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Feasibility of a Student Unit Record System Within the Integrated Postsecondary Education Data System

Research and Development Report

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Executive Summary

This report examines the feasibility of implementing a student unit record (UR) system to replace the student–related components of the Integrated Postsecondary Education Data System (IPEDS). The feasibility study was initiated by the National Center for Education Statistics (NCES), a part of the Institute of Education Sciences (IES) within the U.S. Department of Education (ED), in response to growing interest within the postsecondary education community for more accurate measures of net price and graduation rates, especially measures that take into account institutional mission and student mobility. This interest parallels a growing congressional desire to hold postsecondary institutions accountable for student outcomes.

Background

This discussion of the feasibility of a UR system at the federal level is occurring within the context of the development of other UR systems for students attending postsecondary institutions. Unit record systems are maintained by most colleges and universities to track registration for courses, academic performance, degree and certificate completion, financial aid, and other purposes. A number of states began to develop UR systems in the mid–1980s and use UR data for analysis and program evaluation. Today, 39 states have at least one student UR system. A limitation of state UR systems, however, is that most do not include data on students attending private institutions, or students who leave an institution and transfer across state lines.

Many governmental and other organizations also maintain UR systems on specific groups of students. For example, the National Student Loan Data System (NSLDS) within the office of Federal Student Aid (FSA) compiles information on all recipients of federal student loans, including verification of enrollment by academic term. In addition, the National Collegiate Athletic Association (NCAA) collects UR data on 1,800 institutions with Division I, II, or III varsity athletic programs, and about 2,800 colleges and universities currently contract with the National Student Clearinghouse to perform enrollment verification and other services using student UR data uploaded from member institutions.

At IES/NCES, the Integrated Postsecondary Education Data System (IPEDS) is the core postsecondary education data collection program, designed and implemented to meet its mission to report on the condition of postsecondary education in the United States. IPEDS is a single, comprehensive system that encompasses over 10,000 institutions whose primary purpose is to provide postsecondary education (including roughly 6,700 institutions that have Program Participation Agreements with ED for Title IV federal student financial aid programs and are required by statute to report to IPEDS). The IPEDS system collects institution–level

data in the areas of enrollment, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid. The use of aggregate data has some limitations in comparison with UR data, such as the inability to track the academic progress and experiences of individual students, and therefore to study the longitudinal enrollment of different types of students.

Despite its comprehensiveness, the IPEDS system cannot measure many of the evolving trends in postsecondary education that are necessary for sound policy decisions. The current IPEDS framework cannot accurately capture changing enrollment and completions patterns in the postsecondary education sector, especially given increasing numbers of nontraditional students, and cannot describe the prices various types of students face after financial aid is taken into account. To do so, it would be necessary to collect accurate student–level information on persistence systemwide (i.e., regardless of institution and nationwide), multiple enrollment, part–time enrollment, transfer, and attainment. It would also be necessary to collect student–level information on prices and financial aid, in order to calculate net prices that take into account the individual circumstances of each student. By its very nature, a UR system would enable the collection of data that would lead to more accurate estimates of these variables. In addition, a UR system would allow the development of a whole range of new measures, such as net prices for specific groups of students, graduation rates that take into account institutional missions, persistence rates that consider student mobility and a

systemwide perspective, measures of enrollment patterns for nontraditional students, and time to degree by field of study.

Goals and Design of the Feasibility Study

In exploring the feasibility of a UR system, the study attempted to investigate whether such a system *could* be constructed technically and effectively, given the knowledge about UR systems already accumulated at the state and institutional levels. In addition, the feasibility study tried to explore whether such a system *should* be developed by the federal government. To do so, the study solicited input on several dimensions, including privacy and confidentiality, institutional burden, coordination, technical issues, and timing.

As part of the feasibility study, three Technical Review Panels (TRPs) were designed to gather feedback and ideas from different perspectives related to the study, and included representatives from the following groups: 1) states, state systems, private systems, and private associations of colleges and universities; 2) institutions, particularly institutional researchers and registrars; and 3) other stakeholders, including the national postsecondary education association community, federal agencies, units within the ED, and vendors such as administrative information system developers. In addition, the contractor developed an architecture and flow of operations for a proposed student UR system, as well as a list of potential data

elements that might be collected under such a system.

In reading this report, it is important to keep in mind that any redesign of IPEDS to develop a UR system would require legislative authorization through amendments to the Higher Education Act (HEA) and funds would have to be appropriated by Congress to implement the system.

Proposed Redesign of IPEDS

If authorized and funded, the proposed UR system would replace the student–related components in the current IPEDS collection—Fall Enrollment, Completions, Student Financial Aid, and Graduate Rates—as well as the price of attendance variables collected in the Institutional Characteristics component. The UR system would be designed to include all of the variables necessary to replace those components and calculate institution–level estimates for the Peer Analysis System (PAS). The collection process for nonstudent–related components in IPEDS would remain the same.

It is difficult to describe exactly what the UR system would look like before the design process is undertaken. Such a process would involve numerous technical review panels and input from campuses, university systems, and state coordinators, particularly from states with UR systems. Generally, the UR collection system would be designed to collect individually identifiable data through files that are submitted electronically by institutions. The files

would be used to calculate institutional summary totals for each school, with information about enrollment, completions, graduation rates, financial aid, and price. Four types of files would be submitted.

- Header files: These data provide individually identifiable information such as name, Social Security Number (SSN), date of birth, address, race/ethnicity, and gender that are attached to an individual student's record. These files would be required at least once for every student. New header records would be submitted as needed to document any changes in these key data.

- Enrollment/term files: These data include program information such as number of courses and credits attempted, major field of study, start and end dates, and attendance status. The files would be required three to four times a year, and institutions would be allowed to upload files more frequently if they wished.

- Completions files: These data include information on degree completions and the date of completion. The files would need to be uploaded at least once per year.

- Financial aid files: These data include information on financial aid received from federal, state, and institutional sources. Information on price of attendance would also be included with the financial aid file. These data also would need to be uploaded at least once a year.

In addition, in the first year of an IPEDS UR collection, additional files would need to be submitted in order for NCES to complete the historical calculations that are part of the Graduation Rate Survey. Depending on program length, these could include up to six years of data for key pieces of information.

For each submission of data, the IPEDS keyholder at an institution or coordinating agency would submit data electronically through the IPEDS collection system, similar to the process that exists currently. After submission, NCES would review the data to make sure they are consistent within the file and with prior submissions. Schools would work with the IPEDS Help Desk to match all records, and any that do not match would have to be resolved. The UR data would then be summarized in online institutional reports, which would also be checked for consistency, before the keyholder "locks" or finalizes the submission.

The UR data would then be moved from the collection system to the permanent database storage system. The full UR database would only exist in this permanent storage area, which would not be accessible via the Internet and would be subject to high IES/NCES levels of protection for confidentiality and security. Ultimately, aggregate estimates would be calculated from the full UR database and moved to the PAS, where they would be stored as institution–level data.

Individually identifiable data would remain within the permanent storage system. The only allowable redisclosures of individually identifiable data would have to be specifically authorized in the HEA legislation, including.

- Enrollment verification for the National Student Loan Data System (NSLDS): The UR system would be used to verify enrollment for students who are receiving federal student loans. Currently, this verification is being done either by institutions themselves, or by organizations such as the National Student Clearinghouse.

- Verification of subsequent enrollment to the IPEDS keyholder: The UR system would be used to redisclose individually identifiable data back to the initial keyholders and to state/system coordinators, in order to give something back to institutions. Data on the subsequent enrollment of students who left the first institution in the previous year would be redisclosed to the keyholder, including the institution of subsequent enrollment, date, attendance status, attainment, and date of attainment.[1]

- Record mismatches: During the process of data collection for the UR system, mismatches between data records and other types of edit failures would have to be resolved. This would involve sending individually identifiable information back to the IPEDS keyholder. These

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[1] Redisclosure of student information to the original institutions could take place over a longer time period if this was decided by a future design Technical Review Panels and NCES.

types of edit failure resolutions would be essential to the data integrity of the database.

Other uses of the data would not involve the disclosure of individually identifiable student information. For example, while ensuring the confidentiality of the data, NCES could generate aggregate reports for the Office of Postsecondary Education (OPE) using the UR data (e.g., to generate aggregate measures of persistence, transfer, and attainment for various types of federal student aid recipients, such as those attending on a part–time basis). It would also be possible to add new derived variables to the PAS, used by institutional researchers and other analysts. Each of these derived variables would be reviewed for potential disclosure risks prior to their release on the PAS. Such variables could include new definitions of net price; new measures of graduation rates that better take into account the missions of postsecondary institutions and the mobility of students across institutions; new definitions of time to degree, including transfer calculated for various fields of study; variables that describe enrollment by field of study and program length; and completions by field of study.

Challenges to Implementing a UR System

Technically, UR could be done at most institutions in the long term, after investment of time and financial resources. This can be inferred from the fact that 39 states have compiled UR systems in some form; thousands of

postsecondary institutions already submit UR data electronically to private organizations; and postsecondary institutions that are Title IV participants are required to upload information on federal aid recipients to the FSA. Nonetheless, in feedback from institutions, states, associations, and other stakeholders, it is clear if a UR system is legislatively authorized, certain concerns must be dealt with and resolved in the design phase of implementation.

Privacy and confidentiality

Concerns have been raised about student privacy and the confidentiality of individually identifiable student data under a federal UR system. ED, IES, and NCES have always taken seriously the importance of safeguarding student data, but a UR system raises questions about students' rights to withhold or control personal information. This is particularly the case for students who do not receive federal student aid. However, these students benefit indirectly[2] from federal student aid funds, which support all programs, and benefit directly from state appropriations at public institutions and the tax–exempt status of private, not–for–profit institutions. Additionally, data on nonaided students are a critical element to compute graduation rates, retention measures, and other indicators. Information on nonaided students would be necessary in order to compare these measures with information on students receiving student aid.

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[2] Tuition at these schools is probably lower than it would be if they were not the beneficiaries of tax–exempt status and state appropriations.

In addition to misgivings about student privacy, there are practical, technical concerns about unauthorized access to the data by hackers and identity theft. This is particularly true given the proposal to use SSNs as one of several personal identifiers that are necessary for matching student records. The use of SSNs would be essential to a UR system to accurately link together student information on financial aid, enrollment, and completions, as well as records from various institutions. Enrollment verification for the FSA already includes the use of SSNs as a student identifier. An additional measure of enrollment intensity at the start of each term (such as full– or part–time) would also be collected to satisfy FSA requirements.

Despite these concerns, IES/NCES is well suited to protect the data, given the strict limits of the legislation regarding data confidentiality under which it operates. IES/NCES legislation protects the privacy of individuals, making wrongful disclosure a Class E felony punishable by up to five years in jail and a $250,000 fine. NCES has experience in working with individually identifiable data through its various sample surveys, and has created the structures and procedures necessary to prevent unauthorized disclosure of such data. In fact, there are no cases where individually identifiable data collected by NCES have been wrongfully disclosed by an employee, a contractor, or a restricted licensee, or of cases in which hackers have breached IES/NCES firewalls. If collected, the data would be technologically protected and secure, and would not leave NCES unless

allowed by law. Under the Patriot Act, the Attorney General and the Department of Justice could conceivably obtain access to UR data in order to fight terrorism. Students on whom data are held would be able to "opt out" of the redisclosure of subsequent enrollment information.

Institutional burden

The additional burden of a UR system can be divided into two categories: initial implementation and subsequent operations. The burden of initial implementation is expected to be higher than the costs of subsequent operations. A field test would be necessary in order to make sure the system works, to anticipate and address problems that would be encountered, and to develop all necessary features in the system prior to implementation. About 1,200 to 1,500 institutions would be required to participate in the field test and report using both the old and new IPEDS collection system. Although NCES would make every effort to notify selected institutions early, participating institutions would need to make changes in their reporting systems within a relatively short time frame, depending upon the desire of Congress for an implementation schedule.

In the full–scale implementation, many institutions would need to upgrade information technologies and assign staff to comply with new reporting requirements. Staff would need to be trained in the use of these systems and the details of reporting procedures. Some institutions would need to rely on vendors to provide upgrades to existing

software, build their UR extracts, or pay for changes to legacy information systems. These additional activities would likely increase software costs. Obtaining historical GRS files for all cohorts in the first year would present a burden (although these same files are needed now to calculate the GRS locally). The initial burden on small institutions is likely to be relatively high, unless the institutions are part of a larger system or state association.

The additional costs of subsequent operations under a UR reporting system are expected to be lower than the costs of initial implementation. Keyholders would need to coordinate with offices on campus to gather data, run internal checks to make sure data make sense, submit data to NCES several times per year, and work with the IPEDS Help Desk to reconcile record mismatches and discrepancies in data. Some mismatches of records could be difficult to resolve, especially if there are numerous records.

It is very difficult, at the conceptual stage, to make cost estimates with any degree of precision. Costs would differ widely among postsecondary institutions, depending on whether they are in state UR systems, whether they currently upload to organizations such as the National Student Clearinghouse, whether they use local or proprietary administrative information systems, and the extent of their IT and institutional research capability. There would be a decrease in burden after the initial implementation of a UR system, as postsecondary institutions would no longer need to track and maintain records on GRS cohorts for six years or

fill out the current IPEDS student–related components.

If a UR system were implemented, it would be important to take into account these various issues during the design phase of implementation so as to minimize institutional burden. There are different ways to offset the cost and burden of a UR system. One funding mechanism, Administrative Cost Allowances (ACAs), is used to help defray the cost of administering federal student aid programs.[3] A similar funding mechanism could be put in place for a UR system.

Technical issues

Technical issues were also raised as a potential challenge to the implementation of a federal UR system. The proposed system would include the creation and maintenance of a database of millions of student records, with new records added every year. In addition, the system would require the uploading of large files from postsecondary institutions to NCES, using multiple forms of security to protect against unauthorized disclosures of data. NCES currently has most of the hardware and software necessary to implement a UR system, including current equipment used in the web–based IPEDS collection as well as servers capable of storing large amounts of student data. One necessary addition would be database storage, to be located offline in a secure

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[3] Institutions currently receive over $150 million in Administrative Cost Allowances (ACAs), which is provided to help cover the cost of administration of federal programs such as Pell Grants and campus–based aid.

site and protected by physical and software firewalls.

There would likely be greater technical challenges for postsecondary institutions, with the extent varying among the registrar, institutional research, and financial aid offices, which sometimes utilize different and incompatible information systems. Institutions using both legacy and proprietary student information systems would need to make software conversions or updates. For the smallest schools, an Excel template could be provided to collect data and generate the data file needed for submission. Although the technical issues could present a problem, these schools currently find a way to do uniform reporting for FSA financial aid eligibility and NSLDS loan deferment.

The proposed UR system would also use XML[4] technology for the submission of data files to NCES, although it is likely that ASCII files would be accepted in the early years of implementation. Some postsecondary institutions have already adopted XML and are using it in their exchange of data with other organizations. On the other hand, many institutions do not currently use XML and training would be required on the use of this technology. Nonetheless, the FSA has already mandated that institutions begin

submitting data to the office using XML by 2005–06.

Coordination

Coordination of the flow of information presents a multitude of challenges in implementing a UR system. For example, a UR system might not work well within the existing IPEDS structures in some states. Most state UR systems are based on specific census dates. If multiple header and/or enrollment files need to be submitted at different points in time to capture total enrollment, this would involve a change in workload for both institutions and systems. Special TRP meetings should be held during the UR design phase in order to leverage existing UR systems whenever possible in order to meet both federal and state/system requirements and needs. This will prevent unnecessary duplication of effort and reporting, and ensure that any federal UR system maximizes the lessons that have been learned through years of state UR reporting.

Timing

In implementing a UR system, the timing of data collections would have to be addressed. If a UR system were authorized in 2005, a field test would then be administered in 2006–07, followed by full–scale implementation in 2007–08. The project timetable is designed to yield data relatively quickly while avoiding potential problems associated with an expedited timeframe. A phased implementation could also be considered to provide additional time to address problems during

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[4] XML is a "markup language," or mechanism for identifying structures within a document or data file. It employs tags to identify data elements, thereby facilitating the seamless exchange of data. In other words, it allows users to describe data and deliver it across a network, through the creation of common records across disparate databases.

implementation. To respond adequately as part of the field test, it might be necessary for institutions to examine the utility of their administrative information systems for the purposes of producing UR extracts and to address some of the burden issues mentioned above such as training and staffing. Early notification for the selected institutions would be crucial for the institution's ability to respond in a timely and accurate fashion. It is possible that NCES could draw the sample of institutions immediately after legislative authorization to allow selected institutions almost a year to prepare.

Since the UR system is based on individually identifiable records, it must comply with the Office of Management and Budget (OMB) requirement for collecting race/ethnicity data with a two–question format. A by–product of the UR system is that schools that have not yet implemented this change will need to do so to meet OMB Statistical Policy Directive No. 15, Race and Ethnic Standards for Federal Statistics and Administrative Reporting.

Another important issue is operational—how to time data collection schedules, while minimizing conflicts with other reporting schedules. The proposed UR system likely would collect enrollment records once per term. However, some institutions do not have standard terms; for example, courses may be offered on a rolling basis or on six–week terms. Institutions could choose to upload data more frequently, especially for the purpose of enrollment verification for student loan programs. It would be necessary to find a method of

specifying a whole range of flexible term reporting options, perhaps by asking institutions to document all possible term sequences using the IPEDS Institutional Characteristics component.

Degree and certificate completions would likely be collected with only one file per year, although institutions with several commencement periods might wish to submit multiple files over the year. In some cases, awards are recorded months after the relevant students have stopped attending institutions; degree dates then reflect the date the degree was awarded rather than when the degree was finished. In designing the timing of data collections and the periods of reference for the data, it would be useful to align the completions data with the enrollment data necessary to calculate graduation rates so that completions records can be matched to comparable enrollment records.

Student financial aid information also would likely be collected in only one file per year. Data submitted in an academic year would be from the previous year's award cycle. It would be important to time the collection of financial aid data so that it does not conflict with the institution's aid packaging period, which is the busiest time of year for financial aid offices. In addition, the treatment of summer sessions varies by institution, especially regarding whether summer sessions would follow or lead the submission of an annual data file.

All of these timing issues would be addressed during the design phase of UR implementation, should a UR system be authorized. In the proposed UR system,

collection schedules would not need to be on a uniform schedule, but rather could be geared to a schedule that works best for individual institutions. In other words, institutions with different calendars or financial aid packaging schedules could submit data to NCES on different cycles.

Conclusions

As this report has outlined, a central question for a UR system is *"Could it be done?"* Have the information technologies and infrastructures at the campus and state levels matured, could the current IPEDS web–based reporting system be adapted to a UR system, and would there be adequate technical and legal protections in place at IES/NCES? The report has addressed some of the technical and system problems associated with the design and development of a new IPEDS UR system. At the technical level, a UR system could be done at most institutions given time for implementation.

The feasibility study also addressed the "*Should it be done?"* question, providing a framework for the discussion of issues inherent in this question. These issues constellate in several areas of concern—privacy, burden, coordination, technology, and timing—which would need to be addressed and resolved in the design phase of a UR system should policymakers decide to authorize and fund such a system.

Finally, the feasibility study outlined areas of federal interest: better information for informed consumer decisions, including the improved calculation of net prices; and more accurate measures for institutional accountability and program effectiveness, including enrollment, persistence, transfer, and attainment rates by program of study. Policymakers would be able to monitor in real–time federal student aid programs (such as Pell Grants) and variations in aid packaging. The study also has attempted to highlight some potential benefits to institutions, researchers, consumers, and other users of NCES data.

The study did not attempt to address every challenge or make recommendations about how each aspect should be addressed. Nor did the study document specific organizational positions regarding the obstacles a UR system might face. Rather, it provided a framework for policymakers to understand the potential costs and benefits of a UR system as they discuss whether it should be considered.

The central defining question of the feasibility of a UR system in IPEDS is not a "could" question. It is a "should" question, asking whether the federal government should develop a system that is based upon individually identifiable information about enrollment, financial aid, and attainment. This system would, for the first time, give policymakers and consumers much more accurate and comprehensive information about postsecondary education in this country. Some of the benefits of a UR system include the collection of new data that would measure the success rates of students at institutions to which family and federal

student aid monies flow, provide more accurate consumer guidance, and improve federal programs that support those families and students. In addition to benefits, the feasibility study found a number of significant issues that would need to be overcome before a UR system could be implemented, including objections about student privacy, confidentiality of data, new institutional burdens, coordination within and outside of institutions, and timing issues.

Foreword

This report examines the feasibility of implementing a student unit record (UR) system to replace the student–related components of the Integrated Postsecondary Education Data System (IPEDS). These components currently are based on aggregate institution–level data collected through IPEDS. The feasibility study was initiated by the National Center for Education Statistics (NCES), a part of the Institute for Education Sciences (IES) within the U.S. Department of Education, in response to renewed interest within the higher education community for improved data.

The findings in the report are based on several components. Three Technical Review Panels (TRPs) were designed to gather feedback and ideas from different perspectives related to the study, and included representatives from the following groups: 1) states, state systems, private systems, and private associations of colleges and universities; 2) institutions, particularly institutional researchers and registrars; and 3) other stakeholders, including the national postsecondary education association community, federal agencies, units within the U.S. Department of Education, and vendors such as administrative information system developers. In addition, the experiences and architecture of existing UR systems at the state level, other federal agencies, and private organizations were compiled.

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Chapter 1—Introduction

This report examines the feasibility of implementing a student unit record system to replace the student–related components that currently are based on aggregate institution–level data collected as part of the Integrated Postsecondary Education Data System (IPEDS). The feasibility study was initiated by the National Center for Education Statistics (NCES), a part of the Institute of Education Sciences (IES) within the Department of Education (ED), in response to renewed interest within the higher education community for improved data. The feasibility study was conducted between October and December 2004. This report describes the findings of the feasibility study.

Overview

If a student unit record (UR) system were to be implemented, it would allow the collection of high–quality data for student–related information in IPEDS, especially related to net prices and graduation rates. By virtue of collecting data at the student level, a UR system would lead to more accurate estimates that take into account both nationwide trends happening *across* institutions as well as developments *within* institutions. The current IPEDS framework cannot accurately capture changing enrollment and completions patterns in the postsecondary education sector, especially given increasing numbers of nontraditional students and the mobility of students. It also cannot describe the prices various types of students face after financial aid is taken into account. In addition to producing the same aggregate estimates that are already collected through IPEDS, a UR system would enable a number of additional estimates that would capture new dimensions of postsecondary education. These new measures could better capture the tracking of students across institutions, unduplicated national headcounts, and compute net prices that take into account student characteristics and enrollment patterns.

In exploring the feasibility of a UR system, this study attempted to investigate whether such a system *could* be constructed technically and effectively, given the knowledge about UR systems already in place at the state and institutional levels. In addition, the feasibility study tried to explore whether such a system *should* be developed

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by the federal government. To do so, the study solicited input from various sources on several dimensions of the issue, including privacy and confidentiality, institutional burden, coordination, technical issues, and timing.

Three Technical Review Panels (TRPs) were designed to gather feedback and ideas from different perspectives related to the study, and included representatives from the following groups: 1) states, state systems, private systems, and private associations of colleges and universities; 2) institutions, particularly institutional researchers and registrars; and 3) other stakeholders, including the national postsecondary education association community, federal agencies, units within the U.S. Department of Education (ED), and vendors such as administrative information system developers. (See appendix A for agendas and participants.) In addition, the experiences of specific states, private organizations, and other entities that have built or maintained existing UR systems were compiled. A revision of IPEDS would need to consider the effective practices of already existing UR systems and maintain an ongoing dialogue with State Higher Education Executive Officers (SHEEOs), systems, and the states. Also as part of the feasibility study, the contractor (HigherEd.org, Inc.) developed an architecture and flow of operations for a proposed student UR system, as well as a list of potential data elements that might be collected under such a system.

In reading this report, it is important to keep in mind that any redesign of IPEDS to develop a UR system would require authorization through the Higher Education Act (HEA) and appropriation by Congress. This feasibility study was initiated in order to explore whether a UR system could, in fact, be developed, as well as what types of challenges existed to the successful implementation of such a system.

The study did not attempt to address every challenge or make recommendations about how each aspect should be addressed, but rather provided a framework for policymakers to understand the potential costs and benefits of a UR system as they discuss whether it should be considered.

Reasons for Feasibility Study

The feasibility study, reflecting a renewed interest in a UR system at the federal level, is the culmination of several trends in postsecondary education during the 1990s.

- annual price increases at postsecondary institutions that have exceeded increases in inflation indexes such as the Consumer Price Index (CPI);

- policy concerns about the impact of price increases on consumers and on student aid programs;

- a growing congressional interest in holding institutions accountable for outcomes, starting with graduation rates for student athletes and campus crime reporting;

- a demand for better and more timely data to inform policymaking and consumer choices; and

- the desire of many postsecondary institutions for more accurate measures of net price and graduation rates, especially measures that take into account institutional mission and student mobility.

Congress has attempted to address these trends in several reauthorizations of the Higher Education Act. The 1992 HEA Amendments created a "National Commission on College Costs" to study the problem of annual increases in prices at institutions beyond increases in the CPI. Such increases in price were an issue both for consumers and for Congress, which each year faced increased appropriations for federal student aid programs. The commission's report distinguished between cost and price of attendance, recommended more accurate and timely data on costs, prices, and student aid, and looked at the relationship of student aid programs to cost increases. The 1992 Amendments also included "Student Right–to–Know" legislation, mandating graduation rate information for all students. In response, NCES began the Graduation Rates Survey (GRS) component of IPEDS collecting data on graduation rates on first–time, full–time students, within 150 percent of the nominal time to degree or completion.

The 1998 HEA amendments instructed NCES to conduct a "Study of College Costs," which included an analysis of whether student aid programs were themselves a factor in driving up costs and an analysis of net prices, focusing on the relationship of

rising sticker prices and the differential net price paid by students and their families. Net prices reflect the prices paid after financial aid is taken into account. Although there is substantial debate surrounding the issue of which definition of net price is the best to use in examining access or affordability, there is agreement about the fact that it is difficult, if not impossible, to measure net prices on an aggregate level. The net price study (Horn et al. 2002) showed that prices were flat both for low–income students taking grant aid into account and for middle–income students with both grants and loans.

The 1998 HEA Amendments mandated a redesign of IPEDS, making it a significant element in institutional accountability.[5] IPEDS was charged with collecting data on institutional prices, changes in prices over a three–year period, and student aid. NCES was also tasked with making this consumer information readily available online, along with graduation rates. To fulfill this task, NCES created IPEDS College Opportunities on Line (COOL), the Department of Education's provision of information on all Title IV institutions. IPEDS itself became a web–based data collection, to insure more timely data for policymakers and consumers (see further discussion below). All of these changes reflected congressional interest in accountability and having better information on college prices and net prices.

In the context of the current reauthorization of the HEA, price increases, particularly in the public sector, led some in Congress to consider an "Affordability Index" to reign in price increases. Under the proposal, institutions whose prices had increased more than twice the rate of increase in the CPI over a two–year period would be required to meet higher standards of accountability. They would have had to report on why prices had increased and outline steps to reduce the rate of increase to remain eligible for campus–based portions of Title IV of the HEA, where federal student aid programs are authorized. Although the Affordability Index proposal has been dropped, the interest in outcomes measures such as graduation rates has remained.

For example, a recent report by the Education Trust (Carey 2004), *A Matter of Degrees*, as well as a congressional oversight hearing, have focused on institutional persistence and graduation rates and on the limits of the current IPEDS Graduation Rates component in providing accurate information for institutional accountability. In addition,

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[5] The mission of and data collected by IPEDS and its predecessor, the Higher Education General Information Survey (HEGIS), have shifted over time. See further discussion below.

the postsecondary education community has shown a renewed interest in better information on graduation rates, which would include new data on nontraditional students who attend part time or otherwise delay their enrollment and have gaps in attendance, as well as on students who attend more than one institution, transfer, or coenroll at multiple institutions. If Congress were to use graduation rates and time to degree as accountability measures for institutions, the consensus is that the GRS in its present form is inadequate. Mission–specific measures would take into consideration the goals of the institution, such as offering two–year, transfer programs; serving part–time, adult learners; or tailoring workforce, noncredit training to the needs of business and industry. Furthermore, the current system treats nongraduates as dropouts, when they may have in fact persisted or completed their educational program at another institution.

More accurate data are necessary for more nuanced policy decisionmaking, toward the goals of improving student performance and informing students and parents about the true costs of college. The American Council of Education (ACE), the Association of State Colleges and Universities (AASCU), and the State Higher Education Executive Officers (SHEEO) sent letters to congressional leaders, asking that IES/NCES conduct a "feasibility study" of a data system, derived from URs, that would provide mission–specific data on enrollment patterns of all students and outcome measures such as institutional persistence, completion rates, and time to degree, along with detailed information on student aid that would make possible accurate calculations of "net price" for students. Taking into account individually tailored financial aid packages—including the packaging of aid from federal student aid programs—would allow the federal government for the first time to assess accurately the relationship of various student aid programs to persistence.

The debate on the feasibility of a UR system at the federal level is occurring within the context of the development of other UR systems for students attending postsecondary institutions. The following section describes some of these efforts, as well as the current IPEDS framework, future data needs, and the context of IES/NCES operations related to the protection of individually identifiable data.

Background

Unit Record Systems in Operation

It is important to distinguish between the two types of data that are available for analysis: (1) summary or aggregate data; and (2) microdata, the raw or unit record (UR) data that are summarized or "rolled up" into aggregate data. For example, an aggregate report may document the number of bachelor's degrees awarded by an institution, where UR data would document the data that go into the report; in this case, individually identifiable information about each degree recipient. A UR system could then document students' demographic, enrollment, attainment, and financial aid information, as individually identifiable records if desired. For each type of data collected, schools would submit one record per student per term per institutional identifier.

For many years, colleges and universities have maintained computerized recordkeeping through the use of administrative information systems. Typically, specialized admissions software is used to monitor student applications and acceptances, in addition to human resources software for hiring and paying employees and registrar software to keep track of course enrollments, grades, and awards/degrees. In order to submit URs to a federal, state, or other data collection, schools must create electronic extracts or snapshots of their recordkeeping data from these different administrative information systems. These extracts are created using special software tools and can include whatever variables are desired. Extracts represent the selected data and records as of a specific point in time when the files are cut.

In order to complete aggregate summaries in reporting to governing boards, state agencies, or other entities, institutions have two basic choices: (1) run a computer program (or query) against the live, administrative information system to produce a summary report; or (2) create an extract of the data needed and use these records to produce a summary report locally. For both choices, schools must then engage in a significant amount of review and clean up of data to ensure that they can be aggregated accurately to reflect the institution at the point in time (or census date).

In cases in which institutions must submit UR data directly rather than in summary reports, schools have two choices about the initial cleanliness of their file submissions. They may either (1) submit the raw data they obtain from their administrative information systems (which are called transaction files because they

represent ongoing transactions or interactions with the live database); or (2) submit files on which they have conducted further editing (in which case they are called analytical files because they have been scrutinized from an analytical perspective). The different approaches are important to recognize because, if submitted, transaction files may be missing some data or include unexpected values, such as invalid Classification of Instructional Programs (CIP) codes. The resulting summary report may be different than expected for the institution as a whole. However, increased work is necessary to create analytical files, resulting in greater burden on institutions.

The distinction between aggregate and UR data is important because there are inherent limitations to using aggregate data, just as there are issues of data integrity for transaction versus analytical files. Aggregate data collected at one level of analysis cannot be used for lower levels of analysis, such as how the data differ among various groups of students or how students move between institutions (unless this is specifically included at both levels). With aggregate data, it is difficult (if not impossible) to examine relationships among variables or to recompile data for different reporting needs (National Postsecondary Education Cooperative 1998).

Many governmental and other organizations maintain UR systems on specific groups of students. For example, in the Department of Education, NCES conducts sample surveys of postsecondary students (such as the National Postsecondary Student Aid Study, [NPSAS]) in which it collects UR information from the institution for each student in the sample. The National Student Loan Data System (NSLDS) within the office of Federal Student Aid (FSA) compiles information on all recipients of federal student loans, including verification of enrollment by term. FSA also has detailed data on all federally aided students, which represent more than half of full–time undergraduates. The Office of Postsecondary Education (OPE) collects student–level information on the recipients of specific program funds, such as GEAR UP, Upward Bound, and Talent Search, for program evaluation.

Other branches of the federal government also collect student information. For example, the National Science Foundation (NSF) conducts its Survey of Earned Doctorates annually from all individuals receiving research doctoral degrees from U.S. institutions. The Internal Revenue Service (IRS) requires colleges and universities to annually submit individually identifiable student data on tuition and related expenses and

scholarships/grants, for all enrolled students, in case they or their parents claim a Hope or Lifetime Learning tax credit. This same information also is used to send 1098–T forms to students for use in preparation of their tax forms. More recently, the Department of Homeland Security (DHS) has created the Student and Exchange Visitor Information System (SEVIS) in order to maintain information on nonimmigrant students and exchange visitors from the time they receive their visa documents until they complete their programs. Under SEVIS, colleges are required to provide regular electronic reports confirming enrollment in postsecondary institutions to the DHS.

State and local governments, which are the primary funding sources for public colleges and universities, have tied this funding to requirements for collecting increasing amounts of data on students attending institutions in their states. A growing number of states began to develop UR systems in the mid–1980s, and some states have 30–year histories of using UR systems for analysis and program evaluation. In fact, according to a recent study (Ewell et al. 2003), 39 states have at least one student UR system; some states have more than one, because separate UR systems are maintained for state colleges, community colleges, and other system structures. Most of these states collect data only on students attending public institutions. However, 12 state UR systems include data on students attending at least some private institutions, and the number is growing (figure 1). Most of these state–level UR databases are maintained by state higher education agencies and multicampus postsecondary education systems. In many cases, state UR databases provide extensive support for institutional IPEDS reporting and, in the long run, reduce the reporting burden to individual institutions.

A limitation of state UR systems is that most do not include students attending private institutions, or students who leave and cross state lines. In recent years, there has been substantial interest in the possibility of linking state UR systems to try to minimize these coverage issues. Ewell et al. (2003) noted that in order for existing data in state–level UR databases to be used to track students on a national basis, they must cover a substantial proportion of the nation's enrollment, the systems must contain roughly similar data elements (with similar definitions), and a method must exist to link them consistently. The study found that state–level UR databases consistently track information on enrollment, degree attainment, program, gender, race/ethnicity, and date of birth, and

Figure 1.   States with unit record systems

SOURCE: Ewell, P., Schild, P.R., and Paulson, K. (2003). *Following the Mobile Student: Can We Develop the Capacity for a Comprehensive Database to Assess Student Progression?* New Agenda Series. Bloomington, IN: Lumina Foundation for Education.

cover about 73 percent of national headcount enrollment. In addition, definitions and structures are compatible enough to allow linkages among databases. Few of these systems include information on financial aid. The National Center for Higher Education Management Systems (NCHEMS) is currently conducting a follow–up pilot program, funded by the Lumina Foundation, to test the feasibility of voluntary, interstate data sharing that would link 10 state UR databases.

Another experimental study is being funded by the Lumina Foundation to collect UR data from a number of community colleges (JBL Associates 2004). Thirty community colleges are submitting data each term for six student cohorts. Data include student contact information, demographics, transfer credits, current courses, credits, grade point average, student aid, and information on college intervention programs. Lumina and the American Association of Community Colleges (AACC) plan to create a database linking the data together longitudinally and create reports for each participating

college.[6] A similar exchange of UR data by community colleges is being done by Jeffrey Seybert at Johnson County Community College with the League for Innovation in the Community College, as part of the Community College Benchmarking Project. Statewide associations of private colleges and universities in Minnesota and Tennessee have initiated their own collections of UR data recently.

Private organizations also are involved in collecting student–level data. The National Collegiate Athletic Association (NCAA) is experimenting with the use of UR data for student athletes from its member colleges and universities.[7] NCAA collects UR data on 1,800 institutions with Division I, II, or III varsity athletic programs, due in large part to the limits of the current GRS. In addition, many colleges and universities participate in the National Student Clearinghouse, which performs enrollment verification and other services for them using student UR data. The clearinghouse, a nonprofit organization begun in 1993 to facilitate the student record verification process, asks participating colleges to periodically provide them with student UR data electronically. The clearinghouse then provides guaranty agencies and FSA with status and deferment information on student financial aid recipients on behalf of those institutions. The clearinghouse currently is used by about 2,800 colleges and universities (out of the 6,700 Title IV institutions in IPEDS). Many institutions also pay the clearinghouse for information about students' enrollment and attainment after they leave the requesting institutions.

The National Postsecondary Education Cooperative (NPEC) has conducted several studies of UR systems, including the final report of its Working Group on Unit Record Data Versus Aggregate Data (National Postsecondary Education Cooperative 1998), which compared aggregate and UR approaches to data collection. In 2001, another working group examined student transition data systems, including exchange of records across postsecondary institutions (National Postsecondary Education Cooperative 2001). Work on K–16 UR systems was analyzed as part of a recent publication by the State Higher Education Executive Officers (Voorhees and Barnes 2003), which reported that exemplary state data and accountability systems help establish standards, track the

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[6] With the assistance of JBL Associates.
[7] NCAA used the IPEDS Graduation Rates Survey figures for its annual collection of graduation rate data between 1998 and 2003. See the NCAA website for more information: http://www2.ncaa.org/.

performance of individuals throughout their educational careers, and increase stakeholders' commitment to gathering and using data on student performance.

It is important for NCES to utilize the extensive experience of the states and others, as well as the known benefits of UR systems, to improve upon its data collection capacity, as part of its ongoing process to improve the analytic capability of IPEDS.

Current IPEDS Framework

NCES has been charged by Congress to report on the condition of postsecondary education in the United States, including changes in its size, participants, providers, and other characteristics. To do this, NCES established the IPEDS as its core postsecondary education data collection program in 1986.[8] Prior to IPEDS some of the same information was collected by the Higher Education General Information Survey (HEGIS). Between 1966 and 1985, HEGIS collected information from higher education institutions that offered courses creditable toward a bachelor's degree. IPEDS is a single, comprehensive system that encompasses over 10,000 institutions whose primary purpose is to provide postsecondary education, thereby expanding the universe of institutions. IPEDS includes about 6,700 institutions that have Program Participation Agreements with ED for Title IV federal student financial aid programs, for which reporting is mandatory.

The IPEDS system is built around a series of interrelated components that collect institution–level data in the areas of enrollment, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid. For example, researchers can use IPEDS to analyze information on enrollments of first–time freshmen by race/ethnicity and gender; institutional revenue patterns by source of income; degrees and certificates awarded by type of program, level of award, and race/ethnicity and gender of recipient; and the characteristics of postsecondary institutions, including tuition, room and board charges, calendar system, accreditation, and price of attendance. Racial and ethnic data collected through IPEDS are used as part of each postsecondary institution's Compliance Report for the Office of Civil Rights (OCR).

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[8] Most of the description of IPEDS was taken from U.S. Department of Education, National Center for Education Statistics 2004. More detail can be found at the IPEDS homepage: http://nces.ed.gov/ipeds/AboutIPEDS.asp.

The IPEDS survey data collection occurs at three points during the year (fall, winter, and spring), involving multiple web–based components. Several of these components are student related, in that they request information from the institutions about the activities or characteristics of their students. These student–related components include the following:

- Enrollment (EF). This component collects data annually on the number of full– and part–time students enrolled in the fall in postsecondary institutions in the United States and the other jurisdictions by level (undergraduate, graduate, first–professional) and by race/ethnicity and gender of student. The component has requested the total number of undergraduates in the entering class (including first–time, transfer, and nondegree students) since 2001, to form the basis of the Graduation Rates data. Institutions began reporting first–year retention rates for undergraduate students by attendance status in fall 2003. Racial/ethnic data are collected for the OCR as part of the institution's Compliance Report. Age distributions are collected in odd–numbered years by student level. Data on state of residence of first–time freshmen (first–time, first–year students) and the number that graduated from high school in the past 12 months are collected in even–numbered years. Four–year institutions are also required in even–numbered years to provide fall enrollment data by level, race/ethnicity, and gender for nine selected fields of study— Education; Engineering; Law; Biological and Biomedical Sciences; Mathematics; Physical Sciences; Dentistry; Medicine; and Business Management, Marketing and Related Support Services. Finally, the enrollment component collects the 12–month unduplicated headcount and instructional activity data, which are needed to compute a standardized full–time–equivalent (FTE) enrollment statistic.

- Completions (C). This component collects data annually on recognized degree completions in postsecondary education programs by level (associate's, bachelor's, master's, doctor's, and first–professional) and on other formal awards by length of program. These data are collected by race/ethnicity and gender of recipient and by field of study, which is

identified by six–digit Classification of Instructional Programs (CIP) codes (National Center for Education Statistics 2002b). Completions data on multiple majors are collected by CIP code, award level, race/ethnicity, and gender from those schools that award degrees with multiple majors. Racial/ethnic data on completers are collected in odd–numbered years for the OCR as part of their biennial Compliance Report.

- Student Financial Aid (SFA). This component collects the number of full–time, first–time, degree/certificate–seeking students receiving aid compared to the total number of full–time, first–time students, as well as the number of students receiving each type of financial assistance and the average amount received by type. The types of aid included are federal grants, state and local government grants, institutional grants, and loans from any source.

- Graduation Rates (GRS). The Student Right–to–Know Act of 1990 (SRK) requires Title IV institutions to disclose information about graduation or completion rates to current and prospective students. This component collects data on the number of students entering the institution as full–time, first–time, degree/certificate–seeking students in a particular year (cohort), by race/ethnicity and gender; and the number completing their programs within 150 percent of nominal time to completion. In the GRS, if an institution has a transfer mission, transfer–out students in the cohort should be reported, if the transfers to other Title IV eligible institutions are known to the original institution.[9] The GRS also collects data on the number of students receiving athletically–related student aid in the cohort, and the number of these students completing within 150 percent of nominal time to completion.

- Prices section of Institutional Characteristics (IC). The core of the IPEDS system is the annual Institutional Characteristics component, which acts as the control file for the entire IPEDS system and constitutes the sampling frame for all other NCES surveys of postsecondary institutions. This

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[9] For these institutions, known transfer students are considered completions.

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component collects the basic institutional data that are necessary to sort and analyze not only the IC database, but also all other IPEDS databases. One section of the IC component collects information on tuition and required fees, room and board charges, books and supplies and other expenses charged to various types of students.

There are also IPEDS components collecting information on institutional revenues and expenditures (Finance) as well as faculty and other staff (Salaries, Fall Staff, and Employees by Assigned Position).

IPEDS data collection is conducted using a web–based data collection system. Each postsecondary institution designates a keyholder, who is responsible for ensuring that data for the institution are submitted as well as editing and "locking" the data.[10] Many states or systems also have one or more coordinators who are responsible for reviewing the data for a specific group of institutions and applying subsequent locks.[11] Together, keyholders and coordinators are referred to as the IPEDS coordination tree.

The process of IPEDS data collection requires a number of steps. Keyholders first enter data through online data entry screens for each IPEDS component, which are tailored to each institution based on characteristics such as degree–granting status, control, and length of longest program offered. In many cases, data from previous years are preloaded on the customized screens for easy reference and comparison purposes. Once the current–year data are entered, the keyholders are required to run edit checks and resolve all errors before locking their data.[12] Once data are locked, they are considered "submitted" and IPEDS Help Desk staff conduct a final review. If any additional problems are detected, the Help Desk staff contact the institutions to resolve any remaining questions. Once data are reviewed and problems resolved, the data are moved from the data collection system to the Peer Analysis System (PAS), which is available on the IPEDS website.[13] At the collection level of the PAS, estimates are available to the

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[10] Locking occurs when a keyholder has decided that the data are ready to submit to IPEDS; once locked, the data become read–only and the keyholder no longer can make changes.
[11] Coordinators may provide different levels of review. For example, some may only view data provided by their institutions, while others may upload, review, and lock data.
[12] Edit checks are built into the web–based instrument to detect major reporting errors. The system automatically generates percentages and totals on each collection component. Edit checks compare current responses to previously reported data and look for consistency within and between components. As edit checks are executed, survey respondents are allowed to correct any errors detected by the system.
[13] See: http://nces.ed.gov/ipedspas/.

keyholder; once the estimates are moved to institutional level, they become available to other responding institutions for comparison purposes. After the data have been adjudicated, estimates are moved to the guest level of the PAS, where they are publicly available; these are the "official" estimates.

Creation of the PAS was prompted by the 1998 HEA Reauthorization, which directed the Commissioner of Education Statistics to provide students and families with better information about college costs and prices. In response, the NCES Task Force for IPEDS Redesign recommended the move from paper forms to the web–based collection system (Peng et al. 1999). The task force also recommended the development of a peer analysis system, the provision of help desk support for responding institutions, and specific changes in data content, such as collection of information on financial aid and total price of attendance for first time, full–time degree/certificate–seeking undergraduates. These changes, as well as the suggestion to adopt a process of continuous improvement for the IPEDS system, added accountability and the provisions of information to students and families to the mission of IPEDS.

Other recommendations of the task force were adopted and implemented in subsequent years. NCES developed a searchable website, College Opportunities On–Line (COOL), to provide up–to–date statistics on a broad range of postsecondary institutions for easy access by consumers. The site presents general information about the institution and its mission, as well as data on institution prices, financial aid, enrollment, degrees and awards conferred, accreditation, and types of programs that are offered by the institution. COOL is designed to help college students, future students, and their parents understand the differences among colleges and how much it costs to attend college. The site also provides links to each institution's website, campus crime statistics, and other postsecondary education websites.[14] In early 2004, graduation rates were added to COOL, despite the fact that many colleges perceived them to be an inadequate measure of student outcomes.

The IPEDS Data Analysis System (DAS) was recently released by NCES. This online tool allows users to dynamically generate summary tables for one year of IPEDS data. These summary tables provide sums, counts, and percentage estimates. The DAS

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[14] The site is available at http://nces.ed.gov/ipeds/cool/.

allows users to select and regroup categorical variables to produce estimates and to identify ranges of values to form subgroups and estimates.

Complementing these tools is an ongoing process of revision and improvement to the IPEDS collection system, as well as the variables that are calculated for the PAS. To effect change within the IPEDS framework, Technical Review Panels (TRPs) are held on a specific topic to solicit input from postsecondary institutions, associations, researchers, and other stakeholders. The findings of the TRP are summarized and then posted to the NCES website for public comment.

Future Data Needs

Despite the comprehensiveness of the IPEDS system, there are several important items that cannot be calculated accurately from the current data, including net prices, graduation rate measures, and other such variables. The current IPEDS framework uses institution–level aggregates for purposes that would be better served by student–level, longitudinal data collection. These techniques are already being employed by other government and nongovernment organizations to look at student behavior using a secure data collection mechanism. A federal UR system could make several improvements to the data available from IPEDS.

The calculation of accurate net prices has become more important as published tuition and fees ("sticker" prices) have become increasingly unrelated to the price students actually pay to attend college (Horn et al. 2002; Cunningham and Merisotis forthcoming). Currently, sample surveys such as NPSAS can investigate net prices with many different definitions (Horn et al. 2002). Other studies have attempted to measure net price on an aggregate level (College Board 2004; Cunningham and Merisotis forthcoming), but aggregate figures mask the wide variation in net prices paid by students with varying characteristics at different types of institutions. Although a UR system would focus on students already enrolled in colleges, it would improve the calculation of net prices for different types of students annually from a dataset that includes information on all types of financial aid. This would allow the federal government, among others, to more accurately measure the relationship of student aid programs to persistence and other outcome indicators.

The calculation of outcome measures such as graduation rates, persistence, time to degree, and rates of transfer has also become increasingly important, and suffers from similar problems with data collection. As mentioned above, the current IPEDS framework includes a Graduation Rates component that requests graduation rate data for a specific cohort of students—full–time, first–time, degree/certificate–seeking undergraduates enrolled in a specific year.[15] Student data are reported by gender and race/ethnicity, and are separated between those entering bachelor's degree programs and other programs. Institutions then report the number of students in the cohort who complete a degree/certificate within 150 percent of the nominal time to award (for bachelor's degrees, this is usually within six years)[16] These graduation rates are calculated so as to comply with the Student Right to Know Act.

The graduation rates calculated from these data allow researchers to make comparisons between institutions, and within institutions, with regard to gender and race/ethnicity. However, these measures are primarily rates of institutional retention, and largely do not capture what happens to students who leave an institution and may go on to attend another institution and attain a degree. The existing GRS report only counts student completers and transfers in a very narrow fashion. It does not include accurate information about students who stop out, drop out, graduate at a later date, or transfer out unbeknownst to the school. These more complex persistence and attainment data can only be documented with a UR–type system that looks longitudinally across schools to analyze all possible enrollment behavior. GRS graduation rates also measure the educational path of the minority of students who are traditional full–time, degree–seeking students. Yet research has shown that 73 percent of postsecondary students are nontraditional, with characteristics such as part–time attendance and delayed enrollment (Choy 2002). In addition, 40 percent of students now enroll in more than one institution at some point during their progress through postsecondary education, including transfer to other institutions as well as coenrollment (Berkner et al. 2002). These nontraditional paths—along with the increasing price of college—may have encouraged students to

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[15] Institutions that predominantly use standard academic terms use a fall cohort, whereas other institutions use a full–year cohort.

[16] Two–year institutions may count as graduates those students who complete the "equivalent of an associate's degree" (i.e., students who complete, within three years, a two–year transfer preparatory program that is acceptable for full credit toward a bachelor's degree and that qualifies a student for admission into the third year of a bachelor's degree program) (Association for Institutional Research 2000).

work while attending college and may have contributed to longer times to degree. These issues are especially relevant for colleges that serve large proportions of nontraditional students, such as public 2–year institutions. Therefore, the current IPEDS framework cannot measure all of the aspects of postsecondary education persistence, attainment, and transfer that are necessary for sound policy decisions. To do so, it would be necessary to collect accurate student–level information on persistence systemwide (i.e., regardless of institution, nationwide), multiple enrollment, part–time enrollment, transfer, and attainment, on an annual basis.[17]

Additional information on net price, graduation rates, transfer rates, time to degree, and enrollment by discipline would provide consumers, policymakers, and others with more complete information on which to base decisions. By its very nature, a UR system would enable the collection of data that would lead to more accurate estimates of variables currently in the PAS, such as fall enrollment and institutional graduation rates. Like any data collection instrument, a new UR system would have to recognize some degree of error in measurement; however, a UR system would be expected to produce estimates superior to the ones created under the current IPEDS framework, which, for example, do not capture student transfer in the calculation of graduation rates. Perhaps more important, a UR system would allow the development of a whole range of new measures that could be added to the PAS, such as net prices for specific groups of students, graduation rates that take into account institutional missions, persistence rates that consider student mobility and a systemwide perspective, measures of enrollment patterns for nontraditional students, time to degree by field of study, and other critical data. A variety of factors impact net prices and graduation rates, many of which would not be collected by the proposed UR system. However, the level of detail collected through a UR system would greatly improve understanding of the issues.

There are several other important improvements that would be made by a national UR system. For example, the UR system would expand upon the current Enrollment component to allow unduplicated 12–month enrollment calculations and measures of enrollment by field of study, while continuing to comply with Office for Civil Rights requirements. The current Enrollment component of IPEDS double counts students who

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[17] Note that a change in the required calculation of graduation rates would require a change in the Student Right–to–Know legislation.

are coenrolled, and does not provide enrollment counts for all programs (enrollment is requested in a limited number of programs in even–numbered years). Better estimates of full–time–equivalent enrollment (FTE) would also be possible. A national UR system would expand upon the current Completions component by enabling the measurement of time to degree for each field of study. It also would facilitate the calculation of completions for students who attained awards at more than one institution, or attended institutions in more than one sector.

Context of IES/NCES Operations

The creation of a national UR system would involve the collection of individually identifiable student data on a scale that has not yet been accomplished. IES and NCES are required by law to protect the confidentiality of these individual respondents. The collection, reporting, and publication of data based on student records are overseen by the Family Educational Rights and Privacy Act (FERPA). FERPA was enacted in 1974 and is administered by the Family Policy Compliance Office (FPCO) of the U.S. Department of Education (ED). FERPA requires the protection of student records by educational institutions that receive funds from ED, and prohibits the disclosure of individually identifiable information from educational records without students' consent (or their parents or guardians). There are exceptions in specific circumstances, including the disclosure of directory information,[18] disclosure to school officials with legitimate educational interests, and disclosure to organizations conducting studies on behalf of educational agencies or institutions.[19] In addition, FERPA law was amended by the U.S. Patriot Act of 2001, so that any data protected by FERPA are available to the Attorney General for the purpose of investigating or prosecuting acts of terrorism.

In addition, IES and NCES operate under a number of other laws and regulations governing the confidentiality and security of individually identifiable data. The Privacy Act of 1974, as amended, requires federal agencies to collect, maintain, use, or

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[18] Directory information includes information that would not be considered harmful if it were released, such as name, address, telephone number, date of birth, field of study, and degrees awarded (Pfeiffer 2003). Also see http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html.
[19] Under the proposed UR system, the original submission of student records by schools to NCES would be considered disclosures allowable under FERPA. Redisclosures refer to cases in which UR data that have been submitted to the UR system are sent, or "redisclosed," to the original institution or to another party. See chapters 2 and 4 for a more complete explanation.

disseminate any record of identifiable personal information only for necessary and lawful purposes and with adequate safeguards to prevent the misuse of data. A federal agency cannot disclose individually identifiable information without the prior written consent of the individual, although there are exceptions. The Federal Statistical Confidentiality Order of 1997, an order by the Office of Management and Budget (OMB), defines relevant terms and provides guidance on the content of confidentiality pledges that federal statistical programs should use under two different conditions—when the data may only be used for statistical purposes, and when the data are collected for statistical purposes but the agency is compelled by law to disclose the data. The second condition is relevant under the Patriot Act, which permits the Attorney General to petition a court of competent jurisdiction for an ex parte order requiring the Secretary of the Department of Education to provide data relevant to an authorized investigation or prosecution of an offense concerning national or international terrorism.[20]

NCES has had strong confidentiality laws since 1988, where disclosure or publication of individually identifiable information is a Class E felony. The Patriot Act amended the National Education Statistical Act of 1994, which was adopted and amended in the creation of the National Education Sciences Act of 2002. Under the Education Sciences Reform Act of 2002 (ESRA 2002), all individually identifiable information about students, their families, and their schools shall remain confidential. This law requires that no person may use any individually identifiable information for any purpose other than the statistical purposes for which it is supplied. In addition, the law prohibits publications where the data provided by a particular person could be identified, and forbids anyone other than the individuals authorized by the Director of the Institution of Education Sciences to examine the individual reports. Employees or other individuals who knowingly disclose or publish any individually identifiable information are subject to fines of up to $250,000, or up to 5 years in prison, or both. Similarly, the E–Government Act of 2002, Title V, Subtitle A, Confidential Information Protection (CIP 2002) declares that all individually identifiable information supplied by individuals or institutions to a federal agency for statistical purposes must be kept confidential and may only be used for statistical purposes; any willful disclosure of the data for

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[20] This law was incorporated into Education Sciences Reform Act 2002.

nonstatistical purposes, without the informed consent of the respondent, is a Class E felony.

As a result of these laws, individually identifiable data must be held confidential unless the individual provides written consent, except for specific exceptions (e.g., the release of directory information under FERPA, the use of information for statistical purposes, and the authorized investigation and prosecution of terrorism). To assist IES/NCES staff and data users in meeting the requirements to protect these confidential data, IES/NCES has established statistical standards that govern the handling and use of confidential data (National Center for Education Statistics 2002).[21] For example, all IES/NCES staff and relevant contractors are required to pledge (and sign notarized affidavits) not to release any individually identifiable data for any purpose, to any person not sworn to the preservation of confidentiality. All materials with individually identifiable data must be kept secure at all times through the use of passwords and secure data handling and storage. In order to prevent the publication of individually identifiable data, NCES uses techniques such as range restrictions, collapsing of categories, data swapping, and other methods of data perturbation. Qualified external researchers who desire access to data files with individually identifiable information must pass through a formal application process for a restricted data license, and must follow similar security procedures as mentioned for IES/NCES staff and contractors, subject to unannounced inspections. The only UR data file that would be made available to licensed researchers is the one used to create the NPSAS sample. The complete UR data would not be available to licensed researchers.

NCES has over three decades of experience with individually identifiable data files, including the National Postsecondary Study Aid Study and other sample surveys. These files have undergone disclosure avoidance procedures prior to release, and restricted use licenses have been granted to qualified researchers. To date, IES/NCES has experienced no known disclosures of the confidential data entrusted to IES/NCES by the many respondents to IES/NCES data collections.

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[21] NCES recognizes that the use of UR records for FSA enrollment verification is a nonstatistical purpose and therefore is not protected by CIPSEA. However, the rest of the UR data uses are protected in this manner.

Organization of this Report

The remaining sections of this report describe various aspects of a proposed UR system. The following chapter provides a brief depiction of what a UR system might look like, including the potential redisclosures that might be allowed under such a system as well as some proposed alternatives to a UR system. Next, chapter 3 presents a number of potential challenges to a national UR system, including privacy and confidentiality issues, increased burden to postsecondary institutions, technical problems that might be faced, coordination issues, and possible problems with the timing of data collection. Chapter 4 describes a potential architecture for a UR system, including the collection system, the permanent UR storage database, migration of data to the Peer Analysis System (PAS), redisclosures, training, the IPEDS Help Desk, software, and hardware. The final chapter summarizes the findings of the feasibility study.

Several appendixes also are included with this report. Appendix A provides the agendas and lists of participants from all three Technical Review Panels. Appendix B offers some rough estimates of the potential burden of implementing a UR system.

Chapter 2—Proposed Redesign of IPEDS

The UR system, as proposed, would replace the student–related components in the current IPEDS collection—Fall Enrollment, Completions, Prices, Student Financial Aid, Graduate Rates, and the price of attendance component. The UR system would be designed to include all of the variables necessary to replace those components and calculate institutional–level estimates for the IPEDS Peer Analysis System and other required reporting. At the same time, the collection process for nonstudent–related components in IPEDS (Institutional Characteristics, Finance, Fall Staff, Salaries, and Employees by Assigned Position) would remain the same.

It is difficult to describe exactly what the UR system would look like before the design process is undertaken. In general, however, UR collection may be described as a process involving the upload of individual student records to NCES by the IPEDS keyholder[22] at each institution. The following presents a broad overview of the proposed UR system; Chapter 4 describes the system architecture and collection process in more detail. Note that the proposed UR system outlined here and in Chapter 4 is presented to provide a picture of what a UR system could look like, if authorized, and to help the reader understand the challenges to the implementation of such a system as well as potential solutions. If a UR system were authorized and funded, various aspects of the proposed system could change in the design and implementation phase[23].

Brief Description of Unit Record System

General Architecture

The heart of the proposed UR system involves the collection of individually identifiable records about students based on their enrollment, price paid, financial aid, and attainment at different points in time. When combined for all students and all

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[22] The IPEDS keyholder is the person at each institution (or coordinating body) who is responsible for compiling data for IPEDS, submitted the data to NCES, and locking the data.
[23] If a UR system were implemented, TRPs would be held to advise on various aspects of the design of the system. These TRPs would include input from financial aid officers, institutional researchers, registrars, IT staff, and other institutional staff representatives.

schools, the UR database would allow NCES to complete its IPEDS enrollment, financial aid, completions, and price survey components for each institution's data in the PAS and on COOL. In order to collect all of these data, different collection schedules would be required with separate file submissions. Details on the proposed collection schedule are included in Chapter 4. The working list of variables includes the following:

- <u>Student identifiers and demographic information</u>: These data provide individually identifiable information such as name, Social Security Number (SSN) or Individual Taxpayer Identification Number (ITIN), date of birth, address, race/ethnicity, and gender that are attached to an individual student's record. Many of these variables allow records to be matched with one another to follow a student over time, or to follow a student that attends more than one institution. A header file containing these variables would be submitted for each student enrolled at each institution.

- <u>Enrollment variables</u>: These data include program information such as number of courses and credits attempted, major field of study, start and end dates, and attendance status. These data would be required three to four times a year (in other words, once per term), while institutions that do not use a term system would be allowed to upload files more frequently if they wished. The use of multiple files is tied to the FSA enrollment verification process and allows for the more accurate calculation of full–year enrollment. Institutions would identify the type of calendar system they use and the way they measure course activity in the Institutional Characteristics component during the fall collection schedule.

- <u>Attainment variables</u>: These data include information on degree completions and the date of completion. The file would need to be uploaded at least once per year.

- <u>Financial aid variables</u>: These data include information on students' annual receipt of financial aid from federal, state, and institutional sources (i.e., financial aid passing through the institution's financial aid office). These data also would need to be uploaded at least once a year.

- Price of attendance variables: Information on annual price of attendance would be uploaded with the financial aid file.

In addition, a one–time only collection of historical information on GRS cohorts would be required in order to complete the calculations for the GRS. Data would be needed for the established GRS cohorts, including basic enrollment and attainment information. The full student records for each cohort would not be necessary, such as field of study codes and financial aid.

For each submission of data, the keyholder at an institution or coordinating agency would upload a data file using XML,[24] although ASCII would likely be accepted in the initial years of implementation.[25] The data would be submitted through the IPEDS collection system, similar to the process that exists currently. At NCES, the data would go through internal and external edit checks, and mismatches would be identified and sent back to the keyholder for review and resolution. For example, if a student changes her name, the record may show up as a mismatch because all other aspects of the previous header file are the same, but the name differs. Other mismatches might include misspelled names, students identified as first–time students who appear to match records of previously enrolled students, and keystroke errors. When edit failures are resolved or signed off by the keyholder, aggregate reports would be available onscreen to the keyholder to view and correct as needed (see the Chapter 4 for a full description of this process). Once the data are satisfactory and pass all edit checks, they would be locked by the keyholder (and other members of the IPEDS coordination tree, if applicable). The data would then be moved from the collection system to the permanent database storage system. The full database would only exist in this permanent storage area, which would not be accessible via the Internet and would be subject to NCES' high levels of protection for confidentiality and security. The aggregate estimates that are calculated from the full UR database would be moved to the Peer Analysis System, where they would be stored and available as institution–level data.

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[24] XML is a "markup language," or mechanism for identifying structures within a document or data file. It employs tags to identify data elements, thereby facilitating the seamless exchange of data. In other words, it allows users to describe data and deliver it across a network, through the creation of common records across disparate databases.

[25] Beginning is 2005–06, FSA will require that all Title IV institutions transmit FSA–required data using XML tags. Some institutions have already begun the process of converting to XML tags. An Excel spreadsheet would be provided for institutions that are not capable of cutting extract files; this would include a feature that lets the user automatically export the spreadsheet data in the required format.

Redisclosures

As mentioned, the UR system would be heavily protected from unauthorized abuse of individually identifiable information. According to FERPA, redisclosures refer to cases in which UR data that were submitted to the UR system by institutions would be sent, or "redisclosed," from the UR system to the original institution or to another party. The only allowable redisclosures of individually identifiable data would have to be specifically authorized in the HEA legislation. Several authorized redisclosures of data have been proposed:

- Enrollment verification for the National Student Loan Data System (NSLDS): The UR system would be used to verify enrollment for students who are receiving federal student loans. Currently, this verification is being done either by institutions themselves, or being outsourced to organizations such as the National Student Clearinghouse.

- Verification of subsequent enrollment to the IPEDS keyholder: The UR system would be of significant value to colleges and universities if they could gain information on students who left their institutions—i.e., if they re–enrolled subsequently or enrolled and obtained a degree from another institution. Therefore, a redisclosure of individually identifiable data back to the initial institution keyholder and coordinator is proposed. Data on the subsequent enrollment of students who left the first institution in the previous year would be redisclosed to the keyholder and coordinator, including the institution of subsequent enrollment, date, attendance status, attainment, and date of attainment.[26] This benefit would come in addition to potential new aggregate variables on graduation rates, time to degree, and student mobility that would be posted to the PAS (see below).[27]

- Record mismatches: During the process of data collection for the UR system, mismatches between data records and other types of edit failures would have to be resolved. This would involve sending individually

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[26] Students would be able to opt out of this redisclosure. This will be discussed in future sections.

[27] Redisclosure of student information to the original institutions could take place over a longer time period if this was decided by a future design TRP and NCES.

identifiable information back to the IPEDS keyholder. These types of edit failure resolutions would be essential to the data integrity of the database.

No other new redisclosures of data would be allowed besides those described above and those permitted under the Patriot Act. Individually identifiable data would remain within the permanent UR storage system.

Originally, a proposal was considered to redisclose UR data to the Internal Revenue Service (IRS) to verify enrollment for students who claim the Hope or Lifetime Learning tax credits. However, after considering feedback from TRP panelists as well as discussions with IRS, it was decided not to include the collection of data for the 1098–T forms in the proposed UR system framework. Nonetheless, including 1098–T data in the UR system, if authorized, might save money for the federal government and may be considered in the future.

Analysis for OPE

Individually identifiable student information would not leave the UR database for any other purposes, such as generating performance measures for federal financial aid programs; rather, aggregate reports would be generated by NCES from the data. For example, the Office of Postsecondary Education (OPE) is required to assess the success of student financial aid programs under the Government Performance and Results Act (GPRA). Accurate measures of the persistence and attainment of students who receive federal financial aid are important to fulfill these requirements. OMB has developed annual program indicators for each federal agency under the Program Assessment Rating Tool (PART). For OPE, required program indicators include the percentage of aid recipients that persist and attain a degree or certificate, for various groups of students broken down by attendance status, gender, race/ethnicity, and other factors. Currently, OPE can obtain these types of measures only from the Beginning Postsecondary Students (BPS) study, which is administered by NCES once every six to eight years. A UR system, on the other hand, would allow the calculation of these measures on an annual basis. NPSAS and BPS samples would be drawn from the UR data. NPSAS collects financial aid and employment data well beyond the data that would be supplied with the proposed

UR system. BPS includes a number of variables that are used to predict persistence, including information about family formation, health, and employment.

Under the proposed UR system, NCES could not allow OPE access to the UR database. However, NCES could generate aggregate reports for OPE using the UR data. In other words, OPE could submit the identifiers of student financial aid recipients to NCES, or records could be extracted by NCES from OPE databases. NCES could then match those records with the UR database and generate aggregate measures of persistence, transfer, and attainment for various types of aid recipients, such as those attending on a part–time basis, or those attending institutions in different sectors. Under such a scenario, NCES would conduct disclosure risk avoidance analyses of these aggregate measures and perturb the data as necessary to ensure confidentiality.[28] While ensuring that cell sizes were large enough so that no individual could be identified, NCES would send reports with these aggregate measures back to OPE. A similar process could be performed for program evaluation of other OPE programs, such as GEAR UP, Upward Bound, and Talent Search.

Other Possibilities

After the full–scale implementation of a UR system, it would be possible to add new derived variables to the PAS, COOL, and the Data Analysis System (DAS). These new variables could take into account institutional missions, transfers, or the characteristics of various groups of students. The procedure for adding or modifying data elements under IPEDS involves holding Technical Review Panels to discuss a particular topic and posting the findings of the TRP online for public review and comment.

Several variables of interest were mentioned at the three TRPs. For example, panelists were interested in new definitions of net price. A UR system would allow the development of net price calculators that could estimate net price for groups of students with differing characteristics. After a number of years of implementation of a UR system, it would be possible to calculate new measures of graduation rates that better take into

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[28] In order to preserve the confidentiality of information regarding individuals' financial aid and graduation rates, the student financial aid and graduation rate data files are perturbed in various ways. All aggregate student financial aid and graduation rate statistics are based on the perturbed data. NCES would keep a copy of the file with flags for perturbed cells for internal documentation purposes.

account the missions of postsecondary institutions and the mobility of students across institutions. New definitions of time to degree, including transfer, calculated separately for various fields of study, could also be developed. In addition, variables could be created to describe enrollment by field of study and program length, completions by field of study, and other factors.

Alternatives using IPEDS Aggregate Components

Rather than redesigning IPEDS to create a UR system, the current IPEDS framework could be modified by adding additional variables or survey components. Additional data elements might lead to improved aggregate measures, although they would still suffer from the limitations of aggregate data.

For example, a Technical Review Panel was held as part of the ongoing IPEDS revision process to discuss the calculation of net price and the potential for improved data collection. The TRP came up with more than 100 different definitions of net price that would be useful to calculate. TRP members also came to the conclusion that in order to calculate additional definitions of net price that were useful to the postsecondary education community, an entirely new IPEDS net price component would be needed. Such a component would require collection and reporting of tuition and fees, housing costs, books and supplies, and total price of attendance by such categories as residency status, dependency status, attendance intensity, and aid status. Although this option has the benefit of fitting within the current parameters of the IPEDS framework, it would require substantial additional burden on the part of colleges and universities.

To calculate graduation rates and variations on persistence, transfer, and time to degree, it is possible that NCES could modify the Graduation Rates component in several ways. For example, aid categories could be added to the existing matrix of race/ethnicity and gender counts. Transfer counts could be made mandatory for all institutions with transfer missions, and the time to degree could be extended to 250 percent of normal time to degree. Cohorts of part–time students could be established. In addition, a variety of derived variables could be defined and added. Like the net price component described above, however, these changes would involve increases in institutional burden and would not answer many of the questions related to student mobility, multiple enrollment, and

related issues. Changes also would be necessary to the Student Right–to–Know legislation to define new measures of postsecondary outcomes. After legislative change, additions would need to be made to the current IPEDS collection schedule to collect the new variables required to calculate these measures.

To gather better data on completions and enrollment, existing IPEDS components could be modified with increases in data elements. For example, fall enrollment data could be collected by field of study, and age and residence and migration data could be collected annually rather than every other year. Unduplicated full–year enrollment, including credit activity, could be collected by gender, race/ethnicity, student level, attendance intensity, and field of study. Completions data could be collected by field of study and the average number of credits earned, including transfer credit. Again, however, these changes in aggregate data collection would involve increased costs. A UR system would allow the collection of all of these data elements within the framework of fewer file submissions and without adverse impact on the schools least able to do aggregate IPEDS reporting.

Other Alternatives to Unit Records

There are other alternatives to a full UR system that might be able to generate variables needed to fill gaps in necessary knowledge. However, each of these alternatives has its own costs and/or disadvantages. For example, one suggestion for gathering more accurate net price information was to administer the National Postsecondary Student Aid Study as an annual sample survey. NPSAS collects information on students' receipt of various forms of financial aid (federal aid as well as state, institutional, and private), tuition and fees, total prices of attendance, residency, demographic information, and other variables. However, while NPSAS could provide nationally representative net price figures, it could not provide net prices by institution. In addition, representation by state would likely be far more expensive than a UR system, and would be more burdensome for state agencies.[29] NPSAS and BPS are necessary, though, to collect additional data

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[29] It was estimated that administering NPSAS on an annual basis for all 50 states would cost an additional $40 million per cycle.

that are needed to understand student persistence, including income, health, and employment.

Another alternative that would allow more accurate graduation rates is that NCES could administer the Beginning Postsecondary Students (BPS) longitudinal study on an annual basis.[30] BPS captures a national, systemwide perspective of persistence systemwide (i.e., regardless of institution), multiple enrollment, part–time enrollment, transfer, and attainment using students as the unit of analysis. However, BPS is administered only once every six to eight years. In addition, similar to NPSAS, BPS is a nationally representative sample of students, and the data cannot be used to make generalizations about states or institutions. Finally, the cost of administering BPS is quite high, and conducting such a survey on an annual basis would be substantially more expensive than a UR system.

It also has been suggested that since the National Student Clearinghouse already collects UR data from 2,800 institutions, perhaps these data could be used for the purpose of calculating graduation rates and other measures. Currently, these data cannot be used to calculate national estimates because the coverage is not complete (there are about 6,700 Title IV institutions), with 4–year institutions being more likely to participate than 2–year institutions or private for–profit institutions. The Clearinghouse currently includes only a subset of the data elements that would be required to complete the existing IPEDS components. In addition, not all participating institutions currently report degree or certificate attainment to the Clearinghouse. This means that students who are enrolled at a nonparticipating institution, or whose degree was not reported to the Clearinghouse, would show up as stop–outs or drop–outs from postsecondary education. Near 100 percent participation would be necessary for the Clearinghouse to be used as a viable alternative. There also are questions about liability and whether these data are protected by FERPA.

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[30] BPS is a subset of the National Postsecondary Student Aid Study (NPSAS).

Chapter 3—Issues Related to the Development of a Unit Record System

As mentioned in the introduction to this report, it was important to examine two separate questions in examining the feasibility of a UR system. First, *could* a UR system be technically and efficiently constructed, or are there insurmountable issues to developing such a system? Second, *should* such a system be developed by the federal government? If the barriers to development of the system can be overcome, what are the specific issues that must be addressed before moving forward?

The answer to the first question may be inferred from the fact that 39 states have compiled UR systems in some form, and thousands of postsecondary institutions submit UR data electronically to private organizations such as the National Student Clearinghouse, which collects student UR data for a large proportion of currently enrolled students (in addition, for a fee the Clearinghouse will send back to the institution selected information on their students). Technically, UR could be done at most institutions in the long term, after investment of time and financial resources. NCES already collects student UR data through sample surveys such as NPSAS, and postsecondary institutions have experience in reporting data on financial aid recipients to FSA.

The answer to the second question is not as clear. This chapter provides a framework for the problems associated with the "should" question, including several dimensions: privacy and confidentiality; institutional burden; coordination; technical issues; and timing. Much of the information in this chapter came out of the three TRPs convened as part of the feasibility study, as well as individual comments submitted to the contractor in response to the posting of public documents. Some of the concerns raised in this chapter are addressed more fully in the following chapter, which presents a detailed architecture of a proposed UR system.

One should note that several design issues were raised during the TRPs, often regarding the definition of data elements. These types of questions would be resolved in

the design phase of a UR system, should a UR system be authorized and funds be appropriated.

Privacy and Confidentiality

Some of the biggest challenges to a national UR system are concerns about student privacy and the confidentiality of individually identifiable student data. Some panelists at all three of the TRPs raised the issue of the individual right to withhold or control personal information. If NCES collects individually identifiable data in a UR database, student data would be in the possession of an external party, but may still be within the student's right to control. ED, IES, and NCES have always taken seriously the importance of safeguarding student data, but many in the postsecondary education community are concerned that creation of a federal UR database of all students would potentially be more dangerous than smaller databases held by states or other organizations. Some critics of a federal UR system believe that the simple existence of such a database is a violation of privacy. As one TRP member asked, does the need for data outweigh individual freedoms? Another way to look at this issue is, if a UR system is implemented, can student privacy and the confidentiality of student records be protected?

The goal of the proposal is not to build a system that would endanger students' privacy, but rather to use the experiences of partial collections of student UR data to construct a secure system for collecting data on all students. Currently, information about federal financial aid recipients, including their SSNs, is collected by FSA to evaluate and monitor federal student aid programs. Students who apply for federal student aid or claim the Hope and Lifetime Learning tax credits in effect give consent through the Free Application for Student Aid (FAFSA) and tax forms submitted. Some panelists, however, questioned the need to report data on students who do not receive federal student aid, asking what the compelling government interest is in collecting data on nonaided students and wondering whether the involuntary inclusion of such students violates their rights of refusal. Nonetheless, data on nonaided students would be necessary to compute graduation rates, retention measures, and other indicators in order to compare these measures to those of aided students. An additional argument made was that students who

currently do not receive federal student aid are aided indirectly through such forms of subsidy as state appropriations to public institutions and deferred tax revenues at private, not–for–profit institutions.[31]

Another concern raised regarded the redisclosure of individually identifiable information for purposes of matching student records and providing information about subsequent enrollment of students to IPEDS keyholders. Such redisclosures could provide new information going to the original institutions, for which the students did not specify their consent.

Federal privacy laws, such as FERPA, require that individually identifiable student information collected by federal agencies be protected and released only with the prior consent of the individuals, with certain exceptions. Under FERPA and other privacy laws, organizations are required to notify students if their information may be collected and used for research studies or other purposes. Students would be able to "opt out" of the redisclosure of subsequent enrollment information back to the original keyholder.[32]

Finally, some postsecondary leaders for private institutions are concerned about possible legal liability once they have submitted data to NCES if the data are subsequently misused or unlawfully disclosed, because they do not have the sovereign immunity protection that exists in the public sector. The Office of General Counsel at the Department of Education has agreed that because NCES adds value to submitted data, NCES therefore "owns" the data submitted by the institution.[33] If a UR system were to be legislated and implemented, IES/NCES would work with the FPCO to ensure that collection of data and redisclosures are lawful under FERPA.

TRP panelists also expressed concern over possible unintended uses or consequences of the UR data. Other federal agencies might want access to the data for noneducation–related purposes. This concern is understandable, although it is the purview of Congress to determine legitimate disclosures. If other agencies were to have access to the data, this would need to be incorporated into law as appropriate.

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[31] Tuition at these schools is probably lower than it would be if they were not the beneficiaries of tax–exempt status and state appropriations.

[32] An "opt out" flag would be included in each student's header record. Students would not be able to opt out of the statistical use of the data. Note that students receiving federal loans have already given their consent to enrollment verification. See the Chapter 4 for details.

[33] This agreement was obtained in relation to NPSAS data from the University of Michigan in 2004.

In addition to misgivings about student privacy, there are more technical concerns about unauthorized access to the data by hackers and identity theft. This is particularly true given the proposal to use SSN/ITINs as one of several personal identifiers to match student records. Many institutions do not require that students provide SSN/ITINs upon admission unless they apply for federal student aid or the Hope and Lifelong Learning tax credits. In fact, several panelists in the second TRP noted that their institutions are moving away from using SSNs to identify student records due to concerns about unauthorized access, and that more students are refusing to supply those numbers. TRP panelists suggested looking into alternatives to collecting SSNs, such as using compression or only the last six digits of the number. Nonetheless, SSN/ITINs are currently required by FSA to determine aid eligibility and by NSLDS for loan deferment. The use of SSN/ITINs would be essential to a UR system, to accurately link together student information on financial aid, enrollment and completions, as well as to link records from various institutions. Without SSN/ITINs, mismatch rates would increase significantly, which would substantially increase the burden on the Help Desk and keyholders to resolve. The practice of obtaining SSN/ITINs from students would have to be reinstated if the UR system were authorized. For students without SSN/ITINs or who refuse to provide them, a matching process would be used with fuzzy logic and identifiers such as name, date of birth, and address. Fuzzy logic involves mathematical algorithms or methods for making a decision (in this case a fuzzy match between records) based on ambiguous or missing information.

Certainly there are valid concerns about privacy in a time when increasing amounts of information are being gathered on all citizens as well as students. Nonetheless, there are assurances IES/NCES can make regarding the confidentiality of any data collected through a UR system. IES/NCES is well suited to protect the data, given the strict limits of the legislation regarding data confidentiality under which it operates. IES/NCES legislation protects the privacy of individuals, making wrongful disclosure a Class E felony punishable by up to five years in jail and a $250,000 fine. NCES has experience in working with individually identifiable data through its various sample surveys, and has created the structures and procedures necessary to prevent unauthorized disclosure of such data. In fact, there are no known cases where individually identifiable data collected by IES/NCES have been wrongfully disclosed by

an employee, contractor, or restricted licensee, or of cases in which hackers have breached IES/NCES firewalls. In addition, IES/NCES is the only component of ED that is separately certified by the Chief Information Officer and the Inspector General for its computer operations and system firewalls. Therefore, if collected, the data would be technologically protected and secure.

In the proposed UR system, data would be submitted to NCES but would not ever leave NCES unless authorized by legislation. Estimates created from the UR database would be reported only as aggregates at the level of institutions or groups within institutions. In order to move forward with a UR system, decisions would be necessary regarding which redisclosures are valid uses of the UR data and therefore should be authorized by law.

Burden

The potential for additional burden in terms of labor and financial costs is another challenge to a federal UR system. Postsecondary institutions believe that they are already stretched thin by requirements from federal agencies, state governments, and other organizations to submit data electronically throughout the year, as well as the need to respond to questions in accordance with the Freedom of Information Act (FOIA). At some schools, the need for compliance reporting has used scarce resources that could have been spent on other needs, such as policy analysis. At the same time, many small colleges do not currently have an institutional research office, and any submission of data represents a challenge. Institutions might pass the costs of additional reporting along to students and families in the form of price increases. Nonetheless, when examining the burden a national UR system would present, it is important to focus on the incremental burden of such a system—i.e., the costs produced over and above the costs that would have occurred without the UR system, or to what IPEDS might evolve to if UR is not used. This needs to measure the burden of UR above what might happen to data collection without UR, including the use of XML for transmitting data across computer systems.

The additional burden of a UR system can be divided into two categories: initial implementation and subsequent operations.

Initial Implementation

The burden of initial implementation is expected to be higher than the costs of subsequent operations. The burden may be substantial at some schools that are not already part of UR at the state or private system level. Initial implementation would involve both a field test and the first and second years of full–scale implementation. Generally, there are some challenges that are specific to the initial implementation period, including possible hiring of additional staff or shifting of existing staff, training staff about the requirements of new IPEDS UR reporting, the purchase or upgrade of software, and creating and submitting historical GRS files.

If a UR system were implemented, a field test would be necessary according to IES/NCES standards, in order to make sure that the system works, to anticipate and address problems that would be encountered, and to develop all necessary features in the system prior to implementation. The data submitted for the field test would not have to be complete, but would need to be sufficient to test the system comprehensively. About 1,200 to 1,500 institutions would be required to participate in the field test, and they would have to report using both the old and new IPEDS collection system. NCES would make every effort to notify selected institutions as early as possible. Regardless of the timeframe, it is recognized that participation in the field test would present an additional burden on institutions.

In the full–scale implementation, many institutions would need to upgrade various technologies and assign staff to comply with new reporting requirements. Some institutions would rely on vendors for upgrades to existing software, or to build their UR extracts, which would increase software costs. Others would need to pay for changes to legacy information systems. Staff would need to be trained in the use of these systems and the details of reporting procedures. Institutions in the middle of converting or upgrading their administrative information systems would have particular constraints with implementing these changes during this time. The initial burden on small institutions that may not have sophisticated software or that do not have institutional researchers on campus is likely to be relatively high, unless the institutions are part of a larger system or state association.

Institutional researchers at one TRP meeting argued that obtaining historical GRS files for all cohorts in the first year would present a substantial burden, even though these same files are needed now to calculate the GRS locally. The historical files would not need to include CIP codes or data for time to degree, financial aid, prices, and other information. Required data would include the year of established cohort; first–time, full–time beginning students in the fall; degrees/awards received; as well as a measure of whether students are prepared to transfer. Although institutional researchers attending the TRPs stated that they would prefer to submit historical data the old way if UR were implemented, it was recognized that this would delay the benefits of UR for six years, with no improvement over the current GRS measures. If historical files were submitted, then better calculations such as transfer–out rates at community colleges could begin to be implemented much sooner.

Subsequent Operations

The additional costs of subsequent operations under a UR reporting system are expected to be lower than the costs of initial implementation. Keyholders would need to coordinate with offices on campus to gather data, run internal checks to make sure the data make sense, submit data to NCES several times per year, and work with the IPEDS Help Desk to reconcile record mismatches and discrepancies in the data.

While the data files are being edited, the data would reside in the IPEDS collection system where only the keyholder (and his/her proxies) could view the data. Only after the data were locked, transported to permanent storage, and later migrated to the PAS as aggregate estimates (about a month later) would anyone outside the authorized participants in the submitting institution and the authorized participants in the NCES data receipt process be able to view the data (see the following chapter for details of this process).

Some mismatches of records found by NCES and sent to the keyholder for resolution could be difficult to resolve. For example, NCES would no doubt discover cases in which a student reported by an institution as a first–time student has a match at another institution, indicating that the student had been previously enrolled. NCES might also find a student who matches with other records on all identifiers except last name.

These student records could be sent back to the keyholder to have the mismatch resolved or the identity verified. For these records, the keyholder would then have to check institutional records, resubmit the data if appropriate, or send the data back with no change. These steps might be minimal for each record, and manageable for a small institution. However, the mismatches could add up to a large amount of effort if there are numerous records to resolve, as in the case of large public systems, where the chance of keystroke error might result in many mismatches. Keyholders would have the opportunity to sign off on a mismatch even if they cannot find the student or otherwise resolve the issue. Eventually, the institution's administrative information system would likely be improved to ensure that all students with different types of data can be matched—for example, all students receiving aid would have enrollment records or all graduates would have enrollment records in the system.

Changes in student records during a semester/term, especially regarding changes in attendance status, would require a mechanism for ongoing updates to the UR system. For example, if a student changes from full–time to part–time attendance status, this may affect his or her eligibility for financial aid or loan deferment. This may be difficult for institutions that currently do not store changes in status on their administrative information systems. Similarly, institutions might want to resubmit data from the previous term or year. For example, some institutions post degree awards retroactively during the year after the official degree date, due to incompletes and other issues. This process is available only for the previous year under the existing IPEDS system. The burden of these types of edit failure resolutions and mid–period adjustments could be compounded if institutions are required to keep records of all student data provided to NCES indefinitely in order to remain in compliance with FERPA. If a UR system were authorized, design TRPs would be necessary to decide on the process for dealing with changes in students' records during a term, whether by including mid–term changes in a subsequent file or some other mechanism.

It is difficult to offer cost estimates with any degree of precision, although some rough estimates are presented in Appendix B for purposes of illustration. Costs would likely include additional staff, as well as financial resources for hiring and training, and the costs of software upgrades. These, and other, costs are likely to differ widely among postsecondary institutions, depending on whether they are in state UR systems, whether

they currently upload data to organizations such as the National Student Clearinghouse, whether they use local or proprietary administrative information systems, and whether they currently have relatively low levels of IT and institutional research capability.

At the same time, it is important to keep in mind the labor hours and cost of continuing the current student–related IPEDS components, and the additional costs of expanded data collections in the context of accountability. It is likely that, without a UR system, there would still be increases in the burden of reporting IPEDS aggregate data, including new variables for the construction of net price and perhaps revised graduation rate variables. There would be a corresponding decrease in burden after the initial implementation of a UR system, as postsecondary institutions would no longer need to track and maintain records on GRS cohorts for six years. Rather than each institution calculating its own estimates, NCES would calculate official fall enrollment, graduation rates, financial aid averages, and other measures.

Some institutional researchers attending the TRP meetings noted that the costs to institutions of moving to a UR system would be offset by the benefits of receiving information about students at that institution produced by a UR system. In particular, TRP attendees felt it would be useful to find out, on a UR level, what happens to the students who leave the institution. If such a redisclosure were authorized by the legislation creating a UR system, it would be possible to provide student information back to the institutional keyholder or coordinator. As noted above, issues regarding privacy and the right of students to withhold personal information would need to be resolved in the design phase of the UR system.

TRP panelists noted that if a UR system were implemented, it would be important to try to take into account these various issues during the design phase of implementation so as to minimize institutional burden. For example, design TRPs could develop procedures that minimize the burden of edit failure resolutions and mid–period adjustments while allowing accurate data. Institutions would also have the assistance of the IPEDS Help Desk and various training sessions. Financial aid officials, registrars, IT staff, and institutional researchers would be involved in training and in the project design TRPs.

IPEDS reporting is mandatory for all institutions that participate in the Title IV federal student aid programs. Given the administrative burden of this reporting, it is possible that some funding could be used to mitigate the burden. There are different ways to offset the cost and burden of UR. One funding mechanism, Administrative Cost Allowances (ACAs), is used to help defray the cost of administering federal student aid programs.[34] A similar funding mechanism could be put in place for UR. Another possibility would be for a new grant program to be funded to assist in paying for the costs of implementing a UR system.

Technical Challenges

Technical issues were also raised as a potential challenge to the implementation of a national UR system. The proposed system would include the creation and maintenance of a database of millions of student records, with new records added every year. In addition, the system would require the uploading of large files from postsecondary institutions to NCES, using highly secure mechanisms. Multiple forms of security would need to be in place to protect against unauthorized disclosures of data.

NCES currently has most of the hardware and software necessary to implement a UR system. Much of the equipment used in the current, web–based IPEDS collection would be applicable to a UR collection framework. In addition, ED has servers capable of storing large amounts of student data, as seen for example in the data collected on financial aid applicants by OPE. One necessary addition would be database storage, to be located off–line in a secure site and protected by physical and software firewalls.[35] (See Chapter 4 for more details on software and hardware needs.)

There would likely be greater technical challenges for postsecondary institutions. The extent of the challenge would differ between the registrar, institutional research, and financial aid offices, which sometimes utilize different and incompatible information systems that cannot communicate with each other and complicate the exchange and compilation of data at a central point at the institution. Institutions using both legacy and

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[34] Institutions currently receive over $150 million in Administrative Cost Allowances (ACAs), which can be used toward the administration of federal programs such as Pell Grants and campus–based aid.
[35] The cost to NCES would depend on the final design and implementation.

proprietary student information systems would need to make software conversions or updates, while institutions that do not have such systems would need to implement the UR requirements in another manner. NCES has suggested that it can provide an Excel template that could then be used to collect data and generate the data file needed for submission. Although the technical issues could present a problem, these schools currently find a way to do uniform reporting for FSA financial aid eligibility, NSLDS loan deferment, and IRS tax credits.

The proposed UR system envisions the use of XML technology for the submission of data files to NCES, although it is likely that ASCII files would be accepted in the early years of implementation. Some postsecondary institutions have already adopted XML and are using it in their exchange of data with other organizations. For example, in recent years, there has been movement by the Department of Education toward using XML as part of its Common Origination and Disbursement Initiative (COD).[36] FSA has already mandated that institutions begin submitting data to the office using XML by 2005–06. Like FSA, IPEDS is moving to register all of its data elements and collections with the Postsecondary Electronic Standards Council.[37]

Coordination

Coordination of the flow of information presents a multitude of challenges in implementing a UR system. These include the coordination of offices within postsecondary institutions and the management of data collection through the IPEDS coordination trees. The amount of coordination and interaction will be greater due to the increased level of detail that must be matched in the URs.

TRP panelists noted that coordination between various offices on campuses—registrars, institutional researchers, admissions, IT, and financial aid offices—might be difficult, and becomes even more difficult if those offices are running different information systems. Currently, institutions that report data out to states or to

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[36] For more information, see http://www.ifap.ed.gov/cod/attachments/CODXMLHandout.pdf. Some TRP panelists reported problems in sending and receiving large files in their work on COD.

[37] The Postsecondary Electronic Standards Council (PESC) is a non–profit association of colleges and universities; professional and commercial organizations; data, software and service providers; and state and federal government agencies, whose mission is to lead the establishment and adoption of data exchange standards in education. For more information, see: http://www.pesc.org/.

organizations such as the National Student Clearinghouse often are reporting a narrower range of data, such as only enrollment data. Merging financial aid data with enrollment and completions data would be especially difficult if an institution does not have an integrated system and uses different student identifiers in its various systems. Further, some schools have decentralized structures with, for example, multiple registrar and financial aid offices. Keyholders would need to coordinate the process of extracting data, editing and cleaning data, and running preliminary aggregate reports across these offices. The problems of editing are minimized somewhat if schools rely on NCES matching subroutines for this first round.

State and system coordinators that are keyholders in the IPEDS coordination tree would have access to collection–level UR data, as they do in the current IPEDS collection system. However, several TRP members argued that a UR system might not work well within the existing IPEDS coordination tree structures. For example, if state coordinators were to continue to submit data to NCES, many would have to expand their collections from institutions or expand the type of data they were collecting. Most state UR systems are based on census dates and analytical files. Some SHEEOs and system offices may not see the benefit of coordinating the submission of multiple streams of enrollment files in the IPEDS UR system unless they get something back, such as the redisclosure of enrollment and attainment data. Yet there would be a noticeable decrease in the requirements for aggregate reporting and a resulting tradeoff in their IPEDS work. This could shift more, or all, of the reporting burden to institutions that had previously relied on SHEEOs to submit data on their behalf. State coordinators might not know how the proposed UR system would affect their role as coordinators until such a system was fully implemented and they could assess the nature of collection demands. The various scenarios for state roles and coordination would be described and documented as soon as possible while the TRP design phase is evolving.

Timing

It is possible that if a UR system were authorized in the Higher Education Act (which could conceivably be as early as the summer of 2005), a field test would then be administered in 2006–07, followed by full–scale implementation in 2007–08. The project

timetable is designed to yield data relatively quickly while avoiding potential problems associated with an expedited timeframe. A phased implementation could also be considered to provide additional time to address problems during implementation.

To respond adequately as part of the field test, it may be necessary for institutions to examine the utility of their administrative information systems for the purposes of producing UR extracts and to address some of the burden issues mentioned above such as training and staffing. Early notification for the selected institutions would be crucial for the institution's ability to respond in a timely and accurate fashion. It is possible that NCES could draw the sample of institutions immediately after legislative authorization to allow selected institutions almost a year to prepare.

If a UR system were mandated, institutions that have not already implemented the two–question format for race/ethnicity, required by OMB Statistical Policy Directive No. 15, Race and Ethnic Standards for Federal Statistics and Administrative Reporting on all individually identifiable records, would have to do so during initial implementation.

Another important issue is operational—how to time data collection schedules, while minimizing conflicts and taking into account the treatment of transactional files compared with analytical files. Transactional files reflect operations at a point in time, and usually are used for purposes that require knowing the current status of students, such as enrollment verification. These types of records are not used for the fall enrollment census report that is used to conduct peer comparisons and therefore may not receive as much attention by institutional researchers due to their decreased impact on reporting. Analytical files generally are used for official reporting and analysis, and can be files with a specified snapshot date such as a census date, or files that accumulate all activity during a specified period. The information captured for analytic data reporting may not be the same as a transaction record created for the purpose of student status verification. As mentioned above, many institutional researchers have expressed concern about the burden necessary to clean transactional files before they are submitted. However, it is possible for keyholders to submit files without doing significant data cleaning beforehand and focus attention on the records that come back from NCES as mismatches, which would be resolved by the keyholder before the data were locked and aggregate estimates migrated to the PAS.

To replicate the variables currently collected through IPEDS, the proposed UR system likely would collect enrollment records once per term (with the fall collection file including a census date flag[38] in order to replicate the IPEDS Enrollment component). However, some institutions do not have standard terms; for example, courses may be offered on a rolling basis, or on six–week terms. Flexible term dates are becoming more common with web–based instruction and alternative delivery modes. In addition, some institutions offer courses on both standard terms and nontraditional terms. Institutions might desire to upload data more frequently, especially for the purpose of enrollment verification for student loan programs. The final UR system that is developed through the design TRP process will need to allow for various flexible term reporting options.

Degree and certificate completions would probably be collected with only one file per year. Many institutions have several commencement periods, and might wish to submit multiple files over the year. A problem that occurs with completions data, especially for schools that award degrees only once per year, is that some awards are recorded months after the relevant students have stopped attending institutions. In this case, degree dates reflect the date the degree was awarded rather then when the degree was finished. In designing the timing of data collections and the periods of reference for the data, it would be useful to align the completions data with the enrollment data necessary to calculate graduation rates so that completions records can be matched to comparable enrollment records.

Student financial aid information also likely would be collected with only one file per year. Financial aid data would present some particular challenges in terms of timing, given the logistics of the financial aid award cycle. Data submitted in an academic year would be from the previous year's award cycle, for example. It would be important to time the data collection of financial aid data so that it does not conflict with the institution's aid packaging period, which is the busiest time of year for financial aid offices. In addition, the treatment of summer sessions varies by institution, especially regarding whether summer sessions would trail or lead[39] the submission of an annual data

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[38] An alternative to a census flag would be to require a separate census file for enrollment; this option would be considered during the design TRP phase if a UR system were implemented.

[39] Problems will be raised if the file schedule splits the summer session in two; these issues would be addressed during the design TRP phase of implementation. For example, multiple term files can be submitted beyond those that are required.

file. This is an important difference necessary to state resource allocation models that must be considered in a UR system.

All of these timing issues would be addressed during the design phase of UR implementation, should a UR system be authorized. (In addition, a proposed schedule for data collection is included in Chapter 4). In the proposed UR system, collection schedules would not need to be on a uniform schedule, but rather could be geared to a schedule that works best for individual institutions. In other words, institutions with different calendars or financial aid packaging schedules could submit data to NCES on different cycles. Flags would be used to note collection dates and other timing issues. At the same time, the data could all be consistent with the financial aid year, July 1 to June 30. The following chapter delves into more detail regarding the proposed data collection, including the schedule of submission periods.

Variation Across Institutions

All of these challenges are important to the discussion of whether a UR system should be implemented. They are also critical to consider if a UR system is legislated and moves into the design phase. How institutions would be affected by these various challenges depends on their individual circumstances. Institutions that are already uploading student data, that are familiar with procedures, and that possess the required technology would have the fewest challenges in implementing UR. Institutions with good coordination among offices on campus would also be better positioned to implement UR relatively rapidly. On the other hand, many small institutions with few resources would likely have a more difficult time with reporting, especially those without institutional research staff and technological capacity. It will help institutions if they have a good vendor relationship that is meeting their compliance needs; many private, for–profit institutions, for example, build the cost of compliance into their tuition and fees. Many TRP panelists emphasized that if a UR system were to be legislated and implemented, the more the design phase of implementation takes into account these challenges, the less burden it would place on institutions and others.

Chapter 4—System Architecture

The proposed IPEDS UR system is, by choice, general in terms of the design of the system architecture. It was recognized at the outset of the feasibility study process that any such formal design would need to evolve over time, through extensive dialogue with and feedback from constituent communities, and that this would involve numerous future Technical Review Panel (TRP) meetings if implemented. Nonetheless, for the purpose of this feasibility study the nature of the UR proposal needs to be as clear as possible, in terms of assumptions about what such a system would provide. Policymakers, data users, and institutional representatives want to know as much as possible about what the system would require of institutions and of ED to implement and operate, and how it might work conceptually.

This chapter provides a description of the system architecture that is conceptualized for the proposed UR data collection system. Since the UR proposal builds extensively upon that already in place in many states, a basic description of the state UR model is provided first. The underlying assumptions that are inherent in the proposal for a federal version of a UR system are then discussed, followed by a discussion of the processes for collection and editing for a UR system (illustrated through the use of flow charts). Descriptions of other components of a UR system, such as permanent storage, migration to the PAS, authorized redisclosures of UR data, training, Help Desk support, software, and hardware, are also presented.

The State Unit Record Collection Model

The proposed collection of IPEDS student UR data parallels closely that already in place at many SHEEO and state system organizations across the country. These offices collect individually identifiable enrollment, course, financial aid, completions, human resource, room inventory, and finance data for a wide variety of purposes. Any effort to build a federal IPEDS UR system would leverage the important lessons and experiences of the SHEEO and system offices. The processes and end results are similar, though proposed on a larger scale.

Many institutions are required by their coordinating SHEEO or system offices to submit data files with specific variables and census dates. These files are usually uploaded via the web, and in earlier years were transferred across computers using file transfer protocol (FTP) software. While some of this software is web–based, other offices use standard programs written with statistical packages (such as SAS, SPSS, and STATA) to merge, edit, and aggregate the data. SHEEOs and system offices provide software for schools to run edits against their UR data, looking for outliers and missing data. Few of these UR systems look across schools to more accurately classify cohorts and types of students or to share UR data on awards, transfers, and persistence with participating schools.

According to recent information gathered by the national SHEEO association, at least 23 states and/or state systems use their UR data collections to generate and submit aggregate IPEDS reports for member institutions to NCES (L'Orange 2004). Five offices in Alaska, California, Minnesota, North Dakota, and Wisconsin produce all four student–related IPEDS components with their UR systems. Another 13 states/systems reported that they produce at least three of the components this way; while only six states/systems produce the student financial aid IPEDS component from their UR systems.

Some SHEEOs require schools to submit both state UR and aggregate IPEDS reports about enrollment, financial aid, and completions. In these systems, there is a negotiating process that occurs in resolving edits and addressing errors. It is recognized that while the SHEEO/state system editing process and collection data elements might vary from that proposed for IPEDS, NCES would aim to make the two as seamlessly comparable and compatible in definitions, timing, and specifications as possible. If a UR system were implemented, NCES would hold TRP meetings specifically to examine and build upon the effective practices of SHEEOs and state systems in collecting student UR data to produce aggregate IPEDS reports. The relationship between federal and state/system reporting and data structures is likely to develop over time, depending on which mechanisms work most effectively.

Assumptions about System Architecture

The following assumptions about UR system architecture are embedded in the proposal as it has evolved through the feasibility study process. These help to clarify aspects of the emerging design.

- <u>The UR system would work much the same way IPEDS does now</u>. The basic IPEDS collection system would remain the same, involving the secure, online submission of data by officially designated IPEDS keyholders.

- <u>The IPEDS coordination tree would remain in place</u>. IPEDS keyholders would be appointed by institutional CEOs and could appoint proxies to assist in submitting different types of data. For schools that fall under an IPEDS coordination tree, two or more levels of review and approval would still be in place—once a school locks its data, the coordinator would review them and begin either to edit or lock the file. The process would work the same for URs as it does for the aggregate IPEDS components.

- <u>Data edits would be customized to each school</u>. As is the case now, schools would only submit data for items that pertain to their mission and type, as defined through the Institutional Characteristics (IC) component.

- <u>Editing would be done as before, but expanded</u>. Currently, for example, the previous year's aggregate data are compared with a new submission to look for consistency; if data are different than the expected range, the keyholder is asked to review the results. This type of edit review would continue for URs, but with more levels and types of edits to be resolved and passed.

- <u>Once filed, the UR data would be physically transported to permanent storage</u>. After the UR and aggregate level data passed edits and moved through the coordination tree, they would be physically moved from the collection system to a special UR database.

- Estimates from the UR database would be used to populate the Peer Analysis System (PAS). Currently, when aggregate IPEDS data are moved from the collection system, they are stored in the PAS. The PAS data are then used to load information into the IPEDS COOL website. Although the UR system would not change this general process, data would come from the new UR database rather than the collection system. Aggregate estimates would be calculated, edited, locked, and if necessary perturbed before they were moved to the PAS, per IES/NCES statistical standards and requirements to protect confidentiality. (GRS and SFA data would be perturbed; enrollment and completions data are not subject to perturbation).

- Permissions and levels of access in the PAS would remain the same. In the existing IPEDS collection system, data are migrated to the PAS and are made available at what is termed the "collection level" several weeks after submission, so that keyholders may immediately begin to compare their institution to others using unofficial, preliminary data. After extensive cleanup by NCES, the data are made available to other users at what is termed the "institution level." Only after the data are finalized and made official through adjudication are the data moved to "guest level," which is available to the general public. These three levels of access are available in the PAS. Although the manner of collection would be different if UR were implemented, the release of aggregate IPEDS data through the PAS would continue under this system of collection, institution, and guest level access.

Collection System

Generally, the UR collection system would be designed to collect individually identifiable, student–related data through files that are submitted electronically by institutions. The files would be used to calculate institutional summary totals for each school, with information about enrollment, completions, graduation rates, financial aid, and price. A list of the data elements that would probably be needed is presented in table

1. These elements are listed by file type, along with the IPEDS component or other federal mandates that require them, and information about their format.

Institutions would be expected to submit the four types of files: 1) header files, which would provide individually identifiable information such as name, Social Security Number (SSN), date of birth, address, race/ethnicity, and gender that are attached to an individual student's record; 2) enrollment/term files, which would include program information such as number of courses and credits attempted, major field of study, start and end dates, and attendance status; 3) completions files, which would include information on degree completions and the date of completion; and 4) financial aid files, which would include information on financial aid received from federal, state, and institutional sources, as well as price of attendance. Each uploaded file would include a single record per student, per term/reporting period, per institution. Each of the term, completions, and financial aid files would need to include the same header information which is needed to match records across files; including fields such as SSN, name, date of birth, gender, and address.

In addition, in the first year of collection, historical enrollment files on Graduation Rates (GRS) cohorts would be required in order to complete the required calculations for the GRS. Institutions would be expected to submit the four types of files over the course of a year, much as they currently submit the aggregate IPEDS components, depending upon when the data become available. Some files would be submitted once a year, while others would be submitted more frequently (see below).

Instead of filling out online screens, keyholders would upload files in text or AASCII format, eventually in XML. Keyholders would view their aggregate reports for the EF, SFA, GRS, C, and IC price components online and review edits. In place of submitting corrected reports, however, they would upload corrected UR data, viewing the report results until they pass edits and are locked.

Schedule of Data Collection

The dates for file submissions would be set in order to keep enrollment, completions, financial aid, and graduation rates in line with the student financial aid year. This would ensure that reporting across these components is comparable. This would also

establish a consistent IPEDS year that would be in conformity with the ED FSA year for financial aid, which is July 1 to June 30. As a result, IPEDS—which is mandatory for Title IV institutions—would operate on the same cycle as FSA.

Table 1.   List of proposed variables to be collected in an IPEDS unit record system, by file type and IPEDS requirement

	File type	Requirement	Other comments
Student name	Header	Matching	Full name, not just first and last names
ITIN or SSN	Header	Matching	
Permanent address	Header	EF (Residence and Migration)	
Date of birth	Header	EF (Age)	
State of residence	Header	EF (Residence and Migration)	
Gender	Header	EF, C, GRS	
Race/ethnicity	Header	EF, C, GRS	OMB two-question format
Citizenship	Header	EF, C	
Program	Header	EF, C	CIP 6-digit, including 'undeclared'
Degree plan	Header	GRS	
Program length	Header	GRS	Needed for 'long' programs
Varsity sport	Header	GRS	
High school graduation date	Header	EF	Needed for coenrollment
Institution UNITID	Header	Internal upload	
Transaction date	Header	Internal upload	
Redisclosure flag	Header		
Start date	Term		
End date	Term		
Number of courses	Term	EF, GRS	
Credit hours	Term	EF, GRS	
Attendance intensity	Term	EF	
Level	Term	EF	Including first-time, undergraduate, graduate, first-professional
Census date	Term	EF	Or flag for EF inclusion
Transaction date	Term	Internal upload	
Tuition and fees	Aid	Prices	
Total price of attendance	Aid	Prices	
State residency status	Aid	Prices	In-district, in-state, out-of-state
Campus residency status	Aid	Prices	On campus, off campus, with or without family
Dependency status	Aid	SFA	
Federal grants	Aid	SFA	Including grants from ED as well as other federal agencies
State grants	Aid	SFA	
Institutional grants	Aid	SFA	
Loans	Aid	SFA	Including federal loans and loans from other sources
Assistantships	Aid	SFA	
Transaction date	Aid	Internal upload	
Degree granted	Completions	C, GRS	
Degree date	Completions	C, GRS	
Exclusion flag	Completions	GRS	
Ready for transfer	Completions	GRS	
Transaction date	Completions	Internal upload	

NOTE: Term files contain enrollment information. IPEDS components are the following: ITIN = Individual Taxpayer Identification Number; SSN = Social Security Number; EF = Enrollment; C = Completions; GRS = Graduation Rates; OMB = Office of Management and Budget; CIP = Classification of Instructional Programs; UNITID = Institution Identification Number; SFA = Student Financial Aid; Prices = Price of attendance.

IPEDS would use the July 1 to June 30 year for full–year enrollment, credits attempted, completions, student financial aid, and graduation rates. The enrollment transaction files could be selected as appropriate to accommodate these dates. The student financial aid data would be identical in dates to those used for Fiscal Operations Report and Application to Participate (FISAP) reporting. It is recognized that the completions and

graduation rate data might result in slightly different calculations if aggregates were to be computed this way, but only for the first reporting period.

If this schedule were put in place, it would require modification of the census dates currently in use for the Graduation Rates component to match those used for financial aid. These dates would be used as the computational year and would not necessarily be the same as the academic year used by institutions. The nominal time for calculating the attainment of a bachelor's degree is based upon a fall enrollment and a spring graduation, not on a late summer graduation. The calculation of a graduation rate that is 100 percent of nominal time would be based on completion within three years and nine months, not four full years, since most bachelor's degrees are conferred in May. This change in GRS calculation dates would require a revision to the Student Right–to–Know legislation as part of any Higher Education Act reauthorization. The first year that the GRS was calculated with URs, the rates would be slightly different because of this shorter time period. This would return to a standard period of time the following year. These rates would then be comparable to those calculated for time–to–degree using the completions and header data. The change in graduation rate timing would affect trend data, and would likely create problems with reporting study abroad and summer completers in the first year.

Header records would be submitted at least once for every student, so that all students have at least one header record in the UR system. These would be replaced only when there is a change in the student information. Another option that emerged in the feasibility study is for schools to submit these records each term, over and over, replacing those previously submitted. Regardless of which option was implemented, it would have to ensure that certain key information changes were documented. These files would provide the information needed for matching the different types of files and would therefore include social security or taxpayer identification number, first and last name, gender, date of birth, and permanent address.

The enrollment/term files would capture intensity of instructional effort for purposes of financial aid and loan deferment eligibility. Student level, courses attempted, and credit hours attempted would also be documented. Since the enrollment files would be used to generate the fall enrollment data, the records for those students that should be

included in the fall census snapshot would need to be flagged.[40] The schedule for submitting term enrollment files would vary depending upon the institutional calendar as documented in the Institutional Characteristics component. Typically, the data would be submitted quarterly for schools on the quarter system and three times a year for those on the semester system. All files would be merged into a composite file that documents all enrollments for the 12 months between July 1 and June 30. For schools with a quarter system, for example, files would be submitted for the enrollment periods July–September, October–December, January–March, and April–June (see Table 2 below). In some cases, the summer term would lead the files for a given year, while in others it would trail at the end of the year, and both could possibly be permissible as long as this was documented in the IC file. The treatment of the summer term might vary depending upon the institution's financial aid year for the submission of files. Institutions with continuous enrollment would need to submit files at least quarterly.

Table 2. Schedule of data collection

	Enrollment			Completions			Financial aid		
	Submission of files	Data lock	Migration to PAS	Submission of files	Data lock	Migration to PAS	Submission of files	Data lock	Migration to PAS
July	Submit April–June file								
August									
September		X		Submit file (July to June of previous year)					
October	Submit July–September file (including census flags)		X				Submit file (July to June of previous year)		
November					X				
December		X				X		X	
January	Submit October–December file (including census flags)		X						X
February									
March		X							
April	Submit January–March file		X						
May									
June		X							
July			X						

NOTE: PAS = Peer Analysis System.

Regardless of how often they were submitted and for what dates, the files would need to capture all activity within their official time period, and include flags that identify

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[40] An alternative to a census flag would be to require a separate census file for enrollment; this option would be considered during the design TRP phase if a UR system were implemented.

which students should be counted in the fall census and enrollment report.[41] The files for July–September and October–December would include all students who should be counted in the official fall enrollment census date of October 15 that is used for the IPEDS EF component.[42] These students' records would be flagged to document that they should be included in this aggregate report. The October–December file would have to be filed and locked by the end of March at the latest, so that it could be migrated from the collection system to the PAS by the end of April. This timeframe would be possible because of the extensive editing and matching processes that would be built into the submission process.

The proposed schedule of file submissions would provide more flexibility in term reporting than is the case under the existing IPEDS components, revolving around a schedule that works for each institution. With this system, schools would have extended time to ensure that their aggregate reports pass edits and that their aggregate EF reports are accurate (see details about the edit process below). Data would be provided in the PAS at the end of April, whereas enrollment figures are currently being released at the institution–level at the end of May. The use of UR would help speed up the production of EF data, which are needed by schools to document official IPEDS enrollment figures for internal and external purposes.

Completions file(s) would contain the date, type, and level of degree or certification award. In cases where transfer was the measurable outcome, the file would include whether the student is ready for transfer. The file would also include any exclusion codes that are required for maintaining the correct GRS cohort. Institutions would be given two choices for submitting completions data. With the first, they would submit one annual file at the end of September for all awards between July 1 and June 30. As an alternative, they could upload individual files for each commencement during this time period. All files would still be due in September. Once the data are locked in November, they would be used to populate aggregate reports. Cleanup would be done and the data would be migrated to the PAS at the collection–level in December.

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[41] It is important, whatever number of files are submitted or schedule is adopted, that the composite result include all possible instructional activity within a year's time, so that aid eligibility and loan deferment status could be determined in a timely manner and graduation, transfer, and persistence measures could be calculated accurately and with more precision than is currently the case.
[42] The two sets of files would include the records of all students who started a term that would be included in the October 15 census data count.

Price and financial aid data would be included in the aid file, along with dependency status and other fields necessary to accurately calculate the net price paid by the individual student. Given a financial aid year from July 1 to June 30, institutions would submit one annual file that includes all financial aid awards during this time period. The file would be uploaded at the same time that FISAP is due to FSA, on October 1. The file would be locked in December, processed with internal NCES edits, and net price information would be posted in January. Tables for IPEDS COOL would be created and posted in February. Although these data would be one year old, the financial aid data are needed in great detail for the calculation of net price. The current year's published price would be collected as part of the Institutional Characteristics component in order to maintain more recent figures.

In addition to the annual schedule of file submissions, there would need to be several data submissions as part of the initial year of implementation of a UR system. First, institutions would need to supply header records for all students, not just new students. Second, historical information on GRS student cohorts would be needed in order to perform the multi–year calculations needed for graduation and transfer rates. For example, four–year institutions would be required to upload up to six years of historical GRS data. Data would be needed for all established GRS cohorts for the different program lengths at each institution. The full, historical student enrollment and financial aid records for each cohort would not be necessary; only the current header record for every student in any active cohort, including those still enrolled, completers, and known transfers. The GRS cohort header record would include several fields not in other header records, such as first date of attendance, current status (enrolled, completer, or known transfer), date of most recent status change, and any exclusion flags that may apply.

File Preparation and Submission

A flow chart of the collection system follows that depicts the registration and coordination processes for the IPEDS coordination tree; file preparation before submission; online file submission; resolution of edit problems; locking of data files by the keyholder; and subsequent activities within the IPEDS collection schedule (figure 2). These stages are explained below in more detail.

Figure 2. Registration, file preparation and submission, and post–file–lock activity
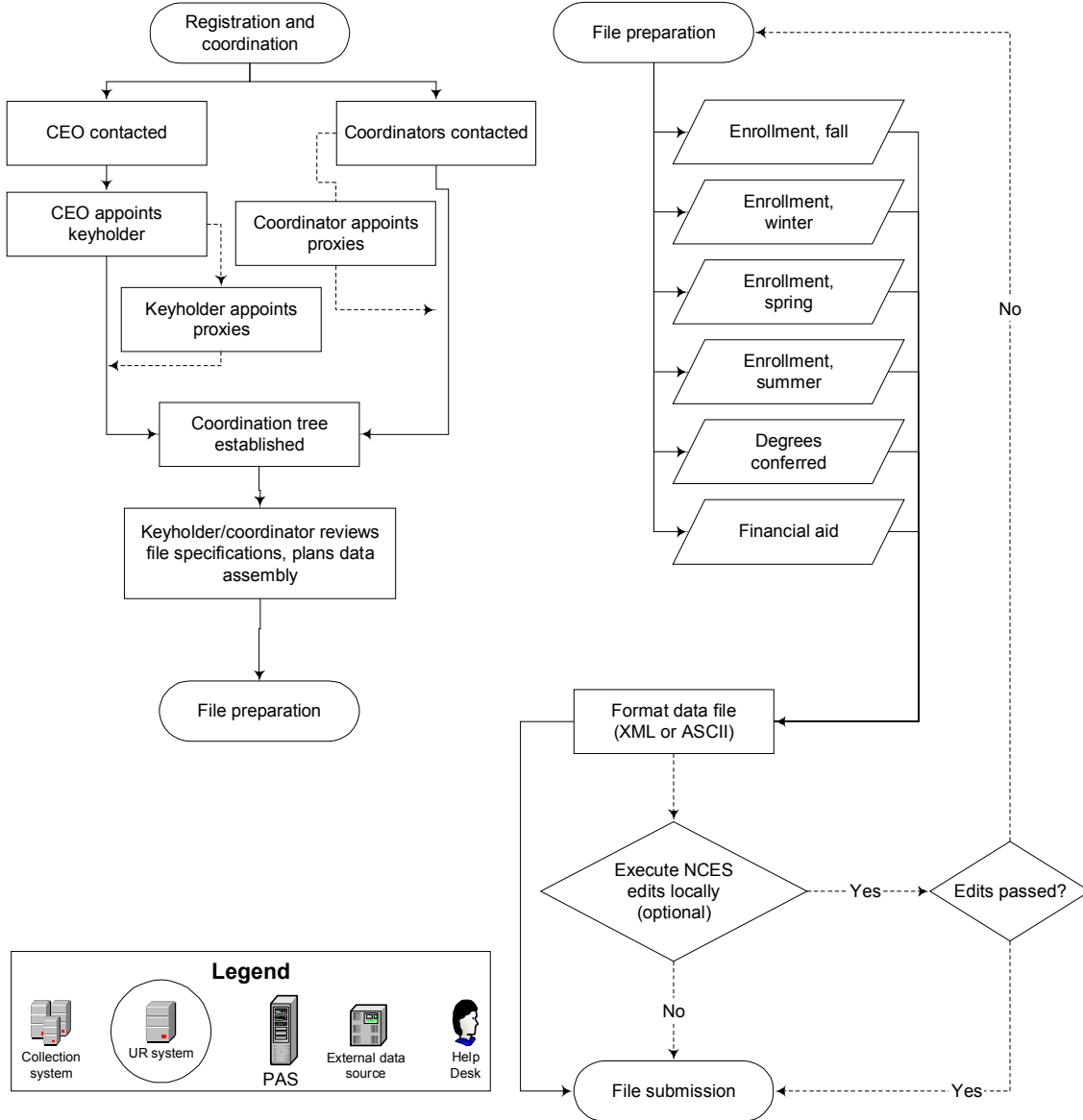
See notes at end of figure.

Figure 2.   Registration, file preparation and submission, and post–file–lock activity — Continued
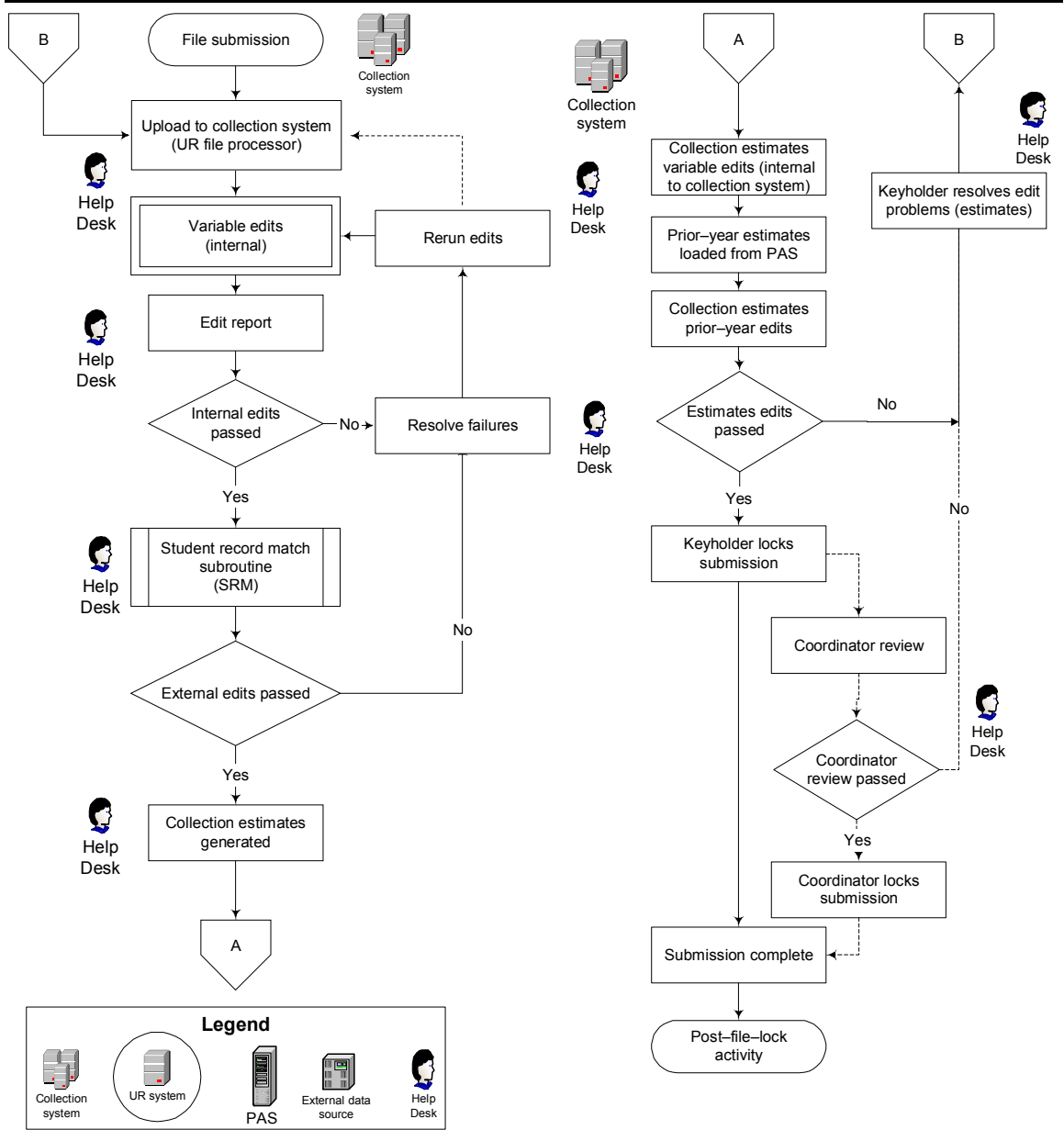
See notes at end of figure.

Figure 2. Registration, file preparation and submission, and post–file–lock activity — Continued

NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test. The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS offline database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk. IPEDS COOL refers to College Opportunities Online. IPEDS DAS refers to the IPEDS Data Analysis System.

The registration process under a UR system would be similar to the current IPEDS framework. Registration is begun with a letter from NCES to the school CEO, who appoints an official IPEDS keyholder (see figure 2, registration and coordination). The keyholder may then appoint proxies to work with or view different data pieces. For those institutions that fall under an IPEDS coordination tree, the state or system coordinators also are contacted and these persons may in turn designate proxies within their organizations. The appointment of institutional keyholders and their proxies and coordinators and their proxies constitute the establishment of the "coordination tree." All future IPEDS collections must follow this tree for submission and approval or locking of data.

Under a UR system, in preparation for a new collection year, all keyholders and coordinators would review the file specifications and plans for assembling all of the IPEDS components. Then the process of preparing files would begin, including the student–related files for the UR system (figure 2, file preparation). These files would include enrollment, degrees conferred or completions, and financial aid, as well as a header file for every student who has one or more of these three types of records. File preparation would begin with the creation of a data file that conforms to the requirements and specifications from NCES in terms of what data need to be included and how they should be formatted. The data would need to be submitted in XML format, though AASCII text format might be permissible for some institutions during the implementation phase.

The timing and sequence of data files for enrollment, completions, and financial aid would be designed so that institutional researchers and other school staff would have as much time and opportunity as possible to clean up the data before they become public. Obviously, if schools submit completions files more frequently than once a year, there would be additional time spent with these than if one composite file for the entire year were produced.

Excel templates would be provided for schools requiring help in exporting XML data. NCES also would provide the source code that documents in Structured Query Language (SQL) the many edits that would be conducted at NCES once the data are submitted. As a preliminary step, some institutions might want to execute these edits locally on their own computer systems, although it would not be required under the UR

system. If the local program passes edits, then the data would be ready for submission; if not, additional file preparation and editing would be needed. Because institutions would not have access to the complete database, the final IPEDS numbers would differ slightly from those calculated locally. Some institutions would likely choose not to run edits locally, preferring to submit the data files and then deal with the mismatches sent back to the keyholder.

Edit Process

In the next step of the collection process, keyholders would upload a data file to the collection system (figure 2, file submission). A wide range of levels and types of edits would be put in place for URs, and these would all need to be resolved and passed. Any corrections to the aggregate data would be made by submitting new UR files. The focus would remain on producing accurate results for the aggregate EF, C, GRS, SFA, and IC price components. However, the difference between how IPEDS works now and how it would work using URs is that the only way to correct reports under the UR system would be through submitting new URs, rather than submitting another summary file. Also, the editing process would admittedly be more complex, working at both the UR and the aggregate level.

In the first step, edits for internal consistency would be run on the NCES server, resulting in an edit report. The IPEDS Help Desk would work with the keyholder to resolve any failures at this stage, until the data pass edits.

Once the internal edits are passed, the data would proceed into the record–matching phase. In this phase, the data would be physically transported to the permanent UR storage database and matched with other students' records for discrepancies. For example, a school could classify a student as first–time, full–time freshmen, but NCES verifications across the entire student population might find that she/he took previous course work elsewhere. Discrepancies would need to be resolved and re–run until they are passed successfully. The process of matching student records is described below in more detail. After records are matched, then the UR collection data would be ready to be used to generate institutional, aggregate estimates.

In the final stage of edits, collection estimates would be generated and compared with the previous year's aggregate estimates from the PAS (figure 2, collection estimates variable edits). If the comparison of aggregate reports passed the edit process,[43] then the keyholder would finalize or lock the submission and the submission would be considered complete. If a coordinator were involved as part of the coordination tree, then another level of review and approval would be necessary before the submission was considered complete. If the keyholder edits did not pass, or the coordinator review found problems, then the edit problems would again need to be resolved by the keyholder, requiring the resubmission of the data.

Movement of Data to Permanent Storage and Aggregates to PAS

After the UR data pass edits, move through the coordination tree, and are locked, internal NCES processes would occur before the end of the collection schedule (figure 2, post file lock activity). The data would be physically transferred from the collection system to a special UR database. This would be done separately for each institution, so that UR data would reside on the collection server during only the brief time in which submissions and edits were being made. All UR data would then be deleted from the collection system. The permanent storage database would reside behind all firewalls and would not be connected to the Internet; it would not be connected directly to the collection server or to the database server that would house the PAS. Data would be transferred manually through media by secure NCES staff. No one outside of these approved NCES staff and contractors would have access to the permanent storage database for UR.

As part of the move from the collection system to the UR system, aggregate estimates would also be moved to the PAS at the collection level. Aggregate data from SFA and GRS would be subject to disclosure risk avoidance analyses and would be perturbed where required by IES/NCES policy to maintain confidentiality. At this stage, a variety of quality control reports and analyses would be conducted using the migrated PAS data to ensure their data integrity. The collection level estimates would be available

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[43] In the PAS, keyholders would view aggregate data that have gone through the NCES edit process; redisclosures of NCES edit changes (including perturbation) would not be made to institutions.

only to keyholders and their proxies at this point. After passing these quality controls, the estimates would be moved to the institutional level of the PAS, where they would be available to institutional level users for peer comparisons.

As multiple UR files are submitted, new data would be made available after they go through the editing process (subject to the advice of design TRPs). Different estimates of aggregate totals might be calculated for institutional data, requiring adjustments to the PAS for UR transactions and corrections during the year (figure 3). These could be combined into a full year's worth of transactions with various corrections for header information and other changes. Previous year edits would be run. If edits failed due to corrections, then the student records would be put through another student record matching process. If they passed edits, then aggregate institutional estimates would be recompiled and then transferred to the PAS. As a general rule, no more changes would be permitted until the following year, when schools would be able to resubmit prior year data to make corrections. This is one proposed model for dealing with mid–term adjustments; design TRPs would need to explore this issue to determine which mechanism might minimize burden on institutions while allowing necessary adjustments such as attendance intensity for enrollment verification.

Once the data were finalized through adjudication, the estimates would be moved to the guest level of the PAS and would be used to update two additional data tools, IPEDS COOL and the IPEDS DAS. Adjudicated, final files would follow per the required, standard IES/NCES review and approval process. With the availability of data on the IPEDS PAS, COOL, and DAS, the IPEDS cycle would end. Aggregate reports in the PAS could be expanded if additional derived variables were to be raised in design TRPs and approved by NCES. In this case, the new variables would be available at the collection level of the PAS.

Institutions would be able to view aggregate reports for each file at each stage of the collection process, including after the files were locked. Generally, it would take approximately one to two months to do cleanup of the data after they have been locked. It would take approximately two months after the end of the collection period for data to be moved to the institution–level access in the PAS. This timeframe is comparable to the current IPEDS workload for institutions and would need to be reviewed and refined as

Figure 3. Adjustment of Peer Analysis System for unit record transactions and corrections
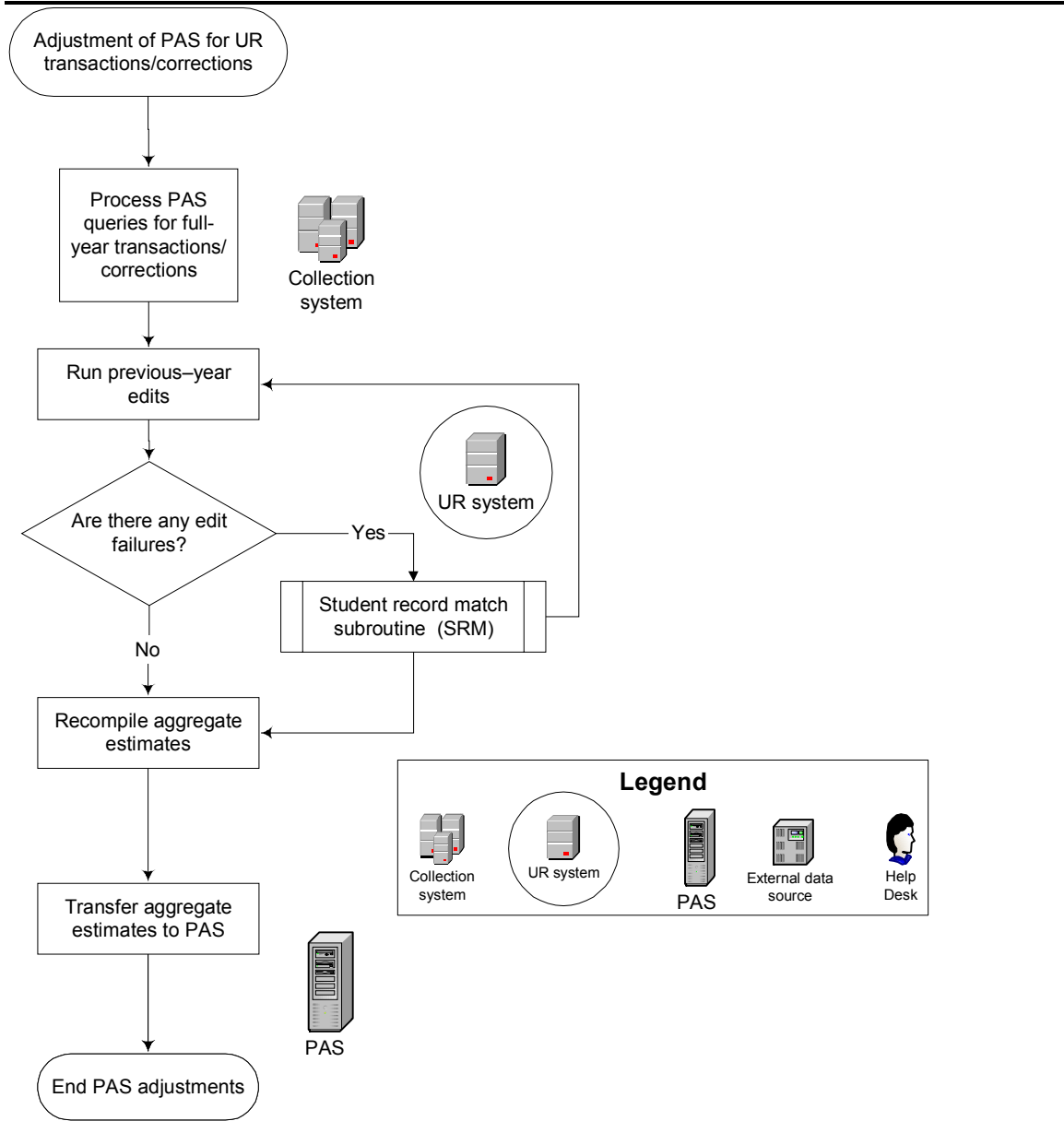
NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test. The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS off–line database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk.

part of the TRP design phase if a UR system were implemented. Adjudication would continue to take longer to produce guest–level PAS files than many would prefer; however, this process is continually being improved to be as quick as possible given the levels of approval required.


Process of Matching Records

The process of matching student records with the larger UR database might happen at various stages of the collection system. First, matching of records would occur during the edit process after submission of data files by keyholders. Mismatches would be resolved by the school's keyholder working with the IPEDS Help Desk. Special algorithms and "fuzzy matches" would be used to suggest logical, possible matches and how best to resolve discrepancies between records, so that time spent on reconciling mismatches would be minimized. Figure 4 illustrates that in matching student records, data would be physically moved from the collection system to the secure, UR system where they would be matched against prior records and submissions.

When new files entered the system, they would be checked against existing records in the UR database; if there were no match, a student would be confirmed as new to the system. If there was a match, a student record would be confirmed as continuing, unless the previous work was concurrent high school enrollment and the student qualified as a first–time freshmen. The record would be flagged and an edit report would be created and sent to the keyholder for review in the collection system. With the assistance of the Help Desk, the keyholder would either correct a flagged record or verify that a student was new. Keyholders would go through various processes, including reviewing edit reports; validating, verifying, or correcting records; and submitting the reconciled data file. After this, the data would once again be physically transported to the UR system, where flagged edits would be resolved and edits cleared. Then, the data would be moved back physically to the collection system, where all student matching edits would be cleared and the process of matching would be finished as part of this subroutine.

Other mismatches between record sets would need to be verified by keyholders working with the Help Desk, such as a financial aid record for which there was no enrollment record (this could occur for several reasons, including the late post–processing

Figure 4.   Student record match subroutine
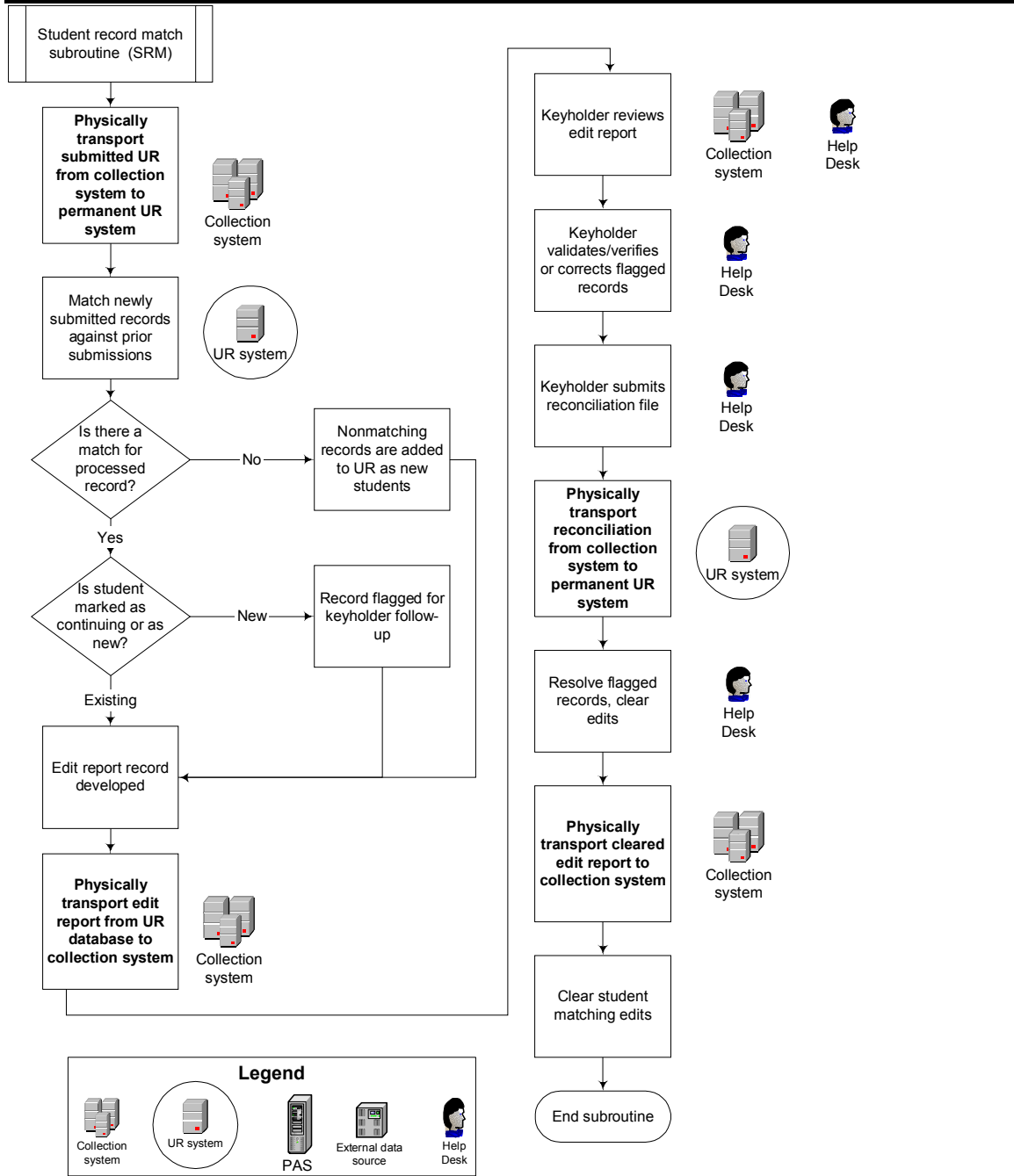
NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test.   The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS offline database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk.

of an award amendment, which is done after a student has already graduated). A similar process might also occur if the PAS needed to be adjusted for UR corrections.

As described previously, NCES has extensive experience in matching URs from different sources as part of NPSAS. It is estimated that approximately 4 to 6 percent of such file merges result in mismatches in records that must be resolved. For an institution with a headcount enrollment of 10,000 students, there could conceivably be 10,000 header records and 10,000 term enrollment records for a given file submission. At a 4 to 6 percent mismatch rate, this would result in approximately 400 to 600 records that would need to be resolved. However, there would be plenty of time for schools to edit or validate the matches for these records within the schedule of file submissions.

The actual increase in burden with the implementation of URs would be the time necessary for resolving these 400 to 600 records. Some institutions consider estimates of the time staff would spend merging records and creating draft summary reports locally to be part of the additional burden of a UR system. Many TRP members believed that the student matching routine would be time consuming and difficult. However, this burden of verifying the outcome and matching records locally would not be designed or required as part of the UR system, but rather would be a choice of institutions to conduct as an additional process. During the TRP design phase, NCES would work to ensure that there is adequate time for editing and matching for submissions.

Issues in the Collection Process

In utilizing the experience and knowledge of SHEEOs and state systems, of TRP meeting panelists, and of others who have provided comments and feedback as part of the feasibility study process, there would be some important data and collection issues to address if IPEDS student URs were implemented. Some of these are highlighted below.

- Working with term dates. The calculation of credit hours/contact hours and instructional intensity would be difficult if it must take into account different types of terms with different start and stop dates. A methodology would need to be developed to allow for some kind of agreed–upon weighting scheme, so that measures of output are comparable and could be converted across types and time frames.

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- Extracting data. Some schools might utilize vendor products to extract the data for IPEDS URs about students, financial aid, and completions. Other schools might involve different offices and require coordination between admissions, financial aid, registrar, bursar, and other functions. Each system might have automatic extracting capability, but be designed for different purposes that are predominantly operational in nature versus geared for federal reporting and analysis. The IPEDS UR extracts would need to have identical census dates and business rules for what records to include, so that they could be merged appropriately to produce the required data.

- Problems in merging IPEDS data files. With this system of data files, NCES would need to match records between files for reporting analyses. For example, completions records would be matched against header files to obtain demographic information. Financial aid and completion records would be matched against enrollment files to obtain enrollment eligibility and cohort information. If records in one or more merged files were missing, the error rate would increase and there would be increased need for institutions to work with the IPEDS Help Desk to resolve the mismatches. Therefore, at the outset, training would be provided to ensure that extracts are designed with the merging of data files in mind. Institutions would be given the SQL code with which to do these types of merges. For those that rely on vendors to automatically generate these files in required IPEDS format, there would be software development involved.

- Timing of reporting. Institutions responding to IPEDS would have their official fall enrollment, graduation rates, persistence and retention, and financial aid averages calculated for them by the NCES software. It is important that these data be collected and disseminated in a timely manner so that this process does not impact important deadlines for other types of submissions, such as to SHEEOs or admissions guide publishers. The UR system would be designed so that it ensures that reporting is reasonable, accurate, timely, and meets other reporting needs besides those of NCES.

- <u>Change in the locus of reporting</u>. NCES would provide institutions with the SQL code and data structures necessary to calculate aggregate IPEDS reports locally. Some schools would want to do this before submitting the data to IPEDS. However, since some of the data would be revised based on redisclosures (such as for the corrected determination of first–time, full–time freshmen status), some schools might not be able to replicate this calculation entirely locally, because they cannot access UR data for all schools. This is not very different from the changes that are made as part of data migration from collection to the PAS to preserve confidentiality through perturbation. Still, this represents a potential change in the locus of control for reporting.

- <u>The need for different streams of data</u>. In designing a system that brings together data from different offices on campus at different times for different purposes, one possibility would be to stream these data directly from those offices to NCES. In this case, enrollment and completions data would be submitted by the registrar, financial aid data from the financial aid office, and price data from the bursar. Schools would not have to merge record sets locally, but would work with NCES and the IPEDS Help Desk after submission to resolve mismatches. Institutions would benefit from more sophisticated and peer–reviewed federal edit and matching processes, in order to provide much more accurate information for consumers and policy makers than they would be capable of doing themselves due to staffing and resource constraints. In this model, the streaming of data would help build and strengthen colleges' and universities' capacity for institutional research.

Redisclosures and Other Data Uses

As mentioned in previous chapters, the proposed UR system includes several redisclosures that would need to be authorized by the legislation creating UR. In addition, there are other uses of a UR system that would involve matching or sampling of student

records. In order to address privacy issues, it is proposed that students would have the right to "opt out" of some of these uses.

One of the proposed redisclosures—the redisclosure of mismatches of student records back to the keyholder for follow up—would be necessary for the accurate functioning of a UR system. As mentioned above, flagged student records would be sent to the keyholder after data submission, and the keyholder would work with the Help Desk to resolve the mismatches before the data were locked.

The second proposed redisclosure would involve periodic enrollment verification to NSLDS (figure 5), for which students receiving federal student loans have already consented.[44] After each collection of enrollment data passed internal and external edits and was transferred to the UR permanent storage database, a database coming from an external FSA data source would be physically transported to the UR system, where there would be an attempt to match records from the external database to the URs. For those records that matched, flags would be created and a file of verified enrollments would be built. For records that do not match, the data would be moved to the collection system where the IPEDS keyholder would be notified by email and asked to resolve the mismatches and edit failures. After these were resolved, the data would be replaced in the UR system. The records with matches would be flagged and an enrollment verification file would be built for these students. Enrollment verification files would be physically transferred to FSA for processing and the FSA records in the UR collection system would be deleted.

The redisclosure of subsequent enrollment information back to the IPEDS keyholder would provide a benefit to institutions to help mitigate the burden of submitting UR data; institutions would be "getting something back" from the process besides mandated compliance. This redisclosure would allow institutions to gain information about students who leave the institution.

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[44] The proposal is for enrollment verification once per term, which OPE has said will be acceptable. Some institutions may want to report enrollment more often, and they would be allowed to do so.

Figure 5.   Enrollment verification for the National Student Loan Data System
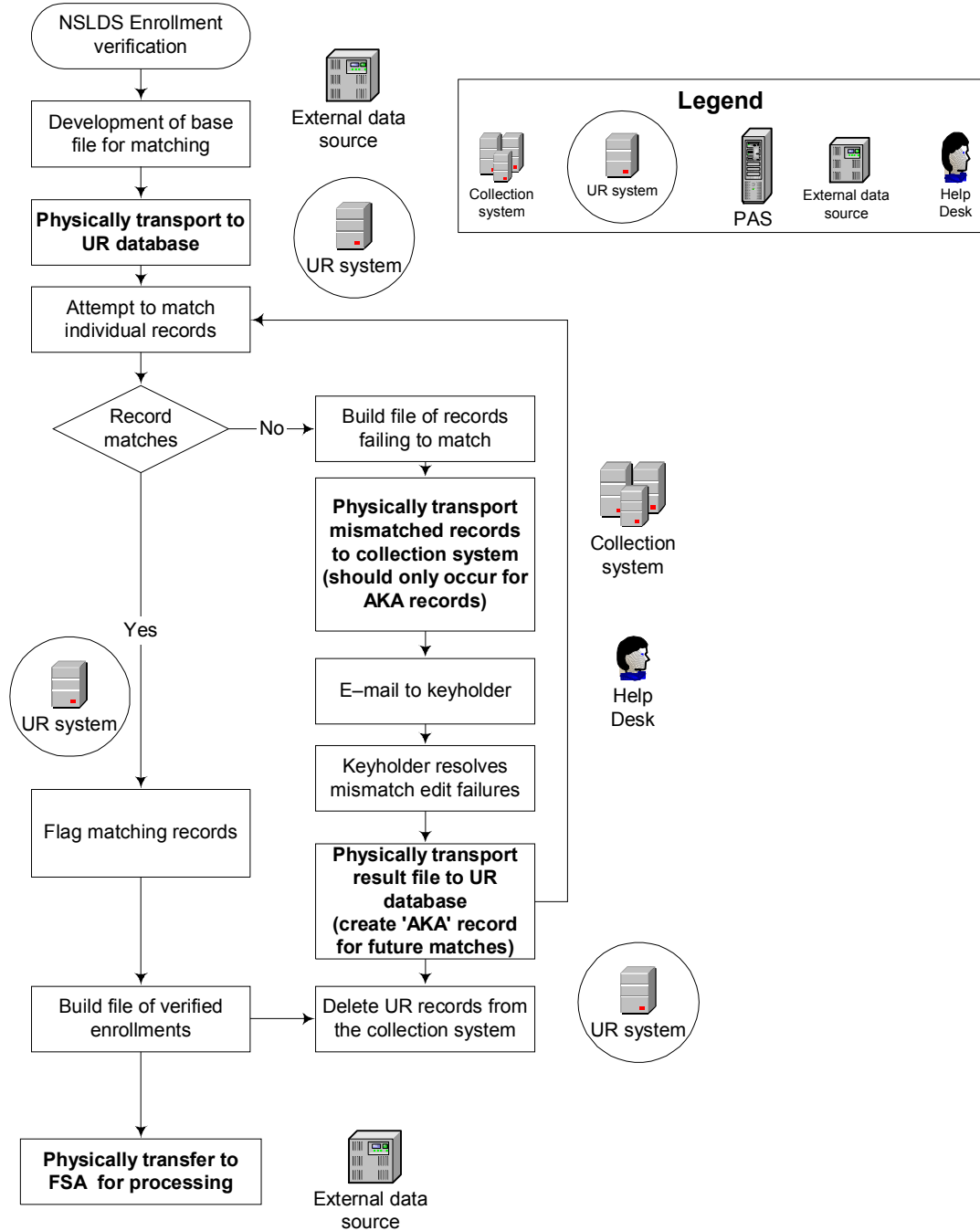
NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test.   The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS offline database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk. AKA means 'Also known as'.

One possible conceptualization of these subsequent enrollment redisclosures is presented in figure 6. The redisclosure would be conducted once a year using the previous year's enrollment and completions data. NCES would identify an institution's previous year enrollment data file in the UR database. For each institution, queries would be run for the previous year's students to check on subsequent enrollment activity. Directory level information would be compiled from the UR system, including basic information about persistence and completion during this one–year period[45]— including the subsequent school UNITID, the students' enrollment status, and the date and type of any award. The data would be physically transported from the UR system to the collection system. IPEDS keyholders would be notified by email that a data file of subsequent enrollment information for their students would be available for a limited period of time to download. A system would be developed for keyholders to access the redisclosed data in a secure environment so that they can then match them to internal records, another reason for ensuring that the matching process is as successful as possible. The file would be deleted after two weeks from the collection system. The exact process would need to be designed at a future TRP meeting, if a UR system were authorized and implemented.[46]

The data would be redisclosed back to the original institution only if each student's record does not indicate that she/he has opted out of the redisclosure. If the student has opted out, then there would be a flag documenting this response, with no additional data.[47] Given privacy concerns, institutions would be required to inform students about the use of these data for this purpose and establish a campus–wide mechanism for students to officially opt out of the redisclosure if they choose to do so. This data element would probably need to be stored as part of the header record, which could be overwritten with future submissions.

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[45] Redisclosure of student information to the original institutions could take place over a longer time period if this was decided by a future design TRP and NCES.

[46] This process would include any potential restrictions to the use of redisclosed data by institutions and state coordinators.

[47] Note that institutions would still benefit from aggregate estimates generated through the UR system (for example, the percentage of student who earned a degree at a subsequent institution) that included all students, and measured what happened to students over longer periods of time.

Figure 6.   Subsequent enrollment disclosure to institutions
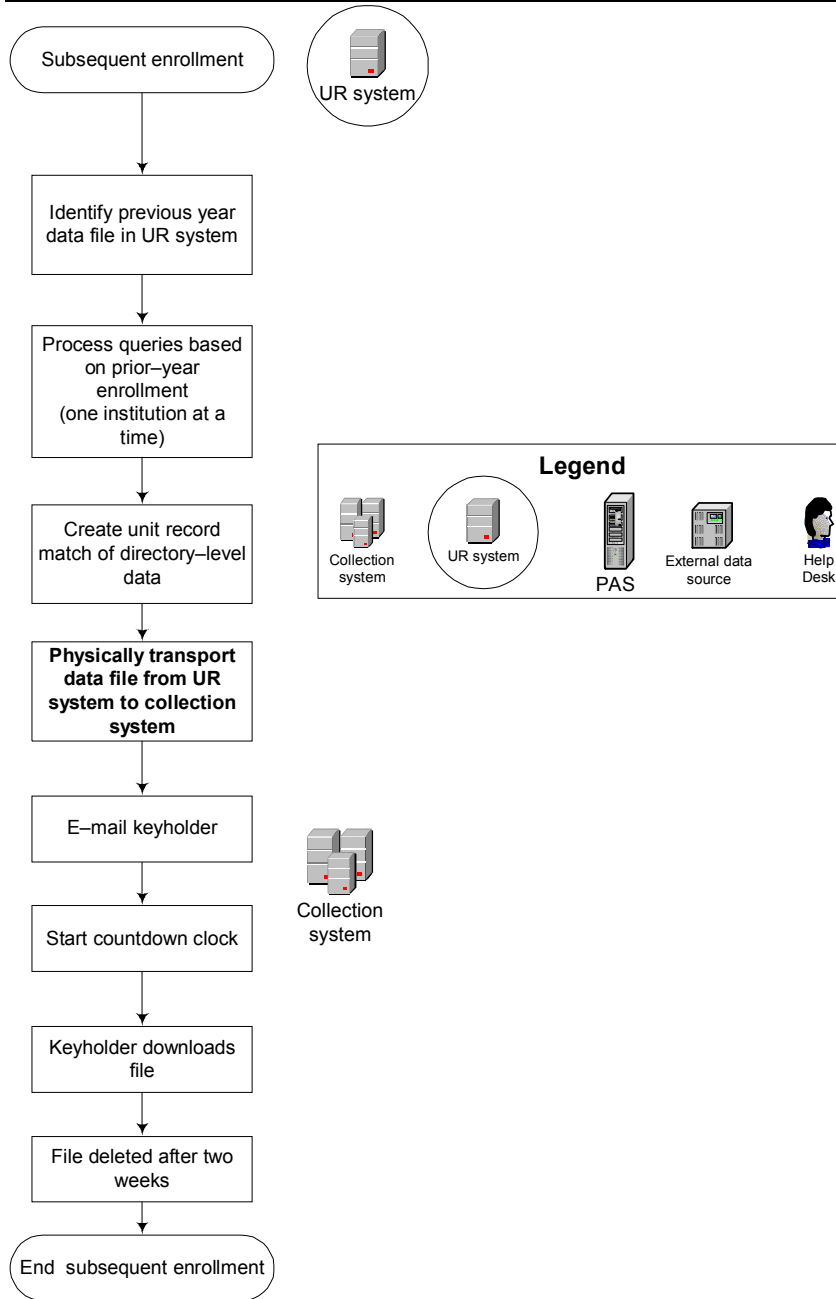
```
Subsequent enrollment          UR system

        │
        ▼
Identify previous year
data file in UR system

        │
        ▼
Process queries based
on prior–year
enrollment                         Legend
(one institution at a
time)                    Collection    UR system    PAS    External data    Help
                          system                            source          Desk
        │
        ▼
Create unit record
match of directory–level
data

        │
        ▼
Physically transport
data file from UR
system to collection
system

        │
        ▼
E–mail keyholder           Collection
                           system
        │
        ▼
Start countdown clock

        │
        ▼
Keyholder downloads
file

        │
        ▼
File deleted after two
weeks

        │
        ▼
End  subsequent enrollment
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NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test.   The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS offline database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk.

Other uses of a UR system would include the generation of aggregate program reports for the Office of Postsecondary Education (OPE) in order to assess the success of student financial aid programs (figure 7). OPE staff would create a program file from the COD external data source for aid recipients and specify the comparison groups and outcome variables it wished to have reported. After NCES received the records, it would physically transport the external data file to the secure UR storage database, where query reports would be processed to match the records. NCES would create program reports with aggregate measures, after ensuring that cell sizes were large enough so that no individual could be identified and if necessary perturbing the data. The reports would be physically transported from the UR server to OPE for further analysis and dissemination. A similar process could be performed for other OPE programs.

Samples of students for NCES sample surveys, such as NPSAS and BPS, could be drawn directly from the UR database. The current process for sample surveys involves drawing a sample of institutions, which are required to send UR data back for their students. The sample surveys would continue to survey students directly and merging in data from other ED databases. Figure 8 documents the process of creating NPSAS, BPS, and Baccalaureate and Beyond (B&B) sample files from the UR system. A sample size would be specified and a sample drawn from the UR system. After drawing the sample, perturbing data, and data file, the file would be appended to the sample survey database where the survey would be completed. Students would still have the possibility of opting out of NCES sample surveys, as they do now.

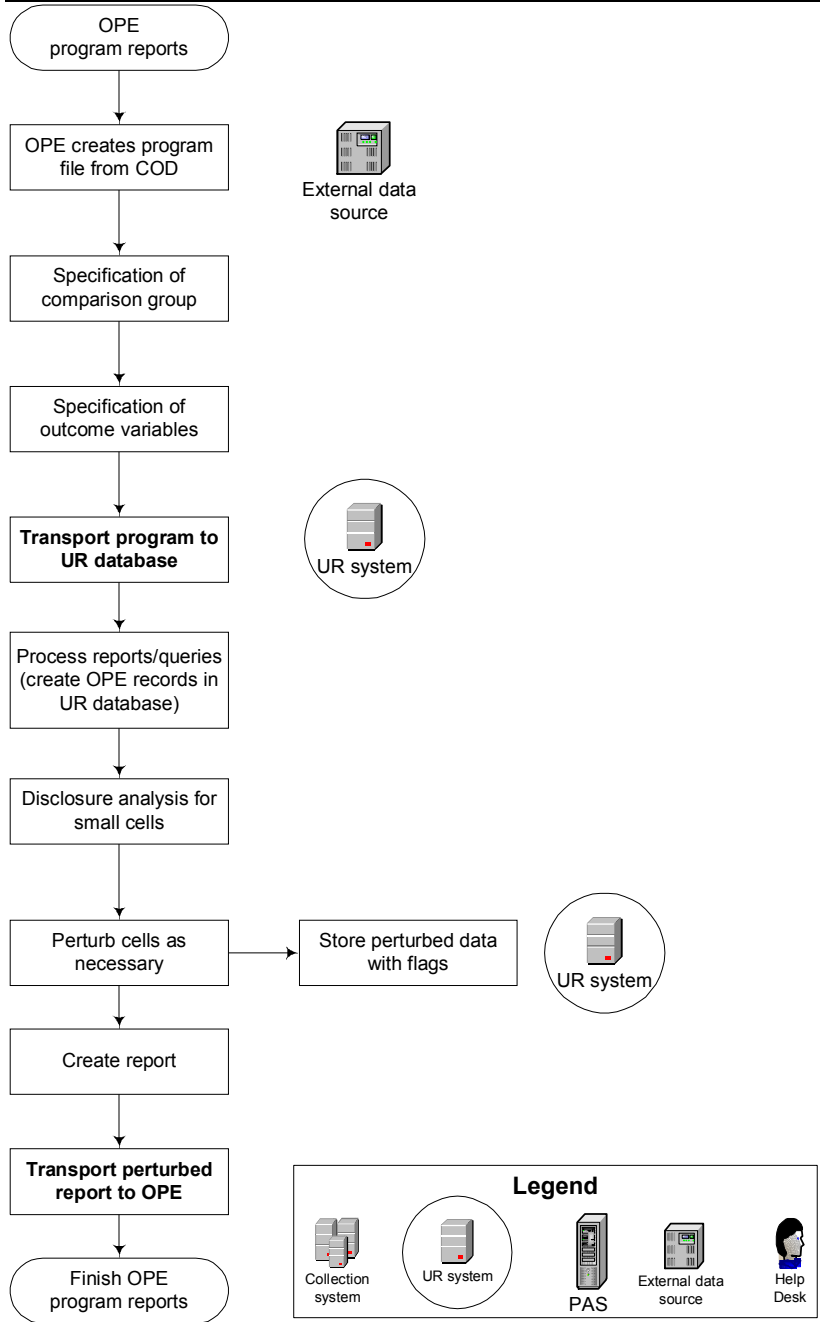**Figure 7.   Program reports for the Office of Postsecondary Education**

NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test. The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS offline database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk. COD refers to Central Processing System.

Figure 8.   NCES sample survey files (NPSAS, BPS, and B&B)
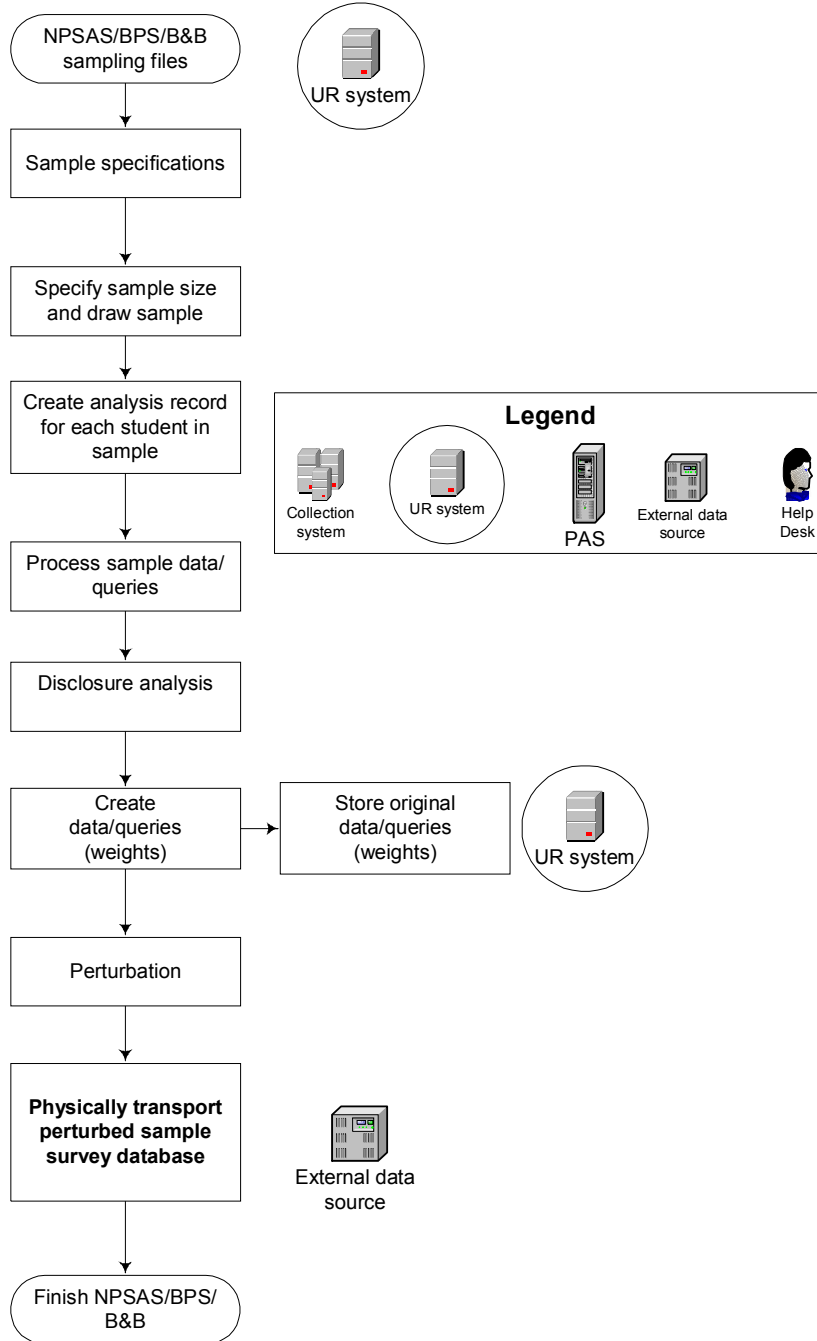
NOTE: Flowchart is for a proposed UR system; if such a system was authorized and funded, the details of the system architecture would be decided after several Technical Review Panels as well as a field test.   The collection system icon refers to the IPEDS collection system for aggregate and unit record data collection. The UR system icon refers to the IPEDS off–line database unit record data storage and analysis. The PAS icon refers to the IPEDS Peer Analysis System storage and analysis. The external data source icon refers to nonspecific offline data systems. The Help Desk icon refers to the IPEDS Help Desk.

Training

Training of IPEDS keyholders and coordinators is important to ensure that the data are submitted correctly and meet the parameters of the data collection. Currently, numerous training opportunities exist in the postsecondary education community to help practitioners learn the skills of using and merging datasets. For example, the Association for Institutional Research (AIR) conducts "train the trainer" sessions generally as part of state and regional conferences, which allow institution staff to attend one close to their institution.[48] In addition, web–based tutorials are currently being developed to provide instruction for gathering data for IPEDS reporting, entering data into the data collection system, using the Peer Analysis System to produce data for analysis, and other functions to assist data providers and users. The American Association of Collegiate Registrars and Admissions Officers (AACRAO) also hosts IPEDS training sessions to inform members of changes to IPEDS and related issues, and EDUCAUSE conducts IT training. The need for these types of training would increase substantially if a UR system were to be implemented. Training would be extensive and involve multiple levels of institutional staff as well as both web–based and in–person delivery models. Other types of institutional staff, such as information technology professionals, may require training as they may become more involved in the process of IPEDS data submission at the institutional level.

Help Desk

Under the current IPEDS collection system, institutional keyholders can contact the IPEDS Help Desk to help resolve questions about data definitions, procedures, and technical problems. The Help Desk would become even more important should a UR system be implemented. Help Desk staff would be trained to answer questions from keyholders on various aspects of the data collection process. In addition, the Help Desk would ask keyholders to resolve mismatches in the URs, working closely with the keyholders to assist in this process. The proposed UR system envisions having the Help

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[48] These sessions are funded through a subcontract with RTI International, which has a contract with NCES for this and other purposes.

Desk open throughout the year, whereas currently it is open around the dates of the three collection periods.

Software

The existing system for IPEDS collection and dissemination is maintained in a Microsoft Windows software environment that incorporates Active Server Page (ASP) scripting, the Visual Basic scripting language, and Microsoft SQL Server. In planning for the possibility of UR reporting, a number of requirements need to be addressed for software and hardware. Specifically, the UR collection software would need an adequate database management package capable of holding millions of student records per year; security protocols that include Secure Socket Layer (SSL), digital certificates, and password protection; and load balancing software that utilizes multiple web and database servers to prevent overload and effectively and efficiently handle large data transactions. These needs would come in addition to the current PAS environment, which would continue to expand with the addition of more years of IPEDS aggregate data files and new data elements.

Hardware

For one year of UR data, there would theoretically be four enrollment files, one completion file, and one financial aid file for each of the estimated 6,700 Title IV institutions. Disk storage space is posited to be approximately 50 GB for the first year. This includes room for the historical GRS data files that are needed and header files for all students currently in the system. The header file would remain at an estimated 4 GB per year with additional new students, with the number of term records growing slightly each year for a total of approximately 270 GB of storage needed by the end of seven years. In order to accommodate this growth, two database servers would be needed, each with 300 GB of capacity. The first server would be used for collecting the data, the second for securely storing the URs away from the Internet in final form.

The existing IPEDS collection database server does include load balancing. It might be necessary to split the UR database across two SQL Servers. The IPEDS

collection system for the five non–unit record components (S, SA, EAP, Finance, and IC) would be given its own database server. It has also been suggested that a separate database server be installed to house the IPEDS PAS, which grows annually at more than 1.5 Gigabytes (GB) per year, and the NCES DASOL applications (which include the postsecondary sample surveys and the IPEDS DAS). While the scalability of Microsoft SQL Server for handling hundreds of millions of records in the future is worthy of discussion, numerous examples of similar enterprise–wide solutions are in place in this environment across the country.

For the database server that is currently used for the IPEDS collection, the collection developer has estimated future growth of 1.5 GB per year. With new reports and tables that would be exported to other agencies for redisclosure, approximately 50 GB of disk space would be needed on this server. The PAS database server would continue to grow, with the accretion of larger and more complex files, requiring approximately 100 GB over the next seven years.

Overall, the implementation of IPEDS URs could require four dedicated database servers—one for collecting and another for storing the data separately; one for the continued collection of the nonstudent IPEDS components; and a fourth for dissemination of IPEDS via the PAS and the DASOL.

Chapter 5—Conclusions

This report has examined the feasibility of implementing a student UR system to replace the student–related components of IPEDS. As part of the feasibility study, an architecture and flow of operations for a proposed UR system, as well as a list of potential data elements that might be collected under such a system, were developed and described. In addition, the feasibility study solicited input from states and state systems; private associations of colleges and universities; institutional researchers, registrars, and financial aid officers; and other stakeholders such as the postsecondary education association community and federal agencies.

As this report has outlined, a central question for a UR system is *"Could it be done?"* The answer to this question is essentially technical. Have the information technologies and infrastructures at the campus and state levels matured, could the current IPEDS web–based reporting system be adapted to UR, and would there be adequate technical and legal protections in place at IES/NCES? The report has addressed some of the technical and system problems associated with the design and development of a new IPEDS UR system. At the technical level, a UR system could be done at most institutions given time for implementation, and the problems associated with development of such a system are manageable.

The feasibility study also addressed the *"Should it be done?"* question, providing a framework for the discussion of issues inherent in this question. These issues revolve around several areas of concern, which would need to be addressed and resolved in the design phase of a UR system should policymakers decide to authorize and fund a UR system.

Privacy is the first and more fundamental area of concern. Does the federal interest in collecting better data "trump" the right of students to control information about their enrollment, attainment, and financial aid? The confidentiality of student data would be protected to the extent allowable in the legislation under which IES/NCES operate.

Second, there would be costs and burdens to institutions associated with implementation, especially in the initial years. However, over $80 billion in federal

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student financial aid presently flows to postsecondary institutions. A decision would need to be reached as to whether these direct federal benefits to institutions are sufficient to counterbalance short–term concerns about cost and the burden of implementation, or whether additional funds are needed.

Third, a UR system would require institution–level coordination, involving the cooperation of registrars, institutional research, IR, and financial aid offices on campuses; with the need to assign or perhaps hire staff. A UR system might bring fundamental changes to state coordination structures and the management of the data flow on enrollment, completions, and student aid.

A UR system would also involve issues with technological capacity and the timing of data collection and implementation. Although changes in technology could be daunting for some institutions, mechanisms would exist to help institutions with reporting. The operational timing of data collection could pose complications, but would be addressed during the design phase of UR implementation with input from institutions.

This feasibility study has outlined areas of federal interest: better information for informed consumer decisions, including the improved calculation of net prices; and more accurate measures for institutional accountability and program effectiveness, including enrollment, persistence, transfer, and attainment rates by program of study. Policymakers would be able to monitor in real–time federal student aid programs (such as Pell Grants) and variations in aid packaging. The study also has attempted to highlight some potential benefits to institutions, states, systems, consumers, and other users of NCES data.

The study did not attempt to address every challenge or make recommendations about how each aspect should be addressed. Nor did the report document specific organizational positions regarding the obstacles a UR system might face. Rather, it provided a framework for policymakers to understand the potential costs and benefits of a UR system as they discuss whether it should be considered.

The central defining question of the feasibility of a UR system in IPEDS is not a "could" question. It is a "should" question, asking whether the federal government should develop a system that is based upon individually identifiable information about enrollment, financial aid, and attainment. This system would, for the first time, give policymakers and consumers much more accurate and comprehensive information about

postsecondary education in this country. Some of the benefits of UR include the collection of new data that would measure the success rates of students at institutions to which family and federal student aid monies flow, provide more accurate consumer guidance, and improve federal programs that support those families and students. In addition to benefits, the feasibility study found a number of significant issues that would need to be overcome before a UR system could be implemented, including objections about student privacy, confidentiality of data, new institutional burdens, coordination within and outside of institutions, and timing issues. Whether a UR system should be authorized, appropriated, and implemented is left to policymakers to decide, given the benefits and constraints examined in this study.

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Appendix A—Technical Review Panels

AGENDA

IPEDS STUDENT UNIT RECORD FEASIBILITY STUDY
TRP #1 (STATES, SYSTEMS, & PRIVATE ASSOCIATIONS)
October 28-29, 2004

Hyatt Arlington
Arlington, VA 22209-9990

Thursday, October 28

8:00 a.m. - 8:30 a.m.	Continental Breakfast
8:30 a.m. - 8:45 a.m.	Meeting Begins
8:45 a.m. – 9:00 a.m.	Introduction to the Feasibility Study—Dennis Carroll, NCES
9:00 a.m. – 9:30 a.m.	Co-Chair Introductions—Hope Williams, North Carolina Independent Colleges and Universities; Tad Perry, South Dakota Board of Regents
9:30 a.m. – 10:30 a.m.	Existing State Unit Record Systems—Tad Perry, South Dakota Board of Regents; J. Michael Mullen, West Virginia Higher Education Policy Commission; John Porter, SUNY System Administration
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 12:00 p.m.	Re-disclosures—Hope Williams
12:00 p.m. – 1:30 p.m.	Working lunch
1:30 p.m. – 2:30 p.m.	Burden—Gary Cox, Association of Independent Kentucky Colleges & Universities
2:30 p.m. – 3:30 p.m.	First year Implementation—Dennis Carroll Field test—Cathy Statham, NCES
3:30 p.m. – 3:45 p.m.	Break
3:45 p.m. – 4:45 p.m.	Wrap-up discussion

Friday, October 29

8:00 a.m. – 8:30 a.m.	Continental Breakfast
8:30 a.m. – 8:45 a.m.	Meeting Begins
8:45 a.m. – 10:00 a.m.	Review of previous discussion—John Milam, HigherEd.org

10:00 a.m. – 10:30 a.m.	On-going discussion
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 12:00 p.m.	Continued follow-up discussion
12:00 p.m. – 1:30 p.m.	Working lunch and Summary statements—Hope Williams & Tad Perry
2:00 p.m.	Adjourn

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AGENDA

IPEDS STUDENT UNIT RECORD FEASIBILITY STUDY
TRP #2 (INSTITUTIONAL PERSPECTIVES)
November 3-4, 2004

Hyatt Arlington
Arlington, VA 22209-9990

<u>Wednesday, November 3</u>

8:00 a.m. – 8:30 a.m.	Continental Breakfast
8:30 a.m. – 8:45 a.m.	Meeting Begins
8:45 a.m. – 9:00 a.m.	Introduction to the Feasibility Study: Context for Proposal and What will be Learned—Dennis Carroll, NCES
9:00 a.m. – 9:15 a.m.	Co-Chair Introductions—Mike McGuire, Georgetown University & Jeffrey von Munkwitz, University of Connecticut
9:15 a.m. – 9:30 a.m.	Summary of TRP1 Discussion
9:30 a.m. – 10:30 a.m.	Privacy/Re-disclosures
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 12:00 p.m.	Burden
12:00 p.m. – 1:30 p.m.	Working lunch
1:30 p.m. – 2:30 p.m.	Campus Coordination/System Issues
2:30 p.m. – 3:30 p.m.	Data Flow/Possible Record Formats Transaction vs. Analytical Extracts
3:30 p.m. – 3:45 p.m.	Break
3:45 p.m. – 4:45 p.m.	Timing/Census Dates

Thursday, November 4

8:00 a.m. – 8:30 a.m.	Continental Breakfast
8:30 a.m. – 8:45 a.m.	Meeting begins
8:45 a.m. – 9:15 a.m.	Review of first day's discussion—John Milam, HigherEd.org
9:15 a.m. – 10:15 a.m.	First year Implementation—Dennis Carroll Field test— Cathy Statham, NCES
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 12:00 p.m.	Continued follow-up discussion
12:00 pm – 1:30 pm	Working lunch and Summary statements—Mike McGuire, Georgetown University & Jeffrey von Munkwitz, University of Connecticut
2:00 p.m.	Adjourn

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AGENDA

IPEDS STUDENT UNIT RECORD FEASIBILITY STUDY
TRP #3 (STAKEHOLDERS)
November 9-10, 2004

Hilton Garden Inn
Washington, DC 20005

Tuesday, November 9

8:00 a.m. – 8:30 a.m.	Continental breakfast
8:30 a.m. – 9:00 a.m.	Meeting begins, Co-Chair introductions—Stan Ikenberry, University of Illinois & Chris Nelson, St. John's College
9:00 a.m. – 9:30 a.m.	Background, Process and framework of the feasibility study—David Bergeron, ED Office of Postsecondary Education & Dennis Carroll, ED National Center for Education Statistics
9:30 a.m. – 10:15 a.m.	Discussion of public policy considerations
10:15 a.m. – 10:30 a.m.	Break
10:30 a.m. – 11:30 a.m.	Privacy, confidentiality, and security—Sarah Flanagan, National Association of Independent Colleges and Universities & Francis Moran, ED Family Policy Compliance Office
11:30 a.m. - 12:00 p.m.	State issues—Paul Lingenfelter, State Higher Education Executive Officers & Tod Massa, State Council of Higher Education for Virginia
12:00 p.m. – 1:30 p.m.	Working lunch
1:30 p.m. – 2:30 p.m.	Campus issues: Coordination across offices—Melanie Corrigan, American Council on Education; Pat Smith, American Association of State Colleges and Universities; Frank Balz, National Association of Independent Colleges and Universities
2:30 p.m. – 3:30 p.m.	Campus issues: Burden and cost—Ken Redd, National Association of Student Financial Aid Administrators; Barmak Nassirian, American Assoc. of Collegiate Registrars & Admissions Officers; Terry Russell, Association for Institutional Research
3:30 p.m. – 3:45 p.m.	Break
3:45 p.m. – 4:45 p.m.	What next? "If authorized, if funds are appropriated."

Wednesday, November 10

8:00 a.m. – 8:30 a.m.	Continental breakfast
8:30 am. – 8:45 a.m.	Meeting begins
8:45 a.m. – 9:15 a.m.	Review of first day's discussion—John Milam, HigherEd.org
9:15 a.m. – 10:15 a.m.	On-going discussion
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 12:00 p.m.	Continued follow-up discussion
12:00 p.m. – 1:30 p.m.	Working lunch and Summary statements
2:00 p.m.	Adjourn

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Appendix B—Estimates of Burden

As part of the IPEDS Student Unit Record Feasibility Study, a wide variety of information has been collected about the potential costs to institutions of implementing the proposed unit record system, including participant comments and discussion as part of three Technical Review Panel (TRP) meetings[1]. Cost data were not included in the design for the study; however, this appendix describes cost estimates that were received from institutions and broadly discusses the various types of estimates that were made. In addition, specific comments regarding institutional burden are presented. In addition, numerous informal comments and feedback from the postsecondary education community were received. As the discussion of cost and burden evolved during the process of the feasibility study, one of the TRP panelists suggested that any input regarding cost estimates could help in the preparation of the report. Subsequently, an AIR Alert email was sent to over 5,000 subscribers by the Association for Institutional Research (2004; 2004b), and references to the feasibility study were made at presentations before the American Association of Community Colleges (AACC), the National Association of Independent Colleges and Universities (NAICU), the Southern Association for Institution Research (SAIR), and the Northeast Association for Institution Research (NEAIR) national and regional conference sessions.

Several hundred persons participated in the TRP meetings; their comments are integrated into this discussion of cost estimates. Numerous additional comments were received by e-mail. Table B1 summarizes these comments and those from the TRP discussions that are attributable to an individual. Some of these comments represented groups of institutions, specifically the Higher Education Data Sharing consortium of private schools and the Association of America Universities Data Exchange. Other respondents included a range of schools, including SHEEOs (Maryland and Virginia); large state systems (Indiana University and the University of Texas); research universities (Washington University, Johns Hopkins, and University of New Mexico); state universities (George Mason University and the University of Colorado at Boulder); small private institutions (St. Olaf's, Shimmer, Mount Mary College, and Randolph Macon Woman's College); and community colleges (Pima Community College and Walters State Community College).

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[1] This section discusses the costs to institutions if a UR system were implemented. The costs to NCES would vary depending on the design of such a system; as noted earlier, NCES already uses much of the technology required in the current IPEDS collection.

Table B1.   Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic

	Comment
Classification	
James Madison University	…. Also IPEDS UR should give serious consideration to maintaining two fields for student status: one as submitted by the institution, the other as determined by IPEDS for analysis above institutional levels. Accuracy of first-time freshman (FTF) data is given a high priority in this proposal and I expect that IPEDS will mandate changes to FTF status based on historical data in the IPEDS UR system. An institutional status field, controlled by the institution, could be used for IPEDS and institutional GRS calculations. This would drastically reduce the burden on institutions and IPEDS, prevent resubmission of data back to state systems (close the fed-state edit loop), and allow earlier release of consistent FTF statistics.
New York Institute of Technology	I think consideration needs to be given to how much effort it will take to properly classify students. For many years, especially in institutional research (IR), I think institutions have grown accustomed to downloading what is in institutional databases and then "working with that data" to fit into the IPEDS reports. This person effort may prove to be very difficult to accurately code. In fact, in some cases the metadata needed to create the IPEDS reports exists outside the student database of record. This could involve dozens of full-time equivalent (FTE) days of effort by both programming staff and the staff of IR in conjunction with the functional offices. Some of the fields in the proposed upload list would have to be created in this reverse-engineering method so that the fields live natively on the database of record from which the uploads ought to occur.
Coordination	
Alabama Department of Postsecondary Education	Institutions will have to implement more elaborate reconciliation processes between the business office, Title IV records, and IPEDS, etc.
Bates College	Elements of the data to be requested tend to be scattered among several offices, including the registrar, financial aid, admissions, finance, information services, and/or the Dean of Students. These offices may report to different members of a college's senior staff, and they may have different priorities, calendars for updating information, and deadlines that conflict with those set by IPEDS. The cultural/administrative obstacles to coordinating new forms of sharing across independent offices are not insignificant, and will require extensive meetings, as well as buy-in from senior staff, to raise the data sharing issue to an institutional priority. The coordination task becomes even more difficult as multiple surveys become integrated and have to pass multiple edits and cross-checks. Space does not permit us to convey the amount of time and high-level negotiations that regularly take place at our institution when "data providers," "data analysts," and "data consumers" have slightly different interpretations about data definitions, or differing levels of understanding of the complex IPEDS instructions. The level of access to data varies greatly in small institutions. Some institutional research offices or IPEDS coordinators simply compile data prepared by other offices; others have can only run certain "canned" reports or time-specific data extracts; some have to request others to run extracts for them, and a limited number have full access to data and the technical ability to obtain it across administrative systems. Few small institutions have "data warehouses" that are adequate to handle the types of questions being raised in the IPEDS unit record context. Others have written to you about the complexity of integrating census data with transactional data... Like it or not, at many institutions, key offices at many institutions still have a "stovepipe" mentality, and there will also be "territorial" battles to be fought when offices are challenged with new reporting processes. Because of the many ways in which the IPEDS data are used, even seemingly minor changes in definitions and reporting practices (from IPEDS' perspective) can require direct decisions and intervention at the most senior administrative levels. At some institutions, some reporting questions may even require faculty legislation to change definitions or procedures. There are internal concerns about security and privacy, since many more staff will probably need to have access to certain data elements and will need additional training in how to protect privacy.
Marian College	Some of the information being requested is not readily available the way it is requested. For a variety of reasons, the college financial aid, admissions, HR, and receivables are either not integrated or only partially integrated with the campus academic information systems, and not at all or minimally with each other. Connecting information from these disparate resources, while not impossible, requires hand manipulation and resolution of mismatched keys, etc. The IR office, which has done all the reporting, does not access some of these records, such as the student billing accounts (1098-T). With the merging of files that don't normally talk to each other, each step of this submission will have to be supervised manually, with error resolution of keys or other concerns. While this scenario should improve over time as corrected data becomes the norm, the need for close intervention and error checking in the process will almost certainly continue indefinitely.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
National Association of Student Financial Aid Administrators	Currently, aid offices at some multi-campus and branch campuses report Pell Grant and campus-based aid data through their larger system offices. These offices may have to reprogram their systems in order to get data for individual students at the branch campus level. This may cause some additional costs or other burdens.
Towson University	In order to complete the mandatory data cleansing and verification of multiple submissions of student unit-record files, additional personnel will be necessary in several service offices; institutional research, financial aid, enrollment services, and admissions.
University of California	Different offices working on different issues and reporting through different mechanisms, whether it is the bursar versus the financial aid office, or campus-driven data versus system wide data, different requirements for data collection and reporting at the state and federal levels, competing deadlines, timelines, multiple dates for submission of data, and overall coordination of dates in general were all topics discussed at length.
University of Maryland, Baltimore County	The transactional nature of the proposed system will require a data reconciliation process that would involve staff in multiple offices and on a continuous basis. Minor errors or inconsistencies could lead to substantial negative affects on the lives of individual students.
University of Wisconsin – Madison	Several different offices at a large institution will be involved in UR IPEDS file development. At UW-Madison, those offices include the registrar's office, the bursar, institutional research, business services, athletics, and student financial services, information technology, and others.
University System of Maryland	Many institutions in the USM run systems which are functional in one area (financial aid, enrollment management, human resources, etc.) but are not cross-compatible. The proposed data collection system would require greater compatibility which would require the purchase of software and/or substantial programming . . . The use of the unit record data for federal financial aid verification demands a higher level of accuracy for each individual record than is currently necessary for analytical purposes. Put simply, today a minor error in analytic data might create a data anomaly, but in the proposed system it could have a substantial negative impact on the lives of individual students. This will require assigning personnel from enrollment management to monitor these data.
Field test	
Association of American Universities Data Exchange	Institutions are concerned about the timetable and their ability to generate the unit-record information by 2006-07, if they are selected to be in the pilot program. With regard to the pilot program, one responded indicated: "State systems have not been studied sufficiently, goals are not clear, and clearly 100 voluntary pilot institutions would provide considerable information. Why not do these things first, then go to the mandatory pilot."
Columbia College Chicago	Some of our deepest concerns surround the proposed timing of this change. The current proposal states that the pilot year for this switch will occur during the 2006-2007 academic year. The College strongly feels that this does not give our institution enough preparation time. If the legislation is passed this year, the pilot year should occur no sooner than the 2007-2008 academic year.
Johns Hopkins University	Student records are presently scheduled for implementation in summer 2006, right before the planned pilot study for IPEDS unit records in fall 2006. If selected for mandatory participation in the pilot, Hopkins would be asked to submit IPEDS in both the current and the new formats. Hopkins would be a poor choice for the pilot because it would be attempting both formats for the first time on the new system. We would be spending money to develop a new way to replicate the old format, never again to be repeated, and the timing of the pilot could bring the entire implementation to a halt.
Financial aid file	
Columbia College Chicago	There are also concerns that it will be difficult to reconcile the current financial aid audit information to what will be required in the files. It is critical that the deadline of the financial aid file must come no sooner than the six months after the end of the academic year, after all other federal audits are completed.
Financial aid administrator: large, four-year, private, not-for-profit, university in the Mid-Atlantic region	I notice that "Institutional Grants" are lumped together in one category, without differentiating between grants that are funded and those that are unfunded. This might be described as the NACUBO approach . . . but it is worrisome in that those who like to impugn institutional aid as "tuition discounting" tend to give the impression that all institutional aid is unfunded, and those who wish to use institutional aid for enrollment management purposes like to assert that there is no difference and behave as all institutional aid is funded, if only, in some cases, by "tuition money."
Financial aid administrator: large, public, four-year university in the Midwest	It is not a large task to get the information requested.
Financial aid administrator: large, public, four-year university in the Southeast	We have this information in our database, so I do not know that it would be very cumbersome to report.
Financial aid administrator: small, liberal arts college in the Northeast	While I'm not sure of the impact, once we design the programs and steps in the first year (and provided they don't change the requirements every year) it shouldn't be too bad to produce this data and send it off.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Marian College	Financial aid data, which seems to be of paramount interest, changes continually and dramatically throughout the year. At any point you fix it, it is a partial picture, not settling out until the following year. It is probably not useful for the purposes intended unless received early, and isn't stable enough to generate firm conclusions at that time. We do not consider our financial aid data final until the next year.
Maryland Higher Education Commission	The use of multi-submission of IPEDS UR for all types of data is problematic in some areas. The collection of student financial aid data over multiple points within a year does not provide an accurate picture of the financial aid picture at the end of a yearly period. There are too many adjustments (awards adjustments, audit verification corrections) made to student financial aid over a year's period to make any type of collection besides end of year accurate.
National Association of Student Financial Aid Administrators	Collecting information for graduate/professional student assistantships may be difficult at many campuses. These data are usually not kept in the financial aid office. They are kept by deans, who are not always willing or able to share these data with the aid office. This is particularly true at campuses that have decentralized aid offices.
University of California at Berkeley	The treatment of summer sessions will be another issue, especially with respect to financial aid.
University of Miami	The net price for students for students enrolled in fall/spring is much lower than for those enrolled in summer. For example, students who use Pell for fall and spring won't have it in the summer because of the annual eligibility limits. No UM gift aid is awarded during the summer. NCES needs to decide whether they want net price for a "typical" student (enrolled just fall and spring) or for all students. This question also seems to fail to take into account differential pricing offered by some programs, so any attempt to look at the whole will not represent the norm. . . . Overall budgets are not very accurate. Students living off campus don't pay us for room and board so that component of total budget is difficult to estimate for them, and no student pays the University for books and supplies, personal expenses or transportation. In addition, if the student changes intensity, the costs change but may not be reflected accurately in the database. So you'll never really know the net cost for students if the total "budget" is used. You'd have to focus on the tuition and fees only, but then you'd only have net tuition and fees, not net cost. Even that won't be completely accurate because we award aid on the budget, not on just tuition and fees. Furthermore, some students will have a negative net tuition and fees because they receive aid for expenses above and beyond just tuition and fees. How would these students be handled?
University of Miami	It sounded as if SFA would continue to be based on the prior-year cohort (either fall or full-year). If that's the case SFA data collected during the year associated with the first EF (e.g., Fall 2007) would be for the students for the prior year rather than the students included in that UR anyhow (e.g., it would be for students enrolled in Fall 2006 not Fall 2007). Delaying UR collection of SFA data a year after EF would align the SFA cohort with the EF cohort (e.g., NCES would request data for students enrolled in Fall 2007 in 2008-2009).
General issues	
Agnes Scott College	I also have concerns regarding the human power and financial resources necessary to address even the most conservative data requirements. Small institutions, such as Agnes Scott College, simply do not have the human nor technological resources to comply.
Alverno College	Completing IPEDS is time consuming but the present practices dovetail with institutional reports, information to Common Data Set, Petersons, US News & World Report, etc. I am concerned about anything that would mean additional work, additional checks and balances on the institution's part . . . It seems to me it is the responsibility at the local level to submit the IPEDS information for the institution. This feels like someone else taking our numbers, manipulating them and drawing conclusions. Also, just letting the computer "do the numbers," does not provide a check and balance. Sometimes when I am completing IPEDS I notice a race code or age or state, etc., missing, I can then have that investigated and manually fix the report.
American Association of Community Colleges	Community colleges represent about half of all undergraduates and they "don't know what happens to their students once they leave their schools." They don't know what happens to a lot of students in higher education. "AACC is cautiously optimistic and looking forward to the results of the study. However, we are concerned about issues related to privacy and the potential burden on our institutions, and how these will be addressed as a result of the feasibility study."

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
American Council on Education	There are "lots of operational issues." Many of these were raised in the previous two TRPs. These are "not insurmountable, but can be magnified or minimized in terms of burden" because they can be "very complex in actions." "We're prepared to love this a lot unless we hate it. It could do us a lot of good, unless it hurts us." We acknowledge that "most of us are desperate to tell the institutional and the student success story in a better way." While recognizing that future TRPs will need to hash a lot of this out if UR moves forward, the concerns they have "are not inconsequential." It is "not so much the intent and design of what it is trying to do, but the whole host of attendant issues that it raises."
Association of American Universities Data Exchange	Campuses have established numerous reports with a long history of data definitions and protocols. Many expressed concern of having to reconcile internal campus reports with NCES reports and "correcting" errors in the data files as identified by NCES. One could potentially generally three different answers to the same questions based on campus, system/state, or NCES data.
Bates College	One of the primary problems with the IPEDS unit record proposal is that it completely ignores the practical organizational, cultural, and training obstacles that would have to be overcome. Let me try to summarize some of the problems that will be faced by many of the smaller institutions, who would find unit-record reporting to be extremely burdensome and expensive. In spite of their good intentions, many small institutions will probably end up being forced to pay fines, because they will be unable to comply with the new requirements.
Bucknell University	One point, however, needs to be made very clearly: all burdens are not equal. A number of college representatives with whom I have spoken would be very willing to complete an additional IPEDS report on net cost, an option which entails data collection and reporting of the type with which we are familiar from other IPEDS reporting, and which is free of any associated risks.
Cardinal Stritch University	Submitting the data as suggested in the proposed student record layout would not create a significant burden for us, as we already have all that information available in our data system . . . Institutions will still need to compile all of the same reports that are currently submitted as most institutions still need to report these summarized data internally anyway. Institutions are highly unlikely to be willing to use the government's summarized data, which will not include small values, for their regular internal reports. Most institutional researchers are intent on analyzing their own data. I myself won't even use our own system's canned reports as I prefer to work with the real data and analyze it in various manners for various needs. Using the government's version of the data will not suffice for these reporting needs, even if the data summaries were available in a timely manner. This new process will not reduce the institution's reporting burden, but will likely increase it.
Caspar College	This proposed data collection system will require a monumental amount of time and effort at all levels to make it work and I am not convinced that we will learn anything new about our students in the process.
Central Wyoming College	It would take months to input the data. If a standardized list of variables on each student could be agreed upon, the reporting parties could extract this data from their respective databases.
College of Notre Dame	Such a system of data collection would create an immense burden on the College of Notre Dame of Maryland.
College of Southern Maryland	In a period of reduced support and funding at the state level for higher education, some degree of sensitivity to this issue should be displayed by a delay or phased in approach to student unit record data collection by the federal government.
Columbia College Chicago	This change will have significant short and long-term impacts on the workload of several offices on campus. Most obviously, the IT department would need to develop the reporting mechanisms to generate these data files incurring set-up and training costs.
Concordia University Wisconsin	I am very comfortable with the current IPEDS data system, so the idea of making sweeping changes is a problem. After reading the descriptions of the proposed changes it appears they would require a lot of work and time.
Council of Independent Colleges	There needs to be a way to "help colleges of their size make the transition to UR," especially with the double burden of the pilot.
DePaul University	From the research's perspective there would be many aspects of a federal unit record system that would be extremely desirable.
Eastern Wyoming College	In theory, student unit records reporting could probably lead to long-term gains in the amount of time we spend responding to surveys and required annual reporting. However, I do not think there is anyone optimistic enough to believe this will actually happen.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Financial aid administrator: large, public university in the Mid-Atlantic region	IPEDS needs to consider that this new level of reporting would add considerably to a set of institutional reporting responsibilities that include greatly increased state reporting, new and intensified grant reporting (the National Science Foundation, the National Institutes of Health, etc. all requite far more statistical data and assessment than previously) and an ever-growing number of surveys and questions from the public sector that we respond to in accordance with the Freedom of Information Act . . . I guess I wonder if more time should be spent assimilating what we know and less in new data collection.
Financial aid administrator: large, public, four-year university in the Midwest	We heard NCES folks talk about using the financial aid data to show sample aid packages based on a family's guess of financial need. This puts schools in an extremely difficult position as we attempt to explain why the information they saw on the NCES COOL website doesn't fit their situation or represented last year's approach or any number of other possibilities . . . There is a real potential for these data to be naively misunderstood or even intentionally misused.
Financial aid administrator: large, public, four-year university in the Northeast	I agree that more thinking and discussion is needed (in that order) and I agree with the American Association of State Colleges and Universities (AASCU) who is supporting the feasibility study . . . In general, I think collecting unit record data for IPEDS is a good idea that potentially could contribute much to ameliorating the terrible state of IPEDS-based statistics.
Financial aid administrator: medical school in the Southeast	It would be wonderful to have one central depository but the logistics of it could present some significant issues.
Higher Education Data Sharing Consortium, Wake Forest University, Haverford College	We would also like to take exception with the contention that institutions view the burden and cost of such a collection of education records as a "tax" for using Title IV financial aid. We would remind [NCES] and others that Title IV financial aid is a benefit to individuals and not institutions. These individuals have already paid the taxes through their federal income taxes and have already fulfilled their responsibilities for provision of information through their applications for these benefits.
Houston Community College System	The proposed project seems to me to be too much done too fast . . . It seems to be popular of late to place ambitious projects on a fast track for completion. This unfortunately does not ensure success or quality. It is certain that the effort will be expensive, with much of the true cost being hidden in the budgets of thousands of information services budgets in colleges across the country. It is also certain that the effort will provide a veritable bonanza for consultants selling their services in support of the project.
Indiana University	The plain truth is that the programs necessary to produce the IPEDS components have already been created and leveraged as institutional reports, indicators, and decision support. With all their foibles, these surveys have become the currency for those of us that attempt to provide consistent metrics to higher education. More importantly, the data that under gird these measures are under our control; to be extracted, transformed, manipulated, and presented on our institutional schedules. As such, it is pure folly to think that we will no longer be tasked to do these reports but rather, simply supply data sets to NCES and wait for our reports to be returned to us.
James Madison University	Overall, the current proposal creates more burden than value. It also mitigates against the credibility of IR offices who need to deliver official statistics consistently and in a timely fashion.
JBL Associates	"Once schools get the data and use them internally, they see things about themselves and it helped them build a whole new agenda." The first implementation of UR for this project "came much more easily than thought."
Jefferson Davis Community College	UR will "help validate the role of community colleges in higher education, a role that is somewhat overlooked now and does not get the pre-eminence it deserves."
Laramie County Community College	I see several possible benefits for us, including being able to present a more complete picture of how LCCC impacts students. I also think that this proposed student level (unit level) data system will give us much more flexibility in terms of research questions. We can ask our own research questions and get national average dated data; now we are dependent on the summaries available through the current system. I disagree with Northwest's position that the current practices are "reasonably acceptable."
Lewis and Clark College, Juniata College	In moving to transactional data, NCES will put considerable stress on my institution's ability to verify its numbers. Additionally, I am somewhat pessimistic regarding NCES' ability to do its own verification of any statistics derived from such a database, given the lack of context for the statistics . . . I have used the recent tools proved by NCES to my institution. They are powerful automated tools. They are a testament to the amount of labor invested at NCES and my home institution in providing good comparative data for analysis. Unfortunately, the NCES model of one-size-fits-all works very poorly in the case of our institution. So, while there are wonderful graphs, many of them create misimpressions that take even more work to overcome. When this limitation is combined with the IPEDS penchant for "perturbation," much of the institutional benefit is lost.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Marian College	I think it would be feasible for us to generate these files, though I am sure it would be very time-consuming and even painful at times. I think there are probably a million questions that will come up in the first year if they decide to do this—e.g., what to do with 2nd majors. At this point, I don't see how any potential value added to institutions in doing this could possibly match the cost and pain involved.
Maryland Higher Education Commission	There are certain benefits to analysis of UR data nationally, as it would allow tracking of students across State boundaries. The downside to this is the loss of individuals' privacy. This is a question that cannot be addressed by the panel. In addition, NCES policies would not allow states or institutions to work with the national UR data. This will limit the benefit to the states and the institutions while not offsetting the increased burden to them to collect this data.
Mount Mary College	The proposed changes to IPEDS that would require us to submit unit data would be an extreme burden for us.
National Association of Independent Colleges and Universities	Is UR so superior that it justifies the risks, burden, or costs to this than what we know now? We know quite a bit. Is this the best way to do it? There are all kinds of other factors that we don't have that much data on with how students get through.
National Center for Higher Education Management Systems	The proposal for UR "represents a real opportunity to reconceptualize the way enrollments are structured and measured. Credit and term are not adequate and institutions are already doing things to better define them."
National Association of Student Financial Aid Administrators	Despite these points, it is possible that the UR requirement will not be a huge extra burden for some campuses. Any problems will probably come from smaller public and private colleges that have just one or two aid office staff. These small offices (which tend to have just one or no IR office staff) may have additional costs or other burdens. The larger schools that have participated in the National Postsecondary Student Aid Study (NPSAS) or other major federal surveys that involve unit records probably will not have much difficulty with UR."
Northwest College	I am writing to state that our college does not support the proposal in any manner. Financial cost, time commitments, lack of personnel, technical difficulties, legal issues, regional accreditation issues, privacy issues, and reasonably acceptable current practices are the general grounds for our decision.
Northwestern University	We are reluctant to comment on the burden of the IPEDS student unit record feasibility study because we are fundamentally opposed to it. We believe from a cost/benefit standpoint that the costs to institutions far outweigh the benefits or demonstrated value to all stakeholders. We are concerned about the many nuances and institutional specific definitions of many of the data elements that could potentially be misinterpreted when the data are compiled and reported.
Occidental College	I believe that the unit record proposal is a bad idea, and that its proponents have not realized just how bad it is. I think that a few years from now, regardless of whether it gets implemented or not, people will look back at this time and ask "What were they thinking?" . . . If enacted, this data collection scheme will be a fiasco, initially. The burden on schools will be tremendous, and much of the data will not be valid. Eventually, those kinks would get worked out, but at tremendous cost in terms of resources—and in terms of the loss of privacy. A bad idea. It is a good idea to collect the data, but do so intelligently, by sampling.
Oglethorpe University	We are worried about declining data accuracy were we to move the proposed unit record reporting. Since unit record reporting will rely on the submission of transactional data and follow a coding scheme that does not fit our institutional system, quality checks on reported data will be costly and time consuming at best.
Oklahoma State Regents for Higher Education	I think there are benefits to the proposed system that outweigh much of the concerns here. The ability to actually have data on all students will allow us to really grasp at the real nature of the student experience. As Cliff Adelman illustrated in his recent work, students are not tied to institutions, nor state borders. If we are to truly know our business then we should seek better mechanisms for knowing it.
Shimer College	We are sure we are not alone in finding the proposed requirements: 1) immensely burdensome of personnel time and therefore of institutional resources; 2) potentially threatening to privacy and other civil guarantees to citizens; and 3) of no compelling value (indeed the opposite) in serving the public good.
St. John's College	By collecting one kind of data and not another, this causes policy makers to use those data and not others. This is the reason St. John's doesn't participate in U.S. News, because the college believes that higher education can't be quantified. "The more counting we do, the less context we have."
St. Lawrence University	The impact of the unit record system on institutional cost and burden will be excessive, with little to no additional benefit to the institution itself.
St. Olaf College	Most specifically there was great concern about increased burden—having to both run the summary data (as we already do) to check/clean the UR data as well as prepare the UR data in proper format

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
State Council of Higher Education for Virginia	There is a "huge, disparate collection of entities" and community colleges make up more than half. "There is no good, holistic model of what the benefits of higher ed are. We all think we know what higher ed brings to students, states, and the nation, but we cannot prove it." While the UR won't answer all of these questions, it will allow us to tell different stories about what is going on and there are a lot of unanswered questions out there.
State Higher Education Executive Officers	Current NCES surveys aggregate information from many sources. Despite substantial investments in reporting and analysis, these surveys are unable to answer these questions adequately. In fact, they lose track entirely of the progress of students who attend different institutions. The only way to accurately and completely answer these and other important questions is to collect and analyze a handful of data elements on all students over time, even if they attend different institutions.
Student loan guaranty agency representative	Collecting and maintaining student unit record data is clearly practicable, and such data would no doubt yield a wealth of useful facts and figures about higher education. But just because we can do this does not mean we should do this. Such a project would no doubt impose a large and complex reporting burden on institutions.
Towson University	The NCES proposal to redesign IPEDS to collect student data through individual student unit records offers the federal government the potential to provide a more valuable source of information than the current aggregate reporting method, particularly in the area of outcome assessment and cost of higher education. It is imperative, however, that the cost of implementing a system of this magnitude does not outweigh the perceived benefits . . . This initiative will impose a heavy financial and resource burden on our institution to create a database of information that could jeopardize the privacy of our students. Furthermore, it has the potential to seriously compromise the validity of data that institutions are routinely required to report.
United Negro College Fund	"Every year there is more and more reporting," requiring schools to send more and more data. "When will it stop?" "Will the end game be beneficial to some?"
University of Colorado at Boulder	"Full-time enrollment" is the most difficult thing to determine about a student—full-time for tuition, for financial aid, for this degree program, for residence halls, for . . . . That makes me shudder when the goal of analysis is stated as rates of this and that for full-time and part-time students, as if they are two separate groups with some qualitative difference between them.
University of Kansas	While schools see the benefits of UR, they have not pursued better numbers because they can't afford to track students this way. In other cases, the cost is greater than the perceived benefits and would cut into instructional activities.
University of Maryland, Baltimore County	This unfunded mandate would be costly and burdensome to the campus and would provide questionable data for the uses planned by the federal government. We do not believe that the data generated from this project would answer the kinds of questions outlined by NCES.
University of Maryland Eastern Shore	The impact of the student unit record system may not be fully appreciated prior to implementation of the proposed change in data collection.
University of North Carolina	IPEDS UR has the potential to allow us to study the timing of student decisions and the process of acquiring credentials. Low-income students and those without enough financial aid are forced to drag out going to college. "Timing is a key issue." One of the central issues is "how to deal with non-traditional students."
University of Wisconsin System Administration	While we recognize the importance of the issues driving a unit record data collection we have not been convinced that this is either the appropriate or adequate vehicle to address these policy issues. In addition to policy concerns, we have conceptual, practical and technical considerations. . . . At a theoretical level this proposal would seem to address the major policy issues plaguing the higher education community at the federal, state and local levels. However, the details, costs and implications are serious enough to warrant further discussion prior to advancing the proposal in its current form.
University System of Maryland	The current discussion has ignored serious flaws in conceptualization and generally underplayed the considerable costs and obstacles to the successful implementation of the system. Most importantly, we do not believe that the data generated from this project will be able to answer the kinds of questions that NCES has outlined . . . As this system is currently proposed, no outside group or agency, including the university or college itself, will be able to validate the accuracy of the data analysis and research released about an institution. The IPEDS data set (concerning an institution) will exist only with NCES, and will compete directly with institutional and state data-sets when any discussion of the institution takes place. This IPEDS data set, for all the reasons discussed above, will not be the most accurate. These data will be non-contextualized, unconfirmed and not trusted by higher education.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Villa Julie College	The proposed unit record system will impose significant administrative burdens on Villa Julie College . . . For an institution of our size, the reporting requirements will generate a massive amount of additional work where administrative resources are already stretched thin. The format in which data will be requested is likely to be more sophisticated and expensive than the systems the college currently uses. The study and implemented program foresees multiple data submissions each year. The likelihood that ongoing individual data errors or anomalies will be identified and require resolution adds to the burden. The assurances by the Department of Education that any additional burden will be initial only, and not ongoing, seems optimistic given the multiple submissions each year. Data "cleaning" will be an ongoing effort. One expert on higher education data collection advised that it is reasonable to expect at least a 5 percent error/anomaly rate each year for unit record data.
Washington University	We could comply with unit record reporting without a significant increase in reporting burden if the privacy/SSNs problem is solved. That is no trivial matter.
GRS data	
Maryland Higher Education Commission	The proposal also identifies the awkward and huge burden that would be required for the institutions or States to report back data (as much as 6 years worth) for starting up the unit record system to handle the Graduation Rate Survey (GRS). This would also need to be provided the first year along with the new UR requirements. A better methodology needs to be developed to phase in the GRS based to IPEDS UR.
Montgomery College	The catch-up submission of GRS support data will be a considerable effort.
Paine College	We would have real difficulty due to software conversion projects, especially retrieving data that are five or more years old for GRS cohorts.
Shorter College	I could already provide numerous cohort files, as long as they could be uploaded in Excel.
University of Maryland Eastern Shore	The back fill data for six years will present us a serious challenge in terms of availability of such data. Beginning fall of 2003 we changed our database from the Legacy system to PeopleSoft. Moreover, the way and the type of data collected over the six year period emphasized freeze data to be reported to the Maryland Higher Education Commission that was aggregated and did not include course level data. Thus finding appropriate level data will be a major challenge.
University of Texas system	The Technical Review Panel (TRP) for developing these files will have to rethink the alignment between the Completions (C) and GRS. The two need to be aligned, since they are based on the same data and timing.
Implementation	
Bates College	The desire to accomplish the unit record reporting system all at once, rather than implementing it gradually, is very perplexing. The decision to bypass the Office of Management and Budget (OMB) clearance process and not do a survey to estimate institutional burden or cost suggests an unwillingness from IPEDS to consider institutions' genuine concerns about a proposal that will have far reaching implications for the very nature of student data reporting. It has not been made clear what overreaching issues of urgency require such a system to be implemented at once, and retroactively, in the case of GRS reporting.
College of Southern Maryland	NCES is moving forward in developing a reporting requirement but a plan for report format, fields within the reports, and definitions of the data elements has not been created. Field testing in 2005 seems impetuous.
Community College of Baltimore County	Of critical concern is the increased burden given the timetable for implementation. The proposed schedule will negatively impact the institutional research, the information technology, and the enrollment management departments. Central to this proposal are major changes in the processing and handling of student records data. The current timeline does not provide sufficient time to adequately plan and implement changes of this magnitude. Allotting additional time between the pilot study and the full implementation would allow for the final requirements to be provided to the institutions well ahead of implementation. This would provide more time for staffing and technology upgrades to be completed before the full implementation.
Eastern Wyoming College	The major challenges would be the workload in the implementation of the new requirements. It would require four years of student data (current year plus last three), including all the financial aid information, at the start-up phase. The personnel costs and training costs to do this would be extensive.
Financial aid administrator: large, public, four-year university in the Midwest	We believe that it significantly increases the institutional reporting burden, especially in the first few years of implementation. We've yet to see any new initiative put in place without lots of back and forth work between the contractor agency and [the university]. Having one of the larger populations in the country, this is not trivial.
Houston Community College System	If implemented, I would suggest that a more gradually phased-in model would be preferable with adequate testing to ensure data security and accuracy.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Howard Community College	We recommend that a secondary review process be considered, one that incorporates further input from institutional researchers, admissions officers, and information technology experts from all higher education segments, including community colleges. The proposed timeline for implementing this initiative needs to be reconsidered as do many of the details of the present project design.
Lewis and Clark College, Whitman College, Juniata College	With the massive potential for bugs, at both the institutional and federal levels, five to seven years seems a more reasonable estimate of the period of disruption and unreliability in the aggregates rather than two or three. (Just look at the time it's taken for NCES to streamline the web-based IPEDS collection.)
Maryland Community College Research Group	Structural changes of this nature require more time than the current plan so that appropriate resources can be acquired.
Maryland Higher Education Commission	The proposed implementation schedule is far too tight to allow time to prepare, test and implement. Typically unit records systems take three to four years to roll out depending on complexity not the one to two year period proposed. Institutions and possibly States will need one year of training and preparation time to modify their systems and procedures. One year is spent on doing a test or pilot at a few institutions. NCES intends to pilot a 25 percent on the institutions in the country and the test will be required of the institutions under current federal law. This could be very burdensome to institutions that have weak systems and limited resources. We have found this to be true at small independent institutions here in Maryland as we implemented the state UR systems. It also constitutes a mandatory shortening to one-year the time for the institution to implement.
Montgomery College	Both the implementation and the feasibility study are on a timetable that is entirely too rushed to permit adequate review and development—at the institution, state, and NCES levels. At least one additional year prior to the feasibility study should be inserted, and universal implementation should be postponed an additional year to permit accommodation of the feasibility study's outcomes.
University of Colorado at Boulder	Startup (internal definitions, agreement within system, work on state UR system to match, programming, modifying numerous internal processes to match new definitions): an estimated 100-200 hours of director time plus 200-400 hours of staff time. Maintenance: probably no more than now.
University of Maryland, Baltimore County	The proposed implementation timeline is aggressive, not allowing for careful planning to avoid data problems and resolve privacy problems, and it would divert campus resources from other planned efforts.
University of Miami	The advantage with the delay for institutions is that they have more time to implement UR submission.
Matching records	
Association of American Universities Data Exchange	Almost all who responded indicated the difficulty of using SSNs to match data files. A 10-25 percent error rate for mismatches using SSNs is not uncommon. The cleanup associated with correcting bad or missing SSNs is very labor intensive and would require additional campus resources.
DePaul University	The one that concerns me the most is the second one of having to reconcile "discrepancies" NCES finds with the data submitted. This need to clean up data will most likely require we reach back into our databases and force us to spend tremendous amounts of resources to match other federal records or records from other institutions and to do so in a manner that adds absolutely no value to the quality of decision-making at our institution.
Dickinson College	The change process will be difficult, especially at small colleges where there are data integrity issues, fiefdoms, and silos of data that make it difficult to match records. It is "hard to get the culture changed, but it is part of the burden."
Eastern Wyoming College	Mismatches on SSN or any other student data would have to be resolved by each institution, which will be very time-consuming. A student who does not want to give us a social security number is allowed an option here, for example, but then that student may use another option at another educational institution. How we match up those student records could be a nightmare.
Rensselaer Polytechnic Institute	Our institutional research office currently consists of one person, the director, and that person is currently the IPEDS keyholder. According to the proposal, it is the IPEDS keyholder that must resolve all mismatches in the data submissions; this will place a substantial burden on this one-person office.
St. John's College	St. John's has never used the Social Security Number as a student identifier and, instead, have always elected to use a computer-generated number in order to protect our students' privacy. The proposed collection system would be in direct opposition to our long standing college policy on this issue.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
University of Maryland, Baltimore County	UMBC, like other University System of Maryland campuses, assigns a temporary SSN/identification number to international students, until they receive their official SSN. This will affect any matching that NCES tries to do for these students. It is possible, and likely, that other institutions would assign the same temporary number for some of these students. This will be an even greater problem as we move away from using SSN as the student identification code. In the new PeopleSoft system, we will be using a different unique code (unique to UMBC only), called EMPLID. Only students who apply for federal financial aid will be required to submit their SSN.
University of New Mexico	When I report aid to students I match a census file against the aid file to see what they were awarded—but this is always different than the total aid awarded, for all the reasons given above. We even have the issue of students being enrolled at more than one of our campuses, and receiving aid from only one campus—associating the aid with the campus enrollment is tricky, and sometimes more of an assumption on my part than actual data. Because we report enrollment as of "census" date (even our end-of-semester file captures only students enrolled as of each course's census date) there are always awards that don't have a corresponding record on our census files. Of course, we have transactional institutional records that show all enrollment, but that is very different data than we've reported to IPEDS in the past . . . It simply isn't easy to merge financial aid and enrollment data together, especially for campuses like ours where we have one financial aid office for all five campuses, but where we report our enrollments, and all other IPEDS data, as if we were five separate campuses.
University of Oklahoma	4-5 percent missing SSNs is still a million students, with a million little research projects that NCES and schools would have to do. While there are a lot of good things that could come out of the system, it involves passing a lot of SSN work to the schools . . . This burden should not be trivialized and that while some of it is due to transposition from data entry errors, there will be many other sources of error.
University of Wisconsin - Madison	The UR IPEDS will make use of SSN to track students between institutions. At UW-Madison we have moved away from the use of SSN as key identifiers because of a state mandate that the SSN not be used as an identifier in higher education. We do not require that students provide a SSN if they don't apply for financial aid, so we don't have SSNs for all students. Plus, people change their SSN, so those changes have to be accommodated.
University System of Maryland	Our institutions are currently moving away from SSN as an identifier. This process has accelerated as new data systems have come online and concerns about identity theft have increased. The proposed data collection system will create major problems with student tracking and will require dedicated staff time to resolve.
Washington University	The follow-up on un-matched records has the potential to be extremely time-consuming for institutions.
Staffing	
Alabama Department of Postsecondary Education	Institutions will be burdened with additional staff and staff training needs.
Association of American Universities Data Exchange	Many of the institutional burdens were outlined in your summary of the second TRP meeting. Until more details are known, it is difficult to estimate the true institutional burden. Preliminary discussions, however, suggest that for IPEDS reporting obligations currently completed by system offices would need to be transferred back the campus. Private institutions have also reported large burdens to "gear up" for such reporting. Estimates of institutional burden have ranged from 600 hours per year to of one or two additional FTEs to "10 times what went into SEVIS" reporting obligations. Some have also indicated that unit record reporting would move IPEDS responsibility out of IR and into IT and operational departments.
Bates College	In many smaller institutions, student IPEDS reporting tends to be done by the registrar or by the person assigned to institutional research. Many institutions do not have full-time institutional research staff, or the role may be relegated to a primarily clerical role of coordinating data collection as the IPEDS web coordinator. Often the person is a half-time faculty or staff member, with many other competing duties. At our institution, we have long had difficulty in hiring and retaining the types of people with the skill levels required to do the more sophisticated reporting envisioned by IPEDS. (We also have de facto hiring limits, so adding staff to address additional reporting burdens is not feasible.) Developing the systems to address an IPEDS unit record mandate will force us to shift a significant portion of the resources of our 2.5 FTE staff IR office away from other mission-critical efforts in our job description, which include: accreditation support; outcomes assessment and institutional effectiveness activities; planning and research assignments for college administrators and faculty committees; enrollment planning. We are very fortunate that we have more staff than most small institutions, but the extensive task list mentioned above is not uncommon for others who coordinate IPEDS reporting . . . Many of the staff in the offices that will need to be involved in unit record reporting do not have access to or adequate training in the reporting tools that must be used to integrate the data.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
College of Notre Dame	It would be necessary for us to expand the institutional research office, which is currently directed by a half-time person, in order to accommodate the additional reporting requirements that would occur multiple times during the year. I would find such a shift in resources unacceptable to the overall health and future stability of the college, especially since the benefits are questionable.
College of Southern Maryland	Once colleges have a functional description of the system, each institution will need to devote a large, and yet unspecified, amount of its resources in the form of programming, analytical support, and testing for development.
Colorado College	I am concerned about the financial costs—both computer capacity and staff capacity—to my institution to report data in this fashion.
Columbia College Chicago	The Office of Financial Services currently undergoes two major, federally mandated audits during the year that require extensive amounts of staff time and energy. This requirement would add to the Office of Financial Services reporting burden and repeat the information that is already reported to the federal government. In addition, work would need to be done to further integrate student accounts and financial aid data with the enrollment files.
Community College of Baltimore County	It is reasonable to assume that the initial start up costs will include additional personnel, possibly additional software, and changes to current processing of student record data. Structural changes of this nature require more time so that appropriate and adequate resources can be acquired.
Financial aid administrator: large, private, four-year university in the Southwest	I believe that it would not be difficult to provide this data, since it resides in the student information system. A programmer would be needed to write a program to extract the data and put it in the required format. It will take time to run the reports and send them to NCES, therefore it will require some additional staff hours to complete the task.
Financial aid administrator: small, private college in the Southwest	The response from our IT department is that this kind of report would be a low-impact project from the cost perspective. It would be simply staff time to develop a script to extract this information from our system.
Howard Community College	Whether for the pilot or for the official start of the project, the imposition of a substantial increase in employee workloads will stretch our current staffing levels to the breaking point. We can provide more information, if you need it, about the problematic nature of the integration of cost and financial aid data with our current student information system, the major potential mismatches with the use of Social Security numbers, and impossibility of applying the new race/ethnicity categories to current and former students. Ideally, a full-time staff member in admissions, another in information technology, and a third in institutional research would be needed to initiate this system. Budgeting for three new positions (a cost of at least $150,000 annually) to address this initiative is not feasible now or in the foreseeable future for our institution.
Indiana University	My estimates of burden were based upon extensive discussions with my programmers regarding the potential data elements required, types of files to be created, and the prospect of providing verification for SSNs mismatches and data anomalies. The per hour rate ($50) is the current price for technology related services, and is a good proxy for this type of work. Since we will be responsible for multiple campuses I believe there will be an "economy of scale" in effect but will still require additional time, hence the use of the multiplier. Of course, with so many unknowns, it's exceptionally difficult to feel comfortable with such estimates but I do believe that these are conservative views on the potential burden.
James Madison University	None of our current programs are likely to meet the IPEDS standards and new ones will have to be rewritten, tested, and monitored for annual updates. The data keys proposed by IPEDS UR are also very different than the current programs, requiring separate programs. I estimate that one FTE staff for at least one year will have to be diverted from other important work in order to create the new data programs. Again, this estimate is based on my experience with rewriting all of the State Council of Higher Education for Virginia (SCHEV) programs during the conversion to PeopleSoft systems. The time gained by eliminating web entry into the current IPEDS collection is likely to be more than offset by complexities involved with multiple uploads created by IPEDS edits. Presently, a graduate assistant can enter the web form data. A higher paid staff person will have to manage the more complex UR system uploads, edits and management of edit data returned.
Johns Hopkins University	The IPEDS unit record proposal will at least double the current reporting burden because it increases the number of file submissions, increases the difficulty of reconciliation, and expands the scope of data collection. The time that will be devoted to federal reporting by offices that are already stretched too thin will require the addition of full-time, technical staff . . . All available IT and functional resources are already committed to the implementation tasks. We would have to hire and train new staff, or hire consultants at higher cost, to handle the additional workload.
Lewis and Clark College, Whitman College, Mills College, Juniata College	The amount of human power and financial resources forced on the institution by the system currently described are enormous. Our institution does not currently have sufficient computing or human resources to address even the most conservative data demands outlined in the current proposal.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Marian College	Costs to the facility to generate these files include: weeks, possibly months of total time from the Director of Institutional Research and the System Administrator for college information systems. Both offices are very lean in personnel and will have great difficulty in achieving other needed work during that time. It has long been a goal to integrate some of the currently separate systems, which we might have already begun if we weren't always behind. We really cannot afford to hire another person to help with those duties, but that is what would be needed.
Maryland Community College Research Group	It is reasonable to assume that the initial start up costs will include additional personnel, possibly additional software and changes to current processes.
McDaniel College	Although institutional burden is an issue secondary to student privacy, it is nonetheless a very real issue to us and institutions like us. At McDaniel College we have a one-person institutional research office (as do 14 of the 18 MICUA member institutions), to complete the ever-increasing mandatory reporting, as well as surveys from publishers and the institution's internal data needs. Further, we have only one database administrator for the institution who would have to do any programming necessary to meet the requirements of such a collection. The burden to the institutions would be great.
St. John's College	It's a fact that office staffing is thinner in smaller colleges. Institutional researchers very often wear other hats and find their time limited by numerous obligations to the college. For these reasons, implementing a data collection system on this scale would be especially burdensome for small colleges.
St. Olaf College	Although our computer system contains most of the information the proposed plan would require, the amount of staff time needed to pull together all the information would be excessive. With tight budgets, we simply do not have the staff required to generate the type of detailed report this proposal would require.
State Council of Higher Education for Virginia	"Most edits have to do with making sure financial aid and enrollments are both merged properly." The Association for Institutional Research (AIR) community has had numerous training opportunities over the years to try and help practitioners develop these skills in using and merging datasets and there are "no secrets on integrating this." There is a wealth of material on this standard in IR and AIR has an IPEDS grant to conduct "train the trainer" sessions. This need will only get bigger if UR is implemented.
Towson University	The anticipated increased IT workload related to the proposal is by no means trivial as indicated by the resource estimates. Although the technical skills required to write the interface program(s) are not expected to be demanding, the real expense will be in the analytical skills required to: (1) analyze the mandatory specifications; (2) map and design appropriate translation business rules; and (3) test and reconcile invalid interpretations and assumptions. These costs will not only be incurred during the initial implementation phase, but will be realized for all succeeding years as the IPEDS specifications evolve over time. If modifications are necessary to our Peoplesoft student data structure, this will impose a greater burden. Additionally, if personnel and resources are redirected from organizational initiatives designed to reduce operating expense and/or improve services, those cost savings to the institution will be lost.
University of Maryland Eastern Shore	It would be difficult to implement a change of this magnitude without additional resources. These resources will be in the form of additional personnel both for short term and for ongoing tasks and for additional equipment.
University of Texas system	This reporting will be a significant burden to our staff and they are already stretched thin.
University System of Maryland	The transactional nature of the proposed system would require constant "cleaning" and reconciling of the data, which can only be accomplished by dedicated personnel. The lack of census dates and the proposed flexible reporting calendar changes data reporting from an episodic to a continuous activity. This, of course, adds to the cost since most of our institutions would have to hire additional staff.
State/system unit record systems	
Association of Advanced Rabbinical Schools	Where are the good educational outcomes of unit records? Where is the comparison of states with and without UR in order to see whether there was a difference relative to achievement? Where are the objective pieces of evidence that show how valuable it is on a national basis? There is no clear justification for the importance of undertaking this collection of UR . . . Where are the examples of wise policies and educational outcomes that they will gain with the national UR?"
Brazosport College	Will the state (re: unit record collecting by NCES) be able to do that for us? Our Coordinating Board collects unit records already and it would help if we wouldn't have to duplicate this process. If more data are needed, the state could simply add it to the list of items we submit—a whole lot easier than programming an entire system to satisfy a new requirement for data.
College of Southern Maryland	The requirement to report student unit records on a transactional basis will result in 6 to 10 submissions each year. This is unrealistic given the existing resources of most colleges. Institutions in Maryland must also provide Student Unit Records directly to the Maryland Higher Education Commission on a periodic basis, thus increasing, rather than reducing, the amount of data flowing between educational entities.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
DePaul University	At a very functional level, also as a researcher, it is obvious that many states including Virginia (where we worked . . . to institute the UR system in 1992 have student unit record systems. It would seem obvious to me that if in fact the benefits of unit records are real, then these states would have better institutions, better educated students, and better state-level educational systems with better levels of financial support. I can only wonder why data supporting this advantage over those states that do have unit record systems was not brought forth by my colleagues from New York, Virginia, and other similar states. Can State Higher Education Executive Officers (SHEEOs) from these states show better outcomes from analyses of their data? I am thinking about more than them being able to do more complex studies by themselves. But while on the topic of states the question does occur for those states that already have unit record systems, will the institutions be required to provide data for both record systems or will the states be required to use record systems that are consistent with the federal government.
Financial aid administrator: community college in the Midwest	Our state requires the two-year community colleges to college this data already. I'm uncertain if they require the same of the four year regents and the independents. For our Community Colleges there would be no additional costs, nor additional staff needed.
Financial aid administrator: community college in the West	In our state, we already report much of this data to our Chancellor's Office. Our state MIS submission is an important IT function that already involves a lot of staff and system time. Duplicating this effort to report essentially the same information in a different format to a different agency is costly and inefficient. We would request that this information be collected from state agencies in states that have already these data elements reported to them. It might also be easier for IPEDS. For example, in our state they would be working with just our Chancellor's Office rather than our individual colleges.
Financial aid administrator: large, public university in the Mid-Atlantic region	First, in our state, we already do unit record reporting . . .while the edits are onerous, it does provide a good, consistent (to the extent possible) database for description, evaluation and inference testing. Once you get in the hang of it, other than the edits (and at least in our state, they're bad b/c the database is not quite robust enough to accommodate permutations of student enrollment/student financial aid as well as the edits could be more sophisticated) . . .it's ok.
James Madison University	Because requirements of the state and proposed federal systems are not aligned in this proposal, at least two programs will have to be updated instead of one with every change in external requirements or internal system changes, thus doubling the maintenance requirements that currently exist for the SCHEV data files . . . The proposed system will also make completion of official data in state systems a greater burden. Because there is no synchronization between state and federal requirements in this proposal and current plans call for edits which state systems cannot predict, institutions are likely to increase the amount of time spent revisiting state record submissions after federal edits drive data changes. The opposite can occur if institutions submit to federal systems first. The prospects of a "federal-state edit loop," where edits in one system create edits in the other, needs to be closely examined for this proposal.
Maryland Community College Research Group, Wor-Wic Community College, Maryland Association of Community Colleges	Currently, the Maryland community colleges provide data to the Maryland Higher Education Commission and the Commission uploads Completions, Student Financial Aid, Staff, Employee by Assigned Position, Enrollment, and GRS data into IPEDS for the community colleges. With the proposed unit record changes, individual institutions will report this data separately to the state and to NCES. Along with transactional file updates . . . institutional burden will greatly increase.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Maryland Higher Education Commission	The use of IPEDS UR would probably disrupt the valuable cooperative data process between institutions, states and IPEDS. Still more issues will result in increased burden to the institutions and even to the States... The burden to the institutions will be enormous. The burden to the states will also be very significant and may cause many states to reduce their role in coordination of IPEDS. It is highly unlikely that most States will be able to mange the proposed multiple submission requirements of IPEDS, modify their systems to accommodate these submissions and support the resolution of errors. Many states (Maryland included) would be unable to support the new IPEDS UR requirements with their current systems. Most of these systems are designed upon well-founded principles to collect statistical data about enrollment, degrees and financial aid. These systems are already integrated with IPEDS components and provide a tremendous benefit of establishing consistency across state and federal level. This will lead to a problem for the states to continue their systems in addition to the new IPEDS UR. It was felt that the loss of these systems would have a detrimental impact on the states in meeting their specialized needs and reporting such as state accountability or high school graduate performance feedback. Some of these needs were established by the legislatures or statutory bodies. This would lead to increased burden to institutions to report to both federal and state same data different ways. Most States (including Maryland) would also be unable to handle increased burden to process both their systems and the new federal IPEDS UR. The federal UR system is an ongoing data collection occurring throughout the year not just annually. States would be required to piggy back on the multi-submission schedule with their own data elements in order to reduce the double reporting burden on institution for separate federal and state UR systems. States will need increased resources to modify their systems and process the multiple submissions. It appeared that NCES had not factored in the enormous effort and costs to states and institutions to implement an IPEDS UR. They were more focused on their technical abilities to implement the system at their end. Since they have policies that do not allow outside access to the UR data, the states would not achieve the major benefits from such a system. NCES would need to make sure they provide adequate resources for special analysis of this repository of data needed by the states. There will be only three real choices states could adopt to live with an IPEDS UR system: (1) dual state and IPEDS UR—states continue to run their own systems. Institutions will additional burden to report both UR systems; (2) combined state/IPEDS UR—states would be required to retool their systems to adopt to the multi-submission requirements of IPEDS and integrate their data needs into the IPEDS format; and (3) disrupt state systems—states may be pressured into shutting down their own time proven systems and lose valuable analysis tools.
McDaniel College	We recently had a similar debate at the state level with the Maryland Higher Education Commission (MHEC). We came to a compromise based on three points: 1) MHEC agreed not to collect unit record data on students who are not receiving state aid; 2) they don't use Social Security Numbers as a unique identifier on students who are not receiving state aid; and 3) MHEC developed a secure way to transfer the data.
Minnesota Private Colleges Commission	Though fully committed and coming with mandates, the schools "didn't recognize the benefits until they got over the trauma of how to fit it within their regular work and manage it with their IR people."
Montgomery College	Integration with existing state systems (such as in Maryland) needs considerable review and assessment to reduce conflicts, overlap, and incompatibility. Also, more time will be needed to determine and implement necessary adjustments.
National Center for Higher Education Management Systems	The states have an enormous amount of wisdom in this" and there is a "lot more commonality in these systems than believed" . . . The calculation of graduation rates for states is recognized to be flawed, and UR will allow for much better calculations to be made. "The absence of data leads to poor policy decisions."
Oklahoma State Regents for Higher Education	Many states, including Oklahoma and Georgia, provide extensive support for IPEDS submission to institutions, thus the unit record data is not a problem. Unit record data could, in the long run, reduce the reporting burden to the institutions. By the way, Oklahoma assists the private institutions with IPEDS submissions. States that have state-wide unit record systems have had no difficulty in addressing the issues that were outlined in the boilerplate letters.
St. John's College	Regarding institutional burden in order to comply with the proposed collection system, the Maryland Higher Education Commission implemented a unit record data system under which the Maryland independent colleges submitted data for the first time this fall. MHEC is only tracking Maryland students who receive state aid. Submission of this small amount of data required several hours of work on my part and our Information Technology office. It required several edits and communication back and forth between the college and MHEC.
State Council of Higher Education for Virginia	Unit records allow us to tell stories and explain the complexity of the system that we couldn't otherwise.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
State Higher Education Executive Officers	NCES will submit a report to Congress in early 2005, which is expected to recommend steps toward the development of a national student unit record collection system. SHEEO supports the design and implementation of such a system.
State University of New York System	"If you can do it in New York, you can do it anywhere."
University of Colorado at Boulder	Obviously would be far better for a state and its institutions if state UR matched federal UR. Some clearly do not. Seems as if these differences might be fruitfully studied.
University of Texas system	If it all plays out, it is important to ensure that "data at the state and national level are consistent so they tell the story consistently the same way, or we may end up with more dissatisfaction."
University of Wisconsin - Madison	Wisconsin is listed by Highered.org as one of the states that already has a unit record data collection. Thus, many assume "we are already doing this" and so the transition will be of little consequence. That's not a complete picture. The UW System Administration collects the Central Data Request (CDR) for analytical—but not transactional—purposes. This CDR is used as the basis for UWSA to provide student record IPEDS reports for all UW's. If the UR IPEDS format includes enrollment files, completions, and financial aid information similar to the CDR, then the administrative burden may be similar to the burden imposed by the current unit record reporting requirements to UWSA. In the first few years, a considerable effort would be required to develop and program the system. The effort would include people from the registrar's office, student financial services, admissions, academic planning and analysis (IR), information technology, and perhaps some other offices. In the first year, it would draw staff away from institutional priorities directed to serving students. In the long run, the ongoing effort may be somewhat equivalent to the CDR; we devote considerable resources to checking, editing and verifying the CDR data, and in maintaining the system. However, the current proposal suggests that the UR IPEDS submissions will require more information than in our CDR model. UW System has indicated they will be unable to support our IPEDS submissions if the tuition information is included and if the UR IPEDS has transactional features.
Wyoming Community College Commission	In general, this proposal will help the Wyoming Community College Commission (WCCC) by making new kinds of data available to the state-level agencies. We support the general idea, however, we do acknowledge the concerns of the Wyoming community colleges and support their points of view.
Subsequent enrollment redisclosure	
Association of American Universities Data Exchange	Support for the proposal could be increased if institutions saw a value-added component to the reporting obligation. That is, if institutions could receive back from NCES information on where their students transferred to or enrolled in subsequent colleges upon graduation (e.g., where they went to graduate school), there would be greater institutional support for this proposal . . . If the proposal is implemented, there is a very strong desire for institutions to receive information back from NCES on their former students. For those students who transferred out or graduated from our institution, what institution did they go to, did they receive a degree from that institution and what type of degree (BA, MS, JD, Ph.D., etc), what degree program (major) were they in, etc. Campus would need unit-record data, not aggregate reports produced by NCES.
Caspar College	As I understand the proposal, one of the main goals is to be able to track students across institutions and state boundaries. We already know that many students do not graduate from their initial college or university—they start and stop, they drop to part-time, they enroll concurrently at multiple institutions, etc. I suppose that the tracking information will be interesting, but I don't see the real value to decision-makers in documenting known practices. Also, unless changes to FERPA are included with the proposed legislation, IPEDS cannot return information about individual students to the colleges for our internal use.
Central Wyoming College	It would be extremely useful to see what other higher educational institutions students have transferred to, what their program of study is or was, whether they have graduated and with what degree. This provides any institution with an excellent evaluation tool for program review purposes.
College of Notre Dame	College of Notre Dame already posts very strong graduation rates and this proposed initiative would only enhance the rates experienced by students who begin their college career with us. I am not concerned about what the "new" data would show.
Colorado College	To be fair, I am attracted to the proposed change for the ability it affords for institutions to track former students (both alums and drop-outs) after they leave us.
DePaul University	If participating in this activity of providing student unit records does not help us do our other task then it will most likely suffer as do other things which are mandated but seen as worthless to the University. It is within recent memory that NCES and IPEDS started providing useful data back to the institutions and it is obvious that this support coincided with a major improvement in the quality of the data provided by the institutions.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Eastern Wyoming College	The advantages would relate to the increased quality of data related to transfer, graduation rates, persistence rates, and college costs. Ed Boenisch is quoted in the 12/7/04 Community College Times as supporting the proposal, since it would track every college and university student's progress. Currently it is particularly difficult to track students who move from one institution to another . . . The catch is that under the current law NCES cannot return record level data back to the individual colleges. That means we have the extra burden but receive little in return. However, if redisclosure of the information is specifically included in the Higher Education Act Reauthorization, then unit record data may be redisclosed to the colleges. It appears that the Dept of Education is in favor of giving unit record data back to the colleges and is willing to support the necessary wording in the reauthorization act. . . . I think we can safely assume that the submittal of the data to NCES in this proposal will be significantly more time consuming than the current IPEDS reporting system. However, if we can get detailed unit record level on each of our students such as transfer and degree completions at other institutions, then we would have useful information that is not currently available to us. I can get some of this information from the National Student Clearinghouse, but it is not complete and does not include all of our students. However, we will still have the benefit of receiving our graduation rates calculated by NCES. They will have access to all transfer and completions at other institutions, so in theory we could show a higher graduation rate.
Financial aid administrator: proprietary school in the Midwest	Our school is very much in favor of creating an industry standard collection instrument that institutions can complete as well as draw data from.
Financial aid administrator: small, private college in the Midwest	We do not have the internal support to provide that kind of data . . . I struggle with doing the National Student Clearinghouse submission and that is supported by Datatel. For us to provide all of the information requested would require massive programming and we don't have the internal support to do that.
Goucher College	It is important to have this redisclosure of the data and that it is "very important to know."
Howard Community College	Although a considerable burden will be placed on institutions to provide detailed data to NCES, colleges will not receive useable data about their students in return. The one-way flow of data may answer some questions about costs and transfer patterns at the national level, but it is at the institutional level that the data could be most useful. Without the flow of data back to the schools, there will be a sense of a tremendous amount of expended effort for no payoff.
James Madison University	While some transfer and post graduate enrollment data might become a reality, the detail of returned information is insufficient to explain "why" a student transferred or "what" a graduate could tell us about the value of their JMU degree. Without knowing "why," the data provide little for the institution to effect change. Institutions need detail sufficient to survey their transfers and graduates. I am also skeptical that privacy laws will be amended to the degree that any detailed information is returned at all.
Marian College	IPEDS asks for things, such as transfers out of our college, that we don't have and can't get without paying a fee to the National Student Clearinghouse. While we have made submissions to the Clearinghouse, our normal data storage does not easily produce the needed file format, so we don't do this on a regular basis. Typically, we haven't reported those things to IPEDS (such as transfers out) that we don't have a normalized method of capture. Even when we do have time and ability to submit to NSC, which is not every year, we don't maintain it with our student data systems and would have to merge it into a new file.
Montgomery College	If the institutions are permitted no access to the additional data obtained about "their" current or former students, there is no benefit for the colleges in this process, and no opportunity to reconcile potential inconsistencies.
Springfield College	She and other institutional researchers really need to know why students are dropping out, that they "have to know that."
State Council of Higher Education for Virginia	There is a "lot of legislative support for looking at what happens after they graduate." The legislative money committees and education committees want to know what happens to students, inside and outside of the state.
Temple University	NCES should reconsider its stance about sharing UR data with the schools on what happens with their students. One of the benefits of using the National Student Clearinghouse is being able to evaluate how effective schools are and evaluating student experiences. "Please reconsider doing it." . . . This would be "very good for institutions to have an effective program. If you are going to have UR, it is a marvelous opportunity to improve higher education. It impedes that opportunity if it is only one-way flow" of data.
University of Colorado at Boulder	I agree with many discussants that getting the data back, in UR form, would be incredibly valuable for institutions and for states. No one is going to want to go through all this simply to allow one and only one agency to have UR data for analysis. No amount of creative aggregate reporting could replace the UR data.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
University of Miami	The more information you can give back to institutions (including institutions to which their students transfer and institutions where they eventually enroll in graduate or other higher-level schools), the better. It's also imperative that you provide us with information about any changes you make to our cohorts based on information you get from the national database (including the student's SSN)—otherwise we'll never be able to figure out why our version of IPEDS reports differ from yours.
University of Wisconsin-Madison	How will individual institutions get access to tracking information for about their own students? What kind of access to unit record or aggregate analysis will be provided? To realize the value and power of this data set, some return of information to institutions is essential.
Wor-Wic Community College	Secondly, our college has recently enrolled in the Enrollment Search and Degree Verify services of the National Student Clearinghouse in order to receive data about where our students transfer and if they earn degrees at other institutions. With the new unit record requirement for IPEDS, we would be supplying enrollment data files to the state, NCES and the Clearinghouse. Since NCES will not be providing transfer data back to the institutions, participation in the Clearinghouse would have to continue in order for us to receive this data. If NCES could provide data similar to what the Clearinghouse provides, we could eliminate sending additional data files to the Clearinghouse.
Technical challenges	
Alabama Department of Postsecondary Education	Institutions will be saddled with having to change administrative software systems. Vendors of administrative software systems will have to rewrite code and revise systems. The costs of these changes will be passed on the buyers, i.e., colleges and universities.
Alverno College	Our administrative software is DATATEL. It would be the company's responsibility to program such that any new recording/file transfer could be accomplished. Most likely some of those charges would be past on to the colleges. It will also take local programmers and users time to document, test, retest etc. any new programs.
American Association of Collegiate Registrars and Admissions Officers	Many additional variables will be needed, such as citizenship, which can require multiple coding of jurisdiction and status such as refugee or provisional enrollee. "By the time it is done, it will be a longer list." . . . with the advent of web functionality, there has been a functional merger between financial aid, admissions, and registrar systems that makes the integration of these data much more possible than previously thought. While they may not be fully integrated, they are enough of a "one stop shop" that they let students register online, with all of the financial consequences which this entails.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Bates College	The technical obstacles to the proposed unit record reporting system are significant, and would require devoting excessive staff time and other institutional resources to the problem. Many smaller institutions would find the technical challenges to be particularly difficult to meet. We think that our institution is in a far better position from the technical standpoint than most small colleges, but having collectively over two decades of experience with how small colleges work, and how rapidly changes can occur, we have very serious doubts that we could both successfully and accurately implement such a change in the timeframe envisioned by IPEDS. Of course, the mandated fines would compel institutions to address the issue, albeit to the detriment of other programs and research of more immediate concern to the students of our institutions . . . One argument has been that most of the development costs would only be a one-time burden. This is not necessarily the case. Error-checking and data edits will be a recurring problem, even after the programming to prepare a draft report is done. The problem is amplified because resolving problems to ensure consistent reporting may now involve multiple offices. Many institutional research offices only have "read" access to data, and getting errors and edits resolved usually involves contacting one or more other offices who "own" the data and who have access rights and the authority to change it. Dealing with even one or two "exceptions" is a very time-consuming process, and it usually requires low-tech approaches—phone tag, e-mail, paper files, etc. With inflexible IPEDS deadlines, it is most difficult to get rapid turn-around to resolve these problems—often we cannot get through to the only person who can resolve the problem (sick/vacation, other deadlines, gaining approvals, etc.) in a timely fashion. We are inevitably stymied when dealing with certain individuals who won't answer e-mail, voice mail, meet deadlines, etc. At these times, our technical skills must take a back seat to our skills at negotiation, diplomacy, and creative nagging. Occasionally, we must enlist a little "coercive support" from senior administrators, but in general, we have neither the authority nor the capacity to be "data police" across the units of the College. In a small institution, there may be little opportunity for cross-training or staffing redundancy, so if the authorized person cannot respond, we are at a loss. Because of these factors, we frequently end up in a situation where we can only obtain data from others at the very last minute, and this does not give us sufficient time to vet the report with others and to take other measures to ensure the accuracy of what we have to submit. We are committed to providing most accurate data possible, but if faced with an impending fine, we are forced to submit the best we can get by the deadline. We suspect that this will lead to an ongoing cycle where we'll receive the IPEDS "published" data, review it, and recognize that we'll have to revise it . . . We will still need to "pre-process" any unit record submissions to verify accuracy and consistency with institutional trends at the summary level prior to locking it. We will need to store an accurate copy of the institutional data in our archives, since others will only have access to IPEDS' "perturbed" version that appears in the Peer Analysis System. We already have to spend more time than we can afford explaining and defending discrepancies between the accurate and the "perturbed" data, and we suspect that these problems will only increase. For example, it took us over a week to evaluate, recalculate, and explain some of the blatantly "off-target" derived calculations in the recently distributed NPEC IPEDS "Data Feedback report." (IPEDS "one-size-fits-all" approach led to some very inaccurate representations of many small liberal arts institutions.) This experience gives us much less confidence in IPEDS' ability to accurately process the unit record data it hopes to collect. Of course, as certain definitions or derived calculations change to enforce consistency and matching across components, many of our trend analyses will "break" and have to be either re-done or heavily annotated. Our own experience with several past changes in definitions is that we are required by our superiors to maintain data elements in both the old way (for internal analyses) and in the new way. And that leads to more confusion and less confidence in all of the data.
Cardinal Stritch University	How will an institution be able to counter what they believe to be mis-reporting by the government? For instance, if we submit enrollment fields, i.e., credits and hours attending, the government will calculate full and part-time rates. At our institution, we calculate graduate level full- and part-time status based upon whether the student is a part of a cohort. In other words, a student who is enrolled for less than seven graduate credit hours is still considered a full-time student if they are part of a cohort program. The government would not likely note such exceptions. How is the prospective parent or student truly going to be able to accurately interpret the government's reported aggregate values? The government would only be able to calculate indices with all schools the same. Currently schools submit not only tuition and fees data, but also book costs, as well as room and board costs. By only submitting tuition and fees and total price of attendance, it could be misperceived by the potential parent or student that an institution is inaccurately priced as exorbitantly high.
College of Southern Maryland	There seems to be no method identified to transmit these files. It may seem a small point, but wanting to upload the files electronically and bypassing an FTP system seems ill-conceived. Whether or not institutions have the electronic capacity to handle these large files is an issue. Large file transfers consume large amounts of resources.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Community College of Baltimore County	The Community College of Baltimore County is an institution that understands the importance of research and that the availability of data can aid in improving current practices. CCBC takes great pride in providing accurate and quality data. The submission of unit record data will require reporting at its highest level of integrity in order to provide information that can play such a vital role in the lives of our students. Suitable time and resources will be necessary to ensure quality reporting.
Eastern Wyoming College	I do not have information on how our Datatel Colleague system could/would handle the data retrieval requirements.
Financial aid administrator: large, public university in the Southwest	Our institution runs SIS-PLUS on a mainframe. Running this kind of data on our students would require significant programming time. It would not require (I don't think) an additional staff person. Of course our hope (as many others I suspect) would be that if this is a required and standardized report the mainframe providers (SCT, People Soft, etc) would permanently write the program to run as part of a standard maintenance cycle.
Financial aid administrator: large, four-year, public university in the Northeast	Two years ago, motivated by the prospect of a significant tuition increase and some nominal support from our IR area, I launched a serious effort to collect limited unit record data on financial aid recipients. Each of the issues you mentioned came up in one form or another during the discussions with data providers. We struggled, and never really resolved, issues of summer school aid (we have both "leader" and "trailer" campuses) and whether to report offered aid, accepted aid or disbursed aid.
Financial aid administrator: large, public, four-year university in the Midwest	Tagging onto the size issue, we've also seen a series of problems sending and receiving large files in our work on COD. The solution has often been to break our large files into a series of smaller ones, again causing more work and introducing the opportunity for error. Sending duplicate files is just one issue we've already seen. This is likely exacerbated by what I expect will be even larger file sizes for unit records than for COD records.
Financial aid administrator: medical school in the Southeast	Medical schools already submit the following data in the Student Record System to the American Association of Medical Colleges (AAMC).
Financial aid administrator: mid-size, private college in the Southeast	Our data base system (Banner) contains all the proposed data elements, so I don't see that as an issue. My opposition is more philosophical than procedural.
Financial aid administrator: optometry school in the West	We are a small college with limited electronic support. We would probably have to do this manually if required.
Financial aid administrator: proprietary school in the Midwest	My concern is that some of the elements we do not collect and how would that be interpreted by the NCES and others.
Financial aid administrator: Small, private college in the Midwest	Given that caveat, of the data items you have listed, our system does currently contain all except possibly the six-digit CIP code for a program of study. It may be that the registrar does have such numbers for IPEDS etc and I am just not aware of it. If such a number sequence is not in place, it would obviously take some time to set up but would probably be not be overly time consuming or expensive.
Financial aid administrator: small, private, liberal arts college in the Northeast	The registration information they are looking for is easy enough to pull from the as/400. From everything I've read about this, the issues/concerns regarding the proposal are not based upon how hard it is to pull the data or the workload required, but rather the ethics of how the list will ultimately be used and/or shared. It is interesting that none of the questions asked were regarding that area, just how easy it would be to do.
Houston Community College System	I believe that the recent acquisition of PeopleSoft by Oracle could also have an affect on this proposed project. Oracle has verbally committed to continuing to support the PeopleSoft product for the next 10 years, but this is a gratuitous promise and cannot be regarded as a certainty. Conversion to another system for college administration would further increase expenses in times when resources are scarce.
Johns Hopkins University	Johns Hopkins does not have a university registrar. Some academic divisions, e.g. School of Medicine, maintain their own student record systems. The university is in the midst of implementing a new student information system. The Matrix system from SUNGARD SCT was selected in part because it provided the flexibility to manage student information eight different ways, according to the needs of each of the divisions. The university will need to retrieve data from satellite systems, the legacy system, and the new student information system.
Lexington College	We have a computer-based system of student unit records, but would have to create a different type of unit record system for NCES submissions. This is a big issue for us. We are a small, private institution, and changing our technology is not in the current budget. Would we receive funding to undertake this task?
Marian College	At a minimum, this would require a comprehensive systems analysis to determine data sources and timing, and careful file creation would require several weeks. Given the currently fragmented systems that would have to be accessed, it is doubtful that these processes could be even mostly automated in the foreseeable future.
Maryland Higher Education Commission	Lastly the use of a very new technology for data transfer (XML) was being pushed without regards to clear benefits to either side. In the meeting IPEDS did suggest they would support current ASCII text file transport as a option. This would eliminate state and institution costs to implement this technology.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Mount Mary College	Over the past ten years we have diversified our programs in an effort to maintain a reasonable enrollment level; tracking these students in the way proposed would conflict with the ways we track them for our own purposes. We would not be in a position to provide these data electronically without maintaining a separate data set for our own tracking. Our experience is that the way we need to count our students, because it is atypical, never matches what we are asked to send to IPEDS. We meet the current expectations by extracting data and manually reconfiguring it into the way in which IPEDS asks for it . . . In addition, we already have an outdated system that does not provide a shared data base and we do not have the funds to upgrade our system. We certainly don't have the funds to comply with the proposed requirements either instead of or in addition to what we need to do for our own purposes. At present we are challenged to maintain the data that we need to operate our institution and provide the data required by IPEDS. There is no way we could meet these new expectations without major changes in our work and a significantly higher level of staffing.
National Student Clearinghouse	It will be a challenge for schools to scrape it up and put it together, since most of the data come from multiple systems and it will be difficult to integrate the data in the same time period depending upon when the reports are cut. The Clearinghouse collects way less than this.
Occidental College	While it is certainly true that finding out what happens to "transfer-outs" and tracking students who attend multiple institutions are important goals, requiring every single college in the country to report on every single student is a grossly disproportionate response. Virtually every social science research or policy question is answered not by bludgeoning the country with a nation-wide data collection scheme, but instead by sampling. For several million dollars, a longitudinal sample of several tens of thousands of subject could be created to answer these same questions. That would be far less costly and intrusive than the proposed national unit record scheme.
Purdue University	There was some discussion about the current difficulty for larger institutions of reporting financial aid data in the XML format. Will there be supporting software, training and/or assistance for convert to the XML format?
Rensselaer Polytechnic Institute	Pulling the data in the format requested will take a complete re-examination of the computer system that Rensselaer uses for student records management. Pulling the data in the specified format may require significant modifications to fields, metadata, and reports.
St. John's College	Smaller institutions struggle with the implementation of new data transmission systems. On our campus, for example, there are several computer systems in use. Coordinating these systems for a reporting requirement of this magnitude would involve not only a great deal of staff time but great expense. The IT staffing just isn't adequate considering the demands on their staff from all college offices . . . At St. John's College, they have five computer systems and don't have UR for a number of reasons—technology, managerial, privacy, and registrar protections. Lots of people would like a wall of data from admissions to registration and on through to alumni and advancement. St. John's is playing out in miniature what is happening on a national scale.
St. Lawrence University	We are worried about declining data accuracy if we moved to the proposed UR reporting. For each IPEDS reporting cycle, the institution employs a thorough data cleansing process. Data entry or extraction errors might be discovered by running special queries and looking at aggregated data. Since UR reporting will rely on the submission of transactional data and follow a coding scheme that does not fit our institutional system, these quality checks will no longer be able to be employed . . . While we have a well-functioning, and well integrated homegrown information system, it would need to undergo substantial expansions and modification to accommodate the proposed UR reporting. Most significantly, we would need to develop a comprehensive audit system to flag record changes, requiring the acquisition of a separate server. Another start-up obligation would be the creation of hundreds of crosswalks from our internal coding scheme to the numeric format used in IPEDS UR reporting. None of these activities would directly benefit the institution!
Towson University	The data we report both internally and to external constituencies may not match the data ultimately reported by NCES because of different reporting methodologies. In order to ensure that NCES and the institutions are reporting comparable data; it will be imperative that standardized methods of analysis be developed and shared.
University of California at Berkeley	It will be difficult to include extension, summer, and assistantships at national labs that are not part of existing admin systems
University of Colorado at Boulder	Upload options need to include flat/ASCII files as well as more exotic formats.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
University of Maryland	The feasibility of implementation depends on the cost, timeframe, and planning. While we go to great lengths and costs to assure quality of the census data that are currently collected and reported, to expand that process would require major changes in the campus infrastructure. Our transaction systems are designed to maintain daily operations for the institution. These systems do not keep longitudinal data or up-to-date information outside of the needs of the service offices. Our census system maintains historical, accurate, reliable information that is auditable and verifiable. While we still have data quality issues, we do our best to maintain documentation to explain changes in trends that are due to definitional issues. To blend these two systems together and maintain accurate and reliable data on a regular basis would require an integrated infrastructure that would take away a great deal of resources from the primary mission of our institution: to teach students. Data used outside of our census reports would not be deemed reliable by our staff and should not be used to characterize our institution. Given that the intention of the proposed data collection is to improve the quality of the data provided to NCES, this is a critical obstacle in the way of the success of this project.
University of Maryland, Baltimore County	For UMBC, this proposal comes at a particularly difficult time, as we are beginning a three-year effort to implement a new student information system (PeopleSoft). For us, this would mean developing the new reporting requirements twice: once for our legacy system and again when the PeopleSoft system is implemented. While we will not know the true impact (cost and effort) until the final technical specs are developed, we know they will be significant . . . As we interpret the data elements being required in this new UR system, there seem to be items that we now do not report (total price paid per student; total price charged per student; family flag; dependent status). This will require new programming logic and testing.
University of Maryland Eastern Shore	We shall need the services of a PeopleSoft consultant to determine our needs and help us write appropriate programs.
University of Oklahoma	While any systems change will create some real burdens, often ERP package systems may take years to catch up, especially if the process in not built into the software package. Changes to these vendors' administrative information systems can be massive projects... XML is a much wordier way to store data and some submissions of XML data in California have had to break the file into pieces.
University of Wisconsin - Madison	Large institutions like UW-Madison often rely on commercial enterprise data systems. It may take years for vendors to provide patches and changes that support UR IPEDS, particularly since the software packages were not designed with UR IPEDS reporting in mind. And the application of those patches and upgrades can become major projects consuming precious technical and budgetary resources. Support from vendors is unlikely to be available during the pilot phase. Oracle's recent acquisition of PeopleSoft may complicate and delay any vendor-based support for UR IPEDS reporting.
University System of Maryland	Given the amount of data to be collected, the level of poor quality data which enter the system will be enormous. This will, for years to come, effectively frustrate any attempt to draw meaningful conclusions from the data which are not as likely artifacts of the data quality. Problems with tracking, changes in names, confusion about cost, nature of courses and credit hours, degree plan designations, and the "backfilling" of data cannot be resolved, in advance, to a degree which will address this problem. It will be several years of collection before this system could possibly hope to produce an information "signal" discernable through the data error "noise." . . . In-house programming, and in some cases considerable work with consultants, will be required to enable current student information systems to produce the data for these reports. Beyond the direct costs created by these changes, opportunity costs will be incurred as implementation schedules are altered and pushed back to make this federal reporting a priority. Some institutions could lose as much as a year in their efforts to bring new PeopleSoft modules online.
Viterbo University	One of our biggest objections is the cost of converting to another system—personnel, time, and money. (I wonder if some company has been lobbying the government for this so they can "force" each institution to purchase their administrative system.)
Terms	
Career Colleges Association	Whatever is implemented needs to be fair and equitable in recording the instructional activity of all types of institutions and term structures, including summer.
Goucher College	[I am] jolted by the prospect of keeping up with all these status changes over multiple files over a term.
Johns Hopkins University	It will be a considerable challenge both within and across universities to coordinate academic calendars and determine the timing of federal submissions. The academic divisions at Hopkins operate on both semesters and quarters. Part-time programs offer courses that overlap terms.
National Center for Higher Education Management Systems	The issue of term structures and the nature of enrollment suggest the need for "radical ways of thinking about enrollment," where higher education may look more like episodes in healthcare.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
Pima Community College	How often should the file be created and transmitted? It must be at least twice a term—we have multiple terms. Our terms include fall, spring, summer (can be looked at in two fashions, since Summer Session C crosses over the fiscal year—July 1 is the start of the new fiscal year), a term for CTD, terms for Gila County enrollment which is reported on IPEDS by Pima Community College, and a term for students who are in a full-academic year term. 5. How should credit hours be reported—as attempted or as earned? If we send a UR file for our census date (45th day for Community Colleges in Arizona), then most credits would be attempted. The end of semester file could reflect both attempted and completed. If this reporting is going to be used for financial aid tracking, enough data must be submitted to show satisfactory academic progress. It is the frequency of creating the UR that is a major concern. We need to definitely send in a fall enrollment UR to establish a cohort for later reporting. For data to be comparable to past reports, we would need to sent in a census day file and at least an end of the year file to capture completions and enrollment that is not picked up on the first census day.
St. Lawrence University	Data integration would be most problematic where net tuition would be linked to enrollment activity, for the following reasons: 1) Our academic calendar year operates from fall to summer (end of August through beginning of August the following year), while our fiscal year cycle is July1 through June30. In aggregate reporting, it is easy to accommodate these adjustments; however, for unit record reporting, the two cycles would pose a significant problem; and 2) loan charges arrive throughout the year and are not specifically tied to a given semester, making it difficult to report charges beyond an entire academic year.
Thomas Jefferson University	Issues were raised about the official semester/term of record for medical students at freestanding medical schools such as Thomas Jefferson. Differentiated stop and start dates will be needed by student level and some kind of coding structure will need to be in place for these records and documented in the Institutional Characteristics (IC) file.
University of New Mexico	Reporting for multiple terms each year is also a major additional reporting burden. We'd still have to send reports to our state (since NCES can't release any data back out) and our state needs and state definitions are likely to be different than what would work for this proposed IPEDS collection. Thus we'd be doing two different files, would have to reconcile between them, etc. And the IPEDS burden would be year long, and not just a once-a-year report.
Washington University	I think the notion of unit record reporting does have merit in terms of the enhancement it could bring to concurrent enrollment, transfer activity, graduation rate, and time-to-degree issues on a national scale. These all address the Congressional issue of accountability by having a comprehensive set of data from which to report. The submission of census files several times during the academic year would not in my opinion present an excessive burden on schools, particularly when considering the trade-off in not having to do IPEDS Enrollment, Completions, and Graduation Rates anymore.
Timing	
Association of American Universities Data Exchange	Another concern was the reconciliation of unit record data against summary figures provided by NCES (how long will it take to do this within the current locking process).
Brewton-Parker College	After going over the collection processes necessary for the unit record collection system, the administrators from Brewton-Parker College propose that a the deadline for the fall enrollment, enrollment transaction update files, and student finance files not be prior to December 1. The team members all felt that the information related to the required variables could be gathered and input into the database by that time, making a reporting period deadline of early December a goal that could be achievable.
DePaul University	Further the timing will cause some of the variables to differ. For example citizenship for an international student may be one characteristic in the fall for Entering Fall enrollment and another characteristic by the time they complete their program for the Completions report. Of course the same is true for degree plan, program length, and many other variables. If this goes forward serious consideration should be given to putting information about the degree program into the term component of the record which I assume is reoccurring.
Financial aid administrator: large, four-year, private, not-for-profit, university in the Mid-Atlantic region	The admissions and financial aid cycles are anything but coterminous and in fact tend to be about a year apart with financial aid behind. This means, for example, when we generate data for the Common Data Set, we have to decide whether to submit data that is accurate from the most recently closed Award year, but a year behind the equally accurate admissions data, or develop an estimate of the current award year's likely result, that will not be completely accurate but will be consistent with the admissions submission. Since it seems ineffective, and perhaps unfair, to give prospective students inconsistent data and expect them to make the mental adjustment, we wind up doing the estimate. We have become relatively good at it and I am confident that we can make adequate estimates of current year aggregate data. However, I can think of no way to generate "estimated" unit record data. This means that the only way to have consistent and accurate data would be to lag the admissions data by a year, something I suspect the Congress will see as not responding in timely fashion.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
George Mason University, Randolph Macon Woman's College, St. Olaf College	Developing transactional databases with records from over 6,700 institutions would create a verification quagmire, threatening huge delays in presenting meaningful, useful information such as NCES has begun to achieve in recent years.
James Madison University	The IPEDS UR system will degrade the credibility of institutional research across the country if it delays institutional ability to respond to data requests. IR is already expected to respond to a host of questions from both external and internal sources before data is official. This problem is most acute for fall enrollment reports, including data about first-time entering freshmen. Edits that might require an institution to change its FTF cohort have to be available so early that an institution can complete its fall enrollment no later than October 15th of each year. Also, IR shops cannot afford degradation to their credibility associated with changing official numbers or having more than one official number on the same subject . . . Again, timing is an issue with respect to existing state UR systems. To which system should an institution first submit its data? Will state systems still be open for edits after federal mandates force changes to the data? Financial data is very organic and synchronization of state and federal systems will help reduce the potential for generating different information on the same subjects.
Mills College	The current time-lag between data reporting and availability limits the usefulness of the IPEDS aggregates. I believe that NCES has underestimated the potential costs to colleges and universities while presenting an overly optimistic picture regarding the period of disruption in federal-level aggregates. Requiring more time and resources on my part to comply with NCES requirements while providing less timely access to peer data is simply an absurd proposition.
New York Institute of Technology	I believe that the file submission should occur after the traditional Fall semester has ended; in our case that means after the end of December (our Fall term ends roughly at the end of December). I don't believe that the current IPEDS requirement of freezing data files in October has kept pace with the times. There are several reasons why fall enrollment may not be nearly complete by October; some of the big ones I can see are: (1) out of country enrollments where the fall term may not precisely coincide with the fall term here in the United States; (2) online colleges cropping up as part of traditional universities, which may have rolling admissions where the fall term is a moving target and students are continuously enrolling; and (3) Registrations from "offsite" locations that come in late for a variety of reasons. I think many colleges and universities are still attempting to fit their offerings into a fairly traditional fall term but I think the edges of the fall term are being pushed, with enrollments happening all through the entire term. For these reasons I think that if there is to be just one upload of record that it ought to occur sometime after December for the preceding fall term. However, I think a better solution is to have an upload at the end of December with new registration updates to fall enrollment for up to six months after the term has ended.

See notes at end of table.

Table B1. Selected comments received from institutions regarding burden associated with implementing unit records system, by selected topic—Continued

	Comment
University of Miami	Creating a separate census file would probably produce less burden for us than trying to track/date census versions of these fields on an end-of-semester file (I'd suggest you allow institutions an option for how to report Enrollment (EF) data: those institutions for whom a snapshot is appropriate because they have a small number of terms could opt to send a census file, whereas other institutions for whom cumulative enrollments are more appropriate because they have rolling class begin-dates could use the end-of-term transaction file). With that exception, the fewer the number of files the better. . . . Transaction files: One problem with end-of-fall-term files is that many people take vacation at the end of December and early January, so having a due date as late as possible would be helpful. A single summer file, with two records for students enrolled both terms would be easiest for us (for one thing, we have classes that run across both summer sessions). August is a big vacation month so it would be better to have this due in September. It will really help with burden if transaction files can be snapshots that do not require tracking changes in status (e.g., for intensity, majors, etc.) since dates when many of these fields change (including intensity prior to our census date) are not stored on our homegrown computer system. . . . Completions: Degrees awarded over the summer are supposed to be posted by early- to mid-October, but our Registrar said the later this file could be sent, the better. In fact because of incompletes and issues related to international students, a number of degrees are retroactively posted during the year after the official degree date (I'd estimate our 4-year graduation rate increases around one full point when it's recalculated a year later, due to retroactive degrees). If you want accurate data you will need to ask institutions to provide an addendum to the prior-year Completions report each year to reflect these retroactive degrees, but this will of course increase burden (we don't record the date when degrees are recorded so it would require re-running the prior-year completions report and merging with the original report to identify discrepancies). . . . Financial aid: UM's financial aid year tracks our academic year (i.e., fall/spring/summer A/summer B). The SFA data should not be requested until well after the end of the aid year to be sure that effect of spring transfers, fall graduates, late applicants, and students who complete the verification process late are accurately reflected. Our Director of Financial Assistance Services (FAS) indicated the first two weeks of October were the lightest for his office, but our office would probably produce the file and those weeks are our busiest since that's when UM benchmarks its census file. November would be a better month for us.
University of Wisconsin - Madison	In order for UR IPEDS to satisfy the student loan reporting requirements there would need to be timely submissions at critical points in each semester such as: first of term, last drop date, end of term, and perhaps additional points. For example, UW-Madison submits six enrollment files per spring and fall semester and 5 files during summer to the National Student Clearinghouse in order to comply with student loan enrollment reporting. We have access to this system and there are clear benefits to the university and our students and alumni, so we can identify clear benefits to from our investment in this system.
Viterbo University	I think it would not cut down of the amount of time we currently put into IPEDS. We would need to reconfigure our data input/output and our methods of gathering information from students and personnel.

SOURCE: Comments were taken from Technical Review Panel discussions or letters and e-mails send directly to HigherEd.org for the feasibility study. In some cases, the language has been modified to meet NCES publication standards.

Cost Estimates

Comments about cost estimates fell into three general types: (1) data-driven—i.e., those examining a variety of factors in calculating costs; (2) basic—i.e., those that looked at only one or two factors, such as personnel time; and (3) opinion—i.e., those that did not appear to be supported with data but only with anecdotal claims or opinions.

Data-Driven Cost Estimates

Four cost estimates examined a variety of factors and were somewhat data driven, including Indiana University (eight campuses), the University of Texas (UT) (nine academic campuses, six health science centers), the University of Maryland Eastern Shore (UMES), and Towson University. Of the two system offices, the total Indiana estimate is $143,400 for implementation and $54,000 annually; where the UT total estimate is $2,275,000 for implementation and $1,268,000 annually. Towson University estimates $210,500 for implementation and $162,000 annually, and UMES would require $378,000 to implement, but did not include an operational estimate.

The Indiana methodology is "based upon the time it will take to create data extractions for a single campus and then modifications of those queries to accommodate the other campuses," including "an estimate to cover hardware to store the data submissions." The UT methodology "did not include any indirect overhead costs, but did include estimates for person hours required to reprogram and build new files and for transmission processes, as well as an estimate for the data verification process. In a couple of instances, the cost of additional hardware was included to archive submitted datasets. Some software costs were also included, however, the bulk of these costs are for personnel."

The UT estimates are at a more gross level of personnel costs, but average $151,667 per school for implementation. The Indiana estimates are more refined, with personnel hourly estimates for each type of data file, but are less by half for the system as a whole than are calculated for UT. This discrepancy illustrates the different perceptions of the personnel costs and the inclusion of software upgrades for administrative information system improvements. These are more likely a function of these two systems preparedness for extracting and manipulating large scale datasets, with Indiana doing this centrally and UT passing the work and costs onto the campuses.

Towson includes the full $2,000 cost of a computer for each of four full- or part-time additional staff; while UMES would need to purchase nine $2,000 computers for staff and a special $10,000 server. UMES also built in $150,000 to retain a PeopleSoft consultant for six months. The President of Towson University reiterates that "this initiative will impose a heavy financial and resource burden on our institution." The "anticipated increased IT workload related to the proposal is by no means trivial as indicated by the resource estimates." The UMES estimate, the highest for any one institution that was received as part of the project feedback, includes effort by at least eight staff in addition to the PeopleSoft consultant.

Basic Cost Estimates

A wide range of responses were received from schools whose cost estimates were less refined. There is little similarity between them. However, at least seven respondents suggest that the unit record proposal would require approximately one more full-time equivalent (FTE) staff member per year. This is based on their careful reading of the proposal and TRP summaries, which contain much more explanation of the specifics of how the system would work. James Madison University's (JMU) institutional research office states that after needing one more staff FTE the first year, the cost burden would decrease to one-half FTE annually. The cost of this one FTE ranges in estimates from $60,000 to $100,000 per year and would vary based on regional cost of living differentials, among other factors.

The discrepancy in estimates at even this most basic level is shown in these typical responses. The University of Colorado at Boulder suggested that the initial implementation of unit records would require 100 to 200 hours of the director's time and 200 to 400 hours of staff time for startup. However, maintenance would not be any more than it is now. A joint letter from George Mason University and Randolph Macon Woman's College that was disseminated widely to the institutional research community, and that was mentioned in other letters and comments, assumed that it would require "one FTE per institution at a nominal average salary of $60,000." Mount Mary College's estimate, which was not broken out, totals $750,000 for implementation because it has "an outdated system that does not provide a shared data base and we do not have the funds to upgrade our system." The University System of Maryland estimates that it would take four to six additional FTE at a cost of $400,000 for implementation and $225,000 for subsequent years. The comparability of these

estimates is questionable, especially as most of these institutions participate in an existing state/system unit record system collection of student data.

Some schools such as Pima Community College and Shorter College state that they can already do this kind of unit record reporting without additional effort, as do some of the financial aid administrators surveyed by the National Association of Student Financial Aid Administrators (NASFAA). NASFAA comments included statements that: "It is not a large task to get the information requested…It will take staff time but it should be minimal." "It wouldn't require additional staff." "This kind of report would be a low-impact project from the cost perspective. It would be simply staff time to develop a script to extract this information from our system." Another financial aid administrator explained that, "Our data base system (Banner) contains all the proposed data elements, so I don't see that as an issue."

Opinion Estimates

Most of the estimates that were received were based upon anecdotal evidence and opinion and did not appear to be data driven. They focus on how the implementation of unit records would take staff time away from other projects, would require a major overhaul or upgrade of administrative information systems, or would simply "take months to implement." Very often, these estimates are lumped in with other required changes coming from outside of NCES, specifically the use of new race/ethnicity categories and the need to submit data in XML format. OMB is requiring the new race/ethnicity categories for all unit record data collections and FSA is requiring the submission of unit record data using XML.

Some schools report that their costs would be intertwined with the role of their state system or SHEEO offices. If two different unit record systems must be maintained, one for NCES and one for the state, then there would be an obvious perceived duplication of effort and increased burden. If the SHEEO or system could be modified to include the additional data elements needed for IPEDS, as some states do now, then there would be no increased burden with unit records, according to some institutions.

Conclusions

Much of the data in providing estimates of costs for implementing unit records comes down to two factors—additional personnel and additional hardware/software. For schools

that are already well staffed, if priorities are not shifted, then additional work would require additional staff. However, this is estimated in the range of one-half to one FTE per school, at a cost of $60,000 to $100,000. This would vary with the role of central offices, such as in the different estimates of Indiana University and the University of Texas systems and the campus estimates of Towson University and the University of Maryland Eastern Shore.

In preparing any cost estimate, two fundamental challenges will always remain: (1) the lack of good staff workload data; and (2) differences in administrative system capability. The Indiana University model is based on estimated hours for each of the different unit record files. These estimates are likely based on good internal tracking of projects and time sheet tracking. Few institutional research offices can afford this level of project management documentation, operating instead in a just-in-time production mindset. There are no easy comparisons of system capabilities either. For some schools, unit records would require a vendor contract in which the school pays someone else to extract and prepare the data for NCES, and the bid for this would include profit margins. At many other institutions, system offices already do this work and submitting student unit record extracts should involve minimal extra effort. Still at others, such as small career colleges, there would be a need to document print records in NCES-provided spreadsheets, which are needed already for adequate IPEDS reporting.

Most institutions do not include the full, direct costs for new computers as part of their projected costs for implementing UR and this seems appropriate. The cost of additional servers and extensive, long-term consulting relationships with vendors for administrative software systems also should not be attributed as a full, direct cost of UR, since they would benefit and impact other functions at the institution.

The actual increase in burden with the implementation of unit records would be the time necessary for resolving mismatches, which are estimated to be between 4 and 6 percent of all records based on NCES experience with NPSAS. Mismatches would be resolved by the school's keyholder working with the IPEDS Help Desk. Special algorithms and "fuzzy logic" would be used to suggest possible matches and how best to resolve discrepancies between records, so that time spent on reconciling mismatches would be minimized.

Some schools included in their burden estimates the time they would spend merging records and creating draft summary reports locally. This is certainly a choice; however, this burden of verifying the outcome and matching records locally would not be designed as part of the unit record system and would not be a requirement. The matching and editing

processes built into the system would be sufficient to accurately merge records and resolve mismatches.

Without very complex and data-driven estimates, the range of perceived burden in terms of cost is very wide. There is some agreement, among a certain type of school, that it would require an additional FTE for the first year and probably somewhat less staffing annually after implementation. There would need to be a complex survey conducted of staff workload to determine true staffing hours. This has been shown to have limited utility unless extensive daily logs are in place and the results are tied to some kind of reward system. A co-chair of the third Technical Review Panel meeting (at which the issue of cost estimates was discussed at length), Stan Ikenberry, replied that "these dollar estimates may not tell us much, in part because they would vary widely and aren't really informative."

The varieties and differences between administrative information systems are difficult to track. However, where extracting is already done by vendors or internally by the institution, the cutting of a dataset is not the question, so much as the process of handling mismatches. It appears that those schools that are most prepared to deal with the mismatches place a higher priority on data integrity and are willing to devote the staff time to resolve them; whereas other institutions might be more willing to let NCES assist them, using "fuzzy logic" and other techniques to tie streams of data together in order to resolve mismatches.

Overall, perceived cost estimates appear to vary depending upon whether the institution desires to replicate and duplicate the NCES procedures locally. While NCES has stated that it would give out the SQL code for institutions that desired to calculate aggregate reports locally, this is not part of the intended function of the UR system according to the proposal and should therefore be separated from its cost estimates. The creation of aggregate reports prior to submitting UR data should be considered a quality check on the art of the institution, but it is not a required activity in the process as anticipated by NCES.