Towns of

Cornwall Kent Ledyard North Stonington Preston

Connecticut

VIA email to OIRA_submission@omb.eop.gov

June 3, 2015

Howard Shelanski Administrator, Office of Information and Regulatory Affairs Office of Management and Budget Executive Office of the President 725 17th Street, NW Washington, DC 20503

Re: Economic Significance of Proposed Rule to Amend the Procedures for Establishing that an Indian Group Exists as an Indian Tribe; RIN 1076-AF18

Dear Administrator Shelanski:

By letters of May 6, 2013, September 4, 2014, and January 6, 2015, the Towns of Cornwall, Ledyard, North Stonington, Preston, and Roxbury, Connecticut submitted comments to you expressing strong concern over proposed revisions to the long-established rules governing the acknowledgment of Indian Tribes under federal law (25 C.F.R. Part 83), and the inadequate analysis of those proposed revisions under the Paperwork Reduction Act. As discussed in our previous letters, the proposed rules would have an unfair and disproportionate impact on our Towns and the State of Connecticut by allowing previously-denied petitioner groups to seek reconsideration under greatly relaxed substantive criteria, and by limiting the ability of interested parties to participate in the administrative process.

The purpose of this letter is to call your attention to the inadequate analysis of the economic impact of the proposed rules. As discussed in these comments and the enclosed economic report, the proposed rules will easily have an annual economic impact of over \$100 million, and should therefore be the subject of a full economic analysis, as required by section 6(a)(3)(C) of Executive Order 12866, and as necessary to comply with statutory requirements, including under the Congressional Review Act and the Unfunded Mandates Reform Act.

Unfortunately, the proposed rules fail to provide an adequate analysis of this important issue and incorrectly conclude that the regulations would not have such an impact. We therefore request that the Office of Information and Regulatory Affairs conduct its own analysis, determine the proposed regulations will have more than a \$100 million annual impact, and return the proposed rules to the Department of the Interior for revision and compliance with the laws and directives that apply to regulations that have such an impact.

Economically Significant Regulations

Numerous important requirements apply to the promulgation of economically significant regulations. The Congressional Review Act, 5 U.S.C. §§ 801-808, provides an expedited procedure for Congress to disapprove regulations, and imposes specific requirements with respect to "major rules," which include any rule that "is likely to result in an annual effect on the economy of \$100,000,000 or more." 5 U.S.C. § 804(2)(A). Major rules are subject to specific requirements, and cannot take effect for at least 60 days. 5 U.S.C. § 801(a).

The Unfunded Mandates Reform Act, 2 U.S.C. §§ 1501-1571, requires agencies to assess whether a proposed rulemaking "is likely to result in promulgation of any rule that includes any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more (adjusted annually for inflation) in any 1 year." For such a rule, the Act imposes consultation requirements with state, local, and tribal governments; requires the comprehensive assessment of anticipated costs and benefits and other economic effects; and requires the promulgating agency to choose the least costly, most cost-effective, or least burdensome regulatory alternative. 2 U.S.C. §§ 1531-1535.

Section 6(a)(3)(C) of Executive Order 12866, Regulatory Planning and Review (Sept. 30, 1993), requires a full assessment of the benefits and costs of what is known as an "economically significant" rule (and feasible alternatives to that rule), defined as "any regulatory action that is likely to result in a rule that may [h]ave an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities." E.O. 12866, § 3(f)(1). OMB Circular A-4 and related guidance¹ make clear that the \$100 million thresholds under E.O. 12866 and the CRA are identical, apply to impacts in any one year, and include benefits, or costs, or transfers.

These requirements serve to ensure that economically significant regulations receive appropriate scrutiny. These requirements, however, are only triggered if the agency first makes an accurate determination of whether the \$100 million threshold is met. The Department's superficial analysis appears to have been intended to avoid triggering this threshold. Such a conclusion was incorrect.

¹ OIRA, Regulatory Impact Analysis: Frequently Asked Questions (FAQs) (February 7, 2011) at 1-2, available at: <u>https://www.whitehouse.gov/sites/default/files/omb/assets/OMB/circulars/a004/a-4_FAQ.pdf</u>.

The Department's Analysis is Inadequate

In its May 29, 2014, Notice of Proposed Rulemaking, the Department included only conclusory statements that the proposed rule is not significant under Executive Order 12866, and will not have an economic impact of \$100 million or more in any one year. 79 Fed. Reg. 30766, 30770-71. The Department simply asserts that the rule "will not result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector of \$100 million or more in any one year" and that the rule "does not impose an unfunded mandate on State, local, or tribal governments or the private sector of more than \$100 million per year." The Department states that the rule is significant under E.O. 12866, but does not address the \$100 million threshold under that authority.

The Department does not explain its reasoning, but presumably its conclusions are based on its repeated assertions that the proposed revisions are procedural only, and will not significantly affect substantive outcomes. These assertions are demonstrably incorrect.² The proposed regulations will affect substantive outcomes in several ways, as described below. And as discussed below and in the enclosed economic report, coupled with the reasonably foreseeable economic impact of new tribes, especially with respect to the multi-billion dollar gaming economic sector, each of these changes can be expected to have annual economic impacts of over \$100 million.

The Proposed Regulations Would Result in the Acknowledgment of Petitioners That Otherwise Would Not Qualify

The public has not seen the final regulations currently under review by your office, but numerous provisions in the proposed regulations will result in the acknowledgment of groups that would not qualify under the existing regulations. First, the proposed revisions will relax the requirements for acknowledgment. For example, the current regulations prohibit previously-denied petitioners from re-petitioning, 25 C.F.R. § 83.10(p), but the proposed regulations include a provision allowing previously denied petitioner to re-petition. Allowing re-petitioning would thus, by itself, make it plausible that the new regulations will result in the acknowledgment of a previously-denied tribe, who would not otherwise even be eligible. Coupled with changes in the substantive criteria, the acknowledgment of previously-denied petitioners is virtually certain. For example, in Connecticut there are at least three previously-denied petitioners, two of whom initially received positive determinations based on the use of the existence of state reservations as determinative evidence, before these grounds were rejected by the Interior Board of Indian Appeals. *See In re Federal Acknowledgment of the Schaghticoke Tribal Nation*, 41 IBIA 30 (2005). The proposed regulations would allow the

² In addition, OMB guidance is clear that where regulatory impacts are uncertain, agencies should consider "plausible scenarios" and "characterize the evidence and assumptions underlying each alternative scenario." OMB Circular A-4 at 18. Thus, to the extent the Department may debate whether the proposed regulations will significantly change outcomes as compared to the current regulations, OMB need not resolve such a debate, so long as "plausible" impacts are properly evaluated under the applicable authorities and guidance.

existence of state reservations to be used in this way, rendering it a virtual certainty that these previously-denied petitioners would receive acknowledgment under the proposed regulations.

Other proposed changes to the substantive standards, including the community, political authority, and historical continuity criteria, as well as proposed changes to the burden of proof, will similarly result in the acknowledgment of groups that would be denied under the current regulations. Many knowledgeable commenters, including recognized experts; federal, state, and local government officials; and federally-recognized Indian tribes, have offered detailed explanations confirming that the proposed rules will have the effect of recognizing more tribes than under the current rules. A small sample of comments confirming this effect of the proposed regulation include:

- George Roth, Ph.D., 33 years in the Office of Federal Acknowledgment (OFA), whose September 27, 2014 comments state: "The proposed revisions are presented as a method of streamlining the Federal acknowledgment process and making it more transparent and objective while maintain the same standard. Instead, there are numerous large and small changes and additions in the proposed regulations which greatly weaken the standards and requirements. They do not establish an appropriate standard for showing continuous tribal existence and thus eligibility for acknowledgment as a sovereign Indian tribe. ... [The re-petitioning provision] is intended to recognize petitioners previously rejected, using a different standard."
- Michael Lawson, Ph.D., former OFA Senior Historian, whose July 7, 2014 report³ concludes: "The net effect of the proposed changes would significantly relax the standards for Federal Acknowledgment and vest considerable discretion in the decision-maker, the Assistant Secretary. The proposed revisions would undoubtedly have the desired effect of allowing many more Indian groups to qualify for Federal Acknowledgment, dramatically altering the pattern of acknowledgment of the last 36 years and significantly increasing the number of recognized tribes across the country. ... This report argues that if the mandatory criteria are reduced and the evaluation standards are lowered, as is recommended in the Proposed Rule, then the success rate of California petitioners should also increase from the overall national historical rate of one-third to perhaps a success rate of one-half." Lawson estimates that, compared to the current process, the proposed rules would result in a net addition of 11-12 new tribes in California, and 7-8 net additional Indian casinos.
- Agua Caliente Band of Cahuilla Indians, whose September 30, 2014 comments state: "However, after careful review the Tribe has significant concerns that the proposals would diminish the important criteria that must be demonstrated under the current rules to ensure integrity, confidence and reliability in the federal recognition process."

³ Lawson, Michael, PhD, California Indian Petitioners and the Proposed Revisions of the Federal Acknowledgment Regulations, July 7, 2014, available at: <u>http://www.standupca.org/stop/7-7-2014%20California%20Petitioners%20and%20Proposed%20Rule.pdf</u>.

- Cherokee Nation, whose September 29, 2014 comments in opposition to the proposed regulations explain: "We continue to oppose all efforts by the Bureau of Indian Affairs that would make it easier for non-Indian groups to usurp our sovereignty, unique history and culture. ... When an illegitimate group tries to act like a government and uses our name, it damages all Cherokee people. ... Any change to the federal acknowledgment requirements that make it more likely that these groups will be able to manipulate the process to gain federal recognition is an affront to the Cherokee Nation and every other tribe that has a historical government-to-government relationship with the United States."
- Eastern Band of Cherokee Indians, whose September 30, 2014 comments state: "These new rules, as proposed, would so dramatically water down the meaning of tribal sovereignty and tribal identity, potentially authenticating groups whose claims to tribal identity and existence are tenuous at best, that the sovereign rights and authenticity of existing tribal governments will be questioned and jeopardized in the future."
- Mississippi Band of Choctaw Indians, whose September 22, 2014 comments state: "The Tribe is concerned that the proposed rule undermines the substantive criteria for federal acknowledgment Any attempt to lower the standards in the federal acknowledgment process would open the door to invite various groups to submit non-meritorious petitions and cause more backlogs at Interior."
- Muckleshoot Indian Tribe, whose September 29, 2014 comments explain: "The ٠ Muckleshoot Tribe respectfully submits that the Department's characterization of the proposed rule as departing from the current rule "only in very modest ways" and as "largely in line with what we have done" in the past mischaracterizes the changes to the criteria that are proposed and the likely impact of those changes. In some cases the Department has failed to acknowledge the changes proposed, while in others it minimizes the nature of the changes, claims changes are consistent with past practice when they are not, or does not properly explain the reasons for the changes even though the Department is proposing a reversal of past policy and practice. Significantly, nowhere does the Department attempt to describe the impact of the proposed changes on the outcome of acknowledgment determinations. Indeed, it does not appear that the Department has analyzed the impact of the proposed rule on the outcome of its acknowledgment determinations. ... Substantively, the Tribe submits that the Department's proposal to acknowledge petitioners as sovereign Indian tribes without a showing of continuous historic existence impermissibly transforms the acknowledgment process into one of racial classification, is inconsistent with controlling law, and exceeds the Department's authority."
- The full Congressional Delegation of Connecticut, in a September 29, 2014 opposition letter, noted that the proposed regulations "would potentially allow federal recognition to petitioners that would not be considered historical, cohesive tribes as required under federal Indian law."

- Connecticut Attorney General George Jepsen, on behalf of the State of Connecticut, in comments dated September 30, 2014 concludes that under the proposed regulations, "[i]f adopted as proposed, petitioners could gain recognition in circumstances that would be at complete odds with fundamental principles of tribal acknowledgment."
- Our Towns have commented extensively in opposition to the proposed regulations on these grounds. For example, the Town of Kent, in its September 29, 2014 comments, describes in detail how "[t]he proposed revisions go far beyond procedural streamlining of the acknowledgment process and, contrary to law and precedent, represent a radical departure from the established substantive criteria for acknowledgment. As such, they raise serious questions regarding the legal authority for administrative acknowledgment."
- Local governments in other states have also commented in opposition. For example, the California State Association of Counties, in comments dated September 26, 2014, states that "many of California's counties have expressed concerns with and opposition to changes to the existing criteria that would reduce the evidentiary showing required by petitioners to achieve federal acknowledgment." In addition, many California cities have also filed comments expressing similar concerns.

Until recently, the Department has consistently asserted that it is uncertain whether the proposed revisions would change the substantive criteria for acknowledgment. The Towns and numerous other parties have submitted comments explaining in detail why these assertions are simply not credible. At a recent oversight hearing, however, Assistant Secretary of the Interior for Indian Affairs Kevin Washburn conceded that the proposal to allow previously denied petitioner groups to re-petition was conceived as a matter of fairness, *given that the substantive criteria were being changed*.⁴ Assistant Secretary Washburn's testimony leaves no doubt that the proposed rules will result in the acknowledgment of groups that would not otherwise qualify for acknowledgment. As a result, the consequences of allowing the recognition of tribes that otherwise would be denied under the current rules must be taken into account in evaluating whether the economic impact exceeds \$100 million. The Department failed to do so.

⁴ House Natural Resources Committee, Subcommittee on Indian, Insular and Alaska Native Affairs, Oversight Hearing on "The Obama Administration's Part 83 Revisions and How They May Allow the Interior Department to Create Tribes, not Recognize Them." (April 22, 2015) (Part 83 Hearing) at 1:13:52, available at: <u>http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=398320</u>. Assistant Secretary Washburn stated: "Well, honestly, again, we received comments all over the map on that very issue. I, you know, and I will tell you, the way this came up was we originally in the discussion draft had changes to the criteria. What I'm hearing now is that it's okay to change the process, but don't change the standards, the criteria. In the original discussion draft we talked about changing the standards in the criteria, and my view at the time was well, if we're really changing the criteria, if someone that had been through the process failed because of a criteria, and we've changed that criteria later, and they would have succeeded under the new criteria, it was only fair to say if they can prove that, they should be able to go through the process. It seemed only fair. And so that's kind of where the idea of re-petitioning came from. But again, it's been quite controversial."

Furthermore, even revisions that are ostensibly only "procedural" can substantially affect outcomes. The proposed revisions will limit the participation of interested parties, which in the past has been *essential* for the correction of erroneous determinations. The erroneous initial determinations to acknowledge the Eastern Pequot/Paucatuck Eastern Pequot and Schaghticoke Tribal Nation petitioners were *only* corrected because interested parties were able to participate fully in the process, including in administrative appeals before the Interior Board of Indian Appeals, which overturned the erroneous determinations. *See In re Federal Acknowledgment of the Historical Eastern Pequot Tribe*, 41 IBIA 1 (2005); *In re Federal Acknowledgment of the Schaghticoke Tribal Nation*, 41 IBIA 30 (2005). Thus, limiting the rights of interested parties to participate fully in the process can be expected to result in the acknowledgment of groups that would not be acknowledged under the current regulations.

Even Purely Procedural Improvements in Efficiency and Timeliness Will Have Significant Economic Effects

Even if the revisions are procedural only, they are intended to theoretically speed the acknowledgment of new tribes, and will therefore result in economic effects being incurred earlier than would otherwise occur under the existing regulations -- potentially years earlier. *See* 79 Fed. Reg. at 30766 (in response to criticism that the current process is "too slow (a petition can take decades to be decided)," proposed rule seeks to "promote timeliness" and "allows for faster decisions"). This would be a desirable result, as long as substantive standards and procedural rights are not compromised, and should therefore be closely analyzed to ensure that gains in efficiency are maximized without sacrificing the integrity of the process, yet the Department has not provided any analysis of the effectiveness of the proposed rule in this regard.⁵ Nonetheless, any significant reduction in a process that can take "decades" can be expected to result in acknowledgment decisions years sooner than under the current process. Given that a tribal casino can generate *billions* of dollars in annual revenues, such an effect alone can be expected to have over \$100 million in economic impacts in a given year.

The Proposed Regulations Will Have Over \$100 Million in Annual Economic Effects

The enclosed economic analysis prepared by ECONorthwest, an expert consulting firm with extensive background on tribal affairs and Indian gaming, describes generally the kind of economic assessment the Department should have performed—but failed to undertake—and describes ballpark estimates of the reasonably foreseeable economic impacts of the proposed regulations. Newly acknowledged tribes can be expected to receive federal benefits and

⁵ In the recent oversight hearing, Assistant Secretary Washburn stated: "We hope that the process becomes a little bit faster than it's been, well we'd like to say it's a lot faster. And one of the things that our proposal does, and I think our final rule will do is increase the speed of disapprovals, for example." Part 83 Hearing at 1:24:48. When asked if the Department has done an analysis of the effects of the proposed rule on timeliness, Assistant Secretary Washburn stated: "Well, we have, it's hard to know exactly what the effects are. We've been doing this process for 35 years, and we've denied 34 petitions and recognized 17, which is one every two years has been recognized, basically, but you know, one every year has been denied, in essence on average, so we hope that it goes a little faster than that going forward. But our changes I think will be incremental rather than dramatic. *Id.* at 1:25:28.

services, and to have land taken into trust—and thus out of state and local regulatory jurisdiction—for the purposes of establishing tribal headquarters, housing, and economic development activities. Gaming is particularly foreseeable. Gaming is one of the most lucrative economic opportunities for newly acknowledged tribes, especially given the advantage of being able to pick favorable market locations under the Indian Gaming Regulatory Act's exception for the initial reservation of a newly acknowledged tribe. 25 U.S.C. § 2719(b)(1)(B)(ii). Indeed, this is why petitioner groups are often funded by gaming investors.

This economic analysis does not attempt to quantify the full economic effects of the proposed regulations. But even by itself, the magnitude of the tribal gaming economic sector— \$28 billion in 2013—compels the conclusion that the proposed regulations would unquestionably have an economic effect of over \$100 million annually. In Connecticut alone, as described above, the proposed regulations would almost certainly result in the acknowledgment of at least two previously-denied petitioners (who are currently prohibited under the existing regulations from re-petitioning); in 2014, tribal casinos in Connecticut reported over \$1 billion in revenue just from slot machines. In California, gaming tribes reported average revenues in 2014 of over \$100 million per tribal casino. Given these revenues, it is clearly plausible that the proposed regulations could result in over \$100 million in annual economic impacts, if the proposed rules would result in even just one new tribe that would not otherwise be acknowledged under the existing regulations.

The substantial range and magnitude of non-gaming tribal economic activities and other economic effects further buttresses the conclusion that the proposed regulations will clearly exceed \$100 million in annual economic effects. For example, just the eight gaming tribes in Oregon alone reported in 2013, in addition to \$477 million in gaming revenues, \$83 million in revenue from hotels, shops, restaurants, and the like, as well as 4,784 direct employees and a total economic impact on the state of 11,510 jobs. In 2010, the 29 federally recognized tribes in Washington had a collective economic impact of \$3.5 billion—\$122 million per tribe—and collectively retained over 27,000 employees. This economic analysis—which is but a preliminary assessment of the potential impacts—clearly establishes that the Department was plainly incorrect in concluding that the proposed regulations are not economically significant.

In addition, other economic impact information currently in the record for the proposed rule confirms that the impacts on Connecticut alone would exceed \$100 million. As described in the May 5, 2014 comment letter to you from The Business Council of Fairfield County, the acknowledgment of just one previously-denied petitioner in Connecticut, coupled with the foreseeable development of a casino in Bridgeport, would have substantial economic impacts just from traffic impacts alone:

Considering the urban nature of southeastern Connecticut and the high volume of the casino gaming customer base from New York, New Jersey and Connecticut locations, the potential complications from the large-scale gaming that would result from newly recognized tribes are very significant. Concerned about the effects of casino gaming in southwestern Connecticut, the Connecticut South Western Regional Planning Agency (SWRPA) commissioned a detailed study of traffic impacts in 2001 from Buckhurst Fish & Jacquemart. ... The study assumed a new casino in Bridgeport, the location most often mentioned by the [Schaghticoke Tribal Nation] and [Golden Hill Paugussett Tribe] petitioner groups. Current information indicates that Bridgeport remains the likely target for casino development by a tribe receiving a favorable determination under Part 83. Because the traffic and transportation infrastructure problems in this region have only become worse since 2001, the results of the SWRPA report remain very relevant.

The SWRPA study found that a casino located in Bridgeport would have major impacts on traffic conditions along Interstate 95, Route 15, and other major roadways in the South Western Region of Connecticut. Casinos have unique traffic characteristics because they generate traffic 24 hours a day, seven days a week, 365 days a year; result in trips which are much longer than other types of trips; and generate more traffic accidents. In addition, a Bridgeport location would attract a very high proportion of trips from the southwest and would generate peak inbound traffic that coincides with peak periods of northbound traffic on I-95.

Based on the size of previous casino proposals for this location, and even assuming significant enhancements in public transportation, traffic on I-95 and Route 15 would increase in the range of 13-14%. On northbound I-95, this additional traffic would translate to bumper to bumper conditions on a summer Friday that would expand from six hours to 14 hours a day, roughly from 9 a.m. to 11 p.m. Between noon and midnight the average speed of traffic northbound on I-95 would decrease from 46 mph to 34 mph. Because of lower speeds, the traffic capacity of I-95 would decrease, and a substantial amount of traffic could be expected to shift to local roads. Similar impacts would result on northbound Route 15. Traffic on other roads would increase also 1-9%, albeit without capacity problems. Air pollution emissions would rise correspondingly, with substantial increases in volatile organic compounds (VOCs), which contribute to ozone, a pollutant of concern on a regional basis. More than 1,100 new traffic accidents per year would be expected on I-95 and the Merritt Parkway, with nearly 4 additional fatalities each year.

The direct economic impacts caused by the additional traffic would include \$64 million per year (in 2001 dollars; over \$85 million today) from traffic delays alone, and a staggering \$18.7 million (in 1999 dollars; over \$26 million today) from additional traffic accidents. ... The majority of these costs would be borne by commuters, business travelers, and consumers, with the balance primarily borne by local businesses. The full economic costs would also encompass indirect or induced costs related to delays and reduced accessibility, including

relocation costs of businesses and households, loss of employee productivity and business earnings, property value reductions due to reduced accessibility, etc. These costs are expected to be substantial, such that the total economic costs may be more than double the direct costs related to delays.

The members of the Business Council are, of course, highly dependent upon the transportation situation in southwestern Connecticut. Our members would experience very significant negative business impacts if the circumstances described in the SWRPA report occur. There would be far-reaching adverse economic impacts if the proposed regulations are promulgated, leading to the recognition of new gaming tribes in Connecticut. To those economic impacts, the added costs must be considered associated with increased crime, social problems associated with gambling, and increased burdens on governmental services.

These concerns are echoed in the September 30, 2014 comment letter to the Department by Regional Plan Association, the nation's oldest independent urban research and advocacy organization, which has been involved in regional planning in the New York-New Jersey-Connecticut metropolitan region since 1922. The Association noted that the proposed regulations "may also have a substantial impact on the number of tribes able to gain federal recognition" in the New York-New Jersey-Connecticut area, and recommended the Department provide more information in the form of land use and economic impact analyses. And as stated unequivocally by State of Connecticut Governor Dannel Malloy, in his February 24, 2014 letter to the President, if previously-denied petitioners are acknowledged under the proposed regulations, "[f]or Connecticut, the consequences would be devastating."

We therefore request that you return the proposed rule to the Department for a full economic analysis, as required by Executive Order 12866. A full economic analysis is necessary to ensure that the true economic impacts, including to communities and businesses, are fully considered and taken into account that the necessary consultation with state and local governments occurs, and that statutory requirements, including under the Congressional Review Act and the Unfunded Mandates Reform Act, are complied with.

Thank you for considering these supplemental comments.

Very truly yours,

Gordon Ridgwaý First Selectman Town of Cornwall

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Nicholas H. Mullane II First Selectman Town of North Stonington

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Bruce Adams First Selectman Town of Kent

John Rodolico Mayor Town of Ledyard

Robert M. Congdon First Selectman Town of Preston

Enc.

cc: Senator Richard Blumenthal Senator Chris Murphy Representative Joe Courtney Representative Rosa DeLauro Representative Elizabeth Esty Representative James Himes Representative John Larson Governor Dan Malloy Attorney General George Jepsen Assistant Secretary Kevin Washburn



ECONOMICS • FINANCE • PLANNING

ASSESSING THE ECONOMIC EFFECTS OF A PROPOSED REGULATION FROM THE BUREAU OF INDIAN AFFAIRS

28 May 2015

1 Background

The Bureau of Indian Affairs (BIA) at U.S. Department of the Interior (Interior) is considering changing its regulations for acknowledging the legal status of Native American tribes. Legal status as a tribe has several advantages: self-governance, trust land, gaming opportunities on Indian lands, access to various programs and grants, and various tax advantages and other incentives for business development.

At a minimum the change in regulation would reduce the time it takes applicants to navigate the process to its conclusion. It also would reduce the standards for achieving legal tribal status and reduce the means that other parties have to participate in the review of requests for tribal status, with the effect that there would be more legally acknowledged tribes than would have existed without the regulation, and economic consequences for existing tribes.

ECONorthwest ((ECO)¹ has been asked to comment on the *methods* by which one would assess the extent of the impacts of the proposed regulation. In particular, we have been asked how to evaluate whether the proposed regulation would (1) have potential "effects on the economy" that would exceed \$100 million on an annual basis and would therefore qualify as a "major rule" under the Congressional Review Act; (2) result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted for inflation) in any one year, thereby triggering requirements under the Unfunded Mandates Reform Act; or (3) have an annual effect on the economy of \$100 million or more, thereby requiring a cost-benefit analysis of the proposed rule and reasonable alternatives under Executive Order 12866.

Our assessment has three sections in addition to this one on Background:

- Section 2, Assumptions. Where we start from: what does the law say about an economic evaluation of a regulation, and what do we assume about the facts of this case?
- Section 3, Framework for the Evaluation. Based on the economic literature and federal guidance, what should an evaluation of the economic impacts of a regulation look like (a) in general, and (b) for the specific BIA regulation?

¹ ECONorthwest is a consulting firm that specializes in economics and finance, and the application of the principles and techniques of these disciplines to public policy. ECONorthwest has worked extensively in the field of *Benefit-Cost Analysis* (BCA) and on business development for tribes, including casinos. Information about ECONorthwest is included in Appendix C of this memorandum. Also, see econw.com. This report was prepared by Terry Moore and Bob Whelan (503 222-6060).

- Section 4, Ballpark Estimate. Our assignment is primarily to describe the *methods* for a proper economic analysis (Section 3). In this section we go farther to illustrate that that methods can be implemented with relatively modest effort, and to make the case that it is plausible that the BIA rule could have economic effects that exceed the threshold value.
- **Appendices**. Additional information about methods for public policy evaluation in general (Appendix A), methods for benefit-cost analysis (Appendix B), and the qualifications of ECONorthwest (Appendix C).

2 Assumptions

Our work builds from assumptions about the legal theory relevant to this rule making. Specifically:

- BIA's decision to change its regulations should be subject to the Congressional Review Act (CRA), 5 U.S.C. 801-808; the Unfunded Mandates Reform Act (UMRA), 2 U.S.C. 1501-1571; and Executive Order 12866.
- CRA requires a rule-making agency to determine whether the regulation it is proposing is a "major rule." It defines a major rule as one "...that the Administrator of the Office of Information and Regulatory Affairs of the Office of Management and Budget finds has resulted in or is likely to result in—

(A) an annual effect on the economy of \$100,000,000 or more

(B) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or

(C) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets.

- CRA does not define how one should attempt to measure "an annual effect on the economy." The most appropriate guidance is OMB Circular A-4 (September 2003) which says: "This Circular provides the Office of Management and Budget's (OMB's) guidance to Federal agencies on the development of regulatory analysis as required under Section 6(a)(3)(c) of Executive Order 12866, A Regulatory Planning and Review, the Regulatory Right-to-Know Act, and a variety of related authorities."
- UMRA requires agencies to assess whether a proposed rulemaking "is likely to result in promulgation of any rule that includes any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more (adjusted annually for inflation) in any 1 year."
- Executive Order 12866 requires a full assessment of the benefits and costs of what is known as an "economically significant" rule, defined as "any regulatory action that is likely to result in a rule that may:

(1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities."

The regulation, if adopted, would result in more tribes being acknowledged. Those tribes will require federal benefits and services, and will have land taken into trust by the federal government for the purposes of establishing tribal headquarters, housing, and economic development activities. These tribes will have flexibility in choosing the location of such lands and will choose locations favorable for economic development. Land taken into trust will not be subject to state and local land use regulation and taxation, and tribes will probably engage in economic activities that are competitively advantaged by not being subject to state and local prohibition, regulation, or taxation. Examples of such activities are gaming, marijuana cultivation and sales, payday lending, and tobacco sales. Some new tribes may also pursue extensive land claims.

Those assumptions create this chain of logic:

- 1. BIA is adopting a rule, so it must comply with CRA, UMRA, and E.O. 12866
- 2. To do so it must determine whether the rule triggers the \$100 million threshold
- 3. To do so it must use the definitions and procedures described in Circular A-4.

BIA apparently agrees with points "1" and "2." BIA's Notice of Proposed Rulemaking (79 Fed. Reg. at 30770-30771, Section III.C) addresses the CRA, UMRA, and E.O. 12866 requirements and simply repeats the criteria of 5 U.S.C. 804(2) saying that none of them are met (i.e., the rule is not "major" under the CRA). Similarly, it simply states that the rule will not result in an federal mandate of more than \$100 million per year in expenditures under UMRA. BIA states the proposed rule is significant under E.O. 12866, but does not address the \$100 million threshold.

But BIA apparently does not agree with point "3" – BIA provides no evidence to support its conclusion that the rule will not have impacts that would reach the \$100 million threshold.

It is not our task in this memorandum to evaluate whether regulatory review is a good idea in general, or whether the criteria and thresholds for the economic impacts that determine whether a rule is "major" or "economically significant" are the appropriate ones. Rather, we accept the assumptions that (1) federal law requires federal agencies to evaluate certain effects of the rules they adopt, (2) the law requires an evaluation of effects on the economy or expenditures to determine whether they exceed \$100 million annually, and (3) OMB Circular A-4 is the best guidance on how OMB wants agencies to make economic evaluation.

3 Framework for the Evaluation

3.1 Benefit-Cost Analysis and Economic Evaluation in General

The language and procedures of Circular A-4 are unambiguously the language and procedures of *Benefit-Cost Analysis* (BCA). That is the professional opinion of ECONorthwest. We have worked on BCA for 40 years in the fields of water, environment, and transportation, and have written guidebooks and software on how to apply BCA in the field of transportation. Thus, if there are points in Circular A-4 that are not completely defined, one should go to the extensive professional literature of BCA to get that definition.

Appendices A and B provide background information explaining the basic theory and procedures policy evaluation in general, and BCA in particular. These appendices are chapters of a book written by Terry Moore, one of the authors of this memorandum, for the American Planning Association. We summarize the main points as the related to the issues this memorandum addresses.

In concept, any action (whether taken by a single person, a business, a government, or some other grouping of people) has *effects* (*impacts*). Those effects are usually both positive and negative: in other words, they are *benefits* and *costs*. The benefits and costs accrue to different groups, and over time. Taken together, these points describe what a *full evaluation* of any action would, in theory, consider: it would look *what*, *how*, *how much*, *when*, and *who*. In other words, it is a comprehensive evaluation. Figure 1 illustrates the concept.

Any evaluation of actions considers *alternatives*. Doing nothing different is one alternative, and there are dozens of reasonable

Figure 1: Thinking about all the impacts (benefits and costs) of an action



Source: ECONorthwest

ways to do something different. In evaluating actions, what is important are *differences*: how do the impacts (benefits and costs) of this new action compare to the impacts that would have occurred if no action were taken. The no-action alternative is often called the *base case* because it is the base against which the impacts of alternative actions are measured.

To summarize the points so far, in any evaluation of public policy (choices about public-sector actions):

Society evaluates choices (alternatives for policy or investment) by looking at their impacts.

- Those impacts are of many types and can be positive or negative: benefits or costs.
- Identifying, measuring, and consolidating those benefits and costs across alternatives is the essence of policy evaluation (and of the evaluation technique called benefit-cost analysis.

BCA techniques are described in dozens of books, guidebooks, journal articles, and administrative rules (including OMB Circular A-4). One does not have to implement all of the analytical details suggested by BCA, but the basic principles are not far from common sense and common practice in policy evaluation: (1) establish an evaluation framework, (2) gather data and make measurements, and (3) assess and weight measurements, and make decisions.

- 1 Framework
 - Establish a framework for the evaluation. Among other things, that framework establishes categories of impacts for which one might want measurements. For this project, the relevant framework is BCA, and the specific focus is on economic impacts.
 - Consider all relevant project, program, and policy alternatives.
 - **Define a relevant base case.** Projects can be evaluated only relative to some characterization of what would happen without the project in place. Typically, the base case tries to represent the conditions that will prevail if no change (no new project, program, and policy) is initiated.
- 2 Measurement
 - **Consider all types of impacts.** Identify all the significant categories of benefits and costs, and the relevant geographic extent of each.
 - Consider typical challenges for measurement in the context of the particular infrastructure issue being addressed. Those challenges include:
 - **Measurement**. Do we have the data? Can we get them at a reasonable cost?
 - Interpretation: Even if we measure something accurately, is it good or bad? For example, in an effort to reduce greenhouse gas emissions (Environmental objectives) and increase accessibility for certain socioeconomic and demographic groups (Equity objectives), should a metropolitan area restrict parking at its venues to make travel by automobile more difficult? The tradeoffs include the efficiency and net revenues (Economic objectives) of the operations.
 - Magnitude. Even when we know the direction of the outcome we want (e.g., lower travel times), can we predict the effects of policies and projects?
 - **Distribution**. Measurements multiply as we try to deal with smaller groups and areas: by mode, by neighborhood, by special interest.
 - For each measures describe its salient characteristics. Those salient characteristics should be the same as *criteria for evaluating the usefulness of the measures*.

- Reduce the long list of measures to a manageable subset. Any broad category of measurement (e.g., economic impacts) has many possible measures. Analysts and policymakers must use some type of evaluation criteria to choose some subset of all possible measures as the best measures. Categories, measures, and evaluation criteria are easy to expand; trimming is the hard part. In doing the trimming analysts should consider how they will eventually combine multiple measures in each category to get a score for that category for a particular policy, program, or project. Even if scores are not used, the advantages of a nested hierarchy are considerable: in other words, one should be able to roll-up multiple measurement into some kind of rating at the next, more general level, and keep doing that until one is at the top level with a rating of one choice relative to another evaluated with the same measures.
- **Do the measurement**. Measure all the direct costs (construction, operation, capital maintenance and replacement) and benefits over a reasonable assumed life (5 to 10 years from some policies and programs; 20 to 50 years for some capital investments). Describe and, where possible, quantify and monetize, the user and non-user benefits and costs
- Consolidate the stream of future benefits and costs into a single measure of aggregate or average benefits and costs, and subtract the cost measure from the benefit measure to estimate net benefit. This step requires the proper analytical treatment of benefits and costs that occur in different amounts over different years. Annual benefits (in both type and magnitude) and costs (both capital and operating) change over the life of the project. The timing of the occurrence of these costs affects the attractiveness of a project because of the time value of money.
- Measure impacts on important subgroups. A consideration of subgroups rather than society as a whole helps policy makers consider how to evaluate the *distribution* of impacts and the *equity* (fairness) of that distribution. Policy makers might be interested not only in aggregate net benefits, but in net benefits (or costs) by travel mode or income.

3 Evaluation of selected measures to make decisions

As hard as it may be, measurement is the easy part. Where all evaluations of multi-objective decisions (and all public-sector investments and policy choices are multi-objective) get hung up is on aggregating multiple measures into some type of ranking that can be the basis for a choice. A key problem is getting agreement on the relative importance of the different measures. With that agreement, the measures are just an arsenal of data that parties to the debate can select from to press their cases. There are many techniques for aggregating measures suggested in the professional literature and applied in the field:² BCA, least-cost planning, multiattribute utility analysis, analytical hierarchy systems / conjoint analysis, choosing by advantages, numerical compilation of opinions, and matrix display and discussion with consensus or voted agreement.

² Not covered here all the sophisticated analytical and math-based techniques that come out of the literature of decisions analysis and operations research.

For this particular rule of BIA's we do not have to deal with the complications of a full, multi-attribute *evaluation of public policy*. The job is much easier because the assumptions limit the evaluation to a single criterion: the annual effect of the proposed rule on the economy.

Though the steps above are easy to describe, implementing them in the real world is technically complex.

3.2 Application of a Benefit-Cost Framework to the Proposed BIA Rule

The purpose of Section 3.1 was to illustrate that a full evaluation of the benefits and costs of public policy is complex, but that the framework of what such an evaluation should include is both logical and well-established in the professional literature of policy evaluation. It is our opinion that OMB Circular A-4 is clearly aware of this literature and means what it says: any full evaluation of regulatory effects should be done in a way that is consistent with the principles and techniques of BCA in general, and of OMB Circular A-4 in particular.

But the CRA does not specify that a full BCA of the regulation be done by the agency proposing a rule. Our assessment of CRA section 804(2), UMRA, and E.O. 12866 is that they do not ask that an agency initially evaluate the "net impact" (i.e., efficiency) of a proposed regulation to determine whether the \$100 million threshold is met. They apparently presume that a proposed regulation has a purpose and that it would provide benefits. They limit the requested economic evaluation to the cost side: are the effects on the economy greater than \$100 million (or, for UMRA, are expenditures greater than \$100 million)? That is much less than a comprehensive evaluation of the efficiency of the regulation.

Thus, we are looking to Circular A-4 not because the CRA, UMRA, or E.O. 12866 initially require a full BCA, but because the CRA and E.O. 12866 give no further guidance on what "effects on the economy" means or how it would be measured.

The question, therefore, is what BIA should do to produce an economic evaluation that would address the question of whether its proposed regulation is a "major" or "economically significant" rule as defined by Congressional Review Act, 5 U.S.C. 804(2); UMRA, 2 U.S.C. 1532(a); or E.O. 12866, §6(a)(3)(C) (referencing § 3(f)(1)). We created a list of steps based on our review of Section 804(2), UMRA, E.O. 12866, OMB Circular A-4, and the standard steps for economic analysis, policy evaluation, and BCA as described in Section 3.1 above. The steps:

1. **Describe the evaluation framework.** We covered most of this point above, but one point is critical: the definition of "an effect on the economy." Here is why it is so important.

The economic and BCA literature makes many distinctions about categories of economic effects. Most broadly, the ascendance of "sustainability" has reemphasized that a healthy economy is about more than jobs, income, and GDP; environmental quality and urban services contribute directly to the welfare of households, and to the economic

bottom line of firms. For economists, actions that change the environment or the distribution of resources all have effects on the economy.

But set that point aside and assume the effects on the economy are limited to the narrower and standard economic measures: jobs, income, sales, revenue, expenditures, profits, GDP, and so on. The economic literature distinguishes between gross effects and net effects, between real effects and nominal effects, between real economic gains and transfers, between economic effects and fiscal effects, and between efficiency and distributional (equity) effects. Which of these economic effects is the CRA or E.O. 12866 talking about? They do not say. Moreover, nothing in Circular A-4 defines the phrase directly.

One must infer a meaning. Our inference is based on guidance in Circular A-4, and the economic literature of BCA on which it is based. It is possible that the CRA and E.O. 12866 are concerned with a \$100 million *net <u>benefit</u>* to the economy, but that seems unlikely. More likely is a concern about a drag on the economy—about some type of economic loss.

It is possible that the concern was just with some aggregate amount of economic activity, but that would be inconsistent with the clear guidance in Circular A-4 that an economic evaluation must look at distributional effects.³ The Circular does, however, distinguish between "efficiency" effects and "distributional" effects and in one place implies that the description of distributional effects are separate from "the estimates of benefits and costs of a regulation."⁴

With respect to the Section 804(2) and E.O. 12866 requirement to look at "effects on the economy" Circular A-4 adds some clarification but is not definitive. It clearly requires that an evaluation look at distributional impacts and transfers, but it requires (consistent in guidance from the literature of BCA) that the distributional impacts be reported separately so they do not confuse the economic efficiency measures.

Our inference, consistent with Circular A-4, is that any economic evaluation of whether a rule is "major" or "economically significant" (CRA and E.O. 12866) should try to quantify both efficiency effects (benefits, costs, and net benefits or costs), and the

³OMB Circular A-4, September 17, 2003, makes numerous references to the need to address "distributional" impacts: e.g., "You should study alternative levels of stringency to understand more fully the relationship between stringency and the size and distribution of benefits and costs among different groups" (page 8); "Your regulatory analysis should provide a separate description of distributional effects (i.e., how both benefits and costs are distributed among sub-populations of particular concern) so that decision makers can properly consider them along with the effects on economic efficiency" (page 14); "Where distributive effects are thought to be important, the effects of various regulatory alternatives should be described quantitatively to the extent possible, including the magnitude, likelihood, and severity of impacts on particular groups" (page 14).

⁴ OMB Circular A-4, page 38. And "You should report transfers separately and avoid the misclassification of transfer payments as benefits or costs. Transfers occur when wealth or income is redistributed without any direct change in aggregate social welfare. To the extent that regulatory outputs reflect transfers rather than net welfare gains to society, you should identify them as transfers rather than benefits or costs."

distributional (transfer) effects. How these separate measures should be tested against the \$100 million threshold is anyone's guess: the CRA and E.O. 12866 do not answer that question. BCA principles would argue against adding efficiency and distributional effects. Our recommendation would be that if either type of measure exceeded the threshold the rule should be classified as "major" or "economically significant."

Regarding UMRA, the test is different, though superficially it looks the same. It sets a standard \$100 million per year,⁵ but for "expenditures," not for "effects on the economy." Expenditures are easier to both define and measure. If an agency does the required preliminary evaluation and finds that the \$100 million threshold is likely to be exceeded, it must then "…prepare written statements that identify costs and benefits of a federal mandate to be imposed through the rulemaking process……"—in other words, it must conduct a full BCA per the guidance of Circular A-4.

2. **Provide information to support claims about the direct effects of the rule.** In particular, will the rule change the number of acknowledged tribes from what the number would have been without the rule, and if so, by how much. This is the crux issue. If the rule's only effect were to remove unproductive paperwork for tribes that were going to get acknowledged anyway, then there may be some effects on timing, but not on the number of tribes, and the effects on the economy are likely to be below the threshold. But if the effect will be to create more tribes than would otherwise have existed, the economic effects on existing tribes could be substantial.

In theory, even if the rule does not create any more new tribes over some period (e.g., 10 years) it could have the effect of expediting processing so that a larger number of approvals occur in some earlier year increasing the odds that they collectively will have effects in excess of the threshold amount.

3. Assuming the regulation will result in a greater number of acknowledged tribes (point 2, above), quantify the implications for effects on the economy. This analysis would start with a reasonable description of the potential pathways in which a greater number of tribes could have an economic impact.

For many groups wishing to get acknowledged as tribes, the primary motivation may be about culture and self-governance. But with tribal status comes the right to economic resources from the U.S. government and treatment that can be more advantageous to business development than what is offered to non-tribal businesses. That different treatment may be justified based on principles of federal Indian law, but it is probably not justified on the basis of the overall efficiency of the US economy. On the one hand, if acknowledged tribes are net receivers of US tax dollars, then creating more tribes could have negative effects on the aggregate economy. On the other hand, new tribes may

⁵ That is the amount in the original rule, but it is indexed to inflation. By one estimate the amount was the equivalent of around \$150 million in 2014 (Unfunded Mandates Reform Act: History, Impact, and Issues, Robert Jay Dilger and Richard S. Beth, Congressional Research Service, R4095, November 17, 2014).

provide members with a better bundle of services more efficiently provided and cause the individuals thus assembled to be more effective contributors to economic activity.

But the bigger effects are likely to be distributional effects, not net efficiency effects. And the biggest losers could be tribes already acknowledged or affected local communities. The economic success of many of those existing tribes has been based on their rights as sovereigns to engage in economic activity that is not legally allowed by many state and local governments (primarily gaming). One should expect newly acknowledged tribes to look for ways to take advantage of the economic options available to them.

In this example, the market may expand for gaming activities (general efficiency gains), but those gaming revenues will almost certainly come from (1) in part, from a reduction of consumer expenditures on other forms of entertainment, and (2) other gaming facilities.

Gaming is the biggest and most obvious area for economic impact, but there are others. New tribes may engage in other economic activities that compete with local entrepreneurs, take urban land into trust and off tax roles of local government, substitute tribal services for local services, and more.

Maybe these effects amount to less than \$100 million. But without some analysis, there is no evidence to support a claim either way.

The analysis *could* be detailed and long, but it need not be. The basic steps:

- Describe current and likely future conditions without the new regulation: number of tribes, location, budgets, gaming facilities (number and gross revenues), etc.
- Make a defensible estimate of how the number of acknowledge tribes will change as result of the regulation. Presumably BIA would know where people are requesting tribal status: location matters.
- Use economic and market analysis, existing studies, and logical inference to create some simulations of what economic activities new tribes would engage in and how that would affect (10 local economies, and (2) economic operations of existing tribes.

The next section gives a sketch-level example of this kind of analysis.

4 Ballpark Estimates

4.1 Purpose

Our assignment is <u>not</u> to do the analyses that we believe CRA, UMRA, E.O. 12866, and OMB Circular A-4 require and that we described in Section 3.2. Rather, it was to make the case that BIA has not done the kind of analysis that would be needed to test the hypothesis that the

effects on the economy of the BIA regulation are less than \$100 million. The record we were given to review does not contain that analysis.

A weak defense for not doing the analysis that the answer is obvious: the regulation could not possibly have a \$100 million impact. We say "weak" because is the answer is obvious, it should be relatively easy to supply the reasoning and data that lead to that answer.

Our best guess is that BIA based its conclusion on the assumption that the rule would have the sole effect of making a bureaucratic process more efficient and faster. Some tribes might get through the process sooner, but over the long run the same number of tribes would get acknowledged as tribes with legal standing. Under that assumption it is plausible to conclude that a slightly accelerated acknowledgment schedule would (in a BCA sense) have relatively small impacts over time and the present discounted value of those impacts would be even smaller. As noted above, however, it is also possible the rule's expedited processing could cause a larger number of approvals to occur in some earlier year, increasing the odds that they collectively will have effects in excess of the threshold amount.

Our purpose in this section is to illustrate that under a different set of assumptions about what the rule would do, and under a plausible definition of what effects on the economy are, the results are much different and could easily exceed the \$100 million threshold. Our analysis is suggestive only, not definitive. Our purpose is to illustrate that BIA's analysis is inadequate; that its conclusion that economic effects are less than \$100 million could be wrong (given reasonable definitions of effects on the economy), and that it should be required to address the requirements of CRA , UMRA, and E.O. 12866 by doing an economic assessment consistent with the BCA guidelines in OMB Circular A-4.

4.2 Analysis

If one were to measure economic effect as the value of business revenues, the likelihood that a single newly recognized tribe could, by itself, exceed the \$100 million threshold is clear from the federal data. The Bureau of Indian Affairs stated on May 6, 2013 that there were 566 recognized Indian Entities.⁶ The National Indian Gaming Commission reported there were 235 gaming Indian tribes that generated \$28 billion in gaming revenues in 2013.⁷ Thus, on average, gaming tribes generated \$119 million each (\$28 billion divided by 235). Even if one were to claim new tribes were as likely as recognized tribal entities to have gaming, then the average per tribal entity would be \$49 million. Thus, little more than two new tribal entities would push total gaming revenues above the \$100 million threshold.

But gaming revenues are only one economic effect. With gaming come hotels, restaurants, and similar amenities. National data are unavailable, but tribes in some states do collect and report data. In Oregon, for example, there were eight gaming tribes in 2013. Their gaming revenues

⁶ Federal Register. Volume 79, number 19. Wednesday January 29, 2014. Pp. 4748-4753

⁷ National Indian Gaming Commission. "2013 Indian Gaming Revenues Increased 0.5 percent." PR-227 07-2014.

were \$477 million, but they also reported an additional \$83 million from hotels, shops, restaurants, and the like.⁸ These amenities certainly do have economic impacts. They affect labor markets. In Oregon alone, eight casinos and their related businesses employed 4,784 directly in 2013 and had a total economic impact on the state of 11,510 jobs.⁹

More importantly, gaming pays for tribal government services. Tribes have gaming not as their purpose in being, but as a means of earning money for tribal needs. That is similar to the reasons state governments run lotteries. Tribes engage in gaming if they hold enough competitive advantages so that their enterprises can profit and give money back to tribal government.

A study conducted for Washington tribes confirms the effects of tribal recognition on both gaming revenues and tribal government spending. It notes that in 2010 the 29 federally recognized tribes in Washington collectively employed 15,387 in gaming businesses, but also 7,829 in tribal government services and 4,160 in various non-gaming related enterprises. Indeed, statewide, the 29 tribes had a collective economic impact of \$3.5 billion.¹⁰ That is \$122 million per recognized tribe, as measured in total value added, also known as gross state product, which on the national level is called the GDP and is perhaps the most familiar measure of economic effect.

Clearly, on average, existing tribal governments have annual effects on the economy of \$100 million when measured by tribal government impacts or gaming revenues. But would tribes gaining recognition under the proposed new standard be certain to not approach the \$100 million threshold? We need to look no further than consider groups eager to take advantage of the change.

In Connecticut, descendants of three tribal groups have been denied federal recognition because they cannot prove they existed as a community since first contact. They would have a smoother path to federal recognition under the proposed revised tribal recognition rules.¹¹ The likelihood that any of the three, should they open a casino, would be able to generate at least \$100 million in gaming revenues is nearly a certainty, as the two tribes with casinos in Connecticut make at least that from their casinos each month.

In fiscal year 2014, the State of Connecticut reported \$508 million in slot gaming revenues at the Mashantucket Pequot Tribal Nation's Foxwoods Casinos, in Ledyard, Connecticut. The state reports \$688 million in slot gaming at the Mohegan Indian Tribe's Mohegan Sun Casino in Uncasville, Connecticut.¹² And like other casinos, substantial revenues come from non-slot

⁸ The Contributions of Indian Gaming to Oregon's Economy in 2012 and 2013. Oregon Tribal Gaming Alliance. May 5, 2015. Page 17.

⁹ *Op. Ed.* p. 19.

¹⁰ Taylor, J. The Economic and Fiscal Impacts of Indian Tribes in Washington.. 2012. Page 4.

¹¹ Green, R. "Tribal recognition battle may restart." Harford Courant. July 6, 2013.

¹² State of Connecticut website accessed May 28, 2015 at <u>http://ct.gov/dcp/cwp/view.asp?a=4107&q=482876</u>

sources. In 2014, the Mohegan Tribal Gaming Authority reported to the U.S. Securities and Exchange Commission that they brought in a total of \$995 million from Mohegan Sun from slots, other forms of gaming, entertainment, restaurants, and lodging at their Connecticut property.¹³

California is a lucrative gaming market. 69 tribal casinos brought in \$7 billion from gaming in 2013. That is \$101 million per tribal casino.¹⁴ In California, the state reports 72 tribes are seeking federal recognition.¹⁵

Recognition offers groups an ability to engage in other business activities that are prohibited or limited to private sector competition by law. In Oregon, when recreational marijuana will become legal on July 1, 2015, tribes can grow, process, and sell cannabis without having to pay the state specified excise tax or the federal income tax, which is particularly large. A recent study estimates that 29 percent of the ultimate retail price of recreational marijuana (\$144.89 an ounce) in Oregon would go towards the state and federal taxes (\$42.67 an ounce), neither of which tribes would have to pay.¹⁶

Another way to define effects on the economy is to look at the distributional effects (per Circular A-4). The numbers above suggest an average of \$100 million a year in revenues to existing tribal casinos. If newly acknowledge tribes create new casinos that cut in the revenues of existing casinos by just 10%, it takes only ten new tribes to meet the \$100 million threshold.

We noted above that the analysis in this section is not definitive. It is based on only preliminary research. But it illustrates the kind of analysis BIA can and should do if it wants to (or is legally compelled to) provide some evidence for its assertion that its rule is not a "major" or "economically significant" rule because the effects on the economy will be below the stipulated threshold amount.

¹³ Form 10-K. Mohegan Tribal Gaming Authority. United States Securities and Exchange Commission. Fiscal year ending September 30, 2014. Page 32.

¹⁴ Mason, C. "California's Indian casinos draw in \$7 billion in 2013." The Press Democrat (Santa Rosa). March 31, 2015.

¹⁵ CAL/EPA Policy for working with California Indian tribes. California Environmental Protection Agency. October, 19, 2009.

¹⁶ Oregon Cannabis Tax Revenue Estimate. ECONorthwest. July 22, 2014. Page 11.

APPENDIX A

From "The Transportation/ Land Use Connection," Terry Moore, 2008. A book published by the American Planning Association.

APPENDIX A

Framework for Evaluating Public Policy¹

Policy makers and analysts agree, in theory, that good evaluation of public policy² requires identifying and measuring significant benefits and costs. In practice, however, they disagree about how and how well those benefits and costs can be identified, measured, and summed.

Just identifying the potential effects of a large project is difficult. Estimating the *direction* of an effect (positive or negative) gets harder. Estimating the *magnitude* of an effect (how big is that positive or negative impact?) harder yet. Consolidating the many effects into a summary measure of net impacts is beyond the capabilities of almost any impact analysis—although that is often not recognized in the analysis.

The point is not that public policy decisions cannot be made without a thorough and reliable evaluation: such decisions are made daily. Rather, the point is that if a community (local, regional, state, or national) is serious about basing a decision on an assessment of likely impacts, it should accept some well-supported principles about the structure of such an impact analysis.

This appendix discusses principles fundamental to the evaluation of *any* large public investment decision (not just decisions about transportation projects and programs). It has three sections, plus a summary at the end:

- 1. **Overview of Policy Evaluation** describes the broad goals of any evaluation of the full costs of large public investment decisions.
- 2. **Principles for Evaluation** defines terms and gives some guidance on how to identify and measure what matters to the public and elected officials.
- 3. Using Technical Work in a Political Process describes how multiple measures of desired objectives can get combined in a way that is technically defensible and makes sense to policy makers and the public.

OVERVIEW OF POLICY EVALUATION

Public policy gets adopted to achieve public objectives. Thus, at the most basic level, an evaluation of public policy must answer two questions: What do we want to achieve? and What do we do to increase the likelihood that we will achieve it? Figure A-1 illustrates the questions.

The two questions come together when possible policy actions get evaluated against measures of desired outcomes. Below is a description of the ideas and terms used in Figure A-1:

- Things a community wants to achieve (desired outcomes). These things may be stated broadly or specifically. Positives (what we want; desired outcomes; benefits) are mirror images of negatives (what we want to reduce or avoid; undesired outcomes; costs).
 - Goals are broad statements of desired outcomes. Examples: increase environmental quality, economic prosperity, transportation choice, social justice. If the high-level goals get parsed into sub-goals, they are often called *objectives*. Logically, since goals and objectives are the categories of things people care about, they are roughly synonymous with the term *impacts*: the objectives are about good impacts that a community wants to increase, and bad impacts that it wants to reduce.

Outcomes/Impacts Public Actions Goals Planning **Fundamentals** Principles Objectives Funding Investment Measures Incentives Indicators Regulation Evaluation Criteria Specific General

What do we want to achieve?

What do we have to do to achieve it?

Source: ECONorthwest

Pick Best Actions Activities that achieve the desired outcomes most efficiently (given cost/impact) and fairly

Figure A-1. The standard planning model for most regional planning efforts

- 2. *Measures* are specific statements of outcomes. They should fall under ("nest within") one of the higher-level goals or objectives. Examples: number of new jobs by type; reported crimes per capita; amount of new investment in lower-income neighborhoods. Measures are also called *indicators*.
- 3. The measures—which should be consistent with, related to, and more specific than the goals—are *evaluation criteria*: logically, policy choices should be evaluated based on how effectively they achieve desired outcomes as specified by the measures deemed to best reflect those outcomes.
- Things a community is willing to do to increase its chances of achieving what it wants to achieve. The things that the public sector (a local, regional, or state government) can do are actions or policies. There are several ways actions can be classified (by where they get applied; by who implements them; by the area of development they affect). The following is a list of the techniques that can be used to achieve desired outcomes. The taxonomy here is as close as we can get to one that is comprehensive and mutually exclusive:
 - 1. Planning: identifying efficient opportunities for collective action
 - 2. *Funding*: getting the public to agree to pay for some of those actions; getting the money
 - 3. *Investment*: building public facilities; providing public programs (follows Planning and Funding: there should be agreement on what to do and on how much can be paid for before building can occur)
 - 4. *Incentives*: giving financial incentives (direct or in-kind) to the private sector to provide the desired public facilities or programs (an alternative to direct public Investment)
 - 5. *Regulation*: requiring the private sector, as a condition of development, to preserve or provide certain public facilities, amenities, or services (an alternative to Incentives)
 - 6. *Coordination*: getting everyone to cooperate, and to do so efficiently: not just public-private partnerships, but public-public partnerships.

Getting agreement on definitions is essential to any intelligent discussion. Fuzzy language risks fuzzy policy. Some related points:

- The distinction between what we want to achieve and what we should do is often not made. Goals get confused with actions. They are related, but different: Figure A-1 shows that.
- There are many terms that cover more or less the same idea, though they get used differently by different jurisdictions and even by different people in the same jurisdiction. Some examples:
 - Terms related to outcomes: Goals, principles, fundamentals, objectives, impacts, measures, indicators, evaluation criteria
 - 2. Terms related to actions: strategies, policies, implementation tools, programs, regulations, investments

There are lots of ways to define and combine these terms. The essential point is to pick one and enforce its consistent use. Figure A-1 and the text describing it is an example.

Long-run urban planning presumes that thinking and taking collective action now can lead to a better future than failing to do so. When making decisions, longrun planning is trying to describe and evaluate alternative futures. Those futures are called alternatives or scenarios and are defined by the measures and the actions deemed relevant to achieving them.

There is a useful distinction to be made between *likely, desirable,* and *possible/hypothetical* futures. Consistent with the professional literature on scenario evaluation, we recommend the following use of terms:

- Reserve the term *scenarios* for hypothetical futures, independent of whether they
 are desirable or likely. A scenario might be, for example, "Very high energy costs"
 based on a combination of reduced supply from the Middle East and new, high
 gas taxes. That may not be likely, and it is hardly desirable, but it is possible, and
 a scenario might explore the implications of that future for travel demand and
 spatial development.
- Reserve the term *alternatives* to mean "potentially desirable and somewhat likely futures." Alternatives are real choices about policy direction—the typical choices in any planning or policy evaluation process. In the context of long-run planning for growth and development (the focus of a city's comprehensive planning), typical alternatives are defined spatially: "trend or status quo," "focus more growth in centers and corridors," "expansion at the urban fringe," and so on.

We now examine the left-hand side of Figure A-1 in a little more details: outcomes and impacts. The goal of public policy (of government action) is, in broad terms, to make the people government serves better off. The presumption is that collective action in some areas will yield superior results to a lack of collective action. That is the justification for taxing people: government will provide some desirable services individuals might otherwise be unable to provide by themselves (e.g., certain aspects of environmental quality) or would not provide very efficiently (e.g., a regional highway system).

Government usually operates at the base of psychology's hierarchy of needs, trying to make sure certain biological, physiological, and safety needs are met (e.g., clean air and water; shelter; personal and property security). Individuals must supply their higher needs (belongingness, esteem, self-actualization) themselves. The assumption is that adequately meeting the base needs provide the time, security, and economic resources for pursuing the higher needs.³

In economic terms, the goal of government policy is to increase *welfare*: the economic and social well-being of the citizens it serves. Ideally, policy makers and the public they represent would like to know how alternative investments perform relative to one another. They want to know what they get (benefits) for what they give up (costs). Adding benefits (positives) to costs (negatives) yields, in theory, a

measure of *net benefits*. In broad terms, decision makers should be choosing among public investments with the highest net benefits.

A decision to change public policy or to make a public investment is a decision to try to change the future—an assumption of change is implicit in all such decisions. Thus, good evaluation requires a comparison of a proposed policy's benefits and costs to whatever the benefits and costs would otherwise be without the policy. That "different future" is often referred to as the "base-case," "trend," or "status-quo" scenario or alternative. The base case represents how the world relevant to the policy decision is expected to look if policy does not change.

Figure A-2 illustrates the challenge for policy evaluation: to measure all types of relevant impacts on all people at all times. The literature of policy evaluation and benefit-cost analysis sometimes refers to this goal as full-cost evaluation—usually synonymous with a framework that attempts to identify and quantify all impacts.



Source: ECONorthwest

Figure A-2 appears simple, but each of its boxes contains a lot complexity. Consider that there are:

- potentially dozens of categories of impacts, many with multiple measures of impacts;
- potentially millions of people, thousands of businesses, and scores of jurisdictions and interest groups in a metropolitan area, with overlapping affiliations; and
- changes to both impacts and affected people that occur over time. At the most basic level, communities choose to incur costs now (e.g., to build transportation projects) because they expect an acceptable return from future benefits.

Simple statements of broad objectives reveal their artificial simplicity when they get poked. "We are building this new road because it will make citizens better off." Really? In what way? What citizens in what roles: as families, workers, businesses owners, or property owners? Does "citizens" mean voters or residents? What about people that work in the city but don't live here? What about people that don't live here now but will move here within the next five years? And so on, and on, and on: specifying objectives in a measurable way is a very big deal.

These kinds of questions illustrate that a demonstration of net benefits in the aggregate (e.g., for an entire metropolitan region on average) says nothing about the net impacts to subsets of the region (e.g., geographic subareas, special groups). In other words, an efficient policy (one with likely net benefits) is not necessarily a fair one.⁴

Figure A-2. Goals of policy evaluation: what, who, and when



Source: ECONorthwest

The challenge is to somehow make all people in some geography, now and in the future (not just the people that live in those boundaries now and vote, but unknown people who will live in those boundaries in the future), better off.

Figure A-3 considers the impacts examined in a good evaluation, dividing them into categories that try to be both *comprehensive* and *mutually exclusive*. If not comprehensive, important impacts might not be considered; if not mutually exclusive, some impacts may be counted more than once.

Figure A-3 shows that all types of impacts can be generally defined as the things affecting a community's quality of life.⁵ The quality of life is a function of four main forces: economic welfare (or prosperity), the quality of the natural environment, the quality of the built and social environment (amenities), and the cost

Figure A-3. Types of impacts to be evaluated

of achieving quality in those three dimensions (cost of living). The boxes under the first three forces show some of their components, and the boxes around the forces show their main connections with terms often used when people talk about broader objectives for public policy (e.g., the term *livability* usually emphasizes environmental quality and amenity; *sustainability* usually emphasizes the environment and the economy).

The factors identified in Figure A-3 are all the different ways that new programs and policies can affect different groups of people over time. Some factors are not too hard to quantify with existing data: typically those under the "economic welfare" category. But an evaluation of a program or policy should consider all these impacts, not just those that can be counted.

Figure A-3 not only presents what planners and policy makers are typically trying to achieve in urban areas (i.e., the goals of public policy); it is simultaneously a relatively good model of regional growth and migration. People are attracted to an area because of economic opportunity (their "first paycheck"). But everything else influences the overall quality of that area: the natural features, built environment, and social and cultural services. The level of quality-of-life factors is a "second paycheck." People make location decisions based on their assessment of the size and value of both paychecks. Offsetting the first and second paychecks is the cost of living.

These three variables—the first and second paychecks, and the cost of living—have dampening effects on each other. If economic opportunity and wages are high, new residents will migrate to that region. The region might either invest to maintain livability (which may increase the cost of living) or defer maintenance on livability (the second paycheck goes down). Different regions equilibrate at different levels of the three variables.

Figure A-3 greatly generalizes the many concerns people have about regional development and policies that affect land use, transportation, economic development, and environmental quality. To generalize further, for each of these and other key impacts, citizens and their elected representatives should want policy decisions to consider these questions in the areas of efficiency and fairness:

- *Efficiency*: Can a reasonable case be made that a new policy will make enough of the larger collective enough better off? and Is that policy worth the disadvantages created for the rest of the collective (the net-benefits criterion)?⁶
- *Fairness*: Is there some reason (moral, legal) that some subset of the population should pay less than the estimated full cost of benefits, and another subset should pay, independent of the efficiency effects?

Public policy ultimately seeks to improve the overall quality of life for a community. But any policy or program cannot simultaneously maximize all these components of quality of life. Instead, it must *optimize*; that is, it must find the right combination measures to enhance quality-of-life so that it is maximized overall. In other words, good policy balances competing objectives—not only across components of quality of life, but across classes of people, subareas of the affected area, and existing and future residents.

In the context of regional planning, it is common to think about desired outcomes not in terms of efficiency and fairness, but in terms of what people most often think makes a region livable: economic opportunity and security, environmental quality, urban amenity and services (including, significantly, the pattern and quality of built space and transportation), and the cost of living.

PRINCIPLES FOR EVALUATION

This section describes an analytical framework to work towards the goals described above. The framework assumes that better information about the new policies citizens want and are willing to pay for is essential to the creation of sound public policy. An evaluation should try to do the following three things:

- 1. *Identify what matters to citizens*. Depending on the program, things that matter are called goals, objectives, impacts, outcome, priorities, and so on.
- 2. *Measure what matters*. Different disciplines use different terms, but basically the evaluation should measure positive and negative impacts: the pros and cons, the pluses and minuses, the benefits and costs, the values and prices, the causes and effects, the outcomes. That measurement can and should include a qualitative assessment of impacts (e.g., public opinion) as well as a quantitative one (e.g., the outputs of travel-demand models) while being careful not to double-count either a benefit or a cost.
- 3. Let the technical work in the previous step inform the choice of public policies or investments. Though the choices are ultimately political (made by a small group of decision makers elected or appointed to represent a larger public), their choices should roughly conform to a ranking of projects based on net benefits (or cost-effectiveness), subject to constraints imposed by goals for the distribution of net benefits (fairness and equity).

Identifying What Matters

A lot has been written about this step: though important, it is not central to our interest here, which is a framework for technical evaluation (the next two steps). We cannot resist, however, making a few points:

- List the relevant impacts. The impacts are essentially evaluation criteria, and evaluation criteria are measures. Evaluation criteria are similar to and derive from goals. They differ not in kind but in degree: evaluation criteria are more detailed and measurable versions of goals. Sources for the "relevant impacts" are the professional literature, similar studies by other jurisdictions, and public opinion (policy makers, stakeholders, the public).
- Consider short-run and long-run impacts. In the short-run, conditions are relatively
 constant. In the long-run, conditions will change with or without the action being
 considered, and changes will occur in reaction to the project.
- Consider the incidence of benefits and costs. The distribution of those benefits and costs can make a difference among alternative actions. For example, an action may provide net benefits for a city by creating large benefits for a small group of people and small benefits for everyone else. The question of who pays is also important—the costs may fall disproportionately on groups who are least able to pay or on groups that do not receive a proportionate level of benefits from the action.
- Don't waste time reinventing the obvious: high-level goals tend to be the same for all urban and regional land-use and transportation projects. Those goals look a lot like the top boxes in Figure A-3. In any long-run evaluation of transportation investments or policies, the top goals will be some approximation of (1) transportation system performance (access/travel time, safety); (2) urban form and amenity; (3) economic development; (4) environmental quality; (5) equity (social justice: the distribution of impacts); and (6) cost-effectiveness. Everything anyone cares about measuring can probably fit in one of those categories.

Any hope of rolling up dozens of measures in some technically defensible way into some small group of summary measures requires that the measures nest within each other. Since (1) the literature of psychology and common experience suggest that people have a hard time focusing on lists with more than five to seven items,, and (2) an evaluation of the impacts of a regional transportation system may require consideration of dozens or scores of measures of things people care about, the measures must get nested under the goals. Each goal may need subgoals (objectives) to achieve this seven-item limit, which means any goal could have up to 49 (7×7) items—a clear indication how cumbersome this can quickly get if not done carefully. We discuss this important point in more detail below.

Measuring What Matters

In the context of policy evaluation, specific and measurable outcomes are often referred to as *performance measures*. Developing performance measures for evaluating transportation policies and investments requires decisions about the following:

- *The nature of the measure.* What, precisely, is the measure measuring and what form will the measure take? One must consider the following:
 - 1. What level of detail is being addressed in the measure? Will the measure be applied to the entire subject or only a subset of the subject?
 - 2. How will the impact be specified? Assume, heroically, that policy makers can agree on a type of measure. How should it then be reported: as a total, as a change, as a percent change, as a ratio, by the rank of the region against another metropolitan area, or by some other method? Dozens of impacts, each with dozens of potential measures, each with a dozen ways they could be specified and reported.
- *The geographic focus of the measure.* Will the measurement of impact be applied to the entire metropolitan area?; a region within the metropolitan area?; a city?; a neighborhood?; or some other area?
- *The length of time the measure will be applied.* Will it be applied for a year after the end of the project, a five-year period, or 10 years? Does it consider activity before and after the project?
- The link between action being considered and the measure of the impact. In the context of transportation, does a clear and significant link exist between a certain type of transportation action and the measure of its impact? If so, what is the direction of the link? How strong is the relationship? What is the magnitude of the relationship? For example, does the change in the transportation system (e.g., a policy, backed by funding, to make transit stations safer for and more accessible to elderly travelers) have a positive, strong relationship with the nature of the measure (e.g., the percentage of elderly that use public transportation) that can result in a large change (e.g., overall increased ridership, more equity in the various modes of transportation)?
- *Bang for the buck.* What is the impact of the project per dollar spent? If the project provides a net benefit, does it provide enough benefit or does it provide as much benefit as a different project?
- *Winners and losers.* Who are the beneficiaries of the project? Are they the "right" beneficiaries? Equity considerations, in essence, expand the reporting of measurements as a multiple of the number of sub-groups of interest. If, for example, the measure was "change in travel time," that single measure may need to be calculated in a dozen ways: by city, by corridor, by mode, by income, and so on.
- Does the measure work at the margins? In the context of transportation, for example, does the measure cover all transportation projects or does it focus on specific projects or specific types of projects?

No single measure of any category of goals and objectives can cover all these issues. What seems like a simple item to measure might require many measurements to cover everything people care about.

For example, one measure of a healthy economy is the change in the number of jobs in the region. Jobs and transportation are related because firms depend on the transportation system to move goods and people (clients and employees). Once the relationship is clear, developing the performance measure involves answering a number of questions. Does the measurement include all jobs, jobs by sector, or only traded-sector jobs? If the region gets jobs, is that enough?, or Does one care about their distribution to subareas? What time period is being measured: for example, the year after the project or after 10 years with the project? Can one link the creation of jobs via existing models to transportation improvements to make it possible to forecast changes in measures of jobs based on assumptions about changes in transportation?

Can local models do that consistently and reliably for the different combinations of transportation actions (investments, programs, policies) under investigation?

A lot more can be said about measures, but lots of literature already says it. Every regional long-term transportation plan done by a Metropolitan Planning Organization (MPO) must address the measurement issue, and many have tried to do it well. Our advice: network. Subscribe to APA's Planning Advisory Service (they'll point you to the good examples); make calls to the bigger MPOs. You should be able to have plenty of information in a few days.

USING TECHNICAL WORK IN A POLITICAL PROCESS

These technical steps—defining goals and objectives (i.e., impacts you care about) and measuring them—have been central to rigorous and effective policy evaluation for decades. They show up in transportation benefit-cost analysis, cost-effectiveness analysis, least-cost planning, choosing by advantages, budgeting for outcomes, and processes of other names.

The technical evaluation is a *decision-aiding* tool, not a *decision-making* one. The presumption and hope of most policy analysts is for policy to be based on good information (i.e., understandable and accurate, with assumptions and variability clearly documented), resulting in better decisions.

The use of measures to aid public decision making usually follows some approximation of the following steps:

- 1. *Define alternatives* (desired alternative futures and packages of actions intended to increase the probabilities of arriving at those futures)
- 2. *Describe the important attributes of those alternatives* (the impacts, which become measures and evaluation criteria)
- 3. Compare the alternatives across attributes
- 4. Pick the alternative with the best array of attributes

Principles for Comparing Measures

A proper analysis employs several principles of structure and logic to correctly identify and estimate the impacts related to a particular project. Some examples:

- *Frame the analysis with and without the action under consideration.* The impact of a project or planning alternative is the difference between what the world would be *with* the project and what it would be *without* the project. Framing the analysis in this way forces one to consider future changes likely to happen without the project—impacts from these changes are not impacts of the project because they will happen anyway. Framing an analysis as "before and after" often causes analysts to incorrectly attribute impacts to a project that would happen without the project. In the context of an Regional Transportation Plan (RTP), such an evaluation could theoretically be done (1) at the project level (e.g., what are the changes in outcomes—in impacts—when the project gets built and operated?) or (2) at the system level (e.g., with packages of projects organized around some theme; say, a focus on highway expansion versus a focus on transit expansion).
- "No Action" is not "No Change." The "Without Action" alternative referred to in the
 previous bullet should almost certainly not be defined as "nothing changes." The
 economy, politics, and other policies may change the future even in the absence
 of the adoption of the policy being evaluated. A No-Action alternative represents
 the world without the project. The environment is likely to change under the NoAction alternative, and these changes must be considered to accurately assess the
 impacts unique to the project. Changes will occur even without the project because
 of other planned or likely projects, population growth, economic shifts, increased
 travel, and many other factors not directly attributable to or even related to the
 proposed project.
- Focus on differences among alternatives at the margin. Many analyses report the total impact of various alternatives, without reporting the marginal differences

between the alternatives. For example, "health of the economy" is always listed as one of the top five considerations in any regional planning process. But if the transportation policy options under consideration cannot be shown to have any measurable difference on the health of the economy, then that variable is (technically, and in theory) irrelevant to the decision making. There are no *differences*.

Aggregating Measures into a Summary Evaluation

Public policy making always has multiple goals, objectives, and, therefore, criteria. An implication is that public policy is trying to *optimize*, not *maximize*. Technically, one can only maximize a single criterion. Hence, goals like "minimize environmental impacts" are, practically and technically, an impossibility in the real world: pollution can be reduced from what it might have been in the absence of some policy choice or perhaps even reduced in an absolute sense, but it cannot be minimized in any scenario that keeps the economy and government running about like they do now. The evaluation of any region's transportation alternatives is unavoidably in the world of multicriterion (multi-impact) analysis.

Because there are multiple criteria, one cannot avoid the issue of *weighting*: what is the *relative importance* of each measure/evaluation criterion? If no weights are specified, criteria implicitly get weighted equally. Social scientists have been working on developing a method for estimating the relative values of different objectives for decades without finding an ultimate solution. They never will. Among the difficulties:

- A city or region may consist of tens or hundreds of thousands of people, all of whom have slightly different values, preferences, and circumstances, and many will be affected somewhat differently by a change in policy.
- Regional economies, ecosystems, and public policies are complex and interrelated; many effects occur only over a long period; and outside market, social, and natural forces affect those systems. Thus, the net impact of a policy change on all significant aspects of those systems is impossible to predict.
- Even if one could somehow add all the different types of impacts for all individuals to get some estimate of the total net impact, and even if that impact were positive, policy makers might still decide that negative impacts on some people are too great to justify the total net benefits to society as a whole.

Only a small percentage of policy makers, and a smaller percentage of citizens, have the desire or patience to wade through the complexity of the interrelationships in an urban economy and ecosystem. Even if technical experts attempt to deal with that complexity, it ultimately must be simplified substantially. That simplification cannot occur without value judgments.

Benefit-cost analysis is one way to deal with the multicriterion problem. First, in the context of evaluating transportation actions, it collapses many of the possible measures of transportation performance into a single measure of net benefits: a measure of the efficiency of the project. Second, it attempts to convert other, nontransportation impacts to dollars so they can be added to or subtracted from estimates of transportation net benefits. Third, it can, if an analyst chooses, address issues related to equity by showing how those impacts are distributed across different areas or different groups.

This PAS Report takes an economic perspective and argues that transportation systems are so complicated that estimating the net benefits of packages of transportation investments cannot be evaluated without reference to demand-and-supply interactions and the *consumer and producer surplus* they generate. Thus, it should be no surprise that we argue for the application of benefit-cost techniques to the evaluation of long-run regional transportation investment choices. Anyone who wants to explore that advice can find an introduction in Appendix D, and the state-of-the-practice manuals (as of 2006) at the sites in this endnote.⁷

But benefit-cost analysis, in its full glory, is not commonly used. A more common approach to the multicriterion problem involves defining categories of impacts (outcomes) and creating measures of how different transportation projects or packages of projects perform on those measures. As a practical matter, that method usually means that (a) the final public decision on a region's growth alternatives (for the development of land and infrastructure, including transportation) must be about no more than five alternatives (two or three is better), with five to 10 criteria to evaluate those alternatives, and (b) the performance of the alternatives based on the criteria must get summarized in some kind of matrix to facilitate comparison of the alternatives. EISs sometimes miss on both points.

We call this type of evaluation a *matrix display* because the final product is usually a matrix whose cells show how different actions (e.g., transportation project investments: the rows) are expected to perform on outcomes the planning process has defined as important (the columns). To get from the matrix of actions/impacts to a decision about which alternative to choose, one must either score the alternative actions or use a less quantitative means of comparison. If scoring is chosen, one must either (a) put all the criteria in the same units so they can be added (usually dollars, when this method is used, in which case it is a cost-benefit analysis), or (b) give each measurement a score, which implies a formal weighting scheme.

Constructing a matrix of impacts can be accomplished using methods that usually contain some close variation of the following steps:

- 1. Work with a task force, technical advisory committee, or study team to agree on alternatives and general categories of criteria.
- 2. Propose ways to measure the criteria (quantitative preferred; qualitative where measurement is not reasonable).
- 3. Prepare a table and text discussing, for each criterion, the relative performance of the alternatives on that single criterion (the problem of weighting does not occur until one tries to compare alternatives *across* criteria). Each row of the table may be summarizing a somewhat or much larger technical analysis: a section, chapter, or technical appendix of a final report.
- 4. Summarize all that information into a single table. The table shows a summary measure, score, or text description of impacts/performance for each alternative for each criterion, but does *not* try to add up performance measures across criteria to get a score for each alternative.
- 5. Facilitate a discussion among technicians and policy makers that allows them to identify (a) clearly inferior alternatives, (b) clearly superior alternatives, and (c) alternatives in between, in a process that leads ultimately to a choice between two or three alternatives. Note that criteria are not weighted upfront. Such upfront weighting seems to protect fairness (people can not later change weights to favor the projects they want), but it can be a mistake both technically and politically.
- 6. Conduct additional research to supply information policy makers think they need to make a final decision.

The technical analysis to support the decision making should be aimed at a summary evaluation that can be reported in a matrix that looks (in concept) something like Table A-1.⁸

What makes Table A-1 different from a standard matrix display of the performance of policy choices on decision-making criteria is its focus on *relative advantages* when comparing alternatives across criteria. The early steps in the evaluation are the same ones that would be needed to construct Table A-1:

- *Define the alternatives* (see below). In this project, the alternatives are primarily transportation ones, but they have a land use/development component.
- Define the criteria (see below). At the broadest level, criteria are goals. At the most
 specific level, criteria are performance measures. Both will be used—goal-based
 criteria will be the categories within which analysts can consider and "roll-up" more
 specific performance-based criteria depending on the required level of detail.

CRITERIA	ALTERNATIVES						
	A1 (base case)	A2		An			
C1							
C2	 All of the cells in the matrix get filled in with (1) facts about the performance of each A on each C, (2) an evaluation of the relative performance of ALL A's across each C, and (3) an identification and relative weighting of the most important advantages. Each row (criterion) may be supported by a full report. 						
••••							
Cn							

TABLE A-1. TYPICAL EVALUATION MATRIX

Source: ECONorthwest

- *Fill in the facts relating to each criterion, for each alternative.* A fact may be a single number, or it may be an entire report with many numbers.
- *Add criteria as necessary.* While an initial set of criteria and performance measures will be established, it may become appropriate to add criteria or performance measures later in response to the findings of the study as such measures occur.

Table A-2 illustrates the next step in the evaluation, assuming all the data (facts) have been collected and summarized into the matrix. It illustrates how one would compare facts *across each criterion* (work across the rows). (Note: Tables A-2 and following are illustrative only: there would be many more criteria for a real evaluation.) The comparison can and must happen across criteria because, for each criterion, the facts for each alternative are measured in the same units. One cannot work across an alternative (by column) because all the criteria for a given alternative are measured in different units and are, therefore, not easily comparable.

In summary, Table A-2 illustrates these steps:

- Describe the difference in advantage for each criterion.
- *Highlight the best alternative for each criterion.* For illustration, we assumed that Alternative 3 performs best on Criterion 1, and Alternative 1 performs best on Criterion 2.

Many evaluation exercises stop here. If one alternative has the most highlighted cells, the decision might be relatively easy. Even if it does not, it may be that the display of facts and relative advantages is enough of a base for an informed discussion and consensus decision.

CRITERIA	ALTERNATIVE 1 (BASE CASE)		ALTERNATIVE 2		ALTERNATIVE 3	
Format	Describe Facts for Alt 1		Describe Facts for Alt 2		Describe Facts for Alt 3	
	Describe difference in advantage	Score	Describe difference in advantage	Score	Describe difference in advantage	Score
Criterion 1 Air Pollution	10 PPM of X		20 PPM of X		5 PPM of X	
	5 PPM more than Alt 3	Score	15 PPM more than Alt 3	Score	Lowest pollution	Score
Criterion 2 Cost	\$1,500,000		\$2,000,000		\$2,500,000	
	Lowest price	Score	\$.5M more than Alt 1	Score	\$1M more than Alt 1	Score

TABLE A-2. ILLUSTRATIVE EVALUATION MATRIX, PHASE 1, RELATIVE ADVANTAGES

Source: ECONorthwest

If the analysts and decision makers want to go farther into quantification of the relative importance of the advantage (i.e., into weighting and scoring), the matrix facilitates the process. Table A-3 shows the next steps. The fact-finding part is over. Now some group (technicians, stakeholders, citizens, policy makers: it can happen at any or all levels) are trying to make quantitative judgments (i.e., by using scoring) about value—about the relative importance of the advantages.

There are five steps illustrated in Table A-3:

- Look at all the highlighted boxes. Make a judgment (through whatever process) about which cell contains the most important advantage and highlight that cell (green box). This is not necessarily the most important criterion, but the most important relative advantage.
- 2. Arbitrarily give that cell a score of 100.
- 3. Look at the remaining boxes highlighted in yellow. Give them scores relative to the most important advantage (for illustration, we gave a score of 90).
- 4. For each criterion, rank each alternative relative to the score for the best alternative on that criterion.
- 5. Ultimately, the whole matrix of cells gets a score, and the scores can be added by alternative (column).

CRITERIA	ALTERNATIVE 1 (BASE CASE)		ALTERNATIVE 2		ALTERNATIVE 3	
Criterion 1 xxx	Describe Facts for Alt 1		Describe Facts for Alt 2		Describe Facts for Alt 3	
	Describe difference in advantage	Score	Describe difference in advantage	Score	Describe difference in advantage	Score 50
Criterion 2 Air Pollution	10 PPM of X		20 PPMof X		5 PPM of X	
	5 PPM more than Alt 3	Score	15 PPM more than Alt 3	Score	Lowest pollution	Score 90
Criterion # Cost	\$1,500,000		\$2,000,000		\$2,500,000	
	Lowest price	Score 100	\$.5M more than Alt 1	Score	\$1M more than Alt 1	Score

TABLE A-3. ILLUSTRATIVE EVALUATION MATRIX, PHASE 2, SCORING

Source: ECONorthwest

We said above that we would return to the idea of a *nested hierarchy* of goals, objectives, and measures. Figure A-4 illustrates the problems and the solution.

The problem is that as one moves from broad goals to narrower goals (objectives), to impacts of concern (positive and negative), to measures of those impacts, the number of categories expands. Figure A-4 suggests that six broad goal categories⁹ might turn into 50 to 100 different measurements. All those measurements are in different units. They cannot be added. Decision makers and the public cannot deal effectively with 10 different measures, much less 100. Planners know well the standard rule from above "If it's not summarized on a single page, Councilor X won't read it." What does a planner do?

We've already given one solution: work through the details of Tables A-1 through A-3. But for 50 measures?

The likely reality is that technicians will have to systematically roll-up multiple measures into some kind of rating for the category that comprises them. In Figure A-4, for example, that means that various measures of congestion for different transportation alternatives (proposed actions) would get rolled into a single score (e.g., better or worse; + or 1; 1 to 5) on the objective called *Congestion Relief*. Then the scores on congestion relief, safety, choice, and so on would get rolled-up into a score for the goal *Transportation Choices*.



Outcomes and Impacts

Clearly, weighting has to occur to do that. It may happen formally and explicitly; it may happen implicitly without anyone knowing it. But it will happen. If it is explicit, it may happen by scoring (e.g., in a process like the one described for Tables A-1 through A-3), but more likely it will happen by visual inspection, expert judgment, voting, and consensus.

However it happens, it will happen more easily and more defensibly if the process makes an effort from the beginning to nest objectives in goals, and measures in objectives. That is a practical way of approximating the principles of comprehensiveness (every covered) and mutual exclusion (everything covered only once).

The following example makes the theory more concrete. Assume that four alternative transportation investment packages are being considered (the policy alternatives), all specified to meet the same financial constraint (i.e., all have the same budget of "reasonably available" funds). Assume a public/political process has led to agreement on the use of several measures that relate to achieving a broad goal of "Better Transportation System Performance." These measures will be in different units (e.g., vehicle-miles traveled, person-hours of delay, accidents per million vehicle-miles), so they cannot be added. Technical staff (MPO staff, consultants, local government advisory group, a formal task force) could look at these multiple measures of Transportation System Performance and then work through some qualitative process to arrive at a relative ranking of the four alternatives on the broad goal of "Better Transportation System Performance." That process, if applied to all the broad goals (e.g., land use, the economy, the environment) would lead to a summary matrix of relative performance of each of the four alternatives on each of four to seven broad goals that could be presented on a single page.

Note that the method just described assumes an answer to an important question: Should weights be assigned before measuring impacts, after, or not at all? Tables A-1 through A-3 assume weights are assigned after impacts have been measured. The political wisdom of that order is that policy makers (1) may not a have a good idea about weighting criteria in the abstract, and (2) may want the flexibility to adjust weights to try to select their project preferences after impacts have been measured. An additional downside of weighting before impacts are measured: it takes a lot of time to do it properly and can slow down the front-end of a planning process.

The second point in the previous paragraph, however, is why most technicians tend to recommend weighting *before* impacts have been measured: so that policy makers cannot "game" the evaluation process by assigning higher weights to criteria that makes their preferred project look better. We are in the minority in believing that to be potentially as much an advantage as a liability. Policy makers need some time and flexibility to find there best interest. Abstract weights will not have much meaning to many until they see how they affect policy and project rankings.

We do not think there is an unambiguous right answer to the question of when to weight criteria, but the results of the analyses will probably be different depending on when weighting is done.

SUMMARY

Much more could and has been written about the topics covered in this appendix. Our purpose here was to provide a framework for thinking about how to evaluate public policy, not a users manual. The main points:

- In the context of regional planning, there are many doors, but all lead to the same room. Whether you enter because of a primary concern about land use, transportation, economic development, or environmental quality, you will arrive at the same place: one in which all those concerns, and more, have to be considered. Citizens and policy makers will not accept, in response to their questions about the impacts of a transportation project on the achievement of a land use plan, the response, This is a transportation plan, so we didn't deal with land use. In short, you have to deal with multiple objectives, and ones not bounded by any single element or discipline.
- 2. If you accept the previous point, you are confronted by the task of trying to develop the all-by-all, eye-of-God matrix for a regional economic and ecological system. Everything affects everything else in complicated ways that cannot be modeled well individually, much less collectively. Computer models are suggestive, but not definitive. Moreover, policy makers and the public are suspicious of "black boxes" (a process that does not explain itself; things go into the box and come out, but what happens inside is not observable). They want something transparent. They want planners to make something inherently complex into something simple and intuitive (i.e., something they can understand according to their individual intuitions, which, of course, can vary widely across individuals). Good luck.
- 3. In the context of regional transportation, an application of the principles and techniques of benefit-cost analysis has the best chance *technically* of dealing with the multiobjective/multicriterion problem. *Politically*, however, such an analysis is complicated and too much of a black box for most policy makers. In some cases, a benefit-cost measure may be only *one criterion* of a multicriterion evaluation. In short, you are very likely going to do your evaluation with some version of *matrix display*.
- 4. If you use a matrix display (its limitations notwithstanding), your work will be better both technically and politically if you follow the principles described in this appendix. Those include nesting measures under broad goals; having solid analytical work sitting behind the summary evaluation in the summary matrix;

nesting evaluation criteria and measures inside of objectives and goals; evaluating the relative advantages of each policy alternative on each measure/evaluation criterion; and scoring (if you choose to do scoring) based on relative advantages, with scores anchored to the primary advantage.

APPENDIX A NOTES

- 1. The material in this appendix draws heavily on other work by Terry Moore and ECONorthwest, published in part in several other reports and books. Thanks in particular to the Transportation Research Board (TCRP and NCHRP), the Lincoln Institute of Land Policy, and Metro (Portland, Oregon).
- 2. In the rest of this appendix, we use the term *policy* broadly to include any type of public decision, including budget allocations (investments) for infrastructure or programs, or changes in regulatory requirements.
- 3. Government does provide certain social programs (especially education) that help people meet the higher needs, but those policies are not the focus of land-use and transportation agencies, and are beyond the scope of this book.
- 4. "Social justice" is the current jargon for referring to issues of equity and fairness.
- 5. Quality of life is how planners tend to refer to what economists refer to as economic welfare or well being.
- 6. Some texts on public policy distinguish between *efficiency* (do things right) and *effectiveness* (doing the right things). It is not a benefit to society if public actions do the wrong things efficiently. In this appendix, we use the term efficiency to mean net benefits, which implies a consideration of effectiveness.
- ECONorthwest for the National Cooperative Highway Research Program and American Association of State Highway and Transportation Officials (AASHTO).
 2003. A Manual of User Benefit Analysis for Highways, 2nd Edition. Washington, D.C.: AASHTO; and ECONorthwest/Parsons Brinkerhoff for the Transportation Research Board. 2002. Report R-78. Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners. Washington, D.C.: TRB.
- 8. The method illustrated in Table A-1 and following is called "Choosing by Advantages" and is described in: Suhr (1999).
- 9. These six are from the Long-Range Transportation Plan of Metro (Portland, Oregon), 2007.

APPENDIX B

From "The Transportation/ Land Use Connection," Terry Moore, 2008. A book published by the American Planning Association.

APPENDIX D

Benefit-Cost Analysis and Project Selection¹

Appendix A developed a framework for evaluating any type of public policy. This appendix discusses a specific evaluation technique consistent with that framework: benefit-cost analysis. It provides an overview, discusses some techniques and limitations, and comments on issues relating to its application to transportation as part of a regional planning effort.

Benefit-cost analysis is often criticized as biased or impractical. Like any tool for evaluating policy, one must understand its limitations and assumptions to use it properly. We present it here not because we think it can be applied exclusively or well in all transportation evaluations. Rather, we think it provides a logical framework for thinking about transportation investments and a point of departure for any systematic evaluation. We describe benefit-cost analysis as a decision-*aiding* technique, not a decision-*making* technique. It is "not a substitute for political decisions, but it makes their implications more transparent" (Small 2003).

OVERVIEW OF BENEFIT-COST ANALYSIS

If all of the principles of evaluation identified in Appendix A were applied to an evaluation of a transportation investment, the evaluation would have the following steps:

- Consider all relevant project, program, and policy alternatives. Policy makers should not arbitrarily restrict themselves to a particular portfolio of project alternatives. All reasonable alternatives and combinations of alternatives (as appropriate) should be considered.² Project alternatives have to be specified in such a way that their benefits and costs are unrelated (mutually exclusive).
- 2. Define a relevant base case. Projects can be evaluated only relative to some characterization of what would happen without the project in place. Typically, the base case tries to represent the conditions that will prevail if no change (no new transportation project, program, and policy) is initiated. Developing data about base case conditions is just as complex as the measurements required for the project alternatives.
- 3. *Take a networkwide, multimodal perspective.* Any nontrivial benefits produced (or costs imposed) anywhere on the regional transportation network, on any affected mode, should be measured.
- 4. Measure all types of impacts. A full analysis should measure not just transportation user benefits and transportation system costs, but also the impacts on nonusers, other public agencies, environmental quality, and economic development. Economists serious about a technically correct evaluation of choices see benefit-cost analysis as inclusive. They do not limit the analysis to a small subset of impacts traded in the market and measured in dollars, which is often the claim of those who oppose benefit-cost analysis (based on how it is often, but incorrectly, done). This appendix uses benefits and costs to mean all significant impacts, whether they are readily quantifiable (in dollars or other units) or not. The measurement of benefits and costs for transportation projects has these subtasks:
 - Identify all the significant categories of benefits and costs, and the relevant geographic extent of each.
 - Measure all the direct transportation costs (construction, operation, capital maintenance and replacement) over a reasonable assumed life for the investment (20 to 50 years).

- Estimate monetary value of the user benefits of the investments by looking at the values of all individual trips, which would vary by person, mode, time, and location.
- Describe and, where possible, quantify and monetize, all other benefits and costs that do not strictly fall on transportation users (e.g., environmental, economic development, social).
- 5. Consolidate the stream of future benefits and costs into a single measure of aggregate or average benefits and costs, and subtract the cost measure from the benefit measure to estimate net benefit. This step requires the proper analytical treatment of benefits and costs that occur in different amounts over different years. Annual benefits (in both type and magnitude) and costs (both capital and operating) change over the life of the project. The timing of the occurrence of these costs affects the attractiveness of a project because of the time value of money.
- 6. *Measure impacts on important subgroups*. A consideration of subgroups rather than society as a whole helps policy makers consider how to evaluate the *distribution* of impacts and the *equity* (fairness) of that distribution. Policy makers might be interested not only in aggregate net benefits, but in net benefits (or costs) by travel mode or income.
- 7. Compare all the information above across the different investment options.
- 8. Make a decision in the context of budgetary and financing constraints and considerations of risk and uncertainty, and select one or more projects to implement. Although all projects with benefits that exceed costs (properly measured) are projects worth pursuing, budgetary constraints may limit what can be pursued. This restriction is usually the result of policy, legal, or technological considerations.

Though easy to describe, to implement these steps in the real world is technically complex. Typical questions that must be addressed:

- How does one measure the benefits of something that does not yet exist, especially when it interacts in a complex way with other products or services?
- What does one do if some benefits or costs are not susceptible, at all, to measurement? What if the saving or loss of human life is potentially involved?
- What if the benefits or costs play out over time? How should these delays be incorporated in the analysis?
- How does one treat uncertainty and risk?
- What if many projects have positive net benefits, but budgets are limited? Which projects should be selected for implementation?
- What if a project has negative net benefits but is particularly effective at helping a targeted or protected class of user (such as the poor)?

The rest of this appendix examines some of the technical issues relevant to the application of benefit-cost analysis to the evaluation of public investments in transportation.

TECHNIQUES OF BENEFIT-COST ANALYSIS Measuring Benefits and Costs

Principles for evaluating the impacts of transportation investments on transportation performance The focus (not the full picture, but the focus) of performance measurement in a transportation plan should be on measures of transportation system performance for the following reasons:

- The primary purpose of transportation investments should be improving the performance of the transportation system. If other objectives are more important (e.g., economic development, environmental quality, social justice), other, nontransportation policies probably address those objectives more directly and efficiently.
- Some of the other categories of potential objectives/benefits may be largely doublecounts of improvements to transportation system performance. For example,

increases in the intensity or value of land development resulting from a transportation improvement are largely a double-count of the capitalization of the improved access and mobility into land values.

An important (arguably the most important) criterion in evaluating a transportation investment (actually, any investment decision) is *efficiency*: how much bang (benefits to users and nonusers of the transportation system) do you get for the buck (construction cost, and other secondary costs that construction and operation cause)?³

The majority of the benefits produced by transportation projects come from reductions in user costs.

User benefits are determined by travel costs in three distinct areas: travel time costs, operating costs, and accident costs. Taken together, the total of these costs is essentially the price that travelers must pay to travel. When a comparison is made between the costs of traveling and the number of trips taken at each price level, a relationship is determined between the cost of travel and the demand for trips. When all users are aggregated together, the difference between the travel "price" that travelers are required to pay and what they would have been willing to pay is the user benefit affiliated with the trip. Any reduction in travel costs (i.e., trip price), then, will result in a benefit to the traveler. (ECONorthwest 2003)

We skip over the detail of how to measure user benefits to some conclusions:

- Any rigorous evaluation of alternative transportation projects has to focus on user benefits.
- The theory and procedures for correct measurement are neither intuitive nor simple to apply. It is not the case that the components of user benefit can be measured individually and simply added. Travelers evaluate as a package all the components of a trip (e.g., travel time, out-of-pocket cost, accident risk). Recommended procedures for estimating user benefits are to construct a travel demand curve (see Appendix B) to estimate willingness to pay and consumer surplus. Again, we skip the details and go to the conclusions: by using a travel-demand model and benefit-cost techniques, one can get to an estimate of the *efficiency* of some proposed transportation improvement: its net user benefits and the net benefits relative to the cost. Efficient investing in transportation projects is fundamentally a search for projects that have positive net benefits.
- Without that kind of analysis, one must deal even more with the multiattribute
 problems we describe below in this appendix. Various measures of transportation
 performance do not add in any obvious or rigorous way to some measure of net
 benefits.

Consider, as just one example, the reduction of vehicle miles traveled (VMT) as a desired outcome for transportation investment. It is clear to transportation economists that reducing VMT is not necessarily a good idea (it might be, but it might not be). People travel to get access to many things that enhance their well-being: work, health care, shopping, recreation, and so on. Other things being equal, people are benefited by lower cost travel, which (again, other things being equal) allows them to travel more (increasing VMT). So VMT (or VMT per capita) might be a measure of travel *benefit*, not travel dysfunction.

Yet, many transportation and land-use planners argue that decreases in VMT are the desired direction for the transportation system. Those making the argument will often justify it by saying that *access* (the ability to get to places we care about) is what matters more, and *mobility* (the ability to travel anywhere quickly) matters less. With that logic, what they hope to achieve is getting everyone where they want to go but with the smallest increase in VMT. The notion, not illogical, is that government policy (probably more about land use than transportation) can rearrange origins and destinations so that fewer, shorter, and nonauto trips provide the same access.

But trips are not a homogeneous commodity: one trip is not as good as any other trip. Going to the same place but at a different time, in a different mode, and at a different speed, is not as good as going quickly when and where you want. And the cost of rearanging land uses so that access is improved must also be considered. It's complicated.

Transportation economist are clear on the theory and even on the techniques: to measure the efficiency of a transportation project, what needs to be measured is the change in *consumer surplus*, which is the difference between a traveler's willingness to pay for a trip (the benefit or value of the trip) and his perceived cost of the trip, summed across all travelers across all the relevant time periods, and discounted to a present value (see Appendix B). Our guess is that few regional agencies do that in their transportation planning.

Thus, our conclusion is that the matrix display described in Appendix A (showing various measures of transportation performance) is good as far as it goes, and probably goes as far as it can, but it cannot answer unambiguously the question of whether a particular project is more efficient than another. It can point in the right direction: for example, spending a lot of money to expand a highway with relatively light congestion is probably not efficient, so measures of congestion and congestion relief are probably correlated with consumer surplus and efficiency. VMT, however, is probably not.

Measuring the direct transportation benefits and cost to users of transportation facilities

Transportation improvements alter the characteristics of a region's transportation network. In response, travelers may change their choices of the time, mode, path, and frequency of travel. The impact of an improvement on travel behavior is the primary source of societal benefits. The impacts on users of the transportation system constitute the major share of the benefits; they are the primary reason to incur the costs of constructing a transportation facility or implementing a transportation program.

The benefits (and costs) of a transportation improvement redound not only to *users* of the transportation system but to *nonusers* as well. A new road, for example, clearly benefits those who use the facility itself (users). If the new road also reduces air pollution (say, because of reduced stop-and-go driving), it may also benefit nonusers (anyone who breathes the affected air, whether they use the facility or not).⁴ The section after this one discusses those nonuser (indirect; secondary) benefits and costs.

At the heart of benefit-cost analysis is the estimation of benefits and costs to transportation users. The costs to users include the following:

- Direct, out-of-pocket costs—the costs of purchasing, maintaining, and operating an automobile, including fuel, fuel taxes, insurance, and so on.
- Other costs—the most important of these are *time* and *risk of accident*. Time includes all time needed to complete a trip: not just in-vehicle time, but time to walk, wait, transfer buses, find parking, and so on. Many studies have shown that the activity that a person is spending time on influences the value he or she puts on that time: for example, people perceive waiting time as more costly than riding time. Other costs include perceptions of comfort, convenience, crime risk, and so on.

Users care only about the travel costs they *perceive*, and those costs will not include all direct costs when public funds are used to make large transportation investments. If highway improvements are funded by general property taxes, a transportation user does not perceive them as relevant to the marginal cost of a trip, those costs will not influence the trip decision (whether to make the trip, when, where, and by what mode). The fact that travelers do not consider such costs, at the margin, however, does not mean they do not exist. They do: they are real and significant, and must be measured as part of a benefit-cost analysis.

Project evaluation requires an estimate of any change in direct costs specifically associated with implementation of a transportation improvement. Thus, an analyst should be interested in the dollar value of costs:

 incurred for the planning, construction, operation, or maintenance of transportation facilities or equipment; some of these costs may be ancillary but necessary (e.g., increased costs for parking and policing associated with increased bus service);

- typically paid by the nonuser sector (as opposed to many user costs paid directly by travelers, such as gas, insurance, travel times); and
- measured *relative* to the base (nonimprovement) case; hence, the analyst need be interested only in *changes* in costs associated with the improvement, as opposed to the circumstances that will prevail without the improvement.

Revenues are relevant here also. The source of funding makes a difference to the analysis of overall distributional impacts later. But while revenue sources are almost always of interest to policy makers, in the context of benefit-cost analysis, they are transfers, not benefits, and should not be added to other benefits.

Costs and direct revenues are not hard to identify in concept, and even their measurement is relatively straightforward. The measurement of user benefits is more complex. The project doesn't yet exist: how can user benefits be measured? The economist's answer in the context of transportation benefit-cost analysis is that one must estimate (forecast) users' aggregate *willingness to pay* for transportation services at various quantities of those services.

The willingness-to-pay relationship for trips between an origin and a destination is a schedule of the aggregate quantity of the trips users would be willing to make at various levels of cost per trip. (Economists call the willingness-to-pay relationship the *demand relationship*.) Measurements of willingness to pay for transportation services allow transportation analysts to convert changes in travel activity to changes in economic benefits to travelers. In the overall picture of benefit-cost analysis, this focus on willingness to pay makes sense, too. If users of a service are collectively unwilling to pay what it takes to provide or improve that service (conceptually, at least), it is harder to argue that these users receive net benefits from the service enhancement and that new facilities are needed (unless large benefits accrue to nonusers).⁵

The difference between what users (in the aggregate) would have been *willing* to pay, and what they are *required* to pay, is called *consumer surplus*. In economic terms, willingness to pay is defined by a demand curve, which also can be viewed as a marginal benefits curve. When a transportation improvement reduces the users' cost of a trip between two points (which means a change in the supply/marginal-cost curve), the willingness to pay remains the same, but since users' perceived cost of travel is less, consumer surplus will increase. Users who were already making the trip get to make the trip at lower cost, and new users (those for whose the willingness to pay was previously less than the old cost of the trip) are induced to travel.

Figure D-1 shows the basic relationship.

The "demand curve" shows the relationship between the volume of trips (x axis) and the user cost per trip that travelers must bear (y axis). The less the trip is perceived to cost, the more trips users will make, everything else being equal. In the case depicted in Figure D-1, a certain number of users (volume Vo) are willing to incur costs of Uo, but additional users would be willing travel if the costs are reduced to Ui. The notion of consumer surplus recognizes that, at virtually any point on the demand curve (such as the level of demand associated with cost Uo), most of the people who are using transportation services would be willing to pay more than they are actually paying.

This point is so fundamental that its bears restatement: the main reason for doing a transportation project is almost always that its proponents believe that *users will be better off* (will enjoy consumer surplus, which is the measure of their increased net benefits).

This conclusion suggests how to measure the new user benefits of a transportation project: subtract consumer surplus *before* the improvement from the consumer surplus *after* the improvement. To do so, one must estimate two things:

- 1. The willingness-to-pay (demand) relationship.
- 2. The effect of the improvement on the users' perception of travel cost.

To calculate changes in consumer surplus for new trips, however, one must estimate how many additional users there will be after the improvement: in economists'



terms, how *elastic* is the response of demand to the travel cost reduction associated with the improvement. Economists measure the elasticity of travel-demand relationships numerically as the percent change in the quantity of travel that results from a 1 percent change in the perceived unit cost of travel. The proper measurement of *elasticity of demand with respect to travel cost* is one of the key informational needs of transportation project selection methodologies. Modern techniques for measuring demand elasticities

are accurate, but information intensive (Hensher and King 1998).

Measurement of the effect of the improvement on users' perception of travel cost is the other piece of information needed to measure traveler benefits. An unusual aspect of transportation activity (relative to many other goods and services in the economy) is that users commit their personal *time* to transportation activities. Consequently, the perceived cost of travel includes not only expenses like gasoline or transit fares, but also the value of the time spent traveling. This makes the *value of time* a crucial factor in benefit-cost analysis in transportation, in addition to the various cash or *out-of-pocket* costs. The derivation of the appropriate value of time for users of various types, income classes, and trip purposes requires the same detailed information on the demography of actual travelers and the pattern of their travel behavior used to estimate demand relationships (Calfee 1998; Wardman 1998).

Measuring the secondary benefits and cost to nonusers of transportation facilities

Many people who would not directly use the proposed transportation improvement may experience benefits or costs as a consequence of its construction or operation. They can be categorized as:

- suppliers of transportation services (transit companies, road authorities or departments, etc.);
- users of facilities elsewhere in the transportation network on the same, or other transportation modes; and
- other businesses and households.

Suppliers (producers) of transportation services are affected by changes in use of their facilities. Analogous to the *consumer surplus* enjoyed by users, suppliers enjoy

a *producer surplus* if they are able to charge more for a service than they are willing to charge to simply provide it. When the cost of a service declines from a user's perspective (thereby increasing consumer surplus), this may cause the supplier to experience a *reduction* in producer surplus. From a cost-benefit accounting standpoint, declines in producer surplus offset gains in consumer surplus. Calculating changes in producer surplus requires knowing the effect of the proposed project on:

- the producer's *willingness-to-supply* relationship (usually referred to simply as the *supply* relationship); and
- the revenues enjoyed by the supplier (typically, the projected toll or fare revenue).

In practice, producer surplus effects are seldom calculated, even when they may be important, as in the case where the supply relationship slopes down with additional load (i.e., when there are economies of scale or scope, as with bus transit).

Users of facilities elsewhere in the transportation network are usually affected by transportation projects that affect a select portion of the network. It is very common for a positive benefit generated in one portion of the network to be at least partially offset by a disbenefit elsewhere on the network as traffic levels adjust to improvements. The principle of measuring the benefits on these indirectly affected portions of the network are the same as for the primary users' benefits. The challenge here is primarily in quantifying these *network effects*. Although the state of transportation demand and network modeling has advanced significantly, the linkages between these modeling technologies and benefit-cost analysis is virtually nonexistent.

Other businesses and households can be affected apart from their use of some portion of the network. In economics parlance, these effects are *externalities* the transportation system engenders. Externalities can result in benefits or (more commonly) costs in many categories:

- *Environment*. A transportation improvement may either improve or degrade environmental conditions. Transportation activity has significant impacts on air, noise, and water resources; some argue that transportation activity contributes significantly to the apparent global warming trends. Much work has been done on this topic over the last 15 years, but what value to assign to some externalities is still debated, and only a few meta-analyses of transportation externalities have been done (Murphy and Delucchi 1998).
- *Safety.* Some of these costs may already be included in the perceived user cost; others may not. Costs not perceived by the user, such as traffic delays due to an accident, are external costs.
- *Economy*. Transportation improvements can affect the health of a regional economy by increasing the overall production possibilities of the economy.
- Cost of public services. The use of transportation facilities affects the activity of courts, police departments, emergency service departments, etc.
- Land use. These impacts have become a big concern in the U.S. in the last 15 years. From an economic perspective, however, these impacts look primarily like intermediate impacts in the sense that changes to land use may yield changes in impacts already being measured: on travel, the environment, the economy, and public services.

Estimating values when benefits and costs cannot be easily quantified

Specific estimates for the value of time, demand elasticity, the value of human life, impacts on regional economic growth and the environment are either contested or only partially developed. Nonetheless, decision making must and does proceed. By default, the values for these parameters are set implicitly. For example, when decision makers choose not to do something (say, not spend \$10 million on a road improvement that would save one life every year), they are adopting de facto a value of life (or at least an upper bound on the value) as surely as if they had asserted it directly.

If enough decisions were observed from this perspective, it would be possible to infer the values of decision makers. For explicit estimates of decision-maker values, however, the most rigorous procedures generally involve what are known as *multicriterion* decision processes (Nijkamp and Blaas 1994). Decision makers (who may either be officials or the public) are asked to rank the alternative transportation projects on a number of dimensions or criteria, such as net economic benefits, environmental soundness, and so on. In so doing, they reveal the weight they apply to various performance attributes of the projects which, in turn, implies something about the value of the underlying benefit-cost parameters.

The problem with these techniques, from an economist's point of view, is the presumption that, as a group, decision makers somehow harbor knowledge about the "true" value of these parameters and that, once extracted, these values can be usefully and repeatedly applied. It is unlikely that decision-maker intuition is able inherently to solve complex scientific questions. In the worst case, if the decision makers happen to be completely wrong, consistent reliance on the results of multicriterion exercises results in a large number of wrong decisions. The issue here is the same one described in Appendix A as "weighting," and some of the solutions there overlap the ones discussed here.

Discounting and Present Value

Most transportation projects involving capital improvements provide benefits over an extended period of time. For as long as the project is operational, it is providing transportation services. Therefore, some benefits (and costs) will be associated with it throughout its life. The savings (or increases) in user travel time and expense, relative to what they would have been without the project, extend far into the future. Similarly, the development and operating costs associated the improvements play out over an extended period of time. Though the bulk of the capital, or development, costs usually occur at the front-end of the implementation process, operating costs and maintenance costs occur over the life of the project.

The process of telescoping the stream of benefits and costs that occur over time into an equivalent single figure in today's dollars is the process of *present valuation*. Present valuation is not simply a matter of adding up each year's benefits net of costs in a simple, arithmetic fashion. An adjustment needs to be made for society's perception of what a dollar is worth when it is received or spent in the future, as opposed to today.

An example illustrates the reasoning. Given the choice of \$100 today or a note redeemable for \$100 one year from now, most people would choose the \$100 today. But if that note were worth \$1,000 in one year, most people would choose the note over the immediate \$100; that is, they would accept the postponement of gratification, the erosion of inflation, and the risk that, for whatever reasons, the payment in a year will end up being less than \$1,000. At some future payment amount more than \$100 and less than \$1,000, people are indifferent between \$100 today and some larger future payment.

In other words, a dollar received today is worth more now than it would be if received later because one always has the option of investing it and turning it into more than a dollar later. In yet other words, individuals *discount* future dollars: a dollar next year is worth less than a dollar today, even if there were no inflation. Likewise, society as a whole is indifferent to receiving a dollar's worth of benefits in the future or some lesser amount today. This lesser, discounted amount is called *the present value of the future benefit* (or cost). The rate at which those future benefits (or costs) are brought back to present value is called *the discount rate*.

A complicating factor in evaluating public transportation investments is the choice of an appropriate discount rate for discounting future costs and benefits. The rate of return required for public investments is generally lower than that required for private investments due to the lower level of risk for public investments. The public rate is sometimes referred to as the *social rate of time preference* when it is used as a discount rate. If private market considerations dominate financial markets, and private markets care only about the consumption prospects of current generation of

market participants (and thus discount future benefits at a higher rate), it may be the case that society is *underinvesting*.⁶ Many transportation projects involve high up-front costs, with benefits that play out only over long periods of time. If the social rate of time preference is lower than the private rate, projects discounted at the social rate will have net present values higher than if they were discounted at the private rate.

Economists have debated whether very low discount rates should be used on public projects despite considerations like the *social* underinvestment hypothesis (Feldstein 1988). One reason for the debate is that through the operation of futures markets and by virtue of bequest behavior, the consumption prospects of future generations may be adequately considered in present-day, private decision making.

Given these considerations, the choice of a discount rate (the types are described in this bulleted list) depends on the particular project being evaluated:

- Riskless Nominal Rate. If the analyst has structured the analysis so that no or insignificant uncertainty or risk is involved, a riskless, nominal (not adjusted for inflation) discount rate should be used. The best source for this rate is the current yield on government securities with a term similar to the project's term.
- *Riskless Real Rate.* If no significant risk is involved in the project and costs and benefits for future years have been estimated in *real* (inflation-removed) terms, the use of a riskless real discount rate is appropriate. Government securities are also an appropriate place to look for determining the riskless real rate. The U.S. government issues inflation-protected bonds ("Treasury Inflation-Indexed Bonds") for terms of five, 10, and 30 years. The difference between the yield of these bonds and conventional bonds of the same term is the market's current estimate of inflation for future years. At the time of this report (2007), the implicit, riskless real rate was approximately 3.5 percent. In general, economists expect this rate to be in the range of 3 percent to 4 percent.
- Risk Premiums. A risk premium can be added to the two discount rates described above to obtain the risk-adjusted discount rate if the analyst wishes to adjust for risk as part of the discounting process. The private sector provides guidance for determining the size of the risk premium, as private entities providing transportation services to the public often fund these investments with issuance of debt (bonds) and equity. The yield offered on these private securities (with a similar term to the project being analyzed) minus the yield of riskless government securities provides an approximation of the size of the risk premium. By its nature, project risk is very idiosyncratic and conservatism argues for a larger, rather than smaller, risk premium.

To summarize and simplify, here is a rule of thumb probably adequate for a basecase evaluation. The effect of different discount rates could (and should) be tested quickly with sensitivity analysis:

- If all the costs and benefits have been measured in real dollars, use a discount rate of 3 percent.
- If the costs and benefits have been measured in nominal dollars, use a discount rate equal to 3 percent plus the annual, future inflation rate that was used in the analysis. In 2002, in the U.S., the consensus opinion for future inflation was 2.5 percent annually, so the discount rate would be 3.0 + 2.5 = 5.5 percent.⁷ As discussed above, if risk or uncertainty is a consideration, the analyst might add a risk premium to this amount but must be careful about double-counting: that risk may already and more appropriately be accounted for in the initial estimates of benefits and costs, or in sensitivity analysis.

Small (2003, 156) points out an additional problem related to timing: dealing with large-scale, long-lived projects that are much more than marginal adjustments to an existing system (e.g., a new light-rail system; the "Big Dig" in Boston). We share his conclusion: forecasting and valuation in this situation is even more daunting than it otherwise always is, and the focus should be on exploring possible futures (not

picking one) and on developing investment strategies that allow incremental response to an uncertain and unfolding future.

Ranking Projects Based on Efficiency

Benefit-cost analysis is about bang for the buck: benefits for costs incurred. In that sense, it is about *efficiency*. A transportation investment is efficient if benefits exceed costs. More specifically, it is efficient if the presented discounted value of the estimated future stream of beneficial impacts is greater than the presented discounted value of the estimated future stream of negative impacts (costs). A slightly different way of expressing the efficiency relationship is as the ratio of benefits to costs: a project is efficient if the benefit/cost ratio is greater than 1.0 (benefits are greater than costs).

Appendix A talked about the "matrix display" method of evaluation: criteria are selected, and measurements related to those criteria are displayed for each relevant policy choice. It noted that an inherent problem with multiple criteria and multiple measures is that the measures are in different units and cannot be added. Thus, they must be scored or weighted. Sometimes, formal scoring or weighting occurs, but such methods are inherently flawed and, in addition, often poorly implemented.

In benefit-cost analysis, that problem is theoretically eliminated and certainly reduced. All the weighting is already done implicitly by stating all impacts in terms of dollars. Those, different impacts are, on that basis, additive, and have already been weighted (in dollars).

Though true in theory, the reality is usually that not all the benefits and costs of alternative projects or groups of projects are included in the benefit-cost calculation. Some can probably never be included in any rigorous way. For example, "social justice" is a concern not about the efficiency of the transportation investment, but about the distribution of its benefits and costs. "Compliance with the regional land-use vision" might be an important criterion for evaluating transportation investments, but one that does not lend itself easily to a measurement in dollars. And though economists have done a lot of work over the last 40 years to try to estimate the value of environmental quality in dollars, many interest groups and policy makers are not comfortable with the use of those techniques.

Thus, it seems likely that in many cases the best one can hope for from benefit-cost analysis is that it be one criterion among several for selecting transportation improvements. But even that more limited role would potentially be a big technical improvement over current more qualitative methods capable of being manipulated.

For the rest of this discussion, assume that some of the key impacts of transportation performance have been included in a measure of *net benefits*. Those impacts that could reasonably be monetized (specified in dollars) include the value of:

- time savings (or losses);
- decreased (or increased) operating costs;
- reduced (or increased) accidents (property, injury, mortality); and
- decreased (or increased) air pollution.

The primary rule for selecting a project is that net present value should be positive (i.e., the present discounted value of benefits should be greater than the present discounted value of costs).

But society cannot pursue all projects with positive net present value for a lot of reasons, including the following:

- Projects are not necessarily mutually exclusive. Candidate projects may overlap in benefits and costs: building a set of interrelated projects is likely to amount to different net benefits than the sum of the net benefits estimated for all the projects built individually.
- *Budgets are limited.* Decision makers may not have budget authority sufficient to build all of the projects that provide positive net benefits. This circumstance is probably rare; it is more likely that the list of transportation project "needs"

includes many projects with negative net benefits. Moreover, for projects with positive net benefits, the budget constraint could be resolved in many cases through user charges: indeed, if the projects are beneficial to users, properly structured user charges should be able to "capture" part of these benefits to provide the financing. Nonetheless, the perception of budget limitations is common, and in some cases, institutional rigidities exist that truly impose arbitrary budget constraints.

That project benefits and costs are not mutually exclusive means the project selection process should focus on alternative menus and configurations of projects in some cases, rather than on individual projects. The issue of budget limitations means a decision rule other than the simple benefits-greater-than-costs rule must be evoked. The solution is to devise project configurations (the mutual exclusivity issue) and affordable subsets of these configurations (the limited budget issue) that maximize net present value. In particular, consider dealing with the following issues:

- Nonmutual exclusivity. Analysts should include projects in project configurations
 if those projects maximize the sum of own-project and other-project net present
 value. By calculating beforehand the interactions of each project with all others
 (most of which will be zero), devising net present-value maximizing configurations is a manageable task.
- Limited budgets. Analysts should rank projects and project configurations in descending order, based on the ratio of the present value of benefits to costs. Candidate projects should be added to the implementation list until the budget is exhausted, starting with the project with the highest ratio.

If budgets for transportation system improvements were unlimited, (1) all projects that produce benefits in excess of their costs could be built, and (2) the transportation system would be as good as it could be, given technological and physical constraints. Budgets are limited, however, so a process must be put in place to select those projects that will provide the most benefit from the limited budget.

Several factors complicate the process of identifying and selecting the transportation projects that deserve implementation:

- *Competing political interests and community needs.* Though many sources of transportation funding can be used only for transportation, clear limits exist as to how much people are willing to assess themselves in taxes and fees to pay for all the things that might be collectively provided. Education, parks, environmental management, and so on all compete for tax- and rate-payer dollars.
- Project interdependence. The feasibility or efficiency of one transportation project may depend on the existence of another.
- Competing public policy goals to produce transportation outcomes. For example, the transportation project that does the most to reduce travel time may give most of the benefits to a small group, conflicting with goals for fairness.

Dealing with Distributional Issues

Note that the project ranking we've discussed in this appendix was based only on *aggregate estimates of benefits and costs that can be quantified and monetized.* But, not only do some costs and benefits resist quantification, it is also the case that *disaggregated* estimates of impacts (e.g., by subarea or subgroup) are important to the final ranking. Assume that one has done a thorough job of evaluating a transportation investment along the lines outlined above: all user and nonuser, direct and secondary, benefits and costs have been estimated for all people in the relevant geography, over an extended time period, and future benefits and costs have been discounted to present value. More must still be done before one can make a technically and politically defensible decision.

Benefit-cost analysis is sometimes criticized as being blind to the *distribution* or *equity* of benefits and costs. Distributional problems are not a conceptual fatal flaw in benefit-cost analysis from the Hicks-Kaldor perspective. If a project generates

net economic benefits, it should be possible to use tax or pricing schemes to capture enough of the benefits from the winning group and redistribute them (in an effective way) to the losing group to nullify their loss. The issue from the Hicks-Kaldor perspective, therefore, is whether it is possible to derive effective redistribution schemes.⁸

In the 1980s, economists raised the stakes on distributional issues in benefit-cost analysis by presenting ways that project-selection processes could be modified to support the more general income redistributional aims of society, if so desired. They proposed that the selection of *even inefficient projects* (i.e., those with negative net present values) might be justified under some circumstances if those projects have the effect of improving the economic status of certain targeted or protected classes of individuals.

The logic of this argument is that when society decides to assist the less fortunate, it is implicitly saying it is willing to trade off a certain amount of *efficiency* for improvement in societal *equity*. The only issue is the selection of the method for effecting the income transfers; it should, of course, have the smallest possible adverse efficiency effects. By this reasoning, it may be worthwhile under some circumstances to choose projects not strictly on the basic benefit-cost criterion (net present value of benefits greater than net present value of costs) if a project has sufficiently large, positive effects on the well-being of the targeted groups relative to the efficiency penalty.

One way for conventional benefit-cost analysis to address equity issues computationally is to apply weights to the benefits received or costs paid. If, for example, a targeted class is deemed to merit special benefits, the estimate of those benefits could be multiplied by a number greater than 1. As a result, a project is made to appear better or worse than it otherwise would in the normal, aggregated estimate of net benefits. The weights to use in this recalculation can come from decision makers via methods noted previously, or they could be derived analytically (e.g., by observing the relative treatment of various income groups in other aspects of policy—say, the tax or welfare systems—or by calculating the marginal value of additional income from other income and consumption data) (Weisbrod 1968; Gramlich 1979).

The introduction of distributional considerations (and any other qualitative assessments of impacts, for that matter) raises some problems and must be treated carefully. For example:

- To what extent does a project actually benefit or harm the targeted class? Existing transportation travel data and demand models are not particularly good at identifying the income class of beneficiaries of transportation projects. Modelers know very little about precisely who travels where in metropolitan areas or interregionally. In addition to this problem (and partly because of it), travel demand parameters (such as demand elasticities) are not typically differentiated by income class. Hence, the measurement of the likely effects of a transportation project on any particular identified class of beneficiaries is highly speculative.
- Who is keeping track of the aggregate effect of such concessions to income distribution? If efficiency concessions are made, over time, to select projects that provide services to certain classes of travelers, how will decision makers know when enough projects have been adopted? Measured income statistics, of course, might well remain unchanged even if many transportation projects friendly to the targeted class have been built.
- Is the development of inefficient transportation services the best way to raise incomes? This is the central question that, to date, has been begged in decisionmaker acceptance or rejection of transportation projects or policies because of equity considerations. Policy toward transit, older polluting vehicles, uninsured motorists, and congestion pricing are often influenced by the implicit weighting based on concerns about the impacts on specific groups (e.g., the efficiency benefits of congestion pricing are offset disproportionately⁹ by concerns about impacts on lower-income drivers).

LIMITATIONS OF BENEFIT-COST ANALYSIS

A typical critique of benefit-cost analysis is that it measures everything in dollars or only what can be measured in dollars. In fact, though practitioners of benefit-cost analysis try to measure more things in dollars (e.g., putting a dollar value on, say, a measured increase in air pollution), they acknowledge it would stretch credulity if some impacts were measured in dollars (e.g., the benefit of civic pride or the value of political acceptability). Their recommendation, and one endorsed here, is that some impacts be measured in dollars, some be measured in natural units (e.g., parts per million, number of people affected), and some be only described (i.e., not quantified).

A related critique is that even if technicians understand the limitations of benefitcost analysis, the public and their elected officials may not, with the result that some people will argue that all decisions about transportation can be made mechanistically based on, say, the benefit-cost ratio. A variation of that argument is the quantification of benefits and costs leads to a false sense of confidence in the validity and reliability of the estimates. All of the calculations rest on some or many assumptions, alternative assumptions are always possible and often justified, and final results may vary (perhaps substantially) when different assumptions are made.

The critique is not fatal to benefit-cost analysis as we have defined it. If analysts and policy makers generally accept the idea that better identification and measurement (where possible) of transportation's full benefits and costs can be useful in public debates about transportation policy and investment, the methodological debate is not about the benefit-cost framework, but about the details of the measures and measurement.

SOME IMPLICATIONS FOR APPLICATION TO TRANSPORTATION

We provided ample reasons for transportation analysts to be pessimistic about their ability to measure all the impacts (benefits and costs) of transportation projects and policies in a way that is comprehensive, mutually exclusive, and amenable to consolidation. Figure D-2 piles on. It illustrates in a stylized way a hierarchy of choices a region must make when it tries to select transportation projects (typically as part of federal requirements for a Long-Range Transportation Plan).

Figure D-2. Types of investment choices in a regional transportation plan



Given: What the agency/community want to achieve Then: How to allocate scarce resources to achieve those goals?

Source: ECONorthwest

The main points in Figure D-2 are:

- *Transportation investments compete with other public investments.* Though much of the funding is dedicated (e.g., revenues federal and state highway trust funds), much is not (e.g., allocations from state or local general funds). All agencies usually ignore that fact, in part because their missions assume they will and require them to. If you are a planner in a transportation agency, your job is to serve the public by making transportation improvements, not by building schools or providing health care. Yet, at the margin, investing in education and health care may give the public a bigger bang for the buck. You don't know, and it's not your job as a transportation planner to care. But for elected officials running a region or a state, and for the public they represent, that comparison is not only relevant—it is critical.
- Transportation projects and programs compete with each other. Once an amount is dedicated to transportation, the first big choice is how much of the total funding to allocate to operations and maintenance. That choice is first based on the logic that it is likely to be more efficient (bang for the buck) to keep existing capacity functioning properly now and into the future than it is to build new capacity. The decision clearly can be informed by benefit-cost techniques (in engineering terms, life-cycle costing). No elected official will disagree with the truism that it is often more effective to maintain the infrastructure we have than to build new. That makes engineering and economic sense. But decisions these officials make about regional and local transportation investments rarely implement that principle rigorously. Our work throughout the northwestern U.S. suggests that, depending on the place and the calculation, local and state governments are funding between 30 and 70 percent of what engineers and economists would estimate as cost-effective maintenance. In the context of the techniques of benefit-cost analysis, investment in the maintenance of existing capacity may yield a better return (present value of benefits over costs) than investment in new capacity. Many regional transportation plans give only perfunctory attention to that important point. Cost-effective maintenance has less voter appeal than a new highway or new lane.
- The revenue remaining is available for other things: primarily for projects to increase capacity. The diagonal in the figure shows where the bulk of the transportation money has gone historically: to capacity, to highways, to new and big projects. In the jargon of transportation planners, these are "modernization" projects. But a region can also get net benefits by investing in policies and programs. In fact, at the heart of the argument for better transportation/land use connections is the belief that investments in land policy (e.g., in the rearrangement of origins and destinations) can have big impacts on the effectiveness of transportation. Also in this category are transportation demand management policies (e.g., pricing, carpool matching). Clearly we believe these are important. Figure D-2 shows them outside the hemisphere to illustrate that they are usually not the primary focus of regional transportation planning: they should at least share the spotlight.
- Coming back to capacity, those modernization projects could be for highways or for alternative modes. How does that choice get made? At yet a finer level, there are choices about the types of projects. For example, in the context of highways, should a region invest in big, new projects (new beltways or bridges or big digs), or in more modest expansions of existing arterials? More difficult yet, should it seek to solve congestion problems by investing in transport improvements of any type or by funding land-use policies and programs that change origins and destinations?

The reality is that technical analysis cannot answer these critical questions unequivocally even if it were allowed to try, and it almost never is. Some of these big allocation decisions are made quickly and politically. Some jurisdictions use flexible funding from federal and state highway trust funds to support transit; others do not. How do they decide? Almost certainly not by using benefit-cost analysis or any other rigorous evaluation technique to try to get to some estimate of net benefits by investment alternative.

Much, much more could be said about specific techniques for project evaluation. We are not going to say it here. Those interested should look in the professional literature: multiattribute or multicriterion utility analysis (e.g., Merrick and Garcia 2004); analytical hierarchy process (e.g., Saaty 1994); FHWA and TRB websites; websites for large MPOs.

Our goals for this appendix are less grand. Our point, made at several places in this report, is that while technical analysis cannot be definitive, it is not irrelevant. We believe that thinking about transportation investments in the context of benefits and costs is the right way to approach a technical evaluation of the investment alternatives. The kind of thinking that benefit-cost analysis requires is probably more important to solid decision making than the formal techniques for estimating benefits and costs. Trying to add some rigor to the evaluation of projects—the kind of rigor suggested by Appendices A, C, and D—improves the debate about these complicated investments and, by doing so, improves the final decisions.

In the context of the framework we established in Appendix A, benefit-cost analysis and a more rigorous estimate of net benefits (efficiency) can feed into a matrix-display evaluation format as one of a few key criteria. In our opinion, it should probably be the most important one: regions should be making transportation investments to get the biggest bang they can in transportation performance (improvements in travel time, safety relative to a base case) for a given amount of investment. We think that wedding the concepts and some of the techniques of benefit-cost analysis to a multicriterion matrix display is a practical direction for system and project evaluation.

An explicit benefit-cost framework for evaluating transportation options has the important additional advantage of explicitly dealing with the pricing of transportation and the demand/supply relationships, which are part of the evaluation of user benefits. At a minimum, some basic benefit-cost analysis would show some of the worst boondoggles for what they are and would help regions focus on what they are giving up when they allocate scarce public resources to one project or another. Small (2003, 168–70) says it well:

... just as accounting rules curtail the tendency of corporations to manipulate financial statistics in their favor, professional standards for project evaluation limit the extent to deception that [sic] can pass for objective analysis... The best method of presentation is one that makes it possible to understand and justify political decisions that are in the interests of the citizenry at large, while embarrassing those who would make decisions favoring only narrow interest groups.

APPENDIX D NOTES

- This appendix draws on many related reports done by ECONorthwest (primarily by Terry Moore and Randy Pozdena), including ECONorthwest/Parsons Brinckerhoff (2002) and ECONorthwest (2003). That work was done independently from, but is consistent with, Small (2003).
- 2. Making a decision in advance about what is "reasonable" will be difficult. The point is to find the balance between: (1) going into the evaluation with a very narrow focus (perhaps for institutional or political reasons), and (2) burdening the evaluation with many fringe ideas that have little hope of surviving the screening process. The standard, and best, solution is for the evaluation to screen more than once, at increasing levels of detail as alternatives are narrowed.
- In economic jargon, this is benefit-cost analysis, and the resulting measure is either net benefits (benefits less costs) or a benefit/cost ratio (benefits divided by costs).
- 4. In a benefit-cost framework, *benefits* can be positive or negative: a negative benefit is the same as a *cost*.
- 5. Induced demand is what Downs (2004a) describes more graphically as triple convergence: users change time, route, and mode to converge on the new capacity provided.
- 6. Arrow and Kurz (1970) and others argued that the *social rate of time preference* should be lower than the private market rate of time preference (i.e., the private market discount rates is higher than the one that should be used in public projects).

- 7. The correct arithmetic is more complicated, but this approximation works.
- 8. Even if it is not possible to implement a redistribution scheme within the context of the project itself, the adverse effects could be nullified through tax or other more general redistribution schemes. Hence, from a Hicks-Kaldor perspective, distributional issues are not a fatal flaw to implementation of efficient projects.
- 9. "Disproportionately" in the sense that the Hicks-Kaldor criterion might show that the disbenefited parties could be, theoretically, compensated for their losses and there would still be net social benefit, but the proposed project dies because of concerns about low-income drivers.

Overview of the Firm

ECONorthwest has been helping clients solve problems and make data-driven decisions since 1974. Our consultants provide expertise in economics, finance and planning to public- and private-sector clients worldwide. We evaluate policy decision-making for public agencies across the Pacific Northwest, and evaluate the impact of those policy decisions. We apply benefit-cost analysis to help decision makers compare different project and policy options.

At its most basic level, benefit-cost analysis (BCA) is a tool for comparing alternatives. Done correctly, and recognizing its limitations, BCA provides a well-defined method for examining the value of an action and tradeoffs among different actions. Our attention to detail, rigorous application of peer-reviewed methods, expertise in quantifying non-market values, and assessment of risk and uncertainty have helped our analyses withstand the highest levels of scrutiny.

We have testified on the principles of BCA to juries in state and federal court, and for the U.S. Department of State in arbitration proceedings under the North American Free Trade Agreement.

Our use of non-market valuation techniques to account for ecosystem-service benefits has been recognized by the U.S. EPA and the State of California.

We have conducted analyses using the principles of BCA for a wide range of clients and projects:

- Comparison of strategies to produce and distribute reclaimed water in King County, Washington.
- Evaluation of different gasoline additives, their costs, and their effects on air and water resources.
- Assessment of over 30 water-related restoration and water supply projects in California.
- Comparison of forest certification alternatives for county forestland in Oregon.
- Analysis of port development and environmental restoration scenarios in Portland, Oregon.
- Assessment of highway realignment alternatives.
- Evaluation of the benefits and costs of multiple remediation scenarios for contaminated

Relevant Project Experience

AASHTO Redbook Manual for Highway User Benefit Analysis

For the National Academy of Sciences and the American Association of State Highway and Transportation Officials (AASHTO), ECONorthwest led the rewriting of the 1977 AASHTO Manual on User Benefit Analysis for Highway and Bus Transit Improvements ("AASHTO Redbook"). The new manual focused on highway improvements only and included topics not covered in the original Redbook, including intelligent transportation systems, road pricing, and innovative construction management techniques.

TCRP Transit Guidance: Benefits and Disbenefits of Transit

For the National Academy of Sciences' Transit Cooperative Research Program, ECONorthwest developed a guidebook to help transit agencies measure the benefits and disbenefits of providing rail and bus transit. ECONorthwest's work included an extensive review of the existing literature and the development of clear methods to help transit agencies measure economic impacts.

Economic Value of the Final Remaining Stretch of the Okanagan River

For the Okanagan Basin Water Board and the Okanagan Nation Alliance, ECONorthwest conducted an analysis of the economic values associated with a natural section of the Okanagan River in southern British Columbia. As part of the analysis, ECONorthwest compared the economic benefits derived from ecosystem services under two scenarios: one with the natural section of river as it exists today, and another with channelization of the river and development on adjacent lands. The analysis focused on values associated with the Okanagan's sockeye stock (which accounts for the vast majority of the sockeye population in the Columbia Basin).

In conducting the analysis, ECONorthwest staff relied on information provided by the Okanagan Water Board, the Okanagan Nation Alliance, personal communication with other First Nations, and consultation with other experts with experience conducting research in the Okanagan Basin. In addition to the values associated with the Okanagan sockeye stock, ECONorthwest analyzed values associated with 10 additional ecosystem services provided by the river as it exists today. In presenting its results, ECONorthwest discussed distributional issues related to temporal and geographic distribution of beneficiaries. ECONorthwest considered the sensitivity of the analytical results in terms of discount rates applied to future generations, and also identified instances in which the benefits of river conservation extended beyond local communities that typically bear the costs.

Economic Benefits and Costs of Water Conservation and Restoration Guidebook

ECONorthwest prepared a guide for the North Bay Watershed Association to use when preparing applications seeking funding from the CA Department of Water Resources under Prop 84. The guide helps the NBWA better understand and communicate the economic benefits and costs of water conservation and watershed restoration projects in Northern California.

Framework for Economic Evaluation of Transportation Investments

Terry Moore and Randy Pozdena wrote a chapter outlining the framework for economic evaluation of transportation investments for *Economic Impacts of Intelligent Transportation Systems: Innovations and Case Studies,* published in 2004.

Economic and Market Evaluation for Tribes

Since 1996, ECONorthwest has provided services ranging from market analysis to economic impact analyses for tribes across the Pacific Northwest on topics ranging from hotel and gaming impacts, economic and fiscal impact analyses, hotel expansion feasibility, land valuation and development feasibility, and overall economic contributions. Tribes we have worked with include:

WASHINGTON

- Muckleshoot Tribe
- Port Gamble S'Klallam Tribe
- Puyallup Tribe of Indians
- Squaxin Tribe
- Suquamish Tribe
- Swinomish Tribe

OREGON

- Oregon Tribal Gaming Alliance
- The Klamath Tribes
- The Confederated Tribes of Warm Springs Reservation
- The Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians
- Cow Creek Band of Umpqua Tribe of Indians
- The Confederated Tribes of Grande Ronde
- The Confederated Tribes of the Umatilla Indian Reservation
- The Confederated Tribes of Siletz Indians

Staff for this Project

Attached are short resumes for the authors of this memorandum, Terry Moore and Bob Whelan.

M.U.R.P. Urban and Regional Planning, University of Oregon M.A. Public Administration, University of Oregon B.S. Environmental Engineering, Stanford University

Terry Moore is a founding principal and project manager at ECONorthwest. Since 1979, he has managed over 800 projects in land-use and transportation planning, economic development, growth management, policy analysis and finance, and market analysis.

In addition to his full-time work at ECO, Moore is an adjunct professor in the Department of Planning, Public Policy, and Management at the University of Oregon and an research associate at the National Center for Smart growth at the University of Maryland. . He started in planning as a Peace Corps Volunteer in Central America. He was a Fulbright Scholar on urban planning in Peru in 1986-1987. In 2001 he was selected as a Fellow of the American Institute of Certified Planners. In 2007 and again in 2009-10 he was a visiting scholar at the National Center for Smart Growth. He has consulted and presented on planning issues in Central and South America, Europe, New Zealand, China, and Africa.

Moore is a practitioner with a strong knowledge of current professional planning literature. His articles on growth management, urban growth boundaries, housing, project management, planning theory, and the land use / transportation connection have appeared in the Journal of the American Planning Association, Land Use Policy, Urban Land, the Journal of Urban Planning & Development, and the Journal of the American Institute of Planners. He has contributed chapters to three books published by the Lincoln Institute of Land Policy: Land Market Monitoring (2001), Engaging the Future (2007), and Planning Support Systems (2008). He was principal author for three books published by the American Planning Association Press: Economic Development Toolbox (2006), a second edition of The Transportation/Land Use Connection (2007), and Zoning as a Barrier to Multifamily *Housing Development* (2007). He co-authored the chapter on "Smart Growth" for the ICMA Greenbook on Local Planning, and a chapter on fiscal impacts for the Oxford Handbook of Urban Economics and Planning (2011). In 2014 he did an independent evaluation of the performance of the department of Planning and Urban at the Lincoln Institute.

Moore's current work focuses on integrated regional planning for land use, transportation, and economic development; the economic evaluation of growth management and housing policies; scenario planning and tools, and market analysis for private development. He has worked on regional land use and transportation plans in Portland, Seattle, Salt Lake City, Boise, and Oklahoma City; transportation project evaluation and funding analysis for several MPOs; and economic development plans and housing market analyses for cities throughout the Northwest.

Moore's strength in regional planning projects and evaluations is his multidisciplinary background and 35 years of practical experience at the intersection of technical analysis and politics. He has degrees in engineering (Stanford University), urban and regional planning, and public administration (University of Oregon); he has published books, book chapters, or refereed journal articles on the transportation / land use connection, benefit-cost analysis in transportation, economic development, market analysis, scenario planning, and project management. Post Graduate Courses, Economics, Columbia University M.S. Mineral Economics, Pennsylvania State University B.S. Earth Sciences, Adelphi University

Robert is a senior project manager who has been with ECONorthwest since 1996. He specializes in market research, strategic planning, feasibility analysis, and economic forecasting. He has successfully used his skills to advise Indian tribes, local governments, nonprofit organizations, and businesses on strategies, new developments, expansions, and social/economic assessments. He has analyzed a wide range of industries including retailing, tourism, electronics, energy, construction, casino gaming, agriculture, food stores, film and video production, manufacturing, and residential housing. Before joining ECONorthwest, Robert was a mineral economist for the State of Oregon. He has also worked as a director of strategic planning for a major northwest corporation, as a manager of market research for a multinational materials company, and as a senior economist for a division of the Chase Manhattan Bank.

Representative Projects

- Determined the best mix for financial success for a commercial visitors center and retail complex proposed by a major Oregon Indian Tribe. The research focused on the likely demand for campground space, gasoline, convenience store items, gift shop products, and travel assistance.
- Conducted a market feasibility study for a living-history Indian village for a northern California tribe that would offer visitors the opportunity to experience what it would have been like to live in a village 500 years ago. The village concept centered on the need for an experiential learning environment where visitors would stay overnight in traditional Indian dwellings.
- For a Northwest Tribe, determined the economic and fiscal revenue impacts on a county from the Tribal government and its business operations, which include a farm, housing authority, health clinic, assisted living center, hotel, and casino. Through the analysis, found that the Tribe has substantial positive impacts on County employment, retail sales, tourism, and local taxes.
- Wrote feasibility analyses for native plants nurseries on behalf of two Indian tribes.
- Provided ongoing work for the Oregon Lottery regarding market developments and the economics of video lottery retailers.
- Produced the semi-annual economic forecast commentary on the national, state, and City of Portland economies for Tri-Met.
- Conducted a market feasibility study of a proposed fiber optic communications network for a major Oregon Indian tribe. In addition,

developed the key basic strategies necessary to maximize the economic development stimulus from the network, as this would benefit the tribe while creating high-wage jobs in the community.

- In 1995 built a sophisticated system of construction models for the Oregon Department of Geology and Mineral Industries. Highly praised by both industry and government, it was the first construction-based forecast of aggregate demand ever developed for a state. Other researchers around the world have since adopted the forecast methodology.
- Constructed a set of financial, econometric, and operation models of a semiconductor-recycling refinery. Working with Charles River Associates and the Massachusetts Institute of Technology, the results were incorporated into a business plan for the project.
- Conducted a revealed and stated preference survey for a Washington tribe. The findings were used to develop a business expansion plan and to identify topics for focus groups.
- Wrote a groundbreaking report on the cost of methamphetamine addiction on the residents of a metropolitan county, which calculated the cost to the general public of the hidden "meth tax" on society.
- Assisted a city with the determination of impacts from a large tribal casino-retail development. The analysis was then used to aid the city in its negotiations for suitable mitigation measures.
- Built an integrated model of the casino industry using economic, demographic, traffic, and consumer survey data. The model forecasts revenues and attendance and has been used to assess the revenue potential of casino sites in Washington, Oregon, California, and Idaho.
- Produced the first complete study of the nonprofit sector of the Oregon economy. This groundbreaking report showed that the nonprofit industry is the largest private employer in Oregon.
- Conducted studies for several hotel projects including forecasts of operating conditions and costs, financial feasibilities, and the testing of various scenarios of market and operating conditions.
- Analyzed the potential outcomes and competitive responses a regional business would likely face during a transition from being a regional monopoly to becoming an oligopoly with a comparable, single competitor.
- For a private developer, conducted a market feasibility study for a major mixed-use development near a Portland hospital. Work included an analysis of the rental and condominium markets, the feasibility of retail development at the site by comparing the stock of retail space with the local retail demand of residents, employees, and visitors, and a vacancy/rent assessment of office space.
- Given two building options for a property in the Pearl District of Portland, determined the market feasibility for a movie theater versus building of starter condominium housing. Research employed cluster

analysis and demographic data to determine the viability of a theater and the absorption rate for housing.

- Analyzed the need for more aggressive cost of living provisions for a construction union engaged in labor negotiations.
- Conducted a market demand forecast for a planned natural gas distribution system that was to be built on the Oregon coast.