Memo

To: Members of the Investment Committee
California Public Employees' Retirement System

From: StepStone Group

Date: November 14, 2016

Subject: 2016 Annual Infrastructure Program Review

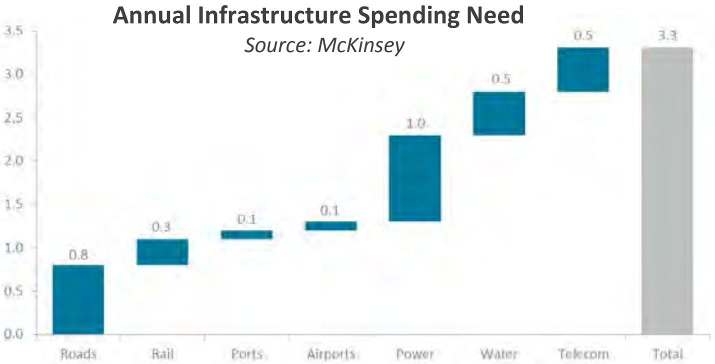
In our role as the Board's Infrastructure Consultant, StepStone Group conducted an annual review of the Infrastructure Program (the "Program") for the Fiscal Year ("FY") ending June 30, 2016. Our review covered program performance, investment activity, Investment Policy ("Policy"), organization, and CalPERS' Investment Beliefs. In StepStone's view, the Program has operated consistently with the objectives and guidelines set forth in the Policy and with CalPERS' Investment Beliefs during the year.

Background

CalPERS' Infrastructure Program was initiated in 2007. At CalPERS, the role of infrastructure is "to have ownership risk in essential infrastructure assets and provide predictable returns with moderate long-term inflation protection. Infrastructure also acts as an economic diversifier to equity risk."[1] CalPERS has a 1% target allocation to the asset class, with an interim range of 0% to 2%. As of June 30, 2016, Infrastructure represented approximately 0.9% of the Total Fund. The Program's NAV increased by 18% over the prior year end, to $2.6 billion, and was invested across eight manager relationships, comprising eight commingled funds, three direct investments, and three separate accounts.

Infrastructure Market Overview

As we have noted in recent communications to the Board, market conditions for core infrastructure are highly competitive, particularly in North America, the UK, and Australia, which are a focus for CalPERS. While conditions are expected to remain competitive over the medium term, the fundamentals of the asset class remain attractive for investment, and StepStone continues to see opportunities for investment created by both long-term structural trends and shorter-term dislocations in specific infrastructure sectors and regions.



Declining public spending in critical infrastructure projects has led to a projected shortage in systems that provide essential services globally. This gap is estimated by the McKinsey Global Institute to be US$3.3 trillion per year between 2016 to 2030, or a total spending of US$49.1 trillion based on needs associated with projected GDP growth.

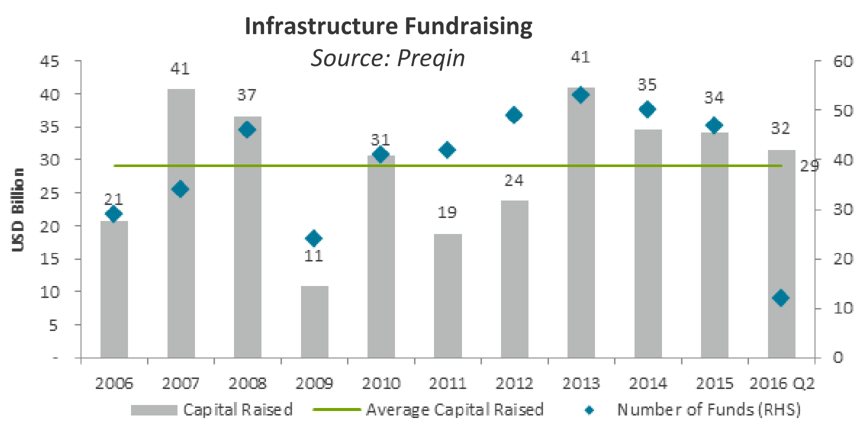
In North America, recent infrastructure investment activity has been robust in the transportation, utilities, and energy sectors. In February, a consortium of Canadian institutions, including Ontario Teachers' Pension Plan, Canada Pension Plan Investment Board, and Ontario Municipal Employees Retirement System acquired the Chicago Skyway, a 7.8 mile toll bridge with 89 years remaining on its concession, for US$2.88 billion, equating to an estimated 35x 2015 EBITDA multiple. In May, a consortium of investors led by Macquarie

[1] 2013 ALM Workshop.

Infrastructure Partners acquired Cleco Corp., a regulated electric utility that serves approximately 284,000 customers in Louisiana. Within the energy sector, the buildout of renewable generation has continued to attract significant capital. Growth in renewable power in the US has been policy driven, supported by tax incentives comprising accelerated depreciation and credits (which were extended in December, creating a multi-year runway for new development). A record 7.3GW of solar was commissioned in the US in 2015, and the extension of the investment tax credit is expected to push solar installation to even high levels in 2016. Related sectors that historically had been the focus of venture funds, such as battery storage, are now drawing interest from infrastructure investors. Public Private Partnerships ("P3") are increasingly utilized to fund new infrastructure projects. In the second quarter, the landmark NYC LaGuardia Airport Terminal Public Private Partnership ("P3") project reached financial close. The US$4 billion deal is the country's largest P3 to date. In July, a consortium led by the Plenary Group reached financial close on the US$1.3 billion campus expansion project at the University of California Merced. And, in September, five teams were shortlisted for a people mover system between terminals and facilities at Los Angeles Airport.

While Britain's vote to leave the European Union in June ("Brexit") has created shorter term market uncertainty, stemming from currency volatility and concerns about rising funding costs, economic linkages between the UK and EU are significant and it is expected that interconnectivity between them will endure. And, given the nature of infrastructure assets, it is expected that the impact of Brexit will be relatively less than for other sectors in the economy. Typically revenues are not exposed to market volatility as they are structured as long term contracts or subject to regulation. While some infrastructure assets might have GDP exposure (such as airports), it is expected that long-term demographic trends and the essential need for travel will underpin revenues in these assets. Financial investors have been active in European renewables, including UK offshore wind, drawn to long-term stable cash flows. A large pipeline of offshore wind projects will require funding over the next 15 months. Further, projects in Germany, the Netherlands, Belgium and France all offer investors opportunities in both debt and equity financing. Deals with a mix of generation exposure were also featured in 2016, including ISQ Global Infrastructure's Q1 acquisition of Viridian Group, an Irish integrated company with 1.8GW of gas and wind assets.

In Australia, the 50-year lease of Port of Melbourne was won in September by a consortium consisting of QIC, Future Fund, GIP and OMERS, at a reported price of A$9.7bn and an estimated 25x EBITDA multiple. This deal continues the trend of the sector being highly contested by a range of infrastructure investors, with transaction outcomes over the past 5 years for Port of Brisbane, Port Botany and Port Kembla, Port of Newcastle, and Port of Darwin ranging from estimated EBITDA multiples of 24x to 27x. And, in the electricity sector, the AusGrid transaction introduced new uncertainty for foreign investors into critical infrastructure assets. Chinese bidders State Grid and Cheung Kong Infrastructure were blocked from the sale process due to cited national security considerations. This has delayed the sale process for Endeavour, the third transaction in a series of privatizations for New South Wales' electricity providers.

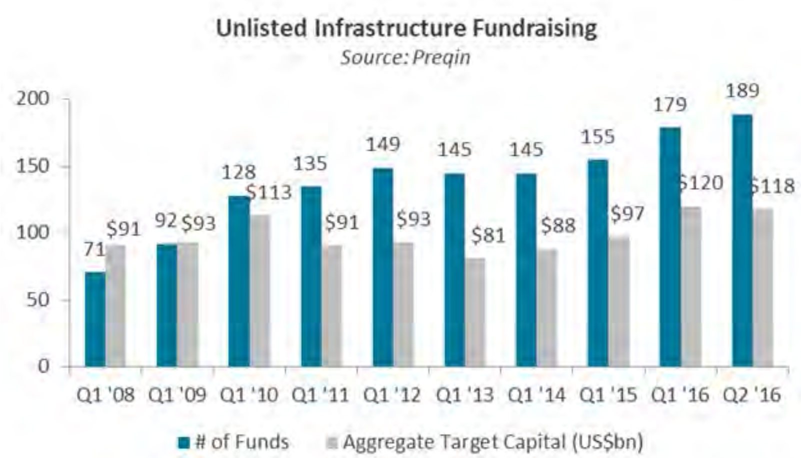


Infrastructure Fundraising

Demand for infrastructure investments from institutional investors remained strong during 2016. Interest in infrastructure was driven in part by expansionary monetary policies in developed markets, which have kept interest rates at very low levels, caused investors to seek alternatives to traditional sources of investment income. Growing demand continued to drive a high valuation environment for the infrastructure asset class, particularly in mature infrastructure markets of North America, Western Europe, and Australia.

Globally, fundraising during recent years has surpassed levels not seen since the Global Financial Crisis. In 2015, 47 infrastructure equity funds held final closes globally, totaling US$34 billion, and the last three years have experienced sustained levels of fundraising above the 10-year average, driven by a depressed interest rate environment with investors seeking alternative sources of yield.

In 2016 to date, the level of institutional capital secured by unlisted infrastructure funds reaching a final close in Q2 2016 was significantly lower compared with both Q1 2016 and the prior year. During the first quarter, eight funds held final closings raising an aggregate US$4.2 billion. The amount represented a year over year decrease of 63% compared to Q2 2015, when 24 funds held a final close raising US$11.5 billion. However, general partners were also more successful in achieving or exceeding their initial target fund size. On average, funds closed at 108% above their targets. And, in 2016, Brookfield Infrastructure Fund III and Global Infrastructure Fund III raised more than US$22.5 billion combined, to become the largest closed-end infrastructure funds. During Q2 2016, the largest fund to reach a final closing was Carlyle Power Partners II, which raised US$1.5 billion of commitments to invest in the US power generation sector. Additionally, Meridiam Infrastructure Europe III raised €1.3 billon to continue its strategy of investing in greenfield-stage P3 transactions in Europe.



Investment Performance

For the one-year period ending June 30, 2016, CalPERS Infrastructure Program returned net 9.0%, compared to the Policy Index return of 4.9%, representing an excess return of 4.1%.[2] Over the trailing three and five-year periods, the Program returned 14.9% and 11.7%, respectively. Returns for each of these periods exceeded the Policy Index by 10.1% and 6.3%, respectively.

[2] The Policy Index is Consumer Inflation Index ("CPI") + 400 basis points, lagged one quarter.

June 30, 2016	One Year	Three Year	Five Year
Infrastructure Program Returns	9.0%	14.9%	11.7%
Policy Index (CPI+400 BPS)	4.9%	4.8%	5.3%
Excess Return	4.1%	10.1%	6.3%

A combination of commingled funds and direct investments contributed to the Program's strong one-year performance. Further, CalPERS' Infrastructure Program outperformance across all periods has occurred without increasing the risk profile of the portfolio. For the one-year period ending March 31, 2016, exposure to Defensive, lower-risk investments increased from 33% to 37% of the Program's NAV, reflecting a de-risking of the Infrastructure portfolio.[3] Performance is expected to moderate over time, as more recent commitments to Defensive-risk commitments mature. However, StepStone believes the portfolio is positioned well to meet CalPERS' infrastructure benchmark.

Investment and Program Activity

Through June 30, 2016, two investments were made in the Infrastructure portfolio. In March, CalPERS acquired a stake in Desert Sunlight Investment Holdings, LLC, which owns two solar photovoltaic power generation facilities near Palm Springs, California. The investment was made through Gulf Pacific Power, an account with Harbert Management Corporation, one of the Program's external managers. In May, CalPERS acquired a 10% interest in the Indiana Toll Road from IFM, who led the transaction and owns 85% of the asset in its open-ended global infrastructure fund. One investment has been made since the end of the fiscal year. In September, it was announced that Golden Reef Infrastructure Trust, a separate account between CalPERS and QIC, was acquiring a stake in Port of Melbourne, in the state of Victoria, Australia.

From the beginning of FY 2016 to the present, StepStone reviewed and provided opinion letters on four investment proposals, one investment disposition, the expansion of an existing custom account, and several other transactions that did not progress to the proposal stage. We also participated in meetings and numerous discussions focused on establishing a new infrastructure separate account to target US investments. In addition to reviewing Staff's investment recommendations, StepStone participated in all relevant Real Asset Investment Committee meetings and was able to observe staff's due diligence process, use of internal and external resources, and the deal flow provided by the Program's investment partners. In our view, staff continued to demonstrate a high degree of discipline in bidding on potential investments in what have been very competitive conditions. In addition to the Program's investment activity, StepStone also reviewed changes to the Real Assets Investment Committee Charter and the Infrastructure and Forestland Procedures Manual.

Investment Policy

As of June 30, 2016, the Program was in compliance with the key parameters outlined in the Policy, including diversification and concentration limits by risk type and region.[4] The Program was also in compliance with the Policy leverage limits. On the overall infrastructure portfolio, leverage was 47.1% of the total Program, compared to a long-term strategic limit of 65%. Investment activity during the year was consistent with the Program's strategic role and objectives as outlined in the Policy. StepStone notes the following:

[3] Program Characteristics are calculated based on total NAV as of March 31, 2016.

[4] According to Section V.F.2 of the Policy, the requirement to meet Key Policy Parameters pertaining to Risk Segments and Geography applies only when the Program NAV exceeds US$3.0 billion. As of June 30, 2016, the Program's NAV was US$2.6 billion.

Policy Objective	Comment
Preserve investment capital	✓ Defensive-risk investments increased from 33 to 37% of NAV ✓ 99% of the Program's NAV is located in Developed OECD countries (59% in the US)
Generate stable investment returns that are attractive, on a risk adjusted basis, relative to the program benchmark	✓ For the one year period, the Program returned net 9.0%, which compares to the Policy Index return of 4.9%, representing an excess return of 4.1% ✓ Returns for the three and five year periods, also exceeded the Policy Benchmark
Provide cash distributions as a prominent component of investment returns	✓ For the one year period, the Program's investments earned net 3.2% in income. ✓ Income is expected to become a more prominent component of the overall return as Defensive investments mature
Provide long-term inflation protection	✓ The Program targets essential infrastructure assets, which often have inflation linkage through indexation to CPI through regulation or contractual provisions
Diversify CalPERS' investments	✓ Defensive and Defensive Plus infrastructure investment strategies are expected to demonstrate a low correlation to other asset classes in which CalPERS invests.
Establish CalPERS reputation as a premier infrastructure investment manager and investor of choice within the investment community	✓ Recent investments, including the Indiana Toll Road and Port of Melbourne, drew significant interest from many other sophisticated infrastructure investors. And, in both transactions CalPERS partnered with top-tier institutions.
Practice responsible investment to support efficient operation of assets, delivery of quality services, utilization of responsible labor and management practices and implementation of responsible environmental practices	✓ All transactions completed by the Program during the year complied with CalPERS investment policies, including the Responsible Contractor Program ("RCP") Policy ✓ CalPERS is a founding member of the Global Real Estate Sustainability Benchmark ("GRESB") for Infrastructure and is represented on the GRESB Infrastructure Advisory Board ✓ Greater incorporation of Real Assets Sustainable Investment Practice Draft Guidelines into the RAU
Foster renewal and expansion of infrastructure assets	✓ The managers and partners with whom CalPERS is invested have demonstrated an ability to increase the value of infrastructure assets

Since the beginning of FY 2016, the Program has undergone a number of significant changes with respect to its Strategic Plan and Investment Policy. These changes were part of the initiative across the Investment Office to align the investment policies of each individual program with the new framework of the Total Fund Policy. As part of this process, a new integrated governance structure and set of guidelines were created for the Real Assets Unit ("RAU"). During FY 2016, staff and StepStone brought the following items to the Board with respect to the Strategic Plan and Policy:

- In December 2015 and February 2016, StepStone reviewed and provided comments on a proposal to incorporate limits and constraints in the current Real Assets Delegation Resolution ("Delegation") as an attachment (“Attachment D”) to the Real Assets Policy (“Policy”). The Board approved these changes in February 2016.

- In April 2016, the Strategic Plan for Real Assets was updated. With respect to the Infrastructure Program, the updates were primarily focused on creating (1) an integrated organizational structure across RAU component programs, with the objective of increasing consistency in the investment process, decision making, asset management, and reporting across the Investment Office; and (2) a single portfolio hierarchy for Real Assets, under which risk classifications, parameters and the business model for the component programs will conform to those currently used in Real Estate. Specifically, the updated Strategic Plan changed the Infrastructure risk classifications to conform to those used in Real Estate (from Defensive, Defensive-Plus, Extended to Core, Value-Added, Opportunistic). The use of a single risk classification scheme should help to clarify the role that Real Assets investments are expected to play in CalPERS’ portfolio, particularly for purposes of Asset Liability Management. The Board approved the updated Strategic Plan in April 2016.
- In June 2016 and August 2016, StepStone reviewed and provided comments on the revised Real Assets Program Policy (“Policy”). The revised Policy incorporates changes to the Infrastructure Program included in the updated Real Assets Strategic Plan, as well as several other amendments, including changes to Delegation/Staff Authority limits, risk classifications, and the removal of definitions and other elements in the current Policy intended to guide staff on the implementation of Policy objectives to a separate document (Investment Policy Procedures and Guidelines). The Board approved the revised Real Assets Policy in August 2016.

Organization

In FY 2016, Paul Mouchakkaa, SIO for Real Assets, initiated a process to integrate the Real Asset component programs (Real Estate, Infrastructure and Forestland). The implementation of this process continued during the fiscal year. The changes were driven by the belief that the respective programs have similar objectives, and that integration is consistent with the Vision 2020 objective of reducing complexity across the organization. As part of this effort, the Real Estate and Infrastructure and Forestland Investment Committees were integrated to form a single Real Asset Investment Committee. Other significant changes included (1) the division of the investment team into a distinct Portfolio Management Group, focused on existing investments, and a New Investments Team; and (2) the reassignment of responsibilities among Real Estate and Infrastructure Investment staff, such that several investment professionals now have responsibility for investments in both of the asset classes. In April 2016, Ed Yrure was appointed Investment Director for the New Investments Team, a new role that spans all sub-asset classes within Real Assets. Through its participation in RAIC meetings and other Program related projects, StepStone has observed that, in general, the new organizational structure is effective. StepStone notes that infrastructure is relatively new to several members of the RAIC, yet familiarity with the differentiated characteristics of infrastructure investments and their associated risk classifications will increase over time. Further, we note that the RAU is still in the process of drafting definitions for the infrastructure risk classifications that will be used in the updated Policy (Core, Value-Added, Opportunistic). StepStone will continue to monitor any changes resulting from the reorganization and update the Board as appropriate.

Investment Beliefs

Both the characteristics of the infrastructure asset class and the RAU's approach to infrastructure investing are consistent with many of CalPERS' Investment Beliefs, examples of which are identified below:

	Investment Beliefs		Comment
1.	Liabilities must influence the asset structure	✓	The role of infrastructure at CalPERS (investing in in essential infrastructure assets and provide predictable returns with moderate long-term inflation protection) is consistent with its liability structure.
2.	A long time horizon is a responsibility and an advantage	✓	Infrastructure is typically long-lived, and CalPERS' seeks to implement a "buy and hold" approach.
3.	CalPERS investment decisions may reflect wider stakeholder views	✓	Infrastructure assets have multiple stakeholders. Effective management and strong governance can positively impact investment outcomes.
4.	Long-term value creation requires effective management of three forms of capital: financial, physical, and human	✓ ✓	Sustainable Investment Practice Guidelines are being integrated into the investment process. An increased focus on integrating governance, alignment and risk sharing in considered when structuring accounts.
5.	CalPERS must articulate its investment goals and performance measure and ensure clear accountability for their execution	✓ ✓	Organizational changes in Real Assets have focused on increasing efficiency and accountability. Recent organizational changes have an objective of building a consistent and repeatable investment process.
6.	Strategic asset allocation is the dominant determinant of portfolio risk and return	✓	The strategic role of infrastructure at CalPERS is defined through the ALM process and is a guideline for the Program's investment activities.
7.	CalPERS will take risk only where we have a strong belief we will be rewarded	✓	The Program's investments are weighted towards Defensive, lower risk investments and have consistently outperformed the Policy Benchmark.
8.	Costs matter and need to be effectively managed	✓	CalPERS' scale and the utilization of separate accounts enable the Program to invest at below market fees.
9.	Risk to CalPERS is multifaceted and not fully captured through measures such as volatility or tracking error	✓ ✓	The investment process is focused on evaluating risks associated with infrastructure investment, including risks associated with counterparties, regulation, public sector exposure, and others. Increasingly, staff should develop monitoring procedures and capabilities to assess and manage risk post-investment.
10.	Strong processes and teamwork and deep resources are needed to achieve CalPERS' goals and objectives	✓	Recent organizational changes geared towards streamlining investment policies and procedures should also create efficiencies in resource allocation.

Conclusion

Throughout the year, the investment activity conducted by the Infrastructure Program, as well as changes to policy and organizational structure are generally consistent with its strategic role, Policy, and CalPERS' Investment Beliefs. As of September, the Program was successful in making new commitments to three high-quality assets, each of which is consistent with the role of Infrastructure at CalPERS, and has continued to demonstrate discipline in competitive market conditions. As mentioned, the integration of the RAU is still at an early stage; StepStone will continue to work with staff on the implementation of this new structure, and the updated Strategic Plan and Policy, and will continue to keep the Board apprised of progress and developments with respect to the Infrastructure Program.

StepStone welcomes the opportunity to answer any questions of the Investment Committee.