Economic Evaluation for Decision Making on Transportation Projects, Programs, and Policies

PRESENTATION

Randall J. Pozdena, *ECONorthwest*

Note: The full text of the resource paper prepared and circulated by Mr. Pozdena in advance of the conference appears in the "Resource Papers" section of these proceedings.

My paper is about the transportation decision-making process—the process by which we plan for, select, and implement transportation projects in the public sector. This process can be viewed as the public-sector analogue of the process that the private sector uses to choose from among competing investments.

However, the private sector has the advantage of having a singular objective: to maximize profit. It enjoys the benefits of a winnowing process in which economically unproductive projects are very quickly taken out of the mix. We don't always have that luxury in the public sector. So, we have to have to develop analytic processes that are more complex and more time-consuming. The paper I prepared for this conference focuses on the information requirements for selecting transportation policies, programs, and projects within the public sector.

My paper and my remarks revolve around a simple decision hierarchy. Within this hierarchy you set clear policy objectives and evaluation criteria. You then set up

programs that align with those objectives and meet those criteria. The programs are used to develop candidate projects. Finally, you apply a rigorous selection methodology to those candidate projects. Above all, it is important to articulate objectives and evaluation criteria at the front end of the process and then carry those objectives and criteria throughout the hierarchy.

Of course, all this takes place in a bath not only of data and analysis, but also of political and social goal-seeking. Thus, many projects are selected through a shortcut process, which is not always a healthy thing. Shortcut analyses and ex-post-facto project justifications actually were not too bad in our nation's early years. If you knew you needed to span the Golden Gate or cross the East River, you could make small errors relative to the project's large benefits and really not impair economic efficiency very significantly. But now we must concern ourselves with the margins. In this day, we are more likely to make relatively large errors on a project's incremental benefits unless we do the analysis with more rigor.

There is an old joke about lawyers, that 99 percent of lawyers give the rest of them a bad name. I think the same is true about the transportation decision process: it is not perfect in the main, but it still has kernels of good judgment. Moreover, we can understand how it can be improved by looking at the idealized process.

Certainly you have to respect political reality, because this is the world in which we live. Still, my own feeling is that a lot of the constraints on analysis that are attributable to political demands could be removed if we bet-

ter understood the opportunity costs that they impose. I truly believe that information and analysis can help remove some of the political constraints that we otherwise take for granted.

As we move through the decision hierarchy from policy, to programming, to project selection, we must face a myriad of measurement issues. The main thing is to make sure that we count everything worth counting. This is really the sum total of the various research statements I have included at the end of my paper. These research statements deal with such things as

- The inadequate characterization of transit supply responses within the urban transportation context,
- How to better monetize transportation externalities,
- How to better integrate system modeling and evaluation, and
- How to deal with distributional issues related to who pays for and who benefits from a given improvement to the transportation system.

I am sure that this conference's working groups will come up with many more.

WORKING GROUP FINDINGS

Abigail McKenzie of the Minnesota Department of Transportation, Anthony Rufolo of Portland State University (Oregon), and Terry Gotts of the Michigan Department of Transportation led the three groups assigned to the issue of economic evaluation for transportation decision making. The findings of these groups follow.

Key Questions

- Have all policy and project options been considered? For example, have all engineering design alternatives and modal alternatives been considered? Has the potential role of pricing and privatization been considered? What impact do existing legislation and, notably, earmarking have on the decision? What are the trade-offs between system preservation and enhancement?
- Have all potential effects of the proposed project been evaluated (e.g., congestion, environmental effects, user benefits, land-use patterns, business development, job creation)?
- Does the proposed project produce net gains to society as a whole? Within those net gains, who benefits? Who defines the benefits? What is the nature of the perceived benefits? Who bears the costs and why? How, if at all, can we compensate those bearing a disproportionate share of the costs?
- How well did prior decisions work?
- How do we ensure that the analysis is credible?
- What share of resources should be directed to data gathering, analysis, and monitoring?
- Is there a clear, well-defined policy that reflects societal values? Can I defend and justify my program?
- How should we allocate resources among modes (highways, public transit, intercity rail, ports, etc.) and nontransportation projects?

- How should we finance transportation investments? Does the choice bias future decisions?
- How do we monetize (value) benefits whose natural units are not dollars?
- How do I rank projects?
- What alternatives can achieve program objectives?
- How do we factor risks (and uncertainty) in outcomes into the decision-making process?
- What is the internal rate of return for a project and its alternatives?
- What is the interaction/synergy between projects?
- How do we consider factors such as environmental justice?
- What are the limitations on data and analysis?
- Which impacts are benefits, which are costs, and which are double-counted?
- What problem does the proposed project solve and how will we know if it does so?
- What policies and goals are supported? How do we know? Who cares?
- How do we choose among potential beneficiaries?
- Was economic analysis part of the analysis? What weight should be given to it?
- How do you evaluate system preservation versus enhancement?
- How does one make comparisons across modes?
- Does added capacity increase economic development?
- When should benefit-cost analysis be done?
- How reliable are our estimates of road users' costs?

Sufficiency of Data and Analytic Tools

- In generating alternatives, it is difficult to discern interactions among individual projects.
- We need improved information on how to monetize benefits with natural units other than dollars (e.g., environmental impacts, travel time).

- We need improved travel demand forecasts, and we need to improve our understanding of travel behavior (especially nonpeak). In the same vein, we need to disaggregate elasticities by submarkets. Also, detailed trip/tour characteristics by demographic group are needed to disaggregate benefits and costs.

- As noted by Randall Pozdena, we need a better understanding of proposed projects' impact on networks and businesses. We also need a better understanding of freight and transit supply responses to changing conditions and more fine-grained data on freight movements.

- We need a better method for measuring sprawl.

- We need better information on how technology and changes to existing policy will affect future demand.

- There is little reliable information on the effectiveness of transportation demand management and other strategies.

- Estimates of user benefits from capacity improvements are often based on inaccurate baselines.

- "Costs" may not include all applicable costs, such as the opportunity cost of right-of-way.

- Inaccurate myths are frequently used in policy discussions, such as the notion that each transit ride represents reduced auto use.

- The system effects of individual decisions are neither well modeled nor well evaluated.

- It would be helpful to see how risks and uncertainty might be factored into the decision-making process and how uncertainty affects the results.

- Monitoring is hampered by a lack of baseline (i.e., benchmark) data (speed, safety, travel time, volumes, etc.). We need to keep regular tabs on how estimated costs compare to actuals.

- We lack honest auditors, accreditation, or other methods of certifying the analytic process. We also need updated guidance on how to perform economic analysis. Automated tools to support benefit-cost analysis would be helpful.

- It is unclear how willing policy makers are to commit resources to data and analysis, particularly given the uncertainty concerning the payback from investing in better information and analysis.

- Analysts lack good information on travel-time values by commodity group and trip purpose.

- Data are needed for quantifying the benefits of system preservation; the effect of given improvements on the cost of operating a vehicle; and the relationship among transit infrastructure, amenities, and benefits.

Research Needs

- Obstacles to implementing benefit-cost analysis: issues and solutions;

- Development of best practices for benefit-cost analysis and a standardized reporting template;

- Improvement of estimates of travel-time value for passengers and commodities;

- Development of expanded information on travel behavior and the demographic characteristics of households;

- Improvement of the integration of transportation system modeling and evaluation models;

- Development of a methodology to disaggregate elasticities;

- Identification of primary conditions and determinants for success in implementing congestion pricing;

- Management of risk in the transportation investment decision-making process;

- Development of improved methods for estimating the distribution of benefits and costs from transportation projects among population subgroups and for compensating affected groups;

- Development of a methodology for generating complete sets of alternatives;

- Development of strategies for allocating resources across modal programs;

- Monetization of transportation externalities; and

- Assessment of the impact of project financing choices on project decisions.