Abstract:

Australia is facing a potentially huge need for investment in infrastructure investment in the coming decades to deal with growing population, shifting economic and demographic patterns, and adaptation to sea level rise and other effects of climate change. There is, however, an institutional challenge that is making the necessary financing and investment difficult to come by. The basic problem is that the government institutions responsible for raising revenue and expending it do not match up well with the regions that infrastructure systems serve, regions that typically cross governmental decision-making boundaries.

This paper applies an economic theory approach to this problem. The relevant literature in public choice, public economic and fiscal federalism is reviewed to uncover economic thinking about 'optimal' government institutional design. Then more specific thinking about infrastructure governance is discussed. A consideration of the economic meaning of regions follows. Then the specifics of the Australian constitution as it pertains to regional infrastructure, with a focus on transport, are presented. And the theory and practice are tied together to formulate an economics-based framework for optimal design for Australian infrastructure governance. The paper closes with some policy conclusions.
Introduction

Australia is facing a potentially huge need for investment in infrastructure investment in the coming decades to deal with growing population, shifting economic and demographic patterns, and adaptation to sea level rise and other effects of climate change. There is, however, an institutional challenge that is making the necessary financing and investment difficult to come by. The basic problem is that the government institutions responsible for raising revenue and expending it do not match up well with the regions that infrastructure systems serve, regions that typically cross governmental decision-making boundaries.

This paper applies an economic theory approach to this problem. The relevant literature in public choice, public economic and fiscal federalism is reviewed to uncover economic thinking about ‘optimal’ government institutional design. Then more specific thinking about infrastructure governance is discussed. A consideration of the economic meaning of regions follows. Then the specifics of the Australian constitution as it pertains to regional infrastructure, with a focus on transport, are presented. And the theory and practice are tied together to formulate an economics-based framework for optimal design for Australian infrastructure design. The paper closes with some policy conclusions.

The economics of optimal government design

The theoretical streams most pertinent to an economics approach towards ‘optimal’ design of government are those of public choice, public economics, and fiscal federalism. One of the key questions considered in this literature is optimal jurisdiction size. When economists speak of optimal, they are generally referring to the lowest-cost way of meeting consumer preferences and this instance is no exception. The seminal paper in this regard is by Charles Tiebout. (Tiebout, 1956)

Tiebout’s analysis begins with a conundrum of public choice theory, i.e. that the median voter determines electoral outcomes and that this can lead to allocative inefficiencies. The reason for this is that the median voter’s preferences will not be identical in most cases to the preferences of the marginal voter and it is equilibrium at the margin that makes for optimal resource allocations, at least in theory.

This disjoint comes about from the rigidities that preference detection methods, such as majority-rule voting, introduce when used out of necessity to determine preferences for public goods which are, to use Musgrave’s language, non-rival and non-excludable in consumption. (Musgrave, 1969) To put these concepts roughly and informally, a good is non-rival in consumption when the nature of good is such that to provide one unit to
one person is equivalent to providing one more unit to everyone; a good is non-excludable in consumption, when there is no way to exclude anybody from consuming the good which is offered. Of course these aspects, when present, lead to the ‘free rider’ problem in which there is the possibility that some consumers may obtain the good without paying for it. The presence of such a possibility makes normal pricing of the good in the private market difficult, requiring some sort of public pricing mechanism. If such public goods are provided and priced by a government using majority-rule voting, the conundrum referred to above occurs.

Tiebout was actually responding to Samuelson’s posit of this problem in a 1954 paper which argued that the nature of public goods made them impossible to provide efficiently. (Samuelson, 1954). Tiebout argued that this was not the case if the following conditions applied:

- There is perfect information and costless mobility;
- there are no interjurisdictional spillovers nor other interactions between jurisdictions;
- there are no scale economies in the production of public goods, (i.e., a linear cost curve, not dependent on output, is assumed);
- the jurisdiction pays for public goods with a head tax.

Given these assumptions, households sort themselves according to housing consumption and public goods consumption into homogeneous communities. Thus residents will go to communities which meet their preferences for a public good mix, rather than imposing their preferences on the community through a collective allocation procedure. This is, of course, allocationally efficient since each household moves to the jurisdiction that maximizes utility by providing the best bundle of public goods and services relative to taxes (and here is an additional implicit assumption, namely that the tax price of the public good is set equal to its shadow price, a reasonable assumption in this case, given the unlimited mobility of residents). Figure 1 shows this equilibrium graphically, in terms of cost-minimization. As Tiebout put it, "Spatial mobility provides the local public-goods counterpart to the private market's shopping trip."

It should be noted that Tiebout also excluded the presence of politics (a standard, if sometimes problematic, simplifying assumption) and also ignored other local factors, such as job base, which might affect either choice of community or, possibly, the production technology of public goods (such as natural resource endowments or transport costs). Introducing these complications into the model obviously alters the theoretical results, as will be discussed later on.
The clear implication of Tiebout’s work is that the optimal size of communities should be small. This logic is mirrored in a related literature on club goods, the seminal paper being by James Buchanan. (Buchanan, 1965) Club goods are public goods that are non-rival in consumption, at least in part, but are excludable in consumption, thus making them at least quasi-private (or quasi-public, depending upon your perspective). A classic example of a club good is a road, which is partly non-rival (everyone can consume it up until the point at which congestion sets in, after which everyone’s consumption of the good degrades until the services provided shrink to zero ('gridlock')), and which can be made to be excludable, if, for example, a toll is imposed on the road. Hence the term ‘club’: the provider of such a good can choose to invite in a select number of consumers and those consumers can be charged directly according to their preference for the good and the level of their consumption. The economically efficient number would be that at which marginal benefits to consumers equal the marginal costs of producing the good, presumably before congestion sets in (or at least until congestion gets very bad).

Tiebout’s model argues for separate jurisdictions, homogenous within themselves as far as preference for a mix of public goods went. The presence of club goods argues for separate clubs, homogenous within themselves as far as the individual club good goes. In that sense, the presence of club goods makes optimal size ‘communities’ even smaller, as people sort themselves out into groups consuming a single type of good rather than a mix of public goods. This sort of argument is dependent upon similar types of assumptions that underlie the Tiebout model, namely a local head tax, and no beneficial interaction amongst the different members of a heterogeneous group (which rules out things such as agglomeration economies, a function of physical space which is discussed below).

When tied together with another premise of fiscal federalism, (described by an expert in the field as a theory that: "lays out a general normative framework for the assignment of
functions to different levels of government and the appropriate fiscal instruments for carrying out these functions.” (Oates, 1999, p. 1121) i.e., that the beneficiary of a service should pay for it, the normative bias towards a small optimal community size is firmly fixed. This would seem to argue against the economic efficiency of many large jurisdictions.

There is, however, some ambiguity regarding optimal jurisdiction size if the restrictive assumptions are relaxed just a little. One set of analysts find that, when land markets are incorporated into the analysis, a Tiebout decentralization is best done within a metropolitan jurisdiction. In such a jurisdiction individuals use their resource endowments to develop a composite mix of private consumption, production of local public goods and transport costs. (Hochman et. Al. 1995) This particular model incorporates some dynamics of physical space into it, dynamics omitted from Tiebout and Buchanan. Optimal consumption of the mixed good takes place within overlapping market areas in which total costs of consumption exceed total revenue from optimal user charges, the shortfall being covered in part by land rent. Thus public goods are optimally provided by on a decentralized basis by ‘metropolitan’ governments, whose jurisdictions correspond to the optimal spatial complex of overlapping markets, and which supplies the entire range of local public goods, financing such provision through both user charges and land rent.

Hamilton also incorporated land into the Tiebout by changing the ‘entry price’ into a jurisdiction from a head tax to a property tax. (Hamilton, 1975, 1976) This change in assumptions obviously implies that members of a community with more expensive houses will pay more to be in a community than those with cheaper houses. What this new disparity leads to is the possibility that a groups with large property endowments could set up own municipality with only expensive houses in it, allowing them to lower the overall tax rate, ensuring that all households in the community will pay for the level of services they get. They will do this if gains to doing so are large relative to transaction costs and will enforce this in new town through use of large lot zoning, so as to keep property values high. This leaves the small house town with high tax rate. This change in the Tiebout world, according to Hamilton, increases the number of jurisdictions because now sorting is based not just on desired level of public goods, but on housing consumption. When households sort based on housing consumption, they also sort based on income because housing is a “normal good.”

Hamilton, along with a separate stream of analysis produced by William Fischel (Fischel, 1992) makes the case that local property taxes, when combined with local zoning ordinances, produce a system of benefit taxation. Peter Mieszkowski and George Zodrow (1989) take the opposite view. Without wading into this particular thicket, these strands of analysis essentially reinforce the theoretical propensity towards smaller communities in a Tiebout style world.

Of course, perfect homogeneity of communities is impossible because of all the different ways people could sort themselves. There will never be enough municipalities to match all possible sets of consumer preferences. This issue is more intense in
larger, denser central cities where there is simply too much heterogeneity of population within a small area. Thus it has been argued that suburban municipalities are much more likely to display Tiebout properties than urban ones. Additionally, the more homogeneous the community, the more the property tax is like a user fee; the less so, the more it resembles a conventional tax. Empirical tests of Tiebout seem to confirm this ‘suburban’ tendency towards decentralization, with findings that the greater the number of municipalities, the more homogeneous each is with respect to demand for public services; in such situations there is a clustering of residents with similar preferences. (Gramlich and Rubinfeld 1982, Heikkila 1996). Other research complicates this picture a bit, indicating that there are more and smaller municipalities on average in metropolitan areas with heterogeneous demand for public services (Fisher and Wassmer 1998).

This is where fiscal federalists enter in. Inman and Rubinfeld argue that there is a tradeoff between efficiency, individual rights and political participation by citizens. So if there are economies of scale in local public goods provision, as well as significant benefit (and cost) spillovers across communities (both violations of Tiebout assumptions), then efficiency is best served by larger jurisdictions. However, there is less political participation in such large jurisdictions and also loss of the sort of preference fulfillment that is found in Tiebout-style communities. Therefore a federal system can be designed to create and inter-relate communities which can maximize along all these dimensions. (Inman and Rubinfeld, 1976)

Much of the fiscal federalism literature focuses on the use of grants to achieve both efficiency goals – e.g., grants that remedy the mismatch between the areas containing consumers who receive the benefits of local public goods with actual jurisdiction size – and equity goals -- e.g., grants that redistribute resources from communities with more ability to pay to those in communities less well-off. Grants are the recommended method for dealing with spillovers in either costs or benefits. In the case of benefit spillovers, the public good can either be provided at a higher government level which includes all individuals who benefit, or intergovernmental grants can be used to equalize benefits within different communities. As for cost spillovers, (i.e., residents of neighboring jurisdiction who incur part of the cost of a public good without realizing any benefits), intergovernmental taxes can be used to ensure everyone bears their proper share of the cost and, in so doing, make efficient decisions. In the presence of multiple levels of government, the issue of optimal jurisdiction size obviously grows more complex and the results on optimal size of a given community becomes more agnostic.

As for the role of politics, in the formal sense, this is not considered too much by economists who boil down such considerations to those of incentives (and, understood in this sense, there is much work on the topic, though many political scientists would see this sense as too narrow). Of course, the whole Tiebout stream of thought arose out of the fact that the ‘median voter’ will not generally vote for optimal levels of service once all community preferences are taken into account. And some analysts have examined this issue in some detail. One example is work by Borck, who builds a theoretical construct that builds voter turnout into the allocation decision. Adding this
dimension, he finds that smaller communities are better because they increase turnout which, in turns, increases efficiency (because the detection and measurement of preferences is stronger when more people participate in the political process). This finding is consistent with much of the existing public choice literature. (Borck, 2002).

**Designing government regions for large scale public infrastructure**

The discussion thus does not consider specific government services and their characteristics, a sort of ‘putty-clay’ model. However some government services have unique characteristics. Large scale public infrastructure is one of these. Such infrastructure typically has particular characteristics which can be broadly summarized into “four S-s.”

- scale
- scope
- structure
- strategy

The simplest concept is scale. In a very loose sense, scale is synonymous with size. Thus a large-scale operation is one where production and/or distribution of a single good or service is conducted at a very high volume. A small-scale operation is one where such activities are conducted at a very low volume. In engineering terms, scale is related to throughput, i.e. the more of something which goes through a process in a given period of time, the larger the scale. Economies-of-scale simply refer to the behavior of costs in response to scale. If costs increase with scale of operation, there are diminishing returns to scale, and if they decrease there are increasing returns to scale. This is, of course, very typical of much public utility infrastructure such as water, electricity and transport.

Scope is a subsidiary concept to scale. Scope refers to the range of activities being done, regardless of scale. Large corporate conglomerates are classic examples of organizations large in both scale and scope. A single-product monopolist could be said to have large scale but limited scope.

There are economies-of-scale which refer to the behavior of costs as the range of activities being conducted increases. Sometimes there are complementarities across different sorts of production which lower overall costs to the enterprise, such as when a distributor of one good decides to distribute other related goods and can do so at relatively small incremental cost, having already built the distribution network for the first product. On the other hand, increasing scope can increase costs too, if there are no complementarities (for example, if a company has a great distribution network for fresh produce, that may do no good if it decides to distribute specialty chemicals, which are distributed through an entirely different sort of network), or if it causes the enterprise to lose management focus.
Structure is a more nuanced concept and one that economists tend to neglect. The word itself refers to the components that make up an entity and the way in which those components are put together. In the context of an organization, structure can be defined as the internal pattern of authority, communication, and relationship within an institution. Structure is manifested in such things as the arrangement of departments (i.e. the explicit “org chart”), specialization within the organization, formalization of processes, vertical span, and number of organizational sites (Miller, 1987).

There are almost certainly economies-of-structure. The problem is that there are harder to measure, both in terms of inputs and outputs and the relationship between the two. Inputs in this case would be, for example, the number of division offices in a firm, while outputs could be any number of things, ranging from efficiency in production to overall financial performance. In theory it is possible to come up with some sort of measure for structural inputs (and there are many, such as span of control), but in practice it is very difficult to come up with measures that are generally applicable across the myriad different organizational forms which exist (e.g. two firms may have the same number of divisions, but what if, as is likely, those divisions do very different, and not comparable, things?).

Even if one could measure input and output definitively, how does one establish the causal link between, say, how centralized a firm is and how successful it is? Economies of scale and scope, being more closely linked to engineering processes, are easier to get a handle on than structural economies. That is probably why those two concepts are more well-established and more widely used than economies-of-structure.

Next comes the concept of strategy. In a broad sense the term, derived from military theory, refers to the design and execution of a master plan (distinguished from tactics which are, in effect, the working out and execution of the field details of that master plan). More specific to enterprise management is the term "strategic management" which "defines an organization's attempt to set a direction and to implement and evaluate it in light of its external environment and its internal capacity." It is a process where "managers seek to develop a competitive advantage and create a successful future by managing all the organization's resources." (Roberts and Menker, 2000, p. 562)

An old debate is whether structure follows strategy or vice-versa, i.e. whether organizations change their structures after significant changes in external conditions, or whether strategy follows structure, i.e. the way an organization is laid out causes it to make decisions different from what would be made under a different institutional regime. (Chandler 1962)

Management theorists in particular (as distinct from most economists) are very interested in these things because it seems that if all these factors are aligned just right, then the magic "synergy" will occur. Synergy is a term derived from pharmacology where it refers to an achievement of a physiological effect by two or more
pharmacological agents which could not be achieved if each were used singly, even if used sequentially. In an economic and management setting, the meaning of the term pretty much transfers over to refer to a situation where joint actions yield a whole which is greater than the sum of the parts. One simple way that some theorists put this is that synergy is the case where 2+2=5.

The economics mainstream tends to discount the existence of synergies except in matters of engineering cost, such as decreasing cost industries and external economies in production, where synergies can be measured more easily. Most proponents of synergies tend to be analysts focusing on institutional factors, much as Chandler and others argued that the managerial innovations of the railroad companies led to economic returns not captured by traditional frameworks of benefit-cost assessment.

There is good reason, of course, to be wary of claims of synergy. That does not mean that they never exist. When they do exist, it is important to try to think about what their sources might be – technological, market-based, or managerial – and to assess strategies for how they can be captured. These issues are especially important in large infrastructure systems across large regions. Seen too much in isolation, the return to specific investments, even small ones, may be underestimated if some of the critical links are missed. Good analysis of the situation, before, during, and after, is critical, with an eye on these sources and the various causal links surrounding them.

Regions, economic, fiscal and otherwise

What is a region? From an economist’s perspective, a region is an area that serves a particular economic function for particular economic reasons. Thus an automotive manufacturing region is an area that specializes in the production of automobiles and does so for all the traditional economic reasons, such as internal or external economies in production or consumption. Put another way, economic regions have economic specializations in which one region does the job that it is best suited to, and another region does the job it is best suited to, and the two trade with one another making the whole collection of regions better off in the classic sense of “gains to trade” found in the theory of international economics.

There are other types of regions, of course. A closely related concept is a fiscal region, i.e. concentrations of beneficiaries and/or cost-bearers. One could consider the classic example of firms upstream who dump refuse in the river, thus receiving the economic benefits of that river without bearing any of the cost, and the residents downstream who, in being subjected to polluted water, bear the costs of the use of the river without getting the benefits.

A third type of region is administrative. This is a generic term, referring either to private administration (for example, a marketing territory within a sales firm) or to public administration (the boundary of a state, locality or special district). Administrative regions can be defined either by function ("all claims processing is done in the Sydney
region”), authority (“State government creates local authorities subservient to it”) or both (“The Headquarters region has responsibility for overall corporate management and directs the activities of the regional division offices”).

Of the three types of regions, administrative areas are explicitly designed and drawn by human beings and can be changed by them, while economic and fiscal regions tend to be more organic in origin and evolution.

Of course while de facto administrative boundaries are explicitly drawn and need to be explicitly redrawn, de jure administrative boundaries, that is, true centers of power and lines of authority, do change over time, in a similarly organic fashion, often leading to a mismatch between explicit and implicit boundaries. This fact, combined with the changes that naturally occur in economic and fiscal areas, demonstrates that one trick of good governance and administration is to make sure that all the relevant boundaries match up and stay matched up.

In the infrastructure realm, this problem crops up in all sorts of ways. A classic mismatch is between beneficiaries and cost-bearers, where those paying for the infrastructure system do not receive the payoffs from it. Example: water-rich regions whose lakes and their corresponding watershed development potential are fenced off to make reservoirs for a big city water supply system. Another mismatch is between those able to pay and those willing to pay. Example: a poor inner city core which has great need of transportation rehabilitation and investment, next to a rich suburb which has most of the tax base (which may represent a benefit-cost mismatch as well if suburban commuters make all their money in the center city). Then there are all the usual political-administrative mismatches that occur, where there may be people willing and able to pay for something and even where beneficiaries are the ones bearing the costs as well, but political power resides elsewhere. Example: urban areas which need money from state legislatures dominated by rural interests.

So getting boundaries properly aligned across different players is a basic challenge in regional governance.

**Australian federalism, transport infrastructure, and the regional gap**

A textbook definition of federalism is "a system of government in which powers are shared between a central (national) government and regional (state) governments." This same book defines a federal system as "a means of dividing the power and functions of government between a central government and a specified number of geographically defined regional jurisdictions." This is to be distinguished from a confederacy ("a league of sovereign states in which a limited central government exercises few independent powers") and a unitary system ("one in which all authority is derived from a central authority"). (Bowman and Kearney, 1999, p 5, 24)

Australia is an example of a federal system. The country was formed as a union of independent ‘colonial’ governments. Australia had six independent colonial
governments which united in 1901 under a formal written constitution. These now constitute the six Australian States and two Territories.

A number of constitutional sections are significant with respect to transport policy. Sections 90, 92, 117 create a single nation and a common market, removing barriers of movements of goods and people across State boundaries. S.106, 107, 108 protect the integrity and independence of the States. S.51 defines the powers of the Commonwealth and leaves the other powers to the States. (S.109 provides that where there is a conflict, the Commonwealth law prevails).

To get a better idea of how these sorts of constitutional formalities play out, consider national transport. Traditionally, States reigned supreme in transport policy. The Commonwealth government played a more minor role in this area operationally, though, as mentioned earlier, did provide grants and GST revenue, both of which are still provided on an ongoing basis. Formally speaking, the Constitution granted the Commonwealth powers such as ‘naval and military defence,’ ‘currency, coinage and legal tender,’ ‘immigration and emigration,’ ‘external affairs,’ and the rather progressive ‘invalid and old-age pensions.’ Residual powers left to the States included most everyday public services including (but not limited to) transportation of all forms.

In terms of transport finance, S.51(ii) gives the Commonwealth Parliament the authority to levy any form of taxation. S.90 prohibits States from imposing ‘duties of custom and excise’ (to ensure internal free trade). This might be interpreted as rough equality with concurrent taxing powers given to both governments except for excise taxes.

However, S.96 allows Parliament to ‘grant financial assistance to any State on such terms and conditions as the Parliament thinks fit.’ The national government used this power to withhold grants from States that levied income taxes, a use of authority upheld by the courts; thus States no longer impose income taxes (though it was voluntarily ceded and this cession is not a Constitutional provision). When States tried to fall back on excises, the courts ruled that S.90 prohibited them from imposing such taxes. The result has been that the States have been limited in developing their own sales taxes. States rely for about half their revenue from Commonwealth grants. Their other taxes are sundry ones with increasing reliance on gambling taxes (gambling is legal throughout Australia). (Fenna, 2007; Hollander and Patapan, 2007)

Australia adopted a Goods and Services Tax (GST) in 2000. This is a Commonwealth tax but under the “Intergovernmental Agreement on Commonwealth-State Financial Relations,” all the GST revenue, minus administration costs, goes to the States. Thus the States do have access to this revenue but the tax and the tax base itself remains under Commonwealth control. “Tied grants” remain as well, leaving the central government with a lot of fiscal authority.

On the revenue side, the Commonwealth Parliament can give states tied or untied
grants. Special purpose (i.e. tied) grants can be given to either a state or local government. They are often used to bypass state governments (e.g. on local roads, flagpoles for schools). General purpose grants usually go to the states, but, because control is less, are not often favored.

Additionally, the Commonwealth and States together share tax revenue and distribute it to more "needy" states (for example Tasmania) through the Commonwealth Grants Commission as General Purpose Grants. The Commission compares the level of services available to the citizens of all States, the revenue base in each state, and then redistributes some of it.

As we can see, there is a fair amount of ‘fiscal federalism’ being exercised in Australian transport. There is still, however, a tension in Australia between governmental center and periphery. The central government has strong fiscal powers and the courts are increasingly giving in strong administrative and policy authority. The States still actually deliver, or at least are responsible for, many, if not most public services, but have relatively little independent taxing power. This makes planning and financing of regional infrastructure, which cross State boundaries but are not purely national, somewhat problematic.

Perhaps recognizing this general problem, the framers of the constitution did provide for some cooperative elements of federalism. Section 101 of the Constitution for example establishes the device of an Inter-State Commission. While none exists at the moment, it has been used in the past to coordinate road infrastructure, etc. The modern equivalent is the voluntary grouping called the Council of Australian Governments that first began in the early 1990s in the framework of national competition policy, with the Commonwealth making payments to states that implemented competition reforms.

Another example was the GST reform which replaced the myriad of state sales taxes (many different rates on different commodities) with the single, uniform, national GST. The power to do this was obtained by parallel legislation passed in all the States and by the Australian Government. Indeed, differential levies on petrol, taxes on real estate and a few minor other exceptions continue (which is why the Australian Government won’t give some states their full payment under the Competition reforms). So there is precedence for joint effort and governmental institutional redesign.

However “regions” were not explicitly addressed by the Constitution, particularly regions spanning boundaries of sovereign states, even though many of the compromises which shaped the document were regional compromises. The GST reform was explicitly national. Australia’s transport system could be seen as ‘national’ in a sense, but much of it is regional, for example greater Perth which has little connection with rest of the country. This can be an even greater problem for other infrastructure, such as water, which cover well defined physical areas such as watersheds. While transport has had little activity on a regional governance scale,
there has been more in other arenas, such as the Murray-Darling Commission.

There are some ideas for design of institutions dealing with regional issues. These types, their nature, and some examples of each, are provided in Table 1.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>“Coalitions”</td>
<td>The loosest form of regional organization, essentially a voluntary banding together of different parties for a common purpose. With time, coalitions can take on an institutional permanence, with paid staff and complex organizations, and may exercise considerable authority. In theory, however, their power and workability is in place only so long as participating parties agree that it should be in place. Coalitions can be established for special one-shot purposes, such as conducting a planning study, or for ongoing management of an activity.</td>
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<tr>
<td>“Compacts”</td>
<td>More formal institutional arrangements, usually an explicit signed agreement, which provides for procedures and rules allowing participating sovereign entities to make joint decisions on regional issues. They are like coalitions in that the member parties retain all their sovereign authority, but formally stronger than coalitions in that members generally agree to a binding or semi-binding set of rules for making decisions within the compact and also may enter into formal agreements on specific issues. Compacts are more common for international regions which cross national boundaries.</td>
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<tr>
<td>“Commissions”</td>
<td>Commissions are formal governing bodies which typically have memberships consisting of area governments and other parties with a stake in a particular regional issue. A step up from compacts – in fact they are often set up by compact – in that there is established a formal body with governance power within its specific domain. Generally a commission is set up with a legislature-like form with a supporting permanent staff.</td>
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<tr>
<td>“Regional authorities and agencies”</td>
<td>Separate bodies which are “agents” of some collection of regional entities or, sometimes, a creation of the federal government designed to address issues which cut across State boundaries. In effect regional authorities are one step shy of an actual regional government – something which does not appear to have been tried in Australia yet – but may have powers very much akin to, but more limited than, one.</td>
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There are other possibilities for organizing regional infrastructure governance – for example, private nonprofit corporations with government charters. These are not discussed here, partly because on a regional level they are not much in use (though their use has grown at the Federal level). Suffice it to say that there are many possible options as far as the form of regional infrastructure oversight and direction.
Designing regional infrastructure governance to capture relevant economies of scale, scope, and structure: a preliminary checklist

So whither Australian transport governance? Or any regional infrastructure governance in Australia? For a regional infrastructure system it is important to be clear and explicit about the true components of the project, both in terms of assets, existing and needed management capacity, and administrative jurisdictions. The idea, ultimately, is to assess in advance what the scale, scope and structure across different dimensions of the investment are and how costs might vary with different levels of operation.

A preliminary checklist of what needs to be tallied can, however, be provided, and is provided in Table 2.

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<th>TABLE 2: PLANNING CHECKLIST FOR REGIONAL INFRASTRUCTURE SYSTEMS</th>
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<tbody>
<tr>
<td>Project dimension</td>
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<td>Service area (geographic, etc.)</td>
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<tr>
<td>Infrastructure services provided</td>
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<tr>
<td>Physical Assets</td>
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<tr>
<td>Jurisdictions involved</td>
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<td>Management capacity – existing and needed</td>
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<td>Fiscal capacity</td>
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<td>ETC….</td>
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To take the simplest example, if a regional infrastructure system is being planned, an easy place to begin is with the service area which is going to be served. How big or wide is it (scale), how many services are going to be provided (scope), and how is the service area going to be structured administratively and otherwise (structure)? The last column perhaps should be the first one to be filled out and would spell out the overall objectives that the investment is supposed to achieve as far as the area served. Besides just identifying the characteristics of the different project dimensions, one ideally would provide potential cost behaviors as scale, scope and structure are changed. Then the process would be repeated for the other dimensions listed. Although the discussion here is presented in terms of a new investment, the same sort of analysis could be conducted for changes in the deployment of existing assets, ongoing management and maintenance programs, and even system or asset retirements and shutdowns.

The template provided above is really the first basic step to determining whether there are any synergies to be had and if so, how they may be attained. The discussion earlier in this paper noted that synergies may be technological or managerial and that managerial synergies are the ones, if they exist, that may account for the biggest bang.
in that regard. So having identified the relevant dimensions of a given project and the possible characteristics and cost behaviors of scale, scope and structure associated with each one, the next step would be to do tradeoff analysis between different dimensions. For example, centralized administration might increase economies of scale but could diminish efficiencies in structure (e.g. leading to more bureaucracy) or economies of scope (larger organizations may have more trouble coordinating a wider range of activities). The theoretical setpoint would be to arrive at the tradeoff point where overall efficiencies and program effectiveness is maximized.

Since this is paper which focuses on optimal governance, a little further elaboration on that score is in order. Table 3 provides a stab at a template for analyzing some of the different regional arrangements discussed above.

<table>
<thead>
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<th>Institutional Arrangements</th>
<th>TRADEOFFS</th>
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<tr>
<td>&quot;Loose&quot;</td>
<td>Coalition</td>
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<td>&quot;Loose&quot; --------------&quot;Tight&quot;</td>
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In this particular schema, some of the different arrangements of organizational structure are categorized in terms of "looseness" and "tightness," i.e. how strong the power of the organization ultimately is and how binding its decisions ultimately are. Coalitions are categorized here as the "loosest" of regional arrangements, while full-blowen regional governments are categorized as the "tightest." Obviously there is room for interpretation here. Added to the bottom of the table is a row for internal procedures. Consensus is the loosest procedure and "Diktat" is the tightest.

There are a series of tradeoffs which result from this mix and match of arrangements and procedures. A few possibilities are listed and are hopefully obvious though also certainly debatable. Under a coalition voluntary action by participants is maximal, while under regional government with full and independent sovereignty (currently a Constitutional impossibility in the Australia) is viewed, all other things being equal, binding action is maximal. This is closely related to the fact that the inherent power of a coalition is much lower than that of the inherent power of a regional government, as is the necessity of agreement to reach decisions in the latter case as opposed to the former case. Other factors could and should be added.

Clearly this is not a completely developed template in that the interaction between
procedures and institutional arrangements is not elaborated. A regional government operating with consensus rules may, in fact, be looser than a compact under a dictator. The point to be made here is that there are such interactions, that they should be made as explicit as possible, and that they should be analyzed.

Conclusions

Can regional infrastructure governance be gotten right from an economics perspective? Theoretically, yes. Under the best of circumstances regional governance allows for pooling of scarce resources such as these, a pooling which may have significant payoffs which may rise to the level of genuine synergies. The more that is known about such potentialities, the more replication of them in different but comparable problem settings is possible.

For small projects this may not be much of an issue: a new off-ramp on a State highway can probably be assessed in isolation from the overall organization of the State Roads department which can be taken as a given for the purposes of analysis. But the bigger the project, the bigger the management challenge and in some cases entire new corporate edifices may have to be built.

These governmental structures will definitely have a feedback on the ultimate economic return of an infrastructure investment. Mismanagement, of course, will lead to lower or negative returns, even if the fundamental project itself is “sound.” Superior management will enhance those returns and may spawn positive effects of its own, particularly if new management practices can be imported to other projects and other sectors.

With regional infrastructure investments, particularly in Australia where regions can be very large, these issues are especially important. The myriad of public, private, and “mixed” institutions and the different layers of government which exist in the Australian federal system automatically create a challenge in sorting out roles and responsibilities on regional program. Getting it right, where “it” refers to organization of effort is and should be a key part of any infrastructure plan and analysis of that plan.

References


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