

Following Students After Graduation

Best Practices for Tracking Postsecondary and Workforce Outcomes

APRIL 2020

Catherine Bitter | Kristina Zeiser | Victoria Cirks | Abigail Jeffreys | McCall Pitcher



Acknowledgments

This paper was made possible by the generous support of the William and Flora Hewlett Foundation. It reflects discussion from the American Institutes for Research convening, *Following Students After Graduation: Best Practices for Tracking Postsecondary and Workforce Outcomes*, held on October 1–2, 2019. The primary purpose of the convening was to share and document successful strategies to track longer term student outcomes to enable more districts and states to adopt effective strategies and help researchers leverage data systems to answer key questions raised by practitioners and policymakers.

The authors would like to thank the convening participants, whose thought partnership and engagement during the convening resulted in this paper. We also would like to acknowledge our AIR colleagues who provided content expertise, guidance, and support for the convening and resulting white paper: Scott Davis, Michael Garet, Matt Linick, Jennifer O'Day, Christa Poindexter, Susan Therriault, and Alexandria Walton Radford.

This convening was part of *The Study of Deeper Learning: College, Work, and Civic Participation in the First 6 Years After High School*. To learn more about *The Study of Deeper Learning*, visit <https://www.air.org/project/study-deeper-learning-opportunities-and-outcomes>.

Contents

	Page
Acknowledgments.....	ii
Introduction.....	1
Tracking Postsecondary Pathways and Outcomes	2
Using Postsecondary and Workforce Outcome Data.....	4
Sharing Lessons Learned About Building Linked Data Systems	14
Moving Forward.....	18
Conclusion.....	22
Appendix A. Agenda	23
Appendix B. Convening Participants.....	26

Introduction

In October 2019, the American Institutes for Research (AIR) hosted the *Following Students After Graduation: Best Practices for Tracking Postsecondary and Workforce Outcomes* convening, funded by the William and Flora Hewlett Foundation. This convening brought together a range of stakeholders to share and document successful strategies for tracking longer term student outcomes, including postsecondary education, workforce, and civic outcomes. The goal was to engage participants in discussion and collective problem solving to inform the development of comprehensive state and district data systems that include longer term outcomes. Such systems can provide an opportunity for practitioners, policymakers, and researchers to answer key questions about how to foster adult success for all students. Participants included representatives from school districts; state education, higher education, and labor agencies; national and regional organizations involved in building data systems; and AIR researchers.

The 2-day meeting included in-depth discussions of strategies to connect K–12 and postsecondary data, ensure data quality, address governance and privacy issues, and support student success through data use.¹ This white paper distills the discussions by highlighting features of the data systems currently in place in participating districts, states, and organizations; sharing reasons for the development of longitudinal data systems that capture longer term outcome data; presenting strategies and considerations for developing effective data systems; and offering suggestions for moving this work forward.

The convening was initiated as part of The Study of Deeper Learning: College, Work, and Civic Participation in the First 6 Years After High School. This study examines the impact of attending high schools with an explicit focus on “deeper learning” (i.e., the development of students’ interpersonal, intrapersonal, and cognitive skills) on longer term outcomes, including postsecondary education, employment, and civic outcomes. While planning for this study, the research team and the Hewlett Foundation recognized the need for more accurate and comprehensive data on students’ postsecondary outcomes for use in longer term research studies as well as in the development of educational improvement approaches and policies.

¹ The agenda for the convening is provided as Appendix A.

Tracking Postsecondary Pathways and Outcomes

Consider the following paths of three students who graduate from the same high school:



Student 1: Upon graduating, Student 1 enrolls in a local 2-year community college, completes a medical assistant degree, and begins work at a nearby medical office. After 2 years of employment, she enrolls in a state university to obtain a nursing degree and subsequently moves out of state to take a job at a large hospital.



Student 2: Student 2 takes an unpaid internship for a year after graduating, then enrolls in an out-of-state university to complete his bachelor's degree and later a PhD program. He then stays close to where he completed his graduate program and obtains a job as a professor at a nearby college.



Student 3: Student 3 enrolls in the army after graduation. After 4 years of serving in the military, she attends a college in her home state, obtains a bachelor's degree in engineering, and finds a technology job at a local company. She becomes active in her community, running for the local school board.

These scenarios are just three examples of the many paths that students may take after completing their K–12 education. The scenarios demonstrate the complexity involved in capturing a complete picture of the long-term pathways and outcomes of students. If this district were to track these students' paths, it would need to collect and link not only local K–12 and community college enrollment and graduation data but also in-state and out-of-state university enrollment and graduation data, employment data from multiple states (including military service records, which are difficult to obtain), and internship and civic participation data. And this is just for three high school graduates!

The volume of data available to measure outcomes continues to increase over time, with more comprehensive data being collected at the local and state levels.² In efforts to improve outcomes for their students and residents, individual state and local agencies may track a wide range of indicators, such as student achievement, college enrollment and graduation data, and employment data. However, districts and states vary in their capacity to track and link longer term outcomes, resulting in significant variation in the quantity and quality of data collected by locality. Although some states have data systems that include K–12, community college, higher education, and labor data (Box 1), others may just be starting to look at college enrollment outcomes for K–12 students. For all, linking multiple data systems and

² For example, starting in 2005, the Institute of Education Sciences' Statewide Longitudinal Data System (SLDS) grant program has awarded grants to states to develop systems connecting prekindergarten, K–12, postsecondary, and workforce data. This program has expanded across time, incorporating additional measures and awarding grants to 51 different states and territories (https://nces.ed.gov/programs/SLDS/pdf/History_of_the_SLDS_Grant_Program_May2018.pdf).

tracking individual students across time as they progress along different paths after high school graduation proves complex and challenging.

Box 1. Common Data Sources for Linked Data Systems

The states and districts represented in the *Following Students After Graduation* convening draw on multiple data sources from K–12 education, higher education, and labor agencies for their linked data systems. The primary data sources reported include the following:

1. *Student information system data*: These district data systems typically include demographic information, achievement test scores, course-taking behavior and grades, attendance, and high school graduation data for K–12 students.
2. *National Student Clearinghouse (NSC) data*: NSC is a commonly used source of postsecondary education data. NSC tracks college enrollment, persistence, and degree completion data for more than 3,600 colleges and universities, which include more than 99% of enrolled students in the United States, and partners with institutions to track more detailed data (see <https://www.studentclearinghouse.org/colleges/studenttracker/>).
3. *Data from in-state 2- or 4-year colleges*: Some participants reported establishing data-sharing agreements with publicly funded in-state institutions of higher education (or higher education systems). These agreements provide detailed information on students' course-taking and achievement during college, as well as information about field of study and the types of degrees students pursue. Some participants noted challenges establishing agreements with 4-year colleges and private colleges and universities.
4. *Unemployment insurance (UI) data*: These data serve as a primary source of workforce data within states, providing information about quarterly employment and wages. Participants noted that UI data do not include federal employees (including military) or people who are self-employed. In addition, matching other data sources to UI data requires social security numbers (SSNs), and many district and state data systems do not maintain SSNs. In some cases, links can be made by leveraging data from the Department of Motor Vehicles (DMV), but the process is labor intensive, requires close collaboration with the DMV, and is limited to residents with a state driver's license or ID.

Using Postsecondary and Workforce Outcome Data

Practitioners, policymakers, and researchers have been increasingly interested in harnessing long-term outcome data to support education progress, improvement, and research. As part of the *Following Students After Graduation* convening, AIR asked participants to identify the longer term outcomes they were most interested in tracking for these purposes. The outcomes identified can be subdivided into four main categories:

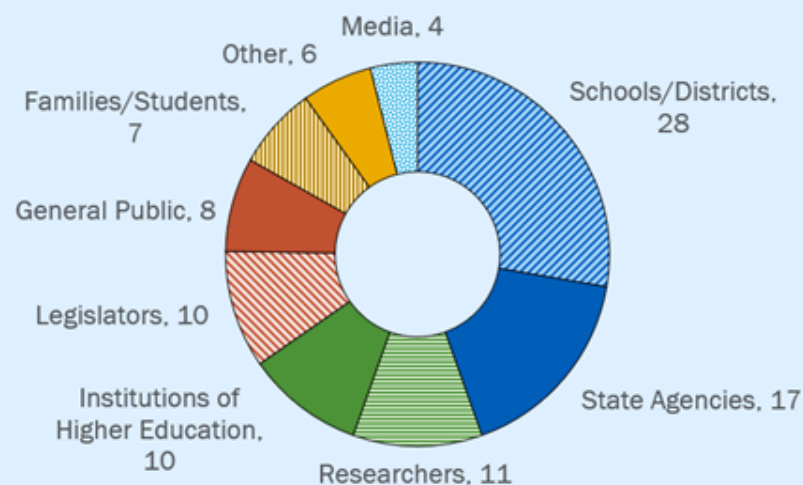
- Educational outcomes (e.g., high school graduation; college enrollment, persistence, and completion; degrees, credentials, and certifications; time to degree; transfer; school to work/military pathways)
- Workforce outcomes (e.g., employment, underemployment, and unemployment; occupation and workforce participation; job alignment to degree; hours worked; salary)
- Civic outcomes (e.g., community engagement; voter registration and behavior; volunteerism; charitable donations and philanthropic giving)
- Well-being and lifelong learning outcomes (e.g., public assistance use; physical and mental health outcomes; participation in continuing education; involvement with the criminal justice system)

Tracking these categories of postsecondary outcomes can provide valuable information to multiple audiences (Box 2) to address important questions about the effectiveness of educational programs, systems, and institutions. For example, *school districts, state agencies, and institutions of higher education (IHEs)* may use these data to identify programs and supports that lead to beneficial long-term outcomes for students. The availability of linked postsecondary data also can enable *external researchers* to more effectively evaluate the longer term impacts of instructional programs, strategies, and approaches if they are able to identify study participants within these data systems. *Policymakers* may use these data and research findings to inform legislation aimed at improving education outcomes that will in turn improve the local economy. In addition, these data allow *educators and families* to investigate the trajectories and paths that similar students have taken, including through multiple 2- and 4-year institutions, work experiences, and multiple states, and consider ways to better prepare their students for these paths.

Box 2. Primary Audiences for Long-Term Outcome Data

As part of the *Following Students After Graduation* convening, AIR asked participants to identify the different audiences for long-term postsecondary outcome data. They identified a wide variety of audiences, including students, parents, and families; K–12 practitioners, such as teachers, school/district administrators, and high school counselors; IHEs; researchers; policymakers, legislators, and state agencies; as well as the general public, media (e.g., bloggers), and advocacy groups. When asked to prioritize the list of audiences based on their consumption of and uses for these data, schools and districts were selected as the primary audience, followed closely by state agencies and researchers, as well as IHEs and legislators.

How would you distribute 100 points based on your perception of the priority of the audience?



In all these instances, longitudinal, linked data provide an important opportunity to identify and examine issues related to equity (Box 3) with respect to educational opportunities and outcomes. For example, *external or internal researchers* may examine whether impacts of instructional programs differ for different subgroups of students; if students who are traditionally underserved do not receive the full benefits of a program, then implementing the program may exacerbate differences in student outcomes rather than reduce them. Using this information, practitioners or policymakers may redesign program components to maximize their effectiveness for all students. In addition, *educators* may use this information to improve programs and structures to better support all students for success later in life.

Box 3. Addressing Equity

Convening participants emphasized the important role that longer term outcome data have with respect to ensuring equity of student opportunities and outcomes. Data analyses can help identify student subgroups that need additional support and can inform improvement efforts aimed at fostering more equitable outcomes. Although K–12 data alone provide important insights into students’ short-term outcomes and needs for support or services, tracking students across time provides a more comprehensive picture of how these subgroups fare beyond high school. Data analyses can identify whether students from different subgroups, despite having similar achievement levels in K–12, have differential graduation outcomes in postsecondary education or differential wages in the workforce. For example, analyses revealing a gap in wages between males and females in local science, technology, engineering, and mathematics jobs may help focus attention on potential causes of this disparity.

Participants also noted that data can be presented in a way to raise awareness of potential inequities. For example, one participant from a district-level data and analytics department described beginning their data presentations with summaries of gaps in achievement to ensure that the gaps are highlighted and that there is transparency with respect to equity. This participant noted, “*The way we present [the data] influences the way it is used.*” Highlighting differential rates of graduation or employment can focus attention on equity of opportunities and outcomes. However, participants cautioned that presenters must consider the audience carefully when sharing data. Although presentations of data by subgroup to an informed audience of educators may highlight the need for more equitable opportunities and supports within schools, community members with limited knowledge of the analyses may see these presentations as negatively singling out certain subgroups of students with lower achievement. As one participant described, it is important to emphasize that these results “*are a report card on what [the schools] are doing, not your students.*”

In the pages that follow, we explore four of the main uses of long-term data discussed by convening participants:

1. Informing the development and implementation of improvement strategies for schools, districts, and IHEs
2. Informing policymakers about K–12 education, higher education, and employment
3. Facilitating long-term research studies and evaluation
4. Providing information to families and students about postsecondary opportunities

1. Informing the Development and Implementation of Improvement Strategies for Schools, Districts, and IHEs

Longer term student outcome data can shed light on the effectiveness of educational programs, approaches, and structures. Convening participants discussed the many ways in which these data can inform schools', districts,' and IHEs' improvement efforts. For example, data can be used to identify specific opportunities for improvement and intervention to better prepare students for college and career opportunities. In addition, examination of longer term outcome data can bring to light strategies for building greater alignment of education opportunities to local demands and desired outcomes. Finally, these data systems can be used to inform internal research, evaluate programs, and answer key questions related to school, district, and IHE improvement efforts. Such data also can be instrumental in identifying sources of inequity and strategies to ensure equitable opportunities and outcomes for all students within improvement efforts.

Identification of Opportunities for Improvement and Intervention

Longer term data may bring to light specific areas of improvement for schools, districts, and IHEs, such as the following:

- Data that demonstrate a high need for remediation in postsecondary education can signal to districts that their students need better preparation for certain subject areas within the K–12 system. Alternatively, some postsecondary systems have examined placement criteria for remedial courses and the outcomes of students in those courses and have developed alternative strategies for getting students “up to speed,” such as corequisite courses or expanded summer bridge programs.
- By examining state employment and wage data, IHEs may identify areas of improvement with respect to programming and supports to ensure that more students are better prepared for local job opportunities after graduation.
- Districts, states, and IHEs also may use long-term trend data to develop early warning indicators that can help identify students at risk. By tracking these indicators, schools, districts, and IHEs can put into place academic and social-emotional interventions to support students who are struggling with low attendance rates, credit accumulation, or grades and who may be at risk of dropping out of high school or not enrolling or persisting in postsecondary education.
- Analyses of students' paths after high school graduation can inform strategies to better support students' preparation for postsecondary education and careers. For example, analyses may identify a need for additional supports for the college application process, including financial aid and scholarship application support or college entrance exam test preparation. Or analyses may indicate a need for further supports for job identification at the K–12 or postsecondary level to ensure that students can find high-quality job opportunities that align with their career goals.

Alignment of Education Opportunities to Desired Outcomes and Labor Demands

Analysis of postsecondary education and workforce outcomes (e.g., employment and wages) within a community also may uncover discrepancies between the types of educational programs available and the demands of the labor market. Information about local labor market features and demands may (a) lead

local institutions to create or promote programs that prepare students for local jobs and (b) incentivize students to pursue educational programs that align with in-state job opportunities. For example, one state identified registered nursing as a high-demand, high-wage career, yet a limited number of postsecondary programs in nursing were available. The development of nursing programs and incentives for students to enroll in nursing programs (e.g., tuition discounts) helped increase the number of students graduating with nursing degrees.

Internal Research to Evaluate Programs or Answer Key Questions

Although much internal research is conducted on a condensed timeline so that results may inform immediate changes in practices and programs, tracking and linking of longer term outcomes can answer key questions regarding students' pathways and provide evidence and insights into whether new approaches, programs, or improvement efforts implemented at the K–12 level are having positive impacts past graduation. For example, one participant described that, although analyses of short-term outcomes demonstrated progress within their district with respect to increasing college enrollment, longer term analyses revealed that decreases in persistence within postsecondary institutions eroded some of these gains. Further analyses of longitudinal data can help educators to identify potential reasons for these trends (e.g., what courses students took in high school, whether they enrolled in remediation classes upon entering postsecondary institutions). Therefore, longer term data can play an important role in enabling districts, state agencies, and IHEs to answer questions of interest in areas such as resource allocation and educational programming.

2. Informing Policymakers About K–12 Education, Higher Education, and Employment

Convening participants identified legislators as a key audience for linked K–12 and postsecondary data. Analyses of longer term outcome data can provide valuable information to legislators as they develop and enact policies to support student success in K–12 and postsecondary education. These analyses may shed light on areas in need of additional resources, including specific programs that better prepare students for postsecondary enrollment and employment. For example, analyses revealing challenges with respect to students' ability to pay for college could lead to legislation designed to facilitate dual-credit course-taking during high school as a strategy to reduce the number of years for which students must pay tuition.

In addition, analyses of workforce data can support the development of strategies to improve the local economy. For example, identifying labor market needs and trends can inform the allocation of resources and the development of educational programs that better align to employment opportunities in the region, thus helping ensure that graduates have ample work opportunities. Increased data availability at the local and state levels opens more opportunities for this type of actionable regional data analysis that has only been possible in the past with aggregate national data.

3. Facilitating Long-Term Research Studies and Evaluation

This convening was initiated in part to address the need for better data to enable studies by external researchers of longer term impacts of interventions and programs, such as AIR's study of the long-term impacts of attending high schools focused on deeper learning. Greater availability of data on postsecondary education, workforce, and civic outcomes (Box 4) can open the door to more in-depth and comprehensive evaluations of educational programs and studies of instructional approaches and strategies.

Box 4. Collecting Civic and Lifelong Learning Outcome Data

One goal of *The Study of Deeper Learning* is to examine the longer term impact of attending a high school focused on deeper learning on civic outcomes, such as community service and involvement in political discourse and campaigns. Participants in the convening listed a wide range of civic and lifelong learning outcomes that would be beneficial to track for their work. Measures of civic participation mentioned by convening attendees included volunteering practices, voter registration, voting regularity, election to public office, and charitable and philanthropic donations. Negative outcome measures, such as incarceration, also were noted. In addition, participants reported interest in measures of lifelong learning, such as participation in continuing education, attainment of certifications, and engagement in arts and community activities. These data can provide valuable information on how successfully schools have prepared students to lead a productive life and make meaningful contributions to society. These data also could inform evaluations of school-based programs intended to foster long-term civic participation or life skills. However, reliable data on these outcomes are not typically collected systematically by districts and states, and strategies such as surveys have many challenges (e.g., low response rate, difficulty finding students). Further consideration of effective strategies and methods to systematically collect these types of data could be beneficial.

Many research studies within the K–12 system rely on high school graduation data as the longer term measure of impact. In some cases, studies may incorporate and analyze postsecondary education data from organizations such as the National Student Clearinghouse (NSC) to look at college enrollment, transfers, and graduation outcomes across states. However, NSC data currently do not allow for more detailed analyses related to course-taking and credit accrual unless colleges provide these data. Furthermore, evaluating impacts beyond high school and college graduation becomes more challenging as students enter the workforce. Typical strategies to follow students further, such as the use of surveys, often are unreliable as well as difficult and costly to execute.

As districts and states build more comprehensive data systems to track and link longer term outcomes, researchers will have more opportunities to access high-quality longitudinal data to examine key questions on a national or regional level. However, convening participants noted the importance of ensuring data privacy and implementing data sharing agreements to ensure proper data use. Researchers' willingness to share insights and results of their studies can make data sharing a mutually beneficial process.

External researchers also can provide additional capacity that districts and states often lack to conduct more rigorous internal research and evaluation. Through data-sharing agreements, memoranda of understanding, and formal partnerships, external researchers can work together with district or state staff to explore key questions. For example, the Research Alliance for New York City Schools' partnerships with the New York City Department of Education (NYCDOE) and the City University of New York system create opportunities for timely research that can inform the city's educational programming. In addition, the

partnership creates opportunities for NYCDOE's participation in national studies conducted by other external researchers by providing a mechanism for conducting analyses while maintaining data privacy.

4. Providing Information to Families and Students About Postsecondary Opportunities

Several representatives from state agencies and districts described creating interfaces and data visualizations that provide valuable information to students and families as they navigate postsecondary options. Some of these interfaces rely simply on aggregated information from IHEs or labor departments, whereas others use linked data to provide insights into pathways that students may choose (e.g., employment outcomes associated with specific college majors). Participants described the use of these interfaces to inform students and their families about (a) the preparation needed to enroll in college and enter specific careers, (b) longer term college costs and the economic impact of financial aid, and (c) labor market trends and conditions (including trends in wages). Participants cautioned, however, that these trend data can be complex and difficult to interpret. Participants also noted the importance of intermediaries (e.g., guidance counselors) in interpreting and communicating the data to help families and students better navigate these tools highlighting postsecondary and employment opportunities.

Preparation Needed for College and Specific Careers

Information on courses, test scores, and grades required for different postsecondary opportunities can help students identify what postsecondary institutions and jobs they may be prepared for, as well as what additional coursework or educational programming they may need to graduate and pursue a particular career option. For example, the Kentucky Center for Statistics Career Explorer (Box 5) allows students to explore potential careers based on the expected knowledge, skills, and abilities of workers in those careers; the required major or certification; and the likely level of compensation.

Participants noted that more detailed disaggregated data could further inform students' postsecondary choices. For example, information on postsecondary persistence, completion, and subsequent employment, broken out by subgroups, could help students identify postsecondary institutions where similar students have found success. Concerns were raised, however, that such data use may perpetuate inequalities across colleges and universities unless IHEs also use this information to identify ways in which they might promote more equitable outcomes for all students within their institutions.

Box 5. Kentucky Center for Statistics (KYSTATS)

Established in 2012 and funded through state appropriations, grants, and user fees, KYSTATS is a state office that integrates preschool, elementary, secondary, postsecondary, and workforce data through the Kentucky Longitudinal Data System. Participating agencies include the Kentucky Department of Education, the Kentucky Education and Workforce Development Cabinet, the Kentucky Higher Education Assistance Authority, the Education Professional Standards Board, and the Kentucky Council on Postsecondary Education. KYSTATS links data on outcomes across multiple sectors, including

- early childhood (e.g., enrollment, kindergarten readiness, program ratings),
- K–12 education (e.g., proficiency rates for key subject areas, high school grade point average, high school graduation),
- career and technical education (e.g., college enrollment and academic performance),
- higher education (e.g., college admission test scores; IHE enrollment, transfer, completion, credits earned), and
- employment and workforce (e.g., employment rates, median wages, sectors of employment).

They also are currently incorporating corrections data and data on children from birth to age 5.

KYSTATS publishes reports, builds interactive dashboards, and responds to research requests to help Kentucky policymakers, state and local governments, and residents make better informed decisions. For example, use of these tools has informed state-level policies on work-ready and dual-credit scholarships. As KYSTATS develops new interactive feedback reports, it works with stakeholders ranging from guidance counselors and local libraries to national longitudinal data groups to increase data visibility and use. KYSTATS also has also developed a Career Explorer tool that uses data such as average salaries to help students identify potential careers.

Source: <https://kystats.ky.gov>.

Longer Term College Costs and the Economic Impact of Financial Aid

In addition to potential earnings information, information on average costs, financial aid, and levels of student debt by postsecondary institution can help students identify the economic impact of postsecondary options or identify institutions that may provide the financial assistance they need. For example, the State Council of Higher Education for Virginia (Box 6) provides information on debt outcomes by race/ethnicity and gender. The state's debt ombudsman (i.e., investigator) uses this information to provide educational materials to families as they navigate postsecondary options.

Box 6. Virginia Longitudinal Data System (VLDS)

The VLDS, which launched in 2012 with funding from the U.S. Department of Education, is a web-based portal that consolidates students' data as they transition through public school systems, postsecondary education, and into the workforce. These data are held by multiple agencies, including the Virginia Department of Education, the State Council of Higher Education for Virginia, the Virginia Employment Commission, the Virginia Department of Social Services, the Virginia Community College System, the Virginia Department for Aging and Rehabilitative Services, the Virginia Department of Health Professions, the Virginia Department of Juvenile Justice, the Virginia Office of Children's Services, the Virginia Information Technologies Agency, and Virginia Polytechnic Institute and State University. VLDS links student outcome data across several sectors, including

- K-12 education,
- higher education (e.g., postsecondary degrees and certificates earned, student debt, college major, public/private/nonprofit colleges and universities), and
- employment and workforce (e.g., employment rates, percentage of graduates employed in the commonwealth, unemployment insurance wage records, wage outcomes by degree, average salary, average student debt, residency).

VLDS keeps a running blog on its website to share reports for which VLDS data were used. In addition, VLDS manages a secure web-based portal to store its collection of data for VLDS data users to pull from. By linking these various student outcome data through VLDS, Virginia leaders can analyze the behaviors and trajectories of their student constituents more consistently to better inform education and workforce policies.

Sources: State Council of Higher Education for Virginia. (n.d.). *VLDS (Virginia Longitudinal Data System)*. Retrieved from <http://research.schev.edu/info/Articles/The-Virginia-Longitudinal-Data-System>
VLDS. (n.d.). *About VLDS*. Retrieved from <http://vlds.virginia.gov/>

Labor Market Trends and Conditions

Some states have recognized that students enter college not fully understanding the types or characteristics of jobs that they may enter when they graduate from college. As a result, students may not have all the information they need to make an informed decision about where to go to college or which field of study to pursue.

In response, some states have created data visualizations to help students and their families better understand how the characteristics of the jobs that college graduates enter vary by college and by program of study. The Kentucky Center for Statistics' [Postsecondary Feedback Report](#), for example,

provides interactive charts that show employment and wage outcomes by major and credential for 42 four-year and two-year public and private institutions within Kentucky. Minnesota's State Longitudinal Education Data System (SLEDS) website also provides interactive reports of outcomes, including employment and annual wages within Minnesota, for high school graduates, college graduates, and students who enroll in developmental education programs (Box 7).

Box 7. Minnesota Statewide Longitudinal Education Data System (SLEDS)

Minnesota SLEDS, created in 2006 and funded by the U.S. Department of Education and state grants, is an interactive web-based platform that tracks and matches prekindergarten through postsecondary education and workforce data. Under the Minnesota P–20 Education Partnership, Minnesota SLEDS is governed by the Minnesota Office of Higher Education, the Minnesota Department of Education, and the Minnesota Department of Employment and Economic Development. Minnesota SLEDS links multiple sources of outcome data that include

- K–12 education (e.g., enrollment, assessment, advanced placement, ACT, GED recipients, educational information systems, instructional program classifications, school and organization directories, dual enrollment),
- career and technical education (e.g., workforce training, adult basic education),
- higher education (e.g., postsecondary enrollment and completion, institutional tuition characteristics),
- employment and workforce (e.g., employment rates, staffing, health licensure data, career and labor market information systems), and
- corrections (e.g., Department of Corrections offender history).

Through their interactive outcome dashboard, annual reports, and press releases, Minnesota SLEDS works to achieve successful student outcomes by helping users more seamlessly identify viable educational and workforce pathways and by informing and supporting related policy and practice decision making. In addition to these resources, Minnesota SLEDS shares tools, such as videos and webinars, with its users to assist them in navigating and understanding the data and reports that SLEDS houses.

Source: Minnesota Statewide Longitudinal Education Data System. (n.d.). *About Minnesota SLEDS*. Retrieved from <http://sleds.mn.gov/>

Similarly, the Iowa Department of Education provides comprehensive reports, data tables, and an online dashboard capturing the workforce outcomes of both credit and noncredit students at Iowa's community colleges. These analyses include employment outcomes, such as entry into employment and wages by

demographics, program, and college. Students may use this information to identify schools and majors that will likely lead to strong employment opportunities after graduation.

Participants cautioned, however, that wage and labor data are particularly complex to interpret. For example, if average wages do not adjust for differences in costs of living across towns and cities, then the data may not accurately depict the variation in income that graduates experience. Providing sufficient context for the data and training intermediaries (e.g., guidance counselors) to understand the trends may be particularly important in this area.

Sharing Lessons Learned About Building Linked Data Systems

Attendees at the convening provided different perspectives on building and using linked data systems. From these varying viewpoints, we gleaned seven main lessons for those in the field who might be early in their journey of building linked data systems within their states or districts (Figure 1).

Figure 1. Seven Lessons for Developing a Linked Data System

- 1 Begin with the goals in mind, including those related to equity
- 2 Balance short-term and long-term needs
- 3 Identify available data, key stakeholders, and data owners
- 4 Build relationships and identify champions
- 5 Develop guiding principles for data system
- 6 Design governance structure
- 7 Focus on quick wins and share successes

Begin With the Goals in Mind

Although simple in theory, convening participants shared that an important first step is to be thoughtful up front about the questions you are trying to answer using longitudinal outcome data. Many different types of data are and could be collected; beginning with clear goals in mind about the specific outcomes of interest will help guide district or state improvement efforts, inform key messages to build buy-in, and prioritize limited time and resources for data collection and reporting.

Few agencies are in a situation in which they need to create a data system from scratch. In many states, data systems covering many of the areas of interest are already in place, although they may not yet be linked. Keep the goals in mind each time you are trying to link to a new system or type of data. For example, as states think about how to link data from the criminal justice system or health system to K-12 and postsecondary education data, it would be important to first clarify what story such linkages can tell, what data would need to be collected, and what this information will allow educators and policymakers to

do that is not possible already with existing data and systems. Will connecting these systems result in improvements in how districts and states complete mandatory federal reporting or respond to requests from legislators and policymakers? Will these data allow educators and community members to better target wraparound services for at-risk students? By identifying the intended goals of the data system as well as the intended audience that the system will benefit, creators of the data system can identify data fields and data sources that will be necessary to meet their goals.

Balance Short-Term and Long-Term Needs

Participants shared that one important step that might be missed or overlooked is a discussion of the balance between the big-picture view of the potential of linked data systems (e.g., long-term economic development) and the specific challenges that are on the table right now (e.g., students are underprepared and failing, adults are underskilled and unemployed). Identifying the short-term and long-term needs for the linked data system—grounded in its articulated goals—will help guide the ongoing development of the system and will help proactively identify potential tension points or roadblocks. In some cases, compromising to create a more limited system that addresses short-term challenges, while slowly working toward a more comprehensive system, will make sense.

Identify Available Data, Key Stakeholders, and Data Owners

Participants also shared the importance of spending the time to inventory what data are already being collected and identify the major stakeholders and data owners. Such an inventory could help reveal whether existing data can be used to answer your questions or inform the goals you have set. It also will uncover gaps where data are missing or only partially collected. This data inventory will create a comprehensive picture of what data are available and where these data reside.

Similarly, identifying the stakeholders and data owners for each data source is critical. Stakeholders and data owners may or may not be the same people. Stakeholders are those

“Data owners are those with the legal responsibility to “create, alter, share, or restrict any piece or set of data”.

with an interest in the collection and use of the data, whereas data owners are those with the legal responsibility to “create, alter, share, or restrict any piece or set of data” (p. 30).³ Stakeholders and data owners have different roles and responsibilities with respect to data use. For example, although some stakeholders may wish to link a particular dataset with that of another agency to answer a particular question, the data owners may be legally prohibited from sharing information outside their agency. In such a case, changes in legislation or regulations may be required to allow for the desired data linkages, though robust data-sharing agreements will still be necessary.

³ See http://www.tribaleval.org/wp-content/uploads/DSIT_Full_Final_Dec_2018.pdf.

Build Relationships and Identify Champions

Once key stakeholders and data owners are identified, participants noted that it is important to intentionally build relationships with them. Relationship building can be a long process; however, spending time to establish a widespread yet loose coalition of supporters for the goals of linked postsecondary and workforce data systems will ultimately pay dividends. Participants identified a variety of stakeholders that they felt were important to engage, including state K–12 and higher education agency staff, state workforce development staff, workforce development boards, state boards of education members, legislators, executive branch offices (e.g., governor, attorney general), parent groups, researchers, and data privacy groups. Each of these groups has unique interests and needs with respect to data collection, data usage, and data linkage. Therefore, establishing relationships among these stakeholders can help build recognition of the mutual benefits a comprehensive linked data system can have for *all* groups, including greater efficiency and enhanced ability to answer important questions through data analysis.

Participants also recommended that champions be identified and cultivated. Champions are those seen as knowledgeable and valuable to the process who have decision-making authority and the ability to commit resources, contextualize the goals to various audiences, and advocate for the process both within their agency or organization and across the stakeholder groups engaged (Proger, Bhatt, Cirks, & Gurke, 2017).⁴ For example, having champions that are policymakers can result in legislation that provides structures or funding for the long-term sustainability of the system. This was the case in Kentucky and Washington, where legislation helped launch the state data systems and continue to provide support for the growth and use of the system.

Develop Guiding Principles for the Data System

Participants shared that once overall goals are developed and stakeholders and champions are bought in and engaged, they would recommend that a set of guiding principles be developed for the data system. Participants reinforced the notion that there is no single model for what a perfect linked data system might look like. It is dependent on the local context, the goals developed for the system, the questions users want to answer, and the rules of the road that need to be designed to govern use of the data.

A common set of guiding principles developed in collaboration with stakeholders and data owners will ground data governance, data privacy, and data access processes. They will serve as a reference point when challenges or issues arise in the operation and use of the system. The guiding principles also are a place in which the commitment to equity can be articulated and codified.

Design Governance Structure

Creating data governance structures that promote transparency yet shield against the misuse of data is a difficult task and an issue that participants discussed at length. Data governance outlines the

⁴ Proger, A. R., Bhatt, M. P., Cirks, V., & Gurke, D. (2017). *Establishing and sustaining networked improvement communities: Lessons from Michigan and Minnesota* (REL 2017–264). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. Retrieved from https://ies.ed.gov/ncee/edlabs/regions/midwest/pdf/REL_2017264.pdf

requirements and expectations for data security and the parameters around access and use of the data. In addition to the many logistical issues of housing large datasets and identifying who will manage the data, participants recommended that data governance processes and structures should include how data systems would address the following:

- **What data will be shared and with whom?** One participant cautioned that you should take into consideration not only the stakeholders with whom data will be shared directly but also who else might obtain permission to share data. This participant emphasized the difference between data owners, who may permit others to access data, and data stewards, who may be granted access to data but are not permitted to share the data with others. Permissions for third-party access may depend on state legislation or other factors, such as whether the data contain personally identifiable information.
- **For how long will data be tracked?** Across data systems, a vast amount of data can be collected, and systems should not be designed to collect data for an infinite amount of time. Data governance should outline the length of time students should be tracked to meet the articulated goals and to make the data manageable. For example, Minnesota SLEDS provides access to 10-year employment and wage outcomes.
- **Will/how will data be shared across states?** As one participant framed it, data systems respect state borders, but students and workers do not. It is becoming more and more important to be able to track students across state lines so that states have a clearer picture of what their graduates are doing after high school and college. One example of how states are trying to navigate this challenge is the Multi-state Longitudinal Data Exchange (MLDE) managed by the Western Interstate Commission for Higher Education (WICHE). The MLDE includes longitudinal K–12 and postsecondary education and workforce data from four states in a pilot effort: Washington, Oregon, Hawaii, and Idaho. The MLDE navigates data governance and privacy issues to allow for cross-state data sharing.
- **How can data privacy be ensured while keeping a focus on equity?** From an equity standpoint, disaggregating data to identify the needs and outcomes of marginalized populations or specific groups of students is an important goal. However, when the group or population within a specific setting is so small that specific students could be identified from the data summary, privacy becomes a concern (e.g., if there are only five Latino students in a small high school). It is important to think about how the data governance processes balance the maintenance of data privacy with the ability to address questions of equity using disaggregated data.

Focus on Quick Wins and Share Successes

Finally, participants shared the importance of having early, demonstrable wins. These early successes will provide evidence that the linked data system provides access to data more effectively or efficiently than current, segregated data systems or provides answers to questions that users are having in real time. What can you answer now that you could not before? As these quick wins pile up, share them through your stakeholders and champions, and through mechanisms such as social media, so that more people know about and understand the value of the system to a broad set of users. By starting small and demonstrating early successes, you can generate more interest and gain stakeholders, and, as a result, additional agencies may express an interest in linking to the data system.

Moving Forward

The *Following Students After Graduation* convening provided an opportunity for in-depth discussion about how districts, states, and organizations can develop effective systems to track and link students' long-term outcomes. Participants discussed specific strategies for building buy-in, resolving governance and privacy challenges, and sharing results to inform educational improvement, research, and students' educational trajectories. More broadly, several areas of consideration emerged for moving this field of work forward across the country.

Building Capacity for Designing, Implementing, and Analyzing Connected Data Systems

Participants emphasized that to build systems that link K–12, postsecondary education, and workforce outcomes, districts and states must invest in the capacity of their data departments. Skills discussed include the ability to collaborate and work across different agencies, as well as technical skills needed to merge datasets, run timely and relevant analyses, and create user-friendly interfaces and visualizations for educators, families, and other audiences. Although some participants' states had significant capacity for this work (e.g., Kentucky), others noted limited staff availability and skills to accomplish this work on a larger scale. Funding also was raised as a challenge. Although many states started developing systems using funds from Statewide Longitudinal Data Systems (SLDS) grants, participants noted the need to identify ongoing sources of funding for this work. In some cases, local legislation supporting or requiring the development of these systems helped make capacity building a priority. However, variation across states in the allocation of resources to these efforts is substantial.

Opportunities for ongoing sharing of tools and strategies across states and districts could help agencies that are developing systems to learn from and build on systems already in place in other jurisdictions. In addition, further development and leveraging of national and regional organizations, such as NSC, WICHE, and the National Center for Higher Education Management Systems (NCHEMS), can provide the capacity to collect and link data that may not be available at the local level.

Building Understanding and Buy-In Among Educators, the Public, and Politicians Regarding the Potential Uses and Benefits of Long-Term Postsecondary Data Systems

As described earlier, participants emphasized the need to build an understanding among educators, the public, and politicians of the many benefits of tracking postsecondary data. Given widespread concerns among the public about identification and privacy, navigating the tension between developing long-term data systems and ensuring that necessary safeguards are in place to keep personal information private is critical. In addition, attendees noted common concerns among agencies about the potential impact and sensitivity of publicly sharing results that are less positive. In one participant's state, for example, agencies built buy-in to a linked postsecondary and workforce data system over time by starting with public reports that highlighted some of the positive results for postsecondary institutions. Areas in need of improvement were communicated more privately to enable institutions to take time to consider methods to address the needs. Over time, the participating institutions gained confidence that the data sharing and reporting were meant to be beneficial and used for improvement, not to cast shame on their work. As time progressed, data sharing and reporting became more open, and more institutions signed on.

Developing legislation to support data collection and use can help spark the motivation for establishing a data system while ensuring that guidelines are in place to maintain privacy safeguards. In the same state mentioned previously, postsecondary institutions eventually requested funding from the state legislature to support the effort in the long term.

Developing Structures and Partnerships to Manage Data Sharing With External Researchers

Long-term postsecondary data systems often are initially developed to address internal needs and answer key questions that district or state leaders have identified. How do the goals of external researchers fit in? In some cases, researchers' questions may align with those of the district or state. However, in many cases, researchers may be looking at questions at a national or regional level that are not a top priority at the local level. Participants provided two important considerations for creating productive research partnerships.

Identify Analyses That Benefit Both the District/State/IHE and the Researcher

Even if an external researcher is not conducting district- or state-specific research, there may be opportunities to share results or incorporate additional analyses that will benefit the district/state/IHE(s) involved. For example, one participant noted that their district requires researchers to present their findings at the end of the study, providing a slide deck or a short, practitioner-friendly brief describing study findings to the district. These types of exchanges can foster stronger relationships and collaboration among researchers and data offices.

Identify Opportunities for Partnerships

In cases in which researchers would like access to linked longitudinal data, creating formal partnerships and data-sharing agreements with districts or states that already have these systems in place may be beneficial. Because privacy regulations and guidelines may limit the types of data that can be shared externally, formal arrangements such as the Research Alliance for New York City Schools' partnership with NYCDOE or the University of Chicago Consortium on School Research's partnership with Chicago Public Schools may allow for researchers to collaboratively develop research agendas with state and district agencies such that both researchers and agencies have the capacity to address their questions of research and practice. For example, a participant from a district data and analytics group described how a research partner offered to write an R program⁵ that would enable the group to examine their data more easily. In some cases, external researchers may offer to provide school- or district-specific results of surveys or other analyses that can be used for their improvement efforts. States and districts may be more willing to contribute data to regional or national studies if, within their partnerships with researchers, they are able to increase their capacity to meet their research goals.

⁵ R is a programming language for data analysis and statistical computing.

Leveraging Data to Help Families, Students, and the Public Make Decisions

Convening participants discussed some of the challenges and considerations in making data publicly available, with the goal of helping families and community members make decisions about educational trajectories, school choices, and employment plans. Participants emphasized that sharing quantitative data alone is not enough to help the public become effective consumers of data. Rather, agencies and institutions should carefully consider their theory of change with respect to data sharing and shape the data interfaces and modes of sharing data accordingly. Participants noted that when sharing data to inform students' choice of postsecondary school, agencies should consider what data would be most important and understandable to students and families in this choice and through what venue and mode to present the data. For example, one participant described their state's efforts to post their data reports on the home page in local public libraries so that families and students who use the library's computers for college and career information will become aware of the reports.

Other types of supplementary information that are not available in data systems also may be needed to help families make informed decisions. For example, in one state, data suggested that careers in manufacturing have good wages. However, to convince families that students should pursue a career in manufacturing, they had to show families what the jobs look like, demonstrating that these jobs have become cleaner and safer over time.

Participants emphasized the importance of understanding the target population and user of the data. Although, ultimately, the goal may be to inform students' and families' decision making about colleges and careers, it may be more effective to tailor the data for intermediaries (e.g., guidance counselors or nonprofit organizations that work with students on college preparation), provide training and ongoing professional development to the intermediaries, and enable the intermediaries to use the tool to inform families in a more personal and targeted way, providing necessary context.

Finally, participants noted that data visualizations and tools often are built for one user, and then they are either shared or minimally adapted for other users. However, making a tool that was originally designed for internal state/district use, researchers, or politicians publicly available without sufficient adaptation may lead to confusion or misinterpretation. For community members and the public, designing a tool from the start that is easily understandable to a general audience and addresses the specific goals and knowledge base of families is beneficial. However, creating multiple tools and interfaces for different audiences requires time and resources, and therefore striking a balance between the creation of new tools and the modification of existing interfaces is important. Evaluation of community members' use of the data interfaces and the impact these interfaces have on users' choices can inform ongoing modifications and improvements to the design and types of information presented.

Participants emphasized that sharing quantitative data alone is not enough to help the public become effective consumers of data. Rather, agencies and institutions should carefully consider their theory of change with respect to data sharing and shape the data interfaces and modes of sharing data accordingly.

Fostering and Ensuring the Appropriate Use and Interpretation of Data

Participants emphasized that whenever data are shared and made public, attention must be paid to the messaging and complementary information provided to ensure that data are interpreted accurately and used in the intended way. For example, one participant described a scenario in which they found that a disproportionate number of students of color had dropped out of specific IHEs. Some may interpret this finding to mean that students of color will not be as successful at these IHEs, and therefore they should find other institutions to attend. However, the data also could be used to identify additional supports and preparation that students who want to attend these IHEs should have at the K–12 level so that more equitable outcomes can be achieved once they enroll. The data also could be used by the IHEs to identify the primary reasons students of color are dropping out and put in place measures to address those issues. In essence, a single finding can be interpreted and acted on differently by three different audiences depending on how they approach the data.

As another example, standardized test data may be used to identify certain students as requiring remediation at the start of college; however, research has shown repeatedly that some subgroups of students perform better on standardized tests than others (Hoffman & Lowitzki, 2005; Orfield & Wald, 2000).⁶ Remedial coursework increases the time required for degree completion, as well as the cost, and ultimately may lead to a higher chance of dropping out (Boatman & Long, 2018).⁷ More detailed data on students' coursework, academic needs, and financial needs could help IHEs more effectively target students for remediation and inform the development of alternatives. For example, one participant's district had moved away from relying on test scores to determine who needs remediation, instead considering students' performance in high school. Data were then used to create a summer bootcamp as an alternative to remediation.

These examples underscore how important it is that context and explanation accompany quantitative findings. Analyses should generate just as many questions as answers, and it is critical that those who present data include relevant context and considerations, and that stakeholders question what the data are communicating. Simple statistics alone can be misleading and misinterpreted.

⁶ Hoffman, J. L., & Lowitzki, K. E. (2005). Predicting college success with high school grades and test scores: Limitations for minority students. *The Review of Higher Education*, 28(4), 455-474; Orfield, G., & Wald, J. (2000). Testing, testing. *The Nation*, 270(22), 38-40.

⁷ Boatman, A., & Long, B. T. (2018). Does remediation work for all students? How the effects of postsecondary remedial and developmental courses vary by level of academic preparation. *Educational Evaluation and Policy Analysis*, 40(1), 29-58.

Conclusion

In summary, the *Following Students After Graduation* convening provided a snapshot of the current state of how districts, states, and organizations are tracking students' longer term outcomes and the challenges they face in collecting, linking, analyzing, and sharing these outcomes with relevant audiences. One reason the development and maintenance of these longitudinal data systems is so complex is the array of parties contributing to them and using them (e.g., state education agencies, IHEs, labor agencies) as well as other audiences (e.g., students and families, policymakers) that may potentially benefit from them.

District, IHE, and state data analysts may serve as the main audience for longitudinal data systems given their knowledge of the data, familiarity with local context, and the technical skills required to appropriately analyze and interpret the data. From a policy perspective, local politicians and government agency officials also may be a primary audience because they have the power to enact legislation and allocate funding based on analysis findings. Although most convening participants agreed that the ultimate beneficiaries should be students and their families, it was not always clear whether students and their families should be seen as the main consumers of the data, or whether an intermediary (e.g., guidance counselors, college advisors) should interpret and convey key patterns or findings. Finally, although states, districts, and IHEs may have their own purposes for developing and maintaining these data systems, external researchers also may seek to gain access to them to address their own research goals. Given this playing field of actors invested in the creation and analysis of longitudinal data systems, it is not surprising that many systems face obstacles along the way related to setting goals for the data system, establishing data governance protocols, and obtaining buy-in from relevant stakeholders and champions.

In this paper, we have highlighted the successes of several states in overcoming many of these challenges. In some states, legislation cleared the path for the creation of linked data systems and sustained sources of funding to allow data systems to thrive. The states, districts, and organizations that convening participants represented varied in the nature of their data systems, including the goals around which systems were created, the ease with which external researchers may access individual-level data, and the extent to which data interfaces were flexible to meet the needs of various data consumers. However, convening participants were unanimous in their support for maintaining and growing these longitudinal data systems and fostering their use, with a particular eye on how these data systems may be used to improve equitable educational opportunities and outcomes for their students.

One overarching message from the meeting was the importance of establishing relationships among and buy-in from stakeholders to build recognition of the mutual benefits that a comprehensive linked data system can have for *all* groups, including greater efficiency and enhanced ability to answer important questions through data analysis. The key is to demonstrate how the linked data system provides more effective or efficient access to data than current segregated data systems or presents answers to current and timely questions. For example, linked data systems may be able to shine a light on the longer term outcomes of students who do not graduate. Greater availability of data on postsecondary education, workforce, and civic outcomes can open the door to more in-depth and comprehensive evaluations of education programs and studies of instructional approaches and strategies, which will help districts, states, and IHEs achieve the broad goal of improving long-term outcomes for the next generation of learners.

Appendix A. Agenda

Tuesday, October 1, 2019

Time	Session
9:00–10:00 a.m.	Registration
10:00–10:30 a.m.	Welcome, Introductions, and Opening Remarks
10:30 a.m.–12:00 p.m.	Connecting K–12 and Postsecondary Data—Goals and Systems In this session, participants will identify and discuss the primary goals for tracking and linking K–12, postsecondary education, and workforce outcomes; the data systems available for this work; and the major challenges facing states and districts.
12:00–1:00 p.m.	Lunch
1:00–2:00 p.m.	Supporting Student Success Through Postsecondary Data Use (Part 1) In this session, we will discuss how long-term postsecondary outcome data can be used to support student success. The session will focus on ways in which data can be used to inform school and district improvement efforts, to conduct internal and external research, and to inform individual students' goals and trajectories.
2:00–3:15 p.m.	Ensuring Data Quality As students graduate, move to other cities or states, and embark on different paths, ensuring accuracy of postsecondary data becomes more challenging. In this session, participants will discuss key issues of data quality and the challenges associated with ensuring data quality across a range of measures.
3:15–3:30 p.m.	Break
3:30–4:45 p.m.	Addressing Governance and Privacy Issues to Support Data Use Policies at the state and local levels can both support and hinder the tracking and linking of K–12, postsecondary education, and workforce outcomes. In this session, we will discuss what policies and flexibilities can support the development of linked postsecondary outcome data systems and discuss strategies to address student privacy within the systems.

Time	Session
4:45–5:00 p.m.	<p>Reflections, Preview of Day 2, and Adjourn</p> <p>Participants will share their main takeaways from the day’s discussions. Participants also will select and vote on specific topics for the problem of practice discussions on Day 2. Convening facilitators will provide an overview of Day 2’s sessions.</p>
6:00–7:30 p.m.	Optional Networking Dinner

Wednesday, October 2, 2019

Time	Session
8:00–9:00 a.m.	Breakfast
9:00–9:30 a.m.	Additional Reflections From Day 1 and Overview of Problem of Practice Discussion Sessions
9:30–10:30 a.m.	<p>Problem of Practice Discussion 1</p> <p>In this session, participants will engage in small-group discussions around specific problems of practice.</p>
10:30–10:45 a.m.	Break
10:45–11:45 a.m.	<p>Problem of Practice Discussion 2</p> <p>In this session, participants will engage in small-group discussions around specific problems of practice.</p>
11:45 a.m.–12:00 p.m.	<p>Problem of Practice Discussion Debrief</p> <p>We will share out the key takeaways from the problem of practice discussions.</p>
12:00–12:45 p.m.	Lunch

Time	Session
12:45–2:30 p.m.	Supporting Student Success Through Postsecondary Data Use (Part 2) In this session, we will return to the discussion on how to more effectively use long-term postsecondary outcome data to support student success, with specific focus on reporting and data visualization strategies.
2:30–3:00 p.m.	Reflections, Next Steps, and Adjourn We will debrief and share the main takeaways from the two days of discussions. We also will discuss next steps with respect to preparing a white paper based on the convening’s discussions.

Appendix B. Convening Participants

Convening participants included the following:

- Jorge A. Aguilar, Superintendent, Sacramento City Unified School District
- Anthony Battaglia, Director of Career and College Readiness, Cleveland Metropolitan School District
- Catherine Bitter, Senior Researcher, AIR
- Michelle Blackwell, Manager of Data Partnerships, National Student Clearinghouse
- Victoria Cirks, Principal Technical Assistance Consultant, AIR
- Scott Davis, Principal Economic Researcher, AIR
- Eric D. Flowers, Chief Opportunity Officer, Arkansas Department of Education
- Michael Garet, Vice President, AIR
- Chris Graves, Senior Manager, Analytics and Information Management, Shelby County Schools
- Gina Johnson, Senior Associate, NCHEMS
- James Kemple, Executive Director, Research Alliance for New York City Schools
- Jan Kiehne, Senior Associate for Decision Support Resources, Connecticut State Colleges and Universities
- Patrick Lane, Vice President, WICHE
- Matt Linick, Senior Researcher, AIR
- Tod Massa, Policy Analytics Director, State Council of Higher Education for Virginia
- Keren Zuniga McDowell, Executive Director, District Performance Office, School District of Philadelphia
- Travis Muncie, Director, Data and Advanced Analytics, Kentucky Council on Postsecondary Education
- Paula Nissen, Lead Education Program Consultant, Iowa Department of Education
- Jennifer O'Day, Institute Fellow, AIR
- Christa Poindexter, Research Associate, AIR
- Jim Schmidt, Director, Washington State Education Research and Data Center
- Scott Secamiglio, Visual Analytics and Strategy Director, Kentucky Center for Statistics
- Allison Smith, Manager, District Performance Office, School District of Philadelphia
- Susan Therriault, Managing Researcher, AIR
- Rachel Vilsack, Agency Performance Manager, Minnesota Department of Employment and Economic Development
- Alexandria Walton-Radford, Managing Researcher, AIR
- Julie Yu, Data and Policy Manager, San Francisco Unified School District
- Kristina Zeiser, Senior Researcher, AIR

To learn more about AIR's *Following Students After Graduation* convening, contact Kristina Zeiser at kzeiser@air.org.



AMERICAN INSTITUTES FOR RESEARCH®

1400 Crystal Drive, 10th Floor
Arlington, VA 22202-3239
202.403.5000

About the American Institutes for Research

Established in 1946, with headquarters in Arlington, VA, the American Institutes for Research® (AIR®) is a nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance, both domestically and internationally, in the areas of education, health, and the workforce. For more information, visit www.air.org.

Notice of Trademark: "American Institutes for Research" and "AIR" are registered trademarks. All other brand, product, or company names are trademarks or registered trademarks of their respective owners.



American Institutes for Research®, 2020

Copyright © 2020 American Institutes for Research®. This report is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) license. You must give appropriate credit and provide a [hyperlink](#) to the license. You may not use the material for commercial purposes. If you remix, transform, or build upon the material, you may not distribute the modified material without permission from the American Institutes for Research. For permission requests, please use the Contact Us form on www.air.org.

Suggested citation: Bitter, C., Zeiser, K., Cirks, V., Jeffreys, A., & Pitcher, M. (2020). *Following students after graduation: Best practices for tracking postsecondary and workforce outcomes*. Washington, DC: American Institutes for Research.