CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of Retirement Services
Federated City Employees' Retirement System
Police and Fire Department Retirement Plan

PRIVATE MARKETS PROGRAM

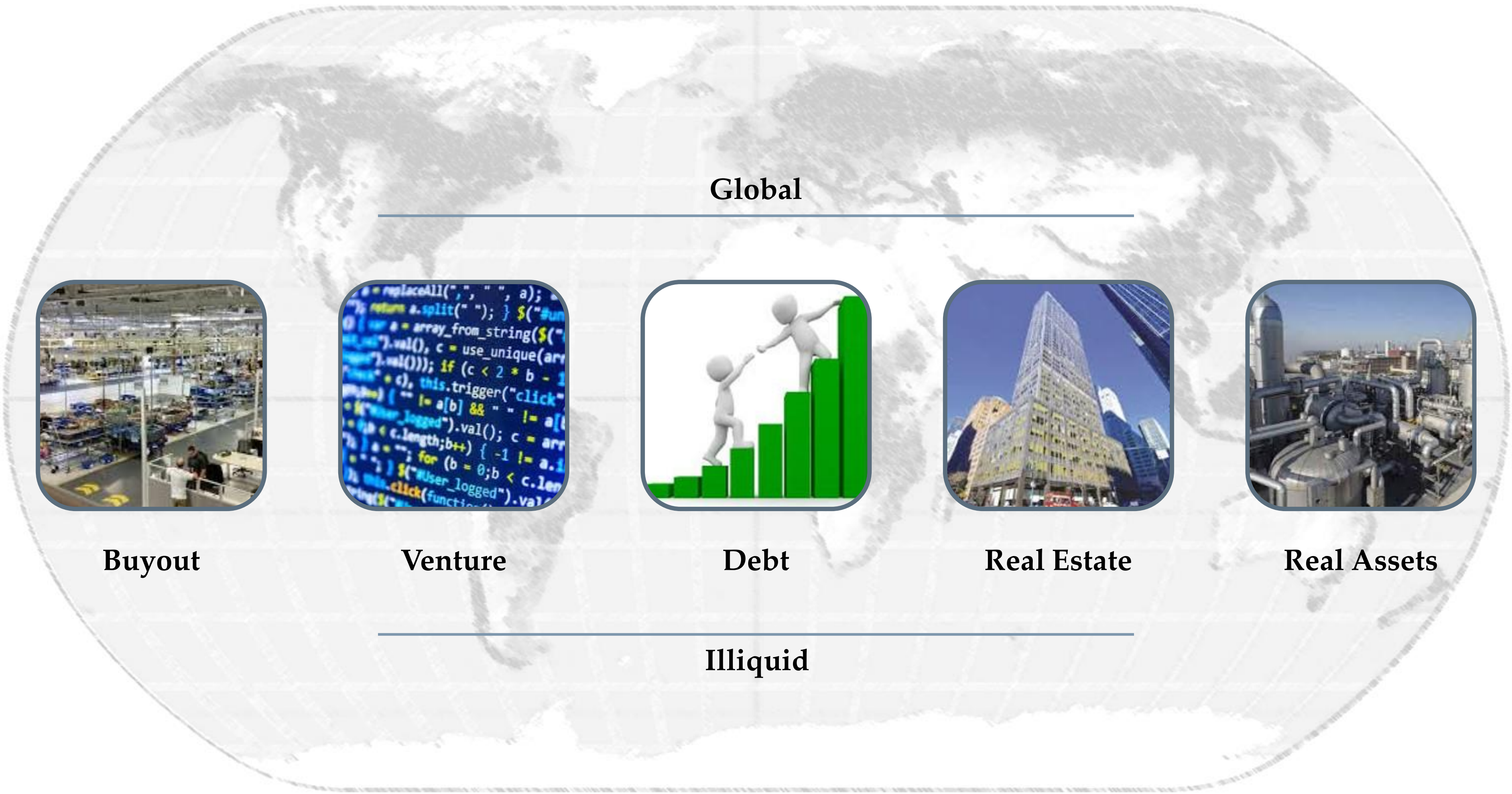
Introduction and strategy document

Introduction

- This strategy document is meant to outline the way in which the staff of the Office of Retirement Services ("ORS") intends to approach private markets.
- **The strategy document is a living document.**
- It is for internal use by ORS staff. It is not subject to Board approval, though governance processes result in many aspects of implementation requiring explicit or implicit Board approval.
- Except for allocations and size of investments, the separate plans are treated identically. Any Board-desired differences are assumed to be conveyed in the decisions of the plan-level asset allocation and other Board-imposed constraints.

Contents:

Private markets



Diversified exposure to economic growth

Buyout

- Large Buyout
- Small-/Mid- Buyout
- Special Situations
- Other

Equity investments in growing, established, and mature companies, with enterprise values generally ranging from $20mm to $20bn.

Venture

- Fund-of-funds
- Direct funds
- Co-investments

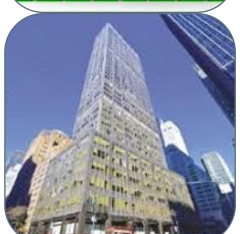
Primarily equity investments in start-ups and high growth companies.

Debt

- Par Credit
- Securitized
- Stress/Distress
- Other

Debt investments include credit expected to pay back original principal and interest (par credit), loans and bonds that have been packaged into special purpose vehicles (securitized), securities where the obligor is in a stressed or distressed financial situation (stress/distress), and unique strategies that have some or all the characteristics of debt investments.

Real Estate



- Value-Added
- Opportunistic
- Real Estate Debt
- Other

Equity and debt investments in operating companies and physical properties where the economic value is derived primarily through real estate-related activities. Value-added and opportunistic are distinguished by the level of risk associated with an investment.

Real Assets

- Infrastructure
- Energy
- Natural Resources
- Other

Investments in operating companies and physical assets where the economic value is derived primarily from the development, production, transport, or processing of natural resources, and the facilities supporting their downstream progress.

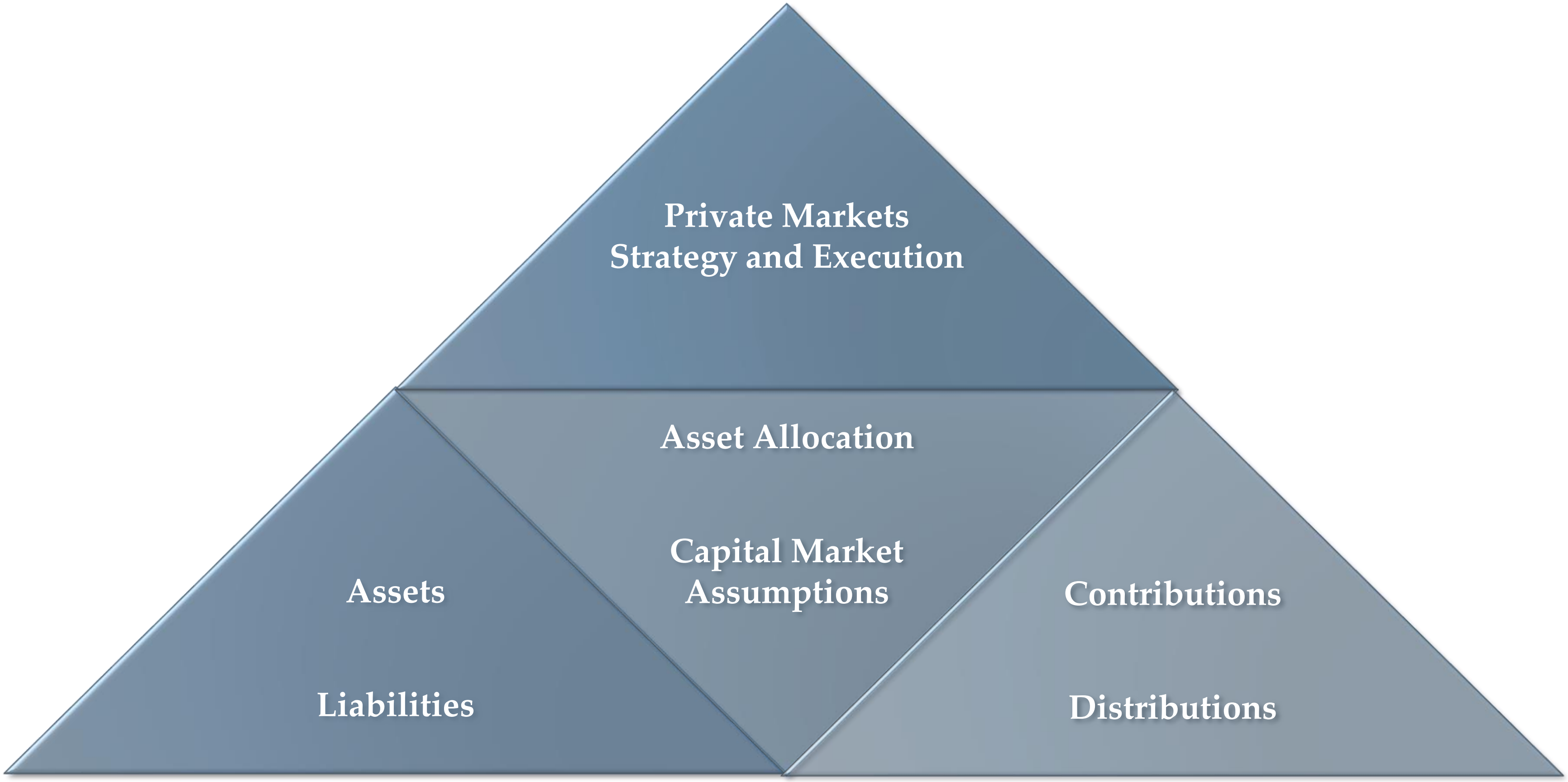
Transaction examples*

Fund commitments 2013 / 2016 **First time fund / Spinout re-up** Europe Special Sits.	*Advised by Neuberger Berman* 2017 **$425,000,000** Private Equity Strategic Partnership	*Fund commitment* 2018 **Anchor Investor** CLO Opportunity Fund III	*Fund commitment* 2018 **$9,000,000** Innovation Endeavors III
via commingled fund 2011 **Multi-tranche Capital Solutions** Music Publishing	*via commingled fund* 2014 **$3,400,000,000** Automotive Finance REIT	*via commingled fund* 2014 **Senior Debt Financing** Specialty Packaging	*via commingled fund* 2017 **$1,825,000,000** Crude Oil Transport Infrastructure

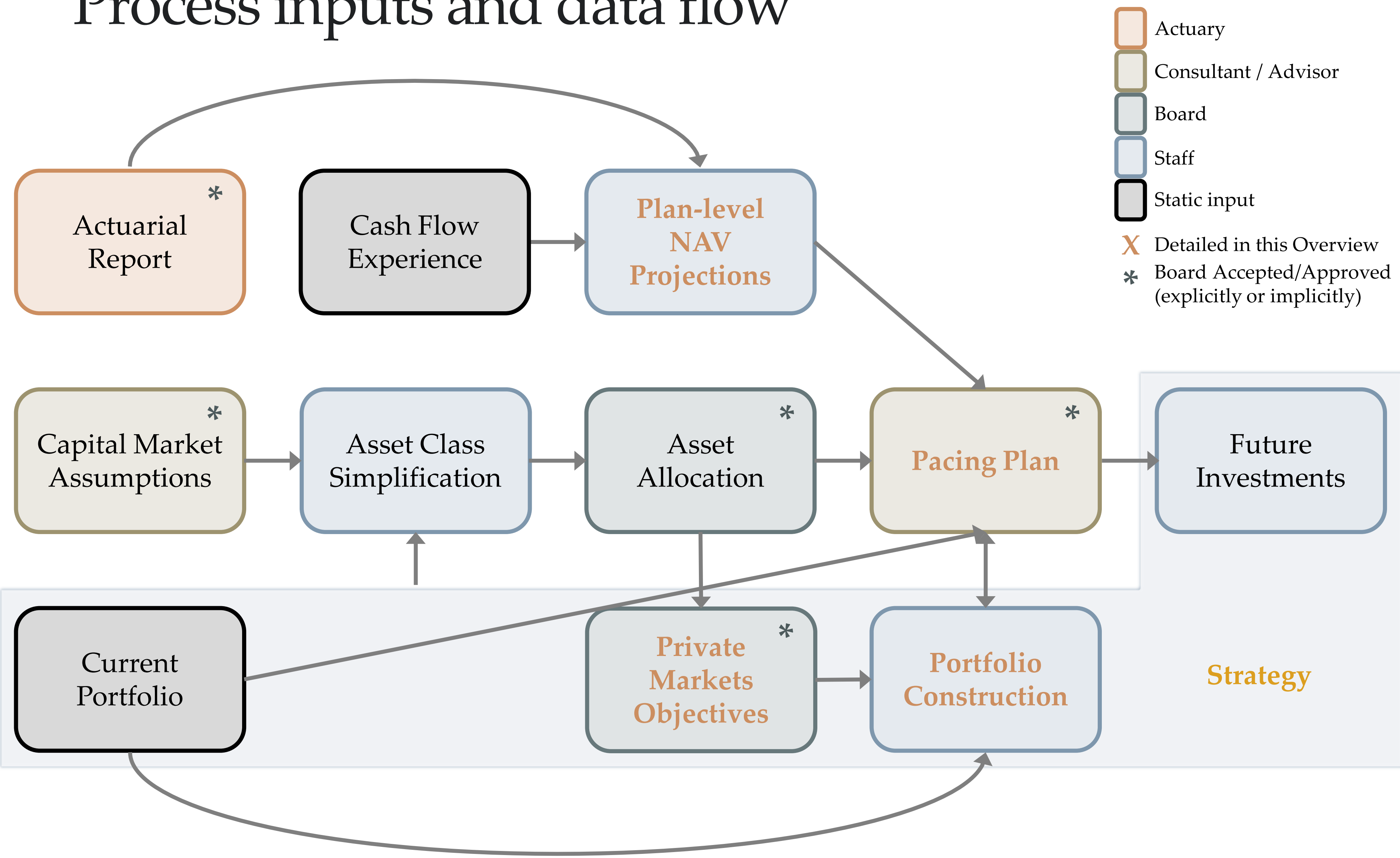
* All information is in the public domain and does not necessarily reflect the plans' existing or past investments within alternative investment vehicles.

Foundation for the Private Markets Program

Prior to any strategy development or execution of investments, there is foundational work that goes into determining if there should even be private markets investments. These data, inputs, and processes are presented in the sections “Pre-Strategy Processes” and “Objectives, targets, and constraints.”



Process inputs and data flow



Assumption consistency throughout process

Meketa – select 2020 Capital Market Assumptions		
Private Markets	*20Y Exp. Geo. Return*	*Exp. Std. Dev. (Risk)*
Buyout	9.4%	24%
Venture Capital	9.3%	34%
Private Debt Composite	6.9%	15%
Value-Added Real Estate	8.4%	18%
Opportunistic Real Estate	9.9%	24%
High Yield Real Estate Debt	6.0%	18%
Infrastructure (Non-Core)	8.8%	21%
Natural Resources (Private)	9.1%	22%
Global Equity	7.8%	17%

Target Allocations	Fed.	P&F
Private Markets	*21%*	*19%*
Buyout	8%	6%
Venture Capital	4%	4%
Private Debt	4%	4%
Private Real Estate	3%	3%
Private Real Assets	3%	3%
Private Markets Exp. Return	8.9%	8.8%

Pacing Plan Development	
Uses fund-level modeling from consultant	
Produced using Neuberger Berman assumptions: Large Cap Buyout – 10.5% IRR, 7.5% Std. Dev. Sm/Mid Buyout – 11.0% IRR, 8.0% Std. Dev. Special Sits. – 11.0% IRR, 8.0% Std. Dev. Co-investments – 16.0% IRR, 18.0% Std. Dev.	
Venture Capital includes fund-of-funds, direct funds, and co-investments	
Private Debt includes direct lending, mezzanine, and distressed debt.	
Private Real Estate includes value-added, opportunistic, and high yield real estate debt.	
Private Real Assets includes non-core private infrastructure, energy, mining, and agriculture.	
Exp. Premium to Public Equity	~100 bps

Objectives

<u>Economic objectives leading to inclusion of private markets within the asset allocation</u>

The purpose of Private Markets is to get exposure to investment strategies that are not available in public markets, thereby capturing an illiquidity premium. The factor exposures will be comparable to those of public markets – primarily growth, supplemented by credit and inflation. The sub-asset classes are Buyout, Venture Capital, Private Debt, Private Real Estate, and Private Real Assets.

<u>Quantified "absolute" objectives as a result of the asset allocation</u>

- Be near Target Net Asset Value for Private Markets and individual private asset classes.
- Achieve performance consistent with asset allocation assumptions:

Measurement Group	*Net Return*	*Time Horizon and Methodology*
Private Markets Program	8.5%-9.0%	20Y, time-weighted rate of return
Buyout	9.0%-11.0%	
Venture	8.0%-9.5%	
Debt	5.5%-7.5%	
Real Estate	6.0%-11.5%	
Real Assets	6.5%-9.5%	

<u>Quantified "relative" objectives as a result of asset class characteristics</u>

- Achieve performance that justifies use of private markets versus public markets.
- Achieve performance that demonstrates a level of staff skill.

Measurement Group	*Net Return*	*Time Horizon and Methodology*
Private Markets Program	Global Equity + 100 bps	20Y, time-weighted rate of return
Individual investments	1^{st} & 2^{nd} Quartile	Investments' peer groups, by vintage year

Targets

The asset allocation provides for a target percentage of plan assets to be invested in particular private markets asset classes, but provides no guidance on how to achieve those targets. The pacing plan uses smorgasborg of assumptions to provide actionable direction on how to reach the desired targets. Because of the high variability of assumptions, the pacing plan is revisited at least annually with updated assumptions.

<u>Key pacing plan assumptions</u>

1. Plan-level net asset value

   Staff uses an average of two models to project plan-level net asset level many years into the future. The model inputs are based on information contained in the annual actuarial report, the discount rate, and recent historical experience for the contributions into and distributions from the plans. The resulting net asset values, by year, are multiplied by the target percentages for each asset class and provided to consultants to use in their pacing plan models.

2. Portfolio investments

   a. Current holdings

      Existing investments have contribution, distribution, term, and return projections that may differ from the asset class as a whole. These characteristics can be quantitatively modeled to project future net asset values of current investments.

   b. Future commitments

      Future commitments are used to fill the gap between projected future net asset values of current investments and target net asset values consistent with the asset allocation. Because of the uncertainty around the timing of cash flows within private funds, stylized assumptions on contribution rates, distribution rates, term and return are used to model future commitments. The output of these models are the size of future commitments required each vintage year in each asset class to approximate the target net asset values.

Plan-level net asset value

For the most recent pacing plans, the following Target Net Asset Values were used:

Plan-level net asset value forecasts

(in $ mm)	6/30/2019	6/30/2020	6/30/2021	6/30/2022	6/30/2023	6/30/2024	6/30/2025	6/30/2026	6/30/2027	6/30/2028	6/30/2029	6/30/2030
Federated		**2,123**	**2,270**	**2,427**	**2,592**	**2,766**	**2,951**	**3,145**	**3,350**	**3,567**	**3,795**	**4,037**
Previous NAV forecast	*2,122*	*2,178*	*2,307*	*2,440*	*2,578*	*2,720*	*2,866*	*3,019*	*3,177*			
Difference (%)		*-3%*	*-2%*	*-1%*	*1%*	*2%*	*3%*	*4%*	*5%*			
Police & Fire - *Current*		**3,615**	**3,871**	**4,141**	**4,407**	**4,685**	**4,969**	**5,264**	**5,571**	**5,889**	**6,219**	**6,553**
Previous NAV forecast	*3,623*	*3,844*	*4,080*	*4,325*	*4,560*	*4,800*	*5,058*	*5,325*	*5,541*			
Difference (%)		*-6%*	*-5%*	*-4%*	*-3%*	*-2%*	*-2%*	*-1%*	*1%*			
Police & Fire - *Contingent*		**3,617**	**3,883**	**4,166**	**4,447**	**4,741**	**5,043**	**5,360**	**5,689**	**6,033**	**6,392**	**6,758**
Difference vs. Previous (%)		*-6%*	*-5%*	*-4%*	*-2%*	*-1%*	*0%*	*1%*	*3%*			

Asset Class NAV Targets as of 6/30/2020

Federated	Target	$ million
Private Markets	*21%*	*446*
Buyout	8%	170
Venture	4%	85
Private Debt	3%	64
Private Real Estate	3%	64
Private Real Assets	3%	64

Police & Fire - *Current*	Target	$ million
Private Markets	*19%*	*687*
Buyout	6%	217
Venture	4%	145
Private Debt	3%	108
Private Real Estate	3%	108
Private Real Assets	3%	108

Police & Fire - *Contingent*	Target	$ million
Private Markets	*21%*	*759*
Buyout	8%	289
Venture	4%	145
Private Debt	3%	108
Private Real Estate	3%	108
Private Real Assets	3%	108

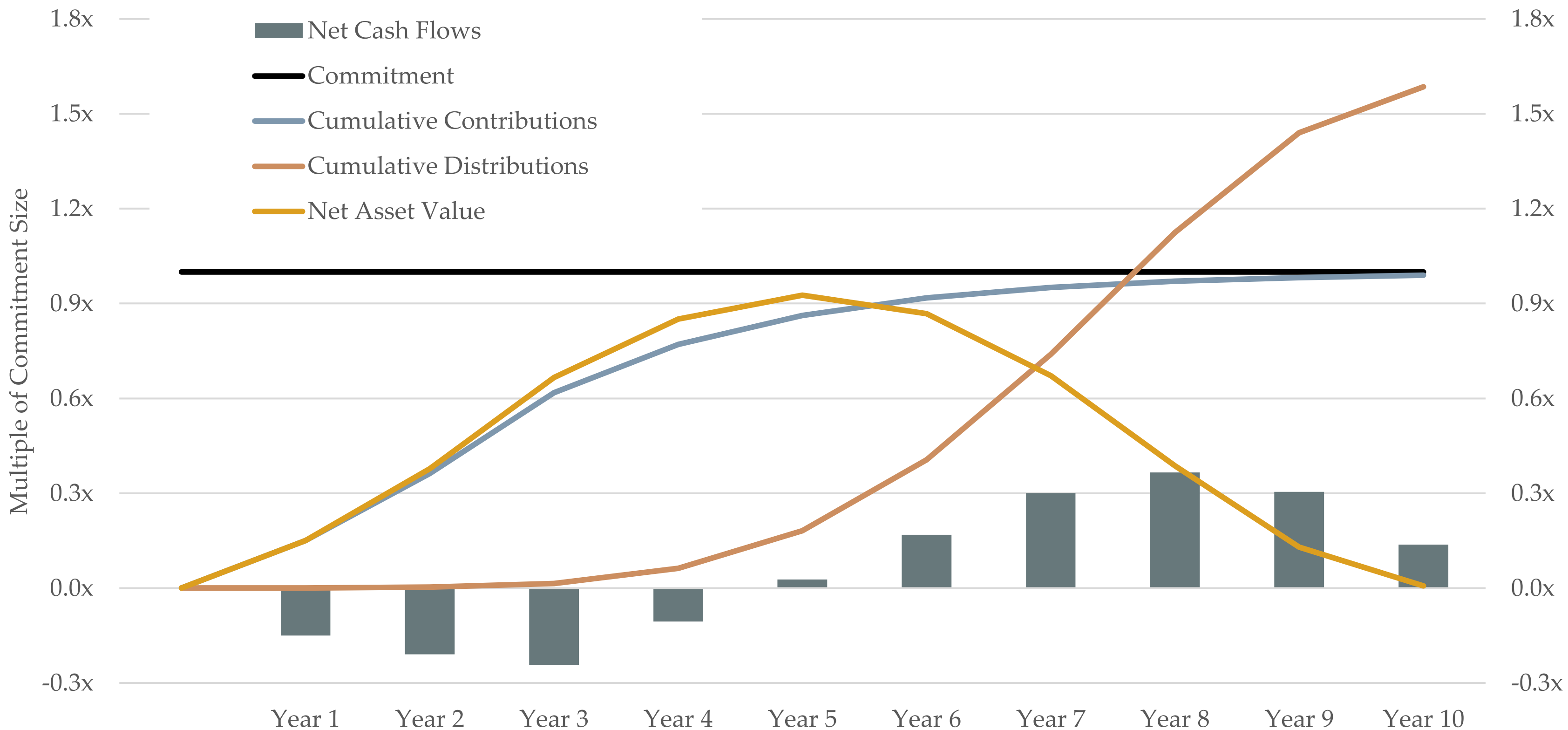
Investment projections

Meketa produced an easy-to-read white paper on commitment pacing that outlines their specific methodology (PDF link). Staff has created an internal model based on the Takashi-Alexander framework, which is also the basis for the Meketa model. While the models are nuanced, the example below uses staff's model to demonstrate the assumptions and output for a particular investment.

Inputs

Fund type:	Large buyout	**Projected net return:**	12% IRR / 1.6x TVPI
Contribution rates, Year 1 / 2 / 3+:	15% / 25% / 40%	**Projected yield:**	2%
Fund term:	10 years	**Bow factor:**	3.0

Output



Pacing plan

Pacing plans were part of the new asset allocation implementations approved by the Boards in 2020. They are presented below, along with a graphic showing the anticipated progression toward the asset allocation targets. Pacing plans serve only as guides to private market commitments, and are revisited and updated annually. Net asset value shortfalls are invested in a Russell 3000 index as a proxy.

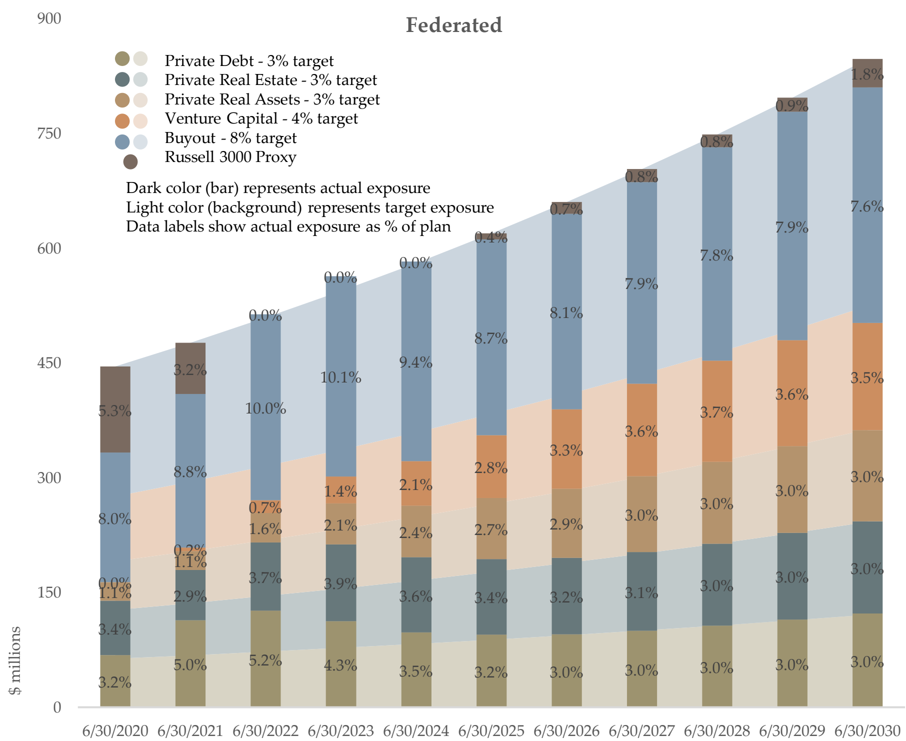
- Execution of the pacing plan is multi-faceted (described in "Methods of investment and structuring").

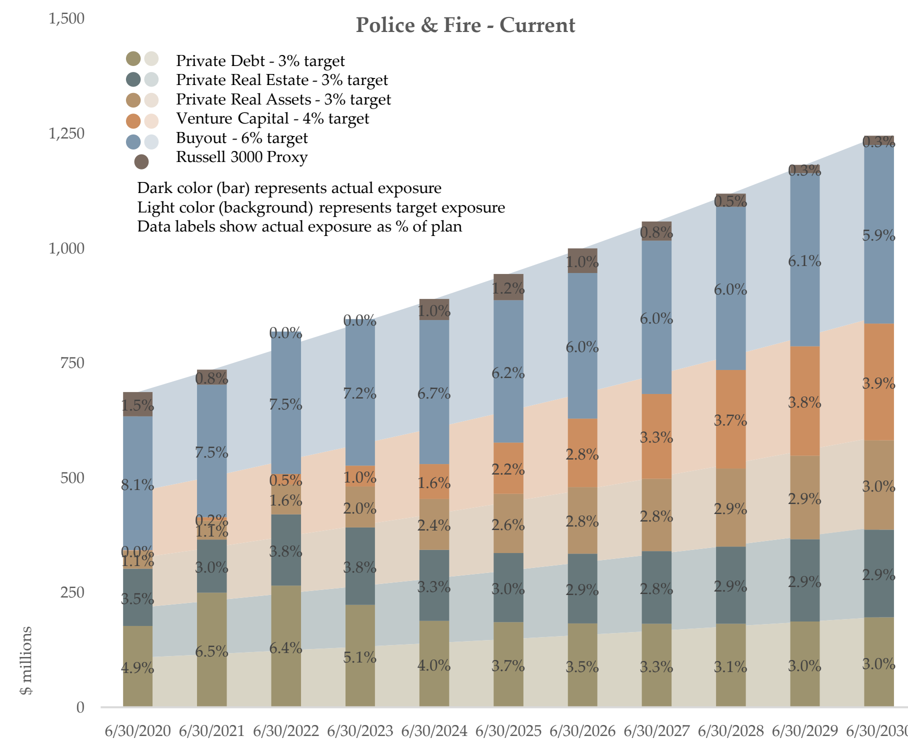
Federated

(in $ mm)	FY 19-20		Pacing Plan		
	Pacing Plan	**Actual**	**FY 20-21**	**FY 21-22**	**FY 22-23**
Private Markets	*130*	*107*	*104*	*122*	*130*
Buyout	52	35	13	25	28
Venture	na	na	28	31	31
Private Debt	40	32	24	24	24
Private Real Estate	20	22	20	20	25
Private Real Assets	18	18	20	22	22

Police & Fire

(in $ mm)	FY 19-20		Pacing Plan		
	Pacing Plan	**Actual**	**FY 20-21**	**FY 21-22**	**FY 22-23**
Private Markets	*234*	*206*	*156*	*176*	*194*
Buyout	80	65	13	30	40
Venture	40	20	32	34	37
Private Debt	60	49	48	48	48
Private Real Estate	20	39	30	30	35
Private Real Assets	34	33	33	34	34





Constraints

Most constraints on the plan are deliberate governance and resource decisions, but one critical constraint is immutable.

California Public Pension Status

California public pension plans have transparency requirements in accordance California government code. These requirements are limiting to the extent that (a) certain investment managers do not want to be subject to such disclosures; and (b) Board and staff risk appetites are altered by non-economic forces, such as headline risk.

Governance

Current governance constraints are that all investments are approved by IC/Board. The draft Police & Fire Investment Policy Statement is likely reflective of the future constraints on the Private Markets Program:

- Minimum qualifications – registered under Advisor's Act or similar, fiduciary standard consistent with law, size and nature of mandate consistent with asset allocation, concentration limits;

- Concentration limits –
  - Max 15% with any private fund manager
  - Total asset class commitments max 150% of approved annual pacing plan
  - Per primary fund commitments max 2% of plan assets (first allocation to a manager) or 3% of plan assets (follow-on)
  - Per secondary fund investment max 1% of plan assets
  - Co-investments must be approved by Board

Resources

The availability and reliability of resources has the largest impact on strategy and execution, and includes:

- Time – the only resource that cannot be enhanced;

- Capabilities – personnel, external advisors, technology;

- Budget – the constraint on enhancing capabilities.

Resource enhancement (Private Markets)

As the importance of Private Markets to the plans has increased, additional resources have been added, demonstrating the ability of all decision-makers (ORS management, the Boards, the City) to collaborate in order to best position the plans to capture the most value.

Year	2005	2010	2015	Present
Personnel	Investment Officer	Investment Officer	Investment Officer Investment Officer	Sr. Investment Officer Investment Officer Investment Analyst Investment Analyst (1/2)
Advisors	General Consultant General Consultant	General Consultant General Consultant External Counsel	General Consultant General Consultant External Counsel	Specialist Advisor General Consultant External Counsel
Technology			Bloomberg Cambridge Optica	Bloomberg Cambridge Optica Dynamo Pitchbook

Summary of objectives, targets, and constraints

- Private markets are included in the Growth section of the asset allocation. The plans allocate to private markets because capital market assumptions show higher expected returns for these asset classes.
- The asset allocation provides the breakdown of private markets and implies a set of objectives and targets for the asset class, which if achieved, contribute to the plans' meeting their overarching objectives.
- The pacing plan articulates the specific actions that need to be taken in order to achieve the private markets objectives.
- Execution of the pacing plan is constrained by several factors that influence strategy, including California public pension status, governance, and resources.
- Every input – capital market assumptions, asset allocation, pacing plan, and resource constraints are reviewed and updated at least annually.
- Based on the reviews, the Boards control the direction of the plans and the role of private markets.

Strategy

Key Elements

1. **Ensure beta exposure above all else.**

    Failure to execute the pacing plan guarantees not meeting objectives envisioned within the asset allocation.

    Implication is that consistent commitments and vintage diversification matter more than anything else, including manager selection.

2. **Alpha is an outcome of process.**

    The plans can achieve their objectives without alpha, but alpha is likely required to justify the Private Markets allocation.

    Sources of alpha can be choosing: better sub-sectors (beta timing), managers who are better at choosing the right investments (security selection), manager who operate more effectively (value creation), capital structure optimization (risk decomposition).

    Consistently harvesting alpha from those sources requires a competitive advantage relative to all sources of private capital, which must be deliberately developed and maintained.

3. **Alignment of interests can overwhelm most other investment factors.**

    Agency conflicts increase with (a) distance from the asset and (b) dispersion of ownership.

    Fees are the result of a buy-versus-build decision and market forces.

Ensure beta exposure

- The Private Markets Program is expected to generate ~100 bps of outperformance versus public equity markets over a 20-year time horizon, based on Meketa's 2020 capital market assumptions.
- As the uninvested portion of the Private Markets Program is held in public equity, the excess contribution to total return is approximately 15-25 bps at the plan level (i.e. being invested in private markets vs. public equity for the ~20% of plan assets).
- In dollar terms, being underweight Private Markets by 5% (i.e. 15% actual vs. 20% target, on a blended basis) has an annual loss of excess return of about $3 million.
- However, over-allocating to Private Markets can create cash shortages at the plan level, which is even more costly. Over-concentration to certain vintage years by trying to "get to target NAV" more quickly, is also risky. As such, it is critical to make commitments in close accordance to the annually updated pacing plans.

Alpha - desirable, but not necessary

- Private Markets allocations are optimized based on capital market assumptions that incorporate median returns. If the Private Markets Program achieves these returns, its contribution to the plans will be inline with an overall level of return sufficient to meet the plans' discount rates.
- Ample research shows that median private equity returns do not meaningfully outperform public equity market returns over many time periods. While ex-ante median returns (expected returns) are good enough for the plans, on an ex-post basis, median returns are likely insufficient to justify the allocation to private markets.

Intuitively:

- The absolute return is what matters for generating cash to pay benefits.
- If the relative return is not good, everyone will be disappointed, but not in trouble.

Alpha - sources

Beta timing

Examples

- Staff allocates to a manager specializing in stressed/distressed credit instead of direct lending. Six months later, the economy enters a recession.
- An infrastructure investment manager acquires a hydroelectric power plant in China, forgoing a toll road investment in Brazil. Subsequently, China growth surprises to the upside while Brazil languishes in political disarray.

Security selection

Examples

- Staff opts to co-invest alongside a manager in an investment that has more capacity than the fund can take. The investment ultimately returns 2.1x invested capital, compared with 1.6x for the fund as a whole.
- A private equity manager explores the insurance brokerage sector, ultimately executing a buyout of XYZ, Inc. Over the next five years, XYZ market share climbs 5 points and margins expand beyond the sector average.

Value creation

Examples

- Understanding the few portfolio companies remaining in a term-extended fund, staff encourages a GP-led restructuring that decreases the gross-to-net return spread over the period until the assets are exited.
- A management team backed by an energy private fund manager acquires 853 acres of PDP assets in west Texas. Using its own geology and engineering crew to enhance extraction techniques, BOE production increases 22% versus the standard decline rate.

Risk decomposition

Examples

- Staff convinces a venture capital manager that its portfolio company could raise subordinated debt instead of equity and introduces a manager who is able to provide a lower cost of capital.
- A leveraged loan manager retains the subordinated note of a collateralized loan obligation that returns capital prior to the paydown of other debt secured by the loan portfolio.

Alpha - competitive advantage

For asset allocators and investors, competitive advantage will generally arise from financial capital, informational edge, and/or human capital.

Capital

- Scale
  The amount of capital available significantly influences strategy. Large amounts enable resources and negotiating power, but also make niche opportunities too small to be meaningful.
- Flexibility
  Capital flexibility wins deals. Having a lower return requirement (cost), or being able to provide capital quickly (speed), in a variety of securities (structure), and for variable lengths of time (liquidity) are all advantageous.

Information

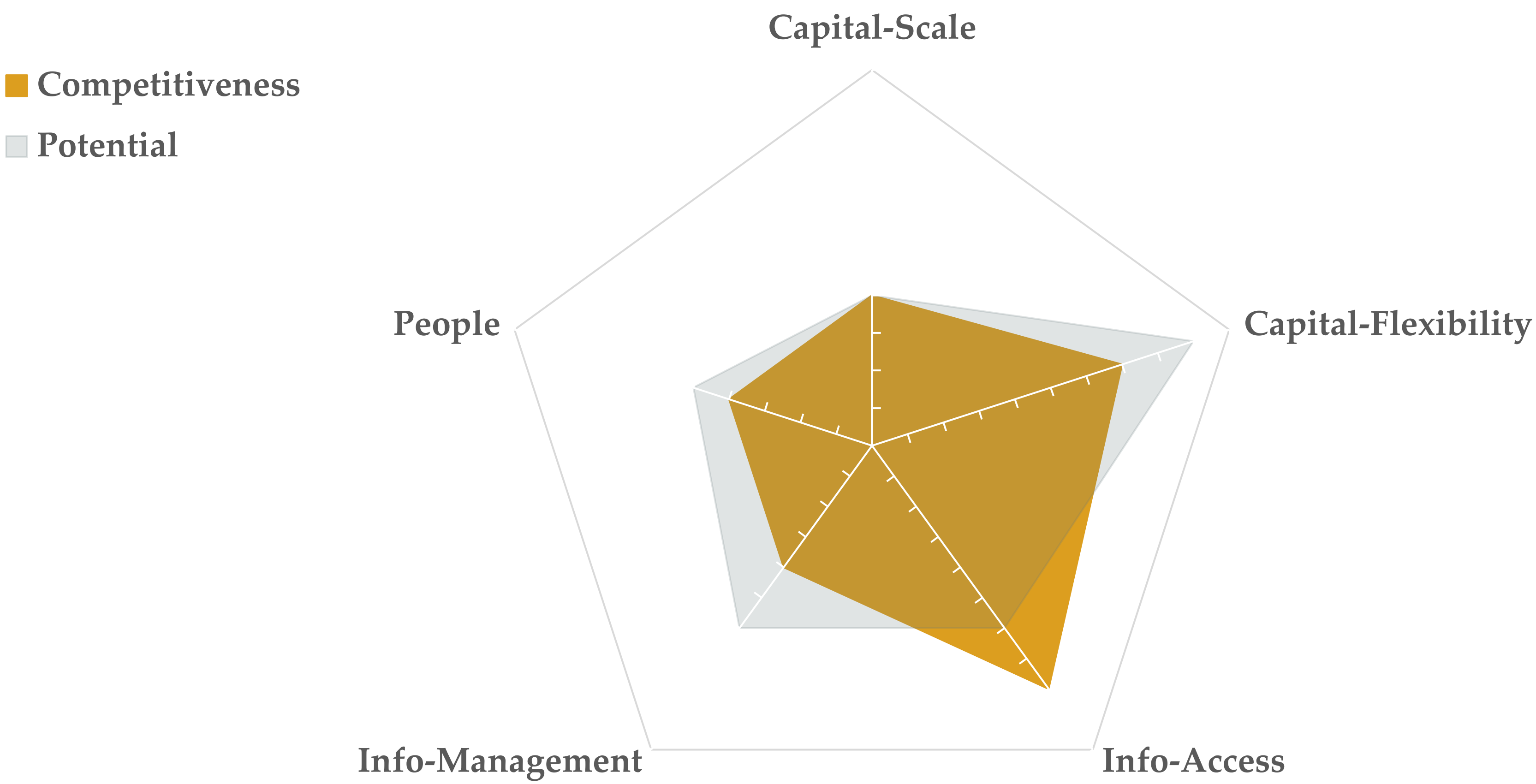
- Access
  The vast majority of private markets information is not available to the public, or even via paid services. Having proprietary information facilitates greater certainty in decision-making.
- Management
  Having unique access to information is not required, if it is possible to use available information more effectively. Investment process is largely a manifestation of information management.

People

Human capital can be a source of competitive advantage because private market decision-making is still primarily done by individual people. While capital and informational advantages could be (theoretically) implemented by anyone, the ability to build relationships, use critical thinking to develop creative solutions, and have unimpeachable work ethic can be positive differentiators. However, human capital is among the more challenging advantages to sustain.

Alpha - competitive advantage scorecard

Relative to all other participants in private markets, the plans have better flexibility of capital and better access to information. Better information management is possible, which could have a slight negative effect on access. As the plans are unlikely to grow significantly, and are unlikely to ever provide competitive human capital policies, the focus should be on improving the capture and use of data and enhancing execution techniques (speed, structure).



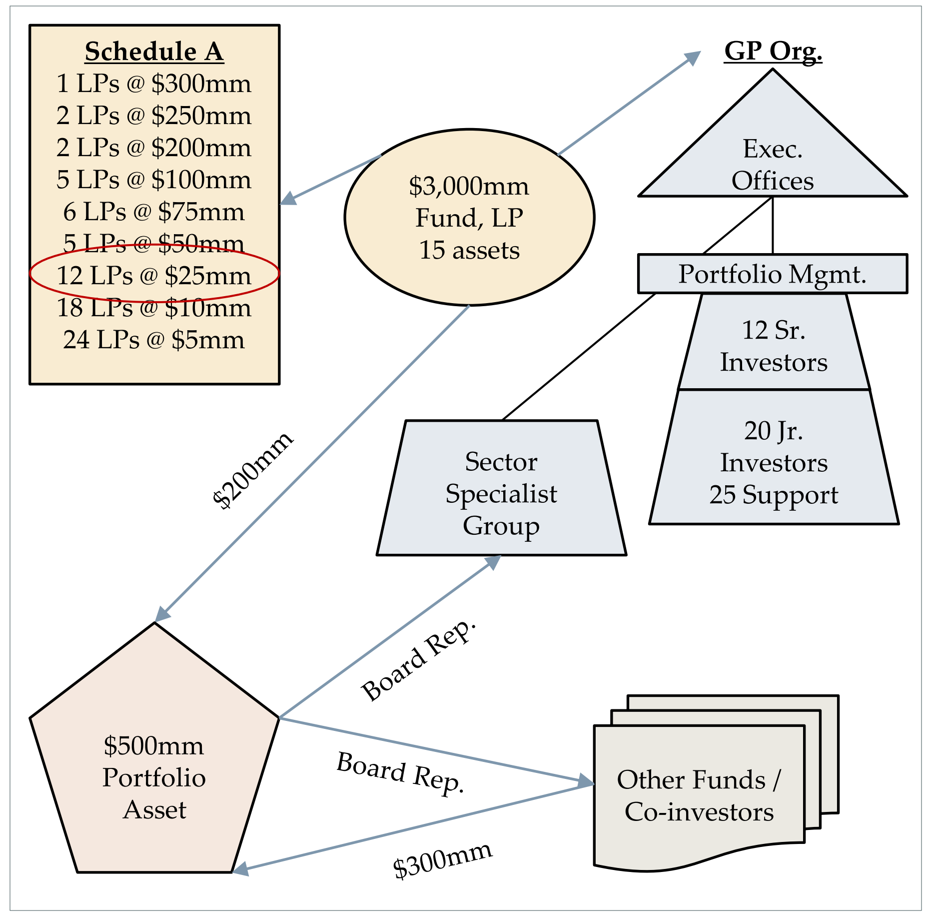
Alignment of interests

For a $25mm/commitment LP, Scenario A should generally be preferable to Scenario B. Relevance within the fund will mean greater negotiating power, greater access to information, and – in the event of a problem – control features are easier to exercise. From an investment perspective, outcomes at the portfolio asset level are closer to Scenario A LPs and individuals doing the work in Scenario A are likely to have their compensation more closely linked to the outcome.

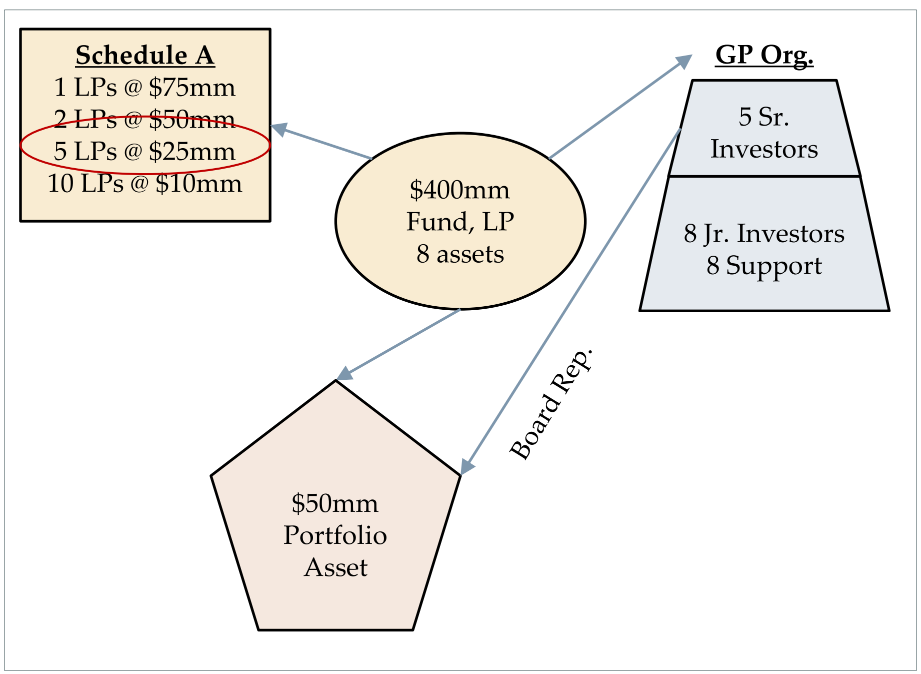
Results dispersion is greater in Scenario A, though, and there is less ability to leverage the work of larger, more sophisticated investors. In the event that the fund in Scenario B underperforms, performance can still be in-line with peers; the same is not true in Scenario A.

With constraints on resources, sometimes it is necessary to accept Scenario B, but every effort should be expended toward sourcing Scenario A-like situations.

Scenario B



Scenario A



Fees - buy versus build

The preference to receive a service for the lowest possible cost is not unique. Investment management is a high margin business, so it is naturally more costly to acquire these services rather than build them internally. Many factors inhibit the building of internal capabilities, but the decision of what to build instead of buy ultimately resides with the Board. Staff attempts to maximize value within those constraints.

Highest Cost ⟷ **Lowest Cost**

	Fund-of-funds investments	**Direct fund investments**	**Direct fund + Secondaries**	**Direct fund + Secondaries + Co-investments**	**Direct company investments**
Staff	• Part-time personnel sufficient • Minimal specialized knowledge and experience	• Requires dedicated staff, moderate levels of knowledge, experience, and relationships	• Requires dedicated staff with high knowledge, experience, relationships	• Requires multiple dedicated staff with high knowledge, experience, relationships, deal-execution	• Requires substantial dedicated staff, expert level knowledge, experience, relationships, deal-execution
Resources	• Small AUM • No specialized resources	• Moderate AUM • Moderate operational sophistication • Light information systems	• Moderate AUM • Moderate operational sophistication • Moderate information systems	• High AUM • High operational sophistication • Moderate-high information systems	• High AUM • Expert operational sophistication • Expert information systems • Third-party experts
Governance	• No specific requirements	• Reasonable speed in decision-making • Some flexibility in expenses • Ability to support relationships	• Quick speed in decision-making • Some flexibility in expenses • Ability to support relationships	• Ultra-fast decision-making • Moderate flexibility in expenses • Ability to support relationships	• Ultra-fast decision-making • High flexibility in expenses • Ability to support relationships

Fees - market forces

Market-accepted fees tend to be a function of (a) supply of / demand for LP capital; (b) manager past performance; (c) expected future returns. Below are approximate current market rates:

Highest Cost ⟷ Lowest Cost

	Venture	Buyout	Private Real Assets	Private Real Estate	Private Debt
Standard Fees	• 2.00% mgmt. fee • 20% carried interest	• 2.00% mgmt. fee • 20% carried interest	• 1.75% mgmt. fee • 20% carried interest	• 1.75% mgmt. fee • 20% carried interest	• 1.50% mgmt. fee • 15% carried interest
Asset Class Idiosyncrasies	• 2.5%-3% mgmt. fee + 25%-30% carried interest common for successful VCs. • Tiered carry stepping up from 20% common.	• Large buyout has stepped down mgmt. fees to 1.5%. • Fund sizes have grown instead of mgmt. fee rates.	• High dispersion of fee levels. • Allocator-model funds have "hidden" promote to PortCo management teams.	• Value-added, Debt sectors have lower cost (and return targets) than Opportunistic. • Frequent 9% preferred return.	• Widest variation in fees: mgmt. fees 0.50%-2.0%, carry 10%-20%. • Shortest fund terms.

Secondaries & Co-investments

- Secondaries are not less costly – acquiring a fund interest includes both rights and obligations – but a known fee structure and known portfolio enhance analysis of fee-driven optionality. In fund restructurings, there is an opportunity to re-align interests via fees.
- Co-investments almost always have a lower fee structure than the associated commingled funds. In real estate and private credit, it is common to have to pay a reduced fee, whereas buyout co-investments are generally without management fee or carry.

Implications of philosophy

Key Elements

1. Ensure beta exposure above all else.
2. Alpha is an outcome of process.
3. Alignment of interests can overwhelm most other investment factors.

Implications

To ensure beta exposure, staff will need to make ongoing commitments with an adequate level of diversification to minimize the risk of underperforming the expected return of the asset classes. Underpinnings of risk and diversification are addressed in the next section, “Diversification and risk management.”

The breadth of investments covered by buyout, venture, private debt, private real estate, and private real assets combined with the level of in-house resources dedicated to the Private Markets Program necessitates using substantial amounts of outside involvement in the investment process – via investment managers, investment consultants, middle- and back-office assistance.

Greater levels of alpha are constrained primarily by a willingness to provide resources to create a sustainable competitive advantage. Fees (driven by investment management fees) are a reflection of the cost of not building in-house expertise. Because people are not a main part of competitive advantage, investments should not rely on internal staff for their success.

Assuming that the level of resources available today are reflective of the near-term intentions of the plans, staff efforts to generate alpha should concentrate on the plans’ ability to access information and structure unique capital solutions. Improving information usage and ongoing gains to staff experience should facilitate development in these areas.

The build-out of capabilities and working to unique capital solutions are both time-intensive. Staff capacity is the main near-term constraint, which means that investments will need to balance the practicality of maintaining beta exposure with the desirability of pursuing alpha. These trade-offs are discussed in “Methods of investment and structuring.”

Appropriate diversification

While the plans typically invest through funds, and much work is done around fund performance in order to determine GP skill, the ultimate exposures of the plans are the funds' portfolio assets. In addition to the diversification mandated through the specific allocations to private markets asset classes, the plans seek to be diversified to the underlying portfolio assets. The right level of diversification is that which eliminates most non-systematic risk, but maintains the potential for alpha by avoiding over-diversification.

In addition to optimizing the number of portfolio assets, the staff resources constraint influences the optimal number of investments. The investment process, including sourcing, due diligence, and execution takes multiple months to complete, limiting the number of new deals that can be done annually. Post-execution, each investment requires a level of monitoring, which also requires resources. Building an optimal portfolio should not be compromised by inadequate resources, but in practice, there is a wide range of what could be considered optimal, and the level of resources can help guide within the range.

A simple model backs into the optimal number of portfolio assets based on expected cost of capital for portfolio assets, dispersion of portfolio asset performance, investment expense, net expected return, and the desired confidence of achieving an arbitrary minimal rate of return on the portfolio:

90% Confidence Level	Exp. Net Return	Exp. Standard Deviation	Exp. Gross / Portfolio Asset Return	Acceptable Deviation / Min. Net Return	Ideal Range of Number of Portfolio Assets
Buyout	9.3%	25%	14.1%	-1.8% / 7.5%	300 – 400
Venture	9.2%	35%	14.0%	-2.0% / 7.2%	500 – 600
Private Debt	6.6%	17%	9.8%	-1.5% / 5.1%	200 – 300
Private Real Estate	7.4%	22%	11.5%	-1.7% / 5.7%	200 – 300
Private Real Assets	8.2%	22%	12.5%	-1.7% / 6.5%	200 – 300

To state the results more intuitively, using Private Credit as an example:

- Building a portfolio of private credit funds whose underlying holdings number 200-300;
- If the expectations of net return of 6.6% and 17% standard deviation are the actual statistics for the population of private credit funds;
- Then there is a 5% probability that the realized net return on the plans' private credit portfolio is worse than 5.1%.

At the entire Private Markets Program level, if the capital market assumptions are correct, the portfolio construction assumptions above would lead to a long-term expected tracking error of about 100 bps.

Tying commitments to exposures

Impact of significantly reducing buyout target asset allocation

Based on net asset value targets, the ideal number of portfolio assets for each asset class, and an estimation of the average number of portfolio assets per fund, it is possible to derive average portfolio asset exposure and average fund commitment. From there, applying the total annual commitments anticipated in the pacing plan leads to an expected number of commitments per year. Notably, these figures assume all investments are primary fund commitments.

	Fed. Target	P&F Target	Pacing Plan Commitments	Avg. Portfolio Asset Size	Average Fund Commitment	Implied Per Year Commitments
Buyout	8%	6%	$26	$1.42	$15.0	0 – 2
Venture	4%	4%	$60	$0.45	$10.0	4 – 8
Private Debt	3%	3%	$72	$0.91	$20.0	3 – 4
Private Real Estate	3%	3%	$50	$0.68	$20.0	2 – 3
Private Real Assets	3%	3%	$53	$0.68	$15.0	3 – 5
Plan size ($mm):	**2,500**	**4,100**				

Making reasonable assumptions about the average investment period and average term of a fund, and re-up rate with a manager, it is possible to estimate the number of investment managers, actively investing funds, and total funds that would exist within each asset class.

	Re-up Rate	Avg. Inv. Period	Avg. Fund Life	Total Funds	Investing Funds	Est. Managers
Buyout	67%	5 years	12 years	72	30	44
Venture	67%	5 years	12 years	24	10	15
Private Debt	67%	4 years	7 years	15	7	10
Private Real Estate	67%	5 years	10 years	19	10	13
Private Real Assets	67%	5 years	12 years	48	20	29
Totals:				**~150-200**	**~70-90**	**~75-125**

Too many everything!

The number of total portfolio assets, funds, and investment managers are outputs of many assumptions, so if intuition provides that the output are undesirable, the assumptions can be revisited. The following may be relevant questions:

1. Is the output reasonable (does it look right)?

   For any particular asset class, the results seems fairly intuitive. In order to get a sample whose statistical characteristics are similar to the entire population, the sample size needs to be relatively large. Part of the challenge is adding five different populations. If measurement took place only at the Private Markets Program level, it would be possible to accept more variation at the individual asset class level.

   One potential meaningful source of error is in the standard deviation assumption that necessitates a high level of diversification. The model does not incorporate any correlation benefit that could reduce the level of portfolio assets required to get to the same confidence level.

   Discussions and reporting from other mid- and large-size North American institutional investors with mature private equity programs show similarly high levels of diversification, even when those portfolios are narrower in scope than the entire Private Markets Program. Anecdotally, a typical mature program has 150-250 funds, 50-150 of which are active (depending on definition), with 50-100 GPs.

   As staff regularly states, the plans' do not necessarily need (or want) to behave like peers. While the output of the models appear reasonable and consistent with the experience of other investors, it may not be desirable to have that kind of portfolio.

2. Is the output desirable?

   Most likely, the initial reaction from the output is "too many everything!" Obvious potential concerns are: Can the plans outperform with such diversification? Does staff have the resources to manage so many commitments and funds? Will the plans need to become non-economic sellers when the number of funds and relationships grow so large?

   On the other hand, the model appears mostly reasonable, so if the plans are most concerned about meeting the objectives of the Private Markets Program, that should take precedence over downstream concerns about portfolio composition. Also, the model is just a simplified guide. Actual portfolio activities can be complex, working around challenges coming out of the model.

   The next slides discuss merits and considerations about the output of the portfolio construction model.

Model considerations

- Diversification limits the ability to outperform.

  The purpose of diversification is to ensure that a small number of negative outcomes do not compromise the overall objectives of the Private Markets Program. Similar to the argument for active management in public markets, manager selection can be a source of alpha in a diversified private markets portfolio. The sources of alpha described in the Philosophy section continue to be available. Realistically, not every fund selection decision will be a good one (though that is the objective), so diversification insulates against those outcomes.

- Staff resources are constrained.

  Resources are absolutely a constraint, but there are a number of mitigating factors. First, the outside advisors aid in the investment process. Neuberger Berman is largely responsible for the buyout asset class, and Meketa Investment Group provides high levels of support in other private markets asset classes. Second, in private debt and private real estate, the anticipated number of commitments is roughly in-line with what staff has done historically. Third, staff resources have increased to match the requirements of a part of the portfolio that is critical to the plans' objectives. Fourth, if necessary, the board and/or management can increase staff resources in a way that is meaningful to capacity but insignificant relative to a Private Markets Program targeting $1.3+ billion in net asset value.

- Other institutional investors with highly diversified private equity programs have become sellers to rationalize their portfolios.

  Perhaps the most realistic concern is how an initial quest for diversification can backfire. Looking at more mature private markets programs, there are high levels of diversification, widely publicized efforts to reduce the number of funds and relationships, and secondary market activity. These things, in and of themselves, are not bad. Diversification is a positive objective. Strategic portfolio management, including deliberate use of the secondary market, is also positive.

  There is a natural progression in private markets, from building a diversified, primary fund-driven portfolio, to more sophisticated private markets techniques. The progression happens as the core of the portfolio becomes more stable, the institutional knowledge and staff skills mature, and the concerns of governing bodies are alleviated by the slow progression into these sophisticated techniques.

  The distinction should be made between the natural progression and non-economic strategy shifts. Wholesale changes made at a high level and implemented by a "forced" staff can be incredibly damaging. In practice, though, these irrational behaviors are usually political and not the norm. Particularly as it relates to the secondary market, the last few years have seen leaps in process, evaluation, and liquidity. In many cases, it is possible to transact with minimal financial impact.

Merits of the model

- High confidence that the Private Markets Program objectives will be met.

  There is nothing more important than getting the beta exposure indicated by the asset allocation in a manner that is highly likely to achieve the objectives of the Private Markets Program implied by that asset allocation. To this end, the first priority is to deploy the commitments envisioned in the pacing plan. If the number of commitments envisioned in the model is prohibitively large, then the size of the actual commitments needs to increase. However, this results in a higher probability of not achieving a minimum return threshold.

- Workload split between investment and operations, initial investment decisions and monitoring.

  Most of the work in a private fund commitment is done before a decision about whether or not to invest. Particularly at the plans' average commitment size, LP engagement opportunities/requirements are not common. Monitoring is generally limited to being aware of what is happening in the fund for portfolio management purposes and as a check on GP activities. Operational activities have more frequent per-fund engagement, managing capital calls and distributions, custody and accounting records. The processes for these activities are mission-critical, but they are less time consuming and more scalable than on the investment side.

- Strategic use of co-investments and secondaries can simplify and enhance the portfolio versus the model.

  Co-investments are one way that the portfolio can be simplified, by deploying the same funds into fewer funds, and enhanced, by reducing fees, deepening GP relationships, strengthening monitoring abilities. If the plans targeted 20% of each asset class into co-investments, with position sizes around 1-3% of each asset class, these $3-10mm (plans combined) co-investment sizes could reduce the number of portfolio assets to the low end of desired range and reduce number of commitments per year. Realistically, in order to execute a co-investment program, staff would need discretion, as the timing requirements on attractive investments rarely allow for our traditional due diligence process and board approval. Some "syndicated co-investments" allow for the legacy approval process, but staff typically does not find these investments warrant such a large position in the portfolio.

  Secondaries can help simplify the portfolio by up-sizing positions that are desirable and eliminating non-core positions. For example, if the plans made 3 commitments in 2014, and in 2021 only one of the three GPs is going to continue to be in the portfolio, there could be an opportunity to sell one or two of the 2014 vintages while buying additional stakes in the other. It goes without saying that the situation is highly dependent on pricing, the GPs/portfolio assets in question, and transaction costs. When these situations do work out, they will help avoid proliferation of funds and over-diversification.

Portfolio construction summary

Overall, the model presents a fair approach to building the Private Markets Program. While it is not without shortcomings, those weaknesses can be overcome by practical portfolio management that is not as easily modeled.

			Pro Forma, Stabilized Portfolio			
	Annual Commitments	Avg. Size per Commitment	Est. Managers	Investing Funds	Total Funds	Number of Portfolio Assets
Buyout	0 – 2	\$15 – \$25mm	40 – 50	25 – 35	65 – 80	300 – 400
Venture	4 – 8	\$3 – \$15mm	10 – 20	5 – 15	20 – 30	500 – 600
Private Debt	3 – 4	\$10 – \$40mm	5 – 15	5 – 10	10 – 20	200 – 300
Private Real Estate	2 – 3	\$10 – \$40mm	10 – 20	8 – 15	15 – 25	200 – 300
Private Real Assets	3 – 5	\$8 – \$20mm	20 – 30	15 – 25	40 – 50	200 – 300
Totals:	**10 – 20**		**75 – 125**	**70 – 90**	**150 – 200**	**1,200 – 1,800**

Risk management

Because of the illiquid nature of the assets, risk management in private markets is more limited in the frequency, accuracy, and actions that can be taken. Consequently, actions taken before or at the time of investment have the greatest impact.

Plan-level exposure concerns

The biggest controllable risk is the exposure that comes from concentration in initial commitments. The pacing plan provides for vintage diversification, and revisiting it annually is the way to ensure the sizing of the asset classes remains near the targets. While executing the pacing plan, staff ensures diversification in strategy, which prevents over-concentration within a particular asset class.

Traditional risk metrics like standard deviation or tracking error are not as easy to measure and budget because of infrequency of reporting and a lack of good benchmarks. At a high level, risk preferences can be expressed via suggestions on portfolio construction, which provide imperfect but useful guides on risk tolerance.

The Boards' main tools for risk limits on the Private Markets Program are the pacing plan and guardrails on delegation of authority. Staff will continue to try and capture actual exposures via the risk system.

Risk management activities

For individual investments, most of the risk management work comes in negotiations related to the limited partnership agreement and side letter. These are the unfortunately blunt instruments with which staff can drive limitations on GP activities, reporting requirements, and control features. Once an investment is made, these documents rarely change in a way that is LP-friendly, and any influence that the LPs have are generally structured around the interpretation of language in these documents.

There may be times when proactively monitoring of the portfolio identifies potential concerns that are either not widely shared or not widely known. Often, the concerns will be about GP capabilities or disagreement on portfolio asset value. Another potential situation is multiple GPs with different strategies sharing a sector view, resulting in overall over-exposure to sector (e.g. energy or financial services). In these cases, use of the secondary market may be a risk mitigation device.

Investment options

As with planning and constructing the right portfolio for the plans, the actual process of making investment decisions and structuring transactions is combination of the right resources and investment vehicle. There are three primary investment vehicles and three primary resources used for investments. For the purposes of this presentation, these descriptions apply exclusively to private markets.

Investment vehicles

- Separately managed account (SMA)
  Assets are held in the plans' name. Control over assets can be given via an investment management agreement (IMA), but there is no legal requirement for an IMA to be in place. As the IMA is bilateral, it can be highly negotiated and customized. These are economic at any asset level, but feasible only at large asset levels if an investment manager is to manage it.

- Fund – single investor
  Assets are held in a separate legal entity (typically an on-shore limited partnership or limited liability company), in which one or both of the plans are the only standard limited partners. There must be a legal entity-general partner, which generally enters into the IMA with an investment manager. Since the plans and the GP/investment manager are the only parties, these can also be highly negotiated and customized. The single investor fund is only economic at large asset levels (usually $100mm).

- Fund – commingled
  The same situation as above, except there are multiple standard limited partners, which usually dilutes the plans' ability to customize or negotiate the strategy and/or terms. The benefit of these structures is that the plans can access a variety of investment managers and strategies without committing the same amounts that would be required for a SMA or single investor fund.

Resources

- Staff
  The people employed exclusively by the plan.

- Non-discretionary advisors
  People and organizations hired by the plan to advise on investments, but without authority to execute investments.

- Discretionary advisors
  People and organizations hired by the plan to advise on investments, with authority to execute investments.

Practical partnering is prudent

The plans currently use a variety of combinations. While multiple resources are used on any particular investment, the examples below reflect where the heaviest portion of the investment underwriting was conducted.

The least costly method of investing with the highest degree of transparency and control is direct investing – that is, staff identifying and executing investments directly into portfolio assets. For a variety of reasons, that is not practical.

Non-discretionary advisors/consultants largely serve as an extension of staff. Consultants tend to represent a large number of similar clients, and have different skills sets than staff. That makes them well suited for things like performing most of the underwriting on a large infrastructure fund.

Discretionary advisors/investment managers are focused on generating performance within a well-defined area. For example, it is not effective for staff or a non-discretionary consultant to manage a number of small commitments to emerging markets funds, but a specialist emerging markets fund-of-funds manager provides a way to get that exposure.

The plans have excellent discretionary and non-discretionary advisors and staff works hard to ensure their knowledge and experience is leveraged as much as possible. The only negative aspect to external advisors is their expense. Whether paid through a retainer, asset-based fee, or profit-sharing arrangement, staff tries to be thoughtful about how to structure these agreements.

	Separately Managed Account	**Single Investor Fund**	**Commingled Fund**
Staff	Arrowmark Co-invest.		Octagon CLO Opportunity Fund III
Non-Discretionary Advisor		Neuberger Berman Strategic Partnerships	Lime Rock Partners VIII
Discretionary Advisor	White Oak Direct Lending	GSO SJ Partners	57 Stars Global Opportunity Fund 3

Balancing creativity and suitability

Staff is capable of generating deal flow beyond traditional fund investing – something proven internally but rarely brought to the investment committees or Boards. The challenge is that a good investment is not necessarily an appropriate one. In particular, staff and the plans have to cautious to avoid investments where the success or failure is dependent on the individual remaining part of the staff. The plans have a history of high turnover and there has been no action to avoid more of the same in the future .

Because the plans cannot hire and retain staff to do all investing in-house, the use of discretionary and non-discretionary advisors should be tied to the alpha generation strategy. Specifically, the plans' competitive advantage was identified as access to/use of information and capital flexibility. Considering these advantages, most investing will take place through commingled funds and co-investments.

The key to success will be to generate investment ideas that are not seen by others. For example, the staff time saved by having a consultant do the underwriting of a small commitment to a large fund can be redeployed to the underwriting of a smaller strategy where the consultant does not have the same relationship or access. Or structuring a warehousing arrangement for the first deals of a new manager. Or working with an old fund on a GP-led restructuring.

Continuous process improvement at the staff level is driven toward originating creative – and suitable – investments that build informational advantage, provide scalability, improve on existing partnerships or take advantage of macro tailwinds or capital scarcity.

Patience and accountability

The hardest element of private markets is the time frame. While most other investments show immediate analyzable gains/losses, a typical fund investment can show negative returns for a couple of years and be cash flow-consuming for a few years more. True ability to analyze performance does not start for, at an absolute minimum, three years. For an entire program, particularly one as young as the plans', true ability to identify success will likely take three to five years. The good news is that for the private real estate and private debt asset classes, the net IRRs since inception are in-line with those required to meet the returns anticipated by the asset allocation.

Reporting

Performance reports are produced quarterly. There are two versions of each report – a public version and a private version. The public version is placed on the investment committees' agenda as a communication item and then presented at the subsequent Board meetings as part of the Investments section. The reports are typically available five months after quarter-end. The lag occurs because each investment manager takes 45-90 days to produce the fund-level report, and then it takes another 30-60 for all investments to be combined into the plans' performance reports.

Currently, Neuberger Berman produces a report for private equity, which includes the single investor funds (i.e. the NB funds) and "legacy" investments in private equity outside the fund-of-ones. In the public version of the report, investments in the single investor funds have the names masked because they are not subject to disclosure. In the private version of the report, all investment names are shown. Additionally, Neuberger Berman produces a spreadsheet of cash flows that staff provides to the general investment consultant.

Currently, Meketa produces a report for the entire Private Markets Program, as well as private debt, private real estate, and private real assets. The public version of the reports are nearly identical to the private versions, with the exception of certain discussions about portfolio activities within individual private funds. The spreadsheet of cash flows provided by Neuberger Berman is what allows Meketa to produce performance figures for the entire Private Markets Program.

Summary

- The plans invest in private markets to achieve their assumed rate of return, net of fees.
- The asset allocation process determines how much to invest, and the objectives of each asset class.
- Annually revised pacing plans provide a guide for staff to follow when investing.
- While getting the appropriate beta exposure is most important to success in the plans' private market investments, most of staff's work is geared toward generating alpha.
- Alpha comes through competitive advantage, which is developed by building on the plans' strengths: access to information, information management, and capital flexibility.
- To achieve the plans' objectives, the portfolio needs to have hundreds of positions, dozens of funds, and several annual commitments in each asset class.
- Diversification and savvy up-front investment structuring are the best risk mitigation tools.
- The plans use staff, discretionary advisors, and non-discretionary advisors to invest through a variety of investment vehicles.
- Staff leverages advisors and investment vehicles to focus each group on the highest value-added activities in order to maximize the chance of alpha.
- Quarterly performance reporting with absolute and relative return data is provided to the Board, though it will be several years before it is possible to meaningfully evaluate the performance versus the plans' goals.