



Topic Insights

What Are the Best Infrastructure Investments to Make? Is It Based on Economics, or Resilience, or Both?



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Our infrastructure investment decisions matter enormously if infrastructure is to be long lived, so how can we select infrastructure investments that are optimum? How do we determine what would be the best investments to make?

Projects are generally selected on economic grounds, but they should also be meeting “other criteria” including the ability of the infrastructure to restore, regenerate and increase social, cultural, natural and economic capital.

This “other criteria” is the focus of work being undertaken by the Infrastructure Sustainability Council of Australia (ISCA), who in 2018 will launch version 2.0 of the IS Rating Scheme (ISv2.0), which provides a basis for planning of infrastructure—not only how it rates from a sustainability point of view, but also provides input into how we should best plan, design and operate this piece of infrastructure.

It is widely agreed that infrastructure (such as transport, water, energy, and communications) underpins our ability to live in cities and our quality of life. There is a known and stated need for investments in infrastructure and as we sit in the Age of the Anthropocene (a new geological age defined by the global scale of humanity's impact on the Earth)—which places new requirements on our infrastructure—never has it been more pertinent that our infrastructure investment decisions matter enormously if infrastructure is to be long lived.

An unfortunate reality across the globe is that infrastructure delivery often becomes a hostage to political agendas and therefore there are some questions that can and should be asked about whether the infrastructure we select is optimum.

However, how do we know if an investment is optimum? How can we select infrastructure investments that are optimum? How do we determine what would be the best investments to make? There is some understanding in Australia that we should be basing investment decisions on economic grounds (that is, does project A deliver better benefit in terms of cost than project B), however this may not be the best way to choose between certain projects. There may be other goals or other criteria that we are seeking to achieve with our investments. It could be that a larger number of smaller projects would be preferable to one or two very expensive projects.

Therefore, we should ask: What are the “other criteria” that these projects should be meeting? More than half of the world's people live in cities, and have just one planet's worth of material

resources to share around. This necessitates that we must define a new set of expectations and performance criteria for infrastructure investments. Rather than settling for doing “less bad,” such as less environmental destruction or social disruption, we must aim from the outset to do more good. This net-positive approach requires us to restore, regenerate, and increase social, cultural, natural, and economic capital.

A good example is Bishan Park on the Kallang River in Singapore. Formerly a channelled stormwater drain, this collaboration between the national parks and public utility agencies has recreated significant habitat while providing flood protection and an exceptional recreational space. All this has been achieved in an extremely dense city.

Looking into the future, in transport, a net-positive motorway might prioritise active transport and make public transport central by design. It might send price signals based on the number of passengers, vehicle type (such as autonomous or electric), and vehicle ownership (shared, for instance). A core part of the switch to net-positive infrastructure is the realisation that resilience and robustness are different things. Historically, robustness has been central to infrastructure planning. However, robustness relies on assuming that the future is more or less predictable. In the Anthropocene, that assumption no longer holds.

Building in resilience: Infrastructure must be at its core flexible and adaptable. This could include, for example, phasing infrastructure investment and development over time. Current analysis is biased toward building big projects because we assume our projected demand is correct. Therefore, we expect to reduce the overall cost by building the big project now. However, in a more uncertain future, investing incrementally reduces risk and builds resilience, while spreading the cost and impact over time. This approach allows us to monitor and amend our planning as appropriate. It has been shown to save water utilities in Melbourne as much as A\$2 billion.

Aligning with the idea of flexibility and adaptability, net-positive—or infrastructure that restores, regenerates, and increases social, cultural, natural, and economic capital—is work being undertaken by ISCA, who will launch ISv2.0 in 2018. This augmented rating scheme provides a basis for planning of infrastructure—the basis for determining not only how it rates from a sustainability point of view, but also to provide input into how we should best plan, design, and operate this piece of infrastructure, moving back up the

planning and design decision tree. As part of ISv2.0 development, a planning rating is being investigated, which will focus on the decision-making processes applied by infrastructure proponents to reward projects that are the result of robust appraisals.

Regulatory reform is another key part of what is required to enable public and private investment in better outcomes. In the United States, we are seeing strides in the right direction, with their government driven by the National Mitigation Investment Strategy. Major disasters and extreme weather events continue to test the nation's ability to adapt and recover. Many organisations have accepted the challenge to make communities and critical infrastructure less susceptible to these hazards, however they all have differing approaches, funding sources, mandates, and requirements for investing in efforts to mitigate disaster risk. The National Mitigation Investment Strategy aims to support the alignment of pre- and post-disaster mitigation investments. It could ultimately help the US Federal Government enhance national resilience for future disasters, by increasing

the effectiveness of investments in reducing disaster losses and increasing resilience. It could also provide strategic planning considerations for the US Federal Government, as well as the state, local, tribal, and territorial entities and the private sector in making resource allocation decisions.

This approach—a coordinated one—is vital in the selection of infrastructure investments that are optimum. Understanding the nexus which exists between “sustainable infrastructure” and “infrastructure sustainability” could then be utilised as the framework to identify more of the “right” projects in which to invest. Infrastructure sustainability frameworks enable more effective and efficient planning, design, and delivery because so many of the key issues are inherently identified throughout the process.

Systematic deployment of ISCA's infrastructure sustainability rating scheme in asset planning and—in parallel—across the management of current assets can result in cities, policy makers, planners, and operators quickly understanding what a smart, resilient, and healthy city might look like.