELATIONS CHIEF FOX: Yes. Madam Chair, the next caller is Mr. J.J. Jelincic.

MR. JELINCIC: Hello. Am I off mute?

CHAIRPERSON TAYLOR: Yes. Go ahead, J.J.

Did we lose him?

COMMITTEE MEMBER BROWN: I think he's muted now.

CHAIRPERSON TAYLOR: It doesn't look like it.

MR. JELINCIC: Am I unmuted?

CHAIRPERSON TAYLOR: You are unmuted.

MR. JELINCIC: Hello. Can you hear me?

CHAIRPERSON TAYLOR: Yes.

MR. JELINCIC: Can you hear me?

Can you hear me?

CHAIRPERSON TAYLOR: Yes.

MR. JELINCIC: Okay. Thank you. This is J.J. Jelincic. And when I read the item the first time, I said I don't understand this. So I read it a second time and I said I can't be understanding this. So I read it a third time and said, yes, I do, in fact, understand it.

This is a proposal -- you've got some very bright people in the Investment Office, but as a proposal, this would fail in intro to investments. Right now, asset prices and risk are high and expected returns are low. So the proposal is let's load up on risky assets. Later, we expect asset prices and risk to be lower and more normal and we expect expected returns to be higher. So at that point, it's load up on low-risk, low-return assets. This is a classic buy high, sell low proposal. No wonder Wall Street loves us and often sees us as dumb money. The focus is clearly on a high discount rate and risk is clearly a secondary factor.

I will point out your own numbers show that private equity is not good on a risk-adjusted return basis. I would also point out that the American Investment Counsel, which is the lobbying group for private equity, has never said that they are high on a risk-adjusted basis. They boast about high returns, but don't talk about risk at all. So I really ask you to go back and look at this bifurcated, why would you buy high and sell low?

Thank you.

CHAIRPERSON TAYLOR: Thank you.

Mr. Fox, next caller.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is -- excuse me, Alyssa Giachino the Private Equity Stakeholder Project.

MS. GIACHINO: Good afternoon, Madam Chair, Members of the committee. Alyssa Giachino with the Private Equity Stakeholder Project. Given your thoughtful discussion today of private equity, real assets, allocations and risk, I'd like to update you on Ares Management and its ownership of rental home company Front Yard Residential, with nearly 15,000 homes along Pretium Partners.

Ares Front Yard Residential has continued to file evictions, which now number more than 1,200 actions since the CDC moratorium took effect last September, including more than 900 eviction filings since the beginning of this year. In July, the U.S. House of Representatives select subcommittee on the Corona Virus Crisis launched an investigation into Front Yard Residential's eviction filings.

In June, NPR highlighted Front Yard Residential filings to evict the residents at much higher rates in majority Black counties citing our report. Since January 1st, Ares Front Yard Residential has fired to -- filed to evict more than 400 residents in majority Black DeKalb and

Clayton counties in Georgia. Front Yard Residential has filed to evict residents at much higher rates in majority Black counties than in majority White counties. Since January 1st, the firm has filed to evict 20 percent of its residents in Clayton County and 22 percent of its residents in DeKalb County.

By comparison, during the same time period, Front Yard Residential has filed to evict around four percent of its residents in majority White Polk County in Florida. The company's disproportionate eviction filings in majority Black counties means that they could hit Black renters especially hard. Indeed, Ares Front Yard Residential evicted a resident in majority Black Clayton County in Georgia two weeks ago. With the moratorium now lifted, this could signal a wave of coming evictions.

In addition to NPR ane Reuters, the company's disproportionate eviction filings against Black renters has drawn media coverage by CBS, Bloomberg, and present a clear substantial headline risk.

Ares Management's failure to address questions about its company's eviction actions represent a significant management failure on Ares part, and appears to directly contradict Ares ESG policy.

We believe CalPERS should hold off on any new investments with Ares Management until the firm adequately addresses its home rental firm's eviction actions and its disproportionate eviction filings in majority Black counties.

Thank you.

CHAIRPERSON TAYLOR: Mr. Fox, is that it?

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, we have one more caller on this item. We have, from the League of California Cities, Jonny Pena.

MR. PENA: Thank you and good afternoon, Madam Chair, members, and staff. Jonny Pena with the League of California Cities.

I appreciate the opportunity to speak about Item 8A. The information presented today has been incredibly informative and is important to the continued sustainability and vitality of the pension system. I'd like to give a special thanks to staff for including the pros and cons, along with the estimated shift in employer contributions associated with each candidate portfolio.

As you know, retirement benefits are only as secure as an agency's ability to pay them. As cities continue to face rising pension costs and reduce budgets in light of the pandemic-induced recession, Cal Cities remains concerned about the prospective increase of employer contribution rates. That is why the Cal Cities board of directors voted to not be in support of lowering the discount rate.

As the asset liability management process continues, Cal Cities and its members will advocate against increased costs that crowd out funding for essential services. California cities are facing multiple pressures on the budget, and so projected pension obligations -- projected increases in pension obligations is certainly unwelcome news.

Those cities throughout the state have demonstrated their commitment to meeting pension obligations by continuing to dedicate funding, making advanced payments, and working collaboratively with employee organizations to find sustainable solutions to fund retirement benefits. While cities are being creative and innovative, there's only so much they can do.

An exacerbation of city pension obligations, coupled with general revenue shortfall resulting from the COVID-19 economic shutdown, may force -- may force our cities to make very tough decisions in the near future. Any additional costs make it extremely difficult for cities to maintain their core services.

As you consider the various candidate portfolios and their respective discount rates, please consider the impact that an adjustment in the discount rate would have on cities throughout California. A further lowering of the discount rate would create new cost pressures on already strained local budgets. As you have heard from several cities already, this cost pressure will have a real impact on local communities.

We share the same goal of a prosperous pension system, and we look forward to the continued partnership on ensuring a secure and sustainable retirement system.

Thank you again for the presentation and the opportunity to provide comments. Thank you.

CHAIRPERSON TAYLOR: Okay. Thank you. Mr. Fox, that was the last caller?

STAKEHOLDER RELATIONS CHIEF FOX: That is correct, Madam Chair.

CHAIRPERSON TAYLOR: Okay. Thank you.

So I just want to reiterate - I did clarify something here - what we're saying to bring back in November is Candidate Portfolios C and D - I did clarify that we didn't want B brought back - and a portfolio with leverage and without leverage at a 6.5 percent, because as I understand, that won't change contribution rates.

That's for bringing back. Those are -- and we're -- the rest of those portfolios can go by the wayside.

In the meantime, before we move on to 8B, we should probably take a break, because I think we've been sitting for about three hours. So it's about 4:25, how about we start back at 4:40.

(Off record: 4:22 p.m.)

(Thereupon a recess was taken.)

(On record: 4:40 p.m.)

CHAIRPERSON TAYLOR: Are we all back?

It kind of looks like we might be.

We've got like a half a minute left.

CalPERS Trust Level review and I guess that's Dan.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes. Thank you, Madam Chair. Let's see here, if we could please get the presenters up here with us. If I could ask for Lauren Rosborough Watt, Jean Hsu, Greg Ruiz, and Sarah Corr to come forward and join Arnie and me as presenters.

And as you said, Madam Chair, this is Item 8B, which is the annual trust level review and annual program reviews prepared by the Investment team.

CHAIRPERSON TAYLOR: I'm sorry?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Actually, this is the annual trust level review and annual program reviews that have been prepared by the Investment team. And I think we can move Christine Reese back to the attendees area. Let's see, I see Sarah, Greg, Lauren, Jean. All right. And I know we already had

Arnie.

Okay. Let's see. If we can get the slide deck up, please.

(Thereupon a slide presentation.)

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Excellent. Thank you.

Yes, this is staff's annual trust level program review. And it's one of the most important agenda items I would say that we present to the Committee each year, because it sums up the efforts of the fiscal year, in terms of the performance, the risk of the portfolios, market and economic conditions, as well as business initiatives. And it talks about both at the total portfolio level, meaning both the PERF and the affiliate trusts, but also the asset class levels.

So we have three main parts to go through today. I'll start by kicking us off reviewing key issues that span the entire program, giving an overview of the --

CHAIRPERSON TAYLOR: Dan, I'm sorry to interrupt. I have Karen Greene-Ross that needs to be promoted to panelist.

ACTING COMMITTEE MEMBER GREENE-ROSS: Theresa, they took care of it.

(Laughter.)

CHAIRPERSON TAYLOR: Thank you.

ACTING COMMITTEE MEMBER GREENE-ROSS: Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. So we're going -- we're going to start -- like I said, we have three main parts. We're going to start by reviewing the issues that go through the whole program, talking about the risk positioning and the performance of the various trusts. Then I'll hand it off to Lauren Rosborough Watt with an update on global market and economic conditions. And then finally, the Managing Investment Director of each asset class is going to provide an overview of the performance, key accomplishments of the assets class, and then as well as forward-looking initiatives.

So Arnie will cover both global equity and global fixed income, Jean will cover opportunistic strategies, Greg, private equity, and then Sarah Corr, real assets.

And really the goal is to deliver this content as succinctly as we can to allow plenty of time for questions. I know we're running late in the day, but we will pause after each section for questions, because, you know, as I mentioned, this is one of the critical oversight parts of -- you know, presentations that we provide to the Board.

So if we can move on to the next slide, please.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: The Investment Office's mission and vision were created to really support the CalPERS enterprise mission and vision and the 2017 strategic plan. And it reminds us first the mission. It reminds us what we're here for, which is to manage the CalPERS investment portfolio in an efficient and risk-aware manner to generate returns to sustainably pay benefits, but then also how we carry-out that mission, which we call our vision, which is our desired culture, and that's about working as one team with a culture of trust, respect, and accountability to effectively manager one total fund.

And again, with one total fund being very intentional, both the PERF and affiliates, but then also referencing the fact that really it's the total fund or however that comes together that's what really matters, because it's the total fund that pays the benefits.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And we brought back this functional view of the organization to offer insights into how each program correlates the key phases of managing the total portfolio holistically. Those phases are: strategy and research, always looking out on the horizon for what we can do to evolve into a group; implementation, meaning where and how we execute on what we're looking to achieve; and then the monitor, review, and assess function, which is really about constantly looking at what we're doing and how we're doing to see what we should either do more or less of, what we're doing well or what we could do better.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And our total fund investment strategy and our process really reflect our Investment Beliefs and our governance and sustainability strategies in lots of ways. For example, you can see Investment Belief 2, the fact that a long-time horizon is a responsibility and an advantage. Invest Belief 7, that we'll only take risk where we have a strong belief that we'll be rewarded for it. And Invest Belief 9, that risk at CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error. And we certainly reflected quite a bit on that in our discussions of candidate portfolios.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And that takes us to our strategic objectives, which we approach through the lens the four Ps, those being first the portfolio, then the process that supports the management of the portfolio, then the people that drive and execute on that process, and then the resulting performance.

And so when developing these strategic objectives, we included context about what success will look in each of those objectives.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And despite working remotely through a pandemic for the entire fiscal year, the team really got a lot accomplished and has a lot to be proud of. On this slide, you can see really a handful of those that we chose to highlight, but these really are just the tip Of the iceberg. And I could spend quite a bit of time on any one of those, but in light of the fact that it's 4:45, I'll skip past it. But it really -- I really do want to underscore just how much the team was able to accomplish especially in this pandemic setting.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And looking ahead to the fiscal year we're currently in, we're focused on, first of all, concluding the ALM process in partnership with the Financial and Actuarial offices. And, of course, (inaudible) further executing on strategies in private assets. We talked about that, looking to deploy assets at scale with high underwriting standards and with cost advantaged economics to deliver returns to the total fund. Also, further executing on our technology and data strategies, and then continuing to evolve our one-team one-fund culture.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And so that's what the business has been up to. So now let's look at what that looks like in terms of performance and risk to the portfolio.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Before we get to the details, I thought it made sense to draw your attention to a few key numbers surrounding our performance, and critically why we will look at one-year numbers. As we've discussed before, the longer horizon numbers are really the ones that are more important as they speak to the return generation over an extended period of time, much like our liabilities are measured over an extended period time.

So first, let's look at the absolute return, which is primarily the result of the strategic asset allocation we select through the ALM process. Absolute return, of course, is the critical numbers, because it's the absolute return that pays the benefits for the various trusts. And over the 10-year period the PERF returned 8.5 percent average annualized return.

This second number I'll call your attention to is excess return, which is a combination of implementing the strategic asset allocation, and the active decisions taken by the Investment team. And over the five-year period, the excess return was a negative 13 basis points. And there are several reasons for this underperformance. But if I have to pick one to discuss, it's the one that's been by far the most impactful, which is specifically our underperformance in private equity.

Now do know that the absolute return of private equity has been highly accretive to the returns of the PERF, being our highest performing asset class. But our historical inconsistency in our approach and the lack of diversification within the asset class has led to our underperformance relative to our benchmark. And really that's one of the reasons for our very focused work, taking a very strategic and very consistent approach to private assets in their entirety and specifically to private equity.

Finally worth noting is that the affiliate trusts continue to perform in line with expectations based on their respective asset allocation. And while again, in the interests of time, I don't want to spend too much time on it, I will just remind us that there's nearly $30 billion in assets in the affiliates. So performing in line with expectations is a really good thing and reflects the work of a talented team of individuals managing these allocations on a daily basis.

So after that look at a few highlights, let's keep going and look at some of the details.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And as we know from our Investment Beliefs, the returns of the various trusts are driven predominantly by their respective strategic asset allocations. And I say that in general performance of the various trusts was roughly in line with expectation, with the one exception being again the underperformance relative to the benchmark of the PERF across many time periods.

And given our nature of a long-term investor, I will lead with the 20-year number for the PERF, the absolute return being just below seven percent. Now, since this is an annual program review, where we cover the fiscal year results, I will move us to the one-year numbers. I'll just remind us to keep these one-year numbers in context, given our true nature of a very long-term investment. And in terms of absolute return, during the fiscal year 20-21, the PERF earned a 21.3 percent return. And this return came primarily -- primarily from the equity asset classes, which is expected given that equity is the dominant driver of the PERF's return. And we'll talk more about that in a bit.

Private equity posted the highest return, up nearly 44 percent. Followed by public equity with a return of 36 percent. Within public equity, the cap-weighted segment returned 42 percent, but the factor-weighted segment returning 23 percent.

Now as a reminder, the factor-weighted segment within public equity was specifically adopted by this Board during the last ALM cycle, because of its ability to offer equity exposure, but with some downside protection. And we've seen it do exactly that and we'll talk about that more in a few minutes.

Real assets, which earned (inaudible) percent and income assets were approximately flat (inaudible) segment, which was down 9 percent, being offset by the spread and high yield parts of the portfolio. Now, bear in mine that like the allocation to factor-weighted equities, (inaudible) allocation to treasuries was another intentional action taken by this Board during the last ALM cycle (inaudible) exposure to mitigate drawdowns.

And this focus on mitigating severe drawdown and the desired diversification came out of the portfolio priorities work and was widely navigated by this Board in 2015-2016 time frame assessing what priorities we should have for our portfolio, really given the unique circumstances at the CalPERS plan, and we'll talk more about that in a couple of slides.

But the short story is that the U.S. treasuries segment and the factor-weighted equity segments were intentionally added to the strategic asset allocation in the interests of prudence in mitigating drawdowns. And we've really seen them provide the protection and the performance we expected.

Now, if we move from absolute returns to benchmark relative returns for the fiscal year, the PERF underperformed the benchmark. And again, this was entirely due to relative underperformance in private equity. And this relative underperformance in private equity comes from two main sources. First, like we discussed earlier, a consistent approach taken to this asset class (inaudible), which has resulted in (inaudible) exposure (inaudible) diversified. And second it also has to do with evaluations in private markets, which result in the benchmark being a public equity markets equivalent benchmark being measured in the low of the markets in March of 2020 post-market recovery in March of 2021, with the private equity portfolio returning 44 percent. That's still lagging the public markets benchmark.

And for the Affiliate trusts and is shown on slides 10 and 11, these funds are generally passively managed, so that performance is in line with expectations and really follows their respective asset allocation, the trusts that have a higher weighted equity having the strongest returns, given the buoyancy in the equity markets.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: The same was the case for the supplemental income funds with very strong performance in the equity components of the portfolio, resulting in higher and higher returns for the target date funds with more and more equity exposure.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: So similar to the affiliates that have a heavy equity weight, and therefore the performance largely follows equities, the PERF exhibits similar return characteristics, largely following equities. On the left side of this slide, you can see that the PERF's line largely follows the line for equities. The magnitude is different and this speaks to the benefits of diversification. But generally speaking, when equities are up, the PERF will be up about half as much, and when equities are down, the PERF will be down about half as much.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And we talked at a high level about this earlier. I mentioned this, but this diversification really speaks to some of the actions taken by this Board over the past several years to protect the PERF from the significant drawdowns that can come with a large equity weighting of the portfolio. Of course, the ideal state for this portfolio would be to earn the assumed rate of return on a consistent basis year after year. The portfolio would get to a hundred percent over the amortization schedules and there'd be minimal contribution volatility.

But we all know that markets don't behave that way. Markets are volatile and therefore some years we'll exceed the assumed rate of return, in other years we'll fall short. And one thing that became very clear through market events such as the financial crisis and other significant drawdowns is that while we do have an appetite for significant upside returns of course, appetite for upside is actually less than our aversion to significant downside risk, which can greatly impact the funded ratio and also result in significantly higher contributions and higher contribution volatility.

So as a result over the last several years, the Board took a series of actions to protect the portfolio from significant downside risk, all the while looking to harvest the assumed rate of return. The funding Risk Mitigation Policy was adopted in 2015. And this was intended to bring down portfolio volatility over time by locking in good years and reducing risk.

Through a series of discussions at Board off-sites and Investment Committee sessions, the portfolio priorities were developed and adopted by the Board with those (inaudible) to protect the funded ratio to mitigate severe drawdown. The second priority being to stabilize employer contributions, to manage overall portfolio volatility, and the third being to achieve the required rate of return over the long term.

Based on these priorities, this (inaudible) in 2017 ALM work, including the introduction of new asset segments, which is about 10 percent allocation to long-dated U.S. treasuries and that 15 percent allocation to factor-weighted equities. Then we split the 50 percent allocation to public equity into 35 percent cap-weighted, and then 15 percent factor-weighted. And don't forget the effect -- the intent of the factor-weighted dealing with the capture equity returns, while mitigating some of those drawdown characteristics they do come with equities inherently.

From this slide what you can see is that these segments really have behaved roughly how we expected they would. During both the 2018 drawdown and the pandemic drawdown in early 2020, we can see the factor-weighted equity is offering diversification by reducing the impact of the negative equity markets. Conversely, during this past fiscal year, equity markets experienced significant appreciation, factor-weighted equity underperformed the high flying cap-weighted equity markets.

We also see the long treasuries segment offering clear diversification benefits. For example, during fiscal year 19-20, cap-weighted equities drawdown in a flat return the entire year, the treasury segment was about 20 percent. Conversely, during fiscal year 20-21, cap weighted (inaudible), the treasury segment was down 20 percent following that 20 percent up-year.

So I guess the point is that in the interest of prudence and in consideration of CalPERS unique status and objectives, this Board made a series of decisions to add diversification and to protect against significant drawdown. And really as a result, the portfolio has been performing largely as expected in various market environments.

Can I get the next slide, please.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Since (inaudible) looking at the risks in the portfolio, and as we've discussed in the past, the PERF's primary risk is really dominated by asset-sensitive economic growth, primarily equity risk, but also credit and real assets featured here too. And we saw that a couple of slides ago when we saw that as the equity market goes, the PERF tends to go, but with less violent swings, again the result of diversification.

The next number I'd like to mention surrounds the ongoing challenges we have given the (inaudible) in deploying sufficient capital into the private markets, while maintaining our high underwriting standards and seeking cost advantaged economics.

Now, we have some good News that recently we have reached our eight percent target for private equity, which really is the result of some very good and concerted work by the private equity team. But for real assets, we stood at about a 10 percent allocation which is a target of 13 percent. And further, as we're mentioning that even these targets of 8 and 13 percent, and we talked about this, are particularly artificially low relative to our actual appetite for these assets. And pursuant to our discussion of candidate portfolios, they could arise during this ALM cycle.

Remember also that these assets serve as a source of diversification. And it's from these reasons that we continue to focus on how we can deploy assets at scale with these assets classes while maintaining high underwriting standards and focusing on cost-advantaged economics.

The next number on this slide is the current actionable tracking error, 13 basis points. And again, we talked about this actionable tracking error as a risk management tool on the action item on the Total Fund Policy.

And finally, it's worth mentioning that the portfolio remains highly liquid, both in terms of having a great deal of liquidity on the balance sheet, but also having many and diversified avenues to liquidity should the need arise. And as we've discussed, this central management of the allocation leverage and liquidity of the plan is another really key area of focus for the investment team. As we add private assets and in light of their illiquidity, maintaining this focus on liquidity and doing some in a centralized total fund way remains critical.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And this is the last slide that I'll cover here, but this really is just intended to give us a sense of the decomposition of the model's quantitative risk and the relative size of those risks in the PERF portfolio. All the way to the left, you can see the total model based volatility of the portfolio. At the end of the physical year, we had a little bit under 11. Within that, the total tracking error of the portfolio comes out at a bit over one percent, being measured at 116 basis points. And as you can see from the pie chart, that's really dominated by private equity tracking error, which is really just telling us that private equity is not public equity, but that's public equity that it's been measured against. And again, this is a good thing, because this represents the diversification.

Then of that 116 basis points of total tracking error, at the end of the fiscal year, 13 basis points is what we would call actionable, getting the result of decisions that the Investment team has intentionally made that we would change and that we could change if desired.

So that was intended to provide a brief high level overview of kind of what the Investment team has been up to, the performance generated by the various trusts and the risks that we see in the portfolios.

But with that, I'll pause to see if there are questions before passing to Lauren to go through the market -- the market and economic environment.

CHAIRPERSON TAYLOR: Sure. I have a question from Margaret Brown.

COMMITTEE MEMBER BROWN: Thank you. Thank you for that update, Dan. I have two questions. The first one is, you know, because CalPERS returned 21 -- 21.7 percent, we -- it kicked in the policy that required us to lower the discount rate. And I want to make sure -- I mean, I've read it. I watched the little webinar that CalPERS put out. And that is -- we're doing it because in good years, where we have a good return, we want to reduce risk. And that's why we lowered the discount rate to 6.8 percent.

But in talking to cities, counties, local agencies in CalPERS as well as PEPRA members, you know, they're going to have to pay more, but I don't show that CalPERS took any risk off the table. My understanding is you lowered the discount rate, because we took risk off the table and I don't see us doing that. So it seems like there's a problem with the policy. And so I want to -- I want to know how that's supposed to work.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: So I would say that really as far as the risk in the portfolio, you're right, we certainly haven't changed the structure of the portfolio just as a result of the Risk Mitigation Policy. I would say though that what we've seen is that the Risk Mitigation Policy would take us to a discount rate of 6.8 percent, you know, given the several thresholds that we exceeded the assumed rate of return.

COMMITTEE MEMBER BROWN: Yes.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Given we are in the middle of the ALM work, we thought that the prudent thing to do was to work our way through the ALM work and then land at a strategic asset allocation and a discount rate that that strategic asset allocation supports. And that -- you know, as we talked about in the candidate portfolio, that could be a decision to -- you know, I believe the request was for some portfolios around six and a half percent, some portfolios at that 6.8 percent, and I believe I saw in the chat maybe even coming back with a portfolio at the seven percent, that way we give the Board the option. And then the Board can take decision to make the trade-off between the risks and the desired return.

COMMITTEE MEMBER BROWN: Yeah. I appreciate that. I just don't think that we should implement half a policy. Maybe this isn't your call, Dan. Maybe this is the CEO's call. But again, we lowered the discount rate, which means we're -- our percentage funded is lower, employers, and PEPRA employees have to pay more. And we didn't take risk off the table. The whole idea is in good years, we take risk off the table. We didn't do it. So that's a concern I have that we not just implement the harmful part of the policy, which hurts employees and employers.

My next question is about our overall return was 21 percent and we announced in July we were first. We beat everybody out of the gate. And it was an amazing number and I thank the staff for doing a great job. Although, until you compare it to all the other pension funds, Pension and Investments has a link on their website. And there are currently now 66 pension funds on there and they all beat us. They all beat CalPERS.

And so there are 16 in California, San Francisco City and County, as well as UC Regents 33.7; San

Bernardino County, my county, 33.3; Fresno, 30.4; Ventura, 30.1; Sac County 27.7, and, of course, CalSTRS at 27.2. And then there's a whole bunch more. The closest one to CalPERS 21 percent is Kern County at 23.9.

So why did we miss so bad? I mean, that's -- that's a lot of percentages on the table. I don't think you're going to track that all up to -- you can't chalk that all up to private equity misses.

CHIEF EXECUTIVE OFFICER FROST: Dan, can you walk through -- so what we don't understand is all of the various funds and the other systems around the U.S. or here in the state of California what they're doing on drawdown risk protection, of which we've been walking the Board through all the strategies and policies that the Board put in place, that the Board was more interested in protecting on the downside, than it was shaving off a bit of return on the upside. So, Dan, can you talk the Board through that, please?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Certainly. Happy to. You know, I also think, for what it's worth, it might be helpful to have the consultants comment on this -- on this very question, because certainly they understand the peer universe very well.

But to -- this speaks to what we were talking about. And maybe we can go back to slide -- what was it? I think it was 13. Can we go back to slide 13?

Yeah. So this slide talks about really what we've done. And this speaks to what Marcie was just saying, by putting in a 10 percent allocation to U.S. treasuries, we know that 10 percent allocation to U.S. treasuries is going to underperform equities, especially in a year where the equity in the cap-weighted equity market was up 42 percent the way that it was.

But the decision that the Board took was that it was worth giving up some of that upside, so that we can fund those big severe drawdowns. And you can see these big drawdowns in this sort of pandemic drawdown, right? When you can look in the middle of the slide and it's circled, you can see that that cap-weighted equity was off something like 35 percent. Factor weighted was off less, something like 29 percent. And then treasuries were actually up during that time frame.

So what Marcie is alluding to there is that intentionally -- and by we I mean collectively the Board, the organization intentionally added some of these diversifying assets. And that has to do with our unique, you know, risk and return, where we are from the funded ratio and the like. And I would say it's, you know, kind of a similar thing to say, you know, my portfolio is different than my parents portfolio. And my (inaudible) is 80 and pushing 80s. And they almost no risk in their portfolio, because their utility function, their desire for returns is far lower than mine, who's currently, you know, paying for college and I have retirement that's, you know, 10 or 15 years out.

So it's really hard to compare plans one to another, because really it's the allocation that drives the returns, and that comes from this, you know, sort of utility for risk. And this speaks to what we were talking about the candidate portfolios, we could certainly -- as Ms. Middleton said, we could certainly pile into a set risks and try to, you know -- (inaudible) come up -- I think she used the term come up with the 36. But we also know that if we don't, that could be highly problematic.

And really, what this is about is about balancing risks. And as I a say, it is hard to compare plans.

You know, certainly --

CHIEF EXECUTIVE OFFICER FROST: Hey, Dan --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

-- if we look to our neighbors --

CHIEF EXECUTIVE OFFICER FROST: -- I think what would be helpful is to contrast this last fiscal year returns of the 21.3 to the prior fiscal year at 4.7, right, and how that drawdown Risk Mitigation Policy and the strategy really played with those two returns. So 4.7 top decile performance, that was drawdown risk mitigation in place as well. But could you talk the Board through that also?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Certainly. Certainly. We -- and I would say that in fiscal year 19-20, we -- yeah, we returned that 4.7 percent return when most of our peers returned kind of you know a three to low threes type return. And that was due to that big drawdown. And so, you know, because we had these diversifying assets and these protective assets in place, that caused us to outperform in that year. That was -- this year in 2021, there were (inaudible) the case. And this again speaks to this challenge around comparing plans with different asset allocations, because we have different -- you know, different appetites for risk.

And I would mention that, for example, the -- some of our peers to the north in Canada, who I would consider some of the smartest money in the -- you know, in the world, they have a lower -- you know, a smaller risk profile than us. And I would actually say that our returns, in this one year number, they look very favorable relative to some of those Canadian plans. But that has to do with the -- you know, the appetite for risk, for those plans have their expected rate of return (inaudible) their funded status and the like. And that's why it's really hard to do some of these comparisons. I do think it would helpful for Tom from Wilshire to maybe talk through some of this, because I think it would better for you to hear it from an independent source.

But I will say that as for our part, we, this organization, has intentionally added some of these diversifying assets, again because the vintage of a '21 versus call it a '27, while we like that, that's positive for us, to lose say 14 as opposed to losing say eight which is a big difference --

COMMITTEE MEMBER BROWN: So -- so --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: -- on the downside is much more painful.

COMMITTEE MEMBER BROWN: So my concern, Dan, is that, you know, when the Board decided under Ben Meng's leadership to worry about drawdown risk and to do more factor weighting, again -- and then we got rid of the left tail hedge, which could have got us, you know, a billion or so dollars. And so I worry that this is a miss. And if it is a miss, we need to say so, and then what we're going to do going forward, because my understanding it's that factor weighting.

And, you know, that comes directly from -- you know, the Board doesn't say, oh, we need to take risk off the table. The CIO comes to us and tells us what he wants to do and then we agree or disagree. But, you know, my understanding is that we did have drawdown risk covered because we had those left-tail hedges and then we pulled those. We did more factor weighting and now we've got this much bigger -- much bigger miss than everybody else.

We compare ourselves when we do good, but when we do bad, then we don't want to compare ourselves. So I just want to make sure that we're using -- you know, we're using the same arguments when we do well and when we do poorly. And I just want us to be sure -- I just want to know why we missed and that -- so that we can fix it going forward. I mean, this isn't something to be embarrassed about, but it is something that needs to be potentially corrected going forward.

That's my main concern. You know, we can't solve an issue, if we're not willing to work on it.

CHIEF EXECUTIVE OFFICER FROST: And, Ms. Brown, if you believe that there's a better way for us to talk about performance attribution, we would love to hear that, but that's basically what the team has been attempting to do is give you attribution on the portfolio, why we performed in the areas that we did, performed as expected, where we underperformed. If there are better ways to communicate that, we would really enjoy hearing it.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: I also -- I completely agree, Marcie. And I also do want to just -- just a couple of things. It's important just to be clear, factor-weighted equity in a U.S. treasury allocation, those were actually added during the 2017 ALM cycle. So that's actually before Ben got here. That was -- that was under previous leadership, so it's worth bearing that in mind.

And what I'll also say is that, you know, as Marcie said, looking at return attribution and how they work, there isn't a perfect science to it. It's very dependent on start dates and end dates. It's very dependent on what you include and what you don't include. There are sets that you include and don't include.

You know, as I said -- as I mentioned some of the U.S. plans at higher returns, because they've got higher risk. Some of the Canadian plans we actually outperformed because they had lower risks, but who you include it appears (inaudible) very consistent with. It speaks to the need to take a really long horizon when looking at performance that, you know, a one-year performance number, first of all, it will be dominated in a lot of ways by private assets, which doesn't really mean that much. You know, when your numbers -- they don't play out in the strategic strategy --

CHAIRPERSON TAYLOR: Dan, can I ask you a question real quick -- just really quick here. So there's a couple of things. We're talking about the Board made the final decision to mitigate risk, because of the huge drawdown where we went down to lower than 63, but 63 percent when Marcie got here, because of 2008. So that put the fear of God in all the Board members, right?

So I want to -- I want to make sure that we are talking about this in a realistic fashion and -- rather than talking campaign points. Now, number one, the 6.8 percent that we bought down to doesn't cost our employers any money. We bought that rate down. So let's be clear on that.

And number two, we decided we had -- didn't have a huge appetite for risk. So we wanted to back off on risk. And so we put in all kinds of Risk Mitigation Policies. And that left-tail risk that keeps being thrown around wasn't as much as we were able to gain by the policies -- the risk policies, risk mitigation policies that were put in effect that gave us about $11 billion. So let's that clear out there right now.

And then you want to go on and let Mr. Toth talk about this as well? But we all talked about these policies, including Ms. Brown. She was here. So I want everybody to be realistic about this. These are talking points right now that are being used, and in reality the Board made the decision.

MR. TOTH: Madam Chair, if I -- if I could make some additional comments. And this actually will hopefully help with time, because this was part of my prepared comments for Item 8C, because we actually do include the universe comparison. Dan rightfully said comparisons are a challenge, but we try to do it anyway. So if we -- if you -- if you don't mind, if we could flip forward to Item 8C, Attachment 4, and I'll just talk to two pages. First is page two of 14. And that shows those universe comparisons. And as Ms. Brown pointed out, over the last year, the plan does rank in the bottom quartile relative to peers. But as has been, I think, elaborated on at length, it was some of the same portfolio strategies, which this year hindered returns relative to peers, were the exact same strategies that placed the PERF in the first quartile last year -- in the last fiscal year, which was inclusive of that drawdown.

So the return pattern of outperforming when markets sell off and lagging when risk assets rally, particularly as strongly as they've rallied in the second half of 2020, and year-to-date 2021, really does reflect the portfolio priority of protecting the funded status by mitigating drawdown.

Now that being said, I've got four primary reasons for this year's universe ranking.

CHAIRPERSON TAYLOR: Mr. Toth? I am so sorry. I need to interrupt you.

MR. TOTH: Yes, ma'am. That's okay.

CHAIRPERSON TAYLOR: But Mr. Miller has to jump off in about a minute and he wanted to make a comment.

MR. TOTH: Please.

VICE CHAIRPERSON MILLER: I think you've covered it and you've got into it. The kind of driving with the rear view mirror and rehashing things that have been addressed ad nauseam was just somewhat frustrating to me. And so I'd say continue and I will jump back on after I complete a couple tasks that I've got to do that I have a short fuse on, so...

CHAIRPERSON TAYLOR: All right. Thank you.

Sorry, Mr. Toth. Go ahead.

MR. TOTH: That's quite all right. So page two, as I mentioned, of 14, it does show the universe ranking. But I think more maybe illustrative is page five of 14, which is labeled the asset allocation ranking universe comparison. And this is where you really get to the drivers of that.

So I mentioned four primary drivers starting with the higher than average allocation to global fixed income.

That was the asset segment that lagged relative to riskier assets. But it was also that segment as an earlier slide showed, which protected the fund during fiscal year 2020.

The second primary reason is -- sits within the equity allocation. We've talked about this. While the weight for global equity sits right at about the median, the implementation does include the factor-weighted exposure, which exhibits meaningfully less variability. And as one of Dan's slides showed, that was beneficial during the drawdown, but has lagged meaningfully, particularly since November 2020 through this year.

Third, and very relevant to our asset liability discussion, the private equity allocation is meaningfully lower than peers. It sits right at about the 75th percentile. And as we've talked with Greg, and as Dan pointed out, and I think we'll hear more later, private equity was the best performing asset segment over the last year. And so having more of it, as your peers did, was significantly more beneficial for them relative to the PERF.

And then finally, the CalPERS portfolio does have a higher than average weight in real assets. And while performance was positive within real assets, it lagged well behind equity-oriented assets and So detracted relative to peers who have lower allocations to real assets.

So those are the reasons. I think there are some learnings in terms of asset liability management going forward, and we've talked a lot about them and we'll continue to highlight them when we talk about candidate portfolios in November.

COMMITTEE MEMBER BROWN: Thank you, Tom.

MR. TOTH: You're welcome.

CHAIRPERSON TAYLOR: Okay, Dan, you can move on. I'm sorry.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: No. If there aren't other questions on that -- on that section, I'm happy to move us on to Lauren Rosborough Watt -- oh, I think I see a question.

CHAIRPERSON TAYLOR: I'm sorry. It looks like Henry has a question.

Henry, you're off. Your sound is off, can't hear you.

COMMITTEE MEMBER JONES: Okay. Thank you. I'm sorry. This chat box keeps moving around on me. I'm sorry about that. But the question for Tom is that chart that you just left, where you showed that our asset allocation to our peers, was that the allocation or is that based on execution?

MR. TOTH: Those are weights, so those are target allocations. I would say that -- and that's, I'll say, a truism in investments. Asset allocation is going to drive the differences return relative to peers. The one implementation comment I do think is within global equity as a detractor from peer relative returns factor-weighted equity has lagged relative to market cap-weighted equity since November 2020.

COMMITTEE MEMBER JONES: Okay. So but -- so those numbers are based on --

MR. TOTH: Target weights.

COMMITTEE MEMBER JONES: -- execution, not just the asset allocation?

MR. TOTH: It is a combination of both.

COMMITTEE MEMBER JONES: Okay. Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And, Mr. Jones, if I can kind of succinctly put together the -- our sort of '21 versus some of our peers, you know, sort of, you know, high 20s -- and I'll ask Tom to tell me if he disagrees with any of these characterizations. If I can pull up four places, I would say, number one, it's our 10 percent allocation to treasuries, right? That that again -- that those return 20 percent in fiscal year 19-20, but after that great year, they down nine percent in fiscal year 20-21.

Number two, percent allocation to factor-weighted equity that -- you know, factor-weighted equity was still up. I think it was 23 percent. But when public equity -- when cap-weighted equity is up 42 percent, that lags. And, you know, again the decision that we made in the ALM, the last ALM was that it was worth taking that lag when you have that positive a return, because we know we were in a really good state in order to avoid the significant downside, but it did lag in this significant upside market. So factor-weighted equity would be the second one.

The third one, I would say, is private equity. And that is both being underallocated, like Tom talked about, to the highest returning asset class. But also, we do know that we've underperformed in private equity again due to some of those historical inconsistencies.

And then number three, and one that we haven't talked about yet, but I do think is worth mentioning is on the real assets side, many of our peers have REITs in their real assets allocation. They've got commodities in their real assets allocation. They have other things that are very sort of risk-on type exposures in their real assets allocation. You know, this Board, we, collectively decided to really pivot our real assets portfolio, the very core income-producing, inflation-hedging assets that's -- and more -- much more aligned with our, you know, desired exposures again with this sort of avoidance of significant downside. But as a result, and our peers have commodities and REITs in their real assets exposure, in equity -- and very buoyant risk-on markets were going to lag, because, you know, I mean our three percent return beat the benchmark, but lagged a number of our peers.

So I would say those four things are the things that -- and again, Tom, tell me if you disagree with any of those characterizations. But I would those four would be the big things that we see driving this difference. The only thing I would say there is though is that they were intentional. They were added to the portfolio intentionally knowing that significant downside hurts a heck of a lot more than having these really positive up years.

COMMITTEE MEMBER BROWN: So, Dan, that's exactly what I wanted to hear. I wanted to know why we were under, and so -- without getting defensive. And I appreciate that response, because I do need -- I do want to know why we are so much lower. And I do appreciate the comments. Thank you.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Ms. Taylor, if there aren't other questions, then I think I can turn it over to Lauren Rosborough Watt to start us up on -- yeah, I think it's slide 16 there. If we could go to slide 16.

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CHAIRPERSON TAYLOR: Sounds good.

All right, Lauren, over to you.

INVESTMENT DIRECTOR ROSBOROUGH WATT: Wonderful. Thanks, Dan.

Good afternoon everyone. It's a pleasure to be here today. What I normally do in September is do a look back and then a look forward market and economics. The market movements over the past month and fiscal year-to-day, quarter-to-date are broadly in the same direction that we have seen. So I'm going to speak more to the macro side here.

What we can do if we look back is I guess take some comfort that the U.S. recession has ended, purported to be the shortest recession in history. But I want to make it quite clear that a recession is only one part of the business cycle. And the economy is still stepping towards its new normal. And that's sort of what I want to focus on very briefly, given time. So you'll recall earlier this year, I spoke about the degree of macroeconomic uncertainty that we had around the rebound. And you can see that quite clearly in the chart that I've put there on the left-hand side. Now, what this chart this -- it's showing for each GDP outturn, so June

2021, September and so forth out until 2022 analysts' expectations for GDP at different points in time.

So, for example, September 2021, the column on the left-hand side there shows expectations back in June 2020 for September 2021 growth. Now, what I'm trying to demonstrate is that throughout the year for most of 2021 analysts' expectations for U.S. GDP growth have moved up. And that's in part due to a number of different reasons, but predominantly because of the mechanical bounce back, but also the reopening of the economy to some extent.

What we do know is that that increase has started to taper somewhat as concerns around the impact of the Delta variant has on the economy. And I'll talk to that a little bit later on.

But what else you can see from this is moving into next year, so those expectations for 2022, growth expectations are settling down around averages of two and a half, three percent quarter on quarter seasonally adjusted annual rate. So something akin to historical averages.

But even with aggregate numbers returning or expected to return towards normal growth rates, there remain uncertainties. And you can see that on the chart on the right. FOMC participants have expressed a high degree of uncertainty around their own forecasts and we see that in the market as well.

Next slide, please.

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INVESTMENT DIRECTOR ROSBOROUGH WATT: So when we look ahead, what do we see? So this is over the shorter term here. We've got the statistical bounce back in GDP. It's largely behind us. We've got the transition towards new normals that we're referring to over the remainder of this year and into next year, and that depends on a number of different factors. It hinges on the speed and the breadth of the labor market recovery in particular, also on the ability of firms to deliver goods to match demand. There are concerns around the potential debt ceiling what that might mean in October/November. Also a discussion around the reconciliation bill and potential additional fiscal stimulus.

And beyond this, there's this continuation of underlying sectoral shifts. And the U.S. has performed particularly well in navigating these so far. An obvious downside risk, which I alluded to before, was the impact of the COVID-19 Delta variant. And that's having on the pace of the positive growth momentum that we're experiencing today.

Also, some headwinds is the international economy on the U.S. economy, given that the U.S. recovery has been improved at a faster pace than many economies globally.

Now, if we look further than the next few months, which refers to the chart on the right-hand side here, global monetary policy and global fiscal policy is largely expected to remain expansionary, but the rate of change in that support is waning. And Dan mentioned earlier that some central banks already are starting to taper their asset purchase, in other words, purchase less over time.

So together, the marginal support, both fiscal and monetary policies, moved negative. And the chart there on the right shows the cyclically-adjusted fiscal balance. So when you take out the negative impact of the recession that we had is what's the underlying fiscal balance. You can see it's moving higher or its less stimulatory over time.

The Federal Reserve is anticipated to announce tapering later this year. And, you know, on one hand, despite this pull back in monetary fiscal support, you know, it's appropriate that policy support is reduced as the economy gains momentum and growth is self-sustaining.

That said however, it's going to be a very tricky balancing act to manage those two over the next two to three years. So at this point, I'd like to open for any questions before passing back to Dan or Arnie.

CHAIRPERSON TAYLOR: Hold on just a second. I lost my chat.

(Laughter.)

CHAIRPERSON TAYLOR: Oh, wow. I don't have any questions. I guess we can move on.

INVESTMENT DIRECTOR ROSBOROUGH WATT: Thanks very much.

CHAIRPERSON TAYLOR: Thank you so much. That was a great report.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. So that takes us to -- sorry, Arnie, that takes us to global equity and fixed income and the program review parts of the discussion. So, Arnie, over to you to take us through global equity and fixed income.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Great. Thank you, Dan, and thank you, Lauren, for the economic updates.

So this afternoon, I will be covering the two large public asset classes, global equity and global fixed income. So if we could move to the next slide, please.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

So as Dan mentioned, you know, global equity is our largest asset class. You know, currently, a little over 50 percent of the total fund assets. It's largely managed internally in a low risk and low cost manner.

Now, on that last point of low cost and low risk, staff is constantly striving to be more efficient in the harvesting of the equity beta. And we did make some material improvements this year to improve both efficiency and effectiveness.

So to accomplish that, staff removed from the cap-weighted benchmark all holdings that had non-voting shares and we narrowed the cap-weighted benchmark to more efficiently harvest the equity beta.

This narrowing implementation eliminated about half of the securities in the cap-weighted benchmark without changing our expected risk and return. We have become more efficient.

Now, on this last point though, there has been some press around this narrowing activity, including some characterizations that it was a divestment. And staff wants to be really clear, this was not a divestment. It was an investment decision balancing the complexity of an asset class with the benefits of diversification and efficiency.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: So Dan did a lot of talk about the various segments within global equity, but global equity has largely provided the equity beta over all the time periods shown and had strong performance in the current year relative to the strategic asset allocation, taking into account both cap-weighted and factor. And with the move in recent careers to a higher percentage of this equity portfolio being passively managed, so more index-like in nature, we do expect the tracking error relative to the equity benchmarks to remain low.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: So this slide shows global equity's major accomplishments during the 2020-2021 year. So in addition to the narrowing work we mentioned a few slides ago, which was led by the teams headed up by Steve Carden and Tim Misik, we have continued our focus on the use of technology to improve our operations.

The other area that we believe adds a lot of value is the global equity staff continues to collaborate with Anne Simpson and her Sustainable Investments team to support our governance and ESG efforts. CalPERS really benefits from the leadership of Simiso Nzima and Anne Simpson and their teams in this area. And you can see the work that's been done in the appendix on pages 59 through 64.

Next page, please.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: This slide highlights our priorities for global equity for the current career, which include continued focus on data and technology improvements in the investment process. You're likely to see this most every year. It's core to what we do to keep a low-cost implementation and harvesting of the equity beta. We'll also continue to develop our total fund governance and sustainability strategic plan. And finally, like you'll hear a lot through this presentation with all the asset classes, the global equity staff will continue to support the ALM process in any way that it's needed.

So with that, before I go to -- go to global fixed income, I'll pause to see if there's any questions.

CHAIRPERSON TAYLOR: Mr. Jones, go ahead. Are you having trouble with your chat?

COMMITTEE MEMBER JONES: Yeah. It's just me though. It's not the --

(Laughter.)

COMMITTEE MEMBER JONES: It's the screen. I did something with the screen and every time I've got to go find it.

CHAIRPERSON TAYLOR: Okay.

COMMITTEE MEMBER JONES: But I was trying to share and I got mixed up, but I'll fix it later.

And so that's why I've got to go to my iPad. Just a minute. Back to that page on 20 of 91, the global equity performance.

Yeah, that one. Yeah, we were talking about the drag on our performance. And we talked about the factor weight, but I'm looking at this, and it's only two negative excess basis points that was the drag. The biggest drag looked like emerging managers and alternative beta. So it doesn't appear that that was the biggest drag. You know, we were saying why did other pension funds outperform us? And it was mentioned that factor-weighted was one of the biggest issues, but this doesn't suggest that.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Yeah, Mr. Jones, I think it's good to look at it from two perspectives. The first being absolute return, and in that case the factor-weighted did substantially underweight cap-weighted. And so from a total fund perspective relative to peers, we did leave some money on the table with that decision to risk mitigate and protect from drawdown risk.

From a relative basis, you're right, the emerging managers and the alternative the beta sections didn't do as well this year as we would hope. They were offset by active strategies. So again, when you build a portfolio, you don't expect every asset to perform well. We have some diversification in there. So on a relative basis, even though, you know, you pointed out the emerging managers, you know, had a rough year, it was a relatively small percent of the portfolio. And Anne Simpson and team will be coming back in November with a review of the entire Emerging Manager Program. And so we'll be able to dig in a little bit more into not only the Emerging Manager Program within global equity, but the whole total fund.

COMMITTEE MEMBER JONES: Okay.

CHAIRPERSON TAYLOR: Is that it, Henry?

COMMITTEE MEMBER JONES: Yeah. Yeah, thank you.

CHAIRPERSON TAYLOR: Okay. I think that's it. Go ahead.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Great. Thank you. If we could move to the first global fixed income slide, please.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Perfect. So this slide really highlights global fixed income's rigorous investment process that has been built up over decades. And we are continually enhancing it to add value. We do manage our portfolios, the vast majority of them internally and on an active basis, so not an indexing basis. So this investment process is critical to us being able to add value.

But I would be, you know, limiting if I said it was all happening within fixed income. And one of the real areas we've made progress is collaboration across the total fund and our Research and Strategy Group and the quantitative team within that. So Lauren and her team on the economic side, Saeed on the quantitative side, they attend our meetings that we have throughout the month. And that collaborative process helps us form opinions of value within the global fixed income market. And it's a collaboration that the fixed income team appreciates immensely.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

So I think this slide really shows the benefit of that rigorous and collaborative process that we highlighted on the prior slide. As you can see on this slide, the global fixed income team has strong historical performance across all measurement periods and across all substrategies.

Now, I think it was last year when the treasury portfolio was up 20 percent, down nine percent this year, the absolute returns will largely be driven by our duration exposure. And our strategic asset allocation does have a relatively long duration exposure as a hedge against equity drawdowns.

So I would say the performance we saw in 19-20, we were up 20 percent, was a very nice gift. But to give some of it back, you know, in the last year was not surprising and would be expected given our duration profile.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: So this slide highlights the accomplishments for 20-21 and really highlights, I think, the transformation of global fixed income over the years moving from a largely siloed group to one now focused on total fund collaboration. And a lot of that collaboration work shows up in the ALM process, it shows up in our liquidity and leverage bodies of work, but they're just great examples of the total fund focus by all assets classes.

Now, one thing you don't see on this slide that has been there in prior years, and it's intentional, is a mention of integration of governance and sustainability.

And the reason it's intentional is with the help of Anne, and Simiso, and their teams over the past few years, we've incorporated this important work into our daily activity. It's a key part of our security analysis and portfolio construction process as we actively manage the fixed income portfolios.

So it's really our day job now to include in the mosaic, you know, all these factors, which drive returns, but the work itself in the areas of governance and sustainability is on page 70 in the appendix, if anybody would like to look at it.

And finally, you know, I would like to highlight a very lucrative trade we did this year that resulted from the creation of what shows up on the performance slides now as the total fund fixed income account. This account was created following the market dislocation created by the pandemic. This idea -- this trade idea was an active risk recommendation originating in global fixed income. But again, as we became less siloed and we became total fund collaborative, the trade recommendation, while it came from global fixed income, the implementation was a collaboration of many folks, including the Interim CIO, the Investment Management Committee, our Trust Level Portfolio Management team, our Research and Strategy Group, the Investment Risk and Performance group and many others.

And the reason I highlight this is this focus on total fund and this trait specifically, added eight basis points of alpha to the total fund. Our IRP group estimates that was about $325 million. You know, and this effort was originated within global fixed income by Lou Zahorak and Justin Scripps and I think is a really good example of how our office can collaborate at a total fund level.

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INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: And moving to the current year, you know, we'll continued to do what we do. We'll try to add value in the fixed Income portfolios that we actively manage. We'll continue to collaborate at the total fund level. And before I hand it over to Jean Hsu to talk about opportunistic strategies, I'll stop and answer any questions that there may be.

CHAIRPERSON TAYLOR: Any questions anybody? Henry.

(Laughter.)

CHAIRPERSON TAYLOR: Okay. Go ahead.

COMMITTEE MEMBER JONES: No, thank you.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Well, thank you. And at this point, I will hand it over to Jean to walk you through the opportunistic strategies.

Over to you, Jean.

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MANAGING INVESTMENT DIRECTOR HSU: Thank you, Arnie.

Next slide please. Next one.

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MANAGING INVESTMENT DIRECTOR HSU: So some highlights of our success. Successes on the opportunistic side, we have committed over 10 billion to private debt program was roughly about 1.9 billion deployed. And then on the other hand, the LLER side, we outperformed the benchmark by 395 basis points. This was a portfolio which was, you know, at the peak, you know, more than 10 billion. And then it contributes quite a lot of basis points through the total fund.

The challenges on the OS is, you know, opportunistic strategies on the private debt side is slower to deploy, much, much slower than the public market. So for a person coming from public market, we would love to see it deployed a little bit faster. Okay. But it is actually quite a lot of work and we would like to be very, very conservative and then take good care of it.

And then on LLER side, because we have shifted the whole -- our whole team to do private debt, so we leave the LLER on -- portfolio on the run-off mode since August of 2019. So we decided to revamp this portfolio and then we will need to hire new portfolio managers to handle this workload.

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MANAGING INVESTMENT DIRECTOR HSU: Here, it shows the performance of those -- the LLER, as well as the opportunistic side. LLER outperforms 395 basis points in one year. And in the five-year time frame is roughly 214 basis points. The opportunistic side looks like we outperformed by 600 basis points, but I would urge you to ignore this number at this time, because this is a very short period of performance. And then the dollar amount actually deployed is actually not that much. So next year, we should have a better deployment as every -- every GP started to call the capital.

Next slide, please.

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MANAGING INVESTMENT DIRECTOR HSU: Our accomplishments -- major accomplishments is -- again, is the 10 billion deploy -- commitment and then the 1.9

billion deployed. Another one is that we make progress in building out our team and executing on private debt strategies. And we have also developed and implemented the governance process, documents, and then procedures for managing and monitoring the private debt strategy.

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MANAGING INVESTMENT DIRECTOR HSU: So what are our initiatives next year?

The first one is that we want to attract and retain talent, so that we will be able to have enough resources to source -- strategy source manager and then source what we have not seen so far.

The next one is like we want to improve our portfolio monitoring and risk oversight tools. It also includes exploration of extending the use of the eFront is a -- which is a system of housing all the private data to OS.

And then we'll go into continuing to deploy capital to private debt to ensure a robust and well diversified portfolio.

The very last one is we will support TLPM Program in the ALM process, because it is very likely that private debt will become a part of the asset allocation going forward, depending on how the Board choose.

One thing that we are not mentioned here is that our ESG effort -- you know, as a debt holder it is a little bit harder to control the companies because we are not at the shareholders all of it. However, we started to see our GPs, especially in Europe, we do borrowing cost incentives for borrowers. You know, we set up many steps for them to achieve. And if you achieve a certain step, then we will decrease your borrowing spread by let's say five basis points or 10 basis points. And then we actually had a current deal that we actually have a co-investment opportunity that if they reach the goal, then, you know their spread will be cheapened by 12.5 basis points.

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MANAGING INVESTMENT DIRECTOR HSU: So with that, I want to pause for if there is any questions.

CHAIRPERSON TAYLOR: Henry does have a question, but I'm going first.

(Laughter.)

CHAIRPERSON TAYLOR: Jean, really good report. I really, really appreciate this. You had a -- I had a couple of questions, so I'm going to go back to -- well, com on. I'm going to go back to -- where did it go?

Okay. Where you were talking about your priority accomplishments. So, yea on the 10 billion and yea on the deployment. You made progress in building out the team and executing on the debt strategies. Now, building out the team, is that inclusive of, hopefully, if we passed the private debt bill, so you're going to have more staff to take on directly the private debt lending?

MANAGING INVESTMENT DIRECTOR HSU: Can I clarify what do you by mean by directly? You mean, doing it internally or just like --

CHAIRPERSON TAYLOR: Doing it internally, yeah.

MANAGING INVESTMENT DIRECTOR HSU: Oh, doing it internally is a totally different -- total different game than what we are playing it right now, because right now the staff is not -- we don't even have enough staff to do whatever is the GP/LP relationship.

CHAIRPERSON TAYLOR: Oh, wow.

CHIEF EXECUTIVE OFFICER FROST: So, yeah, Theresa, we would need to build out a staff -- staffing plan, once that bill were to pass.

CHAIRPERSON TAYLOR: Okay.

CHIEF EXECUTIVE OFFICER FROST: So Jean's current workforce plan is based on current commitments. The private debt bill will allow us to bring some of those commitments in-house and do our own underwriting, and Jean would need a whole new set of staff to do that.

CHAIRPERSON TAYLOR: Wow. And it sounds like we're still staffing or own. Anyway, okay.

CHIEF EXECUTIVE OFFICER FROST: Yes.

CHAIRPERSON TAYLOR: And then you talked about the ESG strategy and you're doing cost -- borrowing cost incentives. I didn't hear or I missed what those incentives were in exchange for basically? What was the ESG policy or whatever you were do -- working on?

MANAGING INVESTMENT DIRECTOR HSU: Oh, so it is a -- it's a U.K. based company borrowing money. And then we -- the GPs set some steps for them. Okay. For -- number one is like in the environmental side and then the second one is like safety, health, environment, and quality, and then the third one is ethics. Okay. So with these three and if you reach three steps, then the borrowing cost would decrease by 12.5 basis points. If you only reach two steps, okay, we only give you half of that.

On the other hand, if you do not do anything, you're borrowing cost will increase by 12.75 basis points. So this is the way that we incentivize them to do real ESG steps.

CHAIRPERSON TAYLOR: I said nice. That's really excellent. I appreciate that. And I just want to, you know, tell you if you need resources, let us know.

Obviously, you are getting staff to help build this program up. I'm really excited about the program, but I also want to reiterate that I would love to be able to hire State of California employees, so we can take this in-house. So hopefully, cross your fingers, we'll pass the bill next year.

Mr. Jones.

COMMITTEE MEMBER JONES: Yeah. Thank you, Chair Taylor. Yeah, just a quick question. You mentioned eFront, I'm just wondering what is eFront?

MANAGING INVESTMENT DIRECTOR HSU: Oh, eFront is a vendor that they currently are private equity. They use eFront as vendor. eFront has a system for CalPERS it's called PEARS. So it is what we house our private equity's GP/LP relationship, the ILPA template, the performance, and then the -- for private equity also the asset level information.

COMMITTEE MEMBER JONES: So eFront is a vendor?

MANAGING INVESTMENT DIRECTOR HSU: It is a vendor, yeah.

COMMITTEE MEMBER JONES: Okay. Okay. All right.

MANAGING INVESTMENT DIRECTOR HSU: Yeah, it is the system that you use. It's just like in the public market you use Aladdin to house it and then --

COMMITTEE MEMBER JONES: Right.

MANAGING INVESTMENT DIRECTOR HSU: -- in private we're try to use if we can use eFront/PEARS system to see if we can get do that.

CHAIRPERSON TAYLOR: I got you. Okay. Thank you. All right.

MANAGING INVESTMENT DIRECTOR HSU: We are exploring the possibility. Not sure that if it is the best solution, but we will give it a try.

COMMITTEE MEMBER JONES: Okay. Thanks.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Maybe I'll just jump in with a couple of things really quickly on that topic. First of all, Mr. Jones, to you question. One of the goals of the Investment Office, we have our technology that -- you've heard me talk about our technology strategy. One of the issues with our technology is it's based on the old siloed world. And as we move into centralized management and one-team one-fund perspective, it's about trying to consolidate technologies and just reduce some of the complexity that's a result of all these different technologies.

Then the second comment, Ms. Taylor, to your point on AB 386, you know, and you've -- you know, I think you've heard me talk about this, we do think in this private credit space is one of the places where we can best use our -- Arnie talked about it, Jean has talked about. We have a really strong pedigree in my opinion in credit management. We should be able to internalize this function, and if we can get -- if we can get AB 386 passed and give us the ability to internalize. Now, like Marcie said, it would require another staffing plan. We have been significantly -- I think we've doubled the size of Jean's team in the last, you know, call it two years. But it would require more staff. We do think it's something that we could very competitively in-house. So we'll keep our fingers crossed and we get that bill through and then we'll work on that.

CHAIRPERSON TAYLOR: Exactly.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: And we certainly found, you know, the whole team, you know, uncle Michael Cohen's leadership and the like has been, you know, very, very supportive of applying resources.

CHAIRPERSON TAYLOR: Good. And I just want to say it's just -- it's smart, because we are saving money. We're saving management fees, et cetera, so I just think it's the smart way to go.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Absolutely. The value proposition is compelling.

CHAIRPERSON TAYLOR: Yes. Yes. And go on.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right. We'll move on to private equity. So let's -- I'll turn it over to Greg. Greg, over to you.

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MANAGING INVESTMENT DIRECTOR RUIZ: Great. Thanks, Dan. I'll being with a few implementation highlights. Then I'll move into a discussion of asset class performance and execution, and I'll conclude by touching on a few accomplishments and initiatives from the past fiscal year.

On slide 34 here, a few implementation highlights from this year include expanded partnerships with high quality managers, disciplined expansion of capital deployment while increasing portfolio cost efficiency and diversification, as well as a completed strategic planning process framing our portfolio objective and strategic priorities.

On the next slide, we give an overview of the private equity asset class performance.

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MANAGING INVESTMENT DIRECTOR RUIZ: In any discussion of private equity program performance, I believer there are two important principles to consider. The first is time. The goal of investing in the private equity asset class is to generate long-term capital appreciation. This leads us to a focus on longer term performance, individual year performance tends to be less meaningful than the five-, 10-, and 20-year performance numbers.

The second principle is measurement points. There are a number of complexities in assessing private equity stemming from the fact that there is not an investable benchmark, as you have with public equity. As a result, we engage multiple points of measurement, including performance relative to our policy benchmark, peer benchmarks, other asset classes, and absolute performance.

If I could point your attention to the top chart, we'll lay out Private Equity Program performance for the 20-, 10-, five-, three-, and one-year time periods. To ground you in the numbers, private equity generated 10.1 percent return over the past 20 years, 12 percent over the past 10 years, 14.2 percent over the past five years, 13.7 percent over the past three years, and 43.8 percent over the past year. Relative to last year, private equity performance has improved on an absolute basis across all time periods. If you look at the bottom chart, we lay out performance versus the policy benchmark.

Here, you will see private equity performance underperform the policy benchmark for all time periods. We are working to position the private equity portfolio to durably outperform the policy benchmark over time. We understand the underlying drivers of program underperformance, a lack of consistency, a lack of diversification, and a lack of cost efficiency.

In addition to these long-term factors, private equity is likely to underperform in periods of rapid value appreciation in the public markets, as a result of private equity portfolio company valuations adjusting at a more measured pace. This past year was a time of such appreciation in the public markets, and as would be expected in such time periods, the Private Equity Program experienced strong absolute performance, while underperforming the benchmark by a material margin.

On the next slide --

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MANAGING INVESTMENT DIRECTOR RUIZ: -- we've laid on you CalPERS private equity performance relative to peer benchmarks, both Cambridge and State Street. I would note these returns are presented on an internal rate of return basis, which is consistent with how these peer benchmarks are reported.

Here, you can see CalPERS Private Equity Program has underperformed peer benchmarks across all time periods, in many cases by a substantial margin. As we decomposed our performance along various dimensions, we affirmed our assessment that the underlying drivers of underperformance remain the same, a lack of consistency, diversification, and cost efficiency. And I'd like to take a couple minutes to share the progress being made in addressing these issues.

The first is consistency. Time will be the ultimate test of our consistency. Continued adherence to a methodical capital commitment pacing plan will help embed consistency in our program in a way that will contribute to outperformance over time. We are on a path to establishing a consistent pace of deployment, which we have maintained through the market movements over the past 18 months. Maintaining this consistency through cycles will be critical to our program's long-term performance.

The second area of focus is diversification. We are in the early stages of broadening the Private Equity Program's exposure to the middle market, growth, and venture segments. Greater diversification will ultimately provide a more balanced exposure and contribute to long-term performance.

There are however short-term risks inherent to diversification. Diversifying the Private Equity Program will add exposures that may underperform in the near and medium term. We acknowledge these risks and have chosen to proceed, given our conviction that additional diversification by underlying strategy will drive outperformance over longer periods of time.

Our third area of focus is ramping the cost efficiency of our portfolio. To do this, we have reestablished our co-investment program and have strong early traction supporting our managers as an efficient co-investment partner. And our program is beginning to experience notable benefits from reestablishing our co-investment program.

COMMITTEE MEMBER BROWN: Hello. This is Margaret.

CHAIRPERSON TAYLOR: Go ahead. She's muted.

MANAGING INVESTMENT DIRECTOR RUIZ: Yeah. I was just noting that we've begun to experience really notable benefits from our co-investment program, even beyond increasing the cost efficiency of our portfolio. By working closely with our partners on individual co-investments, our team continues to deepen our understanding of the capabilities and differentiation of our partners leading to deeper overall relationships and improved capabilities in manager selection.

On the next two slides, we lay out our priority accomplishments and initiatives.

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MANAGING INVESTMENT DIRECTOR RUIZ: And I'd like to spend a couple minutes touching on a few of these before wrapping up. The first is our team. Our team has been outstanding and persevering through the many challenges over the past year. Through it all, I've seen our team exhibit a level of professionalism, dedication, thoughtfulness, and compassion that stands out.

In a time when some erosion of the team's culture would be understandable, we've strengthened our team's culture and I believe we'll emerge from this time period stronger than when we entered.

We have also completed our strategic planning process this past year to bring clarity to our path forward, and we are working to further evolve our sustainability strategy and the integration of sustainability factors into our processes. And we expect to have more to share on these efforts in the months and years to come.

Thank you for the opportunity to share this overview of the Private Equity Program.

CHAIRPERSON TAYLOR: Thank you, Mr. Ruiz. That was an excellent -- I can't even think of the word right now, I'm so tired -- presentation. It doesn't look like I have any questions, so if you want to move on.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah, we can move on with real assets under Sarah Corr. So, Sarah, over to you.

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INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Sarah, we're not getting -- I'm not getting audio. Are others getting audio from Sara?

CHAIRPERSON TAYLOR: I'm not either

MANAGING INVESTMENT DIRECTOR CORR: Can you hear me now?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Oh, there we go, yep.

CHAIRPERSON TAYLOR: Yes.

MANAGING INVESTMENT DIRECTOR CORR: Okay. Sorry about that. Good evening, members of the Investment Committee, it's a pleasure to present the annual program review for real assets to you. Although, I'm the only member of the real assets team sitting before you, I want to emphasize that the preparation of this presentation was a total team effort not only from real assets but also from many areas of the Investment Office, and other example of the one-team approach we've been talking about.

In July, this Committee approved the Real Assets 2021 Strategic Plan. The plan focuses on achieving the strategic asset allocation target through the deployment of capital at scale, while maintaining high underwriting standards and strong governance.

This past year, the pandemic presented real assets with unprecedented challenges related to retail and office closures and leisure and business travel restrictions. During this period of uncertainty, our exposure to and continued focus on stabilized assets demonstrated the resiliency of the portfolio.

There remain variables that will determine the true impact on COVID and certain real estate and infrastructure sectors. In our view, being consistent and disciplined is key to real assets to be able to continue to provide stable cash yield and inflation protection.

Looking at the past year, the portfolio showed its resilience as evidenced by outperforming the benchmark in the one-, five-, and 10-year periods, largely as a result of exposure to high quality essential core assets.

Despite challenging investment conditions, CalPERS managers completed acquisitions to during the period totaling $4 billion of equity. Through CalPERS continued use of the annual investment planning process for the separate accounts, which currently represents almost 90 percent of the real assets exposure, staff was able to align the focus of our managers with CalPERS desired exposures.

Further, real assets staff continues to benefit from the skills resident in other areas of the Investment Office, whether it's market perspective from Fixed Income, hedging guidance from ESS, or research and insights from the Research and Strategy Group.

Regarding challenges, increased capital inflows into the real assets market coupled with a strong demand for core products has resulted in increased competition. COVID-19 has had a negative impact on certain infrastructure and real estate sectors, namely transportation and retail, and to a lesser extent multi-family and office.

Next slide, please.

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MANAGING INVESTMENT DIRECTOR CORR: The really assets portfolio exceeded its benchmark and continues to meet the important role of providing stable income to the total fund. The core real estate portfolio, which represents over 70 percent of real assets, exceeded the benchmark in the three-, five-, and 10-year periods. Conversely, in the longer term, the non-core real assets portfolio continues to be a drag on performance as is illustrated on slide 87.

The infrastructure portfolio material outperformed the benchmark across all periods. Although we are long-term investors, I would note that the industrial portfolio was a strong contributor to the one-year return.

Next slide, please.

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MANAGING INVESTMENT DIRECTOR CORR: The focus of the previous fiscal year was on the development of the five-year strategic plan approved by the Committee in July. Our managers also required $3.7 billion of new core investments. The continued focus on core investments is consistent with a strategic plan refresh. The team also reduced exposure to assets not aligned with the real assets role by over $800 million.

Related to infrastructure, the team focused on ways to expand the opportunity set, increase deployment, and grow the infrastructure portfolio. Real Assets staff embraced the Investment Office's vision of one team, one fund through the culture of trust, respect, and accountability and collaborated extensively with other areas of the Investment Office. We expanded our analytical capabilities by implementing and asset level attribution framework to strengthen staff analysis of our manager's assets and market selection.

Next slide, please.

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MANAGING INVESTMENT DIRECTOR CORR: Focus in the current year is implementation of the 2021 five-year strategic plan. Priorities of the plan include deploying capital at scale required to reach the strategic asset allocation targets underwriting the infrastructure portfolio. The focus on core assets has served the total fund well and will continue to be a priority. The enhanced attribution framework will further integrate into our portfolio construction efforts.

As we align with the total fund priorities, real assets will continue to integrate sustainable investment practices into our processes. We'll also continue to support the total fund as we implement the ALM.

To conclude, I would like to underscore how important maintaining a disciplined and consistent approach is delivering long-term returns. The 2021 strategic plan emphasizes deployment of capital at scale in order to achieve the strategic asset allocation target, while maintaining high underwriting standards in alignment with our managers.

In closing, the one-team one-fund vision and support of the Investment Committee are key in initiating priority initiatives as well as the Investment Office mission to generate returns to sustainably pay benefits.

Thank you and I'll now take questions.

CHAIRPERSON TAYLOR: Thank you, Sarah. Excellent report. I have a quick question. I don't see anybody else that has a question. But you talked about continuing to deploy capital at scale. Are we -- are we looking at -- and you also said that there were problems with some of our real assets during the pandemic, because of restructuring of the workforce, et cetera. Is that going to be a problem, because our core assets are more commercial and stuff like that. So are we looking at different core assets?

MANAGING INVESTMENT DIRECTOR CORR: No. We'll continue to look at the same kind of core assets. And some of the growth will also come from expanding the infrastructure opportunity set that we look at. We've had a very narrow view on infrastructure. And by looking at -- having a broader opportunity set to look at should be able to increase the scale of the infrastructure within the real assets portfolio.

CHAIRPERSON TAYLOR: Okay. Great. And then I had -- as you continue to focus on your sustainable investment initiatives, are you looking at your responsible contracting and those kind of things, is that what you're talking about?

MANAGING INVESTMENT DIRECTOR CORR: Yeah. The responsible contracting is definitely part of that. The annual report I believe will come to this Committee in November.

CHAIRPERSON TAYLOR: Thank you.

Anybody else with questions?

That's it.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Ms. Taylor, could I comment real quick on Attachment 2? It refers to a few of the questions that came up during the day. Approximately page 461, Attachment 2, page three.

CHAIRPERSON TAYLOR: Hold on. Attachment 2, page three.

Okay.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: So page three, while not black swans that Mr. Jones was referring to, does show some of the various stress scenarios that our Total Fund team and our Risk team run on a regular basis on our portfolio to understand where performance would go in certain environments. So I just wanted to highlight that. Obviously, black swans would not be on this page, but it does show some of the things we look at.

The next page, which is page four, deals with the stress test we do on liquidity. And the slides at the bottom also go through those historical stress events and show a coverage ratio. So the 2.7 rate now showing we have extremely high liquidity. And this work -- this liquidity and leverage work will be extremely important as the private assets go up and/or the use of leverage.

And then finally, the next page five, which I don't want to get too much into the details, but Ms. Paquin asked, you know, where we might see leverage show up in this report, which I do believe Dan comes out twice a year. Page five here does highlight the leverage calculation and references whether it's part of the strategic benchmark or an active decision that staff is making.

So I just wanted to highlight there are these reports out there that -- obviously, it's late at night and another time we could dig into them, but they -- the risk group and the total fund group do a lot of work to highlight the risk to our portfolio. So I just wanted to get that out there quickly.

CHAIRPERSON TAYLOR: Thank you, Mr. Phillips. I appreciate that. That sort of brings me to the point I was going to ask before we move on to the consultants, is that we've got to figure out - we talked about this last year - a better way to do this big meeting that we have in September, so that we are not -- most everyone is off-line. We lost a few of our own Board members, because it's so late. I'm -- I don't know if that means we cut our investment day in half, and then do it on Tuesday, and then move our meetings out. I don't know, but I think we need to kind of explore that, and -- so that we also -- I know there were people probably wanted to comment too, public comment. I think we're probably way past their time. So I just thought I'd bring that up for us to marinate on and talk about later. And then we can move on to, I'm sorry, I believe it's our consultant's review of the trust.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah. If I

MR. TOTH: Fantastic. Thank you, Madam Chair. Oh, sorry, Dan. You had some opening comments.

CHAIRPERSON TAYLOR: Yeah, Henry, go ahead.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: No. I was going to basically say that we have Tom here, but I see a question --

CHAIRPERSON TAYLOR: Yeah.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

--coming in from Mr. Jones, so why don't we take that and then over to you.

COMMITTEE MEMBER JONES: Sorry. I did put in the chat this time. Thank you. Yeah, back to this earning -- the last chart, looking at the leverage breakdown and the liquidity, the liquidity that's what we set up after the financial crisis, that $4.8 billion?

CHAIRPERSON TAYLOR: Dan.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: So that is an estimate we're using, basically one percent of the fund, so it would be 4.9 today. It's a plug based on our estimate of need. Certainly, as leverage goes up or uses of liquidity, you know, through the private assets, things like that, to the extent that's stressed test on the prior page were to show more stress, that plug number there could quite large -- quite possibly become larger.

I think Ben stressed it really well that, you know, too much leverage is costly, but too little is deadly. We are -- and Dan I think mentioned earlier, I was very close through the financial crisis to our securities lending situation. And so we have an acute awareness of how important liquidity is. So those -- all those pages sort of work together, but that's a plug based on today's estimate, given our stress test scenarios.

COMMITTEE MEMBER JONES: So this total policy leverage of 4.4 percent at the bottom, does that -- is that part of the 20 percent leverage policy?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: (Nods head.)

COMMITTEE MEMBER JONES: So -- okay. That's the 4.4 --

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Exactly. Exactly.

COMMITTEE MEMBER JONES: -- you referred to earlier today. Okay.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Yeah, that's the active portion that staff has put into the portfolio, largely in Jean's area with the opportunistic stuff she's doing. But to the extent something is not in the strategic asset allocation, so in the benchmarks, to the extent we do it, it will show up in that number there.

COMMITTEE MEMBER JONES: So looking at the real estate, for example, 22 -- is it 22 billion, I guess, net of cash. So how does that -- what's the leverage amount? Is that the leverage amount of the real estate portfolio?

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: I'm trying to decipher this as I look at it here, Mr. Jones.

COMMITTEE MEMBER JONES: Yeah, because earlier you said that you had embedded leverage throughout the asset -- different asset classes. Is that what you mean here?

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Yeah, I may have to pull Michael Krimm forward who put this together. We have within the real assets benchmark there is leverage in the benchmark, 30 or so percent. And so what exactly this number is, I wouldn't want to speculate. Michael Krimm and now Rob Patterson heading up the Investment Risk Group.

CHAIRPERSON TAYLOR: I think Sarah looks like she might want to talk.

(Laughter.)

MANAGING INVESTMENT DIRECTOR CORR: That's the gross leverage across the real assets portfolio. And then Rob can probably talk to this part better. But the amount that's relative to benchmark is part of the 2.9 that's backed out to get to the 4.4. So part of that 2.9 is the leverage embedded in the real assets benchmark.

COMMITTEE MEMBER JONES: So we really haven't really used a lot of leverage then what this is saying then in our total portfolio?

CHAIRPERSON TAYLOR: Yeah. It doesn't look like it.

COMMITTEE MEMBER JONES: So why do we need to change the policy, if we don't use what we have?

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Well, I -- Dan, you may want to comment, but part of it is whether we want it in the strategic benchmark in the asset classes and then the other part would be either through increased use of opportunistic or potentially if we were to have another heavy drawdown, we could use leverage tactically.

But I think the real question, from my standpoint, is whether we want in in the strategic benchmark or whether we want to use it tactically and/or both.

COMMITTEE MEMBER JONES: So the fiver percent over in the strategic benchmark would be added to this 4.4?

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: It would be added to the 2.9.

COMMITTEE MEMBER JONES: Oh, okay. Okay. I see. Okay. Okay. I think I got it. All right. Thank you.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: And Mr. --

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes. And that would be added to the 2.9 to Arnie's point. And then the 4.4 would continue to be applied to the 20 percent or the 20 percent policy limit would be applied to the 4.4.

COMMITTEE MEMBER JONES: But this is still saying that we have this big leverage policy that -- you know, so you could just make decisions with what you already have. Why -- and that's -- you know, that -- so that that five percent in the benchmark is peanuts compared to this, right?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Well, I mean, it's a good questions. And I would say that currently we're using about a quarter -- one-quarter of the policy provision around using leverage. We're using about a quarter of it now, right, having a four point -- four percent versus a 20 percent policy limit. You know I would argue that in tracking error in some of the asset class ranges, it's similar, that we're using a lot less than the -- you know than the sort of policy authority that the policy gives us.

But importantly to Arnie's point, if we get that dislocation, we like having the -- you know, the authority within the policies, that if we get that dislocation, we can take the active risk, but adding five percent to the strategic asset allocation would be more about just having a systematic exposure to leverage that we would view being in the -- as opposed to active risk, we would see that actually sitting in the policy and the policy benchmark.

COMMITTEE MEMBER JONES: Yeah, because I'm just trying to in -- you know, being informed when we talk about the asset allocation, those scenarios where we're talking about using leverage, that five percent, it go -- and you add it to this 4.4 percent and the current policy of 20 percent, I'm trying to understand what does it do to that 20 percent based on this number and the -- and the five percent in the portfolio construction. It's still way below the 20 percent that you already have.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS: Yeah, two points, Mr. Jones, I would add. The 4.4, if we do got a drawdown, so the denominator effect, so that assets under management for total fund drop, when the leverage doesn't change, that 4.4 will become a bigger number naturally. But the other I think key determinant or difference is adding it to the strategic asset allocation, as Sterling was presenting earlier when we were looking at the candidate portfolios is about improving diversification, not improving return. The ability to do the opportunistic or take advantage of a drawdown would be an opportunity to add actual returns.

So the strategic side really for us at the -- you know, currently and what we're proposing is about better diversification for the same expected return. That 20 percent could be used to actually add value over time in addition to the benchmark.

COMMITTEE MEMBER JONES: Okay. Thank you.

CHAIRPERSON TAYLOR: Okay.

COMMITTEE MEMBER JONES: Thank you.

CHAIRPERSON TAYLOR: Thank you, Mr. Jones.

Are we moving on to the consultants now, Dan?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: I believe so. I think we're good, unless there's anything else, Madam Chair, that you have, we can turn it over to Tom to take us -- to lead us off on the consultant item.

CHAIRPERSON TAYLOR: Mr. Toth, go ahead.

(Thereupon a slide presentation.)

MR. TOTH: Thanks, very much. Madam Chair and members of the Board, I hope this meeting has been productive. There certainly have been a lot of very good questions. I also know it's been a long day, so I'm going to limit my remarks to new information.

Ms. Rosborough Watt talked about the market environment and economy. Dan and the rest of the team discussed the portfolio results. We've also spent a lot of time talking about capital markets assumptions, so I won't dwell on Wilshire's specific asset class assumptions, though the information is there for the Board in Attachment 1.

I'll also point out that the Wilshire report includes portfolio performance by segments on both and absolute and relative basis. There's attribution on pages 12 to 15. That information also aligns with Dan's earlier comments on return drivers, so I won't belabor that this evening.

And I'd plan to talk about the universe comparison, but we touched on that already as well. So

I'll actually, if it's okay, move ahead to Item 8C, Attachment 3, which is our internal program review.

Now, Wilshire evaluates the CalPERS investment programs with a similar framework that we use when assessing other large asset management organizations. This includes a review of the larger organization as well as the individual program teams, the investment processes, portfolio construction, risk management, implementation, and attribution. And it's really meant to provide the Board with an independent analysis of the strengths and risks present in the investment organization.

The output of the review is included in the appendix of our opinion letter. And there's a lot of very good information spread throughout on each of the individual teams.

As I mentioned, an assessment of the factors contributing to the stability of the organization and incentive alignment is an important component of the review. And as such, I think it's important to point out that this year's overall organization score remains impacted by the open Chief Investment Officer position. I've said in the past, and I'll reiterate it here, we have a very high opinion of the interim professionals, but the senior team stability is not where it needs to be in order to receive a higher score. We're certainly monitoring that and would expect that to improve going forward.

We do note that the organization has made strides to be competitive in the marketplace for top-notch high caliber investment professionals. As you know, CalPERS is vying for talent in a very challenging environment. And we think it's important that the Board understands that any contemplated changes to incentive compensation or other should be evaluated with the clear understanding of what those potential changes might have on the team and recruiting. I know that's an ongoing workstream with the Incentive Compensation Committee.

Now, during fiscal 20-21, we continued to see a commitment from the Investment Office to work across asset classes. That was a real highlight of Dan and the team's earlier comments. And that focus on improving total fund performance, as team members lend their expertise across asset classes, and working groups is viewed very favorably by Wilshire. And Arnie, in fact, highlighted one specific action that was additive to total fund active returns.

As I think Ms. Rosborough Watt's earlier presentation highlights, there's meaningful economic analysis and quantitative research available to help understand the investment environment and it's utilized by the senior team to assess opportunities in support of the total fund objective.

Here's where I normally would transition into highlighting the scores of the individual programs and one or two takeaways. But in the interests of time, I'll merely summarize that Wilshire is confident that the internal programs under discussion are being managed in an appropriate manner to efficiently deliver their respective market exposures with potential for outperformance. And you've seen that global fixed income in particular, but also across time frames in other areas like global equity and real assets.

The TLPM team is doing very strong work on the asset liability management side. As we've seen in the discussions today, while the trading team continues to expand its capabilities in providing synthetic exposures in liquid equity and fixed income markets.

I will stop there. I would encourage you to look through the rest of the opinion letter. There's some other points as well as the specific scoring per usual, but I'll stop and see if there are any questions from the Committee first.

CHAIRPERSON TAYLOR: Yes, we do have a question from Ms. Greene-Ross.

ACTING COMMITTEE MEMBER GREENE-ROSS: Yes. So just wanted to ask about, given the Federal Reserve's actions recently to maintain low interest rates, are there any other strategies or considerations we should implement?

MR. TOTH: Ms. Greene-Ross, that's a -- that is a great question and I think it is being incorporated in the ALM work, particularly the opportunistic strategies bucket, which is kind of morphing to a dedicated allocation to private credit. I think that's a very strong strategy considered in this environment, given that it provides what we call idiosyncratic or we'll say off-market opportunities to generate performance. So I think that's one that is being incorporated into the ALM process.

I think from a construction standpoint, we are aligned with some of the comments made earlier around the utilization of leverage to drive returns higher, while maintaining diversification in the portfolio. So I think the continued evaluation of that as a portfolio construction tool remains appropriate.

And then, we've talked a lot about private equity. But from a return driver standpoint, that is one of our highest expected returning asset classes. And you can see -- you have seen and will see further in upcoming meetings the impact that that has on the total fund's return profile.

ACTING COMMITTEE MEMBER GREENE-ROSS: Thank you.

MR. TOTH: Um-hmm.

CHAIRPERSON TAYLOR: I don't have any other questions from any of the other Board members. I'm checking Henry to make sure. But I had a real quick question. You guys made a point on your letter to talk about -- from last year, where you talked about an opportunity to continue shaping INVO culturally and strategically, and to focus on total fund performance. And during this period, you said it's absolutely crucial to maintain a focus on Investment Belief Four, that long-term value creation requires effective management of the three forms of capital, financial, physical, and human, and number 10, strong processes, and teamwork, and deep resources are needed to achieve the goals and objectives.

So I just want to know, are we, you know, promising -- we are working on integration of sustainability across the portfolio. And you guys are doing a great job and I want to applaud you guys on that. And everyone here has talked about their portion of the ESG through their asset class. But I just want to encourage you to keep going, because I guess I think about those long-term structural economic losses, when we're not looking at DE&I, and we're undervalue in the workforce. There's, you know, gender bias, racism, and then of course our climate risks that are just apparent, because we live in California, but it's impacting insurance companies. It's impacting municipal funds. And it's basically a huge disruption.

So I'm just encouraging everybody to stay on track with that, but I wanted to call Wilshire out and thank you for helping us stay focused on that in terms of your commentary on this, so I do appreciate it.

MR. TOTH: Thank you, Madam Chair. It's our pleasure.

CHAIRPERSON TAYLOR: Anybody else?

Oh, wait. Never mind.

All right.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: All right, Madam Chair. I think that moves us to now the private asset consultant portion of this item, which we have Steve McCourt here from Meketa joining us. So I saw Steve, but now I don't see Steve. So can I ask -- it looks like we got Mr. Miller in. Can I ask David to please bring Steve McCourt up into the presenter area.

There he is. Steve, over to you.

MR. McCOURT: Batting in the ninth spot of the order today. This is Steve McCourt at Meketa Investment Group. Thank everybody. It's been -- it's been a long day, so I'll keep my remarks sort of high level at the critical elements of our review of the private equity and real asset programs.

Before I get started, I just wanted to step back and just highlight the obvious, that over the last year, it's been a remarkable year from an operating perspective with COVID. I'm guessing none of us would have expected that 18 months after the COVID crisis, we'd all still be working remotely and meeting remotely. And in the context much that, the operations of the private equity and real assets staff have been remarkable with respect to maintaining strategic focus and aligning the portfolio with strategic initiatives. So I wanted to start with that observation.

Starting with private equity, the private equity portfolio has performed well through the pandemic with a strong uptick in returns. Staff, as mentioned, has executed well. Private equity performance has improved meaningfully over all time periods during the year. Overall, private equity grew by over $14 billion in the trailing 12 months, most of that through asset appreciation.

The one-year return is eye-popping at over 40 percent, reflective of appreciation in the asset class broadly. But as has been noted several times, the focus should really be on longer term returns across the Board, but particularly for private market categories. And the private equity program's returns over longer time periods continue to improve as well with time, reaching for the trailing 10-year period 12 percent per year. That compares to a trailing 10-year return of 10.4 percent last year, so strong improvement.

Obviously, private equity remains the strongest performing asset class for CalPERS and most other investors. I think Greg and staff did a nice job addressing the relative underperformance of the asset class vis-à-vis its benchmark. The one thing I would -- I would add is, because the private equity benchmark is based on a public market index, the relative results turn quite quickly in both directions. Just 12 months ago, the program was exceeding its benchmark over all time periods, because the market had turned south due to the pandemic. So relative volatility of the returns versus the policy benchmark is to be expected.

Regarding implementation, staff's deployment pace has increased in recent years, and in the prior 12 months, reach nearly $14 billion. The majority of the commitments are made to funds which called down their capital over several years.

Additionally, though, staff has meaningfully increased their investment in no, and low fee, and carry co-investments.

Finally, staff's working to increase portfolio diversification, adding growth equity in mid-sized buyouts to a portfolio that has been heavily weighted to large and mega buyout strategies historically. The portfolio is in full compliance with all policy parameters and the private equity team in numbers continues to grow at multiple levels.

Those are my prepared remarks on private equity. I'll pause there for any private equity questions anyone might have before moving on to real assets.

CHAIRPERSON TAYLOR: I am not seeing questions. I think everybody is ready to go. Go ahead.

MR. McCOURT: Very good. On the real assets portfolio, the real assets portfolio was valued at $46 billion through the reporting period, comprised 85 percent of real estate and 15 percent of infrastructure. Real estate returns have more or less mirrored the broad market over trailing time periods. Returns for infrastructure have exceeded benchmarks over all trailing time periods. Within real estate, performance in the areas that have been impacted more directly by COVID, largely retail and office, have been weaker, but have been offset by stronger performance within CalPERS, industrial, data center, and residential sectors.

The real estate portfolio remains primarily lower risk for core assets. Leverage, as measured on a loan-to-value basis is approximately 32 percent. Infrastructure, as mentioned, comprised 1.3 percent of the total fund. And the net asset value was 6. -- was up to $6.1 billion, up nearly a billion dollars from a year prior. Infrastructure over the trailing year was up 7.2 percent, as those assets have recovered somewhat from the dislocation of the pandemic.

Real estate and infrastructure remain compliant with all policy parameters. Both portfolios are predominantly invested in core assets. I will note that one difference between the two portfolios is where real estate is predominantly invested in the U.S. Roughly 93 percent of your real estate assets are invested in the U.S.

Infrastructure currently is about 50 percent U.S., 50 percent non-U.S. And as we noted in our report, given the lumpiness of investments within the infrastructure asset class, it may be appropriate for staff to evaluate modifying the constraint on international exposure within the infrastructure asset class, as it continues to look to increase the allocation to infrastructure.

That concludes my remarks. I'm happy to take any questions on real estate or infrastructure.

CHAIRPERSON TAYLOR: Great. Thank you, Mr. McCourt.

It looks like Mr. Jones.

COMMITTEE MEMBER JONES: Yeah. Thank you, Chair Taylor. Yeah, thank you, Mr. McCourt. Do you have any viewpoints on whether or not the -- if it's passed, the administration's infrastructure bills being implemented, is there a possibility of private partnerships -- public-private partnerships going forward, or would they -- normally, when it's a government program, the interest rates return maybe too low.

(Laughter.)

COMMITTEE MEMBER JONES: Do you have any viewpoint on that?

MR. McCOURT: Yeah, more the latter likely. The -- but I think there's still plenty of space for commercial investment at reasonable rates of return in larger infrastructure programs, even with a federally funded program. There's just too much to do, too much space to fund.

The other thing I would highlight as you bring it up, it's very unclear at this point whether the infrastructure bill -- whether and if the infrastructure bill or the three and a half trillion dollar budget bill exactly how much that will involve deficit spending. But I do note that with respect to infrastructure, because infrastructure tends to be a interest rate sensitive asset class, and so if the infrastructure bill comes with it a large amount of borrowing from the federal government, that could -- that could negatively impact infrastructure assets. But at this stage, a bit too early to tell what that risk might be.

COMMITTEE MEMBER JONES: Okay.

CHAIRPERSON TAYLOR: Is that it, Mr. Jones?

COMMITTEE MEMBER JONES: Yes, please. Thank you.

CHAIRPERSON TAYLOR: Okay. It looks like I don't have anymore questions.

Dan, are we -- do we have anything else?

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: That concludes -- no, that concludes what we have under this item for the agenda, Madam Chair.

CHAIRPERSON TAYLOR: Okay. Then Agenda Item 9 is, I hope you kept track, summary of committee direction. And I will add, I think we had talked about E as one of the portfolios. I think in the chat people were talking about including E, so let's do that.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Yes, Madam Chair, we'll bring back a six and a half after percent levered and unlevered, a 6.8 levered and unlevered, and then a seven percent. That as we talked about with Portfolio E, it does -- it is -- it has to take levered to get to seven percent, but we will bring back those five choices and then through the various lenses that we talked about.

CHAIRPERSON TAYLOR: Okay. Great. So that's the C & D 6.5 levered and unlevered and then Portfolio E, right? I had B. I don't know why. Okay. Go ahead with the rest.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Arnie, do you want to -- do you want to take us through Committee direction, please.

INTERIM DEPUTY CHIEF INVESTMENT OFFICER PHILLIPS:

Sure. So in addition to the portfolio candidates we just talked about, the China holdings outlook overview risk return possibly in November depending on how the November agenda looks, but we owe you that. So that was the only other one I had, Dan. Did you --

CHAIRPERSON TAYLOR: So I think -- I mean, I don't think it's necessary to bring it back on the agenda, because I know that's going to be a huge agenda. If we want to just do a Board note, you can -- we can talk about it. But, you know, I don't know that we want to be talking about that in that busy meeting, because here we are at quarter to seven in this busy meeting. So anyway, I appreciate it.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE: Now, Ms. Taylor, are you talking about the China exposure?

CHAIRPERSON TAYLOR: Yeah.

INTERIM CHIEF INVESTMENT OFFICER BIENVENUE:

Yeah. Perhaps what we could do is we could start with a Board note. And then if there's a desire to have a deeper discussion, we certainly can agendize that, even if we cover it at an off-site or something.

CHAIRPERSON TAYLOR: Sure. Sure.

We can discuss that certainly.

It looks like, if that's everything for summary Board direction, then we do have some public comment. So I don't know if Mr. Fox is still there, but, yeah, we do have four callers for public comment.

STAKEHOLDER RELATIONS CHIEF FOX: I'm here as long as you are, Madam Chair.

(Laughter.)

CHAIRPERSON TAYLOR: Well, go for it then.

STAKEHOLDER RELATIONS CHIEF FOX: We have -- we have four callers. The first caller wanted to catch us on Item 6A, so he's going to make comments about that during the public comment, Mr. William Cunningham.

MR. CUNNINGHAM: I appreciate -- good evening. This is William Michael Cunningham, Creative Investment

Research.

I was commenting on the Total Fund Investment Policy, Items 7 and 15B, as well as, of course, Appendix 7, in light of changes in the volatility, I'll say, of social issues. And I'm specifically referring to reproductive rights in various states, and the impact that that will have on valuation of certain companies that are headquartered in those jurisdictions.

Now, your portfolio is diversified enough and broad enough, so that you will not be impacted negatively we don't think by that sole issue. But there's another factor, and that is as these states become less attractive, and I'm talking Texas, to global cosmopolitan corporations, our economic models show that the state of California, other things equal, becomes more attractive. And that has longer term implications for employment, tax revenues, other factors, again longer term, so -- but to summarize, the Total Fund Investment Policy, Items 7 and 15B, really have done an outstanding job of integrating these ESG factors and social factors into the portfolio broadly, as we've heard throughout the course of this call. So thank you for your time.

CHAIRPERSON TAYLOR: Thank you.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is Suzanne Hume with CleanEarth4Kids.org.

MS. HUME: Hello and thank you so much. My name is Suzanne Hume and I'm the educational director and founder of CleanEarth4Kids.org. I'm a former teacher and a reading specialist, a school district trainer working with children, and CalPERS member that are instructional assistants and also city and State employees.

CalPERS has $30 billion invested in fossil fuels. Fossil fuels are losing money. Today, for hours we've listened to, you know, what to do. So if you would have divested from fossil fuels 10 years ago, you would have increased profits for retirees by about $11.9 billion.

Please divest from fossil fuels and join the numerous universities like the UC system, Georgetown, Harvard, the country of Ireland, the New York Common Pension Fund, the State of Maine, and so many others, because for CalPERS, people did not give up their entire lives working for the betterment of children and the public only to have CalPERS invest $30 million[SIC] into fossil fuels that spew toxic, neurotoxic, mercury, and lead. There's no safe level of mercury and there is no safe level of lead. This causes lots of problems for children with their health and their learning.

Also, burning fossil fuels creates benzene and toxic chemicals that get into our water, the water that our kids drink and the air that they breathe. And so it's so very important. Also for racial justice, think about Native American communities and so many others like Standing Rock, et cetera. And when those pipelines are put in through their only drinking water source, right, and the pipelines leak and the oil spills, I mean, you're just -- you're ending dreams.

So for the -- those of you that have pushed to divest, please know that we are so grateful for you. And for those of you that think that for some reason you need to stay invested in fossil fuels even though they lose billions of dollars, you really need to think about the kids and their future. Fossil fuels are hurting children's brains, hearts, and lungs, and this is all researched. You can go on CleanAir4Kids.org to our different teams. Our youth know. Scientists and doctors know. Its really, really important.

So our youth wrote many questions to you and I won't have time to say all of them, because obviously my time is limited and I can't the screen. I'm calling in on my phone. But one of the questions they wanted to ask was if you were aware that asthma is the number one reason children miss school and the third leading reason why children under 15 are hospitalized, because air pollution triggers asthma?

And also, if you had looked at the studies from children living in Mexico City and other areas with a lot of air pollution, if you've looked at those studies about what happens to the brain? They actually get dementia. They have lesions on their brain. Fifty-seven percent, maybe 56 percent of the children through brain MRIs you can see the lesions

CHAIRPERSON TAYLOR: Ms. Hume, I have to interrupt. I'm sorry your time is up.

MS. HUME: It is. Okay. Thank you so much. Please divest. Have a great evening. Thank you. Bye-bye.

CHAIRPERSON TAYLOR: Thank you.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is Jeanette MacMillan

MS. MACMILLAN: Hi. Hi. Can you hear me?

CHAIRPERSON TAYLOR: Yes, we can.

MS. MACMILLAN: Can you hear me okay?

CHAIRPERSON TAYLOR: Yes.

MS. MACMILLAN: Great. I'm here also to speak in favor of aggressive divestment from fossil fuels and reinvestment in a just transition to cleaner energy.

I'm a current State employee and a future CalPERS beneficiary. I'm also a member of Fossil Free California.

I'm also a mother. I want to be a grandmother some day. When I retire and I'm drawing a CalPERS pension, I want to be able to take my grandchildren to a clean beach or a forest that isn't filled with wildfire smoke. I think CalPERS should be taking a long-term perspective and Building the kind of future we want to retire in. Further more, I don't want my pension funds propping up a dying and destructive industry. Our society can't keep expanding fossil fuel infrastructure. We need to stop now and accelerate the energy transition.

Specific investments I want CalPERS to divest from right of away are China Energy and Exxaro, both of which promote coal use, which we all know now is the worst of the worst of fossil fuels. The strategy of shareholder engagement is not accomplishing what it needs to accomplish. And I urge CalPERS to switch to a divestment strategy.

You know, at some point, this fossil fuel infrastructure is going to be a stranded asset that drags the fossil fuel companies down. Does CalPERS intend to stay invested until that time? CalPERS should want to get ahead of these issues and be a leader instead of a follower.

Thank you.

CHAIRPERSON TAYLOR: Thank you.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is John Bottorff with CleanEarth4Kids.org.

MR. BOTTORFF: Hi, everyone. My name is John Bottorff with CleanAir4Kids.org. And I'm here to ask you to fully divest from fossil fuels. Norway's Sovereign Wealth Fund, UC system and many, many organizations and funds have all divested. What are you waiting for? You've already lost the opportunity to show leadership, to show the world that the health of children and the future of our planet is part of CalPERS ethics. But you can still make a powerful statement as the largest public pension fund in the United States and turn away from fossil fuels.

The fossil fuel industry has a long history of social, racial, and environmental discrimination, and it's absolutely the cause of the climate crisis. This is about justice. This is about doing the right thing. I have listened to all of you talking today about investment risks, while California burns all around us, and that is because of fossil fuels. How can you give money to those burning down your house and your neighbor's house? How can you give money to an industry that poisons children, an industry that knew decades ago they were causing climate change, and not only did nothing, but they actively worked to cover it up to deflect and deny. The Stated of Connecticut sued Exxon over the decades of lying about climate change.

You have talked today about losses. What about fossil fuels causing 8.7 million deaths globally in 2018 and fossil fuel air pollution is responsible for one in five deaths worldwide. Air pollution is linked to dementia, Alzheimer's, and Parkinson's. These are the losses you need to be considering.

CalPERS investments are funding toxic pollution and climate change. Over two million acres of California has already burned this year and CalPERS funded those fires. Fossil fuels are a bad investment for every reason. It's not only a moral and ethical choice. It is also financial. Fossil fuels are a losing investment, something you should be avoiding, while green energy and energy storage show massive growth. Continuing with fossil fuels not only will lose money, it will fund climate change and all the disasters that go with it, like floods, droughts, fires, and hurricanes. It is not fiscally responsible to stay with fossil fuels. Fossil fuels are a bad investment.

Fully fund CalPERS by going green, become the green energy leader and watch cities and counties turn to CalPERS for their investments. I know many of you want to divest. I ask you to make that decision, as it is not only financially responsible, but it is also the right thing to do for yourselves, for families, and the children of this planet. Please, fully divest from fossil fuels.

Thank you.

CHAIRPERSON TAYLOR: Thank you.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is Sheila Thorne, with Fossil Free California.

MS. THORNE: Hi. My name is Sheila Thorne. I'm a CalPERS beneficiary and I'm really tired of hearing the Climate Action 100 and the policy of engagement extolled. What has engagement really accomplished? The Exxon board members' elections was touted as a huge shareholder victory, but most analysts expect little to change and this has been borne out by Exxon's August 6th announced discovery of a new oil field in Guyana.

As I'm sure you know, the International Energy Agency has said there should be no new oil development and stop the exploration, if we are to have any hope of reaching net zero by 2050. And a new study now has come out on September 8th in the highly respected journal Nature finding that 90 percent of coal and 60 percent of present oil and reserves could not be extracted if there was to be even a 50 percent chance of keeping global heating below 1.5 Celsius.

Yet, Exxon continues its expansion plans. Chevron and Exxon continue to lobby against meaningful policy and they all make meaningless pledges, meaningless because they don't describe how they're going to meet them. And CalPERS continues its $8 billion of investments in coal, including 48 million in China Energy, the biggest coal developer in the world, planning 43 gigawatts of oil capacity.

Christopher McGlade, a senior analyst of the IEA said quote, "The research underlines how the rhetoric of tackling climate change has diverged from reality. None of the net zero pledges made to date by major oil and gas producing countries, include explicit targets to curtail production", end quote.

So I ask you what has the Climate Action 100 accomplished? The time is up for engagement. It's no more than a deceptive green washing that allows business as usual at the expense of the destruction of the planet and millions of people's lives. It's time for CalPERS to take real climate action and divest from fossil fuels before we all in California burn up.

Thank you.

CHAIRPERSON TAYLOR: Thank you very much.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, that next caller is Sydney from CleanEarth4Kids.org.

SYDNEY: Hi, everyone. Can you hear me?

Hello?

CHAIRPERSON TAYLOR: Oh, yes, we can.

SYDNEY: Can you -- can you hear me?

CHAIRPERSON TAYLOR: Yes, we can.

SYDNEY: Hi. Thanks. Hi. This is Sydney. Thanks for hosting this webinar. I also am commenting to support divestment from fossil fuels, because there are numerous things that are better that we can invest in. We can invest in a clean transition away from fossil fuels that will promote clean transportation, infrastructure to prevent sewage spills and pollution. We can invest in pandemic preparedness, since with climate change, there is more of a chance that we could experience new and worse pandemics. We can invest in protecting our forests, fire prevention, also water conservation technology that can capture storm water, along with rain harvesting to be resistant to drought and save water, and help put the rain water into the ground of Mother Earth, like it's supposed to be, instead of flowing into our oceans and rivers carrying all kinds of pollution.

If we invest billions from fossil fuels, we will also be lifting black and brown communities out of dirty air-polluted cities. Black and brown communities have had to say they can't breathe for too long, because pollution has been predominantly affecting them, putting them more at risk of getting and dying from diseases like COVID-19, and getting asthma, dementia, and all kinds of negative health problems.

We must also do this for the sake of our children, because our children are the future. And the less sick our communities are, the more that people will be able to work and the better our economy will be boosted. So please do the right thing and help lift several communities out of being able -- out of having to say they can't breathe. Help reduce pollution, help protect our forests, and help promote green transportation and carbon emissions-free technology before it's too late.

Thank you.

CHAIRPERSON TAYLOR: Thank you very much.

Next caller. I think that might be our -- this might be our last caller, is that correct, Mr. Fox?

STAKEHOLDER RELATIONS CHIEF FOX: Just two callers now, Madam Chair.

CHAIRPERSON TAYLOR: Okay.

STAKEHOLDER RELATIONS CHIEF FOX: Next, we have Carlos Davidson.

MR. DAVIDSON: Hello, CalPERS Board members. Thank you for taking public comments so late in the day. I'm a recently retired professor at San Francisco State University, and therefore a CalPERS pension recipient. My union, the California Faculty Association, which represents 30,000, faculty, librarians, and choices in the CSU system recently overwhelmingly passed a resolution calling for CalPERS to divest from fossil fuel companies.

The union has separate chapters at each CSU campus. The following chapters passed their own fossil fuel divestment resolutions with their own kind of process and a vote, Sonoma, East Bay, San Francisco, Sacramento, Chico, San Marcos, Los Angeles, Stanislaus, San Diego, San Luis Obispo, and Humboldt.

And the following union committees, caucuses, and councils all had again their own process and took a vote to endorse the final divestment resolution, the Political Action and Legislation Committee, the Retired Faculty Committee, the Health and Benefits Committee, the White Anti-Racist Committee, the Membership and Organizing Committee, the Peace and Justice Committee, the Disability Caucus, the African American Caucus, the Chicanx/Latinx Caucus, the Asian-Pacific Islander and Desi American Caucus, the Teacher Education Caucus, the LGBTQIA+ Caucus, the Women's Caucus, and the Council of President, and the

Council on Racial and Social Justice, overwhelming union support for asking CalPERS to divest from fossil fuels.

In independent studies, the financial consulting the firms BlackRock and Meketa both concluded that fossil fuel divestment has generally led to modest increases in financial returns, so no financial harm and actually financial benefits.

Many other large pension funds have decided to divest from fossil fuels including New York State, New York City, and the State of Maine. The Intergovernmental Panel on Climate Change recently issued what has been reported widely -- or what has been called widely a red alert to humanity. Now is the time to take strong action on climate change. I urge you to divest CalPERS holdings from fossil fuel companies.

Thank you very much.

CHAIRPERSON TAYLOR: Thank you.

Next caller, please.

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, the next caller is Gwen Larmeb from Fossil Free California.

MS. LARMEB: Hi. My name is Gwen Larmeb. I work for Santa Monica College as a Recycling Coordinator. I'm a new hire. I'm only 25 years old and I just recently became a CalPERS member, because I just started this position with Santa Monica College. And I am a CSEA union member. And I just recently started volunteering with Fossil Free California and learned about how CalPERS has $30 billion still invested in fossil fuels, and that the policy for engagement strategy with fossil fuel companies allows them to continue to delay being net zero until 2050.

And for reference, because I'm only 25 years old now, I'll be lucky to retire around the year 2050. So by the time that 2050 comes, my career will have come and gone and CalPERS will have done nothing to hold these follow fuel companies accountable. And this summer has been the hottest summer on record during my lifetime. And if CalPERS continues their business as usual, then this will continue to be -- or this will also be the coolest summer I experience for the rest of my life.

So we're already seeing severe impacts from climate change. In 2016, 650,000 acres burned across California. And in 2020, 1,000,650 acres burned. This is what our future looks like. This is what our future looks like if CalPERS waits until 2050 to be net zero.

I believe that a lot of CalPERS beneficiaries agree and I would urge you to consider what kind of future you are creating for your beneficiaries, if you continue to stay invested in fossil fuels.

Thank you.

CHAIRPERSON TAYLOR: Thank you very much. Is that everybody, Mr. Fox?

STAKEHOLDER RELATIONS CHIEF FOX: Madam Chair, that concludes public comment for today.

CHAIRPERSON TAYLOR: Okay. Thank you very much. I think that concludes the Investment Committee open session. I want to wish everybody a good night and see you all tomorrow.

(Thereupon California Public Employees' Retirement System, Investment Committee meeting open session adjourned at 7:04 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Public Employees' Retirement System, Board of Administration, Investment Committee open session meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and was thereafter transcribed, under my direction, by computer-assisted transcription;

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of September, 2021.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
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