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Developing and Maintaining the Information Infrastructure for State Level Higher Education Policymaking

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DEVELOPING AND MAINTAINING THE INFORMATION INFRASTRUCTURE FOR STATE LEVEL POLICYMAKING

I. INTRODUCTION

Good policymaking requires information that is both accurate and relevant to the decisionmaking process. This is true whether the decisions are to be made at the national, state, or institutional levels. Because higher education is primarily a state-level responsibility, sound higher education policy depends particularly on the availability of information that supports decisionmaking at this level. Poor information at the state level can result in decisions that negatively affect large numbers of students, institutions, and citizens in multiple ways. Relevant information enables substantive discourse, dialogue, and debate about key policy issues in higher education.

Without such information these processes will certainly proceed. Indeed, we make no claim that most policymakers will ground their decisions on thorough, information-based analysis—even most of the time. But there are two compelling reasons why an investment in policy information is both appropriate and timely:

- Sound information enables policymakers to avoid making costly mistakes that might otherwise have been avoided. While only a necessary condition for decision-making because decisions can surely be made without it, investments in policy information thus provide extremely cost-effective "insurance" against policy failure.

- Information of the right kind enables policymakers to re-frame questions and debates about higher education policy on the basis of societal *needs* and *benefits*, not just around the mechanics of funding and operating public colleges and universities. For a variety of reasons, the time is right for such a shift in perspective. Our experience in many states, moreover, suggests that producing and sharing information about state needs and opportunities is one of the best ways to enter and sustain productive debates about any state's higher education future.

Nevertheless, our experience also suggests that state higher education policymaking based on a sound factual foundation remains rare. There are several possible reasons for this phenomenon:

- **Lack of an Accepted Conceptual Framework.** There is presently no widely accepted understanding of the array of data needed to generate and implement a public agenda for higher education within a given state. Institutions and state agencies are well practiced in providing and compiling data about individual institutions—especially information that relates directly to funding decisions. There is a long history of interchange of such data, resulting in a fairly sophisticated understanding of what is relevant and why. Further, this understanding is common across most of the fifty states; it is a *shared* understanding among policymakers, key constituents, and academic leaders. Shared understanding of this kind served us well when the principal policy concern was simply to provide access by expanding higher education's capacity. But no similar understanding exists to ground information that focuses on the needs of clients and beneficiaries of higher education, and how those needs are actually being served. Furthermore, the current model of state-level higher education policymaking is based on a view that a state's higher education

enterprise is essentially the sum of its parts—an aggregation of individual institutional inputs, outcomes, and needs. A new conceptualization is needed that recognizes the higher education enterprise as a synergistic array of relationships among multiple actors in which colleges and universities can become *more* than the sum of their individual parts. Such a "systemic" model would explicitly recognize all stakeholders of higher education in the state and their interactions, rather than focusing solely on institutions as the unit of analysis.

- **Uncertain Sources.** Sources for much of the data needed are outside the direct control of higher education institutions and agencies. Only data about providers of higher education are within the purview of the higher education establishment itself. Data about clients are found elsewhere—in the U.S. Bureau of the Census, state Departments of Public Instruction, Departments of Labor and Commerce, etc. This situation means that the specific ways in which these data are kept, collected, and displayed are almost always determined by the needs of organizations that are not principally concerned with higher education. As a result, data relevant to higher education policymaking must be patched together from multiple sources. Most of those who own such data are not particularly interested in changing their practices simply to satisfy the needs of a secondary set of users.

- **Deficit of Analysts and Analysis.** In the environment described above, policy-relevant information must be *constructed*, not merely *compiled*. Further, much of the information must be derived from sources that differ markedly from state to state. Both activities demand an uncommon level of analytic expertise, as well as a common understanding of the most productive kinds of analyses to undertake. But analysts skilled at working in this complex environment are in very short supply. As a consequence, a number of entrepreneurial individuals have generated much of the key information that is available, and a number of external organizations have developed information for all 50 states as a by-product of other research activities, or through grant support. This response has been uncoordinated, though, even when it has resulted in sound information. Furthermore, because of its dependence upon individual entrepreneurship, it is extremely fragile.

- **Comparative versus Absolute Data.** There are few absolute standards in higher education. As a result, comparative data—benchmark statistics—play a particularly important role. Much of the needed information cannot be generated by states acting alone. Obtaining agreement about benchmarks and establishing multi-state and cross-national data-collection frameworks is beyond the resources (let alone the legitimacy) of any individual state. Often, states cannot acquire needed data except through joint action. Data about students who leave the state to attend college or who enroll in distance education courses provided by out-of-state institutions fall into this category. Both conditions create circumstances in which the source of important data is *other states* or political entities. Data must then be collected regionally (e.g., through WICHE, SREB, etc.), nationally, or internationally if they are to be made available in a useful manner.

These and other factors interfere with state policymakers' ability to access relevant and useful information when the time comes to make key higher education decisions. Higher education is too important to both citizens and to society at large for states to be satisfied with ill-informed

policymaking. Thus, there is every reason to explore the question, *"What would it take to ensure that key data and information resources can be made available to those engaged in state-level higher education policymaking?"*

The timeliness of this question cannot be overstated. The release by the National Center for Public Policy and Higher Education (NCPPHE) of *Measuring Up 2000: A State-by-State Report Card for Higher Education* has created an upsurge in requests for data and information. It has also drawn attention to important gaps in available information about the clients, performance, and consequences of higher education. But while the process of developing *Measuring Up* identified important data deficiencies, its review was incomplete. Having identified specific areas needing improvement, we need to know more about what might be done in response: "How have the more successful states achieved success?" "What policy steps should we consider in order to improve performance in our state?" These are questions about *means*, not *ends*, and they raise additional questions about data and information that were not addressed in the process of developing the Report Card.

Purpose of This Paper

In the context of growing demand for policy-relevant data and information, it is time to take a fresh look at unmet needs for policy-relevant data and information, and to explore alternative approaches to addressing these needs. In that context, the purposes of this paper are to:

1. Clarify the *language* being used, making distinctions between data and information and the relationship between them.

2. Propose a *conceptual description* of a state's system of higher education that can serve as a diagnostic tool for ascertaining:

    - The potential *array of data* needed to describe the system.

    - The important *gaps* in data availability.

    - The kinds of analyses that need to be undertaken.

3. Identify *limitations in the availability of information* needed to support policymaking in higher education and to note some of the key reasons for the lack of availability including:

    - The necessary data are not being collected.

    - The data are collected but the conventions for converting data to information, or for conducting particular kinds of analyses, are undeveloped or inadequate.

    - The data are available and conventions have been developed but the individuals/ organizations who have served as the source of information are no longer providing this service.

4. Suggest *strategies for addressing these unmet data and information needs*, including attention to:

    - Creating the infrastructure necessary to address these issues on a more regular basis.
    - Financing strategies for such an infrastructure.
    - Activities that can be undertaken in the short run to alleviate unmet needs.
    - Priorities for long-term development activities.

II. CLARIFYING THE LANGUAGE: DATA → INFORMATION → KNOWLEDGE

Three terms—data, information, and knowledge—are often used interchangeably. At best they are used loosely and without a lot of thought. Because it is important to be clear about the central terms used in this paper, some distinctions among these key terms are presented below.

Data are the basic building blocks of information. A data item always includes:

- An identifier that specifies the *entity* (individual, institution, etc.) to which the data item refers.
- A *characteristic* of that entity (age, gender, etc. if an individual; public, community college, etc. if an institution).
- A *measure* or *code* that serves to quantify this characteristic in some way.

Data are akin to the raw materials (bricks, lumber, pipes, wiring) used to construct structures of various kinds. They are absolutely essential, but are of little use until they are organized in such a way as to yield a house, a factory, or some other actual building.

Information is data that has been organized, combined, or otherwise transformed in such a way that it has meaning and utility for policymakers as they address a particular purpose. To carry the analogy further, information is the house or the factory that emerges when building materials have been organized in a particular way. Two points about information are key. First, without data there can be no information. Second, many kinds of information can be developed from the same array of data—what emerges is determined by a set of analytic conventions analogous to the construction plans. It is this lack of "construction plans" that sometimes prevents the development of meaningful information, even when all of the data "building blocks" are present.

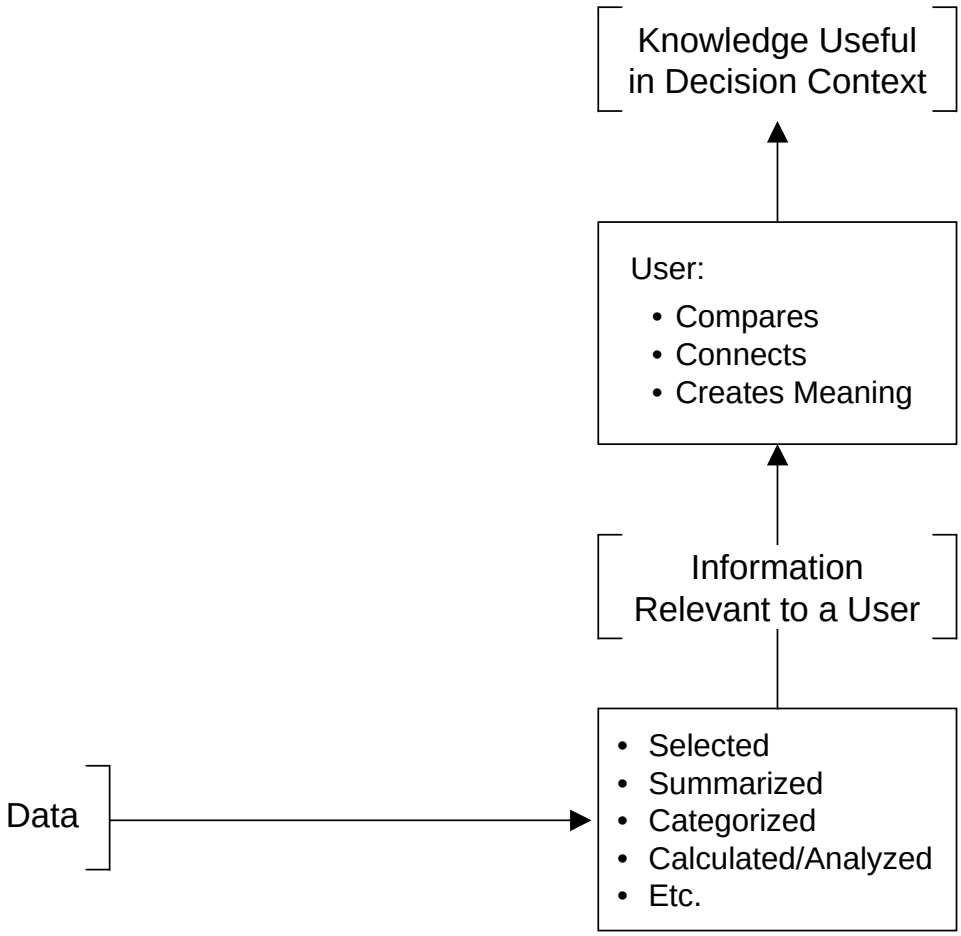
Knowledge is information that has been accepted and processed by the user. Davenport and Prusak (1998) define knowledge in this way:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers.

> In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms (p. 5).

Knowledge is the successor of information, just as information is derived from data. Davenport and Prusak believe that information is transformed to knowledge in a number of ways. Knowledge comes from a comparison of newly presented information with other information and situations. Understanding the consequences and implications of the information for decisions and actions also creates knowledge. In addition, knowledge comes from the connections made between disparate pieces of information. And, finally, conversations with others help make meaning out of available information. Relationships among these terms are summarized in Figure 1.

Figure 1
The Central Terms: Data, Information, and Knowledge



III. A CONCEPTUAL VIEW OF A STATE'S SYSTEM OF HIGHER EDUCATION

Approaches to policymaking in higher education at the state level are changing in subtle but important ways. Probably the most important such change is a shift toward a more balanced perspective about the focus of state policymaking—from an almost exclusive attention to providers toward approaches that recognize clients (employers, communities, individuals, and the state itself). This shift does not mean that the wellbeing of colleges and universities will (or can) be ignored in the policymaking process. Public institutions of higher education are critical state assets. As such, it is in any state's best interests to ensure these assets are maintained and enhanced. But policymaking cannot—and increasingly does not—end at this point. Indeed, public policy necessarily extends to ensuring not only that these assets are maintained, but that they are utilized in a manner that addresses the priority needs of the state and its citizens.

As the focus of policymaking expands beyond simply supporting institutions to embrace a public agenda, there is a growing need for new policy tools. Institutional funding and fiscal regulation are being augmented by creative use of market mechanisms—financing that empowers clients as well as providers. At the same time, the focus of accountability reporting is moving from a traditional focus on monitoring institutional actions to providing potential "customers" with information needed to make meaningful choices. Both of these developments have immediate implications for the kinds of information needed for policy by focusing on such concepts as client satisfaction and return on investment.

Concurrent with this evolution is a transformation in the base of information needed for sound policymaking. As long as colleges and universities themselves are viewed as the primary targets (and beneficiaries) of state higher education policy, most of the supporting data must come from them directly. Here the fact that the beneficiaries of policy and the providers of data are one and the same ensures that data about institutions will be provided when requested.

But the information base needed to meet the challenges posed by the emerging policy environment is comparatively underdeveloped. To reiterate, this is because:

1. There is no systematic capacity within higher education to compile and use information for which there has, to date, been little demand from policymakers.

2. The sources of much of the available data are not the direct beneficiaries of policymaking. This results in no direct leverage on information providers to generate what is needed.

3. The original sources of information are much more numerous and more complex and, as a consequence, data collection activities are more expensive.

4. In the tug of war for attention, institutions have a stronger voice than clients; furthermore, it is often in institutions' interests to ensure that too much data about clients is *not* available.

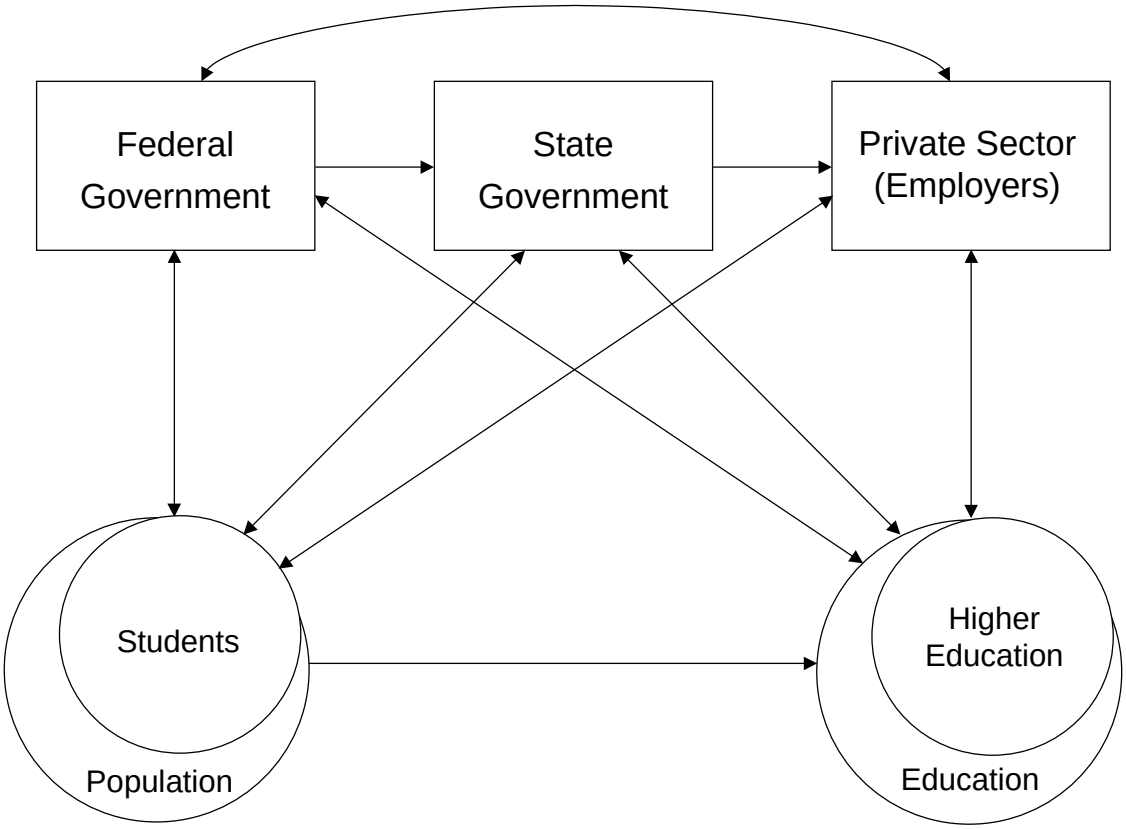
For these and other reasons, the demand for information about clients—and about the interactions among clients and providers—exceeds our ability to provide it.

Because there is little policymaking experience focused on clients, many policymakers and analysts are unsure about the questions that they should be asking and the kinds of information

that they should be compiling. Rather than wait for experience to dictate need, a new conceptual view of a state's "system" of higher education might provide useful insights into the probable needs for information to support effective policymaking. The term "system," as it is used here, is unrelated to governance arrangements for colleges and universities. Instead it refers to a model of the higher education enterprise as a set of more or less independent entities that act—and interact—within a particular policy framework. As shown in Figure 2, such a model might include:

- The key entities to be included in the system.
- The nature of the key interactions among them.

Figure 2
A State and Its Higher Education Enterprise



In this model, the key stakeholders/entities in the system are the:

- Population of the state, including:
  - The subset of the population that is enrolled as K-12 students
  - The subset of the population that is enrolled as higher education students

- Private sector/employers in the state
- Federal government
- State (and its subdivisions—cities, counties, parishes, etc.)
- K-12 institutions
- Higher education institutions (public and private) in the state

Certainly other entities deserve recognition in some states (including social services and additional state activities that directly benefit its citizens). But those listed must always be incorporated when taking a "system view" of higher education in any state. Stakeholders and their relationships thus provide an initial way of identifying and organizing the data and information needed to inform higher education policy. Furthermore, it should be fully understood that information about most of these entities needs to be further broken down into specific populations or regions to be of maximum policy utility.

In the following sections of this paper, important unmet needs for information and data to support policymaking in higher education are identified in relation to the model proposed in Figure 2. Data needs are largely derived from information needs; in some cases the lack of information can be attributed to an underlying lack of data from which to construct it. This listing, too, is informed by the proposed model.

IV. INFORMATION ISSUES

Information is most useful not only when it serves to call attention to important issues, but also when it does so in a way that provides hints about how these issues might be addressed. The construction of the "Affordability" grade in *Measuring Up 2000* is a good example. While individuals can and will argue about the specific way this indicator is formulated, it addresses in a manageable form an issue that most policymakers find extremely important. By breaking down multiple data elements into manageable information "bytes," important underlying policy choices are immediately revealed (in this case, between tuition and need-based student financial aid). This section of the paper first discusses the array of useful information that is *not* currently available. It then catalogs some critical sources of information that may be in danger of disappearing, absent deliberate intervention.

A. Information Not Available or Not in Useable Form

Measuring Up 2000 represents a path-breaking effort to compile policy-relevant information about the consequences, rather than the providers of higher education. A number of important "big picture" measures are contained in the Report Card, including preparation, participation, affordability, persistence and completion, and education benefits. Several other potentially important measures were considered during the design phases of *Measuring Up*, but were rejected because the data required to construct them were simply not available, or there were no generally accepted

analytic conventions to convert available data into meaningful information. Examples included:

- 12th Grade Academic Proficiencies. There is a growing amount of information about the academic abilities of students at 3rd, 8th, and 11th grade levels. But no information is available about student proficiencies at the point at which they enter either postsecondary education or the workforce. This is an area constrained entirely by data availability.

- Collegiate Student Learning. All states received a grade of incomplete (I) in this area in *Measuring Up 2000*. And student learning continues to attract major attention from both political and business leaders. The absence of information in this arena represents a particularly conspicuous gap because student learning is an intended objective of all institutions of higher education. Filling this gap will assuredly require new approaches to data collection; depending on the approaches to data collection, moreover, analytic conventions may or may not be a problem.

- Adult Literacy. From the state perspective, higher education is a means to a larger end. One such end is the overall literacy level of the state's adult population. Measurement techniques to address this data gap are available, and data are being collected in some states. Here the gap is strictly a function of incompleteness of extant data collection activities.

- Cost-Effectiveness/Public Rate of Return. In higher education, as anywhere else, questions continuously arise about, "What are we getting for our money—are we investing a lot and getting meager returns, or investing a little and getting a 'big bang for our bucks'?" Given the pervasiveness of this question, it would be useful to develop a measure of return on public investment in higher education—a measure that would indicate not only the benefits of economic growth that can be attributed to higher education, but also any reductions in societal costs like welfare or criminal justice that might be so attributed. Most of the data needed to support such a calculation are available, but an acceptable method of converting these data into a meaningful indicator is wanting.

- Cost-Effectiveness/Individual Rate of Return. Data on individual rates of return for the investment in a college education are available at the national level and are published in such sources as *Postsecondary Education Opportunity*. Given the differential costs incurred by students, and the potentially varied benefits that accrue to educational attainment in different states, a means to calculate a measure of this kind at the state level would be a significant contribution. Such a measure would do much to inform the debates that inevitably surround conversations about affordability. The remaining data issues are those surrounding income characteristics of recipients of state student financial aid.

- Civic Engagement Outcomes. *Measuring Up 2000* used measures of voting and philanthropic giving as indicators of the non-economic benefits of an educated

citizenry. Certainly, these measures tell part of the story, but they are poor surrogates for more desirable measures like levels of volunteerism and leadership for college graduates in comparison to similar measures for individuals who did not graduate from college. Here attention must be given to both data acquisition and to the development of appropriate conventions to convert these data into meaningful policy information.

- Access of K-12 Students to Quality Resources/Teachers. It is clear from *Measuring Up* that preparation for college is an important determinant of later participation and success. Further, research evidence is accumulating that teacher quality makes a real difference in learning outcomes at the elementary and secondary levels. *Measuring Up* reports on K-12 learning outcomes and some of the correlates of those outcomes—rigorous course taking and access to (and performance on) advanced placement courses. Available policymaking levers could be strengthened by emphasizing the access K-12 students have to teachers who are fully equipped to teach the subject matter and grade level they are teaching. Furthermore, what access to technology do elementary and secondary students have? What forms and quality of learning support are available to them? In this case, again, attention must be given to both data acquisition and analytic conventions.

In addition to the information needs that were specifically identified in the process of developing *Measuring Up 2000*, other information needs emerge through reference to the conceptual model.

- Adequacy and Equity of Institutional Funding. The issues of the adequacy and equity of institutional funding are at the heart of state-institutional relationships in most states. As a consequence, much work has been done in individual states to come to grips with these issues. Because these efforts have been piecemeal, generally accepted measures of these twin concepts have not emerged. As increased emphasis is placed on client-oriented measures (accessibility, affordability, etc.), moreover, it is likely that institutional funding issues will have to be addressed simultaneously. Necessary data are available in this area, but required analytic conventions/benchmarks are not in place—at least, not from a source that is credible to most policymakers.

- Engagement of Higher Education in Addressing State Problems. Colleges and universities represent a major asset for all states. But for many reasons, they have become increasingly disconnected from the societies that surround them and that provide many of the resources that sustain them. Here it is important to recognize that not all of the public benefits that result from investment in higher education emerge from an accumulation of private benefits. While direct measures of state contributions to public purposes are difficult to develop, it is possible to approach the issue from the perspective of incidence of good practice. For example, states that have explicit priorities and policy tools that are aligned with public purposes might be explicitly identified and analyzed as benchmarks. Even better, states that can demonstrate measurable progress

toward achieving their public agendas over time might be located and studied. This area, too, requires attention to both data acquisition and analytic procedures.

- Alignment Between K-12 and Higher Education. One particular priority always mentioned by state policymakers when considering ways that higher education might address state problems is K-12 education. We know that success in college is substantially affected by the K-12 curriculum and, because of the leverage exerted by higher education through its admissions processes, that college and university requirements exert considerable leverage over K-12 curricula. What we do not know is how standards of achievement or curricular expectations line up with one another in these two sectors in every state. Partly this is a result of incompatible measures being used in various states to describe their K-12 curricula. Partly it is also a function of the fact that few states have defined graduating K-12 abilities and entering college requirements in comparable ways. Addressing this problem is therefore primarily a question of definitional alignment because most states already collect some kind of data describing K-12 coursetaking and a majority now test student abilities as a condition of high school graduation.

- Job Placement and Mobility for Former Postsecondary Students. Because of the salience of workforce issues in higher education policy, questions about the subsequent work experience and success for former students are of high salience for state policymakers. Indeed, measures of initial job placement are mandated for vocational/technical programs in many states, as well as being required for accountability by federal Perkins and other funding programs. To meet this requirement, some states already tap available databases on employment such as the Unemployment Insurance (UI) wage record. But the technical issues involved in doing so are many including a) lack of coverage beyond the borders of a given state, b) lack of inclusion for certain types of workers (e.g., federal workers or self-employed workers), and c) lack of important data elements (such as occupational title) in the records currently collected. At least as important are political issues that are associated with the Family Educational Rights and Privacy Act (FERPA), which prohibit much of the record-linking required to accomplish these analyses. Needed here, therefore, are common conventions to align and expand data that all states already collect, as well as political action to develop appropriate privacy safeguards that don't simply block all use of the data collected.

This list of new information needs is relatively short. Many of the data gaps listed later underlie these information needs, and allow further disaggregation of indicators that are already well established (for example, disaggregating participation, persistence and retention, etc. by income level). New analytic conventions are not necessary in such instances; the additional data suggested simply provide greater fidelity for those indicators previously developed.

B. Information Limited by Organizational Capacity

Another category of policy-related information, however, requires special attention. This category encompasses indicators for which data are routinely collected, and for which analytic procedures are well established and are generally accepted, but for which the organizational capacity to sustain the required calculations is either missing or in jeopardy. Over the years, a number of individuals and organizations have developed information sets that have become widely accepted and used in higher education policymaking. These usually grew out of other endeavors and they have evolved in an uncoordinated fashion, but they are nevertheless extremely useful. Many policy analysts use them regularly. As a result, the continued availability of these information sets is of considerable importance to the policymaking community. Here the need is not for more data or for new analytic approaches, but instead for a credible entity (or entities) to carry on existing work that may now be in jeopardy. Among the most prominent information sets of this type are those prepared by:

1. Research Associates of Washington

   Kent Halstead has developed several indicators of ongoing utility to state policymakers. Those of greatest value include:

   a. The Higher Education Price Index (HEPI). This is a measure of cost and cost increase is configured specifically to reflect the "market basket" of goods and services typically purchased by colleges and universities, analogous to the more general Consumer Price Index.

   b. Profiles of State Higher Education Finance. *State Profiles: Financing Public Higher Education* provides trends in benchmark information and includes a variety of measures that have considerable utility both individually and collectively for policymaking purposes. They include:

      - Tax Capacity and Tax Effort. These are measures of the ability of states to raise revenues given their underlying tax bases and the extent to which they actually tap that taxing capacity relative to other states. These measures directly address the extent to which states really are "high-tax" or "low-tax" states as policymakers are wont to argue.

      - State Support for Higher Education. This measure consists of the relative shares of system costs borne by the state, again compared to all other states. Elements include per FTE student funding and share of total state appropriations devoted to higher education.

      - Family Support for Higher Education. This measure examines the relative shares of system costs borne by the individual/family compared to other states. Elements include per-FTE student funding contributed by individuals and a measure of ability to pay—net tuition relative to household income.

- Shares of Overall State Appropriations Devoted to Higher Education. This information reflects trends in the share of states' general fund appropriations being directed to higher education.

- System Support Index (SSI). This index measures the inherent cost of supporting the public higher education system in the state given this system's structure (e.g., relative enrollments in research universities, community colleges, etc.) and comparative wage rates in the states. This measure can help explain the common, but very real, paradox that some institutions or sectors can be underfunded in a given state, at the same time that the collective system is expensive when compared to other states.

Mr. Halstead has indicated that he is retiring from the production of these indicators and would be pleased to have a credible organization continue the work that he initiated.

2. State Policy Research

Harold Hovey produced *State Policy Reports* (now *State Fact Finder*) and *State Budget and Tax News*. These materials continue to be available from the Congressional Quarterly (www.cq.com) and the National Conference of State Legislatures (www.ncsl.org) respectively. In addition, however, he produced a report entitled *State Spending for Higher Education in the Next Decade* for the National Center for Public Policy and Higher Education. This report projected two key measures eight years into the future and provided insightful commentary on the structural imbalances in state budgets and the difficulties associated with higher education obtaining an increased share of state appropriations even in the face of increasing demand. The two indicators are:

- State and Local (Budget) Surplus or Shortfall as a Percent of Baseline Revenues in the State. This measure provides an indication of the likely budget picture for each state, assuming stable tax rates on the revenue side and maintenance of current effort on the expenditure side. As such, it provides a relatively long-term perspective on the fiscal context within which higher education policy must be made.

- Relative Percent Changes in Spending for Higher Education and All Programs Needed to Maintain Current Services. This measure indicates how difficult it will be for higher education to compete with other sectors of state government in order to maintain a constant per-student level of funding.

These measures become particularly useful when paired with some of Mr. Halstead's measures. They need not be replicated every year, but should be compiled every two years to reflect the substantial changes in state fiscal fortunes that can occur in a relatively short time. Mr. Hovey passed away in 1999. No provision has been made for continuing the production of this very useful report.

3. Postsecondary Education Opportunity

   Thomas Mortenson publishes the document *Postsecondary Education Opportunity* on a monthly basis. It contains numerous useful items of information, three of which are of particular importance:

   a. Chance for College by Age 19. This measure is of the likelihood that a student entering 9th grade will be enrolled in college at age 19. It combines measures of high school retention and college participation, thus bringing the interconnectedness of K-12 and higher education into sharper focus than would be possible with separate measures. The information is provided on a state-by-state basis.

   b. Chance for College for Students from Low-Income Families. This measure is similar to the former with the added nuance that it addresses the issue from the perspective of only the lowest income students in the state.

   c. Adjusted [Predicted/Actual] Persistence and Graduation Rates. This measure compiles a statewide estimate of persistence and graduation rates for all of the institutions in the state, and compares it to the rates that might be expected, given the demographic and other characteristics of entering students at each institution as determined by a regression procedure.

   Mr. Mortenson has indicated his intention to continue producing his information for the foreseeable future. But it's availability is nevertheless dependent upon a single individual.

4. *Grapevine: A National Database of Tax Support for Higher Education*

   Developed by M. M. Chambers and now maintained by other faculty at Illinois State University (formerly Edward Hines and now James Palmer), this database is available on a website, and includes data on state tax appropriations for operating expenses of higher education. It includes data on:

   - State appropriations per capita
   - State appropriation per $1000 of personal income
   - Revenue capacity, willingness, and higher education effort
   - State rankings on one-, two-, and ten-year percentage changes
   - Annual average five-year percentage changes in state tax appropriations

   These data provide a useful adjunct to those prepared by Mr. Hovey and Mr. Halstead. Mr. Palmer has indicated that he expects this work—long maintained at Illinois State University—will be continued there.

5. Projections of High School Graduates

   The Western Interstate Commission for Higher Education (WICHE) produces a document approximately every four years that presents both historical and projected data on numbers of high school graduates by state are presented (the most recent entitled *Knocking on the College Door*). Over the years, these reports have become more sophisticated—initially adding data on private, as well as public, high schools and more recently providing data about students by racial/ethnic category. The WICHE report has become the principal source of such information in many states, and has become the principal standard against which in-state estimates are compared in others.

   The effort associated with producing this report on a regular basis is continually a problem for WICHE. Its episodic nature means that a constantly changing analytic staff must gear up every four years to produce the report. Further, since its production falls outside WICHE's core mission, separate funding must be found. This support has consistently come from the College Board and the W. K. Kellogg Foundation, but there are no assurances of its continuation. WICHE is now beginning the process for producing the next version of this report. Beyond this one additional version, there are no guarantees as to its future.

6. National Association of State Student Grant and Aid Programs

   This association annually produces a report on the types of student aid programs operated by each of the states, the amount of funds distributed through each of the programs, and the number of recipients. This information has been published regularly for 30 years. There is no reason to believe that these data will not continue to be available in essentially the same form. Since the information is the product of the association, not an individual, it is less subject to becoming unavailable.

All of these sources have achieved the status of being authoritative in the specific domains that they have carved out for themselves. They are frequently referenced and, in many cases, they constitute the only information available. But collectively, these sources represent an incomplete set of information. Other needs mentioned earlier—for example, regular measures of the cost-effectiveness of a state's (and an individual citizen of that state's) investment in higher education—are not addressed by this available array of information. Additional measures of performance in areas such as graduate education and research, moreover, should not be ignored in the broader context of state higher education policymaking (even though these areas by design were omitted from *Measuring Up*). It is important to reemphasize the fact that some of these sources will disappear in the absence of intentional action. Others will continue their good work for the foreseeable future, but when such enterprises are dependent on the abilities and interests of a single individual, there is always the risk of an unexpected cessation of activity.

V. DATA ISSUES

The previous section argued that obvious deficiencies in needed information can almost completely be attributed to the absence of the underlying data. By way of summary, the most important of these gaps include:

- K-12 student performance (NAEP data from all states)
- 12^{th} grade academic proficiencies
- College student learning
- Adult literacy (NALS data from all states)
- Income characteristics of state student financial aid programs
- Measures of civic engagement
- Preparation of K-12 teachers and access of students of different socioeconomic groups to fully prepared teachers
- Involvement of higher education in addressing state priorities
- Alignment of K-12 and higher education curricula and standards
- Job placement and mobility of former postsecondary students

While addressing some of these deficiencies will be conceptually challenging, the fact that the list is so short is noteworthy. In fact, its very brevity suggests the utility of looking afresh at the simple conceptual model proposed in Figure 2 to reveal new potential insights about the kinds of policy information that might be generated. Carried out systematically, this exercise enables us to identify the data that are—and are not—available to describe:

- Key features of the entities/stakeholders identified by the model
- The important interrelationships among these entities

Results of this exercise are attached as Appendix A and helped to identify an additional array of data needs. The most salient among them include:

- Employment by occupation (all states) at more frequent intervals
- Placement of college grads in occupations requiring a college education, by state
- Continuation of employer satisfaction surveys
- Achievement of workplace competencies (overall workforce and college grads)

Readers are invited to review the contents of Appendix A to:

- Make additions and corrections as appropriate.
- Offer alternative judgments about the priorities identified.

VI. MECHANISMS FOR ADDRESSING THESE NEEDS

The previous sections have identified a variety of unmet needs for:

1. Procedures to convert available data into information that will help formulate a public higher education agenda or that will illuminate important choices about policy initiatives.
2. Mechanisms to sustain the production of some specific information sets that policy analysts have found particularly useful, and which may not be produced in the future under current sponsorship.
3. Data that are currently not collected, but are needed for informed policymaking.

All of these gaps and needs deserve attention. There remains, however, the significant question of *how* this attention might be given. Who should have the responsibility of recommending priorities? Who should do the actual work of collecting data? Of converting data into information relevant to policymakers? How might these activities be financed?

A. Criteria for Responses

These questions do not have a single right answer. While multiple options are available, though, appropriate answers should meet a clear set of criteria. Among them are the following:

1. Authoritative and Neutral Sources

   The information presented must not only be of high quality, but it must also be produced by sources that are widely perceived as both authoritative and neutral. Information carries added weight if users can point to the source as an individual or organization widely recognized as having substantial expertise in the field. Further, the source must not only be an unbiased source but must be *viewed* as being a neutral source. Therefore, the information source should never be an organization or individual that has a vested interest in what the information reveals. Instead the source must have the freedom to dispense bad news along with good. This criterion suggests that, in most cases, state-based organizations and institutional membership organizations will have a hard time passing the neutrality screen, even if they might otherwise provide good information. It also suggests that the source of information ought not to be tied to a single funder.

2. A Way to Determine Priorities

It will be impossible to address all of the needs identified in this paper immediately and simultaneously. Some method for recommending priorities is needed that recognizes emerging opportunities and funder interests. Recommendations about priorities, moreover, should be developed with a strong bias toward the demonstrable needs of policy analysts and policymakers. Some potential principles that might be used to help determine relative priorities include:

- Direct linkage to questions frequently asked by policymakers, and/or analyses that would help determine gaps between societal needs and existing higher education assets and activities. This should be the primary criterion used to screen potential candidates for further development.

- How much is already in place with respect to base data and how much additional effort would be required to generate useful information. It is suggested that some priority be given to "easy wins" here—that is, data sources which would take relatively little effort to standardize or to render them more useful for analysis, as well as information sources that are already developed but whose future is uncertain.

- Cost and time/effort required for developing useful information. Both a short-term and a long-term strategy should be pursued here, but in both cases it will be useful to know how much of an investment will be needed.

- Public traction and face validity. Priority should be given to data and information sets that can speak broadly and effectively to the policy community and to the wider public.

- Sufficient, but not excessive, precision. Experience with *Measuring Up 2000* suggests that many potentially useful data and information sets will be complete and precise enough to inform policy, yet not meet classic research-based tests of completeness and precision. In determining priorities, care should be taken to concentrate on getting items that are "good enough" for policy work into the hands of the policy community, rather than seeking perfection.

3. Visible and Adequate Quality Control Mechanisms

Information will be useful and authoritative only if it is of high quality. In this context, "quality" has two dimensions, as suggested by the principles above. The first is technical quality: the information must be derived from accurate data using appropriate and sound analytic techniques. The second dimension is fitness for purpose: the information must be relevant to the decision at hand and must be viewed by decisionmakers as being relevant and believable. Candidate information sets should thus be subject to two different screens in the development process. First, a "user screen" should judge the extent to which any proposed measures

reflect concepts of interest and communicate clearly to lay audiences. A second screen should ensure technical soundness.

B. Realities That Constrain Choice

The criteria listed above help define any options proposed to respond to identified needs. More constraining are realities that cannot be ignored. Chief among them are:

1. Dispersed Talent and Capacity

   No single source can adequately address the array of data and information needs identified in this paper. The reality is that information will continue to be developed by multiple experts operating in only a loosely-coordinated fashion. This does not mean, however, that information generated in diverse settings cannot be compiled in a single place for ease of access. There also would be utility in creating a venue where the principal suppliers of information could meet at least once a year to discuss issues of common concern. These might include problems associated with basic data, periodicity of reporting, potential relationships among data sets and information series, etc.

2. Expensive Data Collection

   Partly as a consequence of the above, only limited options are available to fund basic data collection activities. Most data collection will thus continue to be done by government agencies that are subsidized explicitly to perform such functions, or by non-governmental organizations that can provide policy-relevant information as a by-product of other economically self-sustaining ventures (e.g., ETS and ACT compile valuable aggregate information as a consequence of their collecting individually financed test results). To the extent that existing information providers (Halstead, Hovey, Mortenson, et al.) have collected data directly, these data represent only a small fraction of that used in their analyses. Proposed large-scale data collection activities that cannot be funded by either the (federal) government or by individual users/customers are unlikely to meet the needs they were designed to address, simply because they will never be implemented on an ongoing basis.

3. Financial Viability

   Most information gathering activities will not be financially self-sustaining. The audience for information relevant to higher education policymaking at the state level is very small. There are only fifty states, of which only a few will be actively engaged in decisionmaking of strategic importance in any one year. The number of individual users within a given state is likewise quite small. Furthermore, the cost of information often becomes a handy excuse to do without it—particularly if that cost is significant. This response is exactly what needs to be overcome. The closer information is to being a free good, the more likely it is to be used and, ultimately, to make a difference.

VII. RECOMMENDATIONS

The previous sections of this report have:

- Listed a set of key information sets that should be developed and/or maintained in support of effective state-level policymaking about higher education.
- Listed a similar set of requirements for additional data collection.
- Presented a short list of criteria that should guide how these gaps and needs might be addressed.
- Identified some realities and constraints that will likewise influence how progress might be made.

Within this context, the following set of recommendations with regard to next steps appear warranted.

A. A Limited Infrastructure

The task of addressing emerging policy information and data needs is too important to remain an *ad hoc* and purely voluntary activity. But realities and fiscal constraints mean that this infrastructure must be limited in both size and scope. To this end the following components seem appropriate.

1. Create an Independent Advisory Board

   Actions to enhance available data and information resources could benefit substantially from the collective involvement of a group of senior policy analysts and information users. There can be no mandatory role for such a group, but if its members were sufficiently prestigious, its imprimatur would be sufficient to obtain voluntary cooperation on the part of those developing and reporting policy-directed information. Among the functions such a group might play are:

   - Recommending priorities for both additional data collection activities and new information series.
   - Informing funders and data collectors about priorities to obtain support for information initiatives.
   - Lending weight to reports and information sets by publicly endorsing them—after ensuring that the materials had been subjected to the two quality screens identified above and reviewing the materials themselves.
   - Convening those actively engaged in generating data and information to discuss results with key users, discuss possible enhancements, and review priorities for additional needs.

- Advocating for changes in law or policy that currently inhibit the development or use of potentially viable data sources (e.g., the UI Wage Record).

- Promoting support of data collection activities by states in cases where individual states have the option of providing monetary support to obtain state-specific results of national data collection efforts (NAEP, NALS, etc.).

This group could function effectively on a voluntary basis. Indeed, most of the individuals who would likely comprise it already work closely together in many other venues and could be persuaded to add these functions to their other involvements. Their work would assume additional weight if the group was given formal recognition by entities such as NCES and some of the major funders—especially if these actors solicited, and seriously considered, advice from the group as part of their own decisionmaking processes. But it is important that it not be perceived as "owned" by any particular community—either governmental or institutional.

2. Provide a Small Administrative Staff

To ensure ongoing, undivided attention to the central information and data issues, a staff consisting of one experienced higher education data/information professional and a support staff member should be hired. This small staff would be responsible for:

- Providing logistical support to the advisory board.

- Providing staff support to the substantive deliberations of the advisory board.

- Developing and maintaining a clearinghouse of information resources. This site may well consist of developing a web page with links to other sources as well as commentary on available information sets (their idiosyncrasies, any identified problems, appropriate applications, etc.).

- Developing and maintaining information sets as staff expertise and available time allow. This item is added to ensure that staff can devote full-time effort to related activities rather than being involved with the advisory board on a part-time basis.

This staff—at least in the short run—should be attached to another organization that itself meets the criteria of credibility and neutrality in the eyes of policymakers. In time this activity may evolve into a freestanding organization. However structured, the advisory board, its support staff, and its work should be characterized by independence, recognized high status, and visibility among key constituency groups.

B. Key Information Sets

A second set of activities should focus on orchestrating the development/maintenance of a variety of information sets that can be accomplished in the short run with a comparatively small commitment of financial resources. A "short list" of development/maintenance activities fit these criteria and helps identify some prime candidates for near-term efforts:

1. Ensure the continuation of information series for which both data and analytic procedures are already well developed.

   Two such series are of special importance:

   - Hovey's work on state and local (budget) surplus or shortfall and relative percent changes in spending to maintain current services. A mechanism should be found to institutionalize the acquisition of the base data for the state budget report and to publish these data on a biennial basis.

   - Halstead's *State Profiles: Financing Public Higher Education.* The vast majority of the data that drive these analyses are routinely collected by federal agencies. The requirement is to find a new home for the translation of data to information, to acquire copyrights and analytic routines from Mr. Halstead, to replicate his analytic routines on an annual basis, and to make the results available on the Web.

2. Initiate the development of new information series.

   Based on the analyses presented earlier in this paper, it is suggested that top priority be given to:

   - Cost-Effectiveness/Public Rate of Return

   - Cost-Effectiveness/Individual Rate of Return

   Both these measures can be utilized quickly in *Measuring Up* and the data required to construct them are available. What remains is the development of the analytic constructs needed to convert data into information.

C. Long-Term Development in Selected Areas

Two critical information needs emerged from *Measuring Up 2000*. The first of these is Student Learning, an important information category for which neither the data nor the approaches to indicator development are readily available. Initial steps are already under way to determine how to best make progress in this area. A related area is Civic Engagement. While this area has not received the same level of attention from opinion leaders as Student Learning, it is important to start shaping an approach to acquiring data and developing indicators in this area. In the absence of serious attention to this topic, the Report Card and related activities will be accused of focusing too heavily on

the economic benefits of higher education, and risk being ignored by that large and generally influential set of decisionmakers who draw a sharp dividing line between education and training.

With some trepidation, we also suggest that attention be given to measures of adequacy and equity (especially adequacy) of institutional funding. We have already stressed the importance of shifting from a provider-centered to a client-centered approach to public policymaking. But higher education policy has been focused on institutional funding for so long—and educational leaders are such a powerful voice in the policymaking process—that to avoid this topic will open up all other parts of the agenda to attack. The typical stance among educators is that, "You ought not address other priorities until institutions are adequately funded." In that context, facts or benchmarks regarding funding adequacy would do much to inform the broader ranging debates about higher education policy. Required data are generally available on this topic. We suggest it be placed in the "long-term" category because of the importance of being thorough in weighing both the technical and political feasibility of further developmental work. Finally, though we are a lot less clear about how, we believe that long-term attention needs to be given to developing datasets that speak to K-12/higher education alignment and standards, and to international comparisons of higher education practices and effectiveness.

D. A Stable Base of Financial Support

As noted earlier, needed data collection efforts, with few exceptions, will have to be financially supported and conducted by those organizations already well positioned to carry out those activities. These include government agencies like NCES, the Bureau of the Census, NSF, the Department of Labor, etc. and the private-sector testing companies. The maintenance of key information series and the development of new analytic conventions is where alternative forms of support are most critical.

At this juncture we recommend that the Advisory Board, acting collectively and through its administrative staff, investigate the possibility of supporting these activities by establishing a public-private partnership. Such an arrangement might involve a) a coalition of private foundations on the one hand, and b) the federal government on the other. With regard to the latter, the obvious source is NCES, more specifically some part of the funding currently being devoted to the National Postsecondary Education Cooperative (NPEC). NCES is currently rethinking the charge to this group and the allocation of resources to NPEC activities. Within the next few months the time may be right to formally approach NCES to test the feasibility of their participation in such a partnership.

This mechanism should be pursued only if assurances of independence can be given, especially by the federal partner.

VIII. CONCLUSION

This document has reviewed the information required to support higher education policymaking, particularly at the state level. In the process, gaps were identified in:

- Basic data resources
- The availability of generally accepted algorithms to convert data into information
- The capacity to provide key information sets on an ongoing basis

While substantial work remains, we were frankly surprised at how short the list of unfinished business really is. Most encouraging is the recognition that progress does not depend nearly so much on (very expensive) new data collection activities as on attention to (less expensive) new algorithms for converting data to information, to continuing work already accomplished, and to ensure ready access to key information sets.

With the intent of moving beyond diagnosis to action, we have proposed a set of next steps for consideration by both the policy and funder communities. We invite all readers of this paper to provide us with additions and corrections to the diagnostic portions of the paper. More importantly, we invite participation in the dialogue about next steps and in the journey itself.

References

Davenport, T. H., and Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Boston: Harvard Business School Press.

APPENDIX A
AN ASSESSMENT OF DATA AVAILABILITY

This appendix summarizes:

- The policy relevant data that are available.
- Those items of data that are not available and that would be most useful to policy analysts if available.

The summaries are organized according to the conceptual schema described in Figure 2 with separate categories for 1) each of the entities/stakeholders in the model, and 2) the relationships between pairs of entities/stakeholders.

Those items of data identified in the body of the report as most deserving of attention were selected from the "important additions" column of this appendix.

AREA	AVAILABLE DATA	IMPORTANT ADDITIONS
Population	• Numbers • Place of residence within state • Age • Race/ethnicity • Gender • Income • Educational attainment of adults • Primary language • High school completion (18- to 24-year-olds) • Social indicators data dealing with: > Health > Status of children (Kids Count) > Crime statistics/incarceration rates > Family structures > Housing > Migration patterns > Etc.	• Levels of adult literacy—all states with estimates by county • Attainment of basic workplace skills • Estimates of educational attainments more frequently than decennial census (minimum every 5 years) • International comparisons of all of the above
K-12 Students	• Numbers • Grade level • Gender • Race/ethnicity • ACT/SAT scores • AP test takers and scores • Some states > 9th-12th graders taking at least one upper level math course > 9th-12th graders taking algebra > 8th grade students taking algebra > 8th grade students scoring at or above "proficient" on NAEP – Math – Reading – Writing	• 12th grade academic proficiencies • All states > 9th-12th graders taking at least one upper level math course > 9th-12th graders taking algebra > 8th grade students taking algebra > 8th grade students scoring at or above "proficient" on NAEP – Math – Reading – Writing
College Students	• Numbers • Gender • Race/ethnicity • Level • Income	• Measures of academic achievement • Acquisition of key competencies > At point of transition from lower division to upper division > At award of Baccalaureate degree • Attainment (level) of workplace skills • International comparisons of all of the above

AREA	AVAILABLE DATA	IMPORTANT ADDITIONS
Private Sector/ Employers	• Number of establishments • Employment levels > By industry > By occupation (decennial census) • Projections of needs by occupation (some states)	• Employment by occupation—intervals more frequent than decennial census • Occupation by skill required (i.e., Work Keys) • Projections of needs by occupation (all states)
State	• Population characteristics • Economic characteristics > Gross state product, by sector > Employment/unemployment • Tax capacity and tax effort	• Employment by occupation (more frequent intervals) • *Continuation* of tax effort and tax capacity
K-12 Schools	• Revenues, by source • Expenditures, by use • Employees, by type	• Incidence of use of uncertified teachers (using a consistent measure across states) • Number of high school students with no access to AP courses
Higher Education	• Revenues, by source • Expenditures, by function • Assets • Programs offered, by field and level • Governance/control	• A reliable inventory of non-collegiate providers
Student-K-12 Interactions (Disaggregated by County)	• Enrollments by: > Grade level > Gender > Race/ethnicity > SES (free and reduced lunch eligibility) • Dropouts • Graduates (actual and projected) • Some states > 9th-12th graders taking at least one upper level math course > 9th-12th graders taking algebra > 8th grade students taking algebra > 8th grade students scoring at or above "proficient" on NAEP – Math – Reading – Writing	• Numbers/proportions of students, by income level, being taught by teachers not certified in field • Dropouts, by income level • *Continuation* of high school graduate projections

AREA	AVAILABLE DATA	IMPORTANT ADDITIONS
Student–Higher Education Institutions Interactions	• Number of enrollments, by: > Race/ethnicity > Gender > Full-time-part-time status > Level > Age > State of origin (for first-time students) > Transfer status > Type of institution • Number of graduates, by: > Race/ethnicity > Gender > Program > Degree level > Type of institution • Persistence • Graduation rates • Student funding of higher education/tuition revenues	• Numbers of course enrollments, by high school students (level of concurrent enrollments) • Number of students being served by non-traditional providers > In-state providers > Out-of-state providers delivering courses/programs by distance education) (National data—but not state—available from CPS) • Participation, by sector, by students of different income levels • Progression through system of students of different income levels > Persistence > Multi-institutional attendance > Dropouts > Degree completion • Rigorous course-taking at college level • Institutional aid awarded by income level • Number of employer-recognized certifications being awarded annually
Population–Higher Education Relationships	Satisfaction with attitudes toward higher education	
Student–State Govt. Interrelationships	State student aid to students in different types of institutions	• Income levels of state student aid recipients • State of residence of students
Student–Federal Govt. Interrelationships	• Federal student aid, by program • Income levels of student aid recipients (for participants in federal programs)	• Unmet need for student aid
Student–Private Sector Relationships	Employment in occupation related to academic field of study—for vocational programs	• Placement of college grads in occupations requiring a college education, by state and field of study • Career mobility, by state and field of study • *Continuation* of employer satisfaction survey

AREA	AVAILABLE DATA	IMPORTANT ADDITIONS
Population–State/Society Relationships	• Participation in public assistance programs • Crime statistics/incarceration rates	• Levels of involvement of adult population in volunteerism and other forms of civic engagement > Total population > College grads
Higher Education Institutions–State Govt. Relationships	• Funding flows • Operating • Capital • Regulations • Accountability • Governance	• Engagement of higher education in addressing state needs
Higher Education Institutions–Federal Govt. Relationships	• Research funding for doctoral granting institutions in state > By discipline > By source of funding • Institutional funding, by type of institution • Institutional funding, by federal program	
Higher Education/ K-12 Relationships		• Admissions (to college) requirements—relationship to high school graduation requirements • Placement of higher education graduates as K-12 teachers/employer satisfaction • Level of engagement of higher education in addressing needs of K-12 schools • Alignment of K-12 and higher education curricula, coursetaking, and standards of achievement