

# INFRASTRUCTURE

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*Defining Matters*



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## FOREWORD

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Infrastructure is critical to our economy, our community and our pursuit of a sustainable environment. But what do we mean by the term “infrastructure” and do different understandings of that term confuse our attempts to decide on our future investment and development priorities?

In this important paper “Infrastructure – Defining Matters”, Drs Beeferman and Wain explore how we should consider and define “infrastructure”. They focus on enterprise and people and argue that context is critical. It is an important contribution to our thinking on this crucial topic.

They use both formal analysis and practical application to inform this different approach. A number of US Pension Funds contributed to the analysis via a comprehensive survey.

Beeferman and Wain challenge our understanding and definition of “infrastructure”. They argue that understanding infrastructure’s important role in our society is key to informed analysis. That this provides a context for economic and community analysis in both developed and developing countries.

This paper is a very useful contribution to an issue that is increasingly important to economies and communities around the world.

Sir Rod Eddington AO  
Chairman  
Infrastructure Australia

## ABOUT THE CO-AUTHORS

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### Dr Larry Beferman

Dr. Larry Beferman is the Director of the Pensions & Capital Stewardship Project at Harvard Law School's Labor and Worklife Program. The Project addresses key legal, policy, and other practical issues relating to strengthening and extending retirement security for more households and practices, institutions, and systems of pension fund governance, management, and investment that encourage capital markets and corporate policies to work more effectively for workers and the health and well-being of the larger community.

The Project's publications have included ones concerning pension fund investment in infrastructure, the tools for and practice of taking into account social factor risks in investment decision-making, labor and private equity, worker voice and the union role in the management of pension fund assets, the Dodd-Frank financial markets reform legislation, and proposals for automatic enrollment in retirement plans. A forthcoming publication on rethinking fiduciary duty will be part of a collection of essays will be published by Cambridge University Press.

Larry W. Beferman received a juris doctorate from Harvard Law School and a doctorate in applied physics from Harvard University. Prior to leading the Project he was a professor of law at the Massachusetts School of Law and Western New England School of Law, headed up the Asset Development Institute at Brandeis University's Heller School for Social Policy and Management, and served as Associate Counsel to the Massachusetts Special Commission Concerning State and County Buildings.



### Dr Allan Wain

Allan joined Hastings in February 2010 and is a member of the Hastings Investment Committee.

Prior to joining Hastings, Allan was an economics and strategy adviser to the Office of the President and Cabinet in the Middle East and the Managing Director of an investment development company. Previously Allan was at BHP Petroleum where he was strategy adviser to the chief executive and the Principal Economist. In this role Allan was responsible for identifying, evaluating and financing offshore oil and gas and related infrastructure assets. Allan was also a director of a management consulting firm.

Allan has studied at the University of Melbourne, Stanford University, Harvard University and the University of London and has a Master of Business and PhD degrees, together with postdoctoral, postgraduate, and undergraduate qualifications in economics, finance, and engineering.

# INTRODUCTION



## INTRODUCTION

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Pension funds are grappling with serious challenges. Most immediately they are to invest fund monies in ways calculated to keep promises to pay retirement benefits. Some of those promises have ripened with the retirement of certain plan participants. Other obligations, based on the experience of young, active workers or those who will become active workers, will mature only many decades – some six, seven, or more – from now. In the more technical parlance of pension fund discourse there must ultimately be a “match” in time and amount between what can be realized from investments and (what are, for the most part) “long-dated liabilities.”

However, the challenge of meeting that ostensibly purely financial objective is inevitably linked to how enterprises that afford the occasion for investment operate and behave in producing goods and services, and the impact of those operations and behaviors.<sup>1</sup> In other words, the investment choices pension funds (and others) make, certainly at an aggregate level and in some cases at an individual level, inevitably affect and are affected by the larger society, perhaps even profoundly so. Awareness of and attention to this second challenge may be relatively new, but they have grown in importance and likely to increase much further.

This paper focuses on investments in infrastructure informed by the possibility that they are one valuable means by which pension funds can meet the first challenge. But consideration of such investments in those terms implicates issues posed

We believe that pension funds will be better able to meet these dual challenges if they can gain a deeper understanding of first, what infrastructure “is” or might be thought “to be”; and second, the relationship of that understanding to other ways of thinking about infrastructure and how they are ultimately linked to beliefs and contentions about the place of infrastructure investments in their portfolios.

by the second challenge because broadly speaking the enterprises associated with infrastructure are in that regard no different from other kinds of enterprises.

That being said, though, discussion about infrastructure investment is typically animated by a belief or perception that infrastructure is “different.” That is, enterprises associated with infrastructure differ from other kinds of enterprises in terms of the goods and services they produce, most especially the relative importance of the role those goods and services play in the life of a society. In turn, there is a sense grounded in some measure of historical experience, that precisely because enterprises associated with infrastructure are “different” the economic, political, and other arrangements according to which those enterprises might be established and operate are unlike those of others. And, in turn again, there is an impression – also grounded to some extent in historical experience – that the financial characteristics of investments which support, sustain, or drive those arrangements have a distinctive character. Indeed, the belief often is that those characteristics are distinctive in ways which might be particularly apposite with the financial needs of pension funds. At the same time, though, the ostensible special nature and important function in society of that which is understood to be infrastructure may well engender correspondingly unique problems in responding to the larger societal implications of enterprises associated with infrastructure.

We believe that pension funds will be better able to meet these dual challenges if they can gain a deeper understanding of first, what infrastructure “is” or might be thought “to be”; and second, the relationship of that understanding to other ways of thinking about infrastructure and how they are ultimately linked to beliefs and contentions about the place of infrastructure investments in their portfolios.

Toward that end, this paper is organized as follows.

First we take brief note of both historical discourse about infrastructure and specific contemporary discussion as they pertain to investment which in some measure motivates this essay. More particularly we offer a short description of the origins of the term “infrastructure” and how the nature and reach of the term has changed over the years. We do so to emphasize that the choice of definition will be informed by the particular needs, concerns, and circumstances of those who see the term relevant to interpreting their experience. We then look at the shifting, in some measure *ad hoc* ways in which infrastructure has been classified in relation to investment. We see these variations as a signal of the lack of clarity, focus, or consistency which characterizes the field and needs to be addressed.

Next, we turn to pension funds’ – more particularly U.S. public sector pension funds’ – experience with the term from several vantage points. We describe and strive fairly to interpret

responses from a number of such funds to a survey we sent to them which included questions we posed as to possible definitions of infrastructure, particular instances or examples of infrastructure, putative financial attributes of infrastructure investments, and how respondents view such investments in relation to their funds' strategic objectives.

In light of the foregoing we then propose a definition for infrastructure which we believe seems to be apt for pension funds. However, while that definition is targeted enough in those terms we fashion it broadly to capture meanings for others whose needs, concerns, and circumstances are ones to which pension funds might well need to be alert. For several reasons, the definition is anchored in a characterization of the kinds of products and services with which provision through infrastructure is identified. One is that it is often the first and in certain respects easiest way for those who venture into the infrastructure space to orient themselves to the subject matter. Another is that as just suggested, the uses of those goods and services and their impact on others will demand the attention of those who enter the investment infrastructure space. Nonetheless, of course, the focus of funds is particularly on the calculus of financial risk and reward.

In accord with that emphasis, in the next section we identify a series of links and corresponding ways of thinking which connect at one end of the chain, infrastructure as defined, and at the other end, that financial calculus. In doing so, we

highlight the importance of the definition to each different way of thinking or analysis. To afford what we think could be a useful tool for pension funds in their consideration of infrastructure, in the Appendix we distill from detailed analysis of the main text a series of inter-related questions which might prove useful to the decision-making process.

We conclude with a reprise of the arguments offered with the aim of situating the analysis in relation to the tasks pension funds have and how they might pursue them.

### **A short history of the term “infrastructure”**

Definitions are important. They lend clarity and focus to discussions. Without such precision and focus participants are likely to speak by one another or even at cross purposes. If the aim is to make a well-considered decision, especially a weighty one, clarity of definition is essential. This is particularly true for many of those who think about investment in infrastructure. There is no widely shared understanding of what infrastructure “is,” why it is understood in that way, and the link between how investors view it in relation to the perspectives of those who are not investors. Moreover, in some measure, definitions are in the eyes (or the hands) of those who are the beholders. That is, the meaning(s) they attribute to or associate with the word reflect the vantage point from which they view or are situated with respect to it. Even within the relatively modest compass of this consideration of infrastructure in relation to investment there are multiple and overlapping perspectives and interests in play: those of the ultimate users of what infrastructure affords, government officials not only in their own names but also in the name of others whose lives might be affected by it, those most directly engaged in the construction and operation of an infrastructure enterprise, those involved in how that enterprise is financed, and those, like pension funds, who choose to be investors in such enterprises. The extent to which these different understandings (and what gives rise to them) are

reconciled bears on whether and by whom that enterprise is thought to be fit for purpose.

For those reasons we start with the curious, though somewhat uncertain, narrative of the appearance and evolution of the word infrastructure. That history suggests, perhaps not surprisingly, that which has been associated with the word, has been informed by the interests, priorities, concerns, etc. of those who have chosen to include it in their vocabulary. This evolution evidences in part the adoption (and adaptation) of the word in new contexts according to which the associated meanings have changed.

The term seems to be of relatively recent vintage. It might have been derived from the word spelled the same way in French in the 19th century, perhaps as early as 1875 and may have been identified with the military. For example, according to one source, “[t]he earliest use [in English] is in 1927 in the Oxford English Dictionary, wherein the term was used to describe ‘the tunnels, bridges, culverts, and ‘infrastructure work generally’ of French railroads.”<sup>2</sup> Indeed, two contemporary definitions of the French word are connected with railroads.<sup>3</sup> Usage of the word in that way was associated with a “descri[ption of] a sub grade, the original material underneath pavement or a railway bed. It comes from a combination of the Latin prefix ‘infra,’ meaning ‘below’ and ‘structure,’”<sup>4</sup> In the English-language context, the link to the military seems to have been strongly taken up in the early 1950s. An entire chapter in a report

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assessing NATO's first five years "referred to [it as] all of the 'fixed installations which are necessary for the effective deployment and operations of modern armed forces.'"<sup>5</sup> However, according to one analysis, other usages emerged, driven by new and different concerns or priorities. For example "the emerging academic discipline of economic development" brought attention to the need, especially in low income nations for "the capital base upon which a modern industrial society might flourish."<sup>6</sup> With a recognition that "the challenges of health, education, and social organization loomed equally large" came the near "demise[] in the use of the word infrastructure." It was supplanted by the term "social overhead capital," which included "economic overhead (i.e., physical facilities) and social capital (human investment)."<sup>7</sup> Still later, "the term infrastructure in American political discourse" was revived, spurred by a pressing need to maintain and renew existing public sector physical plant as the basis for faster economic growth.<sup>8</sup> At the same time, there have been other, much more wide-ranging definitions proposed.<sup>9</sup>

### **What infrastructure "is" for investors today: an uncertain and moving target**

Pension funds have been introduced to infrastructure by trade and popular publications (and perhaps even academic ones), investment consultants, asset managers, among others. What these sources have given funds to understand infrastructure to be has not only been quite varied

but also shifted, in part driven by the interests and incentives of one or another source in advancing the conversation. Indeed, insofar as those interests and incentives have been tied to the promotion of investment in infrastructure the understandings promoted have expanded.

Some of the approaches describe infrastructure largely in *functional terms; that is, in terms of the uses of the facilities and services involved*. Some analysts use the category of economic infrastructure in reference to toll-roads, bridges, tunnels, airports, seaports, and rail networks, as well as common utilities such as gas distribution networks, electricity and renewable energy production and distribution, and water treatment and distribution facilities. They distinguish those from what they term social infrastructure, such as schools, health care facilities, prisons and intra-city railroads. By contrast, others divide infrastructure into three categories: transportation, utilities, and social infrastructure.<sup>10</sup>

Another method contrasts *facilities that can yield a reasonably privileged income stream with those that do not*. One factor is whether the facility has a true monopoly or a strongly competitive position. Another relates to how the infrastructure enterprise generates income.<sup>11</sup>

Yet another slant is based on the *amenability of the facility to or the extent of privatization*. This might range from outright purchase or acquisition of a long-term lease by a private enterprise to government retention of control through regulatory

oversight and/or contractual provisions. In still other cases, usually involving what is termed social infrastructure (such as schools), there may be no readily identifiable revenue stream such as a user fee to make them attractive to would-be investors so it is provided by government.

An additional way of categorizing infrastructure focuses on *phases of the investment life cycle*. For example, there are what are referred to as *early stage or greenfield* investments, such as new road, bridge and tunnel developments for which there may be no established demand patterns. These are thought to provide little or no income from the asset for some significant period of time, but potentially high returns in the future. By contrast, *growth stage* investments typically are associated with expansion projects and new privatizations of existing operating assets. Here, already known operating track records are believed to auger attractive growth with a reasonably consistent yield. Meanwhile what are designated as *late stage or brownfield* investments, involve assets that are considered mature and proven, seen as offering very predictable income stream derived from a combination of monopoly-base provision and favorable pricing, particularly in relation to inflation, as a result of government prescription.

The proliferation of definitions or characterizations – reaching among other things (for some) to lotteries and parking lots and meters – has, in the view of one commentator, reduced infrastructure to "just a buzzword, a convenient catch-all."<sup>12</sup>

If seeing this as a confused and problematic state of affairs is warranted, then funds which seek a thoughtful and serious consideration of infrastructure – certainly as would-be investors but perhaps equally as providers of means for investment – are ill-served by these developments

Although we believe that the brief portrayal above was informative we thought it important to ask U.S. pension funds directly how *they* see infrastructure and understand how their views shape the infrastructure-related decisions *they* in fact make.

## Survey

Toward that end, in the late fall of 2011, we sent out an extensive survey to all U.S. public sector pension funds which we believed had invested in infrastructure or had seriously considered doing so. It was directed to all the trustees of the pension fund board or the members of its advisory board in the case of a sole trustee as well as the top staff executive officer of the fund. Responses were received from trustees or staff from ten of the funds.

The survey covered the following topics:

1. *Definitions of infrastructure:* Which among twelve possible definitions offered to the respondent most reflected what he or she understood infrastructure to be; least reflected it. Each respondent was also asked what, if anything he or she would add to or change in the definitions to better reflect that person's understanding of what that individual thought infrastructure to be.
2. *Specific examples of infrastructure:* Which among fifteen possible specific examples offered the respondent would definitely include as an illustration of infrastructure; which he or she would definitely not include; and which not on the list should be included. Each person surveyed was asked if he or she thought that the provision of infrastructure was different in significant ways from the provision of other kinds of products or services and if so why. We also inquired of the respondents as to whether pension funds should or needed to think differently about making in-

vestments in the provision of infrastructure as compared to investments in enterprises which provide other kinds of goods or services and why.

3. *Financial characteristics of infrastructure investments:* Which among twelve financial characteristics the respondent thought were accurate or inaccurate in describing infrastructure investments and the reasons why.
4. *Strategic objectives for pension fund investment in infrastructure:* Which among twenty-one strategic objectives in relation to investment in infrastructure were legitimate ones for a pension fund to have and the reasons why; how important those objectives were on a scale of 0 to 5 (5 for the most important). Each person surveyed was invited to propose what he or she thought were legitimate and important objectives that were not included.
5. *Impacts of infrastructure and making investment decisions.* Each respondent was asked if he or she thought that the impacts of investment in infrastructure were dissimilar enough from those of other kinds of investments to warrant distinctive or special consideration, and if so the ways in which the consideration would be different.
6. *Asset classes and infrastructure:* Each respondent was asked how his or her fund characterized, grouped, or located infrastructure in its portfolio, for example, among a class termed "real assets," among a real estate or private equity class, etc. and whether that person agreed with the characterization.

The only definition which elicited a unanimous affirmative response from every person who took the survey was that which *provide[s] services and support that are basic to the functioning of a community, organization, or society and crucial to its economic productivity* (definition (b)).

7. *Fund experience with infrastructure investments:* Each person surveyed was posed a group of questions relating to his or her fund's experience with infrastructure, namely: when such investment was seriously considered; whether the fund had decided to make such investments and if so when; the initial commitment (if any) to infrastructure investment and to what type; the location of the investments in the fund's portfolio; the investments made; the financial outcomes of those investments; whether any changes in policy with respect to infrastructure investment and the person's views on that; and any changes the person thought should be made.

## Survey results and analysis

**Definitions of infrastructure:** The only definition which elicited a unanimous affirmative response from every person who took the survey was that which *provide[s] services and support that are basic to the functioning of a community, organization, or society and crucial to its economic productivity* (definition (b)). The only other definition which elicited unanimous support, though from fewer than all of those who took the survey, referred to what *are the basic physical and organizational capacities and resources needed for the operation of a society or enterprise or are necessary for an economy to function*" (definition (k)). (The letter references are those of the survey questions in Appendix A.).

The two cases in which more than half of those surveyed made choices and were nearly unanimous in the choices involved structures, networks, etc. which *are capital intensive/have high fixed costs and long economic lives and have strong links to economic development, and a tradition of public sector involvement.* (definition g)) *or are essential to driving sustainable economic development and growth, lifting levels of productivity and boosting employment and critical to encouraging business innovation and improving the global competitiveness of enterprises* (definition (a)).

By contrast, only one definition was rejected by all those who made choices – in that instance, a slight majority. It referred to structures, networks, etc. which *are key to managing population growth and meeting current and future environmental challenges* (definition (c)).

There were weakly negative reactions – because a bare majority or fewer made choices and half or fewer made the choice – to structures, networks, etc., that *provide a platform for economic development, social cohesion and stability* (definition (d)); *facilitate the building up and maintenance of the stock of human capital, for example, health and education* (definition (i)); *facilitate the production of goods and services and the distribution of finished products to markets* (definition (l)); *provide social services and support private sector economic activity* (definition (f)); and *form the underpinnings of a nation's defense, a strong economy, and its health and safety* (definition (h)).

Stepping back from these specific results it seems that respondents most strongly embraced choices which characterized infrastructure in terms of it being “basic,” “necessary,” or “crucial,” or as the “underpinnings” to certain kinds of outcomes. The choices were a bit weighted to those of an economic nature. That is, they referred to “economic productivity,” “productive activity,” “economic growth,” “employment,” “innovation,” “competitiveness,” and “reducing production and transaction costs,” and a “strong economy.” However, there was some attention to what hinted at social outcomes such as the “functioning of the community, organization, or society,” the “operation of society,” and more generally, the “public good” which included “public goods and services, environment and order and safety.”

However, the somewhat more broadly phrased and ostensibly non-economic outcomes relating to “population growth” and “environment challenges” were strongly rejected. Somewhat similarly, where “economic development” was included as one of two outcomes with “social cohesion and stability,” there was lukewarm support suggesting it was the latter which was problematic.

Along the same lines, the modest support for human capital/health and education outcomes might have been because they might not have been seen as directly economic and perhaps more social. Also, these outcomes are *individual* in nature whereas the references in the strongly affirmative responses noted above are *collective*

in character in their reference to “society,” “community,” and “organization.”

If these inferences have merit, the modest number and 50-50 split of responses to choices which included “social services” and “private sector economic activity” might suggest support for the latter and lack of it for the former.

Despite the seeming emphasis on economic outcomes, the somewhat greater number of responses but still 50-50 split for production of goods and services and distribution might be explained by the lack of reference to infrastructure being essential, necessary, crucial, etc., and hence the category being seen as closer to direct involvement with traditional private sector activities.

It is not clear why the category which included the diverse sub-categories of “defense” and a “strong economy” and the nation’s “health and safety” elicited a relatively weak response. Perhaps, there were trade-offs made between economic outcomes with the other ones.

By contrast the freely offered comments to the specific questions are revealing about the thinking which informed the responses. More particularly, only some pertained to the *role (and associated outcomes)* of infrastructure. They referred to that which was “essential” and a “broad benefit to society” and that which would “help the nation in general, spur economic growth, job creation.” These broadly worded statements are consistent with the strongest responses described above and “ensur[ing] economic opportunity and mobility”

though the last, while cast in economic terms, has a social and/or individual flavor to it.

Several other comments were concerned not with the *role or impact of infrastructure* but rather with *where infrastructure was situated in relation to markets* with it being characterized by “inelastic demand” and being “monopolistic.” Another deemed infrastructure to (arguably) fulfill a role “too broad or multifaceted for private investment.” It is not clear what the intent was here, as an implicit expression of the importance of infrastructure requiring a dominant or exclusive public role, or otherwise. There seems to be a strong suggestion of a function which the private sector is incapable of or (likely?) unwilling to fulfill. A couple of other comments referred to the *scale of infrastructure* as a distinguishing characteristic, with reference to it as “capital intensive” (and having a “long life”) and as (a subset of) “capital projects.”

**Specific Examples of Infrastructure:** The choices from among possible specific examples of infrastructure were broadly consistent with the reactions to the first set of definition questions. There was a significant lack of support for housing and recreational facilities. For housing, this may have been because in the United States it is generally thought of as a matter of private provision. Another reason could have been that it is seen as a matter of individual supply despite the collective and/or special character of military, student, or low-income housing. It also might not be thought to be (directly) related to productive

economic activity. For recreational facilities the reason may have been because they might generally be viewed as a matter of private action and to some degree one of individual provision. Also, they might simply not be considered to be as especially important, with no obvious or strong link to economic impacts. There was also weak support for post offices. While in the United States, the delivery of parcels and letters has historically been predominantly public and has been quite important to economic commerce, there are now major, competing private(ly) operated companies and post offices may just be seen as “buildings” without particularly distinctive characteristics.

Note that the responses may also be colored by historical/cultural understandings of infrastructure, that is, what have historically been seen as “public works” or a matter of (large scale?) public provision. In some measure the answers suggest a conflation of, mix-up, and/or overlap of descriptive or functional understandings of infrastructure with economic readings in terms of the role of the market. That is they may be implicitly linked to the importance of infrastructure to certain outcomes, for example, the monopolistic nature of provision, inelastic demand, capital intensity, high barriers to entry, and related views as to the (proper) role of government, include extent of government oversight, regulation, etc.

Comments were solicited as to why particular examples were or were not deemed to be infrastructure. Most who replied made distinctions not for

There were a wide range of reactions and sharp distinctions among [respondents] with respect to financial characteristics of infrastructure investments.

reasons of their impact on the society but rather for reputational or policy reasons or because of perceptions about the relative roles of the government and the private sector. Thus one respondent did remark that lotteries and casinos were not essential for the economy to function and, hence, were not infrastructure. By contrast, others excluded lotteries and casinos because of reputation risk; did not include communications systems or networks because they are almost exclusively provided by the private sector; would reject communications systems or networks, energy facilities, and recreational facilities, because they are better handled by the private sector; and would not include communications networks or facilities because they are almost exclusively provided by the private sector. Still others would not include environmental-related facilities because of policies pertaining to hazardous materials; and would bar recreational facilities, public safety-related facilities, and housing because they are “outside policy (such as casinos) or outside policy-approved sectors.”

Comments were also sought as to the ways, if any, the provision of infrastructure differs from other forms of provision. Several respondents focused on societal impact, referring to infrastructure’s role in the supply of services that are essential or fundamental (that is, they are needed for a society to grow and prosper versus products or services that are discretionary in nature), noting the immense (adverse) social impact of failure in provision, alluding to their being works

undertaken as a “public good.” However, others emphasized market-related issues, that is, that the provider enjoys a monopoly or oligopoly position and that there are few or no substitutes. Still others pointed to the infrastructure being of large scale and its implications, namely that it was associated with significant upfront capital costs and entailed a longer planning and financing horizon and continuous maintenance and improvements.

**Financial Characteristics:** There were a wide range of reactions and sharp distinctions among them with respect to financial characteristics of infrastructure investments.

On one hand a substantial number of respondents were unanimous in the view that the characteristics included investments

- being relatively illiquid (because large amounts of capital are required at irregular intervals for these projects, the indivisibility of these projects, and the absence of an effective secondary market for them)(financial characteristic (a));
- requiring large investments (because infrastructure is generally capital intensive, with projects in their nature being because the facilities or structures built and operated, such as transportation energy, communication, and social services, are large scale) (financial characteristic (b)); and
- yielding income which is stable and predictable over the long-term (because income is frequently inflation-linked, regulated, and protected by government guarantees) (financial characteristic (h)).

There was also an almost unanimous judgment (but with fewer responses overall) that the characteristics encompassed

- higher levels of debt/leverage than non-infrastructure (because infrastructure cash flows are more certain than for other projects, with the result that sponsors of infrastructure projects are willing to accept more debt and providers of capital are willing to issue higher levels of debt for infrastructure) (financial characteristic (c));
- returns with a low correlation with other assets (because infrastructure returns are frequently independent of economic conditions such as inflation and changes in GDP)(financial characteristic (j)); and
- risk-return profiles which differ according to whether the infrastructure asset is new (greenfield) or existing (brownfield) (because risk is usually higher during the construction phase of infrastructure projects than the operating phase)(financial characteristic (l)).

By contrast, there was no or very modest support for the financial characteristics of

- there being more possibility of financial performance problems with a project (because infrastructure is long-term and there is greater likelihood of adverse events occurring)(financial characteristic (g));
- offering attractive capital growth (because the contracted revenue and costs applied to infrastructure projects usually provide enhanced

valuations over the long-term) (financial characteristic (i); and

- evidencing higher risk and more uncertain financial performance (because project success is dependent on multiple assured sources of capital, guarantees, and/or subsidies)(financial characteristic (f)).

Finally, there was a weak consensus as to the characteristics including

- their being hard to value (because of complexity of documentation, financing, and technical details the uncertainty of economic and financial conditions over the long-term, and the absence of a market price)(financial characteristic (d)) and
- their likely being held for a longer period than non-infrastructure assets (because non-infrastructure assets have a more established secondary market and can be sold and exchanged more readily)(financial characteristic (e)).

Thus, in terms of anticipated financial outcomes respondents were of the general view that infrastructure investments offered stable, predictable returns over the long term, returns which were not very much correlated with the returns of other assets. At the same time they saw such returns as resulting from the income streams generated and not from capital growth. Moreover, they thought that the profile of investment risk and reward varied with whether the infrastructure was new or existing. Their rejection of the statements that there might be more of a chance of financial

problems with infrastructure projects or that the evidence higher risk or more uncertain financial performance comports with their confidence in investments yielding the kinds of returns noted above.

With respect to the attributes of the investment vehicles the beliefs were that they require large investments, are relatively illiquid, and entail higher levels of debt/leverage than non-infrastructure). As noted there was no strong consensus view as to infrastructure assets being hard to value or that they necessarily have to be held longer than non-infrastructure assets).

The foregoing being said, the additional comments solicited as to why any of the proffered characteristics were inaccurate or not, again largely emphasized that the financial outcomes and attributes varied according to the kind of infrastructure which was the object of investment, for example, brownfield/core versus greenfield. Also the few responses to the question which asked about financial characteristics not on the list did not offer any as such. Rather, a couple took note of factors which have a bearing on financial outcomes, namely, that the investments involved monopolistic assets and price inelasticity driven by the provision of essential services. Another suggested that many infrastructure investments could be taken public, individually, or in combination with other assets. Yet another indirectly alluded to liquidity issues by emphasizing the importance of there being an exit strategy and oft the investment producing a steady stream of cash flow.

**Strategic Objectives:** For the respondents the most important (that is, more than 4.5 or more on a scale of 5.0) strategic objectives were to

- preserve capital (strategic objective (a))(4.5) and
- yield a long-term, high-quality, stable income stream, and generate appreciation at least commensurate with inflation (strategic objective (e)) (4.5).

There was fairly strong support (that is, more than 3.5 but less than 4.5 on a scale of 5.0) for the following objectives:

- contribute to portfolio diversification (strategic objective (o))(4.4).
- yield returns that are stable and high enough in relation to the fund benchmark (strategic objective (b))(4.1)
- provide downside protection to the investment fund during equity bear markets (strategic objective (m))(4.0);
- hedge against long term liabilities (strategic objective (p))(4.0);
- yield returns that are sufficient on a risk-adjusted basis (strategic objective (d))(3.9);
- perform well during economic downturns (strategic objective (u))(3.9);
- reduce the overall portfolio's volatility (strategic objective (j))(3.8);
- afford long-term inflation protection (strategic objective (n))(3.8);
- yield high-quality, long-term, stable income streams (strategic objective (i))(3.7); and
- maintain a low correlation to other asset classes (strategic objective (k))(3.6).

The least important (that is 2.5 or less on a scale of 5.0) strategic objectives were to

- establish the fund's reputation as a premier infrastructure investment manager and investors of choice within the investment community (strategic objective (q))(1.6) and
- promote the fund's standing as an investor who takes legitimate account of stakeholder interests, such as those of members of the communities served and affected by the infrastructure and workers who build or operate it (strategic objective (l))(2.5).

There was only somewhat more than majority support (that is, above 2.5 and 3.5 or below on a scale of 5.0) for the following goals:

- provide investment returns which include a substantial cash distribution component (strategic objective (f))(3.4);
- provide yields that are not only stable but also predictable cash flows (strategic objective (g)) (3.5);
- yield respectable rates of return with low risk (strategic objective (h))(3.2);
- embody the practice of responsible investment, that is, efficient operation of the asset, the delivery of quality services, utilization of responsible labor, environmental, etc., practices (strategic objective (r))(3.1);
- offer transactions are of significant economic scale and magnitude, allowing an outlay of a sizable amount of capital (strategic objective (t))(2.9);

- foster the renewal and expansion of infrastructure assets (strategic objective (s))(2.8); and
- yield returns that are the result more from appreciation in the assets than cash returns, through operational improvements, best management techniques and practices, or otherwise (strategic objective (c))(2.6).

In a number of respects the strategic objectives which respondents state they want to advance through infrastructure investments are commensurate with the perceptions they articulate about the financial characteristics of such investments. For example, the two most strongly embraced objectives, to *yield a long-term, high-quality, stable income stream, and generate appreciation at least commensurate with inflation* (strategic objective (e)) and to *preserve capital* (strategic objective (a)) are broadly apposite with two of the most strongly expressed perceptions about the financial characteristics, namely, strong support for the position that infrastructure investments *yield income which is stable and predictable over the long-term* (financial characteristic (i)) and rejection of the view that *they offer attractive capital growth* (financial characteristic (j)).

Note also that several of the fairly strongly expressed opinions on financial characteristics, which place an emphasis on returns which are stable, and adequate enough by some measure, roughly correspond to a couple of the fairly strongly supported strategic objectives, namely

It seems clear how those with responsibility for making investment-related decisions for plans understand what that responsibility entails – whether understood in terms of fiduciary duty or otherwise – is intertwined with how they think about investments in infrastructure (or other kinds of investments for that matter).

to yield returns that are stable and high enough in relation to the fund benchmark (strategic objective (b)) and yield high-quality, long-term, stable income streams (strategic objective (i)). Similarly the weakly embraced objective that investments yield returns that are the result more from appreciation in the assets than cash returns, through operational improvements, best management techniques and practices, or otherwise (strategic objective (c)) is largely consistent with rejection of the view that such investments offer attractive capital growth (financial characteristic (i)).

It is in some ways striking that the three strategic objectives articulated in other than financial terms were not among those with significant support. However, it is worthy of comment that of the three, there was greater than majority endorsement of embodying the practice of responsible investment, that is, efficient operation of the asset, the delivery of quality services, utilization of responsible labor, environmental, etc., practices (strategic objective (r)), by contrast with establishing the fund's reputation as a premier infrastructure investment manager and investors of choice within the investment community (strategic objective (q)) and promoting the fund's standing as an investor who takes legitimate account of stakeholder interests, such as those of members of the communities served and affected by the infrastructure and workers who build or operate it (strategic objective (l)). It is not clear why this distinction was made. At first blush the language of objective (r) – for the most part

associated with factors or considerations which might be associated with the successful operation of the infrastructure enterprise – would arguably hardly be objectionable and, indeed, be thought to be highly relevant to good financial outcomes. By contrast, the words of (l) appear to reference the advancement of interests of those who are other than plan members or interests of the plan as such which are other than financial.

These reactions are apposite with several comments solicited from respondents with regard to which objectives they thought not to be legitimate and why. Those remarks included an (exclusive) “focus on the long-term health of the fund and what best serves its active and retired members,” “investment “for the exclusive benefit of its participants and beneficiaries,” and “the inconsistency of objectives (i) and (q) with fiduciary responsibility.” (Note, though, one respondent expressed a largely opposing view on these issues.) It seems clear how those with responsibility for making investment-related decisions for plans understand what that responsibility entails – whether understood in terms of fiduciary duty or otherwise – is intertwined with how they think about investments in infrastructure (or other kinds of investments for that matter.)

**Grouping of infrastructure within portfolios:** This was quite varied, in ways suggestive of a lack of clarity or certainty about how investments in infrastructure should be classified. One respondent, while acknowledging that it might not “meet the

precise definition of an asset class,” stated that the fund treated infrastructure to be a unique one. (However, he added that it was “technically a subset of private markets or private equity.”) Another fund apparently kept it under a general alternatives category. In several cases infrastructure was linked to “real assets.” That is, one fund put it in an “alternatives” portfolio, along with other “real assets”; another situated it in a “real assets” grouping along with commodities, oil & gas, farmland, and precious metals; and a third placed it within an “inflation sensitive” cluster along with TIPS, both of which seemed to fall under a broader “real asset” categorization. Two others approached the matter on a more *ad hoc* basis associated with ostensibly new and promising kinds of investments, one placing infrastructure in an “opportunistic/diversifying” class and another in an “opportunity funds.”

In sum the responses in certain ways reflected ways thinking about infrastructure linked to categories which we explore in detail below. On one hand, the use of the terms *opportunity* and *opportunistic* suggests a yet to be formulated coherent and compelling way to categorize infrastructure in a non-financial sense; on the other, a strong belief that what are thought to be infrastructure investments have “unique” and ostensibly attractive financial characteristics (in terms of risk and reward).

Reference to infrastructure in terms of *alternative investments* simply seems to portray infrastructure investments in relationship to what they

are not in terms of the investment vehicle. That is, they are among those investments which are not publicly traded equities or bonds. The same is true with respect to inclusion in the narrow *private markets* or *private equity* grouping.

The incorporation of infrastructure among so-called *real* assets is curious because in certain respects it appears simply to push back and complicate the problem of definition further: namely what are real assets? On one view the category can be associated with “real returns,” that is, investment returns adjusted for inflation. On another, they may be thought of as “tangible assets.” In the latter sense real assets are said to “include land, property, equipment, raw materials, infrastructure, intellectual property, and real options.” (Insofar as being “tangible” is a touchstone for this definition, it is not evident how tangible intellectual property and real options are.) The counterpart to a real asset in finance is a financial asset, which is an ownership claim on real assets.<sup>13</sup> For example, while CalPERS includes just real estate, forest land, and infrastructure in a real assets class for purposes of its investment policy, the phrase is not defined by that policy. However, the strategic objectives for its program are, not surprisingly, specified in financial terms in close relation to real returns, namely “to provide long horizon income return that is less sensitive to inflation risk” and a particular real return related goal.<sup>14</sup> In this respect CalSTRS shares similar goals with its “inflation sensitive class.” It is said to be

To be sure, funds are likely, in the instance, to be drawn to infrastructure spurred by financial concerns. However, the exercise that follows for them ultimately implicates critical matters of provision. That is, it is deeply rooted in what infrastructure provides to or for people, arguably that which is quite important to them and the means by or through which the effort at provision succeeds. Both, in turn, bear considerably upon what funds choose to take on and what they achieve as investor owners or lenders committed to keeping pension promises.

one which strives for a “relatively stable return stream, with a return level between equities and fixed income and an overall higher correlation to inflation than equity or fixed income” with an “initial portfolio will be comprised global inflation linked bonds/securities and infrastructure investments.”<sup>15</sup> By contrast, the fund referred to in the preceding paragraph appears to identify real assets in terms of their being “tangible.”

**Infrastructure investment warranting different or special consideration:** Another group of questions sought respondents’ views as to whether the kinds of products or services associated with infrastructure and their impacts and/or the financial characteristics of infrastructure investments were dissimilar enough from those identified with other than infrastructure to warrant different or special consideration, and, if so, why. In certain respects these questions were a way to explore in another way how those surveyed thought of infrastructure and infrastructure investments. The answers were striking. More than a majority of those who replied found no warrant for different consideration. Another respondent acknowledged that the impacts might be different, but said that it did not affect decision-making. A few others alluded broadly to attention to the use of sustainable development methods and operational practices and environmental sustainability though with little indication as to their distinctive relation to infrastructure as compared to other kinds of investments. However, one respondent referred

to factors which required “special evaluation” in a way which seemed to focus on their bearing on ultimate financial outcomes.<sup>16</sup> By contrast, only one of those who replied made (general) references to looking to return in other than as financial return, that is, the impact on (domestic) jobs, and the “public good.”

**Investments made:** Last, there were several questions pertaining to whether and when respondents’ funds had actually made investments, what those investments were, and what the financial outcomes were to date. For all but on one of the funds, investments had been relatively recent and modest in amount. Not surprisingly, then, there was little said about the track record of those investments. The small amount of information afforded no meaningful opportunity to assess whether the investments actually made by individual funds were in fact aligned with respondents’ perceptions about the putative financial characteristics of infrastructure investments or the strategic objectives with respect to infrastructure investments they attributed to their funds.

Although the survey was of modest reach, our sense from popular, trade, and other literature, reports by U.S. public sector pension funds about their experience, and what we have otherwise learned directly from fund trustees and staff, is that the results are consistent with the ways in which they think about infrastructure. In certain respects the findings are encouraging and impressive. They represent a serious effort to navigate in what are

for them relatively uncharted waters. They reflect the ways in which infrastructure has been spoken of, ranging from the concrete and specific roles it plays in society expressed in everyday words, to the rewards it offers and risks it poses framed in the language of investment. It is within that context that funds have strived to locate infrastructure as an investment within their portfolios and sought to situate their decisions in relation to their fund’s objectives. In other respects, though, the findings pose a challenge and, in turn, warrant the need to go back to basics. By that we mean the following: To be sure, funds are likely, in the instance, to be drawn to infrastructure spurred by financial concerns. However, the exercise that follows for them ultimately implicates critical matters of provision. That is, it is deeply rooted in what infrastructure provides to or for people, arguably that which is quite important to them and the means by or through which the effort at provision succeeds. Both, in turn, bear considerably upon what funds choose to take on and what they achieve as investor owners or lenders committed to keeping pension promises.

With that task in mind, in the following section we propose a brief and a more elaborated definition of infrastructure and seek to justify the choice with that goal and those considerations in mind.

We propose two definitions, a shorter and a longer, more detailed one.

**Definition – Short**

Facilities, structures, equipment, or similar physical assets – and the enterprises that employ them – that are vitally important, if not absolutely essential, to people having the capabilities to thrive as individuals and participate in social, economic, political, civic or communal, household or familial, and other roles in ways critical to their own well-being and that of their society, and the material and other conditions which enable them to exercise those capabilities to the fullest.

**Definition – Long**

Facilities, structures, networks, systems, plant, property, equipment, or physical assets – and the enterprises that employ them – that are vitally important, if not absolutely essential, to people having the capabilities to thrive as individuals and participate in social, economic, political civic or communal, household or familial and other roles – for example, as a citizen, worker, friend, neighbor, family or household member, or customer or consumer – in ways critical to their own well-being and that of their society, and the material and other conditions which enable them to exercise those capabilities to the fullest. Whether people can so thrive and participate depends, among other things, on:

- Their ability to travel from one geographic place to another.

- Their ability to communicate or share information with others in person or at a distance.
- Their ability to move physical objects from one place to another.
- Their ability to establish, operate, and expand enterprises that make physical objects or provide services whether for sale or for use; and perhaps as well to do so more efficiently and/or at lower costs.
- Their ability to engage in familial or household, social, communal or civic, or religious activities, some of which may be critical for social cohesion and stability.
- Their ready access to sufficient potable water.
- Their ready access to sufficient nourishing food.
- Their ready access to shelter which is safe, comfortable, and conducive to the activities which occur within it.
- Their ready access to means by which their health can be preserved and improved.
- Their ready access to means by which to enjoy their presence in the physical environment.
- Their ready access to means to be kept safe from harm from the physical environment – whether caused by human or other hazardous or toxic wastes, pollution from human activities, the effects of process operating within the natural environment, or otherwise.
- Their ready access to means by which to increase their knowledge, competencies, abilities, skills, or experience needed to more fully participate in the social or economic life of the society.
- Their ready access to means by which they can be kept safe from violence, disorder, or depredation by others to their persons or possessions – whether within or from without their society.
- Their ready access to sources of energy sufficient to engage in or benefit from any of the foregoing activities.

There are several reasons for our choice of these definitions.

First, we squarely place the focus on people because the production of goods and services of whatever kind is ostensibly to meet people's needs. Whatever the modalities for such production and the financial or other circumstances under which that production takes place, if the result does not meet those needs, then broadly speaking it is a failure. Of course, there are needs of different kinds (as well as diverse wants perhaps more loosely connected to needs). It seems clear that central to the topic of infrastructure investment are the very important, if not absolutely essential, needs of people which "infrastructure" is associated with meeting.

Second, we believe that needs have to be understood on both an individual and a collective basis. Obviously, people have physical needs which must be satisfied to survive in a very basic individual sense; they have other needs which, if met, can enable them to develop and exercise a wide range of capabilities to live fuller, richer lives – "thrive" – on an individual basis but equally so to play

roles in diverse spheres of collective activity, writ small or large, within their society. Those spheres may well differ in nature and importance but the social, economic, political, civic or communal, and household or familial spheres are illustrative and typical of most if not all societies with which we would be concerned. In all events, the vitality of a society is contingent upon individuals within it having the capabilities of fulfilling the roles which are part and parcel of activities within those spheres.

Third, and related, while it might be possible to frame all needs in purely individual terms it is probably more useful to distinguish between ones that are more a matter of satisfaction on an essentially solely individual basis and others that are addressed in a shared or collective context. It is in the latter sense that we refer to the material and other conditions which enable people to exercise their capabilities. For example, a water treatment plant enables individual access to potable water for consumption on an individual basis. A highway of course affords individuals a person means of movement but it is part of a network of transportation links which enable the interconnection of people/bind people together on a collective basis.

Fourth, the historical origins of and playing out of definitions and our brief characterization of what may have stirred interest in infrastructure investment, facilities, structures, equipment, or similar physical assets – particularly ones of great scale in a material sense and in terms of the economic resources required to create them – have

[W]e think it is a mistake to focus exclusively on the physical assets themselves. Rather, in the definitions we refer to the enterprises to which those physical assets are central in the actual meeting of the kinds of needs delineated.

loomed large both literally and figuratively. We have suggested that in some measure this outcome is the consequence of their creation being essential to the means by which universal or high unto universal needs which are extremely important can be fully and effectively met.

Fifth, the definitions are informed by the notion that the concern at its core is for people being able to thrive with their society as it is and as they might make it to be. They are also grounded in the premise that realization of that possibility rests on people having the capabilities – and the means or conditions for exercising them – that are critical to their individual well being and that of their larger society. Certainly, what enables people to gain those capabilities and exercise of them would entail a lengthy, perhaps complex, and likely contested discussion. For the purposes of this paper we start from the modest idea that among the array of things are certain “physical assets” – which are “vitaly important, if not absolutely essential” in that regard. We do so alert to the fact that while in some not inconsiderable measure what capabilities – or what means or conditions for exercising them – are required might well be common to many societies, there could be great differences within and across societies in both space and time. To be sure, among the list (in the longer definition) of things upon which people’s ability to thrive rests, access to sufficient potable water cuts across all societies whereas certain means for transport or for communication might

be less important or perhaps not even pertinent depending upon the context. The definitions are crafted to allow for this wide range of possibilities even though the kinds of infrastructure for which there would be interest in making investments are might be of a sort identified with relatively “advanced” economies.

Sixth, even though it is quite easy – perhaps almost “natural” – and typical to do so, we think it is a mistake to focus exclusively on the physical assets themselves. Rather, in the definitions we refer to the enterprises to which those physical assets are central in the actual meeting of the kinds of needs delineated. (Typically if not almost certainly those assets are of a large scale in a physical sense and have been created at the cost of considerable economic resources.) By enterprise we do not necessarily mean businesses in their conventional sense. Rather we refer more generally to organized undertakings of diverse sorts which have the goal of producing goods and services of innumerable kinds. They may be for profit or not, they be “private” or “public” or something in-between, the needs to be met might have a more social, or economic, or political, or other character or not, etc.

The critical point of the reference to enterprise is that from both a general perspective and the narrower, though important vantage point of investment, the concern is with the endeavors by or through which particular needs are met. In all events whatever the centrality of the physical

assets to the enterprise, it is the enterprise’s success in provision which is key. By that we mean success both in terms of provision literally as well as with respect to financial outcomes from an investment perspective. That success depends on how well the enterprise functions. And that, in turn, is based on a host of considerations internal as well as external to the enterprise. These connections arise because, of necessity, the infrastructure-associated enterprise involves and affects people on an individual basis as well as a collective one – in the form of families or households, other enterprises, social, political, civic or communal organizations, or government. In many respects those involvements and effects are intimately bound up with the chain of factors detailed in the next section which link at one end, provision by means of a particular kind of infrastructure and at the other, the financial performance of investments in enterprises engaged in such provision. Moreover, because of the potentially wide-ranging implications of these connections, they must of necessity be attended to not only in financial terms but also arguably in normative ones as well. We discuss these associations and their outcomes at greater length below.

**PART 4** | LINKS WHICH CONNECT A DEFINITION OF INFRASTRUCTURE TO A DECISION TO INVEST IN INFRASTRUCTURE

From a practical perspective, any potential investment in an enterprise and its calculus of financial risk and reward are ultimately linked through a chain of factors or considerations to the particular goods and services that are produced and the means for doing so. Here, of course, the special focus of our attention is on infrastructure-related goods and services.

Among the factors or considerations are ones related to (1) the nature of those goods and services; (2) the current and projected need for them; (3) the current or envisioned modes for their provision (involving material, machines, technology, etc.); (4) the possible economic arrangements by which such product or service would or might be supplied; (5) the amenability of any mode of production to those arrangements; (6) the sources and mechanisms for allocating resources to production; (7) the costs identified with production that are borne by recipients of provision; (8) the ability of recipients to bear those costs on their own terms as well as in relation to the costs of benefiting from other forms of provision; (9) the costs borne by others on their own terms and in relation to costs of other kinds of provision they may choose or be required to bear; (10) the claims for recompense or more by those who allocate resources to production; (11) and externalities associated with provision and by whom, to what extent, and in what manner those externalities are borne.

Investments may be grouped based on their shared characteristics according to the different

factors or considerations in the chain and at different levels of generality along it. For example, if one focuses first on modalities for investment one can organize them based on whether they are publicly traded shares in corporations. Then one can consider subgroups such as publicly traded shares of corporations which are engaged in the provision of what in the first instance might be characterized as infrastructure understood in terms of the needs for goods or services that might be met. However, one can alternatively first consider provision of what are thought to be different kinds of infrastructure in terms of the needs for goods or services that might be met. Then one can specify subgroups of different ways to invest in those enterprises, that is, public traded shares, partnership interests, debt, etc.

However, because of the interrelationships among the factors or considerations it may not be easy or even possible to sharply distinguish between or among them. Hence the groupings may reflect a combination of factors (or an interpenetration of categories, so-to-say). The kind of conventional or everyday (in a broad sense) understandings about infrastructure to which we refer above very likely reflect such a combination or interpenetration. So as intimated before, laypersons' or even investors' initial thinking about the subject might well entail terming something to be infrastructure in light of the role it plays in meeting a particular (important) need, the scale at which it operates, whether it has been publicly provided or not, etc. Such understandings are useful but may

From a practical perspective, any potential investment in an enterprise and its calculus of financial risk and reward are ultimately linked through a chain of factors or considerations to the particular goods and services that are produced and the means for doing so.

not be entirely helpful or may even be confusing in assessing potential investments in infrastructure. We have seen in our review of the survey responses how the answers to the questions about financial characteristics reflect such interpenetration.

In the text which follows we detail a series of major links which connect what is understood to be infrastructure with outcomes identified with investment in infrastructure. At one end of the chain is a definition (or characterization) of infrastructure grounded in certain kinds of needs which are thought vital to meet, a definition such as the one we propose.

**Individual Instances/suggestive or illustrative examples**

As noted above, typical discussions about infrastructure focus in the first instance not on individuals and the important needs of theirs to be met but rather on certain kinds of facilities, structures, etc., which as a matter of experience – often popular or everyday experience – are associated with the satisfaction of those needs. In many respects this result is not surprising. The latter are physical rather than abstract in nature. They are distinctive or specific, not broad or diffuse or vague. The facilities or structures are typically large and dramatic in appearance, perhaps even imposing. They are likely to already be in place and thus familiarly present in people's lives; or if not in place, readily envisioned to be so. Their current or projected presence is or will seem to be enduring. They garner great attention because of the typically vast

commitments of materials, labor, and economic resources required to create them.

**Categories based on broad-gauge societal impact**

One intermediate step in effect builds upon, adapts, or organizes individual examples according to an articulation of the broad gauge impact or functional role that infrastructure associated enterprises of a certain kind are projected or thought to have. For example, some are concerned with allocative efficiency through the direct reduction of enterprises' production and transaction costs. That could take a variety of forms ranging from the provision of new or less costly sources of energy, or means for the delivery of materials for production or distribution of finished products, to ways by which to communicate or exchange information within the enterprise or with those who supply it or those who benefit from that which the enterprise produces. Yet another outcome or function concerns the indirect impact on allocative efficiency through better or superior framework conditions for productive activity, often associated with "public goods."<sup>17</sup> Among them could be facilities, structures, and perhaps equipment used in connection with national defense or the maintenance of safety and order, the provision of general public services, and environmental protection. A fourth might pertain to social welfare, sometimes identified with redistribution, and social protection, housing, and recreation. A fifth might have a direct or an indirect impact on social cohesion ranging from courts to community

The economic, social, environmental, or other footprint of the enterprise, especially if it is a large, geographically concentrated one, might have potentially significant impacts on people and the communities in which they live or work. If so, those potentially affected might insist on a greater, dominant, or exclusive governmental role.

meeting facilities and libraries broadly understood to be certain kinds of structured public spaces. A sixth could be the indirect or long term effect of facilitating the maintenance or accumulation of human capital viewed broadly, ranging from the public schools, colleges and universities, technical training institutes, and the like. Here the effects are of a more individual nature. Whether and how an enterprise might be seen to fall within or straddle one of these categories is likely to have a bearing – in some cases, a significant one – on whether it is seen as infrastructure in the first instance. Beyond that its placement might well color judgments as to its importance, the legitimate or feasible ways by which provision is thought proper or best to be organized, the financial and other terms according to which it is operated, and correspondingly, the possibilities for and attributes of investment.<sup>18</sup>

#### **The economic basis for provision**

Here, the focus is typically on factors or considerations that bear upon the amenability of the infrastructure enterprise to some form of market-based provision. At one extreme government could be the sole supplier and provide the product or service on other than the basis of price to the user or consumer. At the other, there could be a competitive market in which only private enterprises participate with government playing a very limited regulatory role with regard to the extent, quality, and price of provision.

It seems that the more important the need which an enterprise is thought to help meet the

more likely that government would play a significant role in satisfying it. The role might be that much greater if there are high barriers to entry because of the large scale/high capital costs of the infrastructure enterprise or because there are potentially large economies of scale in provision. There might be a similar effect as a result of there being limited or no competitive or substitute means by which the needs served by this particular kind of infrastructure enterprise can be met. For want of a better phrase we refer to these factors or considerations which come into play primarily by virtue of the good or service and the material conditions for its provisions as “endogenous constraints on competition or markets”

The phrasing is meant to distinguish it from “exogenous constraints on competition or markets.” By that we largely refer to such limits as government places on whatever market-based provision might otherwise be conceivable given the nature of the particular infrastructure enterprise.<sup>19</sup> That is, government could require some form of monopoly provision, whether by itself or a private enterprise, retain ownership of the enterprise but grant a concession for provision by one or just a few private enterprises, etc. Alternatively it might allow for competition solely among private providers but heavily regulate it. At any given time the decisions in this regard will be colored by the history of involvement of government and private parties in infrastructure-related enterprises of the kind in question. That is, relevant parties will strive

to legitimate or justify the decision in terms of the similarity of the arrangements to those claimed to be historically typical (as described above). In addition, the concerns of those who are not users or consumers of the product or service as such may come into play. The economic, social, environmental, or other footprint of the enterprise, especially if it is a large, geographically concentrated one, might have potentially significant impacts on people and the communities in which they live or work. If so, those potentially affected might insist on a greater, dominant, or exclusive governmental role, perhaps on the premise that government might more readily be held accountable for interruptions in supply or failure to avert harmful secondary impacts than private enterprises.

#### **Demand, Prices, and Payment**

The factors here have two interrelated aspects. One concerns the extent to which those who are the users/consumers of the infrastructure-related products or services directly bear the cost of it as provided to them. The other pertains to who ultimately in some measure bears the cost of enjoyment by others of the benefit of that which infrastructure affords.

The precise allocation between the two is in part driven by several kinds of considerations, key ones of which resonate with the terms of our definition. In particular, they include beliefs or perceptions as to how important access to a good or service is to the minimum requirements for individuals’ well-being and to the quality of life

they might enjoy beyond that. These beliefs or perceptions inform judgments about how individuals’ socio-economic status bears on their access to the good or service, especially when access is conditioned on some payment by them for it. There are, of course, fears about wasteful consumption if the good or service is not priced in sufficient measure to individual consumers, worries about moral hazard insofar as individuals are not sufficiently encouraged or required to provide for themselves, etc. Also implicated are views as to the legitimacy of and necessity for the larger society shouldering the costs of meeting such needs, though this position is typically expressed in terms of government policy, government as such bearing the burden, etc. In that sense, positions as to the extent to which the burden might be borne in that way may well be in tension with stances taken on the necessary limits on government finances in general and the relative priority of meeting competing demands on government, some perhaps equally a vital, in particular.

In certain respects the tension depends upon what in some measure might be the overlapping and conflicting beliefs of different “publics” – of users of the goods or services, of the citizenry as a whole, and of particular segments of the society, whether as individuals or organized as enterprises, civic associations, etc. – each with distinctive interests apart from those relating to the good or service. So, for example, provision through a health care facility of a basic diet of food or immunizations

[The tension among the need for, the pricing, and the forms of payment] depends upon what in some measure might be the overlapping and conflicting beliefs of different “publics” – of users of the goods or services, of the citizenry as a whole, and of particular segments of the society, whether as individuals or organized as enterprises, civic associations, etc. – each with distinctive interests apart from those relating to the good or service.

might be thought to be so important that it should be supported entirely from government revenues. By contrast urban mass transit might be priced to users in a way which affords broad but not entirely free access. By contrast with the latter, the need for potable water might be believed to require relatively greater ease of – if not an absolute right of – access, communication by telephone less so, energy from electricity power sources even less so, and means of transport by air, likely not at all.<sup>20</sup>

Insofar as the ultimate user or consumer does not pay the full cost of the good or service, questions remain as to the government's role in determining who nominally and who ultimately bears the cost. For example it can set the price at less than the full cost or even zero regardless of who the user or consumer is and pay the difference to the infrastructure enterprise. It can prescribe a lower than full cost price, the precise amount of which varies according to the user's or consumer's socio-economic status (where practicable). The subsidy could be given at any level of consumption or use by an individual, up to a specific amount, or perhaps graduated according to the extent of it. The subsidy would be nominally governmental in that the monies come directly from government coffers. However, who ultimately bears the expense of the subsidy depends upon where the monies drawn from government coffers originate. The expenditures might be made without regard to how the revenues come into such coffers. Or there could be a direct link to specific sources.

For example, monies could, as in the United States, be collected from a tax on the cost of motor vehicle fuel. In that case, the government would take in money from those who travel by motor vehicle on roads other than the ones for which the use of which is subsidized.

Clearly, then, an ostensible general commitment to the meeting of infrastructure-related needs requires specific judgments as to the terms under which individuals might in reality enjoy access. As discussed in greater detail below, the calculus according to which an infrastructure-related enterprise is financed will be shaped by those judgments. This is because they are very likely to bear heavily on the nature and extent of the flow of revenues required to sustain the enterprise. In turn, they greatly influence possible modes of investment in the enterprise and the prospects for financial reward from it. Moreover, how those judgments are reached – and how enduring they are – will reflect the ways in which the tensions referred to above have been resolved. For example, over time the prospect of changes in pricing to the user or consumer or absent that, adjustments to the level of any government subsidy (or whoever ultimately pays for it) may re-ignite tensions, inflame existing ones, or drive them to a breaking point in ways that threaten the enterprise or the terms under which it operates. Arguably, insofar as the nature of the enterprise and other factors result in the choice of monopoly provision and/or heavily regulated provision, the occasion for such

scenarios might well be greater. In all events, how those tensions are resolved are of considerable significance to assessments of the risk of investing in the enterprise. Depending upon the scenario it might be associated with what some refer to as political, legal, or perhaps even contractual risk.

#### **Supply and Enterprise Ownership and Organization**

In this and the following sub-section the focus is on the intertwined factors and considerations which bear upon first, who owns the enterprise and the organizational and operational means by which the enterprise supplies the good or service and second, how the enterprise is financed. They are intertwined because the ability and willingness of relevant parties to take on a financial stake in the enterprise is tied to such ownership rights and interests as they might have and the financial and other terms under which they assume such role as they might have in the actual supply of the good or service.

The precise roles which might be played will vary according to the nature of the need being met and the particular technical and other means by which the product or service is provided. Among the roles which are often the subject of consideration are ones which involve planning or designing the enterprise (if it is a new one), building it, and managing, operating, or maintaining it in whole or part. It is important here to distinguish ownership, perhaps as a formal matter, from one or another of these operational roles. Given the extreme

importance of that which certain infrastructure related enterprises supply, concern about the potentially dire consequences of a lack of supply provides an impetus for government retaining ownership rights and the typical associated powers of ultimate control. For example, the government's ability to act quickly under such circumstances by taking over roles that a private entity has been assigned might well afford the requisite comfort or confidence.

In all events, whether the government or a private entity assumes such roles depends upon factors noted in the previous sections as well as other ones. For example, if satisfying a particular need is vitally important, so then confidence in the enterprise's ongoing ability to supply it might warrant a dominant or exclusive role by government simply because such arrangements might be seen as ultimately more stable or enduring than most any private enterprise. Such worry about a threat to provision is heightened if other factors point toward it being on a monopolistic rather than a competitive basis. This is true especially if a large and sustained commitment of economic resources is required in that connection. Of course the sheer fact of government having played that role as an historical matter bears upon the judgment.

However, these kinds of considerations are generally not dispositive. Clearly there are perceptions or beliefs as to how able private enterprises are to efficiently and effectively serve in one or more of those roles as compared to government.

The precise roles which might be played [by the public and private sector] will vary according to the nature of the need being met and the particular technical and other means by which the product or service is provided.

In many respects this might be thought to be a purely empirical question the answer to which would be found in a body of evidence of comparative performance. In reality, such comparisons are difficult and fraught with problems. Moreover, lurking behind assertions about efficiency and effectiveness are the means by which they are achieved. That is, ultimately the efficiency and effectiveness of the enterprise as a whole (or an organization which plays a role in relation to the enterprise) in meeting a need – and how it is achieved – rests on the people who constitute it. Certainly, judgments as to the appropriateness of private and governmental roles with regard to a particular infrastructure related enterprise rest on how actions by and relations among the people who constitute it are linked to notions of efficiency and effectiveness. (By use of the word “constitute” we primarily mean those who are employed by the enterprise though it might extend to others who serve it on a contract basis, supply it with key goods or services, etc.) For example, the tasks and the terms according to which they are to be fulfilled depend upon the character of the relationships of such people to the enterprise, the nature of their work within or with respect to it, the conditions under which they do their work, and the rewards they gain from it.

Similar concerns might apply with respect to others who are affected by the enterprise insofar as it displaces or affects the quality of life – whether in a social, environmental, or other sense – of

inhabitants of the community in which it is located and perhaps abutting or even more distant communities. This is would be true at least insofar as it is thought that in playing a particular role, the government or a private entity might be less likely to cause the harms, be responsive to impacted communities, ameliorate problems caused in a more timely and comprehensive way, etc.

The choice of ownership structure and assignment of roles is, of course, likely to be tied to how the enterprise is financed, particularly insofar as fulfillment of the role is bound up with one or another mechanism for finance. For example, in cases in which the private role is solely in operations and maintenance there may be little place for the private participation in finance. Similarly, where the entity’s responsibilities include designing and building facilities, structures, etc., they might be financed by government and with government retaining ownership and ultimate management control of the enterprise. However, the arrangements could involve a role for the private entity in finance. Arguably it might be solely private finance or government could provide a direct infusion of funds, lend money to the entity, perhaps at lower than market rates, provide tax subsidies such as treating interest as a deductible business expense or not tax interest income to lenders, guarantee loans by others to the enterprise, or make an in-kind contribution (such as land).

In all events, the willingness and degree to which the entity puts its money – in the form of

equity or debt – at risk is tied, among other things, to the character and extent of the revenue stream from which it can, first cover its debt service and operating costs and second, return projected profits. That stream could be based on an agreed upon schedule of user fees – presumably set in light of the entity’s expectations as to the extent of use – with government payments based on use, on availability for use, etc. By contrast, In the case of turnkey operations, a private entity might design and build a facility, finance all or just some of the expense, and recoup its costs and earn a profit by an agreed upon transfer of the enterprise to the government after completion.

We will not here canvas the large number of possible variations along these lines. Suffice it to say that the possible calculus which informs expectations about the financial risks and rewards associated with the private entity’s role in the enterprise will not only reflect its ability to raise equity and debt capital for the enterprise, and the terms for doing so but also bear the imprint of the kinds of factors and considerations noted above. For example, the perceived importance of the need to be met will spur (or not) such agreement as is needed from government to allow the enterprise to be established in the first place. Given finite government revenues, government’s willingness to allocate them to the enterprise on the supply side or on the demand side – and how – will depend on judgments as to the relative importance of this particular need in relation to others and on whom

the costs nominally and ultimately fall. Decisions about the application of revenues on the demand side may be more visible than on the supply side in that they directly relate to the ability of those who benefit from the good or service provided to gain access to it.

The preceding discussion has focused on particular infrastructure-related enterprises which meet specific needs and how they might be financed in light of expectations on the part of private entities as to the risks and rewards of the respective financial and/or operational roles they and government would play in provision. Such discussion is closely, perhaps even very directly, related to how pension funds might see investment in infrastructure. In the first instance, their view of such investment – as described in our analysis of the results of our survey – is shaped in fundamental ways by what their funds’ strategic objectives are. (We discuss what these might be below.) Next is how apposite those objectives are with what might be expected from the particular means by which funds might make an investment.

For example, at one extreme a (presumably experienced and well resourced) pension fund might in effect be the private entity which could play an ostensibly direct role with respect to an infrastructure-related enterprise. We say ostensibly because as a practical matter the fund, not having the relevant expertise in-house, would no doubt contract for a wide range of the management and other services it requires effectively to fulfill the

Clearly there are perceptions or beliefs as to how able private enterprises are to efficiently and effectively serve in one or more of those roles as compared to government. In many respects this might be thought to be a purely empirical question the answer to which would be found in a body of evidence of comparative performance. In reality, such comparisons are difficult and fraught with problems.

role it has assumed. In that case its assessment of the risks and rewards of making the financial investment which is a concomitant of that role will entail its evaluation of the factors and considerations discussed above.

At the other extreme, the fund might be many steps removed from direct involvement. On the equity side of the equation it might purchase publicly traded shares in a company whose business it is to play a role in perhaps a numerous and changing array of infrastructure related enterprises. In that case the fund is far distant from any actual role in relation to any of those enterprises. The calculus of risk and reward for it as a shareholder derives, among other things, from the anticipated risk and reward of the individual enterprises, how well the company chooses which enterprises in which it is involved, the terms on which it does so, the risks and rewards associated with those enterprises in light of that role, how it manages overall the array of businesses, and its judgments of the market value for the company's shares. On the debt side it might purchase a bond issued by the enterprise. In that case the fund has essential no role at all in its operation except insofar as the terms for lending bear upon it in the future. The risk and reward of the investment in a financial sense are defined by the terms of the bond subject to the expectation of interest and principal being paid in a timely and full fashion. An estimate of that prospect, of course, depends upon an assessment of factors and considerations of the kind discussed above.

In between these two extremes are a potentially wide variety of vehicles for investment in infrastructure-related enterprises. For example, there are limited partnerships in private equity fund-like vehicles, with the general partner playing whatever direct role it has as a concomitant of the investment it has made in the enterprises in the portfolio it assembles and manages. Here the pension fund will be concerned with whether or not the risks and rewards of investing through this partnership are apposite with its strategic objectives. It would do so with an understanding that the character of those risks and rewards are determined not only by those of the particular enterprises in the partnership's portfolio but also by the following: the quality of the judgments of the general partner in choosing to invest monies and effectively fulfill certain roles with respect those enterprises, its ability to manage the ensemble of those investments and roles, the fees and other costs that are paid to the general partner for doing so, and the various ways one or another aspect of the principal-agent relationship between limited pension fund partners and the general partner play out. (If they play out badly the consequences can be costly and perhaps even devastating.) Unless the partnership focuses on a relatively narrow and homogeneous category of enterprises in terms of the infrastructure related product or service being provided and the geographic area where it is supplied (and correspondingly the economic, political, social, etc. environment in which

this occurs), the profile of risk and reward of the limited partnership will likely look quite different from that of any of the individual enterprises in the portfolio. More generally, of course, the financial outcomes for any particular vehicle through which a pension fund invests are rooted, among other things, the vehicle manager's criteria for crafting the portfolio, its particular choices of enterprises to include in it, the attributes of the ones it selects, the manager's role with respect to the operation of those enterprises, and its ongoing oversight of the portfolio.

#### Strategic Objectives

As noted above, possible pension fund investments in infrastructure must be in accord with the fund's investment policy and advance the strategic objectives which inform that policy. Discourse about which strategic objectives investments in infrastructure might help to achieve includes reference to several or even many of the following (which were included in the survey reviewed earlier in this paper):

- a. To preserve capital
- b. Yield returns that are stable and high enough in relation to the fund benchmark return
- c. Yield returns that are the result more from appreciation in the assets than cash returns, through operational improvements, best management techniques and practices, or otherwise
- d. Yield returns that are sufficient on a risk-adjusted basis

- e. Yield a long-term, high-quality, stable income stream, and generate appreciation at least commensurate with inflation
- f. Provide investment returns which include a substantial cash distribution component
- g. Provide yields that are not only stable but also predictable cash flows
- h. Yield respectable rates of return with low risk
- i. Yield high-quality, long-term, stable income streams
- j. Reduce the overall portfolio's volatility
- k. Maintain a low correlation to other asset classes
- l. Promote the fund's standing as an investor who takes legitimate account of stakeholder interests, such as those of members of the communities served and affected by the infrastructure and workers who build or operate it
- m. Provide downside protection to the investment fund during equity bear markets
- n. Afford long-term inflation protection
- o. Contribute to portfolio diversification
- p. Hedge against long term liabilities
- q. Establish the fund's reputation as premier infrastructure investment manager and investors of choice within the investment community
- r. Embody the practice of responsible investment, that is, efficient operation of the asset, the delivery of quality services, utilization of responsible labor, environmental, etc., practices
- s. Foster the renewal and expansion of infrastructure assets

[T]he array of objectives thought to be achievable by means of infrastructure investment is fairly broad.

- t. Offer transactions are of significant economic scale and magnitude, allowing an outlay of a sizable amount of capital
- u. Perform well during economic downturns

It is worth taking note of certain characteristics of these goals.

First, the array of objectives thought to be achievable by means of infrastructure investment is fairly broad. There are probably several reasons for this breadth. In some measure it simply reflects uncertainty as to what is understood to be that infrastructure which is an object of investment. It may be so because a potentially wide variety of such objectives might be thought to fall under the same rubric but be associated with an ability to advance diverse goals. In certain respects it mirrors the variety of outcomes some promoters of infrastructure investment have asserted might be achieved. To some degree it simply is a consequence of vagueness about what are the putative financial attributes of even relatively narrow categories of infrastructure investment. To be sure, this is likely to be in part an artifact of the lack of data in scope and quality as to outcomes of such investments. But as suggested by the text above, the multiplicity of links which connect such categories ultimately to the characteristics of what are typically seen as of most importance to pension funds and the array of factors and considerations which constitute the ties at each stage of connection, make for a potentially wide range of characteristics being identified with that category.

Second, not surprisingly, among the objectives are some which might be thought to be advanced by other kinds of investments. It is unremarkable because the range of features is rather large so that there are likely non-infrastructure related investments which might well be thought to evidence some of them.

Third, some objectives overlap with one another. In part this is because some goals are almost synonymous with others and in part, because some might well appear to be achieved in tandem with others, that is if one is present, the other is likely to be as well.

Fourth, in certain respects, some goals conflict with others. This is in part because the aims place a different emphasis on aspects of reward and dimensions of risk. Insofar as there are connections between reward and risk, then the ability to achieve one objective necessarily implies a lesser ability to attain another.

Fifth, while a good many purposes are cast in terms of financial outcomes some appear to relate to other sorts of results or consequences. The inclusion of these other kinds of outcomes has its origin in the different points of intersection between what is thought to be the pension fund's overarching mission with one or more of the stages which link the needs which are met by infrastructure-related enterprises to the ostensible financial outcomes of an investment in a particular kind of such enterprise. The large number of financial characteristics in the list of strategic objectives

quite plausibly and legitimately is indicative of the central task of pension funds of investing in ways suitably calculated to ensure that pension payment promises are kept. As such, the focus is intensely (and for some perhaps exclusively) on the very end of the chain, the financial characteristics of an investment in a particular infrastructure-related enterprise. (As noted, in practice, the focus may well be on the financial characteristics of investment by means of a particular investment vehicle. That vehicle has financial characteristics rooted in those of the infrastructure-related enterprises with respect to which it makes investments.)

However, other objectives (such as l, q, r, and s) manifest awareness that pension fund investments are a potential subject of intense scrutiny by plan members and in many cases by the larger public as well. Of course, that close attention may be spurred by the financial outcomes of investment decisions (especially large, adverse ones). But there is also a recognition – indeed, a growing one – among pension funds (and other institutional investors) that serious inquiry may or even must be made not only into the financial attributes of the enterprises in which they invest, but also into how well they succeed in the production of goods and services as such and the nature and quality of the relationships they maintain with those who have a direct stake in the enterprise or are otherwise affected by it. In part this is simply a matter – though a very critical matter – of the fund's reputation in a general sense in the eyes of its members and

that larger community and hence its “license to do business.”

In addition, though, major failures in those other spheres will in specific instances hardly go unnoticed for at least two kinds of reasons. The shortcomings will in the end almost certainly have negative financial consequences as the result of misjudgments about and/or realization of risks associated with one or another of the linked stages to which we have referred. But behind the descriptive language for each cast in terms of risk lie the needs, concerns, and aspirations of those who have that direct stake in or who experience an impact from the infrastructure-related enterprise. Of course, the immediate object of criticism will be the enterprise as such. But the greater and potentially more visible a pension fund's role as an investor in relation to the enterprise the more likely it might become an object of disapproval or even censure as well.

Moreover, in making decisions calculated to ensure keeping pension extending far into the future, requires funds to have clearly in mind what the state of world will be and how that should shape its decisions over the long term. Stakeholders in and those impacted by the enterprises that are the objects of investment are likely to vigorously articulate what are apt to be strongly held views about the how enterprise acts in response to their needs, concerns, and aspirations. Those demonstrations of disappointment, dismay, anger, and the like may be manifest openly. They may be expressed

[W]e believe and hope that the definition we propose, the modes of thinking about infrastructure so defined, and the interrelated aspects of the process for deciding upon investment in enterprises associated with provision of infrastructure so understood will prove valuable to what funds choose do. We say hopeful because a necessary if not sufficient condition for prudent decisions . . . is being fully alert to all the implications of what those decisions entail.

silently through a holding back of purchases of products and services, concerted action within the enterprise, or organized efforts in the civic or even in the public sphere (leading to legislative or regulatory action). In a number of these cases those expressions are signals of the occurrence of important and perhaps even fundamental changes in the world as people experience and understand or anticipate them. As such they may offer critical insights into the world of the future to which pension funds as long term investors must be alert and for which they must plan.

How, precisely, any particular pension fund takes account of these considerations will be a matter of judgments made in light of an ongoing debate about a fund's proper role and responsibilities. In the first instance they concern plan members' interest in receiving promised benefits. But however important those benefits are to plan members they have other interests – some quite important ones – which extend beyond those critical benefits. Moreover, as should be implicit from the preceding narrative, most likely any pension fund investment in most any form of provision has potentially serious import not only for the interests of the immediate recipients of provision but also for those engaged in the enterprise and affected by it. In some cases that import may readily be evident and have consequences only in the distant future. But insofar as judgments are made in relation to what is understood to be infrastructure, if the definitions we offer above are of merit they suggest that infrastructure is

a matter of provision of extraordinary importance. Of necessity then, it may well require especially informed and thoughtful judgments about whether and how a fund makes an investment decision with respect to infrastructure.

We think there is warrant for our narrative of the series of connections which link provision associated with the infrastructure ultimately to financial decisions about investment in enterprises engaged in provision. If so, then even the seemingly more straightforward task of reaching a conclusion based on a credible and perhaps even convincing pure calculus of financial risk and reward requires careful examination and serious reflection. But at least such an exercise has a familiar feel. Rather more challenging is whether and how the calculus of decision needs to be different, perhaps broader or richer in character.<sup>21</sup> We do not here offer a prescription for what any given fund should do. The debate to which we refer may be serious but confined to largely traditional discourse, confronting established views about how financial markets function in general, the ways in which certain ones operate in particular, and the actions of pension funds within and on those markets. However, the arguments to which we refer extend further to contested claims about whether decisions need to be informed by certain norms or values whether embodied on understandings of fiduciary duty or otherwise and if so, in what ways. For example, should or must funds follow the dictum to strive to “do no harm” or go further and act to create or

cause some good or benefit? This poses disputed questions as to whether regardless of such norms or values, account has to be taken of those harms and benefits because over the nearer or longer term they may imperil what pension funds need and hope to achieve, or because the larger society, sooner or later, may simply not tolerate the ways funds' decisions may implicate them in having caused those harms or having failed to produce that good.

We do not here take on the task of offering a prescription for the decisions which any particular pension fund might make in light of that debate. As a practical matter what any given fund chooses to do will be determined by the terms of its own plan, the expectations and perhaps even the demands of members, and what the fund understands its place to be within the larger community which mandates and/or sanctions its very existence and the standards that community sets for the fund's conduct. However, we believe and hope that the definition we propose, the modes of thinking about infrastructure so defined, and the interrelated aspects of the process for deciding upon investment in enterprises associated with provision of infrastructure so understood will prove valuable to what funds choose do. We say hopeful because a necessary if not sufficient condition for prudent decisions – in the sense of decisions with foresight and judgment – is being fully alert to all the implications of what those decisions entail.

That being said, we offer in Appendix B a series of related questions which funds might address in their decisions about whether to invest in infrastructure and if so, how. Seeking answers to these questions might spur alertness to the factors and considerations we have discussed at some length above. In turn, that may serve as a useful tool for funds' thinking comprehensively and cogently on the subject. We note that the focus of the schematic process is essentially on relevant substantive criteria. But decision-making is about not only such criteria but also the institutions and processes by which judgments are made. That is, investors need to consider first how attending to certain issues is embedded in their own processes for decision-making and second, whether and how stakeholders and others affected by the enterprise are engaged or otherwise brought into that process.<sup>22</sup> Indeed, this position is arguably true both for the individuals in whose names or on whose behalf investments are made (to keep pension promises) and for those whose needs are met by the enterprises in which those investments are made and how those enterprises act in meeting that need.<sup>23</sup>

# APPENDIX A



# APPENDIX A

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## **Definitions of infrastructure posed in survey:**

Facilities, structures, networks, systems, plant, property, equipment, or assets that

- a. are essential to driving sustainable economic development and growth, lifting levels of productivity and boosting employment and critical to encouraging business innovation and improving the global competitiveness of enterprises
- b. provide services and support that are basic to the functioning of a community, organization, or society and crucial to its economic productivity
- c. are key to managing population growth and meeting current and future environmental challenges.
- d. provide a platform for economic development, social cohesion and stability.
- e. provide primary services which are crucial to the success of economic development in society in that their absence or their less than optimal performance would severely hamper its productivity and growth.
- f. provide social services and support private sector economic activity.
- g. are capital intensive/have high fixed costs and long economic lives and have strong links to economic development, and a tradition of public sector involvement.
- h. form the underpinnings of a nation's defense, a strong economy, and its health and safety

- i. facilitate the building up and maintenance of the stock of human capital, for example, health and education
- j. create the framework conditions for productive activity, public good: defense, general public goods or services, environment, and order and safety or have direct impact by reducing enterprises' production and transaction costs
- k. are the basic physical and organizational capacities and resources needed for the operation of a society or enterprise or are necessary for an economy to function
- l. facilitate the production of goods and services and the distribution of finished products to markets

## **Specific examples of infrastructure posed in survey**

- a. Transportation-related systems, such as tunnels and bridge, road systems, intercity and metro rail systems, railway rolling stock, airports, seaports, terminals, and barges; traffic control facilities; parking garages or metered parking
- b. Communications systems or networks, such as TV/telephone transmitters, satellites, cable or broadband networks; wire or wireless phone towers; fiber optic or copper cable
- c. Energy facilities, such as energy storage facilities for natural gas and oil, facilities for power, i.e., hydrocarbon, gas, geothermal, wind-generated, water-generated, and nuclear energy, transmission and distribution; renewable/clean energy projects

- d. Educational facilities, such as schools, colleges, or universities, or libraries
- e. Environmental-related facilities, such as for hazardous or toxic waste storage and disposal
- f. Public buildings,
- g. Water-related facilities, such as for storage, purification/treatment, and distribution; waste water collection, desalinization
- h. Water control-related facilities, such as dams and levees
- i. Solid waste collection and disposal facilities
- j. Post offices
- k. Recreational facilities, such as parks, bike or running pathways, stadiums, lotteries, casinos, lotteries
- l. Health facilities, such as hospitals and health care centers
- m. Public safety facilities, such as police and fire and military stations
- n. Public safety-related facilities such as prisons/correctional institutions or facilities
- o. Housing, such as military, student, and low-income/"public" housing

## **Financial characteristics of infrastructure posed in survey:**

- a. Relatively illiquid, because large amounts of capital are required at irregular intervals for these projects, the indivisibility of these projects, and the absence of an effective secondary market for them.

- b. Require large investments, because infrastructure is generally capital intensive, with projects in their nature being because the facilities or structures built and operated, such as transportation, energy, communication, and social services, are large scale.
- c. Higher levels of debt/leverage than non-infrastructure projects, because infrastructure cash-flows are more certain than for other projects, with the result that sponsors of infrastructure projects are willing to accept more debt and providers of capital are willing to issue higher levels of debt for infrastructure.
- d. Relatively hard to value, because of the complexity of documentation, financing, and technical details, the uncertainty of economic and financial conditions over the long-term, and the absence of a market price.
- e. Investments are likely to be held for a longer period than for non-infrastructure assets, because non-infrastructure projects have a more established secondary market and can be sold and exchanged more readily.
- f. Higher risk and more uncertain financial performance, because project success is dependent on multiple assured sources of capital, guarantees, and/or subsidies.
- g. More possibility of financial performance problems with a project, because infrastructure is long-term and there is greater likelihood of adverse events occurring.
- h. Yields income which is stable and predictable over the long-term, because income is frequently inflation-linked, regulated, and protected by government guarantees.
- i. Offers capital growth which is attractive, because the contracted revenue and costs applied to infrastructure projects usually provide enhanced valuations over the long-term.
- j. Returns with a low correlation with other assets, because infrastructure returns are frequently independent of economic conditions such as inflation and changes in GDP.
- k. Returns that are lower than for infrastructure investment but still acceptable and also less volatile, because revenues are usually regulated and inflation-linked.
- l. Risk-return profiles which differ according to whether the infrastructure asset is new (greenfield) or existing (brownfield), because risk is usually higher during the construction phase of infrastructure projects than the operating phase.

NOTE: There was an error in the phrasing of choice “k” so even though many respondents appear to have understood its intent results for responses were not tabulated.

# APPENDIX B



## APPENDIX B

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### Questions pension funds need to address in making decisions about investments in infrastructure at the enterprise level

Ultimately, pension funds are about making the best decisions not only in light of their most immediate task of keeping pension promises but also in view of the roles they must or choose to take on as investor owners of and/or lenders to enterprises in pursuit of that goal. Those roles also require thoughtful decisions in other terms because, of necessity, they are closely linked not only to *whether* those enterprises succeed in the provision of that which is important in people's lives but also to *how* they succeed in doing so.

We offer below what might be termed a series of suggestive and in some measure stylized questions that are important to making those decisions. They are suggestive because we do not presume to have the definitive answers to all the questions which the main text poses for thinking about what infrastructure "is" and how precisely that should inform what might be done. They are stylized because the particular process will depend on how any individual fund views its responsibilities to plan members and others.

A decision-making process for a pension fund considering investment in what might be deemed to be an infrastructure-related enterprise can be formulated in a way guided by the chain of linked sets of factors and considerations detailed above.<sup>24</sup>

That process could be described in the following terms:

1. What need for the infrastructure-related good or service does the enterprise which is the ultimate object of investment ostensibly meet or satisfy?
2. How important is meeting that need to the people who would benefit from its provision by the enterprise?
3. How is the nature of that need understood in broad societal terms by elected officials and other governmental policy makers? By others who might have a significant interest arising from provision to meet it? How important is to them that it be met and in what ways?
4. What is the nature and size of the population that currently has a need for this particular good or service? How might that population and its need in that regard change in the future?
5. Is provision of the good or service individual or collective? That is, does each individual receive or get the benefit of his or her own good or service or do many individuals get access to or the benefit of the same good or service? (This is arguably just a different way of referring to whether the benefit takes the form of a public good in that enjoying the benefit of the good or service by one individual does not reduce availability of it for consumption by others. Whether it is non-excludible as well is another issue. The former is likely to bear on questions of scale in a physical and financial sense. A highway would be large scale with the possibility of being able to bar access to it. By contrast, the benefit (in terms of quality) of a new or improved large scale water purification works would be available to all (who otherwise had access to the water supply). The clean air benefit of a wind-farm in the place of a dirty coal fired plant would go to all who lived in the vicinity; access to the energy supplied would be a different story.)
6. What is the physical footprint of the enterprise that provides or is envisioned to provide the good or service? At that scale what are the actual or projected demands or impacts on the enterprise in full operation on the natural environment? On communities in proximity to the enterprise?
7. What is the footprint of the enterprise in terms of the resources – material, financial, and otherwise – which must be amassed, organized and applied to establish the enterprise? Insofar as that is translated into a cost to establish the enterprise, what is it?
8. What are the ongoing resources required for the ongoing operation of the enterprise? Insofar as they are translated into the ongoing cost of it operation, what is the cost?
9. What is the total cost of provision at different levels of operation of the enterprise?
10. How might the cost change with time whether by virtue of the expense of finance, supplies, labor, ongoing maintenance and repair, etc.?

11. In light of the need for the good or service and other considerations,
- Will it be provided for free or will those who benefit from provision bear some or all of the costs of such provision?
  - If those who benefit will bear some of the cost, how much of it and how?
  - Insofar as some or all of the cost of provision will be borne by those who benefit, how will demand for it change with the cost borne in that way and other considerations (such as the cost and necessity of other goods and services, substitutes, if any, for the particular good or service, etc.)?
12. By reason of its scale and cost or other reasons, by reason of law or otherwise, is this good or service being provided by or will this good or service be provided by a single enterprise or more than one. If the latter, how many? On what permissible or mandatory terms?
13. What are the precise roles of the government and the private sector in relation to the enterprise? For example, what are their role(s) in
- Owning it?
  - Building it?
  - Operating it?
  - Maintaining it?
  - Regulating it?
  - Financing it?
  - Bearing the costs of provision that might otherwise be borne by those who benefit?
  - Otherwise?

14. To what extent does the enterprise as it operates or as it is to be built and operated have a direct and potentially negative economic, social, environmental, or other adverse impact on those with a direct or other stake in the enterprise such as
- Those who ostensibly are the object of provision of the product or service?
  - Those who work in the enterprise which produces the product or service?
  - Those who are suppliers to the enterprise?
  - Those who live or work near the enterprise?
  - Those who do or might provide a competing or substitute product or service?
15. Insofar as the government assumes some or all of the cost of establishing the enterprise or the costs that otherwise might be borne by those who are the object of provision of the good or service, who, by virtue of that government role, ultimately bear the cost?
16. To what extent must or might the enterprise be required to “internalize” any of the negative impacts referred to above?
17. Insofar as the enterprise is or may be required to internalize such negative impacts what are the consequences, financial or otherwise, for the establishment or operation of the enterprise?

Note that the degree to which the enterprise must or can elect to internalize such impacts will depend upon at least two things. One is whether as a matter of law it is obliged or permitted to do so. Another is whether by virtue of the identity of the investor in the enterprise it must or might do so. The identity of the investor refers to situations in which the decision maker acts on behalf of others who are the ultimate source of the monies for investment and who ultimately enjoy the financial rewards and bear the financial risks of the decisions. These situations are two-fold: first, while beneficiaries might benefit in a financial sense, as workers in or suppliers to the enterprise, as residents in the community of the enterprise, etc., they would suffer harms from establishment or operation of the enterprise. Second, those who are not beneficiaries, in any of the same roles or circumstances, suffer the harm.

# ENDNOTES

<sup>1</sup> Here we use the word “enterprise” for the most part in the broad sense articulated by the (online) Oxford dictionary definition of an enterprise, which refers to it as a “project or undertaking, especially a bold or complex one” and as a word having its origin in “late Middle English: from Old French, ‘something undertaken’.” <http://oxforddictionaries.com/definition/enterprise> (Accessed April 2, 2012). That is, infrastructure is associated with a project or undertaking which entails the creation or construction of certain physical structures, facilities, etc. in connection with commencing and operating an ongoing endeavor to provide particular important products and services. As suggested in the foregoing text, such an endeavor is typically of large scale and complex. As such, the definition is largely neutral or indifferent to the particular organizational form the endeavor might take, whether for profit or not, where involving solely governmental action or one or another mix of roles for private and governmental action, the particular forms of each form of action, for example, action by an arm of government, an semi-autonomous agency created by government, a corporation, partnership, etc.

<sup>2</sup> “Infrastructure: Etymology and Import,” by H. William Batt, *Journal of Professional Issues in Engineering Education and Practice*, Volume 110, Issue 1, January 1984, p. 2. See also *NATO: the First Five Years 1949-1954* by Lord Ismay, NATO, November, 1954 (“The word ‘infrastructure’ comes from France, where it has long been used to denote all the work that is necessary before a railway track can be laid, such as embankments, bridges, tunnels, etc.”) <http://www.nato.int/archives/1st5years/chapters/10.htm> (Accessed on February 20, 2012).

<sup>3</sup> See the following current definition of the word infrastructure in French:

1. ensemble des travaux nécessaires pour créer la plate-forme d'une voie de chemin de fer ou d'une route
2. ensemble des installations nécessaires au fonctionnement d'un service de transport
3. ensemble des équipements économiques et techniques d'une société
4. ce qui sous-tend quelque chose de visible

<http://dictionary.reverso.net/french-definition/infrastructure> (Accessed February 17, 2012).

<sup>4</sup> [http://www.answers.com/topic/infrastructure#History\\_of\\_the\\_term](http://www.answers.com/topic/infrastructure#History_of_the_term) (Accessed: February 20, 2012).

<sup>5</sup> See Batt, supra, at p. 2 referring to the chapter on “NATO common Infrastructure” in *NATO: The First Five Years 1949-1954*.

A recent definition of infrastructure by the U.S. military is as follows: “All building and permanent installations necessary for the support, redeployment, and military forces operations (e.g., barracks, headquarters, airfields, communications, facilities, stores, port installations, and maintenance stations). *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02, Joint Chiefs of Staff, The Pentagon, Washington, DC, April 12, 2001 (As Amended Through August 31, 2005).

<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA439918&Location=U2&doc=GetTRDoc.pdf> (Accessed February 17, 2012).

<sup>6</sup> “Infrastructure: Etymology and Import,” by H. William Batt, *Journal of Professional Issues in Engineering Education and Practice*, Volume 110, Issue 1, January 1984, p. 2.

<sup>7</sup> Id. at 3-4.

<sup>8</sup> Id. at 4.

<sup>9</sup> For example in a U.S. government supported study on what was referred to as “public works infrastructure,” the authors asserted that

“[a] comprehension of infrastructure spans not only these public works facilities, but also the operating procedures, management practices, and development policies that interact together with societal demand and the physical world to facilitate the transport of people and goods, provision of water for drinking and a variety of other uses, safe disposal of society’s waste products, provision of energy where it is needed, and transmission of information within and between communities.”

*Infrastructure for the 21st Century: Framework for a Research Agenda*, The National Academy of Sciences, 1987. Note 1, p. 4. ([http://www.nap.edu/catalog.php?record\\_id=798#toc](http://www.nap.edu/catalog.php?record_id=798#toc) (Accessed February 21, 2012).

According to an even more expansive approach to infrastructure note that although “[p]eople commonly envision infrastructure as a system of substrates – railroad lines, pipes and plumbing, electrical power plants, and

wires. It is by definition invisible, part of the background for other kinds of work” it “is a fundamentally relational concept, becoming real infrastructure in relation to organized practices” and goes on to define in terms of variety of properties including the following among others): “embeddedness,” that is, “[i]nfrastructure is sunk into and inside of other structures, social arrangements, and technologies”; “transparency,” that is, “[i]nfrastructure is transparent to use, in the sense that it does not have to be reinvented each time or assembled for each task, but invisibly supports those tasks”; and “links with conventions of practice,” that is, “[i]nfrastructure both shapes and is shaped by the conventions of a community of practice.” “The Ethnography of Infrastructure,” by Susan Leigh Star, *American Behavioral Scientists*, Vol. 3, No. 3, November/December 1999, pp. 377-391, at 380-381. <http://abs.sagepub.com/content/43/3/377.full.pdf+html> (Accessed February 21, 2012).

Also, one recent dictionary entry offers one more narrow, traditional definition and another more general and expansive one: “The basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons” and “An underlying base or foundation especially for an organization or system,” respectively. In its discussion of usage it adds:

Perhaps because of the word’s technical sound, people now use *infrastructure* to refer to any substructure or underlying system. Big corporations are said to have their own financial infrastructure of smaller businesses, for example, and political organizations to have their infrastructure of groups, committees, and admirers. The latter sense may have originated during the Vietnam War in the use of the word by military intelligence officers, whose task it was to delineate the structure of the enemy’s shadowy organizations.

*The American Heritage® Dictionary of the English Language*, Fourth Edition, Houghton Mifflin Company, Updated in 2009. <http://education.yahoo.com/reference/dictionary/entry/infrastructure> (Accessed February 21, 2012).

<sup>10</sup> The first category includes toll roads, bridges, tunnels, parking facilities, railroads, rapid transit links, airports, refueling facilities, seaports. The second encompasses

electricity generation and transmission, gas and water distribution, sewage treatment, broadcast and wireless towers, telecommunication, cable networks, and satellite networks. The third covers courthouses, hospitals, schools, correctional facilities, stadiums, and subsidized housing.

<sup>11</sup> For example, some projects derive revenues from user-based fees linked to benefits provided and costs incurred. In other cases, tax revenues or subsidies may be part of the mix.

<sup>12</sup> “The definition of infrastructure is being applied to a broader range of assets, many with a tenuous link, such as airports and German service stations.” “Infrastructure at Crossroads,” by Ian Fraser, *Financial News Online*, May 14, 2008. Available at <http://www.ianfraser.org/infrastructure-at-crossroads/> (Accessed July 20, 2012). “The original concept of infrastructure investment meant investment in individual projects – such as roads, bridges, and tunnels – that have clear sources of revenue.” That has been broadened to public private partnerships – schools, prisons and hospitals – and latterly into quoted companies that are not involved in single projects or even baskets of projects. My worry is that it has become just a buzzword, a convenient catch-all.” Id. (quoting Nicola Ralston, director of consulting firm Liability Solutions, Ltd.) See also “The Next Asset Bubble,” by Kit R. Roane, *Portfolio.com*, February 4, 2008. Available at <http://upstart.bizjournals.com/news-markets/national-news/portfolio/2008/02/04/Infrastructure-Investment-Bubble.html> (Accessed July 20, 2012)

(noting the “flood” of new infrastructure funds and “new ideas [that] involve less-traditional assets like lotteries, gas stations, and old folks homes”)

<sup>13</sup> “REAL ASSETS IN INSTITUTIONAL PORTFOLIOS: THE ROLE OF COMMODITIES,” *ALTERNATIVE INVESTMENT ANALYTICS LLC*, December 10, 2007, p. 5. <http://www.bache.com/media/managed/RealAssetsInInstitutionalPortfolios.pdf> (Accessed March 19, 2012).

<sup>14</sup> “CALIFORNIA PUBLIC EMPLOYEES’ RETIREMENT SYSTEM STATEMENT OF INVESTMENT POLICY FOR REAL ASSETS,” August 15, 2011, p. 1. <http://www.calpers.ca.gov/eip-docs/investments/policies/inv-asset-classes/real-estate/real-assets-full-policy.pdf> (Accessed March 19, 2012).

- <sup>15</sup> “Teachers’ Retirement Board Policy Manual,” CalSTRS, (Updated February 2012), p. A-15. <http://www.calstrs.com/about%20calstrs/Teachers%20Retirement%20Board/BoardPolicyManual.pdf> (Accessed March 19, 2012). Here commodities appear to be located in a distinct, “innovative Policy Portfolio.” akin to the opportunity/opportunistic categories referred to in the main text. Id. at O-2.
- <sup>16</sup> That respondent stated that “environmental/climate impact, local job creation, cultural legal; differences, reputational risk, political risk, and the long-term nature of the transaction requires special evaluation.”
- <sup>17</sup> That is, goods – sometimes referred to as non-excludible goods – which are of such a nature that affording access to them to any individual necessarily entails providing access to any other individual.
- <sup>18</sup> This discussion is informed by “Composition of government investment in Europe: Some forensic Evidence,” by Juan Gonzalez Alegre, Andreas Kappeler, Atanas Kolev, and Timo Väilä in “Infrastructure investment, growth and cohesion Public investment: Composition, growth effects and fiscal constraints,” European Investment Bank Papers Volume 13. No. 1, 2008, pp. 26-27. [http://www.eib.org/attachments/efs/eibpapers/eibpapers\\_2008\\_v13\\_n01\\_en.pdf](http://www.eib.org/attachments/efs/eibpapers/eibpapers_2008_v13_n01_en.pdf) (Accessed March 23, 2012).
- <sup>19</sup> Despite the distinction this is not to ignore the reality that markets themselves are enabled and constituted by various forms of social action, including by government (through law and other means). And, of course, even where market-based provision might seem both feasible and appropriate, certain market participants might find it in their interest to limit or skew competition.
- <sup>20</sup> With regard water as a human right, see “More Than a Resource: Water, Business, and Human Right,” Institute for Human Rights and Business, August 2011. [http://www.ihrb.org/pdf/More\\_than\\_a\\_resource\\_Water\\_business\\_and\\_human\\_rights.pdf](http://www.ihrb.org/pdf/More_than_a_resource_Water_business_and_human_rights.pdf) (Accessed July 19, 2012).
- <sup>21</sup> Two major and important initiatives provide examples of investors taking on these issues, though efforts which reflect the challenge they face in specifying the precise rationale for the approaches being taken.
- One, the Equator Principles (EP) are standards voluntarily adopted by Equator Principles Financial Institutions (EPFIs) commit to not providing loans to projects where

the borrower will not or is unable to comply with their respective social and environmental policies and procedures that implement the EPs.

At the outset these principles are described as

*a credit risk management framework for determining, assessing and managing environmental and social risk in project finance transactions...* The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

“About the Equator Principles” (bold italics added) <http://www.equator-principles.com/index.php/about-ep/about>. (Accessed April 15, 2012)(bold italics added). By contrast the 2006 preamble to the Equator Principle states that they have been adopted

*in order to ensure that the projects we finance are developed in a manner that is socially responsible and reflect sound environmental management practices.* By doing so, negative impacts on project-affected ecosystems and communities should be avoided where possible, and if these impacts are unavoidable, they should be reduced, mitigated and/or compensated for appropriately. We believe that adoption of and adherence to these Principles offers significant benefits to ourselves, our borrowers and local stakeholders through our borrowers’ engagement with locally affected communities. We therefore recognise that our role as financiers affords us *opportunities to promote responsible environmental stewardship and socially responsible development.*

“The Equator Principles, June 2006,” Equator Principles. <http://www.equator-principles.com/resources/equator-principles.pdf> (Accessed April 15, 2012)(bold italics added).

The other, the Principles for Responsible Investment, is a broader voluntary endeavor by investors informed by the view that *environmental, social and corporate governance (ESG) issues can affect the performance of investment portfolios and therefore must be given appropriate consideration by investors if they are to fulfill their fiduciary (or equivalent) duty*” and offers “a voluntary framework by which all investors can incorporate ESG issues into their decision-making and ownership practices and so better align their objectives with those of society at large.”

“About Us,” Principles for Responsible Investment (bold italics added) <http://www.unpri.org/about/> (Accessed April 15, 2012) (bold italics added).

The same sentiments are reflected in the opening paragraph of the Principles:

As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that *environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios* (to varying degrees across companies, sectors, regions, asset classes and through time). *We also recognise that applying these Principles may better align investors with broader objectives of society.*”

“The Principles for Responsible Investment,” Principles for Responsible Investment,” <http://www.unpri.org/principles/> (Accessed April 15, 2012)(bold italics added).

In other words, for both, the principles are broadly speaking a means of risk management, in the service of better investment decision-making from a financial perspective but with (1) a recognition that decisions so made might be thought to be “responsible” in that it reflects awareness of and takes account of the import of those decisions for other than investors and (2) an acknowledgment that it does not necessarily imply that such decisions are fully aligned with larger social objectives.

- <sup>22</sup> For example, the standards of the International Finance Corporation which inform the practices of those who commit to abide by the Equator Principles, stresses the “importance of ...effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.” “Performance Standards on Environmental and Social Sustainability,” International Finance Corporation, January 1, 2012, p. i. [http://www1.ifc.org/wps/wcm/connect/115482804a0255db96fbfd1a5d13d27/PS\\_English\\_2012\\_Full-Documents.pdf?MOD=AJPERES](http://www1.ifc.org/wps/wcm/connect/115482804a0255db96fbfd1a5d13d27/PS_English_2012_Full-Documents.pdf?MOD=AJPERES) (Accessed April 15, 2012). A similar theme is clear in the related but very different context of investments with regard to manufacturing supply chain issues which has received a great deal of attention. See “Key Performance Indicator for Investors to Assess Labor & Human Rights Risks Faced by Global Corporations in Supply chains: Stage 1 Report,” The Fair Labor Association and The Pensions and Capital Stewardship Project, School, Labor and Worklife Program,

Harvard Law School, January 2012. (describing key performance indicator that “[Supplier] Company Affiliate establishes and maintains relationships with labor non-governmental organizations, trade unions and other civil society institutions”). <http://www.law.harvard.edu/programs/lwp/pensions/publications/FINAL%20Summary%20Report%20Dec%202011.pdf> (Accessed April 15, 2012). See also “In China, Human Costs Are Built Into an iPad,” by Charles Duhigg and David Barboza, *The New York Times*, January 25, 2012. <http://www.nytimes.com/2012/01/26/business/ieconomy-apples-ipad-and-the-human-costs-for-workers-in-china.html?pagewanted=all> (Accessed April 16, 2012)

- <sup>23</sup> Precisely how to attend to both matters is hardly clear or without controversy. With respect to the latter and pension funds it concerns in part the importance of plan member representation in the governing structure and/or consultation with members. (The matter of consultation is discussed at some length in “From Fiduciary Duties to Fiduciary Relationships for Socially Responsible Investing: Responding to the Will of Beneficiaries” by Benjamin J. Richardson, *Journal of Sustainable Finance & Investment*, Vol. 1, No. 1, pp. 5-19. <http://docserver.ingentaconnect.com/deliver/connect/earthscan/20430795/v1n1/s2.pdf?expires=1334591169&id=68319092&titleid=75007106&acname=Harvard+University&checksum=CBE85F5ED8A142141D1E947551AB228> (Accessed April 15, 2012)
- <sup>24</sup> Note, here we almost exclusively focus on decision-making at the enterprise level, that is, with respect to any particular infrastructure-related enterprise. As the main text emphasizes, there are a host of additional considerations at the level of any investment vehicle through or by which a pension fund might make an investment, a vehicle which might entail investment with respect to a multiplicity of infrastructure-related enterprises.

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