The Demand for and Supply of Technical Information and Analysis in State Legislatures

David H. Guston, Megan Jones, and Lewis M. Branscomb

With states making more substantive decisions in technically complex policy areas, the capacity of state legislatures to gather and use technical information and analysis is crucial. Applying a "market" metaphor, the article examines the demand for and the supply of technical information and analysis in state legislatures. The demand among legislators and staff is widespread and increasing, and the supply is varied in origin, importance, and quality. Reliance on sources external to the legislature—usually perceived as biased—is related to a lack of professionalization in legislatures, although the level of satisfaction in the available technical information and analysis is not. Identifiable barriers on both the demand side and the supply side prevent better use of technical information and analysis. There are ways to strengthen the relationship between state legislatures and a broad array of sources, as well as to educate the legislative consumer of technical information and analysis.

The making of informed political decisions—requiring technical information often possessed by unelected experts—raises fundamental issues of the competence and legitimacy of democratic government. Much has been written about the access to scientific and technical information by branches of national government. Despite the fact that state governments face many of the same technically challenging questions as the federal government, very little is known about how state governments, and in particular state legislatures, acquire and use technical information and analysis. With state governments making more substantive decisions on technically complex issues—including science and technology (S&T) for economic development (Coburn, 1995), environmental policy (Rabe, 1997), and education policy (Goertz, 1996), it is crucial to consider whether they have the institutional and analytical resources to do so in an informed way. This paper reports on a research project that investigated the demand for and supply of technical information and analysis in state legislatures.

Introduction: The Problem of Informing State Legislatures

The Development of Technical Advice in State Legislatures

The professionalization of state legislatures has been on the agenda of political science and public policy at least since the mid-1950s (Zeller, 1969). The strife of reapportionment in the 1960s, followed by the need for states to manage President Nixon's New Federalism, caused an upwelling of concern about state legislatures in the late 1960s and early 1970s (Citizens Conference on State Legislatures, 1971). The two decades of "devolution, deregulation, and defunding" of domestic policy begun by Nixon and continued by Presidents Carter and Reagan (Rosenthal, 1990) helped spur a "resurgence of the states" as active and capable policymakers (Bowman & Kearney, 1986) and forced some changes in the legislatures, including better compensation for legislators, increased staff
and staff resources, longer legislative sessions and the relaxation of other constitutional demands, and more streamlined legislative processes (Beyle, 1993).

Devolutionary pressures accelerated again under President Clinton and the conservative 104th and 105th Congresses, but the growth of state legislative staff—which during the 1980s had indicated legislative maturation and contributed to shifts in power within legislatures and between them and executive branches (Weberg, 1988)—has slowed considerably. Total state legislative staff grew from 26,992 in 1979 to 33,330 in 1988 (Weberg, 1988), but only to 34,962 in 1996. One prominent scholar now argues that state legislatures are entering a period of “deinstitutionalization,” in which professionalism is eroding, the norms of trust, civility, and apprenticeship are decaying, and the legislative process itself is becoming less deliberative (Rosenthal, 1996).

The first important attention to the particular problem of technical information and analysis in state legislatures also occurred in the late 1960s, as part of a threefold effort by the National Science Foundation (NSF) to strengthen the technical capacity of state and local government, reinforce President Johnson’s efforts to improve intergovernmental relations, and begin experimental grants for state and local governments under NSF’s revised charter, which emphasized a stronger role for social sciences and applied research (Feller, 1990).

In the early 1970s, both NSF, with its new Intergovernmental Science and Public Technology program, and the National Conference of State Legislatures (NCSL) were active in strengthening the scientific and technical competence of relatively backward institutions (Helminski & Marcelli, n.d.). Legislatures of this period had a substantial variety of mechanisms for S&T information, but they betrayed little consensus about their relative desirability and little coherence around S&T issues (Feller, King, Menzel, O’Connor, Wissel, & Ingersoll, 1979). In 1975, NSF and NCSL partnered to establish the Model Interstate Scientific and Technological Information Clearinghouse (MISTIC). NCSL staffed MISTIC, NSF administered it, and other federal agencies provided funding, but legislatures did not use its services very heavily (Feller, 1990).

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In the late 1970s, more legislatures began to experiment with methods for gathering S&T information, and legislatures also began taking a more prominent role in state-to-state and federal-state discussions about S&T (Feller & King, 1981). NSF expanded its commitment by creating the State Science, Engineering, and Technology (SSET) program, which spent over $5 million to help states gain access to federally supported research and development (R&D) resources and increase their own technical capacities. Forty-two state legislatures participated in the study phase of SSET, each receiving $25,000 grants to conduct planning studies. Evaluations of SSET’s study phase by NCSL and SRI International (Gollub, King, Malek, & Waldhorn, n.d.; Reuss & Mack, 1978) were positive. Finally, state legislatures began to support their own S&T mechanisms. Seven states took advantage of SSET implementation grants in 1980 to assist in this transition. In 1981, however, the Reagan administration terminated SSET and MISTIC, halting federal assistance to states for the development of S&T capacities, as well as much scholarly attention to it.

Market for Technical Information and Analysis

Many studies of the provision and use of information and analysis in a political context apply an implicit model of an information market. In this model, the market consists most generally of consumers of information and analysis—the political decisionmakers, e.g., legislators—and the suppliers of information and
analysis—the experts (Guston & Bimber, 1994). For example, Feller, King, Menzel, O’Connor, Wissel, and Ingersoll (1975, p. 2) label representatives and senators as consumers of scientific and technological information, and scientists and engineers as suppliers. Similarly, Alpert & Markusen (1980) discuss the provision of “policy, ideology, and plans” as a “product” of an “independent sector” of analytic institutions like think tanks.

A major aim of our study was an attempt to understand the outlines and extent of this market analogy for technical information and analysis in state legislatures: What is the “need” or demand for technical information? Who are the suppliers? What are the characteristics of useful analytical products? Are consumers satisfied with the products on the market? What are the barriers keeping them from getting what they want? We organize our presentation around these questions.

Methodology

We conducted field interviews of 185 legislators, staff, and other professionals in 11 states, chosen for a range of characteristics, as well as for expressed interest in participating: Florida, Georgia, Kentucky, Louisiana, Minnesota, New Mexico, New York, North Carolina, Ohio, Wisconsin, and Wyoming. Table 1 shows the rankings of our 11 states on 5 important variables. The selection of states achieved a broad representation, but it is biased slightly toward southern and more populous states.

Table 1
State Rankings on Five Variables

<table>
<thead>
<tr>
<th>State</th>
<th>PART</th>
<th>POP</th>
<th>GSP</th>
<th>R&amp;D</th>
<th>STAFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL</td>
<td>D/E</td>
<td>4</td>
<td>6</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>GA</td>
<td>D/D</td>
<td>11</td>
<td>13</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>KY</td>
<td>D/D</td>
<td>24</td>
<td>25</td>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>LA</td>
<td>D/D</td>
<td>21</td>
<td>22</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>MN</td>
<td>D/D</td>
<td>20</td>
<td>19</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>NM</td>
<td>D/D</td>
<td>36</td>
<td>39</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>NY</td>
<td>D/R</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>NC</td>
<td>D/D</td>
<td>10</td>
<td>12</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>OH</td>
<td>D/R</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>WI</td>
<td>D/R</td>
<td>18</td>
<td>18</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>WY</td>
<td>R/R</td>
<td>50</td>
<td>48</td>
<td>49</td>
<td>48</td>
</tr>
</tbody>
</table>

Notes: PART is the partisan control of the state’s lower and upper chambers, respectively, during the 1993–94 biennium (Florida’s Senate had an even split at the time). POP is a state’s population ranking, according to the 1990 census. GSP is a state’s gross state product ranking in 1990, taken from Coburn (1995). R&D is a state’s academic research and development expenditure ranking, according to Coburn (1995). STAFF is a state’s total legislative staff during session ranking, according to data provided by the National Conference of State Legislatures for 1996.

The interviews, most of which were conducted in the spring and summer of 1994, averaged about 45 minutes and were recorded and transcribed. We approached interview subjects by their institutional roles, e.g., chairperson of a committee likely to use technical information and analysis, or a staffer responsible for that committee. The sample of legislators is therefore biased toward
chairpersons and Democrats. The former bias is not particularly troublesome because our interest was not whether rank-and-file legislators need technical information and analysis, but rather whether any legislators do, and how that need is fulfilled. Indeed, the emphasis on chairpersons is probably appropriate given the structure of committees, their control over staff and other resources, and their centrality in substantive issues.

The latter bias is potentially more troubling. At the time of the research, of the 98 partisan legislative chambers (Nebraska is unicameral and nonpartisan), Democrats controlled 64, Republicans 32, and 2 were evenly split; we studied 16 Democratic chambers, 5 Republican chambers, and 1 split chamber. Following the 1994 elections, Republicans controlled 50 chambers and Democrats 48. Following the 1996 elections, Democrats controlled 50 chambers, Republicans 46, and two were evenly split. The consistency of answers among legislators and between legislators and staff leads us to believe that the inclusion of more Republicans in the original sample would not have altered our findings significantly.

Table 2
Summary of Respondents

<table>
<thead>
<tr>
<th>Total</th>
<th>n = 185</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislators</td>
<td>n = 66</td>
</tr>
<tr>
<td>Staffers</td>
<td>n = 94</td>
</tr>
<tr>
<td>Others</td>
<td>n = 25</td>
</tr>
<tr>
<td>Legislators</td>
<td>n = 66</td>
</tr>
<tr>
<td>Democrats</td>
<td>n = 51</td>
</tr>
<tr>
<td>Republicans</td>
<td>n = 15</td>
</tr>
<tr>
<td>Chairpersons</td>
<td>n = 44</td>
</tr>
<tr>
<td>Senators</td>
<td>n = 29</td>
</tr>
<tr>
<td>Representatives</td>
<td>n = 37</td>
</tr>
</tbody>
</table>

We provided our subjects with a rather expansive definition of S&T—"any issue, including aspects [of a variety of policy areas] which requires technical information and analysis for informed legislative decisionmaking"—which they found satisfactory. Following Feller et al. (1979) and in keeping with a constructivist approach to science-and-society inquiry (Gieryn, 1995), we did not define the phrase, "technical information and analysis," but rather allowed our respondents to draw their own boundaries of the technical.

The Demand for Technical Information and Analysis

Our respondents were virtually unanimous in their perception that legislators need access to technical information and analysis. "Absolutely, there is a need," declared a key staff official from Ohio: "There are an overwhelming number of science and technology issues which need technical information and advice but unfortunately we don't have it. It is a glaring weakness." A member of the Kentucky Assembly observed that "there's a realization ... that nothing is really more important than having good technical information. And if you have good technical information, you can control policy making."
Examples of issues that require technical information and analysis provided by the respondents covered a wide spectrum: economic development, environmental protection, and health care in all 11 states; telecommunications and education in 10 states; energy and human services in 8 states; agriculture in 7 states; transportation in 5 states; gambling, and state S&T policy in 4 states; and political and judicial issues in 3 states.

A large majority of respondents agreed that the need for technical information and analysis had increased in recent years. Table 3 shows the reasons cited for this increase. The three most important were the role of S&T in economic development, the overall complexity of contemporary society, and education policy, particularly the new role of computers and telecommunications technology in schools. With respect to economic development, for example, a staffer from New York declared: “Telecommunications, computer technology, [and] biotechnology are all keys to New York’s economic growth. For the legislature to understand and regulate those industries requires a great deal of technical skill that wasn’t needed ten years ago.”

Another important driver of the need for technical information and analysis was the challenge created by federal mandates, particularly environmental mandates such as the Clean Air Act. Politics also was somewhat important in this increased need; respondents believed that they needed more and better technical information and analysis to compete more effectively with other states, as well as within their own states against executive branch agencies and lobbyists.

Respondents offered additional reasons for the increasing need for technical information and analysis. Increasing demands for efficient and effective performance are important; as a staffer from New Mexico said: “There is a great deal of pressure on state legislatures to perform better. That inherently places a burden on the legislators, especially citizen-legislators, to become more informed and more current on technical knowledge than they were required to be in the past.” Similarly, budgetary pressures force legislators to realize that, in the words of one respondent from Louisiana, “we can’t afford to make bad decisions anymore.” Still others noted an increasing sophistication among legislators themselves who, better educated than their predecessors, ask more questions about the technical bases of policies.

Table 3
Increased Need for Technical Information and Analysis: Importance of Reasons Cited

<table>
<thead>
<tr>
<th>Reason</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 = not important, 5 = very important)</td>
<td></td>
</tr>
<tr>
<td>S&amp;T for economic development</td>
<td>3.83</td>
</tr>
<tr>
<td>Overall complexity of society</td>
<td>3.81</td>
</tr>
<tr>
<td>Education policy</td>
<td>3.69</td>
</tr>
<tr>
<td>Implementation of federal mandates</td>
<td>3.20</td>
</tr>
<tr>
<td>Competition with other states</td>
<td>3.17</td>
</tr>
<tr>
<td>Response to executive branch</td>
<td>3.09</td>
</tr>
<tr>
<td>Response to lobbyists</td>
<td>3.03</td>
</tr>
</tbody>
</table>
The Suppliers of Technical Information and Analysis

Ranking the Suppliers

Table 4 shows how respondents evaluated the importance of their sources of technical information and analysis. Overall, and in 6 of the 11 states studied, the staff of a legislature’s research office ranked as the most important source. Executive agencies were almost as important overall and ranked first in Georgia and Louisiana, two states with traditionally strong executives. Lobbyists clearly were important, as were personal sources (which ranked first in Minnesota and highly partisan New York), clearinghouses (like the NCSL), and state universities (which ranked first in New Mexico). Legislators themselves, personal staff (where available), and private universities were only somewhat important. Federal sources were not particularly important, suggesting that any intergovernmental linkages that might have been created by NSF’s programs in the 1970s did not survive. The Internet was not yet an important source of information, although expectations were tremendous.

Table 4
Importance of Sources of Technical Information and Analysis

<table>
<thead>
<tr>
<th>Source</th>
<th>Average Score</th>
<th>Democrat (rank)</th>
<th>Republican (rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislative research staff</td>
<td>4.09</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Executive agencies</td>
<td>3.95</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Lobbyists</td>
<td>3.81</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Personal sources</td>
<td>3.59</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Clearinghouses (NCSL, etc.)</td>
<td>3.50</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Public universities</td>
<td>3.35</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Legislators</td>
<td>3.09</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Personal staff</td>
<td>2.97</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Private universities</td>
<td>2.93</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Federal sources</td>
<td>2.48</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Internet</td>
<td>2.11</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

With the exception of legislative research staff, personal staff, and legislators themselves, the listed groups are the suppliers in a large, external information market. They provide technical information and analysis (along with other goods and services), usually in exchange for whatever rewards accompany their view of good policy, although in some cases the legislature may direct an executive agency to perform a study or may commission private research from consultants. The exceptions to the external market—the internal suppliers—provide technical information and analysis to remediate the flaws in this market; most specifically, the provision of biased or self-interested information by the external sources.
Perceptions of External Sources of Technical Information and Analysis

Executive Agencies

Respondents acknowledge the importance of executive agencies, occasionally referring to administration sources—in the market metaphor—as having, or no longer having, a “monopoly” on information. They recognize the groundedness of information from executive branch sources in their day-to-day experience of administering programs as contributing to their expertise.

Despite this importance—and perhaps because of it—many legislators and staff find it difficult to trust executive sources of information. They classify them in the same category as lobbyists, as interested parties and policy advocates who, while not playing fast and loose with the facts, will still slant them in self-serving ways. As one former legislator from Georgia said:

The reason we needed [a legislative research office was] simply trying to get the best information possible that we could make a decision on, from somebody who did not have an agenda. And when you get stuff from the administration ... you've got to assume that there's an agenda there.

Lobbyists and Trade Associations

Respondents ranked lobbyists and trade associations as important sources of technical information and analysis. Lobbyists tend to be the most proactive and persistent suppliers in the market, talented at bringing information to legislators and often able to socialize with them. In Kentucky, for example, lobbyists and legislators “can meet after hours and there’s a trust that builds up.” But respondents were also quite explicit about their skepticism toward the information lobbyists provide. As one staffer from Florida put it: "[It’s] not that I don’t trust their data. It’s just that I would have to review their data." A Minnesota legislator explained, “On the whole, I have gotten accurate information from lobbyists, but it is necessary to get an additional point of view about the information they provide.” Similarly, a New Mexico legislator explained that lobbyists supply “accurate, dependable information faster than any other way. But we need more than one source on complex issues. We need the council staff, or we could become victims.”

Personal Sources

Personal sources of technical information and analysis were important across the range of states. Often, personal contacts within one of the other important external suppliers, for example, the state university or a large employer, would provide technical information and analysis. A staffer in New York held that these contacts can be too important at times, “sending members off on a crusade about an issue that has been misrepresented.”

National and Regional Clearinghouses

The importance of national and regional clearinghouses in providing technical information and analysis varied widely among the states visited. NCSL was the most prominent of the clearinghouses, but other important regional clearinghouses included the Southern Regional Education Board (SREB) and the Regional Energy Council. The clearinghouse function is vital for some states, as one staffer in Kentucky said, to get them “pointed in the right direction.” These
organizations also help standardize policy data and provide, as one Louisianan said of SREB, "the Good Housekeeping seal."

**Universities**

Public colleges and universities ranked fairly highly as an important source of technical information and analysis; private colleges and universities ranked notably lower. Respondents nevertheless were not satisfied that state universities were upholding their obligation to public service. As one staffer in Florida said, public colleges and universities "are not realizing their potential ... [because] they tend to deal with the esoteric aspects of research rather than the really pragmatic applied research that is needed for decisionmaking by our legislature." More than one staffer explained the story of the legislator asking the university professor for the time and getting in response the instructions to build a clock. But the legislature itself shares blame for thisShortcoming. As one Kentucky legislator admitted, "[T]he universities have been quite helpful [and] they give us everything we ask for. We're probably not sophisticated in what we can ask for."

**Federal Sources**

Federal sources of technical information and analysis were not very important across the states visited. Respondents who received information from federal sources often did so through a nonfederal purveyor such as their state's congressional delegation or through a quasi-public organization like the Kentucky Science and Technology Council. States with a large federal presence, New Mexico, for example, found that presence an important (if not uncontroversial) source.

**Internet**

Despite the recent and rapid advances in legislative use of computer technology, the Internet and other electronic network resources still were not very important sources of technical information and analysis when we performed our field work. Although internally networked, staff often did not have modems on their personal computers and instead performed electronic searches through a "gatekeeper" such as a librarian or senior staffer with access to a modem. Many staff and legislators nevertheless are quite optimistic about the potential of the Internet as an information resource. Others, however, are more skeptical about how the answers to specific, policy-oriented questions will be available to them.

**Internal Sources as Remediators of Information Market Failures**

As many of our respondents suggested, a principal role of professional staff is to help compensate for the inadequacy of external sources of information and analysis, particularly its bias. The history of professional state legislative staffs is in large part an effort to depersonalize sources of information. In order "to bring democracy into the legislative branch," Wisconsin established the first professional legislative staff in the nation in 1901. According to a current official of Wisconsin's Legislative Research Bureau, a professional staff "means that a representative who is an auto worker ... will get just as good services as a rich businessman or some lawyer, somebody with a lot of education or somebody with access."

Table 5 shows the relationship between the level of professionalization of the state legislatures examined and the importance of external sources of technical
According to a scheme utilized by NCSL (Kurtz, 1992), state legislatures are grouped as "red," "white," or "blue" by three characteristics—length of session, compensation of legislators, and size of staff. Red is the most professionalized (9 states, where sessions are long, legislators well-paid, and staff numerous), white is moderately professionalized (23 states), and blue is least professionalized (18 states). Many states share characteristics across boundaries, e.g., Florida has a very large staff, but its short session keeps it a "white" legislature.

### Table 5

**Professionalization and the Importance of External Sources**

<table>
<thead>
<tr>
<th>Category</th>
<th>State</th>
<th>Exe</th>
<th>Lob</th>
<th>Per</th>
<th>Clg</th>
<th>Uni</th>
<th>Fed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall average</td>
<td></td>
<td>3.95</td>
<td>3.81</td>
<td>3.59</td>
<td>3.50</td>
<td>3.35</td>
<td>2.48</td>
</tr>
<tr>
<td>Red</td>
<td>NY</td>
<td>3.77</td>
<td>3.00</td>
<td>4.50</td>
<td>1.95</td>
<td>3.45</td>
<td>2.32</td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>3.86</td>
<td>3.57</td>
<td>3.86</td>
<td>4.00</td>
<td>3.71</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>WI</td>
<td>3.29</td>
<td>3.08</td>
<td>2.63</td>
<td>2.57</td>
<td>3.00</td>
<td>1.29</td>
</tr>
<tr>
<td>Red average</td>
<td>FL</td>
<td>4.10</td>
<td>3.68</td>
<td>3.32</td>
<td>3.10</td>
<td>3.08</td>
<td>2.32</td>
</tr>
<tr>
<td>White</td>
<td>LA</td>
<td>4.30</td>
<td>3.93</td>
<td>3.36</td>
<td>3.87</td>
<td>3.38</td>
<td>2.60</td>
</tr>
<tr>
<td></td>
<td>MN</td>
<td>3.79</td>
<td>3.75</td>
<td>4.63</td>
<td>3.50</td>
<td>3.88</td>
<td>2.09</td>
</tr>
<tr>
<td>White average</td>
<td>GA</td>
<td>4.13</td>
<td>3.63</td>
<td>3.50</td>
<td>3.40</td>
<td>3.77</td>
<td>2.23</td>
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<tr>
<td></td>
<td>KY</td>
<td>3.92</td>
<td>3.50</td>
<td>3.62</td>
<td>3.56</td>
<td>3.08</td>
<td>2.77</td>
</tr>
<tr>
<td>Blue</td>
<td>NM</td>
<td>3.73</td>
<td>3.83</td>
<td>3.63</td>
<td>3.46</td>
<td>4.29</td>
<td>3.25</td>
</tr>
<tr>
<td></td>
<td>NC</td>
<td>3.90</td>
<td>3.60</td>
<td>3.70</td>
<td>3.35</td>
<td>3.52</td>
<td>2.69</td>
</tr>
<tr>
<td></td>
<td>WY</td>
<td>3.97</td>
<td>3.63</td>
<td>3.61</td>
<td>3.80</td>
<td>3.73</td>
<td>3.10</td>
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<tr>
<td>Blue average</td>
<td></td>
<td>3.94</td>
<td>3.63</td>
<td>3.61</td>
<td>3.52</td>
<td>3.68</td>
<td>2.78</td>
</tr>
</tbody>
</table>

**Note:** Exe is executive agencies; Lob is lobbyists and trade associations; Per is personal sources; Clg is national and regional clearinghouses; Uni is universities; and Fed is federal sources.

The data in Table 5 are consonant with the idea of the role of professional staff as remediators of failures in the information market (Guston & Bimber, 1994), as well as the idea that professionalization differentiates a legislature from its environment and decreases its permeability to outside forces (Rosenthal, 1996). In the most professionalized legislatures, the executive branch and lobbyists are not as important sources as they are in the less professionalized legislatures. Similarly, the clearinghouse function is less important for the most professionalized legislatures; more often they are the data points for other states. Federal sources also are less important to the most professionalized legislatures.

Two exceptions in the data are the importance of personal sources and the importance of universities. With respect to personal sources, New York has an extraordinarily high value and Ohio an above average one. One could hypothesize that because some professionalized legislatures also have highly developed partisan staff (as do New York and Ohio, but not Wisconsin), the ability to trust personal sources becomes crucial in an atmosphere of well-institutionalized partisanship.

With respect to universities, the average score of the three types of legislatures has the smallest range of any but personal sources. New Mexico and
Georgia, both "blue" legislatures, are also the only ones with specific institutions to manage university-legislature relations (the New Mexico Engineering Research Institute at the University of New Mexico, and the Vinson Institute of Government at the University of Georgia). Through this institutionalized permeability, they find the university suppliers to be more important than do "white" or "red" legislatures.

Characteristics of Useful S&T Policy Support

Respondents cited similar characteristics of useful technical information and analysis. We separate their responses into source-related and information-related characteristics.

Source-Related Characteristics

The most significant characteristic mentioned was trust, which can be developed only after repeated, high-quality interaction among people who share some underlying interest. "The comfort level has to be high," said a legislator from Ohio. "You tend to trust those that you know, that you can judge whether you value or don't value their information," opined a legislator from Wyoming. Similarly, a member of the New York Assembly held, "In a profession in which reliability and trust are the most important variables, known quantities control your ability to succeed." A Florida staffer explained that:

[A] member is much more apt to be persuaded by the same piece of information if it is coming from a trusted staff member or a trusted lobbyist from the executive branch or trusted lobbyist from the private sector, a trusted trade association, a trusted constituent, a trusted personal friend ... than receiving that same identical piece of information in a written report from some third party organization, even if that third party may have a national prominence and reputation in that area.

Respondents viewed accessibility as part of what goes into developing trust. In Louisiana, staff are "readily available on a day-to-day basis," and lobbyists and executive branch agencies are accessible "because it is in their self-interest to reach out to legislators and provide them with information." A legislator from North Carolina said, "I trust my own research staff probably the most because I can keep going back and digging." States with short sessions such as Georgia and Kentucky cited the importance of "the immediacy of response and accessibility" as a primary factor in getting information. In Wisconsin, with year-round sessions, accessibility is also important. "The legislature is a reactive institution and information has to be readily available. One of the reasons that lobbyists are so effective is because their information is very easily accessible," said a staff member. A Florida staffer put it more bluntly: "Lobbyists are here all the time.... They're in your face ... and [their] persistence can pay off."

Information-Related Characteristics

Respondents also considered the format of technical information and analysis to be important. "Reports, academic work, simply don't compute in members' minds very well.... The key skills are to be able to reduce everything to 3/4 of a page and be able to brief them on the elevator," said a Florida staffer. A
New York staff director said that “What members are looking for is not just being able to go to somebody with expertise. What they are looking for is setting out what the various options are. There are very few issues where it is just a hard cold fact.” Technical information and analysis also have to be translated into plain English. A state representative from Wisconsin explained:

Legislators are not technicians, and some of the things we have to do get into language that scares legislators away. So they ignore the issue rather than have to grapple with DNA or megabytes or whatever, and as a result it is very difficult to get them interested and involved in the issues.

Such translations have to be adequate not just for legislative decisionmaking, but also for the legislative role of educating constituents about issues and how legislators are deciding them.

Respondents generally agreed that, in the words of a legislator from New Mexico, “partisan information is not credible.” In Wisconsin, nonpartisan policy support is considered one of the main reasons for the credibility of their legislative support agencies. Even partisan staff from Ohio and New York concurred that nonpartisan policy support was preferable. A New York partisan staff member observed that:

We have an obligation to the people we are working for to lay things out in a straight forward fashion. If you put out things that are factually correct then legislators are going to know more about the issue and with better information legislators are going to make better policies and then better politics. Then they win and the institution clearly wins.

Both legislators and staff considered current and relevant information critical. “To use old data is reckless, particularly in light of the fact that if your computer systems are up and working, you can have up-to-the-month [information],” said a Minnesota senator. A senator from New York said that: “technical information has to be very ‘goal-oriented’ to be useful. It must focus on an existing, solvable problem. It's not people going off and doing papers because someone thinks it is a good idea and it just sits there.” A legislator from Wisconsin agreed:

It’s very difficult for someone to sit down and read a journal on, say, telecommunications, talking about all of the things that you could do, without any real focus on how policy affects that technology and how that policy is going to affect constituents. I think that often times the presentation is too focused on the technical and not enough on the applications or policy.

Barriers to the Provision and Use of Technical Information and Analysis

The barriers to the provision and use of technical information and analysis in state legislatures can be grouped usefully into supply-side barriers—which are encountered in the production of information—and demand-side barriers—which are encountered in its consumption.
Supply-side Barriers

The primary supply-side barrier is time; staff feel that they do not have adequate time to produce information and analysis for legislative use. The timing of legislative sessions is another such barrier, with a great deal of work loaded into preparing for sessions and drafting and redrafting bills at the beginning of a session. When legislatures are in session, there is little time or opportunity for members to exchange information with staff; but when the legislature is not in session, communications over a long distance with members who are not focused on legislative business provides yet another difficulty. One staffer in Florida called this dilemma a "communications nightmare."

Another important supply-side barrier is the ability of staff to gather quality data. Difficulties in data-gathering include: lack of access to electronic data bases, the incompatibility of hardware and software among various potential sources of data, uncertainty about the accuracy or credibility of information, lack of cooperation from potential sources of information, and the volume of information that might be relevant but that is inaccessible. The inherent uncertainty of much of the technical data is also a barrier; as one Kentucky staffer said, "there's a lot of controversy and dispute in the scientific community, and I think that makes it difficult for those of us who are not scientists." A third supply-side barrier is that staff who, although generalists, have more expertise than legislators, and need to be able to translate technical information and analysis in order to communicate to legislators.

Demand-side Barriers

On the demand side, there is also a time barrier in that legislators feel pressured and may not be able to spend enough time to formulate the correct questions and assimilate and use all the information that staff and other sources can produce. There is also a set of attitudinal and intellectual barriers to the provision of technical information and analysis because, as one Florida staffer said, "sometimes [legislators] don't seem real interested in knowing the facts" or they have "a tendency to either glaze over when the whole subject matter comes up or there's ..., that possibility of disinterest—'Oh, that's too technical, I wouldn't understand it.'" One Georgia staffer said of legislators:

A lot of them are farmers and businessmen—and especially from the rural areas—who haven't really dealt with technology much, who don't really understand it themselves, and [who] maybe have never used a computer in their lives.... [T]o get them to understand all that is the most difficult part I have.

Competing sources of information also provide a demand-side barrier—not surprising, with the market analogy. One Louisiana staffer maintained that "our members generally have such a good working relationship with the lobbyists that any attempt to give them information that is not accepted by the lobby tends to be dealt with in a jaundiced way."

Competing goals provide another demand-side barrier, as one staffer in New York suggested, the reelection goal often supplants the good policy goal: "Members of the Assembly and Senate are always running for office, trying to nudge their way to the front to get media attention. This is not a good match with S&T issues which require a greater attention span."
Underlying these specific barriers is a more general barrier of the resources devoted to the staff’s production of technical information and analysis. More resources could mean lessening the burden of time and increasing the availability of technical expertise through the benefits of specialization and division of labor. Ultimately, however, the question of resources is where the supply-side and the demand-side connect, for it is through their own mechanisms that legislators set the ability of staff to supply them with information.\textsuperscript{12}

**Legislative Satisfaction**

The average level of satisfaction of legislators with the technical information and analysis to which they have access is 3.86, on a 5-point scale where 5 denotes most satisfied. The modal response (by 23 of 53 respondents) was 4, and slightly more legislators were more dissatisfied than this (17 responses) than were more satisfied (13 responses). As Table 6 shows, satisfaction seems to bear no direct relation to professionalization in a legislature, suggesting that there is some “equilibrium” in particular legislatures between the demand for technical information and analysis and its supply.\textsuperscript{13}

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Despite the general satisfaction of a majority of legislators, another message comes through strongly from respondents: Legislators do not necessarily know enough not to be satisfied. As one staffer from Ohio suggested: “Legislators are satisfied but they need more technical information and analysis and don’t know they need it. They don’t know what they don’t know.” Another staffer from Georgia voiced a similar belief, saying that legislators seem satisfied:

But I don’t think they understand why they shouldn’t be satisfied.... They could be snowed very easily, and they could be impressed really easily, and they perhaps should be a little more critical of technology and information coming from technology and what it all means.
And in Louisiana:

Are they satisfied that they got the gaming report? Yeah, it went like hotcakes.... But if they realized that there’s the same kind of data out there on environmental issues and education issues, that’s not being brought to them in this very user-friendly report, then they’d say, ‘Well, hell, why aren’t I getting that information?’

In other words, legislators are not informed consumers.

Specific sources of residual dissatisfaction include: a desire for “information keyed to their district boundaries in a lot more detail than is typically available from any attainable source at reasonable cost”; the need for “coherent” and “effective synthesis”; less technical information so that “it would make it a little easier” for the citizen-legislator “to make decisions [and] feel good about decisions”; unreasonably increased expectations, especially those wrought by computer technology; the lack of availability of particular kinds of technical expertise internally; and information overload.

An important aspect of legislative satisfaction also seems to be the appreciation of uncertainty in technical information and analysis. As one legislator in Florida said: “it can never be good enough; [in] science ... there’s a certain amount of impreciseness.... You can’t be absolutely certain about this stuff.” Uncertainty drives the search for information and “the more information they get, that causes them to think more long term, the more information they need.” Another legislator from Florida rationalizes the situation this way:

Do I think that I have an in-depth knowledge of most of the subjects that I vote on or deal with? And the answer is ‘no.’ But then I think that I’m not supposed to have too technical or too detailed knowledge about many of these issues. I think you’re expected to have a broad view, so I think that a lot of the times we’re voting with a great degree of ignorance.

Conclusion and Recommendations

Like the members of Congress and their staff in Whiteman’s (1996) portrayal, state legislators and staff acknowledge a need for technical information and analysis, and they attempt to meet it through a wide array of sources. The metaphor of an information market is a useful one to describe and analyze the relationship among legislators, staff, and these sources. Despite the vast differences among state legislatures and between them and Congress, the demands of the legislative process—time pressures, relevance, reduction of uncertainty, and so on (Bryner, 1992)—render the dynamics of this market eerily similar at both levels, but external suppliers appear to have a greater role in state legislatures than in Congress, and their provision of information products with a recognized bias means that the scarcer professional staff in state legislatures face a difficult challenge in comparing the products, checking data, and other tasks to assure the integrity of the information and analysis on which policy decisions are made.14

As one would expect, the most professionalized legislatures are less dependent on these external sources. However, there is no apparent relationship between the professionalization of a legislature and the level of satisfaction with
the technical information and analysis available, suggesting that some kind of equilibrium exists. But the commodity of technical information and analysis is not like food; ideology as a substitute for information (Downs, 1957) is in great supply. Rather, there will be a different kind of politics and different kinds of outcomes, some of which may even be in the interests of some legislators. It would take additional research to determine the actual effects of a scarcity of information and analysis.

As our respondents emphasized, change does not come easily to legislatures. The complexity of dealing with a large and diverse membership, the short time horizons, fiscal constraints, and the reactive nature of legislatures all conspire to preserve the status quo. Nevertheless, respondents identified a number of barriers to the gathering and use of technical information and analysis, and they recommended ways to improve the functioning of this information market. The recommendations can be conceived generally as attempting to strengthen relationships with a broader variety of sources—and thereby making the market more competitive—and helping the legislators and staff become more educated consumers.

Strengthening Relationships with a Broader Variety of Sources

Respondents expressed a strong desire to improve relations between legislatures and state universities, but there was little consensus about how to achieve better relations, especially since many previous efforts had been disappointing. Respondents would like to see universities be both more active in assuming public service responsibilities (at the institutional and individual level) and more accessible to legislators and staff. The scope of recommended activities includes: the provision of interns, the creation of directories of faculty expertise, participation in legislative organizations like interim and study committees, and organizing briefing sessions and other programs.

Respondents also recommended that legislatures strengthen their ties to existing, specialized executive branch and intersectoral organizations, e.g., governors' advisory boards for S&T, or state commissions for science, technology, and economic development (or that states lacking such committees create them). Such organizations can provide technical advice to legislators, as well as serve as a nexus among the variety of political interests in the state to facilitate both the intersectoral and federal flow of technical information and analysis.

Respondents in all states recommended continued improvement of computer technology, access, and training for staff and interested legislators. In such a fast-moving field, some of these recommendations already may have been adopted, especially those involving staff access to the Internet. There also were recommendations for the creation of technical information clearinghouses that would be accessible electronically and that would organize information in a way easily retrievable by legislators and staff.

Educating the Consumer

Respondents agreed that even maintaining their weakly competitive position vis-a-vis the executive branch and lobbyists—yet alone strengthening the relationships described above—required a greater sophistication on the part of legislators and staff as consumers of technical information and analysis. Some recommendations focused on increasing internal expertise, for example: adding full-time, technically trained staff to research offices; offering more training and
education opportunities to existing generalists on research staffs; hiring part-time experts for specific assignments; hiring technical analysts as personal aides; and hiring technically trained interns from universities or fellows through professional societies.

Beyond adding specific technical skills, however, it may be even more important for staff to acquire a greater understanding of the social processes through which technical information and analysis is constructed and communicated—that is, a more sophisticated understanding of how suppliers produce the informational and analytical products they market to the legislatures. This is not to say that legislators and staff need to do science, but rather—as one analyst has written about public participation in technical decisionmaking more generally—they need "to learn how and when to challenge the validity of asserted facts, where new data would be useful, and how the kinds of policy questions being asked influence the type of data [presented]" (Laird, 1993). Without demeaning the expertise of state legislative staff, it might be more productive to think of them as lay persons requiring procedural and strategic assistance, rather than to think of them as quasi-experts requiring more expertise.15

By being better consumers in this way, staff will be better situated to remedy the deficiencies in the market for technical information and analysis. They will be better able to ask questions of a wider array of sources of information. They will better understand how the producers of technical information and analysis understand and communicate technical uncertainty. And they will be better able to translate technical information and analysis for legislative comprehension and consumption, as well as re-communication to constituents.

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Notes

The data presented in this paper are derived from interviews, some of which were confidential, conducted by the authors. The interviews were taped (where allowed) and transcribed by the authors. The authors are happy to share research material for the purposes of replication and extension, provided conditions of confidentiality are maintained.

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1 For Congress, see Bimber (1996) and White (1996); for the President, see Bromley (1994); for the judiciary, see Jasenoff (1995); and for the federal bureaucracy, see Jasenoff (1990) and Smith (1992). For an overview, see Golden (1988).

2 Preliminary data courtesy of National Conference of State Legislatures; Massachusetts is missing.

3 The seven SSET states were Colorado, Florida, Illinois, Maine, New Hampshire, Puerto Rico, and Washington. For descriptions of their projects, see Feller (1990) and Sacarto (1984).

4 For additional models of information markets, see Polanyi (1962) or Tullock (1966); see Fischer (1991) for an assessment of a similar pluralist model and Ricci (1993) for "the marketplace of ideas."

5 The market analogy should not be overextended, and we do not model the provision and consumption technical information and analysis in state legislatures. One missing element, for example, is the setting of prices for the transactions discussed (see Mowery & Rosenberg, 1982 [1979] for a discussion of the shortcomings of market models in discussing technological innovation). In the 104th Congress, proposals from reform-minded conservatives included pricing the services of congressional agencies.

6 A state-by-state analysis of our results is available in Jones, Guston, & Branscomb (1996).

7 It was important to deal with committee chairs because the project also had goals to implement any potential recommendations derived from the research, and contact with chairs and other legislative leaders was the best way to assure this possibility.

8 At the time, most Republican chambers were in less populous states of the plains and mountain region; only one large state (New Jersey) and one medium state (Kansas) had two Republican chambers.

9 Although we did not attempt to measure it, our sense is that S&T issues are less partisan in states than they are at the national level. This status may be due to either the generally lower level of partisan conflict in states or some particular characteristic of S&T issues there. There is some indication at the national level that Republican legislators may be hostile to technical information and analysis, given the failure of the 104th Congress to appropriate operating funds for the Office of Technology Assessment (OTA), but partisanship does not explain entirely the elimination of OTA (see Herdman & Jensen, 1997).

10 For Republicans, the top three reasons cited were S&T for economic development, complexity, and education; for Democrats, S&T for economic development, education, and complexity.

11 In particular cases, however, legislators and personal staff could be very important sources; for example, when the legislator has an advanced degree in a technical field relevant to the issue at hand, or a legislator is committed to a technically challenging area and specifically cultivates technically proficient personal staff.

12 In this regard, the difference between committee chairs and rank-and-file in the need for technical information and analysis may be crucial. Chairs and leaders may desire more information, based on their more visible and responsible positions, but a vote of the entire legislature—including rank-and-file who may not feel the need—may be required to get additional resources to acquire that information.

13 Republicans reported an average satisfaction of 4.0; Democrats 3.82.

14 Some professional staff organizations are also capable of providing technical information and analysis independently of external sources (Guston, Jones, & Branscomb, 1997).

15 See Woodhouse and Nieuwma (1997) on helping inform intelligent decisionmaking through procedural and strategic assistance.

References


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