S...S...S...S Marks the "Spot":
Who should do what, when and why in the provision of regional infrastructure

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DISCUSSION DRAFT

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Comments and suggestions welcome

Overview

This is a paper that covers a lot of ground very thinly and a very specific piece of ground in some detail. The general topic is optimal governance of regional infrastructure. The specific illustration of that topic is an examination of governance of infrastructure in the US as a whole and the American Midwest in particular.

The discussion is organized into four parts. Part 1 provides a broad sweep of theory about management, governance, institutional design and regions. Part 2 provides some illustrations of regional infrastructure arrangements being used around the United States. Part 3 focuses on some specific infrastructure governance and management practices in the American Midwest. Part 4 lays out some preliminary criteria which might be used to better organize management, planning and analysis of regional infrastructure in the Midwest and in the US in general.

PART 1: INFRASTRUCTURE PLANNING, MANAGEMENT AND ANALYSIS THEORY, IN BRIEF

Infrastructure and rate of return

What constitutes an infrastructure investment?

A seemingly simple question, but how simple is it, really? Take a few pages from one of the great debates in US economic history, namely the one over the economic development impacts of the American transcontinental railways, and you can see how subtle the question actually is.

One way to look at transcontinental railways is to simply look at the capital facilities themselves and the services those facilities provide. Thus the rails and all the supporting works, such as grading, tunnels and bridges, would be the primary facility investments, while the services provided by those facilities would be more efficient (i.e. lower unit cost) transportation. One economist, Robert Fogel, looked at the problem this way and came up with the startling answer that the existence of the railways boosted baseline GNP by only around 5%.

There is another way to look at things. One could say that the railway infrastructure did not just consist of bricks and mortar but also the organizational and management systems created to oversee them. Private railway companies in particular were forced to come up with a whole range of strategic innovations to direct their new mainlines, ranging from standardized time zones to early modern corporate accounting and information management. If this broader definition of railway capital is used then the true picture of rate-of-return to the building of transcontinental mainlines would include both the economic effects of the physical investments and the organizational and institutional structures supporting them. This is the sort of argument that the business

historian Alfred Chandler made, and while difficult to measure, the impacts of such structures certainly were considerable.

The transcontinental railways were a large investment, large enough that significant new management capacity needed to be built and this new capacity had bona fide ramifications for the economy at large. Certainly this will not be the case for many projects but for large ones where new oversight capacity will be needed, as is often the case with regional systems, then such issues need to be explicitly accounted for. At least this is the argument made in this paper as it examines some of the issues which should be considered in the planning, management and analysis of large regional infrastructure investments, with a focus on the American Midwest.

S+S+S+S=Synergy?

Take as a given that infrastructure investments – the planning, building, managing, maintaining and ultimate decommissioning of them – requires management. What factors are important in designing organizations which work?

To condense a wide ranging management literature into a single mnemonic, the answer to that question consists of four "S-s."

- scale
- scope
- structure
- strategy
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The simplest concept is scale. In a very loose sense, scale is synonymous with size. Thus a large-scale operation, at least in a technical engineering sense, 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.

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.

Structure in a generic sense 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. [1]

Finally there 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."[2]

Many theorists argue that if all these factors are aligned just right then a magic "synergy" will occur. Synergy is a term derived from pharmacology where it refers to the achievement of a physiological effect by use of two or more pharmacological agents simultaneously, while such an effect could not be achieved if each agent were used singly, even if used sequentially. In an economic and management setting, the meaning of the term refers to an analogous 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.

How do synergies actually work? They work when they achieve positive economies which means unit costs which fall as operations are expanded. Economies can be achieved across any one or all three of the dimensions of scale, scope and structure, and a good strategy will help ensure that all three dimensions work together to achieve maximum positive cost reduction.

> 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.
>
> Economies-of-scope 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, such as when there are no complementarities (for example, if a company has a great distribution network for fresh produce, that may do it no good if it decides to distribute specialty chemicals, which are distributed through an entirely different sort of network), or if it

[1] Miller, D, "Strategy making and structure: analysis and implications for performance," Academy of Management Journal, 30 . (1987).

[2] Roberts, Nancy C. and Janice M. Menker, "Strategic management in the federal government: necessary and sufficient elements." From Handbook of Strategic Management, (2nd edition), Jack Rabin et. al. eds., (Marcel Dekker Inc.: 2000), p. 562.

causes the enterprise to lose management focus, “too many pots on the boil in a single kitchen”, as it were.

There are almost certainly economies-of-structure. The problem is that structural inputs and outputs are very hard to measure and the causal relationships between the two difficult to nail down. Inputs could be 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 organizations which actually 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?). While output is conceptually a little easier, here too there are many different standards of accounting, types of ownership, valuation methods for equity, etc., which make comparison across different organizations difficult (for example, how easily can one compare the equity value of a privately held firm with one with widely traded stock?) Finally, even if one could measure input and output definitively, it is difficult to establish the causal link between, say, how centralized a firm is and how successful it is.

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.[3] No doubt both answers are true: there should be a strategic direction at least partially thought out before an enterprise is organized (“Fail to plan, plan to fail”), and organizations should, and sometimes have no choice but to, change the way they operate as circumstances evolve.

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 as the carcasses of WorldCom, Global Crossing, Enron, and other “new economy” firms attest rather bluntly. 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 larger infrastructure investments or in investments which are critical to the performance of a larger system. Seen too much in isolation, the return to

[3] See Chandler, A., Strategy and Structure, (MIT Press: 1962) for the classic exposition on the structure following strategy argument and "A Strategic Model of Organizational Conduct and Performance," by L.J. Bourgeois and W. G. Astley, International Studies of Management and Organization, 9, 3 (Fall 1979): 40-66 for the opposite case.

specific investments, even small ones, may be underestimated if some of the critical links are missed.

Management versus governance

So much for strategic management theory 101 (the very short course). Most of the concepts discussed thus far were developed and applied to private enterprise. Most large-scale infrastructure investment in the modern era has been in the public sector or at least had a public interest component to it. In these cases, infrastructure, broadly viewed as consisting of both facilities and organizations, must be both managed and governed. The two are not exactly the same thing.

A broad definition of public governance is: "the process and institutions by which authority in a country is exercised; (1) the process by which governments are selected, held accountable, monitored, and replaced; (2) the capacity of governments to manage resources efficiently, and to formulate, implement, and enforce sound policies and regulations; and, (3) the respect for the institutions that govern economic and social interactions among them."[4]

Governance is not a concept limited to public institutions. "Corporate governance" is a hot issue, for example, in the post-Enron era and the word "govern" can simply mean to direct, control or guide. But public institutions generally have a responsibility that corporations do not have, namely to support and uphold societal values. Issues of "voice" for all groups in society, upholding the rule of law, respect for individual and minority rights, and maintenance of consensus values, are theoretically the basic prerequisites for the sovereignty of state institutions in a democracy where sovereignty refers to authority to direct and manage the affairs of the populace. Private institutions need to respect the laws and policies made by government but they do not, in theory, direct those laws and policies, nor do they need to be concerned with broad social issues beyond those dictated by prevailing rule and custom.

To put this another way, points (1) and (2) in the definition above could, with a little word-smithing, apply to both the public and private sector and are essentially synonymous with good management. Point (3) represents a divergence between the public and private realms, indicating the sort of honest broker that government must play amongst all the different players in "civil society."

With public infrastructure systems, then, there is a double burden: to manage the enterprise effectively and to uphold public values. This may seem an obvious point but much of the government performance and rate of return rubric does not explicitly address it. There may be conflicts between the two, of course; the classic "efficiency-equity tradeoff" that is found in most elementary economics textbooks is the simplest statement of that reality. But there need not be such a conflict, and sometimes good

[4] Kaufmann, Daniel, "2001 and Beyond: What research Directions on Corruption and governance?" Workshop Session, October 10th, 2001, 10th IACC, Prague, Czech Republic

governance in the fullest sense of the word, if the infrastructure being considered has any public interest component to it whatsoever, may enhance the value of the project to society. Good management is important, good governance is important, and one needs to know the difference between them to do both of them effectively.

Institutional choices and procedures

To manage and govern effectively comes down to two things: choosing the right institution and choosing the right decision-making procedures within that institution. "Right" in this case refers to organizational outcomes which meet strategic and programmatic objectives, uphold desired values of society, and operate in an efficient manner.

As far as "right", there really is no cookie-cutter approach. There are many different ideas as to what works and quite a few fads. In fact, it is almost a certainty that the best organizational design will very much depend upon the job at hand.

However, some generalizations are possible as to the characteristics of procedures and organizational form which are important to determining outcomes. Table 1 contains a summary of some of these key factors. [5]

[5] The brief discussion of private sector and nonprofit forms of organization embedded in the table and elaborated on in the text is drawn from McNamara, Carter, "Legal Forms and Traditional Structures of U.S. Business Organizations" reprinted by The Management Assistance Program for Nonprofits, http://www.mapnp.org/library/org_thry/forms.htm; and the web site of the Cornell Law School: http://www.law.cornell.edu/topics/corporations.html, http://www.law.cornell.edu/topics/nonprofits.html, http://www.law.cornell.edu/topics/partnership.html, http://www.law.cornell.edu/topics/joint_ventures.html. As for the organizational structure factors, besides the Miller article cited above, there are discussions in Fahey, L. & Christensen,H.K. "Evaluating the research of strategy content." Journal of Management, 12: 167-183 (1986); Frederickson, J.W., "The strategic decision process and organizational structure." Academy of Management Review (1986), 11:280-297; Braybrooke, David & Lindblom, Charles S. A strategy of decision: policy evaulation as a social process, (Free Press, 1970); Lindblom, Charles S., "The science of muddling through," Public Administration Review, 19 (1959); March, J.G. and Simon, H.A. Organizations. (Wiley: 1958); Cyert, R.M.; March, J.G., A Behavioral Theory of the Firm. (Prentice-Hall: 1963)

TABLE 1: KEY FACTORS IN SUCCESSFUL DECISIONMAKING		
ORGANIZATIONAL FACTORS	Legal Form of Organization	Nongovernmental: Private Unincorporated Incorporated Joint Venture Nongovernmental: Nonprofit Unincorporated Incorporated Joint Venture Governmental Unincorporated Incorporated Joint Venture Multilateral/Transnational
	Organizational Structure	Centralization: how authority and power flows within an organization Formalization: use of precise rules, routines, and procedures to gather and categorize data. Complexity: number of layers within an institution and the number of relationships between those layers
	Decision-making processes	Assertiveness: organization's stance towards risk-taking and whether it is reactive or proactive with respect to its external environment; Interaction: organization's internal decision-making processes as well as its relationship to external actors. Rationality: how systematic the gathering and analysis of information is, how methodical planning is, and how explicitly articulated strategies are.

This table obviously just scratches the surface of a complicated issue, but the main elements of institutional choice are there. In designing an organization for a specific end, one needs to specify its legal underpinnings; its internal power and authority structure; and the processes used to make decisions within that organization. These factors would be considered in light of the scale and scope of the desired outcomes and the strategic objectives to be accomplished. More will be said about these factors in the part of this paper.

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. Thus an automotive manufacturing region is an area that produces automobiles. 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 Great Plains 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 jure* administrative boundaries are explicitly drawn and need to be explicitly redrawn, *de facto* 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.

Getting boundaries properly aligned across different players is a basic challenge in regional governance. Granted, there is an economic argument which hold that none of this matters so long as people can vote with their feet and go to jurisdictions where benefits, costs, and services are all to their liking, thus sorting themselves out. [6] Even if this is always true -- which the possible existence of administrative synergies, to say nothing of standard violations of economic assumptions such as free mobility of people and resources makes doubtful -- social values may still dictate that boundaries be redrawn. Such a task, though, should never be taken lightly or without a lot of critical analysis.

Measuring performance

What cannot be measured cannot be managed, the old saying goes. Which really is false, for there is much that is not measured at all that has to be, and therefore is, managed anyway, for good or for ill. The real point is that it does help to know where things are going and that some sort of information about progress and direction is essential in overseeing an enterprise. This is the core issue of rate-of-return analysis which, in the case of public infrastructure, corresponds to benefit-cost analysis.

In theory, benefit-cost analysis is easy – one counts up all the "goods" resulting from an action, measures those against the "bads" which result (and "bad" here would include expenditure of resources towards the action, resources which have alternative uses), and then subtracts "bads" from "goods" to see if the action is a net gain or loss. All the usual conditions apply in such an analysis – the use of discounting if impacts are spread out over time; the use of a proper baseline for comparison, namely a clear distinction between the world with the project and the world without it, so the two states of the world can be properly compared and the net change in position properly assessed; the avoidance of double-counting of benefits and costs; the proper definition of benefits and costs and avoidance of confusing one with the other; and so forth. Get all of this right, and one has a number which has some potential use.

But use for what exactly? Is a positive net benefit an argument for undertaking a given investment? Yes, but only if there aren't other investments that are even better than the one being considered. And only if people really want that sort of project in the first place as opposed to others. Even putting aside all that, an infrastructure manager needs more than just a go/no-go number. One may go, but once the Rubicon is crossed then, in a real sense, the measurement challenge is just beginning.

From a governance perspective, the benefit-cost analysis question is one where the ball is often dropped. Not so much because many benefit-cost analyses are poorly done or not done at all, though that is all too often the case. Rather, the problem is that the analysis often stops after the go/no-go question has been answered, leaving project execution to take care of itself, which is where mismanagement and other defects in

[6] See Charles Tiebout, "A pure theory of local expenditures," Journal of Political Economy 64 (1956), pp. 416-24, for the original and seminal exposition of this viewpoint.

execution can make a good paper effort into a badly built and/or operated physical investment. A project may be a good idea if it can be implemented well, but if there is a high probability that it will not be implemented well, then it may be better to keep it from beginning at all.

Furthermore, a lot of the relevant dimensions of the problem are missed in most traditional analyses. To return to the transcontinental rails, there were arguably synergies to those investments that made those investments more important to the US economy than a mere measurement of impacts to rail and rolling stock would reveal. Would the rail companies have undertaken their investments, or the US government helped underwrite them with right-of-way land grants, if they had in hand the analysis that Fogel did one hundred years later showing a mere 5% rate of return? Even if they had undertaken the investments with that analysis in hand, of what use would that number be to them then? An analysis which accounted for the management innovations and efficiencies which the rail investments spurred would have been more helpful and more convincing.

Of course, what probably did the most to get government to help get the rails built were the free rail tickets that the major rail companies handed out to all the US Senators and the well-stocked private clubhouse bars that they maintained for legislators in the nation's capital. On the private side, the stock manipulations of the rail trusts no doubt helped boost the pro formas of their projects, so long as the relevant executives got out before those manipulations collapsed, which they invariably did.

Which is all to say that as important as analysis is, there are a lot of other factors important in determining whether something gets done and these must not be lost sight of. God, grant planners the serenity to accept the things that cannot be changed, the courage to change the things they can, and the wisdom to know the difference. Good analysis, good planning and good management must never lose sight of the realities, current and probable future ones, and needs to plan around them. Maybe a bad project cannot be stopped, but at least it can built and operated as efficiently, effectively and equitably as possible.

PART 2: REGIONAL INFRASTRUCTURE GOVERNANCE IN THE UNITED STATES

Overview

While theory is nice, it doesn't mean much until it meets the real world. Part 2 of this paper describes some of that real world, at least as far as America is concerned, focusing on the nature of the public sector in this country, and the current arrangements which are used to plan, build and manage regional infrastructure.

American federalism

A recent textbook on American government defines federalism as "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").[7]

In the case of the United States, a federal system grew out of the union between sovereign States which created a new sovereign entity, the Federal government. The document codifying this terms of this union is the Constitution. In this sense, the American union is, or is supposed to be, a sharing of power and sovereignty between two distinct sets of entities.

What is the division of labor with respect to infrastructure? The U.S. Constitution explicitly enumerates powers reserved to the central government. Only one of these powers directly deals with capital spending and investment — the legislature, i.e. Congress, has authority "to establish Post Offices and post roads" (U.S. Constitution, Article 1, Section 8). That same article allows for the US government to have "exclusive legislation" over what later became the District of Columbia, the seat of the national government, so within that area, the national government's power extends over all infrastructure of any type, and indeed the government has built many public works within that district.

Rather than being an explicit power, the central government's authority to provide public works and other infrastructure is implied by two other provisions within Article 1: the so-called "commerce clause" ("to regulate Commerce with foreign nations, and among the several States, and with the Indian tribes.") and the "general welfare clause" ("The Congress shall have Power to...provide for the common Defence and general welfare of the United States.") Additionally, in the same article and section, Congress is allowed the power "to make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the Government of the United States." This, unsurprisingly, is referred to as the "necessary and proper clause." These clauses are vague, but as it happens, much of the U.S. Federal government's power to build, manage, maintain and operate public works comes from them.

As the States were the original founding sovereign members of the union, it was assumed at the time of founding that they would continue to have most of the powers that they had before forming the union except for those powers expressly delegated to the national Congress. This is likely the reason that clauses mentioned above are so vague — many of the framers saw that they had to allow some "wiggle room" for the national government as it carried out its enumerated powers. The States were left with so-called unenumerated powers, namely all those not expressly given to the central authority. The Tenth Amendment to the Constitution codified this understanding by

[7]Bowman, Ann O. and Richard C. Kearney, State and local government (4th ed.), (Houghton-Mifflin: 1999). pp. 5, 24.

stating that “the powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the states respectively, or the people.”

Since the writing of the Constitution, an extraordinarily diverse range of governmental authorities has grown up in the United States: a unitary federal government; the 50 States and the District of Columbia; 38,000 local governments; and 36,000 special districts which are creations of the States and/or local governments and which are governmental units established for specific purposes.[8] It is important to emphasize that any entity other than a State or the Federal government has no inherent sovereignty of its own and gets it sovereignty from elsewhere. However, authority, once granted, is often hard to take away.

Given this jurisdictional complexity, the challenge to the U.S. federal system is to achieve objectives good for the system as a whole (the nation) and also to provide for needs and wants that apply at more local levels, usually only in some places but not in others. While complex, a federal system has an important potential advantage over centralized systems — it is centralized and decentralized at the same time, thereby offering the possibility of achieving economies and efficiencies offered by a large unit of government while also obtaining the nimbleness and responsiveness of small units. However, managed poorly, the federal system can end up being a melange which is neither fish nor fowl, a system which accomplishes the worst of both worlds — distant and unwieldy central government and backward, unsophisticated, parochial provincialism.

It should be obvious that “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. Of course regionalism is as American as apple pie and has been a running issue throughout the country’s history -- the Civil War was as much about regional identity as it was about anything else. The challenge is to address regional issues in the context of a system which pointedly ignored the whole thing.

Regional infrastructure governance mechanisms

Because of this gap, a variety of mechanisms have evolved, relatively informally, to deal with regional issues. Many of these mechanisms have arisen to deal specifically with the provision of infrastructure where the service area cuts across sovereign State boundaries. This is not surprising since regional infrastructure usually requires a large initial and sometimes large ongoing expenditure of resources, is usually necessitated by some pressing perceived need at the regional level, and may not be undertaken at all if the interested parties do not get together and pool their resources and power to undertake it.

[8]US Census of Governments, 1997.

There are a number of different broad forms of regional infrastructure institutions of varying age and development that are being actively used in the United States today. These types, their nature, and some examples of each, are provided in Table 2.

TABLE 2: TYPES OF REGIONAL INFRASTRUCTURE BODIES		
TYPE	DESCRIPTION	CURRENT EXAMPLES
"Coalitions"	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. Advocacy is one common use of coalitions, particularly where States and localities want to get money from the US federal government.	***I-95 Corridor Coalition*** – 12 State DOT's, the US Federal Highway Administration (FHWA) and other local entities joined together to promote the use of Intelligent Transportation System technologies along Interstate Route I-95 ***I-68 (Corridor 18)*** – Coalition of area governments to study, propose and promote (i.e. obtain funding for) a new facility extending the current route from Canada through Indianapolis down to Mexico
"Compacts"	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, but are coming into increasing use within the US across State boundaries.	***Midwest Regional Rail Initiative*** – an interstate compact between several Midwestern State governments, working with AMTRAK, to promote and invest in a regional high-speed intercity rail system.
"Commissions"	Commissions are formal governing	***Great Lakes International***

	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.	***Joint Commission (IJC)***—A joint commission between Canadian provinces and US State governments bordering the Great Lakes which is responsible for regulating water levels of the Lakes. ***River Basin Commissions (various***) – Commissions which have been established in areas where a watershed crosses State boundaries and there are issues of conflicting water use which need to be resolved. The Delaware River Basin Commission, as an example, was instituted in response to a federal lawsuit over conflicting water uses.
"Regional authorities and agencies"	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. Agencies may be connected to or contain or be governed by a Commission – as with the Appalachian Regional Commission – or may stand alone. In effect regional authorities are one step shy of an actual regional government – something which does not appear to have been tried in the US yet – but may have powers very much akin to, but more limited than, one.	***Port Authorities*** – the classic example of a regional infrastructure authority with separate budgets, enabling legislation and revenue sources, and sometimes even taxing authority. ***Appalachian Regional Commission*** – a hybrid between a Commission and an agency. Formally a federal agency.

This discussion is focused on public governance institutions. Of course, there is a whole panoply of private institutions, some of which are especially important in infrastructure provision, such as electricity generation. Most policy action nowadays requires at least active coordination between the public and private sector. The institutional forms described in Table 3 above can, and sometimes do, consist of public, private and nonprofit actors.

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), and partly because this discussion has gone on long enough. Suffice it to say that there are many possible options as far as the form of regional infrastructure oversight and direction.

PART 3: REGIONAL INFRASTRUCTURE PRACTICE IN THE AMERICAN MIDWEST

The Midwest region

What is the "Midwest"? A definition from an encyclopedia states first that it is a "Region, north and central U.S., lying midway between the Appalachian and Rocky mountains, and north of the Ohio River." Then it goes on to make an interesting distinction: "As defined by the federal government, it comprises the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. It includes much of the Great Plains, the region of the Great Lakes, and the Upper Mississippi River valley."[9]

In other words, the Midwest (American) is a region defined by natural features, and/or by administrative fiat, and which contains other regions which overlap one another. It also happens that this region varies in size depending on the parameters used.

That's just in one definition. Here are several of different maps of the Midwest area, a selection of only a few out of many:

[9] Merriam-Webster's Collegiate Encyclopedia, (2000), entry on "Midwest or Middle West."

Figure 1 shows the geographic jurisdiction of one of the institutions holding this conference, as well as the jurisdictions of its sister institutions. Since District 7 of the US Federal Reserve Bank is co-hosting a forum on Midwestern infrastructure, one can safely assume that its jurisdiction is in the Midwest. But common convention would hold

that all or part of Districts 4, 8, 9 and 10 also are “Midwestern.” Taken in its entirety, this is a pretty large area.

Figure 2 shows the U.S. Environmental Protection Agency’s definition of its Midwest region. The figure shows ozone concentrations for the area on August 30 of this year on a 5-color scale, ranging from green to red, with green being “good” or low concentrations and “yellow” being above that, or “moderate.” This is a considerably smaller area, and more urbanized when considered as an area.

Finally, Figure 3 is a map taken from a publisher of materials for primary school students. This map rolls together the Midwest and Great Plains, recognizing that the two regions do shade over into one another, one gradually melting into another, at least when considering the prominent feature of an agricultural plain. Some the States subsumed under the Great Plains were the same ones included in the dictionary definition of the Midwest which was quoted in the beginning.

The point of this exercise is not to rhetorically throw up one’s hands and say that it is impossible to come up with a common definition of the “Midwest.” Actually, the point is that if there is agreement that the concept of a “Midwest” is useful – and there is such agreement for various reasons – then that concept will vary depending upon the purpose at hand.

Turn this question around: how should the Midwest be defined when it comes to regional infrastructure planning, investment, management, governance and analysis? In fact, this is the question that should be asked first rather than last. Ask and then try to answer this question, and one has gone a long way towards figuring out the optimal configuration of the infrastructure project or program at hand.

At the same time, the whole question of what constitutes the Midwest may be irrelevant when it comes to infrastructure. Some infrastructure systems are very much defined by a natural geographic area with relatively identifiable, if not fixed boundaries, e.g. a river basin for a set of river-based navigation works, a watershed for a water supply system, or an airshed for a set of air-pollution control facilities. In other cases, local economic regions may be more important, as in the case of many transportation investments whose logic is dictated heavily by regional passenger and freight flows. Other possibilities could include cultural or social boundaries, things which may be important if homogeneity across those sorts of dimensions makes governability easier or if heterogeneity fulfills certain societal values.

The Midwest is thus a region which contains many subregions. If those regions cross State boundaries, then regional governance mechanisms, in the sense of enterprise management which cuts across sovereign political boundaries, become especially important.

<u>Jurisdictional complexity in the Midwest</u>

The existing public institutional environment in the Midwest mirrors the environment throughout the United States, namely one of many different and overlapping jurisdictions. Table 3 provides overall data on the number of governmental units in the Midwest (here defined as consisting of the States of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Nebraska, Ohio, Wisconsin. The data are for 1997; the US Census of Governments for 2002 is not fully tabulated yet and State level data were not available at the time this paper was written).

TABLE 3: NUMBER OF LOCAL GOVERNMENTS IN THE "MIDWEST"

	TOTAL		GENERAL PURPOSE			
	1997	% change 1952 to 1997	County	Municipal	Township	School District
Illinois	6,836	–11.5	102	1,288	1,433	944
Indiana	3,199	4.9	91	569	1,008	294
Iowa	1,877	–68.0	99	950	–	394
Kentucky	1,367	71.7	119	434	–	176
Michigan	2,776	–59.0	83	534	1,242	673
Minnesota	3,502	–61.2	87	854	1,794	362
Missouri	3,417	–51.2	114	944	324	537
Nebraska	2,895	–63.7	93	535	455	681
Ohio	3,598	–8.6	88	941	1,310	666
Wisconsin	3,060	–57.8	72	583	1,266	446
TOTAL	32,527		948	7,632	8,832	5,173

In these 10 States there are over 32,000 units of local government. Township and municipal governments account for over half of the total of all units. School districts account for around 15% of the total.

The Midwest has gone against the trend in the rest of the country in that it has witnessed a decline in the number of governments between 1952 and 1997. Much of this decline appears to have come about from a decline in the number of school districts, something particularly pronounced in the agricultural areas which have seen rather pronounced depopulation during that period. Additionally, the Midwest has mirrored the country in a more recent trend towards school district consolidation; both the region and the nation saw a decline in school districts between 1992 and 1997. Part of the decline comes from something peculiar to the Midwest, at least in the 1990's: a decline in town and township governments. The Census of Governments notes that this region accounted for most of the decline in township entities between 1992 and 1997. This, too, may have something to do with rural depopulation.

Taken together, there seems to be a general trend towards fewer governmental units in the region – Indiana and Kentucky being exceptions. Still, there are a whole lot of public entities to contend with.

Table 4 provides some detailed data for 1997 on governmental entities that have a specific purpose which are infrastructure-related.

TABLE 4 -- SPECIAL DISTRICTS – Infrastructure related

	Total	Highway	Air-transport	Other transport	Drainage and Flood Control	Soil and water conservation	Other natural resources	Parks and recreation	Sewerage	Solid waste management	Water supply utilities	Other utilities	MULTIPLE--sewer AND water	MULTIPLE -- natural resources and water	MULTIPLE -- other functions
Illinois	3,068	26	31	8	830	105	–	360	126	9	95	19	15	2	25
Indiana	1,236	–	–	–	40	93	1	5	64	62	8	3	6	3	25
Iowa	433	4	3	–	149	100	–	2	28	18	17	6	1	–	2
Kentucky	637	3	–	–	8	123	–	–	4	16	145	3	5	1	4
Michigan	332	–	20	2	–	82	–	2	24	11	14	20	13	–	6
Minnesota	406	–	5	–	13	97	4	2	13	2	6	8	–	11	20
Missouri	1,497	308	2	1	181	–	–	6	28	–	241	1	–	–	14
Nebraska	1,130	13	60	–	40	–	44	1	16	–	25	31	31	–	228
Ohio	592	–	53	13	12	84	1	94	8	18	20	15	11	1	15
Wisconsin	696	–	–	–	36	–	148	6	320	–	3	2	–	–	6
TOTAL	10,027	354	174	24	1,309	684	198	478	631	136	574	108	82	18	345

About a third of the total number of Midwestern governmental units are special districts. Around half of these are infrastructure-related. It is interesting to note that natural resource functions account for most of the numbers. There were 1,309 drainage and flood control districts, followed by 684 soil and water conservation districts, 631 sewerage districts, 574 water supply units, 478 parks and recreation entities and 354 highway entities. Other natural resource units totaled 198, followed closely by air transport (174) and solid waste (136). There were relatively few multiple purpose units overall, but those with functions outside combinations of sewer, water and natural resources did make up a block of 354 units.

Across the States, Indiana is one of those with the greatest number of special districts, but with the fewest devoted to infrastructure. Wisconsin is a State with both relatively few special districts and relatively few infrastructure-related units. Illinois has the most special units, but adjusted for population, Nebraska probably has the greatest number.

There are limits to the stories which can be reliably told from these numbers alone, but some interesting things stand out. First, natural resource special entities predominate and within that category, those areas which tend to have natural physical boundaries, such as floodplains and sewage runoff plains, are the most prominent. Second, the older the government function, the more special districts there tend to be. Thus agricultural and flood control functions, which were amongst the earliest public responsibilities in the infrastructure area, both locally and nationally, are the focus of the 1,309 drainage and flood control units, and the 684 soil and water conservation districts. Sewer and water supply, other functions which were made public relatively early in infrastructure history, make up the next largest categories. Highways follow, and then air transport and solid waste. Indeed the numbers almost perfectly track the timeline of government takeover of infrastructure services over the course of the 19th and 20th centuries. This may suggest that as government functions age, their provision becomes more decentralized.[10]

Regional government in the Midwest[11]

Unfortunately, there is no systematic tally of regional governmental bodies which corresponds to the US Census of Governments. No such tally was attempted here. Instead a very brief discussion of several cases of Midwestern regional infrastructure governance in the transportation field is presented.

[10] There is a lot of information in the Census of Governments which could shed more definitive light on this topic but which is not tapped here. The main data volume of the 1997 US Census of Governments (Issued August 1999, GC97(1)-1, Volume 1, "Government Organization"), contains detailed descriptions and analyses of individual States. I have not analyzed these data here, mainly because 2002 numbers should be soon available and, unless trend analysis was of interest, it seemed a waste of effort to analyze older numbers which would soon be superseded by newer ones.

[11] Most of the factual details in this section come from the white paper, "Challenges With Multi-State / Jurisdictional Transportation Issues For FHWA, Office of Freight Management & Operations, Office of Intermodal and Statewide Programs" by Wilbur Smith Associates (May 2001) and a PowerPoint presentation that complements it by the same authors. The conclusions and interpretations offered are very much my own.

Case 1: I-69 Corridor 18

The I-69 Corridor 18 effort is a coalition of eight state transportation agencies and the US Federal Highway Administration. Its main focus is on the planning of a proposed route extending from Port Huron, Michigan to the Lower Rio Grande Valley (sometimes referred to as Corridor 18 because it was the eighteenth corridor in the list of congressionally designated High Priority Corridors contained in ISTEA (1991). The eight states participating in the I-69 planning activities are Arkansas, Indiana, Kentucky, Louisiana, Michigan, Mississippi, Tennessee and Texas. As such the effort connects some of the Midwest with some of the Southeast, a sort of "bi-regional" affair.

The coalition has a steering committee which all member States and the FHWA sit on. The Arkansas DOT is the lead agency in the coalition. There is also a private corporation, the I-69 Mid-Continent Highway Coalition, which was incorporated in 1993, one year after the coalition itself was founded, which consists of private business and civic leaders, and that undertakes a lot of advocacy activities which the public coalition would not be allowed to do. Much of the funding for the effort comes from the FHWA.

In significant ways, this is a limited structure, less concerned with governance and implementation than it is with planning, and, frankly, lobbying. On the one hand, the project, which would be 1430 miles long with a construction cost estimate of $7.2 billion in 1997, is a good candidate for regional planning of this sort and the advance involvement of State entities across whose territory it would cross is certainly a good thing.

On the other hand, the advocacy function of the coalition may be problematic. Its advocates frankly measure the coalition's progress by the amount of money raised from State and Federal sources and the local opposition to the project which has been

overcome or at least neutralized. While some benefit-cost studies have been conducted which show the project to be a net benefit to society, there is some reason to be skeptical of studies given their source which is heavily funded by the FHWA and governments with something to gain. This is not to pass judgement on the entity but to serve as a cautionary tale against combining advocacy and planning functions too closely in a single entity.

Case 2: Appalachian Regional Commission

The Appalachian Regional Commission (ARC) is a regional economic developmentagency established by an act of Congress in 1965. It is composed the governors of the 13 Appalachian states and a federal co-chairman, appointed by the President. There are also multicounty local development districts (LDD's). (The ARC currently consists of 406 counties, which are part of 71 Local Development Districts (LDDs) in 13 states – Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia). Congressional appropriations fund the agency which then allocates those funds across its member states.

The ARC's primary objective is economic development of the Appalachian region which cuts across a wide number of regions and includes a slice of the eastern Midwest. Its programs cover a wide range of activities; its infrastructure programs consist of the planning and building of an interstate-quality highway system and water and sewer systems.

The ARC represents another pole of regional governance, namely the establishment of regional agency with a separate appropriation (though not tax base). Born in an atmosphere where the poverty of Appalachia had received national attention and a commitment to action on the part of President John F. Kennedy, the intent of the

commission was to coordinate and focus a myriad of federal anti-poverty and economic development programs and work together with affected States and localities to come up with a unified regional plan and execution of action.

ARC is well-established and institutionalized. It has a permanent staff, a well-developed structure of intergovernmental coordination and consultation, and now a close to 40 year history, punctuated by a round of severe budget cuts in 1981 which it ultimately survived. The agency stands as an example of what sustained national interest can build, at least institutionally.

However, as with the I-69 coalition, there are some questions of how truly regional the entity is. There is a great deal of local audience participation as it were, but the federal government is running the show as far as the money is concerned. Pork-barrel and advocacy concerns exist here as well. Not that ARC projects are generally seen as badly executed, but there is some question as to how effective and useful the projects being undertaken are where economic development is concerned.

Case 3: Midwest Regional Rail Initiative

The Midwest Regional Rail Initiative (MWRRI) is perhaps the most interesting of the three cases, and the only one discussed here which is exclusively based in the Midwest (unless you happen to think on principle that Nebraska more properly belongs to the Great Plains). The goal of the effort is a $4.1 billion project to improve and expand passenger rail services in the Midwest. Chicago will be the hub of the Midwest Regional Rail System (MWRRS) with spokes reaching out to Detroit, Cleveland, Cincinnati, Carbondale, St. Louis, Kansas City, Quincy/Omaha, and the Twin Cities. The sponsors of the MWRRI are Amtrak, the Federal Railroad Administration, the DOT's of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Wisconsin, the Nebraska Department of Roads, and the Ohio Rail Development Commission. The nine state

agencies and Amtrak form the MWRRI steering committee. The Wisconsin Department of Transportation serves as Secretariat for the
Steering Committee and also is the lead agency for contractual agreements with consultants who are conducting feasibility and other planning studies. Additionally, there is Federal DOT Secretarial and Staff level involvement and participation by the AASHTO
Mississippi Valley Conference Board of Directors.

On paper, the MWRRI looks to be a true regionally-based alternative. It is backed by an Interstate Compact. It is not just a planning effort, but also a design, build and operate effort as well. Finally, the MWRRI represents a well-defined and focused infrastructure investment with very definite regional objectives.

However, the funding formula for the institution raises some questions. The planning assumptions are that 80 percent of the funding will come from the Federal government, with the remaining 20 percent to be contributed by the member States. Although States are supposed to make up the difference if Federal funding is less than expected, there is no provision for ensuring that this will actually happen in the likely event that Federal funding is indeed not forthcoming. Other regional high-speed rail initiatives have foundered – although none of those had the systematic support of States that this effort has – and there is genuine and legitimate skepticism surrounding ridership projections for most intercity passenger rail projects which have been proposed before.

In general the MWWRI is an interesting experiment in regional infrastructure provision, but like the other cases considered here it sometimes looks more like the an "iron triangle" between interested Federal agencies and interested State and local interests than true regional government. How much of this is perception and how much is reality remains to be seen as this effort is still in its early stages. The issue is nonetheless an important one to consider when designing true regional governmental institutions.

PART 4: TYING THEORY TOGETHER WITH PRACTICE – INFRASTRUCTURE GOVERNANCE LESSONS FOR THE MIDWEST AND FOR THE NATION

Finally, it all comes to the big question in the subtitle of this paper: who should do what, when and why in the provision of regional infrastructure? That includes the question of who should pay for what, when and why.

The evidence considered above is still too sketchy and preliminary to be than suggestive. However, it does begin to suggest an outline of what is important to consider in answering the questions above. In fact, a sketch of a sort of "how-to" guide begins to emerge. The key questions which might be covered in such a guide would include the following:

How to determine relevant economies of scale, scope, and structure
How to maximize the chances of achieving infrastructure "synergies."
How to plan for and deal with the realities of "second best."

How to manage infrastructure well and govern responsibly at the same time.
How to accurately and credibly analyze rate-of-return

Let's consider each question in turn.

How to determine relevant economies of scale, scope, and structure

For a regional infrastructure system, and really for any infrastructure investment with a significant management component, 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.

Because this is a preliminary analysis, this author has the good fortune of being able to punt on the difficult details of actually telling policymakers how to actually carry all of this off. That is a job for "further research." A preliminary checklist of what needs to be tallied can, however, be provided, and is provided in Table 5.

TABLE 5: PLANNING CHECKLIST FOR REGIONAL INFRASTRUCTURE SYSTEMS

Project dimension	Scale	Scope	Structure		Strategic objectives
Service area (geographic, etc.)					
Infrastructure services provided					
Physical Assets					
Jurisdictions involved					
Management capacity – existing and needed					
Fiscal capacity					
ETC....					

To take the simplest example, if a regional infrastructure system is being planned, an easy place to begin is with the area which the project is going serve. Then going across the columns, one may ask how big the area is spatially and how much service is going to be provided (scale), how many services are going to be provided (scope), and how is the service area going to be structured administratively and otherwise (structure)? Beyond this basic information, the template could also be filled in with data on how each characteristic affects the behavior of costs. Now the author not only has to punt, but leave the field, but not before nothing how important this particular piece of knowledge is.

The last column – strategic objectives -- 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.

How to maximize the chances of achieving infrastructure "synergies."

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, market-based (economic) or managerial and that managerial synergies are the ones that sometimes account for the biggest bang for the buck. 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 paper focuses on governance, a little further elaboration on that score is in order. Table 6 provides a stab at a template for analyzing some of the different regional arrangements discussed above.

TABLE 6: INSTITUTIONAL ARRANGEMENTS TRADEOFFS	
[redacted]	TRADEOFFS

				Voluntary action	Inherent power (low)	Need to agree (high)	Resource sharing potential (low)
				Binding action	Inherent power (high)	Need to agree (low)	Resource sharing potential (high)
Procedures	Con-sensus	Majority votes	Diktat				
	"Loose" ----------→ "Tight"						

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-blown 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. For example, under a coalition, voluntary action by participants is maximal, while under regional government with full and independent sovereignty (currently a Constitutional impossibility in the United States), 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 and the necessity of agreement across all involved parties much higher than in the case of full-blown sovereign government.

Clearly this is not a completely developed template in that the interaction between procedures and institutional arrangements is not elaborated upon. 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.

It is very important to note that possible managerial synergies should begin to emerge from this sort of assessment. The bridge to that is the last column in Table 6 which spells out the potential for sharing resources. The sharing of information, knowledge, and ideas could be added. 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.

How to plan for and deal with the realities of "second best."

Templates are well and good for organizing ideas but they tend to be rough at best or lousy at worst when being used in real-world situations. This discussion is not meant to imply that a formula should or even could be applied lock-step to a given situation. Again, the real value of templates such as these are to suggest important factors to make explicit and to incorporate into thinking and action.

Regional infrastructure almost never operates in a "first best" environment but in a "second best" one. "First best" is a concept used by economists to indicate a conceptually perfect world, much like a University of Chicago Heaven where all preferences are clearly ordered and known, all property rules are fully spelled out and fully functional, all information that can be known is known and freely available, and where there are absolutely no barriers to exchange and clearing of transactions and markets. "Second best" refers to every potential reality outside of that Nirvana, which is to say it refers to all the different incarnations of the world as it really is.

In some sense planning for and dealing with the realities of "second best" is a matter of experience in the School of Hard Knocks. But in the context of the templates developed above such acknowledgement could be translated into knowing which rows of a table have flexibility and which do not. For example, some projects are just going to be undertaken no matter what some economist may say about its viability. In that case, one may be able to effectively "x" out the "physical assets" row in Table 5. "We're gonna have a highway and that's that." And in a strange way, the analyst and the project manager has been done a favor insofar as the problem to be handled has become simpler due to the addition of an external constraint. Other examples of constraints could be administrative – "We've just got to have a rule where anyone can veto the plan because the law says we have to" – or political – "Group X has just got to be at the table or else nothing is going to fly."

This is not to say that all external constraints are binding and must be lived with. Although it may require some creativity and some patience, many constraints can actually be gotten around or at least modified. Politics are subject to change and some of the best managers are also the best politicians who are able to "get things done." Beyond recognizing that fact, anything else to be said about the matter is probably more the proper purview of a backroom chat than a conference paper.

How to manage infrastructure well and govern responsibly at the same time.

By now the reader hopefully is aware that there is a difference between governance and management. To drive this point home and to develop it further, let's use a word that might send chills down the spine: corruption.

Good management, in my view, does not preclude corruption. Good governance does. Actually, good is a misleading word here. A better word is effective. So effective management gets the job done but does not preclude the possibility of doing it dirty in some way. Effective governance implies getting the job done while meeting ethical and social standards, preferably the highest standards.

Corruption takes many different forms, quite a few of them very subtle. The subtle forms are the most corrosive. An example is a situation where parties with a material self-interest in a given outcome are also given responsibility for making the decisions on whether a course of action leading to that outcome is taken or not. This is called conflict-of-interest. It is a form of corruption because even with the sincerest of motivations actors in such situations are inclined to make decisions on their own behalf rather than on the behalf of the people for whom they are acting as stewards.

One way to look at this problem and one way to try to design institutions to minimize its occurrence is through proper separation of roles and responsibilities. So people who analyze investments should be independent of those who have a position for or against them. Similarly, those funding the investment should perhaps be separated from those planning and designing it and, again, analyzing its viability.

This is perhaps the biggest difficulty with the three specific regional infrastructure arrangements assessed in this paper. In all three cases decision-making and analysis responsibilities are not clearly separated from vested interest. In particular, there is a lot of up-front money coming from Federal agencies and as the saying goes, "He who pays the piper calls the tune." At the very least, this sort of thing looks bad. At the worst, it ends up resulting in distorted agendas.

This statement is not a blanket condemnation of practices in any of the three case studies nor in any of the other examples discussed. Not enough analysis of the particulars has been done to draw strong conclusions either way. Nor is a formula for perfection being offered. Instead, consider this a call for incorporating the issue explicitly into decisionmaking and organizational design.

How to accurately and credibly analyze rate-of-return

Last, and certainly not least, is the issue of proper analysis of regional infrastructure. Two questions related to this are: "How do you decide what infrastructure should be financed? Can you use benefit-cost analysis?"

To answer the second question first, the answer is "by all means." For benefit-cost analysis, generically speaking, is simply the identification of benefits and costs and the weighing of one against the other. The main argument of this paper is in fact for more benefit-cost analysis, not less. The wrinkle is, however, to expand the sorts of benefits and costs which are being looked at.

Traditional benefit-cost analysis, at least on the infrastructure side, focuses on economics. To the extent that people call for expanding such analysis, they call for looking at a wider range of economic factors such as external costs and benefits (e.g. pollution impacts), nonpecuniary values (e.g. "existence" values for things such as natural habitat preservation) and "macroeconomic" and "general equilibrium" economic effects rather than just "microeconomic" and "partial equilibrium" impacts (examples of the latter case being regional spillover effects). Some of these can be quantified and some cannot, and some can be monetized and some cannot. Additionally, many people believe that there is value in doing "distributional" analyses which show how gets the benefits and who bears the costs, though most would admit that these should be provided in addition to and separate from a net impact analysis for including "transfers" such as this would be a double-counting of benefits and/or costs.[12]

There is a lot of controversy over these issues and so there should be. But as important as these issues are, they do not cover all the issues which should be considered in a benefit-cost analysis of regional infrastructure. All sources of costs and benefits -- managerial/administrative/organizational factors as well as market-based/economic and purely technological factors -- should be explicitly analyzed. Table 7 provides an analytical template for such an analysis.

TABLE 7: A BENEFIT-COST TEMPLATE

	TYPES OF IMPACTS		
TYPES OF MEASURES	Management	Economic	Technological
Baseline (with/without)			
Go/No-Go (net benefit)			
Ongoing Operations			
Distributional			
Etc....			

The Table really only summarizes much of what has been said earlier in this paper. To sum it up, benefit-cost analysis should, where feasible, spell out different sorts of information that is useful across all stages of an investment life-cycle (from Go/No-Go, through operations and so on) and should assess returns that arise from pure technological/engineering arrangements, pure economic/market-based characteristics and pure managerial arrangements.

[12] For a fuller discussion of some of these issues and the methodologies used to capture some of them, see "Implementing benefit/cost analysis in federal agencies: Concepts, practices, and issues," by Cameron Gordon and Michael Bell, paper presented at the 1998 APPAM conference.

It will not always be necessary to do all of the analyses. For example, small projects, such as a new off-ramp on a State highway system, can probably be assessed in isolation from the overall organization of the State highway department which can be taken as a given for the purposes of analysis. But the bigger the project, the bigger the management challenge as in some cases entire new organizations may have to be built.

These management 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 the United States 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 US 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.

Conclusion

Now, getting back to that first question: How do you decide what infrastructure should be financed? Well, if you do all this, you probably have a pretty good idea of what the answer to this question is. And you also have a good way to isolate which parts of the infrastructure complex should be focused on, for you have broken it down into the key moving parts.

But keep in mind that a decision should be supported by an analysis and not determined by it. Analyses can be wrong and wise decisionmakers may go against it on the basis of a broader knowledge or experience. If they do, they should, of course, make it clear why they are ignoring the analysis. Furthermore the analysis should always be clear and transparent and as simple as possible. Analysis, like anything else connected with infrastructure, should be cost-beneficial.

All of which is a tall order. But then again, so is regional infrastructure provision and management. It's a job that must be done, so why not do it as well as possible?