

Promoting Australia's Future Growth Through Efficient, Integrated Transport Infrastructure

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1 Introduction

The state of Australia's transport infrastructure and the processes for improving it have been of concern to Engineers Australia and the National Committee for Transport (NCTR) for some time. The condition of our infrastructure has been highlighted (Engineers Australia 2000, 2001, 2003, 2004, 2005a-f, NCTR 2004a), and the processes for improving it have been discussed at length (Engineers Australia 2002, NCTR 2003, 2004b). This paper outlines further principles which NCTR believes should be adopted.

The problem can be simply stated: our national land transport infrastructure is deficient, and we do not have the money to improve it to the standard we would like.

2 Recapitulation

This is a subject that the National Committee on Transport (NCTR) first identified as being of high importance as a result of our work when the AusLink Green Paper called for submissions in late 2002 (NCTR 2003). Since then public interest in the provision of adequate transport infrastructure for Australia has risen significantly –for instance we have seen recently (early 2005):

- The expenditure plans in the AusLink Bill, undergoing a federal parliamentary inquiry at the time of writing;
- The formation of the three-person “National Infrastructure Council” ;
- Federal government proposals to take over responsibility for Australia's ports;
- The ALP policy to use the “Future Fund” to provide infrastructure;
- Infrastructure plans published by various State governments, notably for South East Queensland, and for South Australia;
- The “Infrastructure Report Cards” both national and for all states and mainland territories of Australia prepared by Engineers Australia (Engineers Australia 2000, 2001, 2003, 2004 and 2005a-f);
- A report prepared for Engineers Australia (though without endorsement) that advocated public debt as a source of infrastructure funding (Engineers Australia 2002); and.
- NCTR's own work on assessing the “Fitness for Purpose” of our national land transport infrastructure (NCTR 2004a), on the issues relating transport to environmental and public health problems (NCTR 2004b) on the approach to changing travel behaviour in urban areas (NCTR 2004c), and on considering national transport energy futures (NCTR 2005).

NCTR supports the policy of Engineers Australia in regard to transport infrastructure, which can be summarised as:

(infrastructure funding generally)

- Total investment in infrastructure must increase so that the condition of existing infrastructure remains at an acceptable level, that the backlog of needed infrastructure is reduced and that newly opened areas are serviced by infrastructure.
- Public investment in infrastructure must increase.
- Innovative forms of infrastructure investment, including infrastructure bonds and privately financed projects, must be pursued to supplement public sector investment in infrastructure.

(infrastructure planning generally)

- A National Infrastructure Council should be formed to bring together government, business and the community to provide high level advice on policy and development priorities in the delivery of infrastructure and to improve the use of existing infrastructure to Federal, State and Territory infrastructure Ministers via the Council of Australian Governments.
- Strategic planning of infrastructure must cover the short, medium and long term.
- Infrastructure, including roads, public transport, schools and hospitals, must be provided at the same time as land is released. Infrastructure funding for new developments must be budgeted for before land is released and its provision must not be at the expense of other projects that are deemed backlog projects.
- Infrastructure should be procured on the basis of best value for money over the entire life of the asset based on a triple bottom line assessment.
- Governments need to have the skills to effectively oversee the planning and management of infrastructure, although these skills do not need to be in-house.

(transport specifically)

- All three spheres of government, as well as business and the community, should be engaged in transport planning.
- The Federal Government should be increasingly involved in urban transport development, including public transport.
- Transport, demographics and land use planning must be integrated. (NCTR would add “energy use” to this list).
- The application of transparent user-pays pricing regimes that focus on direct charging for use rather than indirect taxation must accelerate.
- Passenger transport between rural centres and cities needs higher priority than in the past.
- The Federal Government should implement a national transport strategy.
- Governments should review and augment public sector professional expertise across all relevant departments so that they are an informed buyer of transport planning, operations, infrastructure and research advice.
- Taxation and fiscal instruments should be reviewed to encourage sustainable transport by accelerating the introduction of user pays pricing regimes to reflect and communicate the full environmental, health and economic costs of transport systems, fuels and choices.

The views of the membership of Engineers Australia were canvassed and summarized for DOTARS as our response to the AusLink Green Paper (DOTARS 2002). In summary, our response (NCTR 2003) said that :

- The analytical process at the heart of the project evaluation methodology was critical and more detail was required;
- The treatment of “sustainability” in the Green Paper was unclear;
- Institutional realism (who does what and when) seemed a bit lacking, and the federal rejection of urban public transport as a national issue was seen as a problem; and
- The quantum of infrastructure expenditure was not mentioned, so by implication the process was more managerial (diverting some existing funds from one use to another) than strategic (spending what was needed).

The White Paper, when it appeared (DOTARS 2004), enshrined some of the ideas in planned legislation – approved by Parliament in June 2005 – and we look forward to their further implementation. The NCTR now suggests some new elements which could enliven the national transport infrastructure debate. They are:

- A new framework for assessing schemes, which avoids many of the past pitfalls;
- Suggestions as to how to fund infrastructure projects;
- A “reality check” – some things which should be accepted;
- The outline of the project appraisal methodology; and
- A plea for some co-ordination and planning.

3 Transport Framework

We suggest that one of the reasons why we are failing to obtain the infrastructure we need for transport in the 21st century is because we are stuck with outdated thinking, This might take the form of a road-rail dichotomy, or possibly a public transport-private transport one, or perhaps even a freight movement - person movement one. Promotion of walking and cycling are seldom considered national issues worth consideration.

A different framework is suggested here, prompted by the observation that the functional requirements of goods movement, service delivery and personal movement are quite different and further subdivide depending on whether they are being served by independent transport (the main requirement arguably will be restraining its growing energy use, since it is already widely available), commercial transport (the main requirement arguably is keeping the cost down) or public transport (the main requirement arguably being reliability). So scheduled transport will only be preferred over independent and commercial transport for some trips if it is reliable; commercial transport will be preferred over independent transport if it saves enough money; otherwise, if it is available, independent transport will tend to be preferred. The different functional requirements of the three user sectors are shown in **Figure 1**.

Figure 1: Functional definition of transport

Sector	Functions	Examples
Goods	make goods	manufacturing, construction
	distribute goods for consumption	deliveries, piped liquids
	export goods	bulk, ETMs, perishables
Services	defuse emergencies	firefighting, police, SES
	maintain urban fabric	waste disposal, tradespeople
	support economy/society	trips at work, couriers, “Serve

Sector	Functions	Examples
		passenger”
Travel	access primary activities	work, education
travel (cont)	access personal maintenance	shopping, medical, exercise
	access experiences	leisure, visiting, tourism

Even **Figure 1** is not quite adequate, and it is suggested now that an appropriate division would be into independent transport, and two types of transport services - hire-and-reward transport and scheduled transport. The use of these three categories by each transport sector is shown in **Figure 2**.

Figure 2: Relation between transport demand and supply

	Person travel	Goods movement	Service delivery
Independent	Yes	Yes	Yes
Hire and Reward	Yes	Yes	No
Scheduled	Yes	No	No

On this basis, independent transport includes cars, bicycles and walking for person movement, businesses with their own cars, vans or trucks, and a variety of standard or specialised vehicles in public or private ownership for service movement (from plumbers' vans through paramedical transport to fire engines).

"Hire and reward" services cover taxis for person movement, commercial road haulage and rail freight, now predominantly operated by the private sector, and charter services (coaches, vessels, aircraft). The integral place of taxis in the public transport mix has been argued by many, but when looked at with this framework the public/private distinction largely vanishes. They are clearly a "hire-and-reward" form of transport service.

Scheduled services seem confined to conventional urban public transport for person movement - trains, trams, buses, ferries - and domestic aviation for longer journeys. "Scheduled transport" implies that it is necessary for users to have some advance knowledge of the operator's timetable if they wish to avoid a potentially long wait. Services that run "every ten minutes" or less – like the trams in Melbourne, or the CAT buses in Perth - should probably not be regarded as scheduled transport. However this type of service level for person transport is very much the exception in urban Australia.

It can be appreciated that both the degree of freedom and the cost of use increase from bottom to top of **Figure 2**. However this perspective does not fit too well with the way in which we control our transport systems.

- All three sectors are important and the division between State and Federal responsibilities is a matter for our politicians to argue about.
- Person movement, goods movement and service movement are rarely considered as part of the same system.

- Consideration of cars is usually confined to their role in personal movement. Some car use is actually in service delivery, for which scheduled services (public transport) are not an alternative.
- Taxis are a form of public transport that would be much cheaper to use if they were only subject to quality licencing. Attempts by governments to control the quantity of taxis have created a market in these licences: a substantial proportion of the fare paid by users is determined by the cost to the owner of the vehicle of the licence rather than the marginal cost (depreciation, driver's wage, fuel etc) of using the vehicle.
- The main competitor for independent personal travel could be bicycles, offering the same type of service for shorter trips, rather than scheduled public transport which offers a different type of service. Most urban journeys are short, and there may be other technologies suitable for this market which are not currently used in Australia (eg low-energy motorised vehicles). This has major implications for the supporters of urban rail schemes in particular.
- The battle to move freight by road or rail is essentially being fought within the "hire and reward" sector, where the whole logistics chain is important and not just the point-to-point movement of goods. While some enterprises have the volume to organise their own logistics chain, others tend to use specialist companies to do this. Organisations with their own truck fleets would also fall into this category, since presumably they are cost-competitive with hire-and-reward operators.
- Road infrastructure and rail infrastructure are both used by more than one transport sector. The rail sector does not cater in any significant way for independent transport.
- The ability of the emergency services to defuse potential emergencies is something that needs to be focused on more.
- For the movement of goods, exporting is a different function from importing.
- "Road safety" would be seen as a safety issue, not a road issue, with the same strict standards as apply to workplace safety, aviation safety etc. This would appear to imply stronger accreditation control for "hire and reward" organisations and operators of scheduled bus services, and more rigorous licensing control for independent users.
- Travel time (which planners of new transport systems tend to focus on) is not very important for distinguishing *between* the categories; it is are much more important for competing services *within* a category.
- The peakiness of passenger transport does not greatly affect goods or service transport, although that partly responds to different peak events like the arrival of a ship at the docks . It may be that by trying to engineer a mode shift to public transport governments are perpetuating a structural feature they should instead be trying to reduce.

If this view of transport is taken, what would be the implications? It would remove the distinction between road and rail, and suggest that the main controlling authority should be something like a State Transport Authority whose main administrative divisions would control independent transport, hire-and-reward transport and scheduled transport. The national interest would be best served, as would be those at State level, by measures to reduce the oil dependency of private transport, to decrease the cost of "hire and reward" transport and to increase the reliability of scheduled transport.

Control of land use planning, infrastructure funding, energy supply and transport safety could be assigned to separate agencies, as environmental performance already is. Subsidiary tasks within transport would call for relatively specialised agencies to manage the road system, the rail system and to plan the public transport services. It is assumed that these would be State bodies, because the Australian constitution currently considers transport mostly a State responsibility, but this is not strictly necessary.

Of the three basic elements affecting transport (infrastructure, vehicles and land use), the Transport Authority - and its specialised road and rail arms - would be most concerned with infrastructure, while also defining standards for vehicles and drivers licensed to use it. Land use planning would have little transport input apart from accessibility considerations (as below).

Of the three basic two-way interactions affecting transport, the Transport Authority would need the skills to manage land use/transport integration (matching infrastructure and land use). Constraints on funding, safety, the environment and energy could be managed by other agencies. The provision of services (matching vehicles and land use) would be a commercial matter for service providers or independent users, and the management of traffic (matching infrastructure and vehicles) would probably be public, though this is a matter more in the realm of politics than engineering.

The pricing regime is where all three elements are brought together, and the Transport Authority would need the expertise and the political support to manage it. The technology for more innovative pricing now exists and in some places (eg Melbourne) it is already a significant feature of the road transport system.

A transport strategy to match this framework would seek to increase the reliability of scheduled services; to decrease the cost of hire-and-reward services; and probably to reduce the energy consumption of independent movement (assuming that it would be generally available in some form to those who want it). Pricing would be a major policy tool for the second and third of these strands. The benefits that would accrue are therefore respectively social, economic and environmental respectively.

4 Funding Sources

Many sources of infrastructure funding exist. In the past funding through public sector budgetary processes, based on federal and state taxation receipts and other charges, has been much employed. Currently private sector capital is much sought after, funded through “user pays” arrangements such as road tolls. Public sector borrowing is not in favour in the present climate, though NCTR fails to see a major obstacle to borrowing to fund infrastructure which will produce economic returns. The public sector generally has cheaper access to money than the private., although the allocation of different types of risk is also an important element in any negotiations between the two sectors.

All funding sources should be considered, with the final choice resting with the way in which risk is allocated. This is particularly important for “megaprojects”.

5 Facing realities

“Political correctness” has produced some items of conventional wisdom which should at least be questioned. Cars and trucks are bad, railways are good. If this is so, why do so many people choose to use cars or trucks and why are railways in such decline? In Sydney, where public transport has perhaps made the greatest penetration of urban transport of anywhere in the country, only one weekday person trip in ten is made by public transport (half on trains and half on buses) on a weekday – compared to seven trips by car and two on foot! At weekends rail’s penetration falls to perhaps one trip in fifty. Rail mostly serves a niche role for both person movement and for goods movement. It moves people to and from

the central area in large volumes; and it moves bulk exports from source to ports, and containerized freight over long distances (with the very high percentage of freight movement on the long distance east to west line not being repeated on the east coast).

Is expenditure on rail infrastructure or, for freight, multi-modal facilities the best way to reverse this trend? If a slightly different way of looking at transport is adopted, as advocated above, then rail would not be seen as a separate mode but as the infrastructure component of some commercial transport, and of some scheduled transport.

The different framework would also highlight the inappropriateness of our current administrative arrangements, with the Commonwealth government turning its back on urban public transport (three quarters of all Australians live in settlements of 80,000 people or above) on the grounds that this is a “state responsibility”.

6 Analysis for project identification

We believe that the heart of an infrastructure funding mechanism must be an analytical process, of the sort outlined in the AusLink Green Paper but conspicuously lacking in the later White Paper. Such a methodology would need to be free of interference on ideological or electoral grounds, and should face up to a range of futures including some that we would probably prefer to avoid if we could (such as one in which oil is both rarer and more expensive than it is today – see NCTR 2005).

Given that Australia is unlikely to be able to afford transport infrastructure of the quality and quantity it would like, we believe the emphasis should be on effectiveness (ie how well a project would integrate with other parts of the transport system) rather than efficiency (how good the project is in its own right). While it is difficult to imagine an effective system consisting of inefficient parts, it is easier to envisage an ineffective system consisting of efficient parts.

There is also the maintenance issue: whether we should allow existing assets to deteriorate and then have high costs of maintenance or reduce maintenance to a minimum and resurface or upgrade ahead of time.

If our views about the future of energy for Australian transport turn out to be correct, then our present financial analyses (for the private sector) or economic analyses (for the public sector) will need to be supplemented by energy analyses covering the whole life of a project – the energy required to construct it, operate it, maintain it and eventually dispose of it, compared to the energy benefits it produces. The vehicles using the infrastructure should be considered along with the infrastructure itself (ie the cars, trucks, vans, buses and bicycles as well as the roads; the trains as well as the rails).

Such a move would also support the case for reform of transport pricing. Distortions in demand patterns caused by current pricing would be much easier to identify (though not necessarily to correct) if there were greater comparability between roads and rails.

7 The need for co-ordination and planning

It seems from the above that the role of the Commonwealth government in funding infrastructure is too heavy at present. The opposite side of the coin is that its role in the national planning of infrastructure is too light. A first pass of the analysis for any major infrastructure project, of whatever origin, should be how well it fits with some national strategy. These are not always as clear as they should be – as Australia’s ports and airports demonstrate.

Federal intimations that the Commonwealth would like to take over responsibility for port-related infrastructure from the States have not been much heard since the middle of 2005 – a wish apparently occasioned by frustration at State planning delays in assessing and approving new projects. NCTR would advocate more timely processing of applications for approval, but the absence of a National Ports Strategy would make this little more than a means of by-passing the usual environmental and other assessment processes that infrastructure schemes must comply with.

A similar example is provided by the nation's airports. All major airports are now controlled by private sector bodies. Some applaud the way that all airports are confronting the need to upgrade their terminal facilities to handle "super-jumbos", as evidence that competition policy is working, but others argue that in the absence of a National Airport Strategy all major airports will be competing against one another to attract airlines with such planes, and not all will succeed, leading to wasteful production of independent designs and maybe even construction..

8 Conclusions & Recommendations

We conclude that:

- Thinking about transport has been shaped by mental frameworks which are now outdated: we suggest adoption of a fresh framework based on recognizing three sectors (the independent, the commercial and the scheduled).
- Public borrowing to fund infrastructure should not be discounted provided that the infrastructure has an economically multiplying effect.
- The assessment of proposals should recognize things as they are and not use biased assumptions about what is or is not politically correct.
- An analytical methodology should be central to project appraisal, as originally proposed in the AusLink Green Paper. In future it will be as important to analyse energy impacts as financial or economic impacts.
- The role of the Commonwealth in planning our national infrastructure has been too light, prior to the development of the AusLink program. The various national and state infrastructure report cards (Engineers Australia 2000-2004 and 2005a-2005f) would be one tool with which to address its further development.

It follows that to establish transport infrastructure that will serve Australia sustainably, the steps that are indicated are:

- Elimination of demand distortions caused by hidden subsidy or cross-subsidy or indirect taxation in pricing and charging arrangements for transport
- Adoption of clear land use strategies (settlement patterns, urban land use) and adherence to them over time
- The moderation of freight growth, especially interstate goods movement
- Reduction in the oil dependency of passenger transport
- The completion of essential links in the current system, e.g parts of the Hume Highway, as projects of national significance.

It is not the role of the NCTR to come up with a plan for Australia's transport. In this paper, however, we have offered some new principles on which transport plans can be based.

9 References

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