

# Understanding Public Infrastructure

## Time to get Back to Basics

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### **Introduction**

Investment in infrastructure has been seen by politicians as a way of creating jobs and boosting the economy. More recently views have been expressed that Australia's economic performance is suffering as a result of infrastructure bottlenecks, particularly in relation to our ports and transport and that the private sector is often a more efficient provider of much of our physical infrastructure. It is argued that these views reflect a limited and superficial understanding of the role of public infrastructure and the way Australians should invest in it in the future. This short paper provides a brief review of public infrastructure – to a large extent from a transport perspective, and presents a case for a change in the way we think about it – the way it is valued, used, designed and provided. It is argued that there is a compelling need to get back to basic principles and apply them to infrastructure for a world in which people's needs are rapidly changing.

### **Background – Some Basic Principles and Trends**

Public infrastructure should underpin every civil society and support a wide range of services that are highly valued by the broader community. Infrastructure consists broadly of two types. The first includes 'hard' or physical elements (such as roads, railway lines, dams, power stations and distribution networks, buildings and so on). This supports much of the 'soft' or social infrastructure and services that are highly valued by business and the broader community (water, power, sewerage/drainage etc provided by utilities and a wide range of community services such as education, public health, public transport, environmental protection, police and so on). Much of the discussion on infrastructure tends to be about physical infrastructure but its value generally lies not in the infrastructure itself but in the quality of services it supports, and the social infrastructure that uses it - which is also the area where most of the jobs from infrastructure investment are generated.

Viewed from an economic perspective, physical infrastructure tends to be a cost generator (to supply, maintain and manage) whilst services provided by it generally (but not always) and the social infrastructure it supports are the principle source of benefits. It follows that maximum returns on community investment are provided by minimising the cost of physical infrastructure itself, maximising its utilisation in terms of efficient, effective and appropriate use and minimizing inappropriate use and its associated costs. Basic principles and procedures for assessment/evaluation of physical infrastructure are similar in some respects to those used for conventional investment. It has to provide a satisfactory return on investment. The share holders in this case are the broader community and there is a need to take into account a wide range of social needs and any social and environmental costs (as well as economic) associated with the infrastructure

proposal and the way it is used. This requirement adds to the complexity of the analysis process (typically referred to as triple bottom line) and is made more difficult because many of the social and environmental costs and benefits are difficult to assess in financial terms.

The cost of providing and managing physical infrastructure is often high so it is important that it be provided as cost effectively as possible and reflect the ability of the community to pay for it. In the past the cost of providing the infrastructure has generally been paid by community taxes or borrowings levied by government ie on the basis that the infrastructure is an asset that is owned and used by the broader community rather than individual people or businesses. In some cases special charges are levied and paid by people/business etc that benefit directly from the investment. Net benefits will depend on the nature of the infrastructure, its fitness for purpose, its scale, the way it is designed, constructed and managed and the kind of behaviour it promotes. There will invariably be numerous ways in which infrastructure can be designed and it should be standard procedure to assess a number of alternatives before proceeding with a preferred option. These options should be compared to a base case which is usually to do nothing ie maintain business as usual. In many cases the 'do nothing' option (to maintain the existing and use it more efficiently and/or reduce inappropriate use) will be the best option.

Over provision of infrastructure often results in overuse and inappropriate use, particularly if usage is inappropriately priced. Over engineered streets for example tend to promote faster travel, and more car travel at the expense of walking, cycling and public transport. This in turn increases accidents and pollution, degrades property values and so on. It also reduces the value of the streets for other purposes, which are often highly valued by local communities, such as passive recreation and reduces the livability of the area. The converse may also apply. Narrow, low cost pavements in the Bell Bird area in Blackburn create an environment that encourages low speed car travel, encourages walking and cycling and has improved the livability and attractiveness of the area. These are streets for people not just cars and are highly valued by the community. This is reflected in property values but has been achieved by spending considerably less on infrastructure than the conventional suburban street.

The same rationale can be made for some unsealed roads in semi rural areas. The cost of upgrading unsealed streets to a normal engineering residential standard in a residential estate beside the Great Ocean Road was estimated to cost (on an annual basis) more than twenty times the cost of maintaining the existing streets at an acceptable standard. It was a proposal that would have destroyed much of the rural beauty of the area, disrupted the local community and degraded land values.

Both of these examples reinforce the argument that expenditure in infrastructure is not necessarily sound investment. It depends on the circumstances but it is argued that optimal returns on community investment are often achieved by infrastructure that is small scale, low cost, low risk, and provide early benefits. This principle extends beyond roads. It can be applied broadly to all kinds of physical infrastructure.

Despite this governments at all levels continue to promote large scale, high risk monumental heavily engineered utility projects (transport, water, water etc) and see it as an opportunity to create new jobs. Such projects require long lead times and in some cases cause disruption and cost to the broader community during the construction stage - typical of many 'lemons' in the past.

Many members of the engineering professional and business community like this type of infrastructure and are good at promoting it with government. It often provides opportunities to win contracts for many of the professional services they provide to plan, design and build (often to their own standards), or even maintain and manage the infrastructure often with minimal understanding of the broader community interests and needs and without any responsibility for the broader social/community or environmental outcomes generated by the infrastructure itself. Super funds and investors also like this kind of investment because it often provides opportunities for making considerable profits from user pay charges that are levied from infrastructure in monopoly or near monopoly conditions such as toll roads.

Privatisation of public services and supporting infrastructure has complicated the investment process. These agencies operate with a narrower, commercial focus than the organisations they grew out of. Infrastructure today is often viewed as a means of increasing profits or dividends to private sector organisations, typically large corporations, many of them multinational corporations that now operate/manage them and to others that provide services to provide more infrastructure ie for design and construction, maintenance, and financing. This is not new. Large multinational corporations have been promoting this kind of development for decades, often convincing poor countries to accept huge development loans for grand, over engineered and overpriced infrastructure projects on the basis of unrealistic expectations that such development would lift them out of poverty. The overwhelming outcome has been significantly unrealized benefits, large and unsustainable debt with dire economic social, political consequences.

The overcommitment in railway infrastructure – when the Bendigo line was constructed to the best of British standards – to a standard that Victoria could not afford and nearly bankrupted the state. These standards could not be maintained – other rail lines had to be constructed far more economically – at a price that could be justified and afforded by the State.

The creation of profit centres encourages the sale of more services or resources (such as power or water) rather than less (conservation of water/energy etc) and justifies more infrastructure investment to achieve this goal. In the process broader organisational and community interests can be compromised. Once established this infrastructure is difficult (politically or economically) to remove and if it is inappropriate it can impose substantial costs on the local community for a long time. These issues arise today in many of the public utilities water, sewerage, power/energy and even public transport, telecommunications and roads.

## **Looking Forward**

Much of the physical infrastructure provided today has been constructed in an environment of population growth. Even today much of the thinking is still based on a 'business as usual approach' and expectations that growth will continue for the foreseeable future. This notion is totally unsustainable and needs to be dispensed with. Infrastructure will need to be provided in an increasingly uncertain world in which

- the supply of natural resources is being outstripped by demand (by a large factor) with the inevitable prospect of shortages
- economic and population growth as a consequence will inevitably become negative, with the prospect of collapse.

In this environment forecasts of future usage of long term assets such as infrastructure become increasingly difficult, which in turn increases investment risk. The kinds of investment that will be favored most will be those that are low cost and provide quick returns.

The future will not be business as usual as we know it today and communities and governments will be forced to change whether they like it or not. The challenge for government is to manage the process in a way that minimises community hardship, rather than leaving it to market forces. This will require interventionist policies by government and use of appropriate policy/strategy 'levers' to progress change. Public infrastructure should be one these levers, but it needs to be done with an integrated multidisciplinary approach and focus on low cost systems improvements instead of large scale monumental works.

A number of cities have demonstrated how this can be done. "Referenda in Zurich rejected two large scale projects to solve the public short-range problem by putting public transport underground". "Zurich rejected ...this type of project as a mandate to continue to restrict public transport to existing types – tram, trolley bus and motor bus (also train) – but at the same time to develop these means of transport into a modern up-to-date transport system" (The Zurich Model, E. Joos, Vice Director, Verkehrsbetriebe Zurich, 1988). As Joos noted "Zurich's transport policy is noteworthy of attention because:

- it is not spectacular, but is efficient;
- it costs little and protects the environment;
- it imposes self restraint on politicians, but the population accepts and participates in it."

But this transport strategy is not unique to Zurich. It has been applied in Curitiba (Brazil). In Curitiba the approach has been described as 'cheap and participatory' but the outcome has been excellence. Curitiba has been recognised internationally (like Zurich) as a model for public transport (as well for its environmental and social achievements), which is based on a highly efficient and low cost bus system.

These messages have now been reflected in Melbourne's transport policy "Linking Melbourne" which acknowledged that we cannot continue to build our way out of

trouble, that we need to make better use of existing infrastructure and be smarter and more efficient in the way we operate and give priority to ‘sustainable’ modes of travel – walking, cycling and public transport. The outcome will depend however on the goals that have been set, the service plan that reflects these goals, and how well transport works as a system - quality of system design and the attention to detail of all its components.

These messages apply more broadly to all forms of public infrastructure, not just transport, and by all levels of government. Unfortunately a number of vested interest groups have hijacked the appraisal process to suit their own agenda, not just business groups but also within many government agencies and government itself which view government responsibilities in an increasingly narrow commercial context, and see the private sector (public private partnerships etc) as the most efficient way of providing new infrastructure. Public private partnerships (PPP’s) have been criticized as high cost infrastructure providers in a commercial sense because their cost must include a profit margin.

The greatest cost however comes from the propensity of PPP’s to deliver inappropriate infrastructure: lemons, that are high cost and invariably monumental over-engineered projects that leave a legacy of costs during and after construction and fail to meet community needs in the first place. The private sector would have limited interest in providing the cheap systems based infrastructure improvements carried out in Zurich, or Curitiba. The profits would be low and in most cases they would not have the expertise or understanding to do it, yet that is precisely the kind of investment in infrastructure we need most today.

### **Where to from Here**

There are many areas in which physical and social infrastructure has become run down and new investment is required, some of it desperately. But it is critical that new investment is appropriate, effective, affordable and promotes sustainable behaviour by those that use it. During the 1980’s and 90’s many government agencies developed procedures for evaluating capital projects to ensure investment was appropriate and provided a sound return. Some government agencies, like V/Line set up their own department for this purpose and invested in staff training to develop the necessary expertise. These skills should still exist within a number of government departments and could provide the basis for appraising public infrastructure investment in the future although there will be a need to reflect broadly based sustainability principles. This process needs to be applied rigorously to all public infrastructure as a fundamental requirement for government stewardship. It should be a process that is open to public scrutiny, particularly for large projects.

Government should also impose (at a state and local government level in particular) self restraint on its own spending. In Zurich, a modest limit is set for capital works spending above which politicians are obliged to seek approval by public referendum. This limit encourages smart systems based investment that is low cost, low risk, and provides quick returns - the kind of investment that has made that city a model for public transport for other cities to follow.

Frugal but appropriate and well designed investment in physical infrastructure releases government funds for other areas of need, particularly in social infrastructure: public health, education, research and development, community services, and many others that are highly valued by the community and contribute to its livability and its place as a civil society. It also enables communities to focus more sharply on the social and environmental challenges ahead, challenges that will dwarf those of the past and will need to be tackled seriously and effectively with increasing urgency.

Future investment in public infrastructure must become an integral part of a broader sustainability strategy in which resource use will be a key issue. It can become a powerful lever for change but this will only happen if infrastructure investment is appropriate. This will require a fundamental shift in thinking by government and many of its agencies about the role of infrastructure, the way it is operated and managed and the demands placed on it in the future. It will also require abandonment of the dogma of infinite growth that governments slavishly follow today.