

Portfolio Analytics and Risk Management System

Request for Proposal

June 2021

Sacramento County Employees' Retirement System
980 9th Street, Suite 1900, Sacramento, CA 95814
Main: (916) 874-9119
scers.org



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Section 1: Introduction

Sacramento County Employees' Retirement System (SCERS) is requesting proposals from qualified firms interested in providing a total Fund portfolio analytics and risk system that will identify, assess, monitor and report on portfolio exposures and risk across the total Fund, and across and within individual asset classes.

Those who wish to be considered must submit their completed proposal by 5 p.m., PT, June 30, 2021. Specific instructions for proposal submissions are contained in Section 5 of this RFP.

Questions about this RFP must be submitted in writing by 5 p.m., PT, June 18, 2020 to the Deputy Chief Investment Officer at Retirement-Investments-RiskRFP@Saccounty.net.

Section 2: Background

The Sacramento County Employees' Retirement System (SCERS) was created on April 30, 1941, pursuant to the County Employees' Retirement Law of 1937. SCERS provides retirement, disability, and death benefits for qualified employees of Sacramento County and eleven participating special districts.

A nine-member (with two alternates) Board of Retirement (Board) governs SCERS. The Board has sole and exclusive fiduciary responsibility for the assets of the retirement system. The Board has the sole and exclusive responsibility to administer SCERS in a manner that will assure prompt delivery of benefits and related services to the participants and their beneficiaries. The authority of the Board in the above matters is plenary and absolute.

While the Board has the authority noted above, the organizational structure of SCERS focuses the attention of the Board on governance and policy and less on the day-to-day management of the system. Thus, the primary responsibility of the Board is strategic in setting the direction of SCERS. This includes the enunciation of the mission and setting of goals and objectives.

SCERS' Chief Executive Officer (CEO) has the responsibility for the overall management and administration of the system in accordance with the direction, policy, and goals set by the Board. Reporting to the CEO is the Investment Staff. The Investment Staff has primary responsibility in cooperation with the CEO for SCERS' investment program. The Investment Staff currently consists of a Chief Investment Officer (CIO), Deputy Chief Investment Officer (DCIO), One Senior Investment Officer, one Investment Officer, and an Investment Analyst. Staff works across specific asset classes, but also provides support across the entire fund.

An annual actuarial valuation commissioned by the Board determines contributions into the Sacramento County Employees' Retirement System. The growth of the System results from a combination of employer and employee contributions and the net return, less the administrative and investment costs, achieved from investing the assets.

As of April 30, 2021, SCERS’ portfolio had a net asset value of \$12 billion. SCERS’ asset allocation is as follows:

SCERS’ Current Asset Allocation

Asset Category/Asset Class	Target Allocation
Growth	58.0%
Domestic Equity	20.0%
International Equity	20.0%
Private Equity	9.0%
Public Credit	2.0%
Private Credit	4.0%
Growth Absolute Return	3.0%
Diversifying	25.0%
Core Plus Fixed Income	10.0%
US Treasury	5.0%
Global Fixed Income	3.0%
Diversifying Absolute Return	7.0%
Real Return	16.0%
Real Estate	7.0%
Real Assets	7.0%
Liquid Real Return	2.0%
Cash	1.0%
Opportunities	0.0%
Total	100.0%

* SCERS is currently conducting an ALM Study. The Asset Allocation above is subject to change.

Section 3: Scope of Services and Requirements

The detailed scope of services for this engagement is outlined in the attached Exhibit “A” (“Scope of Services”). The primary objective is are to provide SCERS with portfolio analytics and risk management system services for the management of the defined benefit public employee retirement plan.

The firm selected for this engagement will be expected to meet requirements that include, but are not limited to, the following:

1. The firm must have all necessary permits and licenses to perform the requested services, and must be bonded where applicable.
2. Minimum insurance coverage must include the following items, and proof of such insurance must be provided to SCERS prior to the commencement of work, on an annual basis, and upon request:
 - Commercial General Liability: \$2 million per occurrence, \$2 million aggregate
 - Automobile Liability: \$1 million per occurrence, \$2 million aggregate
 - Workers Compensation: \$1 million per occurrence, \$1 million aggregate
 - Umbrella Liability: \$8 million per occurrence, \$8 million aggregate
 - Professional Liability: \$2 million per occurrence, \$3 million aggregate SCERS must be listed as

an additional insured on the above policies.

3. The firm shall provide all personnel, equipment, tools, materials, vehicles, supervision, and other items and services necessary to perform all services, tasks, and functions as requested in this RFP.
4. The initial term of the contract awarded pursuant to this RFP will be for a three (3) year period,
5. All work under the contract awarded shall be performed and all equipment furnished or installed in accordance with applicable safety codes, ordinances, and other regulations, including the regulations of the State of California, Division of Industrial Safety and the provisions of the California Labor Code, the Occupational Safety and Health Act of 1970, the California Occupational Health and Safety Act.
6. Minimum Qualifications
 - All respondents are required to sign and return the “Minimum Qualifications Certification,” attached as Exhibit “B”.

Section 4: General Conditions

All terms, conditions, requirements, and procedures included in this RFP must be met for a proposal to be qualified. A proposal that fails to meet any material term, condition, requirement, or procedure of this RFP may be disqualified. SCERS reserves the right to waive or permit cure of non-material errors or omissions. SCERS reserves the right to modify, amend, or cancel the terms of this RFP at any time.

SCERS may modify this RFP prior to the date fixed for submission of a proposal by posting, mailing, emailing or faxing an addendum to the respondents known to be interested in submitting a proposal. Failure of a respondent to receive or acknowledge receipt of any addendum shall not relieve the respondent of the responsibility for complying with the terms thereof.

A respondent’s proposal shall constitute an irrevocable offer for the 180 days following the deadline for submission of proposals. Reference to a certain number of days in this RFP shall mean business days unless otherwise specified.

All proposals submitted in response to this RFP will become the exclusive property of SCERS. Proposals will not be returned to respondents.

By submitting a proposal, the respondent acknowledges that it has read this RFP, understands it, and agrees to be bound by its requirements unless clearly and specifically noted in the proposal submitted.

Section 5: Point of Contact

A quiet period will be in effect from the date of issuance of this RFP until announcement of the selection of a firm or firms under this RFP. During the quiet period, respondents are not permitted to communicate with any SCERS Investment team member or Board Member regarding this RFP except through the Point of Contact named herein. Respondents violating this quiet period may be disqualified at SCERS’ discretion. Respondents having current business with SCERS must limit their communications to the subject of such business.

SCERS' normal business hours of operations are from 8:00 a.m. to 5:00 PT Monday through Friday, except for federal and state holidays. SCERS' office is not currently open to the public, due to the ongoing COVID-19 pandemic.

Point of Contact	
Name	Jim Donohue
Title	Deputy CIO
Address	Sacramento County Employees' Retirement System 980 9th Street, Suite 1900 Sacramento, CA 95814
Telephone	(916) 874-9119
Email	Retirement-Investments-RiskRFP@Saccounty.net
SCERS Website	www.SCERS.org
Status	See the SCERS website for status of the RFP and announcements. These items can also be found here: https://www.scers.org/requests-proposals

Section 6: Response to Request for Proposal

Proposals must be submitted to the Point of Contact identified in Section 5, and delivered by the due date and time stated below in the RFP Schedule.

SCERS requires electronic submissions. Proposals may be submitted electronically in Microsoft Word or Adobe Acrobat PDF format to the email address noted in Section 5.

RFP Schedule

The following timetable constitutes a tentative schedule for this RFP process. SCERS reserves the right to modify this schedule at any time.

Deliverable	Date	Time
Release of RFP	June 22, 2021	5:00 pm PT
RFP Questions Deadline	July 9, 2021	5:00 pm PT
RFP Answers Posted*	July 16, 2021	5:00 pm PT
RFP Submission Deadline	July 22, 2021	5:00 pm PT
SCERS Review of RFP Submissions	Through August 2021	
Selection of Finalists	To be determined	
Interviews of Finalists	To be determined	
Service Award	To be determined	

*Please be diligent in checking the website for updates as SCERS may be posting answers to questions more frequently if we deem it necessary.

Section 7: Proposal Requirements

Proposals must include the following information:

1. The “Proposal Cover Page and Check List,” attached as Exhibit “B.”
2. An executive summary that provides the respondent’s background, experience, and other qualifications to provide the services included in the Scope of Services.
3. Please provide at least three (3) public pension plan references for whom the respondent is currently providing portfolio analytics and risk management system services. Please include for each reference the individual point of contact, a summary of the work performed, and the length of time the respondent has provided each service.
4. A list of clients where the firm is providing or has provided portfolio analytics and risk management services to public pensions.
5. The “Questionnaire: Compliance, Conflicts, Insurance & Liability,” attached as Exhibit “C.”
6. Prepare an explanation of the pricing proposal for the scope of work including pricing of fees and costs, billing practices, and payment terms that would apply, attached as Exhibit “D.”
7. A description of the respondent including:
 - a. Brief history, including year the respondent firm was formed
 - b. Ownership structure
 - c. Office locations
 - d. Organization chart
 - e. Number of employees
 - f. Annual revenues
 - g. Areas of practice including firm specialties, strengths and limitations
8. An explanation of all actual or potential conflicts of interest that the respondent may have in contracting with SCERS.
9. A description of all past, pending, or threatened litigation, including malpractice claims, administrative, state ethics, disciplinary proceedings, and other claims against respondent and/or any of the individuals proposed to provide services to SCERS.

Section 8: Evaluation Criteria

Responses will be evaluated based upon the following:

1. Experience and reputation of the respondent.
2. Quality of the portfolio analytics and risk management system proposed to provide services to SCERS, including staffing depth, experience, turnover, and compensation.
3. Quality of reports.
4. Pricing and value.
5. Compliance with technical standards contained in this RFP.
6. The organization, completeness, and quality of the proposal.
7. Information provided by references.
8. Other factors SCERS determines to be relevant.

The factors will be considered as a whole, without a specific weighting.

SCERS will require one or more interviews including presentations by finalists to the SCERS' Investment team.

If the information in the proposal is deemed to be insufficient for evaluation, SCERS may request additional information or reject the proposal outright at SCERS' sole discretion.

Section 9: Reservations by SCERS

In addition to the other provisions of this RFP, SCERS reserves the right to:

1. Cancel or modify this RFP, in whole or in part, at any time.
2. Make such investigation as it deems necessary to determine the respondent's ability to furnish the required services, and the respondent agrees to furnish all such information for this purpose as SCERS may request.
3. Reject the proposal of any respondent who is not currently in a position to perform the contract, or who has previously failed to perform similar contracts properly, or in a timely manner, or for any other reason in SCERS' sole discretion.
4. Waive irregularities, to negotiate in any manner necessary to best serve the public interest, and to make a whole award, multiple awards, a partial award, or no award.
5. Award a contract, if at all, to the firm, which will provide the best match to the requirements of the RFP and the service needs of SCERS, which may not be the proposal offering the lowest fees.
6. Request additional documentation or information from respondents, which may vary by respondent. SCERS may ask questions of any respondent to seek clarification of a proposal or to ensure the respondent understands the scope of the work or other terms of the RFP.
7. Reject any or all proposals submitted in response to this RFP.
8. Choose to not enter into an agreement with any of the respondents to this RFP or negotiate for the services described in this RFP with a party that did not submit a proposal.
9. Determine the extent, without limitation, to which the services of a successful respondent are or are not actually utilized.
10. Defer selection of a bidder to a time of SCERS' choosing.
11. Consider information about a respondent other than, and in addition to, that submitted by the respondent.

Exhibit A

Scope of Services

The purpose of this RFP is to select a multi-asset class, investment portfolio analytics and risk management system to assist in systematically identifying, assessing, monitoring, and reporting on portfolio exposures and risk for the total Fund. The solution should cover all the major asset classes within the total Fund and enable a comprehensive view of aggregate total risk and active risk across the portfolio and within each asset class.

The total portfolio view is important given the blending of public and private market investments within SCERS' broader portfolio, and the need to understand exposures and risk contributions at the total portfolio level. Asset class analytics should provide granular views across asset classes, at the asset class level, the underlying investment fund level, and the portfolio company level. The portfolio analytics system should also inform SCERS' team of the performance of existing managers as well as assist in the analysis of potential new managers.

Through this search, SCERS seeks to procure a portfolio analytics and risk system that will generate risk reports and analysis for the benefit of the Investment team and potentially the SCERS Board.

A broad framework of the RFP is listed below:

- Integration of manager holdings and benchmark information across all asset classes including: equities, fixed income, absolute return (hedge funds), private equity, private credit, real assets, and real estate. The ideal solution would provide the ability to integrate position and exposure details across all managers and holdings across all asset classes within a business day;
- Source and aggregate data from various vendors including custodian, investment managers, fund of funds and various service providers, including investment consultants if needed;
- Value at Risk (VaR): the ability to measure VaR at the manager, sub-asset class, asset class, and total Fund level;
- Stress Testing: the ability to measure potential losses given certain historical or prospective events;
- Scenario analysis: the ability to measure potential losses or gains given certain scenarios;
- Factor exposures: the ability to identify and measure SCERS' exposure to various risk factors, such as equity, credit, rates, inflation, and currencies;
- Portfolio reporting: risk and exposure with the capabilities of performance reporting;

Reporting: asset level detail reports, individual manager level reporting, portfolio level reporting and total Fund level reporting; and the ability to create and run reports necessary to perform ad hoc analysis;

- Cash flow forecasting: the ability to create cash flow pacing models within the private market asset classes; and
- Liquidity analysis: the ability to evaluate the liquidity of individual managers and funds, and to roll this up to the total Fund level to evaluate the total Fund's liquidity profile.

Exhibit B
PROPOSAL COVER PAGE AND CHECK LIST
(TO BE SUBMITTED ON FIRM'S LETTERHEAD)

Respondent Name:

Respondent Address:

By submitting this response, the undersigned hereby affirms and represents that they have reviewed the proposal requirements and have submitted a complete and accurate response to the best of their knowledge. By signing below, I hereby affirm that the respondent has reviewed the entire RFP and intends to comply with all requirements.

Sacramento County Employees'
Retirement System
980 9th Street, Suite 1900
Sacramento, CA 95814
Attn: Eric Stern, CEO

[Date]

Dear Mr. Stern:

Enclosed with this letter is [candidate's] Response to the Request for Portfolio Analytics and Risk Management System (RFP) received from the Sacramento County Employees' Retirement System (SCERS), which is incorporated by this reference.

On behalf of [candidate] I hereby acknowledge, represent and warrant the following:

1. If selected to provide services as the Portfolio Analytics and Risk Management System for SCERS, [candidate] will:
 - a. Comply with the laws of California relating to Conflicts of Interest, including but not limited to the California Political Reform Act;
 - b. Comply with SCERS' Placement Agent Policy, a copy of which was included with the RFP;
 - c. Comply with SCERS' Privacy and Confidentiality Policy, a copy of which was included with the RFP;
 - d. Provide consulting services in a manner consistent with SCERS' Investment Policies, including the SCERS Master Investment Policy and Objectives and Fiduciary Standard Policy;
2. [Candidate] acknowledges that its response to the RFP shall become the exclusive property of SCERS and may be subject to public disclosure under the California Public Records Act (the Act) unless specifically exempted from disclosure under the Act. [Candidate] represents that in good faith it has marked as "Confidential" any material in its response that it believes to be exempt from disclosure under the Act, and acknowledges that it will indemnify, defend and hold SCERS, its officers and employees, harmless from and against any and all claims, damages, losses, liabilities, and costs, including reasonable attorneys fees, of any nature whatsoever arising from or relating to any nondisclosure of such material by SCERS, in its sole discretion.
3. [Candidate] represents and warrants that it is registered with the Securities and Exchange Commission as an investment advisor as required by the Investment Advisors Act of 1940. The candidate acknowledges that if selected as the Portfolio Analytics and Risk Management System service provider for SCERS it will serve as such in a fiduciary capacity to SCERS;
4. [Candidate] represents and warrants that [candidate], its officers, employees and agents, have not had contact with any member of the Board of SCERS concerning the RFP or [candidate's] response to the RFP,

and shall have no contact with any individual member of the Board prior to selection of a candidate as Alternatives Consultant as provided in the RFP;

5. [Candidate] agrees that its response shall constitute a firm offer and may not be withdrawn for a period of 180 days following the last day to accept proposals in response to the RFP;
6. [Candidate] acknowledges and agrees that SCERS is under absolutely no obligation to accept any proposal in response to the RFP from any candidate, including [candidate], and may negotiate with any candidates, whether or not they have responded to the RFP, to provide services as a Portfolio Analytics and Risk Management System service provider to SCERS on such terms and conditions as SCERS shall decide in its sole discretion;
7. On behalf of [candidate] the undersigned warrants and represents that the information contained in its response to the RFP is correct and accurate to the best of its knowledge;
8. The undersigned represents and warrants that he or she is authorized to sign this letter on behalf of [candidate].

[CANDIDATE]

By _____

Name

Title

Exhibit C

MINIMUM QUALIFICATIONS CERTIFICATION

All respondents submitting a proposal in response to this RFP are required to sign and return this attachment, along with written evidence of how the respondent meets each qualification.

The undersigned hereby certifies that it fulfills the minimum qualifications outlined below, as well as the requirements contained in the RFP.

MINIMUM QUALIFICATION CERTIFICATION

(To be signed by an authorized person and returned with the RFP response)

All respondents submitting proposals for the total Fund risk system search must meet the following criteria.

Please answer yes or no to each of the following questions.

Criteria	Yes	No
Must offer a multi-asset class, factor-based risk model appropriate for analyzing the risk and performance of a broad institutional portfolio invested globally in both public and private (liquid and illiquid) markets. The application must enable users to both identify portfolio exposures and risk, and measure investment performance within asset classes and across multi-asset class portfolios.		
Must have experience providing a comprehensive multi-asset class investment portfolio analytics and risk management system to institutional investors such as pension funds, endowments, or other large asset managers. The Proposing Firm must have at least five (5) such clients each overseeing assets in excess of \$5 billion.		
Must include tools for analyzing the following asset classes:		
a. Public equities		
b. Fixed income, including investment grade bonds		
c. Credit, including high yield, emerging market debt, bank loans, and other liquid credit strategies		
d. Private equity		
e. Private credit		
f. Private real estate		
g. Absolute return (Hedge funds)		
h. Real Assets, including private infrastructure and natural resources		
Must identify and quantify risk to the following factors:		
a. Index Factors		
b. Equity style factors		
c. Interest rates Index factors		
d. Interest rates		
e. Credit Spreads		
f. Inflation factors		
g. Foreign exchange		
At least one key professional member of the firm assigned to the SCERS account must have a minimum of five years' experience in assisting clients with the implementation of risk oversight solutions.		
Must allow for stress testing, scenario analysis, and value at risk at the sub-asset class, asset class, and total Fund level.		

Respondent hereby certifies that it meets all of the following minimum qualifications:

The undersigned hereby certifies that they are an individual authorized to bind the Firm contractually, and said signature authorizes verification of this information.

Authorized Signature

Date

Name and Title (please print)

Name of Firm

Exhibit D

PRICING PROPOSAL

All respondents submitting a proposal in response to this RFP are required to prepare an explanation of the pricing proposal for the scope of work including pricing of fees and costs, billing practices, and payment terms that would apply. This section of the response should include an explanation as to how the pricing approach(es) will be managed to provide the best value to SCERS. Briefly describe the scope of the services that fall within the contract and what areas that clients have needed, used, etc. that fall outside of the typical scope of services. If applicable, please provide a cost estimate of additional work provided outside the scope of business (i.e. special projects, additional service team time, etc.).

Exhibit E

Questionnaire: Compliance, Conflicts, Insurance & Liability

A. STANDARDS OF CONDUCT

1. Within the last five (5) years, has your organization, an officer or principal, or any member of your proposed team been involved in professional discipline/censure, litigation, or other legal proceedings relating to your portfolio analytics and risk management system assignments? If so, please provide an explanation and indicate the current status.
2. Other than routine or periodic scheduled on-site reviews, has your firm ever been investigated or censured by any regulatory body? If so, please describe the situation and outcome.

B. CONFLICTS OF INTEREST

3. Are there any potential conflicts of interest issues your firm would have in servicing SCERS? If so, please describe them.
4. Does your firm or any affiliates provide investment management, brokerage, trust, or actuarial services?

If yes, how does your firm protect against conflicts of interest? Would your organization notify a client of any apparent or potential conflict of interest, regardless of whether it was required by regulations?
5. Does your firm hold or sponsor money manager or client conferences? If so, please list and describe all conferences your firm has held or sponsored in the past two years.
6. Have you or anyone in your firm provided any gifts, travel and room expenses, entertainment, or meals to any member of the SCERS' Board of Retirement or SCERS' Investment team during the past 12 months? If yes, please describe the amount and purpose of the expenses.
7. Are there any circumstances under which your firm or any individual in your firm receives compensation, finder's fees, or any other benefit from investment managers or third parties? If yes, please describe in detail.
8. Attest that your firm agrees that neither the firm nor any employee or owner of the firm will receive any commission or fee, directly or indirectly, arising from securities in which SCERS invests.
9. Attest that your firm has not paid any "finder's fees" or commissions to any individuals not employed by the firm as it relates to this search.

C. Organization

I. FIRM INFORMATION

1. Please list your firm's complete name, address, telephone and fax number. Include the name and title of your proposed primary consultant.
2. Please provide a brief history, going back to inception, of your firm and your parent organization if different. Within the past three (3) years, have there been any significant developments in your organization, such as changes in ownership, restructuring, or personnel changes?

3. Describe the ownership structure giving specific details with regard to your parent and/or any affiliated companies. Include an ownership organizational chart showing this structure. Show and describe, if any, the distinct lines of business of your firm, which are in addition to portfolio analytics and risk management services.
4. How long has the firm been delivering portfolio analytics and risk management system services?
5. Describe briefly the primary line(s) of business of your firm, your parent organization, and any affiliated companies. How many employees are involved in each line of business? Please provide a breakdown of the sources of your revenues (firm wide) including businesses outside of risk management system.
6. Explain how the portfolio risk analytics/advisory/consulting business line at your firm evolved, and the business unit's organizational and staffing history.
7. Does your firm, its parent, or affiliate sell information or any other services to investment managers or consultants? If so, describe in detail.
8. Is the firm a registered investment advisor? What regulatory bodies routinely monitor the firm's work?
9. Will the firm assume fiduciary responsibility in this engagement?
10. How does the firm stay up to date on regulatory/market changes?
11. Describe the educational opportunities available to your clients. Provide a list of your most recent published research relevant specifically to this engagement. Web links or periodical citations, and a one- sentence synopsis are preferred
12. Describe any periodic educational sessions, user conferences, or publications that you provide to clients
13. Discuss in detail the level of services provided to your clients. What is the firm's availability for program and technical support on Pacific Time? Is this support available outside of business hours?
14. How do you address client issues; describe the process for reporting technical issues.
15. Describe the standard product training program that your firm offers.

II. PERSONNEL

1. Describe your organizational or team structure as it relates specifically to this engagement, and identify key personnel, including a table showing experience and credentials of the professionals who will be assigned to SCERS' relationship. Include in this table the estimated number of hours each professional will be expected to devote to this engagement in year one and in each year thereafter if different.
2. Provide one-paragraph resumes of the professional personnel who will work with SCERS regularly.
3. Explain how the regularly assigned team would function, including the lead primary contact if different, back up personnel, quality control procedures and support services. Where is each team member located and what percentage of their time is devoted exclusively to portfolio analytics and risk management services similar to those required in this engagement?
4. How many client relationships will the primary contact have other than SCERS?
5. List any of your firm's senior risk management team hires and departures over the last three (3) years.
6. List all non-clerical personnel changes in the risk management group for this same period. For departures indicate the reason for leaving.

- Describe your firm's policy on changing service team personnel assigned to a project.

III. CLIENTS

- Please complete the following table with number of clients using for portfolio services:

	<\$5 B	\$5 - \$25 B	>\$25 B
California 1937 Act Retirement System			
Other Public Pension Plans			
Corporate Pension Plans			
Endowment, Foundation			
Family Office			
Other			
Total Firm Assets by Client Base			

- List references from three clients which you have provided comparable portfolio analytics and risk management system services. For each reference listed include client name, size of plan/portfolio, approximate number of underlying investment managers, approximate size of internal staff, address, telephone number, and name of contact person.
- Please provide the names of all risk-system clients who have terminated your firm's services or any risk-system client relationships from which you have resigned in the last three (3) years. For client, specify the plan type, asset size, and the reason for termination or resignation.

D. Portfolio Analytics and Risk System

I. Overview

- Discuss your firm's philosophy for managing and monitoring investment risk?
- How has the system evolved since its inception? Was it internally developed or acquired?
- Is your portfolio analytics and risk management system fully integrated or are there separate modules? Discuss how your system is structured and if clients can have the ability to pick certain parts of the system piecemeal?
- What are the differentiating factors of your portfolio analytics and risk management system and why do you believe it has an edge over the competition?
- Please describe how your system could be utilized for the following use cases:
 - Risk budgeting
 - Risk mitigation analysis including tail-risk hedging using options
 - Stress testing (correlated and uncorrelated)
 - Historical scenario analysis
 - User-defined scenario analysis
 - Portfolio optimization
- Please describe your system's ESG capabilities and related analytics. If applicable, please describe the process by which data collected through third party providers are quantified and factored into the risk model.

II. Maintenance

- Discuss your commitment to ongoing system and model maintenance.
- Provide an example of the most recent major enhancement or overhaul to the portfolio analytics and risk management system that has allowed you to remain competitive in the marketplace.

3. Describe the internal process by which model changes are initiated, developed, and implemented.
4. What is the formal approval process for model changes? Who has approval authority and is this person allowed to also override set model parameters (for example, in extreme market conditions)?
5. List all the different models available to measure and monitor volatility and Value at Risk (VaR).
6. How are model changes and/or improvements communicated to the client?

III. Implementation

1. Provide an implementation project plan with steps, tasks, timelines, hours, milestones, deliverables, and timing of anticipated resources.
2. What role does the client play in the implementation?
3. Describe the level of involvement required of the SCERS' Investment team concerning reviewing data from the custodian/investment managers or other third parties. How are legacy investments handled? How are variance between various service providers handled?
4. Describe experience with custodians, plan accounting providers, prime brokers, and third- party administrators in setting up and maintaining data feeds.
5. Provide the server and workstation technology requirements of your risk management system.
6. Discuss the data inputs – list all security types supported in your system; what data is necessary for the system to be functional; source of data; what data providers are utilized and discuss instances where securities are not modeled by the providers; process used to handle securities/asset classes not modeled by the providers; how are holdings uploaded to the system and pricing sources.

IV. Analytics and Reporting

1. How is capital activity, including cash flows and quarterly valuations, for private market assets entered into the system? Does your firm provide any assistance with gathering data from fund managers or is this the LP's responsibility? Do you provide any services to collect the underlying holdings data from our managers?
2. Describe methods available to export data from the system.
3. What risk models does your risk management system rely on? Discuss the risk models and outputs for equities, fixed income, and alternative investments.
4. Does your system support risk modeling based on holdings data, and/or return data?
5. What risk metrics are included in your reports? List the metrics your system calculates and describe the level at which those risk metrics are calculated (e.g., total fund, asset class, investment manager, security level)
6. Discuss the system's historical data retention and reporting capabilities. What are the standard lookback periods and length of horizon for models? Is that customizable?
7. Does the system have forecasting capabilities? If so, what can it forecast?
8. Describe how your system handles non-normal distributions of security returns and non-linear payoff instruments (e.g., options).

9. Are there any limitations on the types of derivatives that can be modeled? If so, what are they?
10. Describe what metrics your system uses to analyze downside risk, tail risk, value at risk, etc.
11. Does your system have scenario analysis capabilities? Can these capabilities be customized?
12. Describe whether your system can integrate risk models or calculation engines from external sources.
13. Describe your capacity to identify and measure risks in underlying portfolios of hedge funds, private equity, and other alternative/non-traditional investment strategies and structures. What methodologies and systems have you developed that are unique to your proposal?
14. How do you measure and evaluate counterparty risk across the portfolio?
15. Have you supported or signed on to the OPERA risk aggregation or other aggregators? If not, do you expect to? If no, why not? Describe your involvement in open protocols and industry-wide efforts to provide enhanced transparency in alternative investments.
16. Describe the system's performance measurement capabilities and performance attribution capabilities across asset classes. What model of attribution is employed? Does the system have attribution capabilities down to the security level?
17. Is there a consistent classification scheme that persists across public and private assets?
18. Is there an ability to easily understand exposure to a given sector across public and private assets?
19. Which benchmarks are utilized and supported in your system? What solutions exist for blended benchmarks? For custom benchmarks ?
20. Describe the reporting tools available to clients and do clients have the ability to customize reports. Does the system allow for ad hoc calculations on the spot?
21. What type of reporting do you have for leverage, liquidity analysis, and/or counterparty tracking?
22. Describe the month-end process for updating manager risk exposures, including a general timeline for delivery of reports to the client.
23. Is your system capable of producing reports that show the active and total risk decomposition by asset classes within the total Fund? By managers within the asset classes? Can the system also breakdown VaR and tracking error?
24. Can the system provide oversight for external managers?
25. Does your system have the ability to run compliance reports, for monitoring positions relative to portfolio guidelines?
26. Please provide sample reports for all the risk metrics and screenshots for a demo to allow SCERS to get a strong sense of your portfolio analytics and risk management system's capabilities.

F. Infrastructure & Data Security

I. System Maintenance & Availability

1. What is your average monthly uptime/availability rate?

2. Are your systems on premise and solely managed by your company, on premise and managed by a third party, cloud based and managed by you, or cloud based and managed by a third party?
3. In the past five years, how many service outages have you experienced and what was your longest period of downtime?
4. How often do you schedule maintenance? How long in advance are customers notified of scheduled maintenance windows and their estimated downtime?

II. User Permissions and Data Security

1. Do you support Single Sign On (SSO) and Multi-Factor Authentication (MFA)?
2. How is client data segregated from other client data?
3. How long is client data stored? What is your retention policy for client data?
4. How do we know that our data is not being accessed by other customers or company staff?

IV. Information Security and Controls:

1. Do you engage a vendor or service to routinely scan your networks internally and externally for known security vulnerabilities? Do you fix these vulnerabilities in a timely manner?
2. Do you hire reputable security firms to conduct security penetration tests of your network and web applications at least annually? How do you fix identified security issues in a timely manner? Do you notify clients of known security vulnerabilities? When did you last conduct a security penetration test?

IV. Business Continuity

1. Do you have a Business Continuity Disaster Recovery plan for the products and services we would receive from you? How often is it reviewed? How often is it updated? How often is it tested?
2. What strategies have you put in place in order to respond to the loss of critical resources for the products and/or services your clients receive from you? How do you communicate to your clients if there is a disruption of service?
3. In the past 12 months, have you conducted an employee Business Continuity / Disaster Recovery training exercise of the systems needed to provide your product and/or services? If so, can you share the results?
4. If your service is limited due to a disruption, how will clients be prioritized? What is your backup policy?