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CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Investment Program

IMMUNIZED NET CASH FLOW ALLOCATION

San Jose Federated City Employees' Retirement System

Objectives

The Immunized Net Cash Flow (INCF) allocation is intended to provide the Plans with a buffer against forced selling of growth assets to meet ongoing benefit payment needs in the middle of a temporary market dislocation.

Implementation of the new Strategic Asset Allocation began October 1, 2018, with a "go live" date of January 1, 2019.

The new asset allocation includes 5% of plan set aside to hedge the next 5 year's worth of net cash flows.

GROWTH	P&F	FED
Private Markets	22%	25%
Public Equity	31%	30%
EMD	3%	3%
TOTAL GROWTH	***56%***	***58%***
	$2.0 Billion	***$1.3 Billion***

INCF	P&F	FED
5% of Plan	***$183 Million***	***$111 Million***

<u>Proposed IPS language</u>

> "The Board members intend to maintain sufficient liquidity to meet at least five years of anticipated beneficiary payments, net of sponsor and member contributions."
>
> *Draft Investment Policy Statement, Section III.C*

Objectives, and Other Considerations

"The Board members intend to maintain sufficient liquidity to meet at least five years of anticipated beneficiary payments, net of sponsor and member contributions."

Maintain sufficient liquidity: bonds (cash flow / duration matching)

At least five years: historically, slightly longer than half an economic cycle

Anticipated: flexibility required as reality deviates from assumptions

Beneficiary payments, net of sponsor and member contributions: Net Cash Flows, not projected outflows

Investment Structure

"For the immunized cash portfolio, the Board has established a target allocation amount of up to 60 months' worth of projected benefit payments in the Zero Beta Sub-portfolio, which will be drawn down and replenished annually."

Draft Investment Policy Statement, Section V.A.2

Projected Net Cash flows

provided by the Actuary, updated annually or as needed

Asset Portfolio

managed by external investment firm

portfolio of bonds that cash flow matches projected net cash flows

Staff

coordinates information flow, including any rebalancing

Next Steps

Rebalancing Language in Draft IPS – *Draft language has been updated*

"The CIO shall adhere to the SAAP asset and sub-asset class "targets" approved by the Board and shall rebalance to within the approved range at least quarterly if the actual weights at the sub-asset class levels are not within 10% of the approved target, considering the cost of more frequent rebalancing…The Immunized Cash Flows portfolio is exempt from this rebalancing provision, as it is amortizing by design."

Draft Investment Policy Statement, Section VI.Rebalancing.A

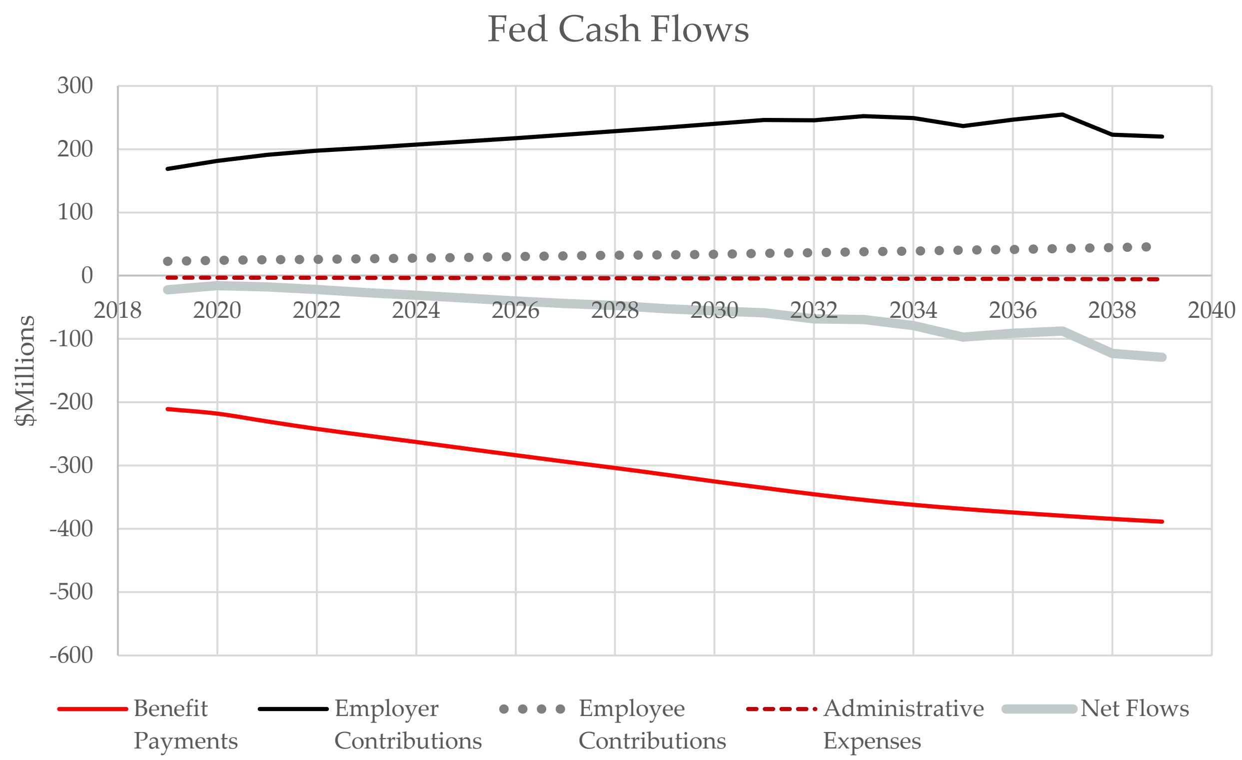
Gather information from solutions providers – *2 rounds of proposals evaluated*

Include asset portfolio risk tolerance, rebalancing preferences, cash flow projections

Final Due Diligence and Selection

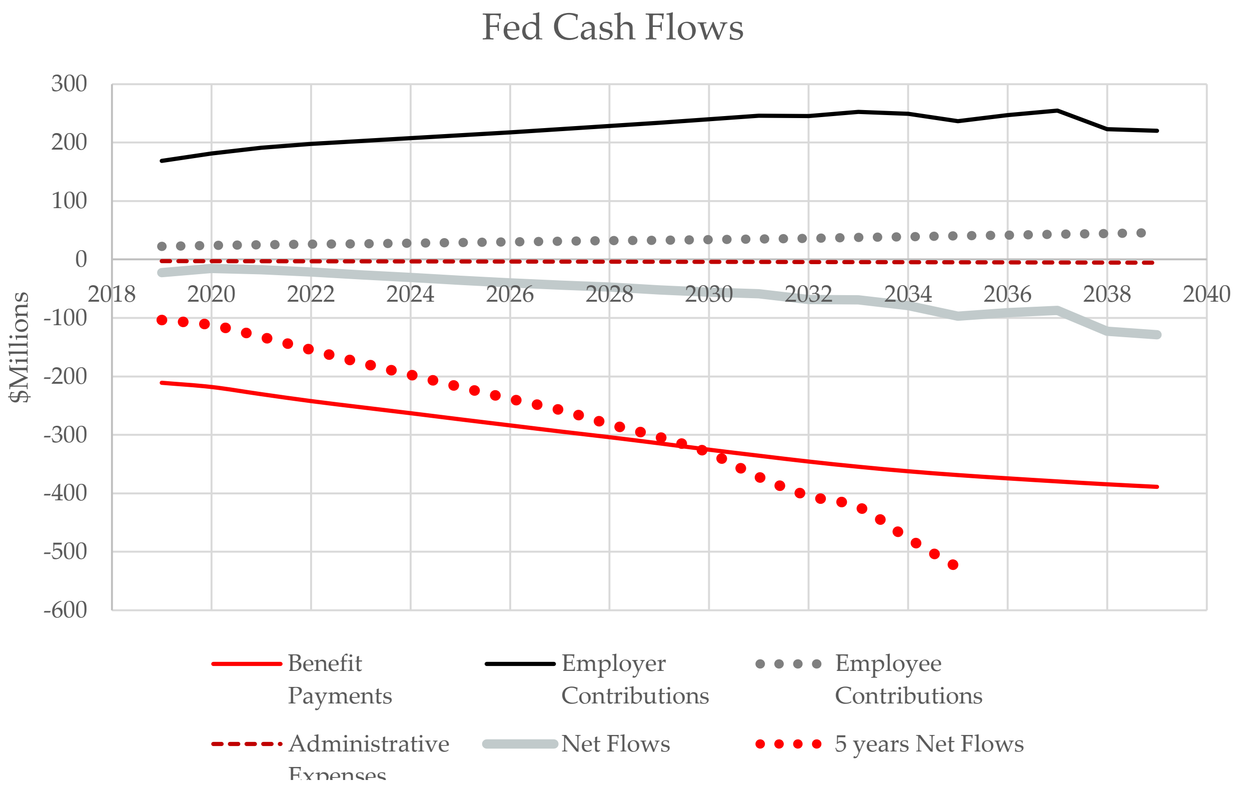
IC recommendation in Q1 2019

Projected Cashflows



Cheiron, Nov 2018

Projected Cashflows, con't



INCF Balances

The Plan will require more than 5% of plan to hedge 5 years of net cash flows in the near future, given current projections.

If limited to 5% of plan, the hedging term plateaus near 3 years. The annual replenishments increase substantially.

Federated			
WITHOUT REPLENISHMENT			
2019	5.1		
REPLENISHMENT TO 5% OF PLAN			
	$	YEARS	% PLAN
2020	29,798,524.3	5.1	5.0%
2021	23,608,387.4	4.8	5.0%
2022	26,110,525.0	4.4	5.0%
2023	30,663,504.9	4.2	5.0%
2024	36,342,929.9	3.9	5.0%
2025	41,333,660.7	3.8	5.0%
2026	46,739,287.0	3.8	5.0%
2027	51,671,498.3	3.7	5.0%
2028	56,426,065.8	3.7	5.0%
2029	60,571,594.3	3.6	5.0%
2030	66,426,802.4	3.5	5.0%
2031	71,033,691.0	3.5	5.0%
2032	75,182,941.4	3.3	5.0%
2033	85,848,909.5	3.3	5.0%
2034	87,867,269.0	3.2	5.0%

INCF Balances, con’t

If the Plan keeps the hedging term at 5 years, the amount of plan required rises substantially, as well as the annual replenishment amounts, using current projections.

Fed	REPLENISHMENT NEEDED TO DEFEASE 5 YRS		
	$	YEARS	% PLAN
2020	23,598,114	5.0	4.7%
2021	29,451,366	5.0	5.2%
2022	45,678,559	5.0	5.7%
2023	63,359,257	5.0	6.1%
2024	79,779,653	5.0	6.4%
2025	95,465,412	5.0	6.6%
2026	109,795,456	5.0	6.8%
2027	121,831,651	5.0	6.9%
2028	138,494,098	5.0	7.1%
2029	151,238,078	5.0	7.1%
2030	169,675,878	5.0	7.3%
2031	200,136,965	5.0	7.7%
2032	220,218,858	5.0	7.8%
2033	232,288,833	5.0	7.6%
2034	269,424,125	5.0	8.1%

INCF Structure

YEAR 1

YEAR 2

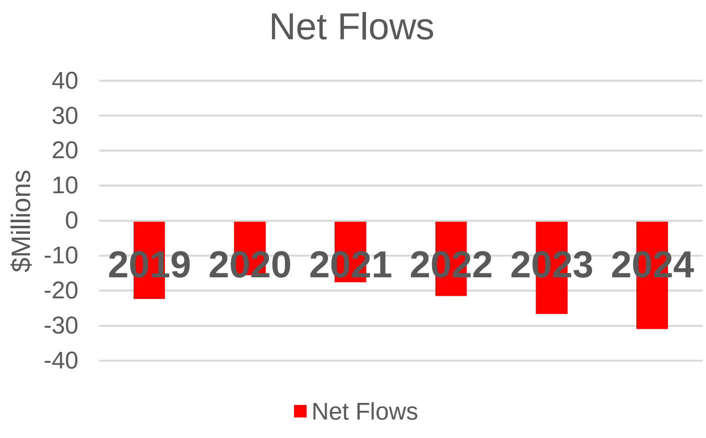
YEAR 3

YEAR 4

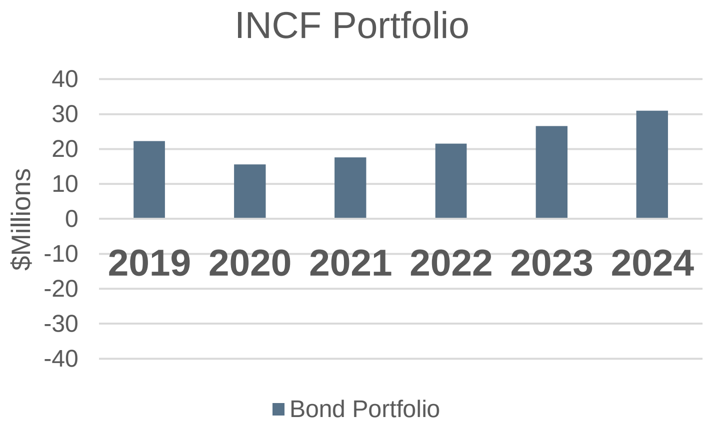
YEAR 5

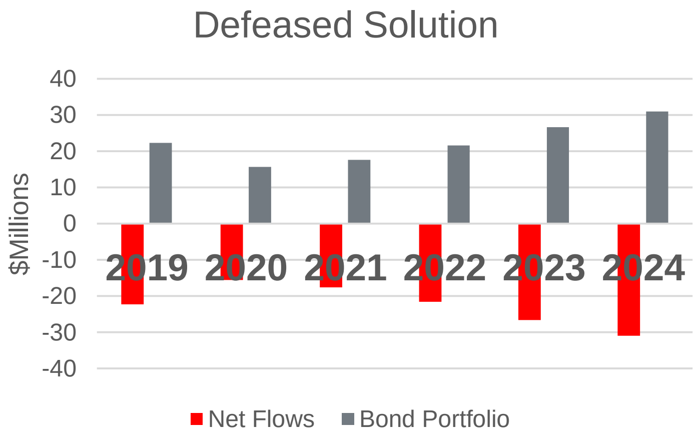
+ Contributions
  - Tier 1 Sponsor
  - Tier 1 Employee
  - Tier 2 Sponsor
  - Tier 2 Employee
- Benefit Payments
- <u>Administrative Expenses</u>

Net Cash Flows

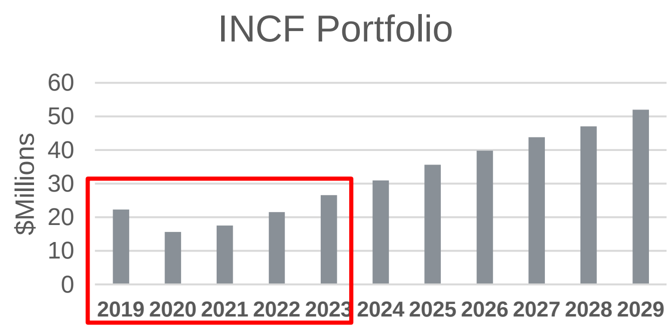


INCF Allocation





INCF Structure, con't



<u>Structure: Additional Considerations</u>

Annual Replenishment

Flexibility is required

- Prefunding
- Actual vs. Estimated Cash Flows
- Changing Risk Tolerance in Asset Portfolio

<u>Asset Portfolio</u>

Lowest Risk: Treasury / Agency

- Most appropriate for a liquidity buffer?
- Lowest return; requires most funding

Medium Risk: Some Credit Exposure

Highest Risk: Credit only

- Includes default risk
- Highest return; requires least funding

	Federated			Police and Fire		
Sector	Portfolio 1 Govt. (%)	Portfolio 2 50% credit (%)	Portfolio 3 100% credit (%)	Portfolio 1 Govt. (%)	Portfolio 2 50% credit (%)	Portfolio 3 100% credit (%)
Treasury	75	25	-	75	25	-
Agency	25	25	-	25	25	-
Corporate	-	45	95	-	45	95
ABS	-	5	5	-	5	5
Credit quality	(%)	(%)	(%)	(%)	(%)	(%)
Govt	100	50	-	100	50	-
AAA	-	5	5	-	5	5
AA	-	5	10	-	5	10
A	-	30	45	-	30	45
BBB	-	10	25	-	10	25
BB	-	-	15	-	-	15
Summary metrics						
Yield (%)	2.53	3.26	3.95	2.53	3.25	3.93
OAS (%)	0.04	0.79	1.49	0.04	0.78	1.46
Avg. credit quality	AAA	AAA/AA	A/BBB	AAA	AAA/AA	A/BBB
Duration (years)	2.5	2.5	2.4	2.6	2.6	2.5
Tracking error (bp)	13	58	102	13	61	104
Assets required ($m)	96.9	95.0	93.3	151.0	148.0	145.0
Savings versus Portfolio 1 ($m)	-	1.9	3.6	-	3.0	6.0

Source: Insight Investment. Illustrative purposes only. Information is as of January 31, 2019 only and subject to change without notice. Please refer to 'model disclosure' as part of our 'important disclosures' section.

INCF Search Process

2018	
Q4	Transitioned to new Strategic Asset Allocation
November	Discussion with Meketa
November	Identified short list of providers
December	Joint Investment Committee
December	Distributed pro-forma data set
2019	
January	First round of proposals
February	Second round of proposals
March	Follow up discussion with Meketa
March	Internal Investment Committee
March	Joint Investment Committee
March – April	Contracting
July 1	Mandate Begins

INCF Criteria

<u>Solution Design</u>
How does their solution address the basic net cash flow hedging objective. What are the components of the solution, and complexity? How much staff and actuarial resources will their solution require?

<u>Flexibility</u>
Is their solution able to handle potentially large and late changes in assumptions? Can their solution adapt to changes in prefunding, desired hedging term, and changes in asset portfolio risk tolerance? Additionally, can their solution minimize the costs of any variances between actual and estimated net cash flows?

<u>Pricing</u>
Fee? Tiered on AUM, and/or risk level of the asset portfolio?

<u>Operational Resources</u>
Does the firm have the resources required to deliver their proposed solution? Will the proposed solution have a dedicated client and operational team?

<u>Communication</u>
Has the firm been able to clearly communicate their proposed solution? Does the firm have a demonstrated history of dealing with public plan clients?

<u>Credit Capabilities</u>
What is the firm's portfolio management philosophy for a LDI / hold to maturity solution, and how, if at all, does it differ from the firm's approach to a total return mandate? How are the individual issuers selected for the credit portfolio? What are the single holding / issuer / sector / rating concentration limits, if any?

<u>Firm Capabilities</u>
Is their firm capable of delivering their solution as offered? What type of expertise and history does their firm have with these types of mandates? What additional capabilities does their firm offer?

INCF Recommendation: Insight

Solution Design

All the submitted designs were similar in format, with minor exceptions around the periphery. Insight's recommendation was one of many that was designed to fulfill the objective while allowing for maximum flexibility.

Flexibility

Insight concurs with Staff's recommendation to begin with a US Treasury / Agency solution. This option has the cheapest rebalancing cost should any adjustments be needed; additionally, this option eliminates the risk of any credit related default. This option can also easily be transitioned to include credit at a later date.

Pricing

Insight has offered a fee structure that is tiered on the risk appetite of the asset portfolio. There are also tiers based on AUM, aggregated across both Plans. The pricing for the Plans' initial Treasury / Agency solution will be 5bps of AUM.

Operational Resources

Insight has a deep and well resourced team, with 115 investment professionals and an additional 80 staff members, including 16 actuaries. They would provide the Plans a dedicated team directly responsible for the Plans' mandates.

Communication

Insight manages two similar mandates with other local public pension plans; both rate the firm's communication skills very highly.

Credit Capabilities

Should they include credit, these mandates would be run with a different focus than a total return portfolio – when used to defease cash flows, "buy and maintain" portfolios tend to favor long-term stability over tactical value-add opportunities. There will typically be a high threshold for rebalancing.

Firm Capabilities

Insight is primarily a LDI solutions specialist, with over 80% of its AUM in LDI mandates for pension clients.

1 Insight's final investment proposal

1.1 Overview

The Federated Employees' Retirement System (Federated) and the Police and Fire Department Retirement Plan (Police and Fire) have set aside a 5% allocation with a goal of immunizing up to the next five years of net cash outflows (benefit payments and investment expenses, net of employee and sponsor contributions).

Our understanding is that:

- The primary objective of the immunization strategy is to meet net projected liquidity requirements while minimizing forced selling risk during stressed market environments.
- A range of risk tolerances and degrees of cashflow matching precision are being considered.
- Investment flexibility is desirable due to uncertainty around the amount and timing of the projected cashflows (e.g., due to variability in timing of sponsor contributions, new actuarial valuations, ongoing program replenishment, etc.).
- Each plan's allocation will be run separately, but in a similar manner.

Additionally, we note that an advantage of the immunization program is to reduce the ongoing operational burden and complexity of funding net cash outflows from multiple managers and any associated rebalancing.

For each plan, we incorporate the updated assumptions provided to us incorporating:

1. Revised risk tolerances, i.e., from a low-risk US Treasury and Agency solution to solutions with some measure of credit risk including high yield.
2. Annual prefunding of Tier 1 sponsor contributions.
3. Annual replenishment amounts based on 6.75% mandate size growth.

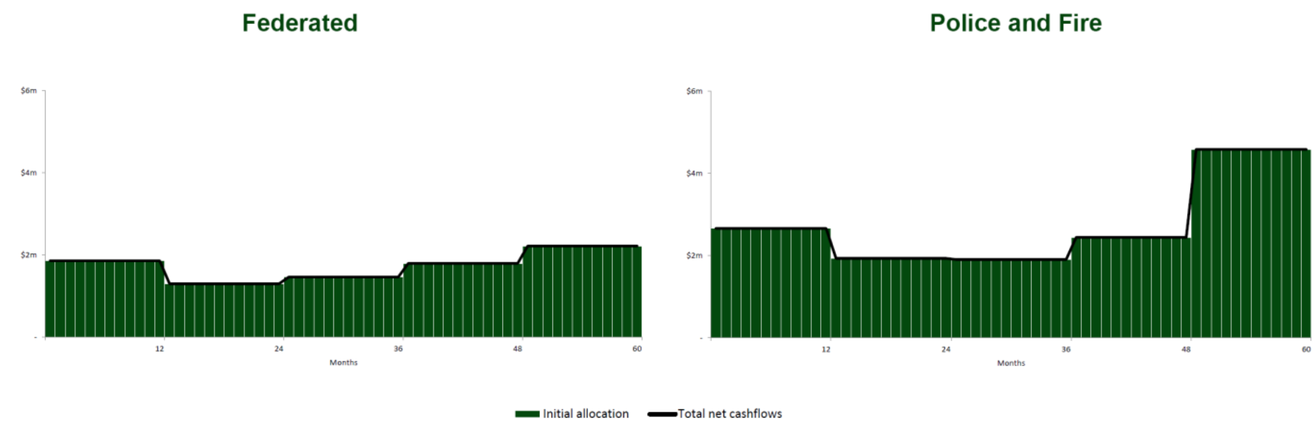
In this proposal, we build upon experience gained from our portfolio of CDI mandates and apply our best ideas to the City of San José's unique situation. For simplicity and comparability across respondents, we present a subset of solutions that target a high degree of precision in matching cashflows. As we highlighted in our initial proposal, relaxing the cashflow matching precision can potentially allow for higher returns while assuming some incremental risk.

1.2 Initial portfolio construction – revised risk tolerances

We have developed a baseline set of portfolios which allow you to easily compare the trade-off between cost and risk. In order to do so, we make the following assumptions:

- Only the first five years of monthly net cashflows have been matched.
- No annual replenishments.

Exhibit 1: Projected five-year net cashflow



Source: Insight Investment. Illustrative purposes only.

We include three portfolios across the risk and return spectrum:

- Portfolio 1: Lowest risk and most liquid investment solution using Treasuries and Agencies (100%).
- Portfolio 2: Mix of Treasuries and Agencies (50%) with a broader diversified investment opportunity-set (50%) including investment grade corporates and a small allocation to AAA-rated asset-backed securities (ABS) targeting stable cashflow profiles (e.g. credit card receivables and auto loans).
- Portfolio 3: Highest yielding and lowest cost investment solution prioritizing spread-based investments (100%). The spread-based investments incorporate a diversified portfolio of investment grade corporate bonds (80%), AAA-rated ABS (5%), and BB-rated high yield (15%). We believe that within high yield, BB rated securities offer the best tradeoff between risk and return for cashflow driven strategies.

Exhibit 2: Summary of portfolios

	Federated			Police and Fire		
Sector	Portfolio 1 Govt. (%)	Portfolio 2 50% credit (%)	Portfolio 3 100% credit (%)	Portfolio 1 Govt. (%)	Portfolio 2 50% credit (%)	Portfolio 3 100% credit (%)
Treasury	75	25	-	75	25	-
Agency	25	25	-	25	25	-
Corporate	-	45	95	-	45	95
ABS	-	5	5	-	5	5
Credit quality	(%)	(%)	(%)	(%)	(%)	(%)
Govt	100	50	-	100	50	-
AAA	-	5	5	-	5	5
AA	-	5	10	-	5	10
A	-	30	45	-	30	45
BBB	-	10	25	-	10	25
BB	-	-	15	-	-	15
Summary metrics						
Yield (%)	2.53	3.26	3.95	2.53	3.25	3.93
OAS (%)	0.04	0.79	1.49	0.04	0.78	1.46
Avg. credit quality	AAA	AAA/AA	A/BBB	AAA	AAA/AA	A/BBB
Duration (years)	2.5	2.5	2.4	2.6	2.6	2.5
Tracking error (bp)	13	58	102	13	61	104
Assets required ($m)	96.9	95.0	93.3	151.0	148.0	145.0
Savings versus Portfolio 1 ($m)	-	1.9	3.6	-	3.0	6.0

Source: Insight Investment. Illustrative purposes only. Information is as of January 31, 2019 only and subject to change without notice. Please refer to 'model disclosure' as part of our 'important disclosures' section.

We note the following for both the Federated and Police and Fire plans:

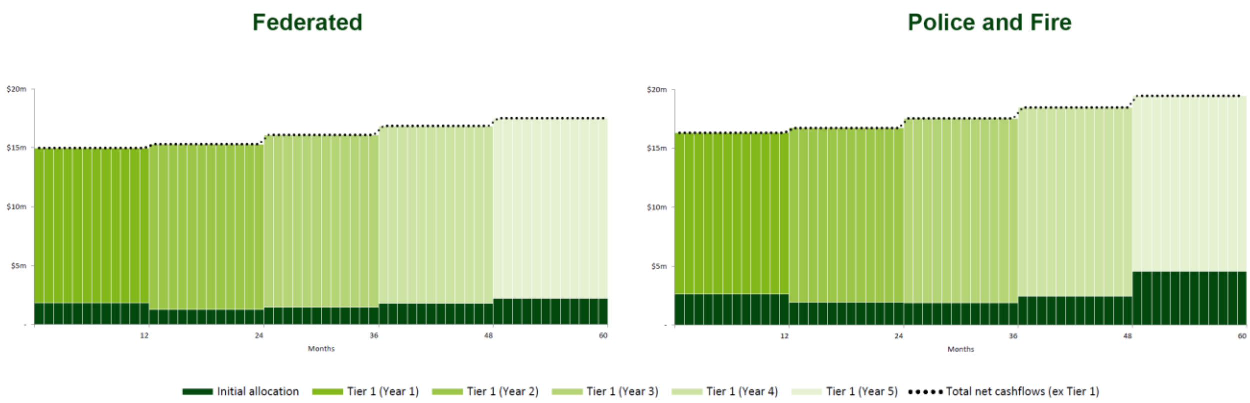
- Portfolio 1: The Treasury and Agency solution requires $96.9m/$151.0m of program funding, respectively, and provides the greatest liquidity and investment safety, but achieving lower yields (modeled at 2.53%).
- Portfolio 2: This solution permits some additional spread and lowers the cost of the program funding by $1.9m/$3.0m respectively relative to Portfolio 1. This is achieved by the modeled additional 78-79bp of yield (~3.25%).
- Portfolio 3: This solution incorporates an allocation to BB-rated high yield and achieves the highest modeled yield (~3.95%). This approach lowers the required program funding by $3.6m/$6.0m respectively relative to Portfolio 1.
- More detail on each of the portfolios can be found in **Appendix 4** as **Exhibits 10-15**.

1.3 Annual prefunding of Tier 1 sponsor contributions

We understand that the sponsor has the option to prepay Tier 1 contributions at the start of each fiscal year and in recent years, has chosen to do so. You have requested that we assume that the Tier 1 contribution is prefunded on July 1 in all years.

In **Exhibit 3** below, we illustrate how prefunded Tier 1 sponsor contributions are incorporated into the solution design:

Exhibit 3: Impact of prefunding on net cashflow profile



Source: Insight Investment. Illustrative purposes only.

The solution can be broken down into two components:

- The first component (dark green) represents the projected net cashflows supported by the initial investment (i.e. $111m for Federated and $183m for Police and Fire). These assets are invested consistent with the desired portfolio described in Section 1.2.
- The second component (various shades of light green) represents cash outflows supported by the Tier 1 sponsor contributions (e.g. $157m for Federated and $164m for Police and Fire over the first twelve months). When contributions are prefunded, the assets are available to invest over the twelve month horizon. We assume they are invested consistent with the risk tolerance of the associated initial portfolio.

In **Exhibit 4** below, we illustrate the estimated benefit of prefunding Tier 1 contributions as the assets are invested over each twelve month horizon, rather than paid out immediately when received (as under the monthly contribution assumption).

Exhibit 4: Benefit of prefunding Tier 1 contributions ($m)

	Federated			Police and Fire		
	Portfolio 1 Govt.	Portfolio 2 50% credit	Portfolio 3 100% credit	Portfolio 1 Govt.	Portfolio 2 50% credit	Portfolio 3 100% credit
Average annual benefit	1.8	2.2	2.7	1.9	2.3	2.8

For illustrative purposes only. Information is as of January 31, 2019 only and subject to change without notice. Please refer to 'model disclosure' as part of our 'important disclosures' section.

We note the following:

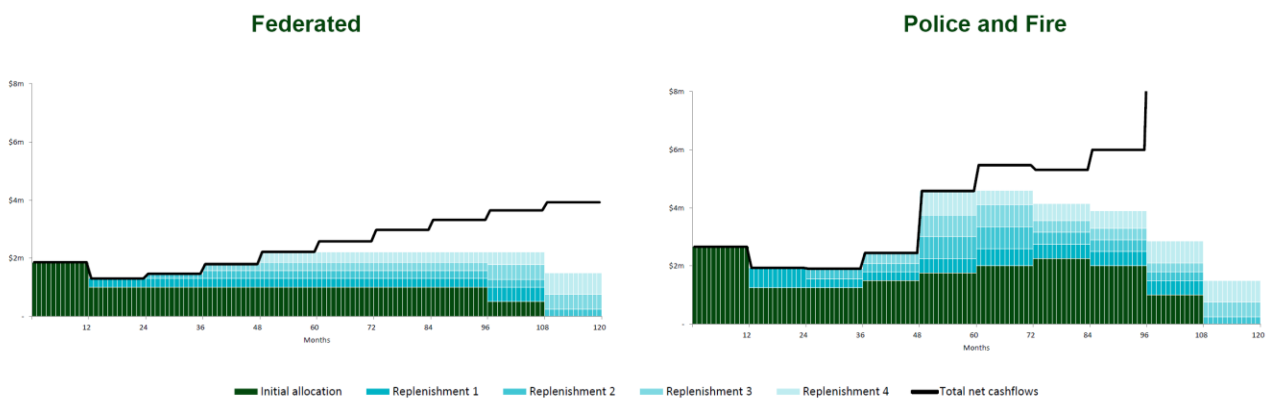
- The estimated benefit in **Exhibit 4** is based on market conditions as of January 31, 2019. Actual amounts will depend on the market conditions that exist when each prefunding occurs.
- We assume prefunded contributions are invested in a similar manner as the associated portfolio. The sponsor has flexibility to select a different risk tolerance and/or can adjust their preferences over time as future prefunded contributions are received.

1.4 Annual mandate replenishment

We confirm our understanding is that the mandate will be replenished annually at the start of each fiscal year. For the purpose of calculating the replenishment amount, you have requested that we assume that the mandate size grows by 6.75% each year. For simplicity, we assume the replenishment equals the increase in the target mandate size and the replacement of net cash outflows. Please see **Appendix 2** for annual replenishment estimates.

In **Exhibit 5** below, we illustrate how the annual replenishments are incorporated into the solution design:

Exhibit 5: Impact of replenishment amount on investment strategy



Illustrative purposes only. Please refer to ‘model disclosure’ as part of our ‘important disclosures’ section.

The projected replenishments (various shades of blue) represent a third component in the solution design and can be used to reduce the amount of cashflows matched by the initial allocation. Such a laddered approach minimizes the risk of generating excess cashflows in the early years due to coupon payments and bond amortizations from replenishment investments.

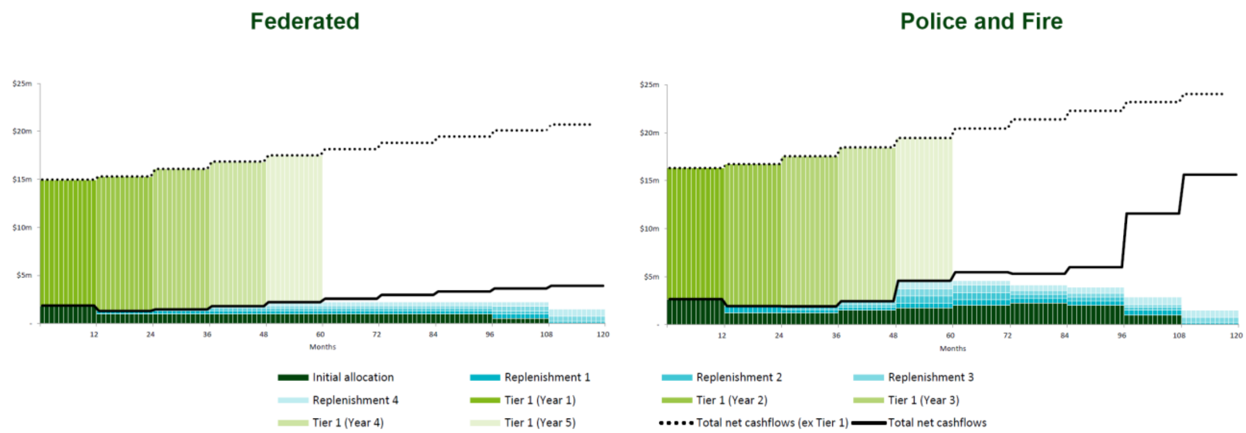
1.5 Bringing it all together

We combine the three components introduced in the previous sections to create a laddered strategy:

1. Initial allocation invested against monthly net cashflows
2. Annual prefunding of Tier 1 sponsor contributions
3. Annual mandate replenishment

A laddered strategy provides a framework to incorporate anticipated future cashflows into the current investment strategy as illustrated in **Exhibit 6**.

Exhibit 6: Integrating the components



Illustrative purposes only. Please refer to 'model disclosure' as part of our 'important disclosures' section.

A laddered strategy has a number of benefits:

- **Lowers the risk of generating excess cashflows:** if the initial allocation fully matches the net cashflows for multiple years, the replenishment amounts will generate a surplus and lead to reinvestment risk due to coupon payments and bond amortizations.
- **Potential to better diversify term of portfolio investments and reduce cost:** assets beyond the five-year horizon can be considered, providing a wider universe of available securities.
- **Enhanced program flexibility over time:** prefunded contributions and replenishments can be invested against the most current net cashflow projections at the time they are received. This allows the investment team to better adjust to a 'moving target' and reduces the investment opportunity cost of any false precision inherent in projecting longer-term net cashflows.
- **Design flexibility:** the laddered approach allows the plans to incorporate specific preferences such as the number of cashflows fully matched at initiation, how precisely longer-term net cashflows are matched, etc.

Please see **Appendix 4**, **Exhibits 16 and 17** for illustrative examples of a laddered strategy.

1.6 Working with you

Given the uncertain nature of future projected cashflows, it is important to maintain flexibility in the investment program. We recommend a laddered structure that is customized to meet your objectives and desired risk tolerance. Specifically, this solution:

- Allows the flexibility to initiate the program at one level of risk (e.g. Portfolio 1) while maintaining the option over time to incorporate incremental credit risk and/or additional asset classes
- Can easily incorporate the prefunding of Tier 1 sponsor contributions and variable replenishment amounts

Because of the additional program design and investment flexibility, we work closely with clients to construct a laddered approach in order to best capture their specific preferences. Practically, this means that the initial design and ongoing management process is interactive and iterative. For example, this includes:

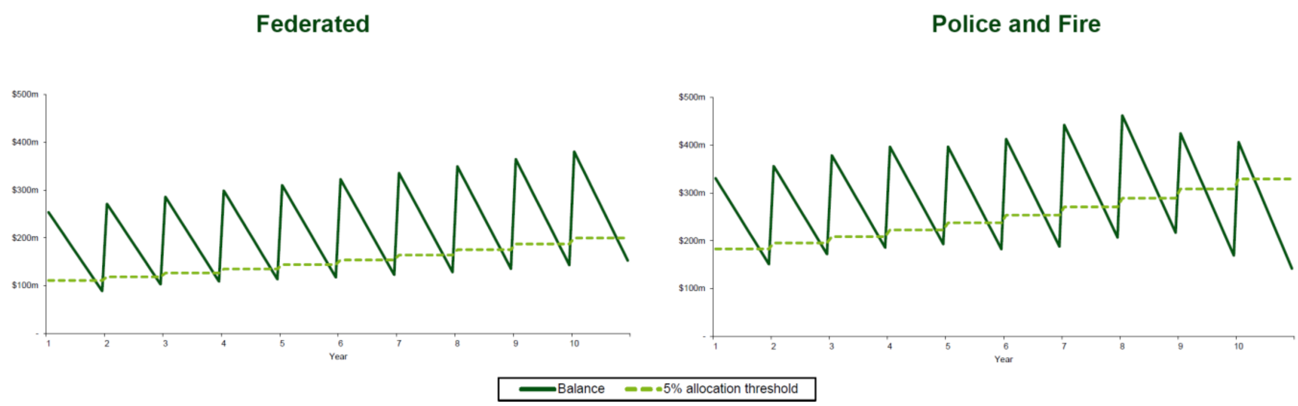
- Presenting, recommending and iterating a range of initial portfolio options that reflect your risk tolerances, specific investment constraints, most current benefit, contribution and expense forecasts, size of any liquidity buffer, cashflow matching precision, any view on the current market conditions, etc.
- Discussing potential opportunities to enhance the portfolio, in the case of a material market movement
- Responding to any ad hoc requests made by the Staff or Board such as addressing an intra-year divergence of expected benefit payments from actual
- Re-optimizing the solution on an annual basis to incorporate new actuarial projections and expected replenishments and reflect changes in investment policy and strategy objectives

Ultimately our solution design process is built around meeting our clients' objectives and is iterative in nature. We would be more than happy to implement any of the proposals and or to work with City of San José to evolve these further in line with your requirements.

Appendix 1: Projected portfolio value

Exhibit 7 illustrates the monthly portfolio balances based upon the projected cashflows and assuming Tier 1 sponsor contributions are prefunded.

Exhibit 7: Projected monthly portfolio valuation for both plans



Source: Insight Investment. Illustrative purposes only.

We note the following:

- The starting portfolio value for Federated/Police and Fire is $268m/$347m respectively. For Federated this includes an initial allocation of $111m plus upfront Tier 1 employer contribution of $157m. For Police and Fire this includes an initial allocation of $183m plus upfront Tier 1 employer contribution of $164m.
- At the start of the next fiscal year, additional tier 1 employer contributions and replenishment assets cause a spike up in portfolio values. The assets are spent down during the year leading to the ‘sawtooth’ pattern shown in the graphs above.
- The portfolio balances for both plans are projected to be well above the 5% target allocation of total plan assets at the start of each fiscal year and then amortize down towards 5% as monthly payments are paid out.
- The duration of the portfolio will change meaningfully through the course of the year.

Appendix 2: Key modeling assumptions

Our key modeling assumptions are below. Should your requirements or instructions change, we will update the assumptions and refine our modeling results as required.

Annual replenishment

As stated previously, for the purpose of calculating the replenishment amount we assume that the mandate size grows by 6.75% each year. For simplicity, we assume the replenishment equals the increase in the target mandate size and the replacement of net cash outflows (see table below).

Exhibit 8: Assumed replenishment amounts ($m)

	Federated					Police and Fire				
Year	Target mandate (BOY)	Target mandate (EOY)	Increase in target mandate	Projected net cash outflow	Assumed replenishment	Target mandate (BOY)	Target mandate (EOY)	Increase in target mandate	Projected net cash outflow	Assumed replenishment
1	111	118	7	23	**30**	183	195	12	32	**44**
2	118	126	8	16	**24**	195	209	14	22	**36**
3	126	135	9	17	**26**	209	223	14	23	**37**
4	135	144	9	22	**31**	223	238	15	29	**44**
5	144	154	10	26	**36**	238	254	16	55	**71**

Portfolio parameters

For our immunization portfolios, we typically include limits to ensure that the portfolio is well diversified. Below are the broad limits we used in our Ayla optimization runs to develop the illustrative portfolios.

Allocation ranges	Portfolio 1 (%)	Portfolio 2 (%)	Portfolio 3 (%)
Treasury	75-100	25-50	-
Agency	0-25	0-25	0-10
Corporate	-	50	75-85
AAA	-	0-10	0-10
AA	-	5-10	5-20
A		0-30	0-45
BBB	-	0-10	0-25
ABS	-	5-10	5-10

High yield	-	-	15

Maximum sub-sector limits as % of corporate allocation	(%)
Consumer cyclical	25.0
Consumer non-cyclical	25.0
Energy	10.0
Financials	25.0
Foreign agencies	25.0
Industrials	15.0
TMT	20.0
Utilities	25.0

Illustrative purposes only. Please refer to 'model disclosure' as part of our 'important disclosures' section.

Other modeling information

- Market environment and analysis as of January 31, 2019.

Appendix 6: Investment team

Insight's business is focused upon pension risk management solutions for corporate defined benefit plans. Over $612bn[4] of Insight's assets under management (AUM) is invested in customized liability-driven investment (LDI) solutions, for ~300 institutional clients. These solutions incorporate a range of liability-based benchmarks from strategies managed against custom public benchmarks to those mirroring the client's liability cashflow profile.

Each customized client mandate is staffed with a lead solution designer as well as a client relationship manager, a portfolio manager for the overall solution together with senior portfolio managers responsible for executing the component parts of the client's investment solution. In each case, the client team is supported by the full resources and technologies of the firm. For the City of San José, we envision the following model:

Portfolio management: Shivin Kwatra, Head of LDI Portfolio Management - US, will be responsible for portfolio construction and management of your cashflow-matching solutions. Shivin will be supported by the broader Fixed Income Group including Gerard Berrigan, Head of Insurance and Intermediate, Jesse Fogarty, Senior Portfolio Manager, Patrick Wacker, Portfolio Manager and Kevin Loescher, Portfolio Implementation Specialist.

The fixed income portfolio managers are supported by our global credit analysis function led by David Averre, Head of Credit Analysis and David Hamilton, Head of Credit Analysis, North America. Our investment teams work across New York and London within a consistent global framework.

Solution design: Kevin McLaughlin, Head of Liability Risk Management – North America, will be responsible for understanding your objectives, overseeing liability modeling and quantitative analysis, investment solution design and working with the broader team on market strategy, implementation and ensuring your solution is executed in line with your requirements on an ongoing basis. Kevin will be supported by the broader solutions group including Erik Thoren, Senior Analyst, Terry Henrickson, Head of Quantitative Client Solutions and Heather Porter, Quantitative Analyst.

Client management: Jeremy King, Head of Business Development, will be responsible for working with you and the Solution Design Team to ensure we fully understand your requirements, structuring the mandate consistently with them and bring to bear the full range of the firm's capabilities on your mandate. Jeremy will work closely with client management and support team, led by Jenna Rivers, Head of Client Services North America, to ensure that your client experience exceeds your expectations.

[4] As of December 31, 2018. AUM are represented by the value of cash securities and other economic exposure managed for clients, and are calculated on a gross notional basis. Figures shown in USD. FX rates as per WM Reuters 4pm spot rates. Reflects the AUM of Insight, the corporate brand for certain companies operated by IIML. Insight includes, among others, IIMG, IIIL and INA, each of which provides asset management services.

Portfolio management, solution design, client management

Shivin Kwatra, CFA
Head of LDI Portfolio Management - US

Shivin joined Insight in November 2017 as Head of LDI Portfolio Management for North America. Prior to this, Shivin was a senior portfolio manager at Goldman Sachs Asset Management, where he managed fixed income and LDI portfolios. He started his career within the Investment Bank at JP Morgan on the Structured Products and Derivatives Marketing team. He was a founding member of the pension advisory group at JP Morgan (which was acquired by Pacific Life) and Head of Direct Investments at Pacific Global Advisors (which was acquired by Goldman Sachs).
Shivin holds a BSc in Commerce with a concentration in Finance from the McIntire School at the University of Virginia, where he was also the captain of the men’s golf team. He is a CFA charterholder and maintains Series 7 and 63 licenses from the Financial Industry Regulatory Authority and Series 3 license from the National Futures Association.

Kevin McLaughlin, CFA, FIA
Head of Liability Risk Management – North America

Kevin joined Insight in August 2016 as Head of Liability Risk Management for North American clients. He brings expertise on corporate finance, pension financing and investment, insurance strategies and balance sheet risk management. At Insight, he specializes in ERM, strategic asset allocation, portfolio construction, liability-driven investment (LDI) programs and pension risk defeasance. Prior to joining Insight, Kevin spent four years at Deutsche Bank in its Corporate Finance division and led its Pension Advisory Group, focusing on corporate capital structure, pension funding, longevity and risk transfer strategies. Previous to this, he worked for 15 years in a number of actuarial and investment roles, including seven years as a senior consultant at Mercer Investment Consulting in both London and New York. Kevin holds a degree in Finance and Actuarial Studies from University College Dublin as well as an MBA from Instituto de Impressa, Madrid. He is also a Fellow of the Institute of Actuaries and a CFA charterholder.

Jeremy King
Head of Business Development

Jeremy joined Insight Investment in London in February 2015 and now leads business development for Insight based in New York. Previously, Jeremy held senior business development and investment structuring roles at Guggenheim Partners and Man Group in London, Switzerland and New York. Prior to this, Jeremy was a senior corporate lawyer at Clayton Utz Lawyers in Sydney, Australia. Jeremy holds Bachelors of Arts and Laws degrees from Macquarie University, a Masters of Laws degree from the University of London, a graduate diploma in Applied Finance and Investment from the Securities Institute of Australia, and is a Chartered Alternative Investment Analyst (CAIA). Jeremy also holds his FINRA Series 7 and 63 licenses and is an Associated Person (Series 3) with the National Futures Association.

Gerard Berrigan
Head of Insurance and Intermediate

Gerard joined Insight in 1994 (via predecessor company, Cutwater Asset Management). He is Head of Insurance and Intermediate within the Fixed Income Group. He originally joined Cutwater in June 1994 and has worked in the financial services industry since 1984 with specific experience in securities and trading. Gerard's responsibilities include overseeing all aspects of portfolio management for insurance and Public Sector Group clients in North America. Previously, he worked at the Federal National Mortgage Association as a member of the Portfolio Management and Treasury Groups where he developed and applied expertise in ABS, MBS and portfolio hedging. Gerard also worked at First Boston Corp. developing and implementing investment strategies for the firm's public finance clients. He has a BS degree from Bucknell University and an MBA from Columbia University. Gerard holds Series 7 and 63 licenses from the Financial Industry Regulatory Authority (FINRA).

Erik Thoren, CFA, FSA
Senior Analyst

Erik joined Insight in July 2016, as a result of the merger between Tiber Capital Management (Tiber) and Insight. As a senior analyst, he is responsible for asset/liability management (ALM) and the development of bespoke solutions focusing on the insurance industry. Prior to Insight, Erik was Head of ALM at Tiber, which was a wholly-owned subsidiary of the Bank of New York Mellon Corporation in 2015. Before Tiber, Erik was an actuarial consultant within Insurance and Actuarial Advisory Services at EY, with a primary focus on risk management and hedging. He started his career in 2007 as an assistant actuary at Genworth Financial. Erik holds a BS degree in Mathematical Economics from the University of Richmond. He is also a Fellow of the Society of Actuaries (FSA), a member of the American Academy of Actuaries (MAAA) and a CFA charterholder.

Jenna Rivers
Head of Client Service, North America

Jenna joined Insight in June 2018 as Head of Client Service for the North America region responsible for the oversight of client service support provided to the firm's relationship management function. Prior to joining Insight, Jenna spent eight years at Schroder Investment Management North America Inc., as Head of Client Account Management, responsible for managing the client service team which covered US and Canadian institutional clients. Jenna started her career in financial services in 2007 at AG Morgan Financial as a financial advisor to high net worth individuals. Jenna graduated from Michigan State University with a BA in Finance. She also holds Series 6 and 63 licenses from the Financial Industry Regulatory Authority (FINRA) and is a NEC Canadian Registered Representative.

Appendix: Contributions